

**PURE
PERFORMANCE**[™]

RNC SERIES
INSTALLATION GUIDE

69-RNC-INSTALL 0620



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LOCATION.....	2
PRE-INSTALLATION NOTES	3
SIMPLIFIED INSTALLATION (RETURN/RETURN METHOD).....	4
PARTIALLY DEDICATED SYSTEM.....	5
FULLY DEDICATED SYSTEM,	6
HANGING STRAP INSTRUCTIONS	7
MOUNTING INSTRUCTIONS FOR RNC4 MODELS	8
DRAIN CONNECTION.....	9
DRAIN CONNECTION FOR RNC4 MODELS	10
GRILLES	11
GRILLE FITTINGS.....	12
LIFEBREATH WEATHERHOOD AND WEATHER HOOD REQUIREMENTS	13
DUAL HOOD.....	14
MAIN CONTROL INSTALLATION	15
MECHANICAL TIMERS INSTALLATION.....	16
INSTALLATION AND OPERATION OF 20/40/60 MINUTE TIMER: DET02	17
INSTALLATION AND PAIRING OF REPEATERS: 99-RX02	18
INSTALLER SELECTABLE HIGH-SPEED SETTINGS	18
INSTALLATION AND OPERATION OF 20/40/60 MINUTE TIMER: DET01	19
DIMENSIONAL MODEL DRAWINGS – RNC4-TPD/TPF	20
DIMENSIONAL MODEL DRAWINGS – RNC5-HEX-TPD/TPF	21
DIMENSIONAL MODEL DRAWINGS – RNC5-TPD/TPF/RNC6-ES.....	22
DIMENSIONAL MODEL DRAWINGS – RNC95 AND RNC 155.....	22
DIMENSIONAL MODEL DRAWINGS – RNC200 AND RNC205.....	23
BALANCING THE AIRFLOWS	24
DETERMINING THE CFM	25
BALANCING COLLAR INSTRUCTIONS	26
BALANCING THE AIRFLOW USING DOOR PORTS.....	27
BALANCING DOOR PORT ILLUSTRATIONS	28
AIRFLOW REFERENCE CHART- RNC4-TPD.....	29
AIRFLOW REFERENCE CHART- RNC4-TPF	30
AIRFLOW REFERENCE CHART- RNC5-TPD/TPF.....	31/32
AIRFLOW REFERENCE CHART- RNC6-ES	33/34
AIRFLOW REFERENCE CHART- RNC5-HEX-TPD/TPF	35/36
AIRFLOW REFERENCE CHART- RNC155	37/38
AIRFLOW REFERENCE CHART- RNC205	39/40
AIRFLOW REFERENCE CHART- RNC200	41
TROUBLESHOOTING.....	42

Location - Installation Notes

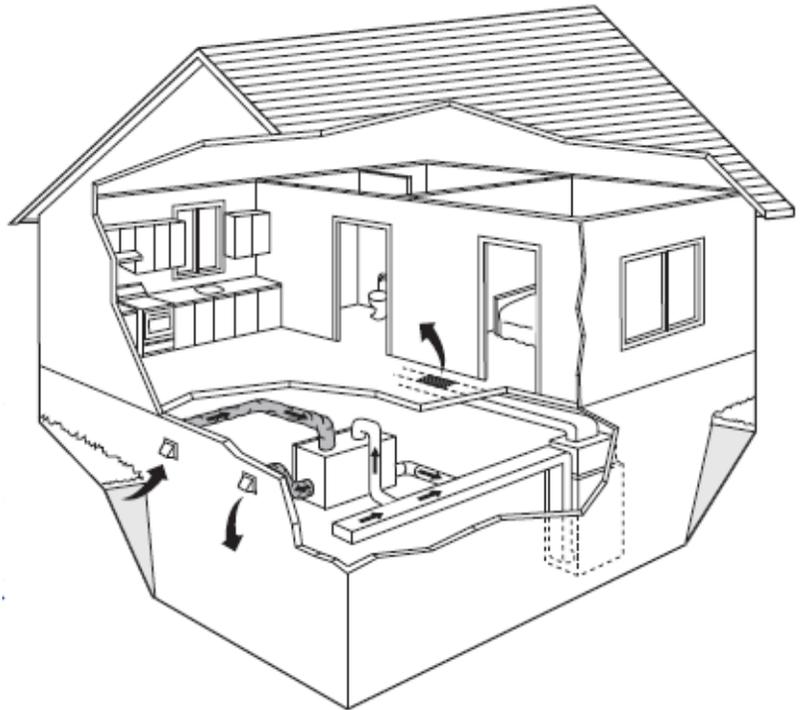
Install the unit in a heated space that provides clearance for service access. A typical location is in either a mechanical room or an area close to the outside wall within close proximity to where the weatherhoods are mounted. If a basement area is inconvenient or non-existent, install the unit in a utility room or laundry room.

Attic installations are not recommended due to

- The complexity of work to install
- Freezing conditions in the attic
- Difficulty of access for servicing and cleaning

If attic installation is necessary the unit must be situated in a conditioned space.

Leave sufficient clearance at the front of the access door for servicing the air filters and core. The recommended clearance is a minimum of 25 in (635 mm) for opening and closing the door. Airia provides four straps for hanging the unit from the basement floor joists.



Pre-Installation Notes

Read this notice before installing unit:

Note

- Due to ongoing research and product development, specifications, ratings, and dimensions are subject to change without notice. Refer to www.LIFEBREATH.com for the latest product information.

⚠ Attention

- Do not apply electrical power to the unit until after the completion of the installation (including installation of low voltage control wiring).
- Ensure the installation and wiring is in accordance with CEC, NEC, and local electrical codes.
- Plug the unit into a standard designated (120 VAC) electrical outlet with ground.
- The use of an extension cord with this unit is not recommended. If the installation requires further wiring, have a licensed electrician make all of the electrical connections. The recommended circuit is a separate 15 A/120 V circuit.

⚠ Caution

- Before installation, careful consideration must be given to how this system will operate if connected to any other piece of mechanical equipment, i.e. a forced air furnace or air handler, operating at a higher static. After installation, the compatibility of the two pieces of equipment must be confirmed, by measuring the airflows of the HRV, by using the balancing procedure found in this manual. Never install a ventilator in a situation where its normal operation, lack of operation or partial failure may result in the backdrafting or improper functioning of vented combustion equipment.
- Unit must be installed level to ensure proper condensate drainage. Due to the broad range of installation and operational conditions, consider the possibility of condensation forming on either the unit or connecting ducting. Objects below the installation may be exposed to condensate.
- Do not install control wiring alongside electrical wire.

⚠ Warning

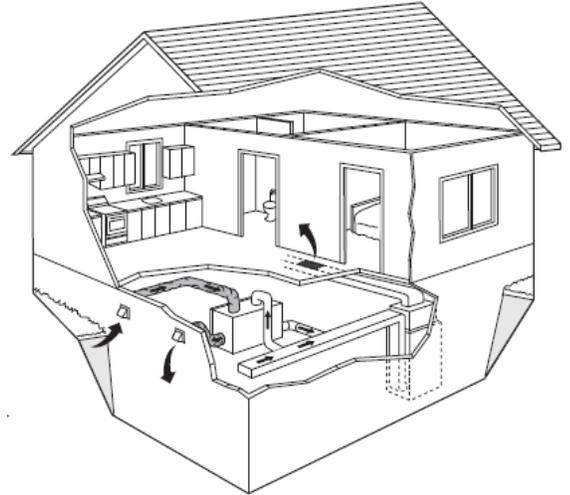
- Disconnect the power from the unit before cleaning or servicing
- To prevent electrical shock, it is extremely important to confirm the polarity of the power line that is switched by the safety (disconnect) switch. The hot line (black) is the proper line for switching. Use either a voltmeter or test lamp to confirm the absence of a voltage between the disconnect switch and ground (on the cabinet) while the door is open. This procedure must be followed, as dwellings are occasionally wired improperly. Always ensure the proper grounding of the unit.
- Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a qualified installer or service agency.



Simplified Installation (Return/Return Method)

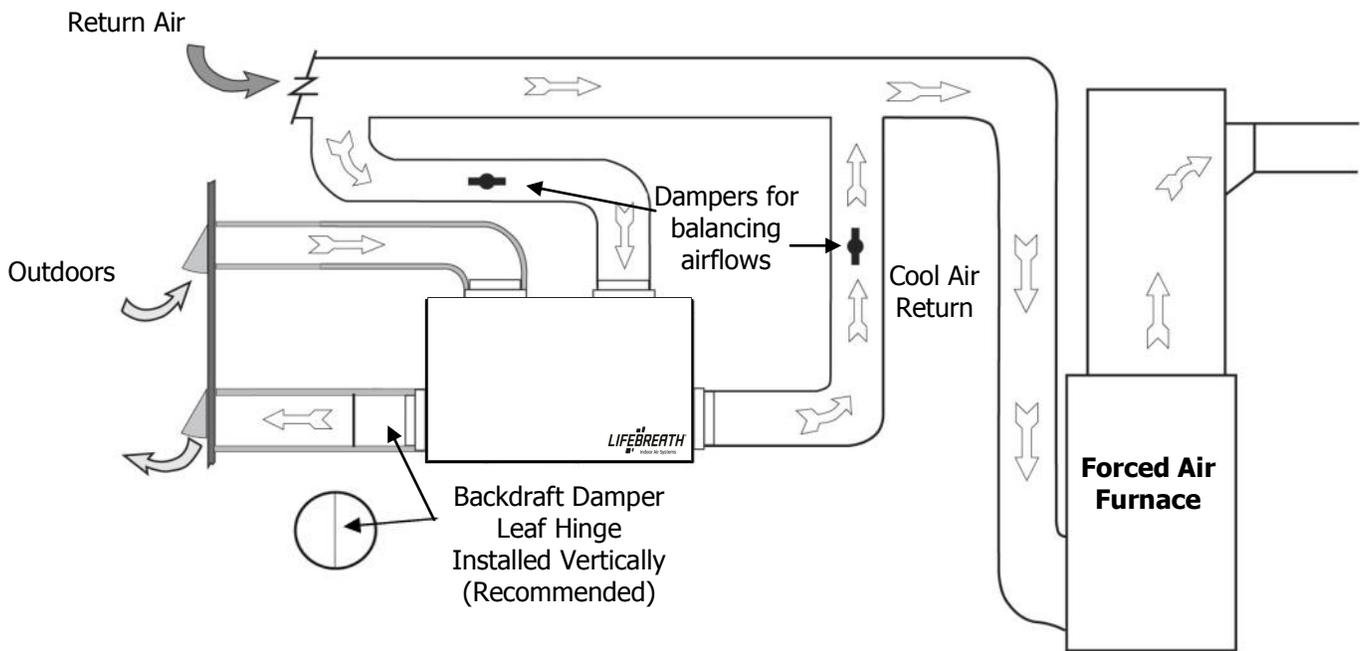
Installation Notes

- The HRV must be balanced.
- Unit should be balanced on high speed with the furnace blower on.
- It is mandatory that the furnace blower run continuously or HRV operation be interlocked with the furnace blower.
- The duct configuration may change depending on the HRV model.
- A backdraft damper is recommended in the exhaust air duct to prevent outdoor air from entering the unit.
- The airflow must be confirmed on site using the balancing procedures found in this guide.



Spring-Loaded Backdraft Damper (Recommended)

Install the backdraft damper with the leaf hinge vertical. The damper is installed on the "Stale Air to Outside Collar"



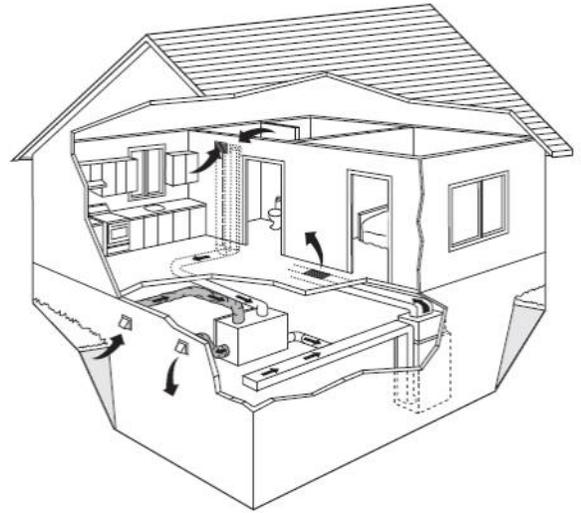
⚠ Attention/Warning

- **Check local codes/authority having jurisdiction for acceptance.**
- Applications such as greenhouses, atriums, swimming pools, saunas, etc. have unique ventilation requirements which should be addressed with an isolated ventilation system.
- Weatherhood arrangement is for drawing purposes only. Check local codes/authority having jurisdiction for acceptance.
- Backdraft dampers are recommended for the stale air to outside air duct. This damper prevents outdoor air from entering the HRV during the operation of the furnace/air handler while the HRV is in standby, off, or recirculating.

Partially Dedicated System

Installation Notes

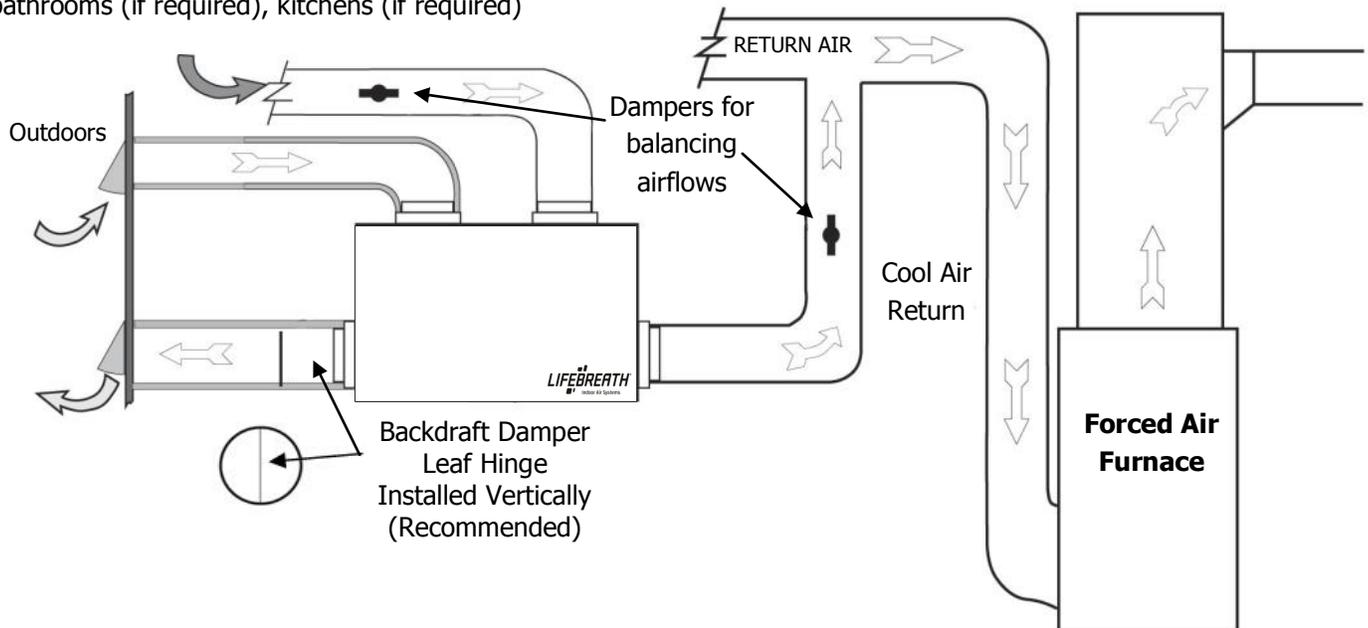
- The HRV must be balanced.
- Unit should be balanced on high speed with the furnace blower on.
- It is recommended that the furnace blower run continuously or HRV operation be interlocked with the furnace blower. Refer to building code.
- The duct configuration may change depending on the HRV model.
- A backdraft damper is recommended in the exhaust air duct to prevent outdoor air from entering the unit.
- The airflow must be confirmed on site using the balancing procedures found in this guide.



Spring-Loaded Backdraft Damper (Recommended)

Install the Backdraft Damper with the leaf hinge vertical. The damper is installed on the "Stale Air to Outside Collar"

EXHAUST AIR from various parts of home. i.e. bathrooms (if required), kitchens (if required)



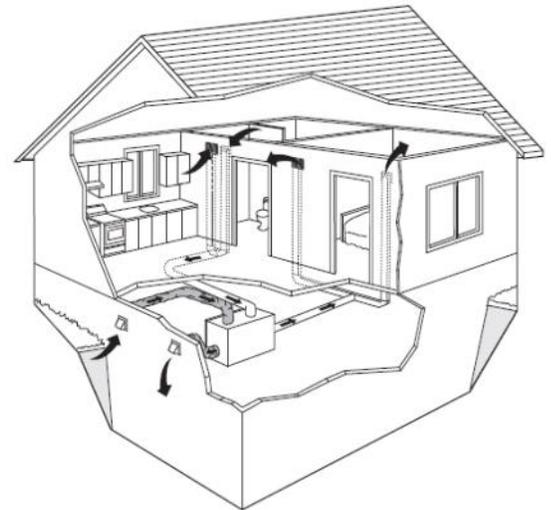
! Attention/Warning

- **Check local codes/authority having jurisdiction for acceptance.**
- Applications such as greenhouses, atriums, swimming pools, saunas, etc. have unique ventilation requirements which should be addressed with an isolated ventilation system.
- Weatherhood arrangement is for drawing purposes only. Check local codes/authority having jurisdiction for acceptance.
- Backdraft dampers are recommended for the stale air to outside air duct. This damper prevents outdoor air from entering the HRV during the operation of the furnace/air handler while the HRV is in standby, off, or recirculating.

Fully Dedicated System

Installation Notes

- The HRV must be balanced.
- When balancing, all external exhaust systems should be turned off (i.e. range hood, dryer exhaust, bathroom vents).
- All exhausting appliances should have their own make-up air, as this is not an intended use of the HRV system.
- The duct configuration may change depending on the HRV model.
- The airflow must be confirmed on site using the balancing procedures found in this guide.

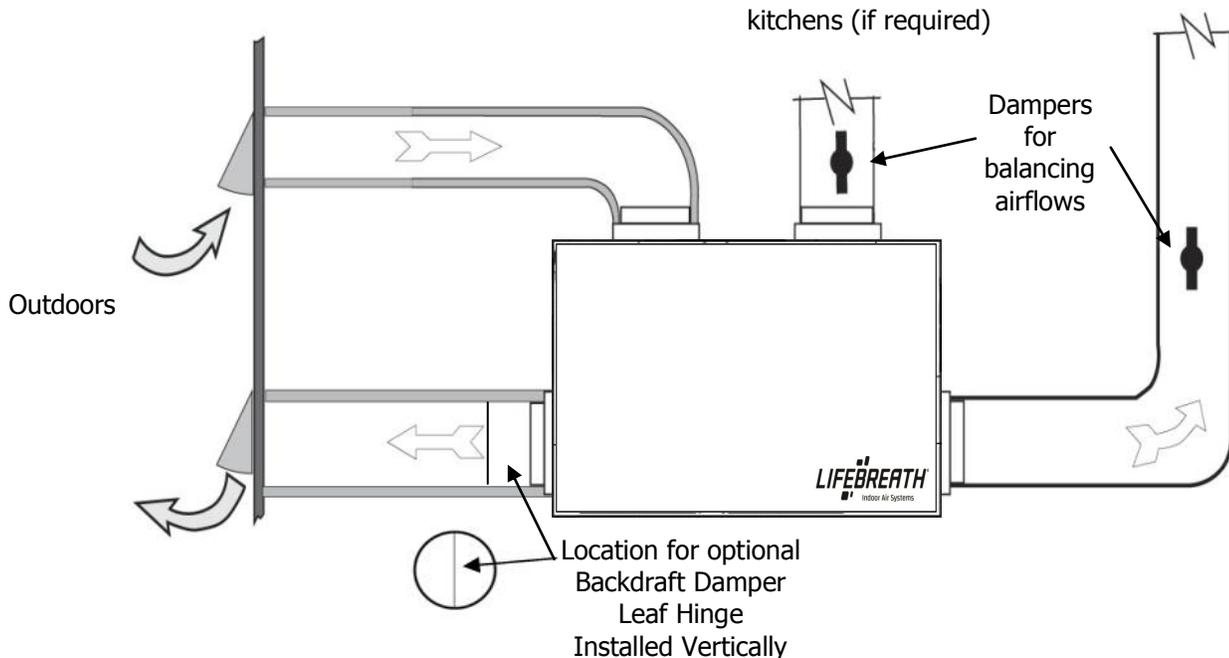


Spring-Loaded Backdraft Damper (Recommended)

There is a location for an optional Backdraft Damper with the leaf hinge vertical. The damper is installed on the "Stale Air to Outside Collar"

Fresh air to house:
main living areas,
bedrooms, living
room, rec. room etc.

Stale air from various
parts of home i.e.
bathrooms (if required)
kitchens (if required)



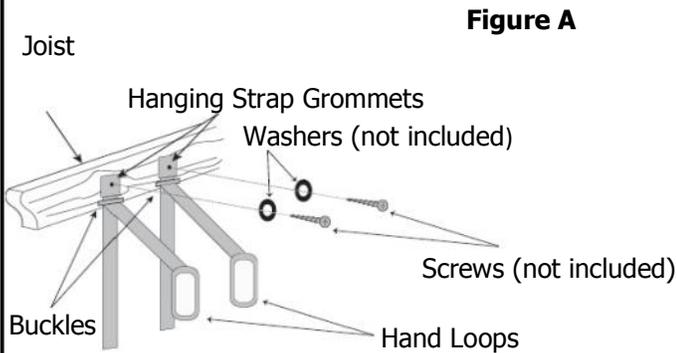
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- **Check local codes/authority having jurisdiction for acceptance.**
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- Weatherhood arrangement is for drawing purposes only. Check local codes/authority having jurisdiction for acceptance.
- Backdraft dampers are recommended for the stale air to outside air duct. This damper prevents outdoor air from entering the HRV during the operation of the furnace/air handler while the HRV is in standby, off, or recirculating.

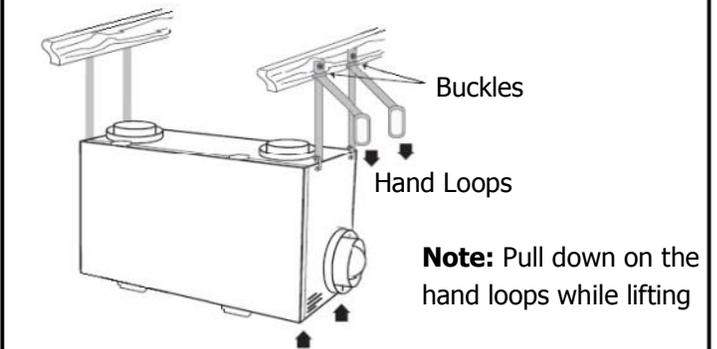
Hanging Straps - Installation Notes except RNC4-TPD/TPF

Use 4 screws and 4 washers (not provided) to attach the hanging straps to the floor joists. The washer must be wider than the eyelet of the grommet on the hanging strap. The hanging straps are designed to reduce the possibility of noise, resonance and harmonics.

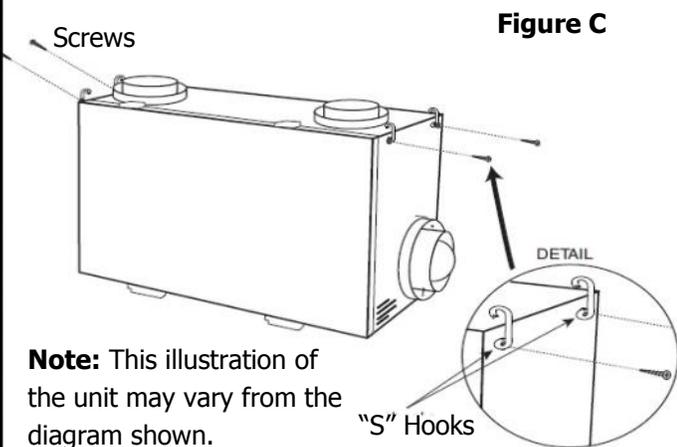
Step 1: Insert the screws and washers (not included) through the hanging strap grommets and fasten to the joists.



Step 3: Hook the bottom grommets of the straps through the "S" hooks. Pull down vertically on the handle loops while lifting the bottom of the unit.



Step 2: Unscrew the 4 machine screws located on the upper side of the unit. Attach the "S" hooks and reinsert the machine screws.



Step 4: Level the unit from right to left to right and front to back. Adjust the unit up by pulling down vertically on the hand loops while lifting up on the bottom of the cabinet.

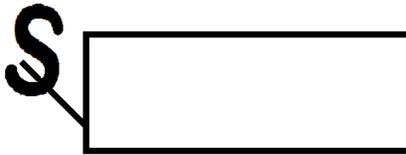
Step 5: Fold the hand loops in excess strap and secure with a nylon tie (not included).

Attention

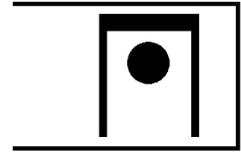
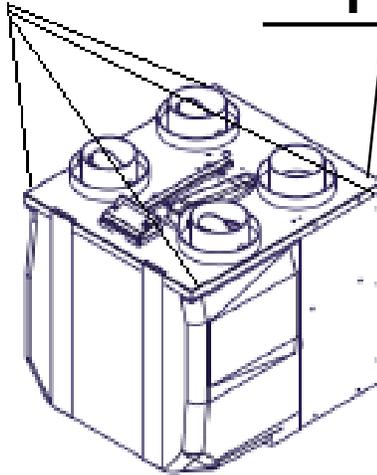
- Must push up on the bottom of the HRV when pulling the hanging straps.

Mounting the RNC4-TPD and RNC4-TPF Units:

1. Begin by locating the four mounting tabs on the left and right sides of the unit, at the front and back.
2. Using a flat / slot screwdriver, bend out the four tabs to approximately 45°.
3. Once the tabs have been all bent outwards, insert the "S" hooks through the four holes on the tabs.



Four Mounting Points



4. Continue with mounting the HRV using the instructions found on page 8.

Drain Connection

Installation Notes **except RNC4-TPD/TPF see page 10**

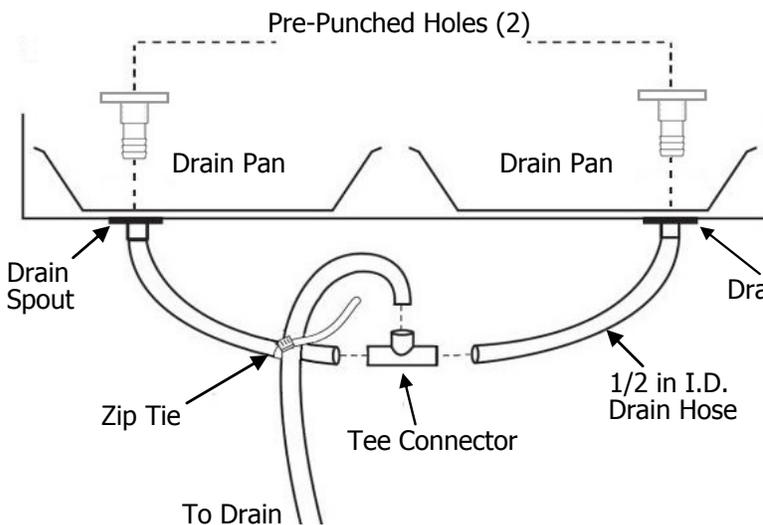
The HRV cabinet has pre-punched holes for the drain (see below).

The HRV may produce some condensation during a defrost cycle. This water should flow into a nearby drain, or be taken away by a condensate pump.

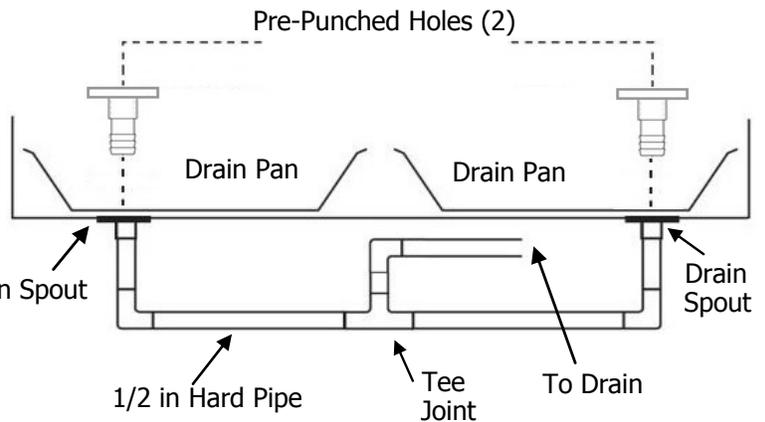
1. Insert the drain spout through the hole in the drain pan.
2. Tighten the nut which holds the drain spout in place.
3. Construct a P-trap using the plastic tee connector. (see below)
4. Cut two lengths of 1/2 in drain hose (not included) and connect the other ends to the two drain spouts.
5. Position the tee connector to point upward and connect the drain line.
6. Tape or fasten base to avoid any kinks.
7. Pour a cup of water into the drain pan of the HRV after the drain connection is complete. This creates a water seal which will prevent odours from being drawn up the hose and into the fresh air supply of the HRV.

The HRV cabinet has pre-punched holes for the drain (see below).

Drain Hose Plumbing



Hard Pipe Plumbing



Caution

- The HRV and all condensate lines must be installed in a space where the temperature is maintained above the freezing point or freeze protection must be provided.
- Drain trap and tubing must be below bottom of door with 1/4 in per foot downwards slope away from unit.
- A secondary drain pan may be required to protect from condensate leakage.

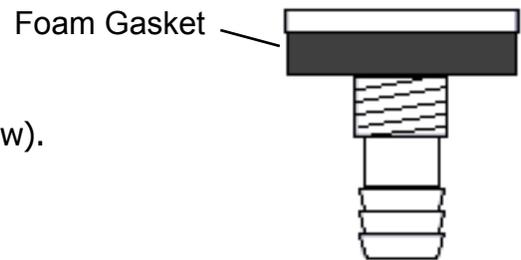
Drain Connection For RNC4-TPD and RNC4-TPF models

Installation Notes

The HRV cabinet has pre-punched holes for the drain (see below).

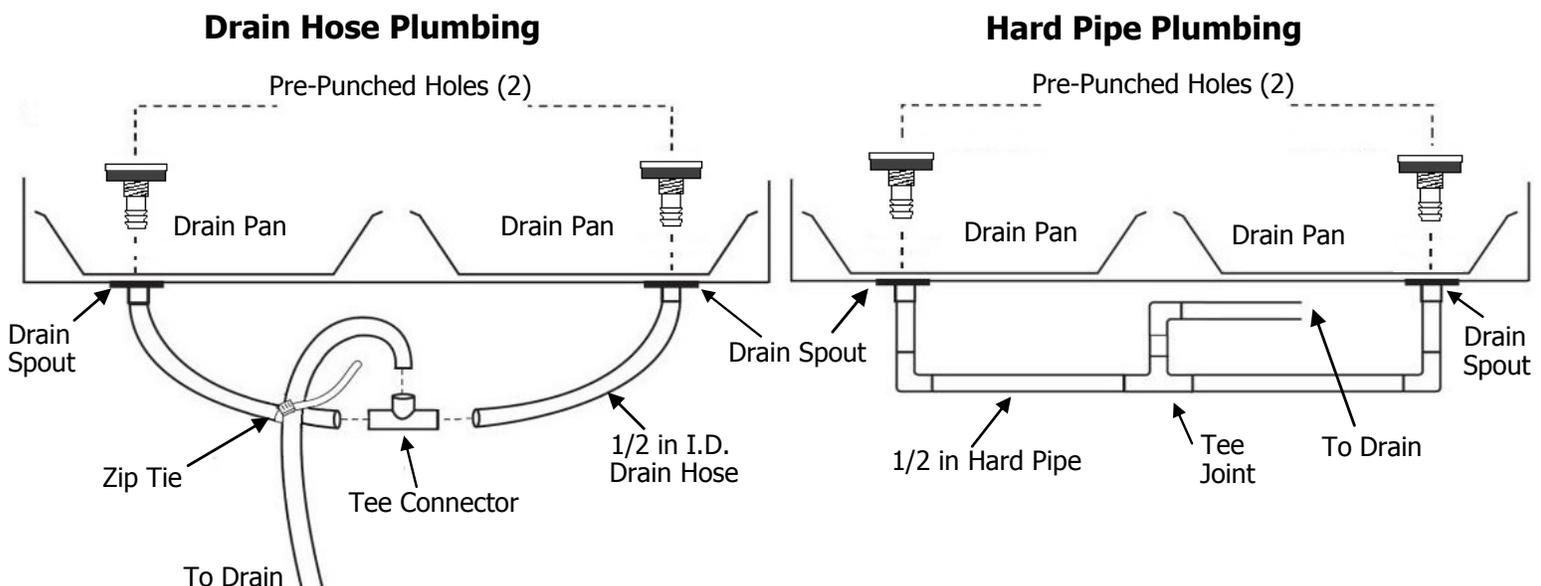
The HRV may produce some condensation during a defrost cycle. This water should flow into a nearby drain, or be taken away by a condensate pump.

1. Ensure that the drain spout has a foam gasket on the bottom of the head. See figure below.
2. Insert the drain spout through the hole in the drain pan.
3. **HAND TIGHTEN** the nylon nut which will hold the drain spout in place.
4. Construct a P-trap using the plastic tee connector.
5. Cut two lengths of 1/2 in drain hose (not included) and connect the other ends to the two drain spouts.
6. Position the tee connector to point upward and connect the drain line.
7. Tape or fasten to avoid any kinks.
8. Pour a cup of water into the drain pan of the HRV after the drain connection is complete. This creates a water seal which will prevent odours from being drawn up the hose and into the fresh air supply of the HRV.



The HRV cabinet has pre-punched holes for the drain (see below).

CAUTION: HAND TIGHTEN ONLY



⚠ Caution

- The HRV and all condensate lines must be installed in a space where the temperature is maintained above the freezing point or freeze protection must be provided.
- Drain trap and tubing must be below bottom of door with 1/4 in per foot downwards slope away from unit.
- A secondary drain pan may be required to protect from condensate leakage.

Grilles

Adjustable grilles should be used to balance the flow rates into and out of various rooms. The grilles should not be adjusted after balancing the unit.

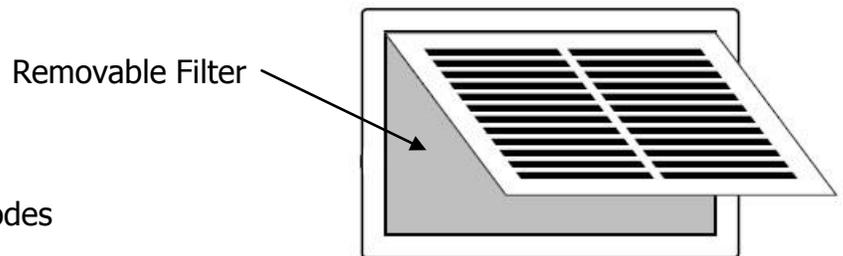
Grilles or diffusers should be positioned high on the wall or in the ceiling. Kitchen exhaust should never be connected to the range hood. They should be installed at least 4 ft (1.2 m) horizontally away from the stove.

Field supplied balancing dampers should be installed external to the unit to balance the amount of stale air being exhausted with the amount of fresh air being brought into the house. Refer to airflow balancing section.

The Lifebreath Kitchen Grille

(part# 99-10-002 6 in x 10 in)

The Lifebreath Kitchen Grille includes a removable grease filter. Most building codes require that kitchen grilles are equipped with washable filters.



The Lifebreath TechGrille

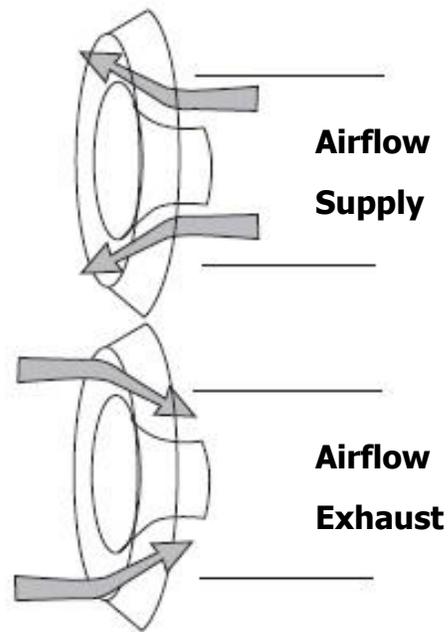
The TechGrille is a round, fully adjustable grille, which provides quiet air distribution.

4 in (100 mm) Part # 99-EAG4

5 in (125 mm) Part # 99-EAG5

6 in (150 mm) Part # 99-EAG6

8 in (200 mm) Part # 99-EAG8



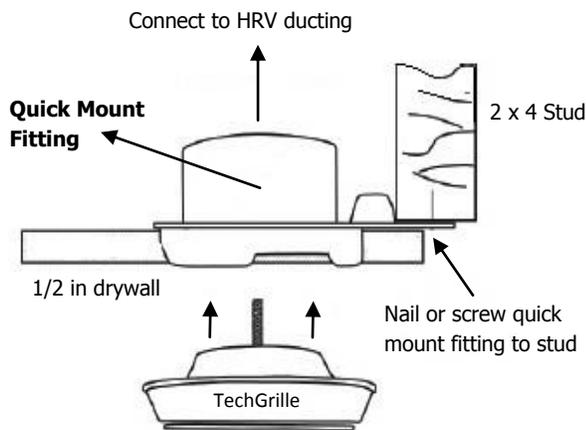
Grille Fittings

Quick Mount Fitting

(part # 99-QM6)

Use this rough-in fitting before the drywall is installed.

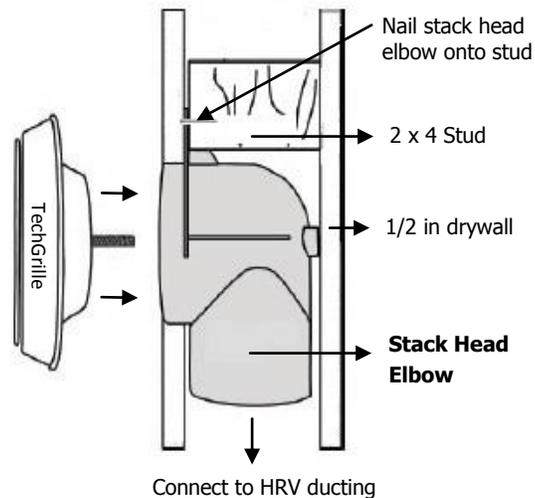
- Nail fitting onto the stud.
- Available size: 6 in.



Stack Head Elbow (part # 99-WF4 / 99WF6)

Use this rough-in fitting before the drywall is installed. This fitting is ideal for running ducting through 2 x 4 (min.) studded walls.

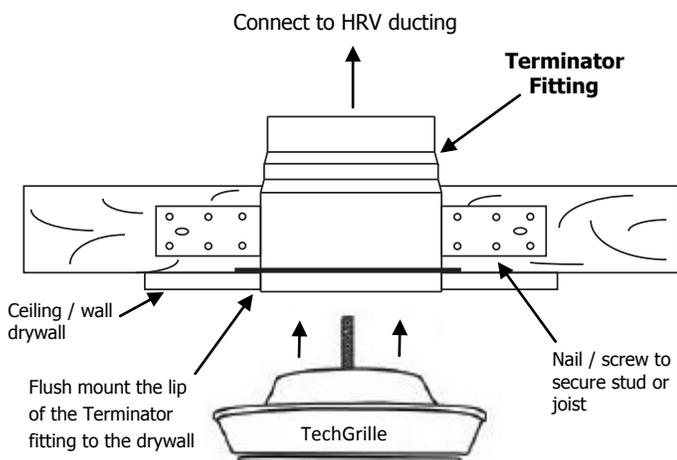
- Nail to stud.
- Available sizes are 4 in and 6 in.



Terminator Fitting (part # 99-TM 4/5/6)

Use this rough-in fitting before the drywall is installed.

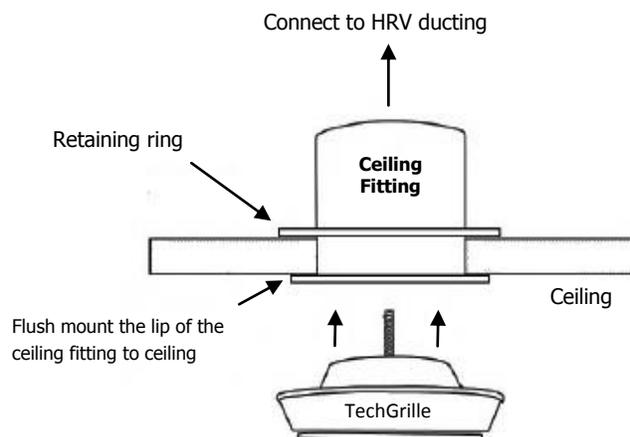
- Nail or screw fitting onto the stud or joist.
- Available sizes: 4 in, 5 in and 6 in.
- Use this rough-in fitting before the drywall is installed.
- Adapts to ridged and flex ducting
- Strong attachment for grilles, either vertically or horizontally



Suspended Ceiling Fitting (part # 99-CF6)

Use this fitting for ceiling tiles or finished/installed drywall.

- Cut a hole through the ceiling tile, insert the fitting and use the retaining ring to hold the fitting in place.
- For finished/installed drywall, use caulking around the lip if you do not have access to attach the retaining ring.
- Available size: 6 in.



! Caution

- Do not mount exhaust grille within 4 ft (1.2 m) (horizontally) of a stove to prevent grease from entering the unit.

Lifebreath Weatherhood

Fixed covered weatherhoods have a built-in bird screen with a 1/4 in (6 mm) mesh to prevent foreign objects from entering the ductwork.

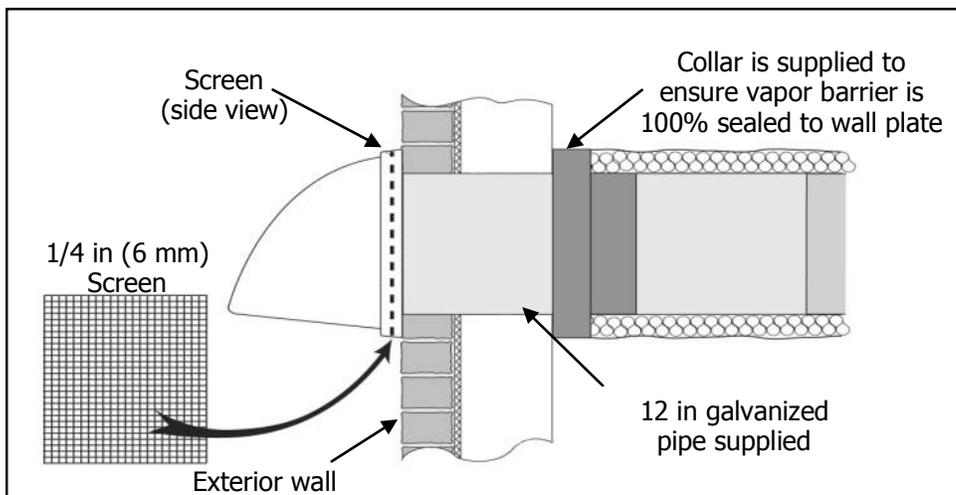
Installation Notes

The inner and outer liners of the flexible insulated duct must be clamped to the sleeve of the weatherhoods (as close to the outside as possible) and the appropriate port on the HRV. It is very important that the fresh air intake line be given special attention to make sure it is well sealed. A good bead of high quality caulking (preferably acoustical sealant) will seal the inner flexible duct to both the HRV port and the weatherhood prior to clamping.

The flexible insulated duct that connects the two outside weatherhoods to the HRV should be stretched tightly and be as short as possible to minimize air flow restrictions.

Twisting or folding the duct will severely restrict airflow.

Hard (rigid) ducting which has been sealed and insulated should be used for runs over 10 ft (3.3 m). Refer to your local building code.



Weatherhood Requirements

- **Check local codes/authority having jurisdiction for acceptance and spacing requirements for weatherhoods.**

- Do not locate in garage, attic or crawl space.

Intake:

- Should be located upstream (if there are prevailing winds) from the exhaust outlet.
- Not near dryer vents, furnace exhaust, driveways, oil fill pipes, gas meters, or garbage containers.

Exhaust:

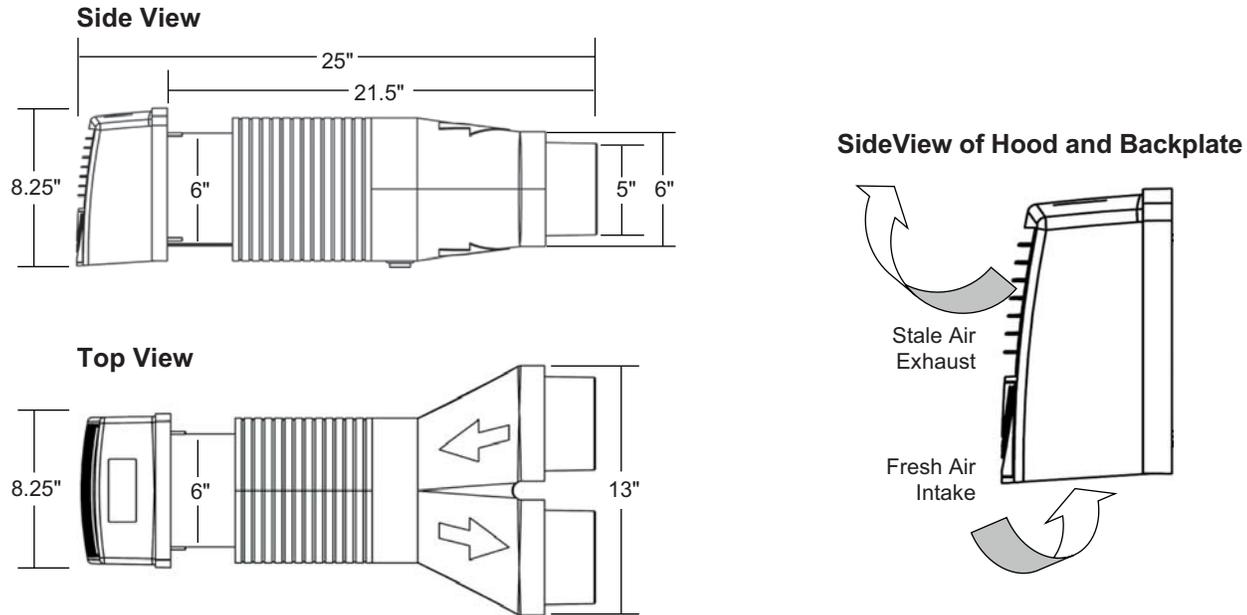
- Not near a gas meter, electric meter or a walkway where fog or ice could create a hazard.

! Attention

- **Contact your local building authority before installation of the Dual Hood to verify compliance with local building codes.**

Dual Hood Part 99-190/99-194

With the Lifebreath Dual Hood, only one 6 in hole is required in the exterior wall to complete two connections: fresh air intake and stale air exhaust.



Note

- Tested by: National Research Council Canada
- Program: Building Regulations for Market Access Report Number: A1-007793
- Report Date: 15 February 2016
- Found to comply with requirement as set in the NBC

! Attention/ Caution

- **Contact your local building authority before installation of the Dual Hood to verify compliance with local building codes.**

Caution:

- Sealant must be applied as per instructions or leakage and condensation may occur.
- Insulate the Fresh Air Supply and Stale Air Exhaust duct work back to the unit.

Main Control Installation

The **Lifebreath Digital Control 99-DXPL02** is to be surface mounted onto a wall and the **Lifebreath Ventilation Controls 99-BC02, 99-BC03 and 99-BC04** may either be installed onto a flush mounted electrical switch box or surface mounted onto a wall. Only one master control should be installed to a ventilation system (the face plate on this illustration may not be exactly the same as yours).

Attention

- Pay special attention not to damage the contact pins when removing and detaching the face plate (Figures B and C).

- For DXPL02 control**, remove the operating instructions card from the top of the control (Figure A).
- Separate the face plate from the back plate by firmly pulling apart (Figures B or C). Be careful not to damage face plate contact pins.
- For DXPL02 control**, place the back plate of the control in the desired location on the wall and pencil mark the wall with the right and left screw holes (Figure D).
- For BC02, BC03 or BC04 controls**, place the back plate of the control in the desired location on the wall and pencil mark the top and bottom screw holes (Figure E or F). For mounting the control without a Decora plate, break off top and bottom tabs and refer to Figure F for mounting.
- Remove the back plate from the wall and mark the center hole for the wires in the middle of the screw holes. Refer to Figure D, E or F for dimensions.
- Drill (two) 1/8 in holes for the screws and wall anchors (Figure D, E or F). For DXPL02 control, drill a 1 in hole in the center (Figure D). For BC04 controls, cut in a 3/4 in by 1 in oval hole in the wall (Figure E or F).
- Pull 3 wire 20 gauge (min.) 100 ft length (max.), through the opening in the wall.
- Connect red, green, and yellow to the wiring terminals located on the back plate (Figure D, E or F).
- Attach the back plate to the wall using two supplied screws and anchors.
- Attach the face plate to the back plate (Figure B or C). Note: Be careful to correctly align the face plate to avoid damaging the face plate contact pins.
- For DXPL02 control**, insert the operating instructions card into the control (Figure A).
- Connect the 3 wire 20 gauge (min.) 100 ft length (max.) to the terminal block located on ventilator (Red #3, Yellow #4 and Green #5).

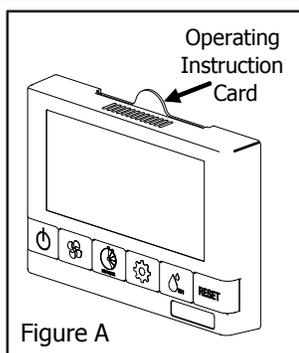


Figure A

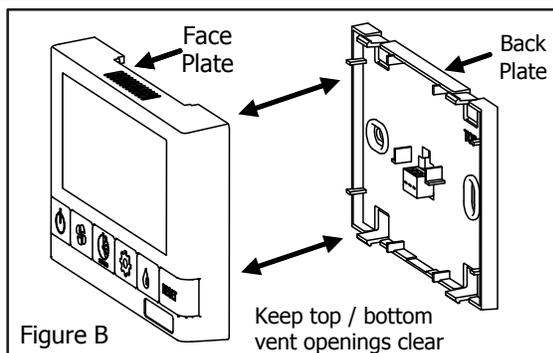


Figure B

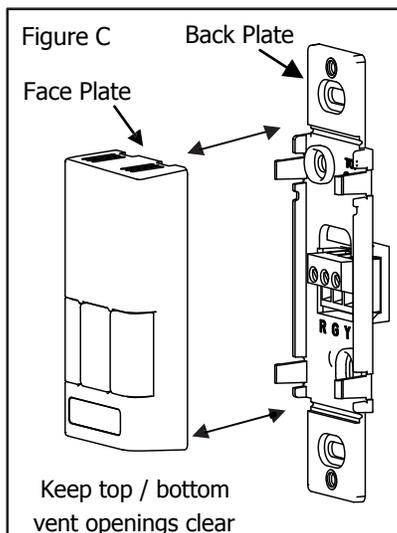


Figure C

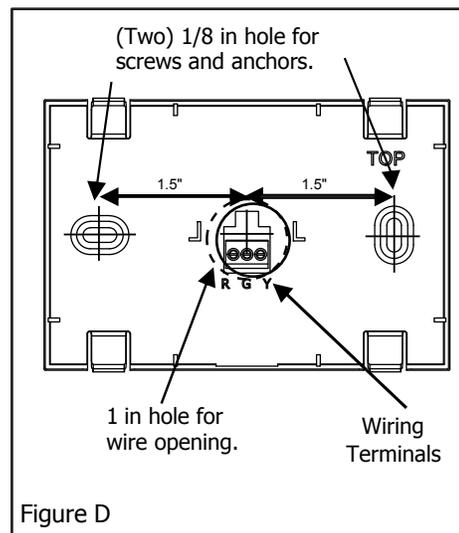


Figure D

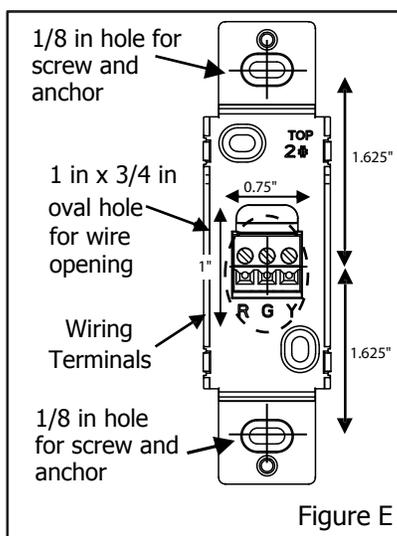


Figure E

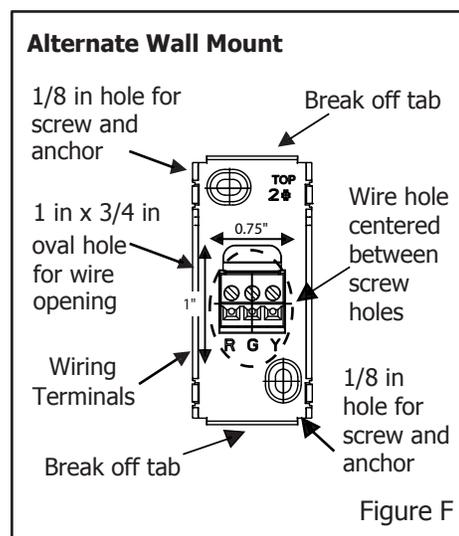


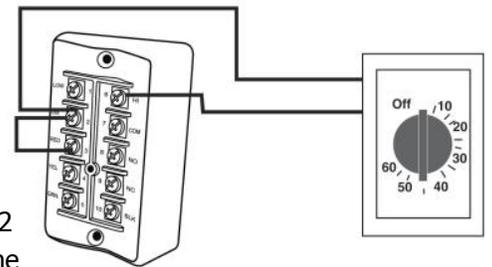
Figure F

Mechanical Timers Installation 99-101

The Mechanical Timer is a 2 wire "dry contact" timer. A jumper wire must be connected between 2 (ON) and 3 (RED). Connect the 2 timer wires to ON and HI.

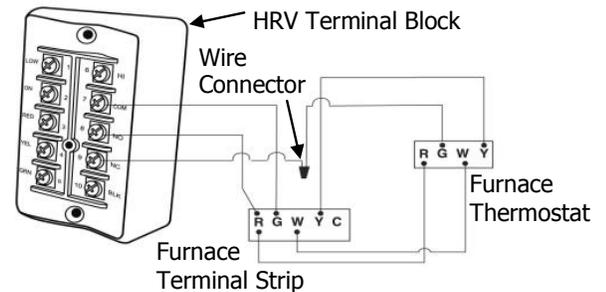
2 wire timers require a jumper wire between ON and RED on the terminal block

Connect the 2 wires from the timer to ON and HI on the terminal block.



Interlocking the HRV to an Air Handler or Furnace Blower

Connecting the HRV as illustrated will ensure the air handler/furnace blower motor is operating whenever the HRV is venting. The HRV must be interlocked to the furnace/air handler with a simplified installation (return/return installation) and should be interlocked with a partially dedicated installation.



Setting "Standby" When Using a Main Control

The HRV will be "fully-off" when the off position is selected on the

Main Control. Timers and/or other controls will not function when the HRV is in the off position.

The "fully-off" feature can be modified to "standby-off" by adding a jumper on the terminal block between 2 (ON) and 3 (RED). "Standby" can also be achieved by setting the main control to the ON position and selecting speed 0*.

*Speed 0 is not available on all controls.

Operating the HRV With Dry Contact Controls

A jumper must be in place between 2 (ON) and 3 (RED) on the terminal block to activate the HRV for timers and/or dry contact controls.

Adding Dry Contact Controls

Low Speed: A jumper between 2 (ON) and 1 (LOW) initiates low speed ventilation.

High Speed: A jumper between 2 (ON) and 6 (HI) initiates high speed ventilation.

Dehumidistat: A dry contact for a Dehumidistat is connected between 2 (ON) and 10 (BLK)

⚠ Attention/Caution

- Timers mount in standard electrical boxes
- Use 3 wire 20 gauge (min.) 100 ft length (max.) low voltage wire and multiple timers individually wired back to the unit.

Caution:

- Consideration should be given to competing airflows when connecting the HRV in conjunction with an air handler/furnace blower system.
- Building codes in some areas require "fully-off" functionality. Check with your local building authority before modifying the unit to "standby-off". Unintentional operation of the HRV by the end user may occur if the unit is modified from "fully-off" to "standby-off".

Installation and Operation of Wireless 20/40/60 Minute Timer: 99-DET02

The Timers may be installed onto a flush mounted electrical switch box or it may be surface mounted onto a wall. Multiple Timers may be installed in a ventilation system. To increase the range of a wireless Timer, a RX02 Repeater should be used.

Pairing:

1. Turn on the main wall control by pressing the ON/OFF button  and remove the battery from Timer.
2. **DET02 with DXPL02 Controls:** Press the left and right buttons simultaneously on the main wall control ( and ). The screen will go blank and the wireless symbol  will appear flashing on the bottom right of the display. This indicates that the main control is now in pairing mode. (Figure D)
3. **DET02 with BC02, BC03 or BC04 Controls:** Press the left and right buttons simultaneously on the main wall control ( and either  or  buttons, depending on the main control). The bottom row of 3 LED's will begin flashing. This indicates that the main control is now in pairing mode.(Figure E)
4. Keep the Timer within 16" of the main wall control when pairing.
5. Install the battery in the DET02 Timer. All four lights on the Timer will immediately flash 5 times, then only the red battery light will remain on for approximately 12 seconds after which the "40" light flashes the rev code. 20, 40, 60 lights will flash until paired or will stop if not paired within 12 seconds. If pairing was not successful you now must return to step 1 to restart the pairing process.
6. Press the  button on the main wall control to exit pairing mode when Timers have been successfully paired.

To pair additional DET02 Timers with the same wall control, or if pairing was not successful, repeat steps 1-6.

When paired, the DET02 Timers can be moved and installed elsewhere. Estimated range of the Timer is 40' with no obstructions. A RX02 Repeater may be installed to increase the range of the Timers.

Test if pairing was successful by pressing the Select Button and listen for the HRV / ERV to initiate HIGH fan speed Ventilation.

Un-pairing:

1. Remove the battery from the back of the DET02 Timer
2. Press and hold the Select Button on the front of the Timer
3. While holding the Select Button, reinsert the battery in the Timer. Continue holding the select button until the LED under "40" begins flashing. The DET02 Timer will now be unpaired with the main wall control.

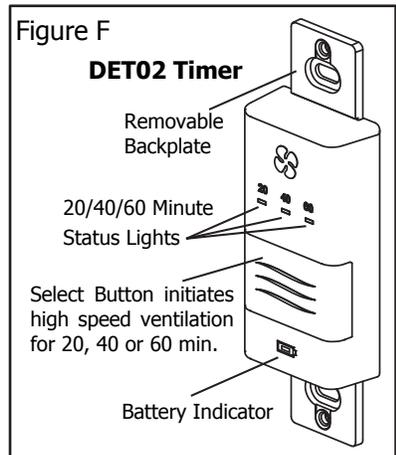
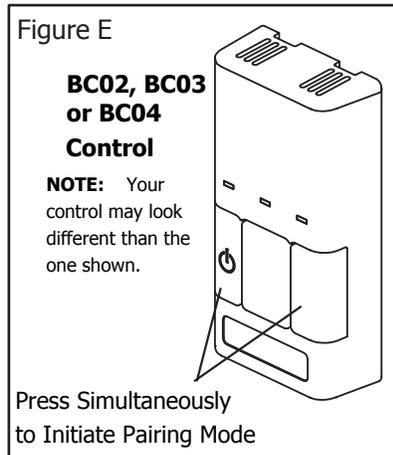
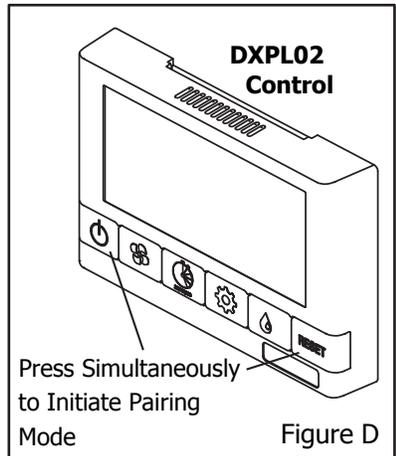
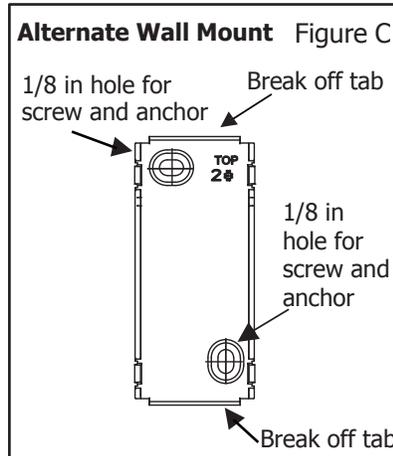
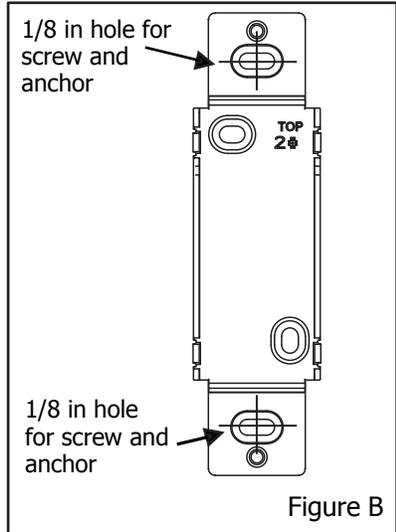
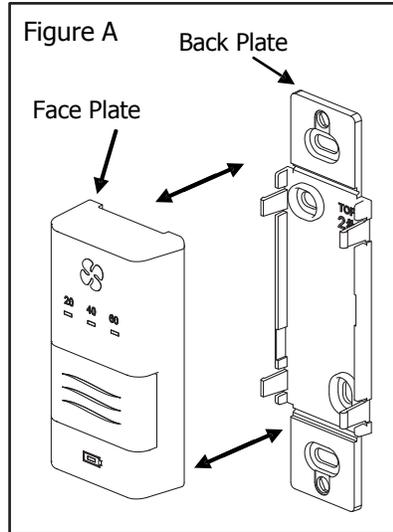
Installation:

1. Separate the face plate from the back plate by firmly pulling apart (Figure A).
2. For mounting the control without a Decora plate, break off top and bottom tabs and refer to Figure C for mounting.
3. Place the back plate of the control in the desired location on the wall and pencil mark the top and bottom screw holes (Figure B or C). Drill two 1/8" holes.
4. Attach the back plate to the wall using the 2 supplied screws and anchors.
5. Attach the face plate to the back plate (Figure A).



NOTE

The wireless Timers and Repeaters must be matched to the main wall control of the HRV / ERV. This process is called "Pairing". Multiple Timers and Repeaters can be paired to a single wall control.



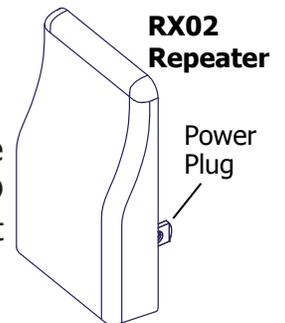
Installation and Pairing of Repeaters: 99-RX02

The RX02 Repeaters are to be plugged directly into a 120V power outlet

1. Turn on the main wall control by pressing the ON/OFF button .
2. **RX02 with DXPL02 Controls:** Press the left and right buttons simultaneously on the main wall control ( and RESET buttons). The screen will go blank and the wireless symbol  will appear flashing on the bottom right of the display. This indicates that the main control is now in pairing mode. **RX02 with BC02, BC03 or BC04 Controls:** Press the left and right buttons simultaneously on the main wall control ( and either  or  buttons, depending on the main control). The bottom row of 3 LED's will begin flashing. This indicates that the main control is now in pairing mode.
3. The RX02 Repeater must be powered within 16" of the main wall control for pairing. If an outlet is not available an extension cord should be used to power the repeater initially for pairing.
4. Plug the RX02 Repeater into the power outlet. The green light will flash after approximately 12 seconds indicating that the repeater is paired with the main wall control.
5. Press the ON/OFF button on the main wall control to exit pairing mode and the Repeater may now be unplugged and moved to its permanent location.

To pair additional RX02 Repeaters with the same wall control, repeat steps 1-5 until all Repeaters have been paired.

When installed in its permanent location, the green LED will remain solid to indicate the best location and the Repeater can be moved farther if required. The green LED will flash to indicate it is in a good location. A red light indicates the Repeater is out of range and needs to be moved closer to the main wall control.

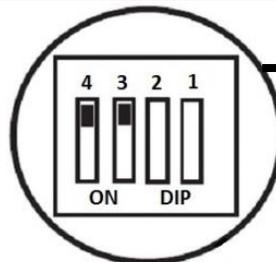


Installer Selectable High Speed Settings

The circuit board on this unit has adjustable DIP switches for the selection of speeds Hi1, Hi2 or Hi3. The factory setting is Hi3. Refer to the specification page found online at; www.lifebreath.com for the airflow rates on Hi1, Hi2 and Hi3. **Note:** Low speed is not adjustable.

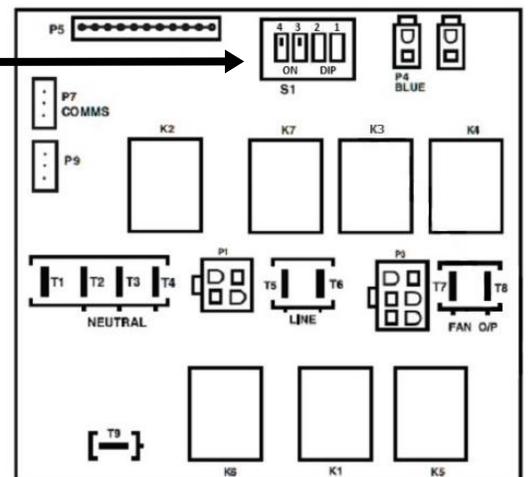
Description	Switch 1	Switch 2	Switch 3	Switch 4
Hi 3 (factory default)	Factory Setting "ON"	Leave on factory setting	ON	ON
Hi 2	Factory Setting "ON"	Leave on factory setting	OFF	ON
Hi1	Factory Setting "ON"	Leave on factory setting	ON	OFF

Illustration of DIP switches 3 and 4 in the ON position (factory setting).



Functionality of DIP Switches 1 and 2

DIP 1 ON	R2000 defrost cycle disabled (factory setting)
DIP 1 OFF	R2000 defrost cycle enabled
DIP 2 ON	recirculate defrost models
DIP 2 OFF	damper defrost and fan defrost models



Installation and Operation 20/40/60 Minute Timer: 99-DET01

Installation

The 99-DET01 Timers are to be surface mounted onto a wall. Multiple Timers may be installed in a system. Once mounted, connect Yellow, Red, Green wires on side of 99-DET01 to the terminal block on unit using 3 wire 20 gauge (min.) 100 ft length (max.).

Operating the Timer

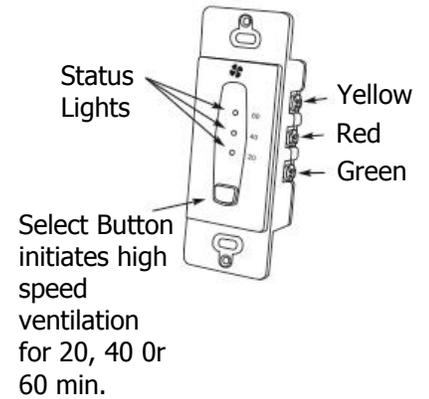
Press and release the Select Button to activate a 20, 40 or 60 minute HIGH speed override cycle. The Light will illuminate and the unit will run on HIGH speed Ventilation for the selected time. The Light will dim after 10 sec. for run time. The Light will flash during the last 5 min. of the cycle. The Timer connected to the unit will illuminate for the duration of the override when the Select Button is pressed.

Lockout Mode

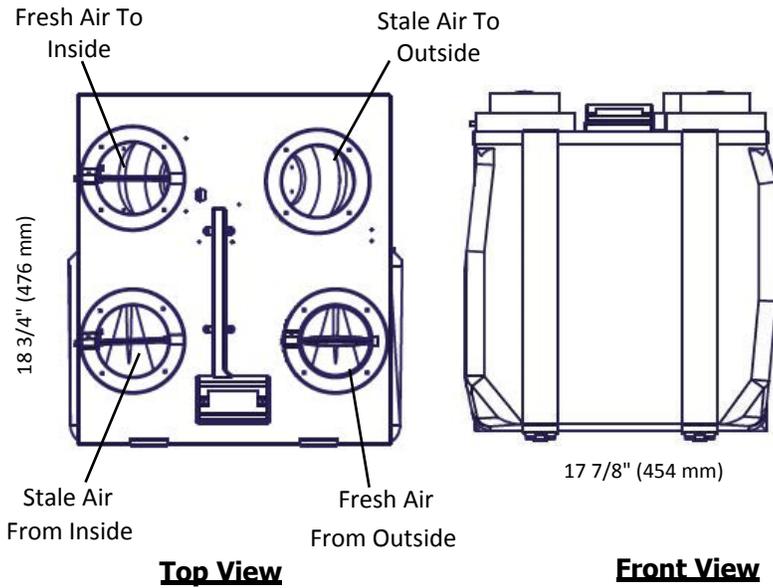
Lockout Mode is useful if you wish to disable the Timers.

The Timer can be set to lockout mode by pressing and holding the Select Button for five seconds. After 5 sec., the Light will flash; release the Select Button. The Timer is now in lockout mode. If the Select Button is pressed during lockout mode the Light will momentarily illuminate but no override will be initiated.

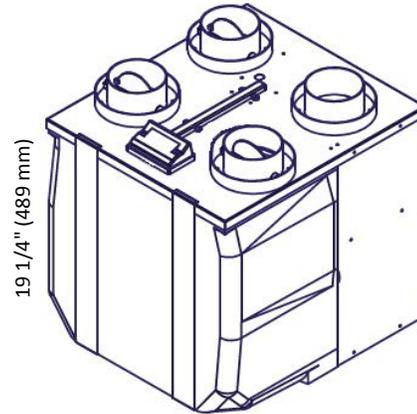
If lockout mode is initiated when the Timer is activated, the Timer will continue its timed sequence but will not allow any further overrides to be initiated. Lockout mode can be unlocked by pressing and holding the Select Button for 5 sec. After 5 sec. the Light will stop flashing. Release the Select Button and the Timer will now operate normally.



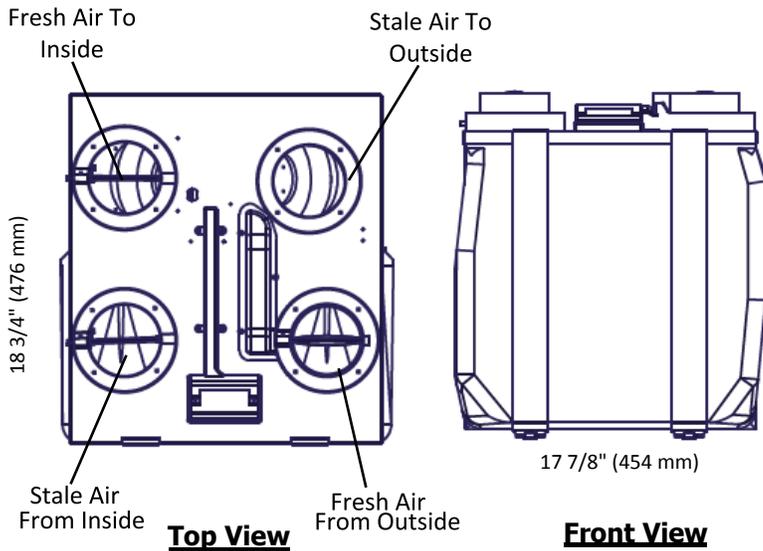
Dimensional Drawing for RNC4-TPF Model



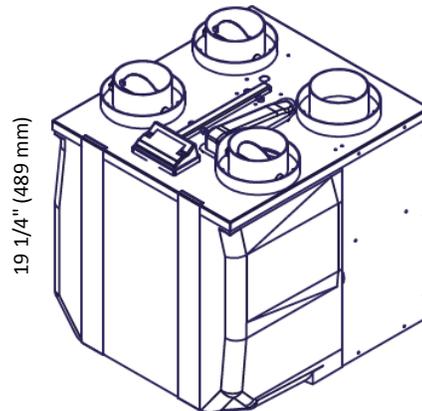
Note: Front clearance of 25 in (635 mm) is recommended for servicing unit. All ducts use 4 in (102 mm) round collars, balancing dampers are located in all air streams.



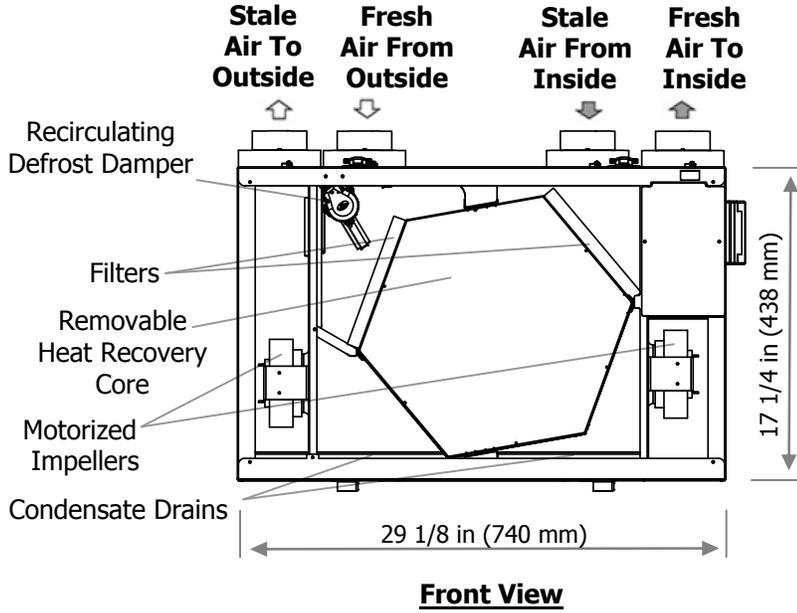
Dimensional Drawing for RNC4-TPD Model



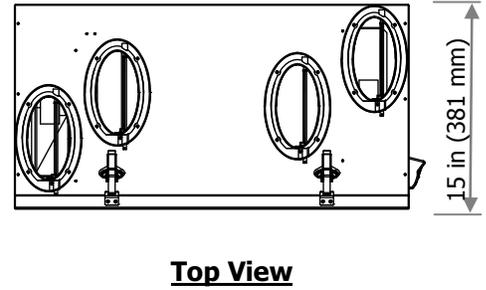
Note: Front clearance of 25 in (635 mm) is recommended for servicing unit. All ducts use 4 in (102 mm) round collars, balancing dampers are located in all air streams.



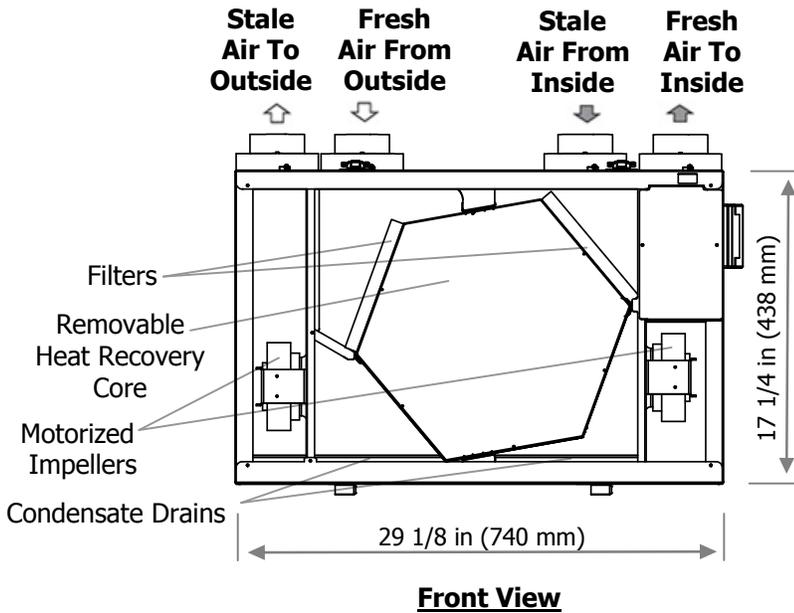
Dimensional Drawing for RNC5-HEX-TPD Model



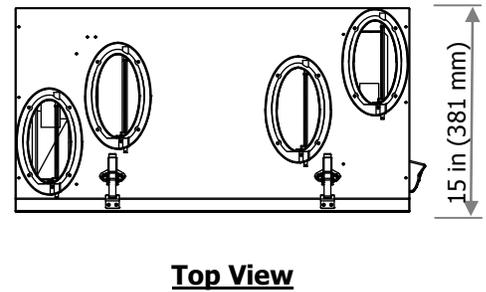
Note: Front clearance of 25 in (635 mm) is recommended for servicing unit. All ducts use 5 in (125 mm) oval collars, balancing dampers are located on all collars.



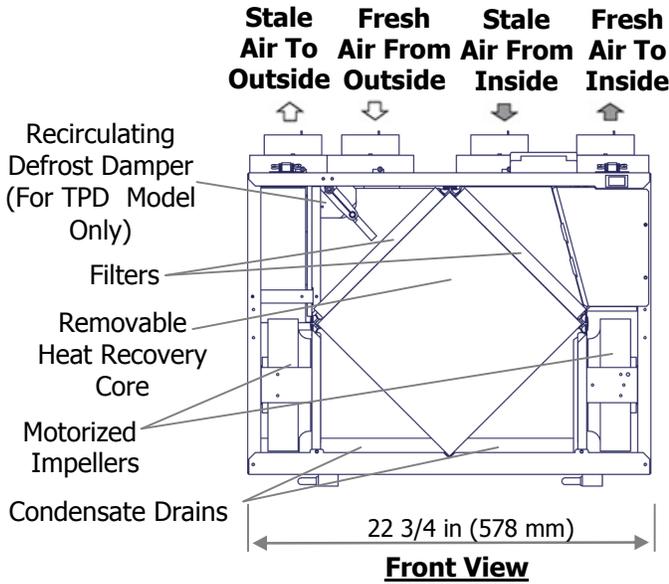
Dimensional Drawing for RNC5-HEX-TPF Model



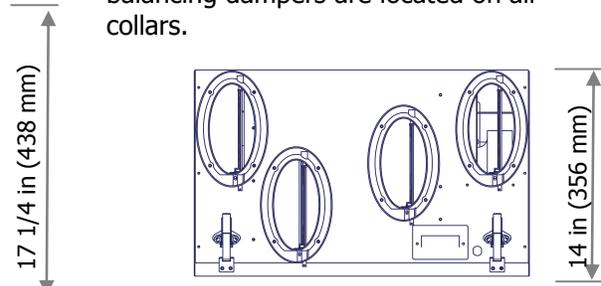
Note: Front clearance of 25 in (635 mm) is recommended for servicing unit. All ducts use 5 in (125 mm) oval collars, balancing dampers are located on all collars.



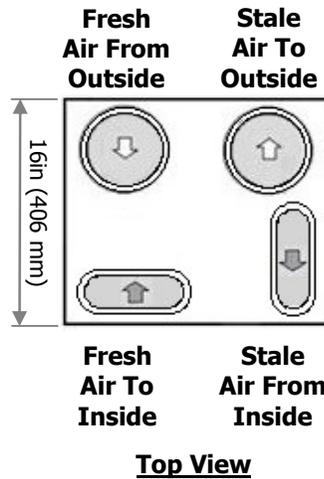
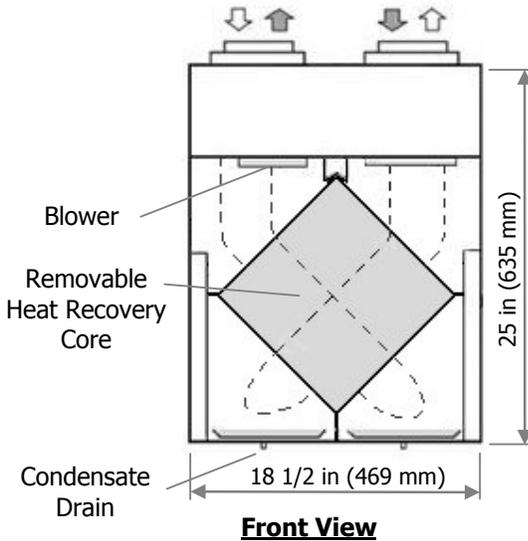
Dimensional Drawing for RNC5-TPD/TPF/RNC6-ES Models



Note: Front clearance of 25 in (635 mm) is recommended for servicing unit. All ducts use 5 in (125 mm) oval collars, balancing dampers are located on all collars.

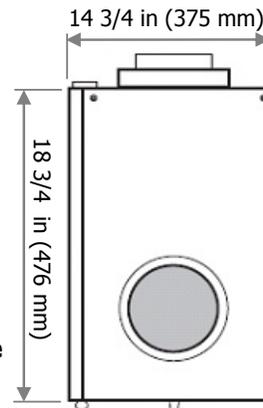
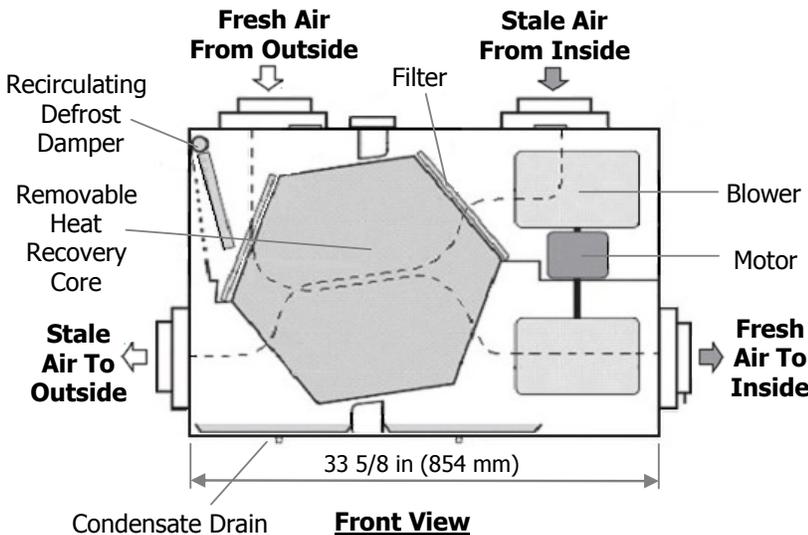


Dimensional Drawing for 95 Model



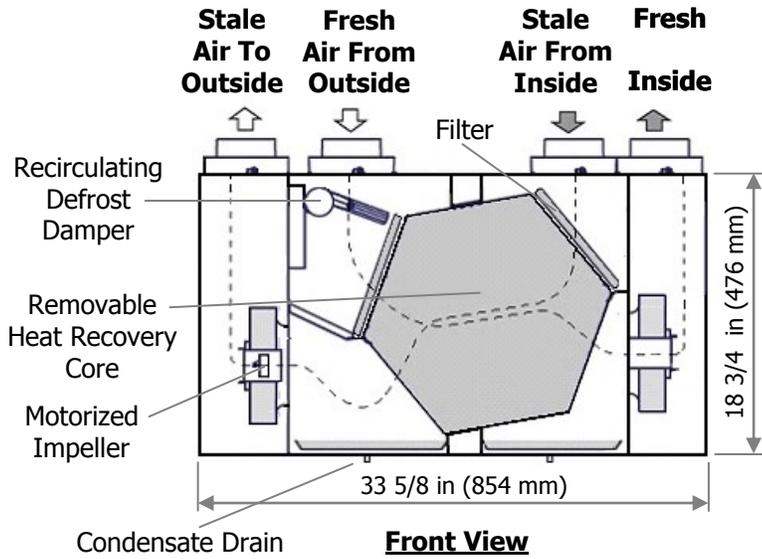
Note: Front clearance of 25 in (635 mm) is recommended for servicing unit. Round duct connections are 5 in (127 mm) and oval collars use 6 in (152 mm) connections.

Dimensional Drawing for 155 Model

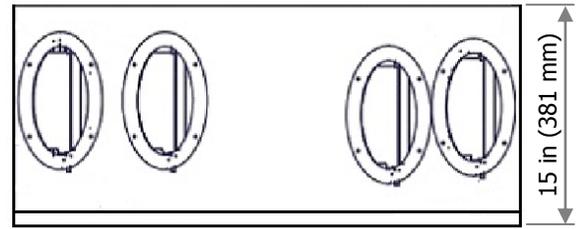


Note: Front clearance of 25 in (635 mm) is recommended for servicing unit. All ducts use 6 in (152 mm) connections.

Dimensional Drawing for 205 Model

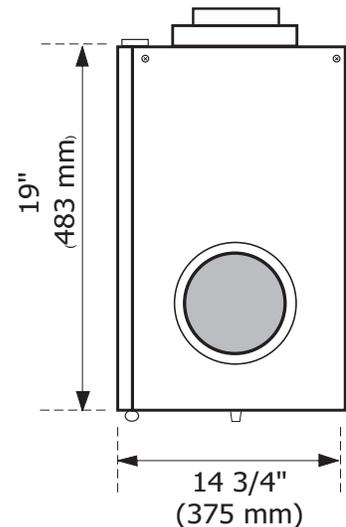
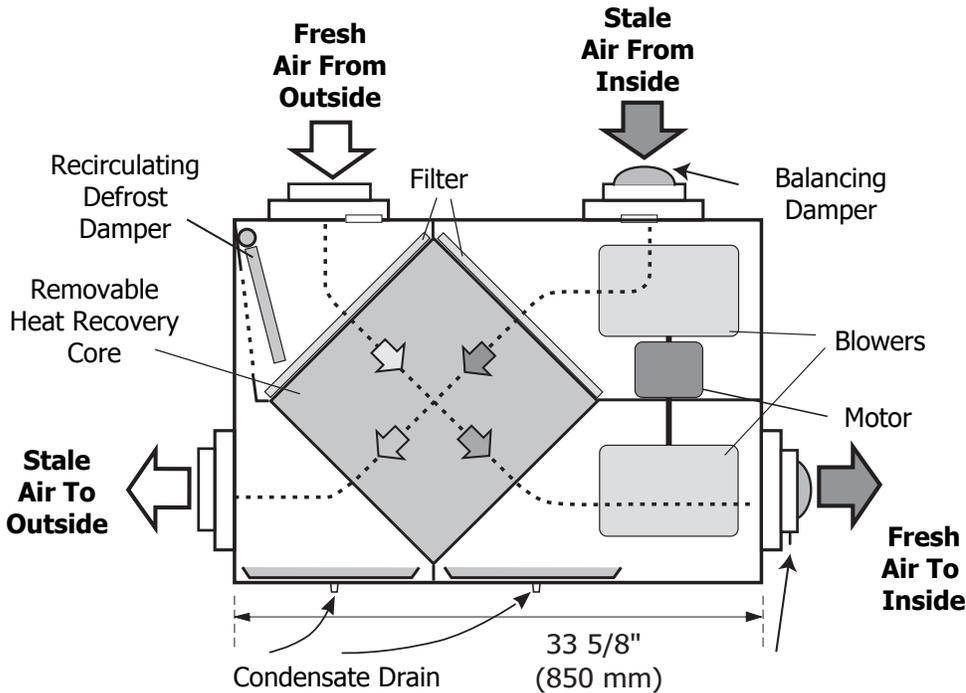


Note: Front clearance of 25 in (635 mm) is recommended for servicing unit. All ducts use 6 in (150 mm) oval collars, balancing dampers are located on all collars.



Dimensional Drawing for 200 Model

NOTE Front clearance of 25 inches (635 mm) is recommended for servicing unit.



**All Duct Connections 6" (152 mm)*

Balancing the Airflows

Balancing the airflows is critical to ensuring that the amount of air introduced from the outside of the building equals the amount of air exhausted to the outside of the building. If these two airflows are not properly balanced, the following issues may occur:

- A positive or negative pressure in the house
- HRV not operate at its maximum efficiency
- The unit not defrost properly

Airflow Measuring Gauge

A digital manometer is a suitable instrument for the balancing of airflows.

99-BAL-KIT Airflow Balancing Kit

Kit includes a digital manometer, pitot tube, hose and tool bag.

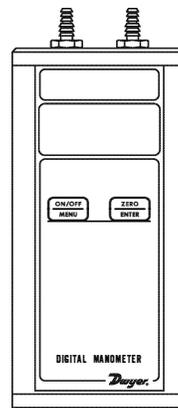


Figure A
Digital Manometer

! Attention

- Continuous, excessive, positive pressure may drive moist indoor air into the external walls of the building. Once inside the external walls, moist air may condense (in cold weather) and degrade structural components or cause locks to freeze.
- Continuous, excessive, negative pressure may have several undesirable effects. In some geographic locations, soil gases such as methane and radon gas may be drawn into the home through basement or ground contact areas, and may also cause the backdrafting of vented combustion equipment.

Gauge Attachments

When sampling an airflow, various attachments are available for use on a digital manometer. Consult with your Lifebreath distributor for available options such as a pitot tube, flow measuring station, and an airflow measuring probe.

Figure B illustrates a digital manometer with a pitot tube attachment. This combination will measure the system air velocity pressure accurately, regardless of the duct size or shape (either round or rectangular).

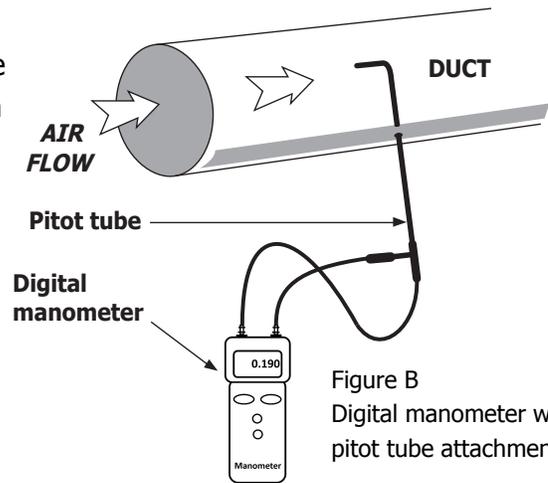


Figure B
Digital manometer with a pitot tube attachment

Determining the CFM

After balancing the airflows, calculate the CFM flow rate.

Example

This example shows how to determine the airflow for a 6 in diameter duct. If the duct velocity pressure reads 0.025 in w.g. on the digital manometer, use the chart that came with the pitot tube to determine a duct velocity of 640 ft/min. for a duct velocity pressure of 0.025 in w.g.

CFM Calculation

$$\begin{aligned} \text{CFM} &= \text{feet per minute} \times \text{cross section area of duct} \\ &= 640 \times 0.196 \\ &= 125 \end{aligned}$$

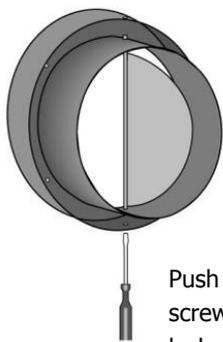
Cross section area of some common duct sizes:

0.087 for 4 in duct	0.139 for 5 in duct
0.196 for 6 in duct	0.267 for 7 in duct

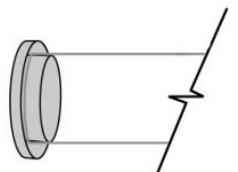
Units with Balancing Collars

Install these units with the dampers fully open and damper down the duct with the higher airflow to equal the lower airflow. Refer to the "Balancing the Airflows" page found in this manual.

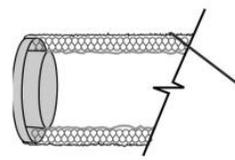
All other units require dampers for balancing airflows installed into the "Fresh Air to Building" and "Stale Air from Building" ductwork.



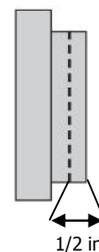
Push and turn with slotted screwdriver. Damper automatically locks when pressure is released.



Hard/Rigid ducting



Insulated flexible ducting



When connecting ductwork to the collar, take note where screws are located. Screws should be located no further than 1/2 in from outside edge of collar, so as not to impede operation of the damper.

⚠ Attention

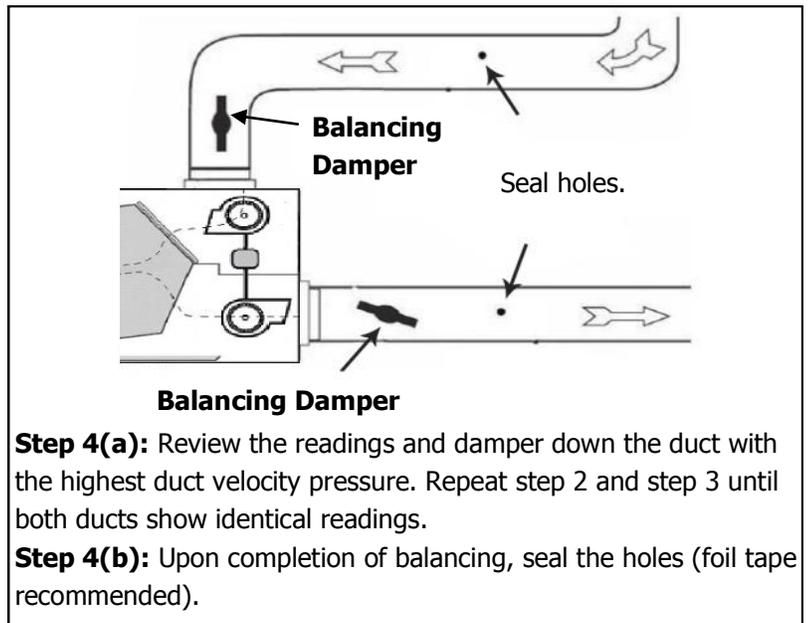
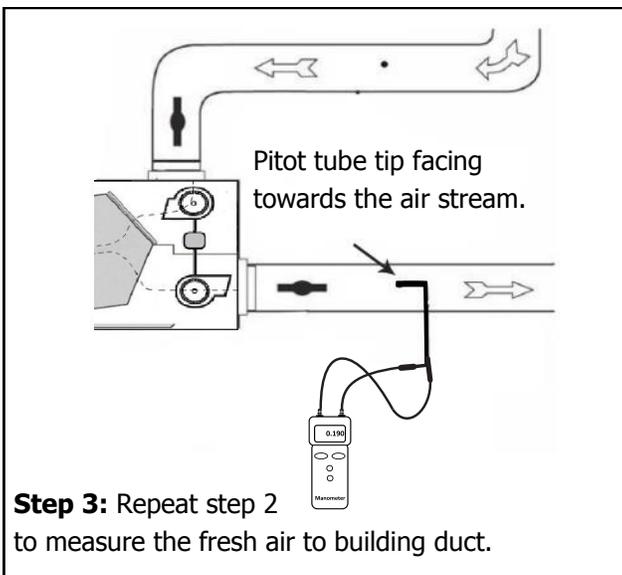
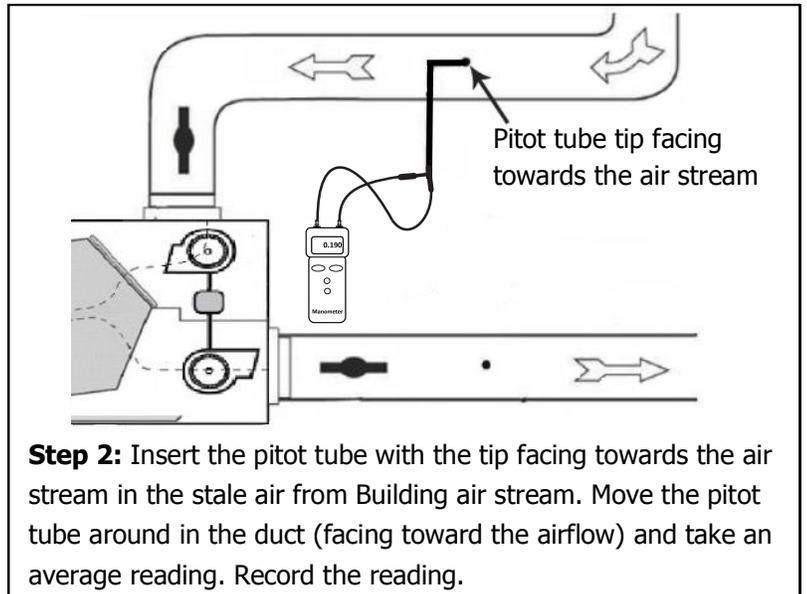
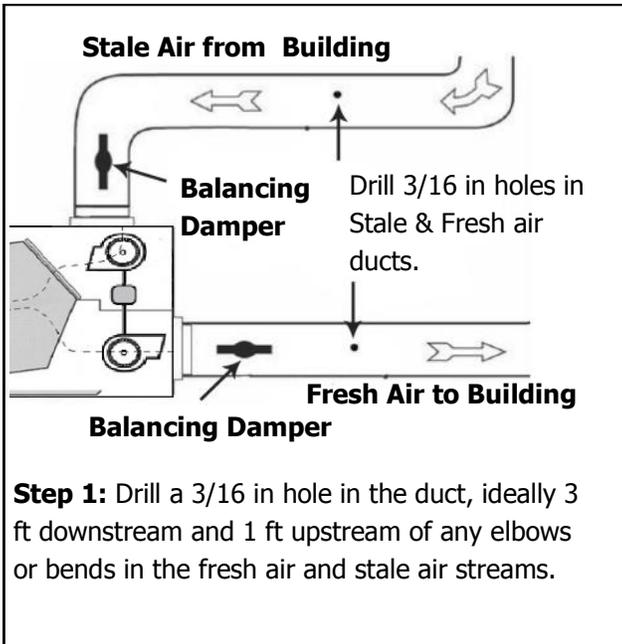
- Installations where the HRV is ducted directly to the return of a furnace may require additional dampening on the fresh air to building duct. This is due to the high return static pressures found in some furnace installations.

Balancing Preparation

Prior to performing the air balancing procedure, perform the following steps:

- Seal the ductwork.
- Confirm the installation and proper operation of all the components of the HRV.
- Fully open the balancing dampers.
- Turn off all household exhaust devices (range hood, clothes dryer, bathroom fans).
- Set the HRV at high speed.
- Prior to balancing the unit, first adjust airflows in the branch lines to specific areas of the house.
- If the outdoor temperature is below 0°C (32°F), ensure the unit is not running in defrost.
- If the system is a simplified or partially dedicated installation, operate the furnace/air handler at high speed.

Balancing the Airflow With a Pitot Tube



Balancing the Airflow using the Door Ports

Door balancing ports (*not on all models*) are designed to be used in the conjunction with a digital manometer to measure the stale and fresh airflows for balancing.

Step 1: Prepare the airflow measuring device by connecting the hoses to the low and high pressure side of the gauge.

Step 2: Insert the hoses into the rubber fittings from the optional door port adapter kit (part 99-182). Use light pressure and rotate until fitting is snug. Do not extend the hose past the rubber fitting.

Step 3: Open the HRV door. Remove the 4 door port covers by carefully pushing them out from the back side of the door.

Step 4: Close the HRV door. Initiate power and operate the HRV on high speed. Operate the forced air system on high speed (if the HRV is connected to the forced air system).

Step 5: Insert the 2 rubber fittings from the gauge to the stale air balancing ports (see illustrations for port locations). Seal the fresh air balancing ports with tape (see illustrations for port locations). Record your reading.

Step 6: Insert the 2 rubber fittings from the gauge to the fresh air balancing ports (see illustrations for port locations). Seal the stale air balancing ports with tape (see illustrations for port locations). Record your reading.

Step 7: Refer to the "Airflow Reference Chart" for your model and determine the fresh air and stale airflow rates (the chart is located on page 23).

Step 8: Damper down the higher airflow and repeat Steps 5 to 7 as required until both airflows are identical (balanced).

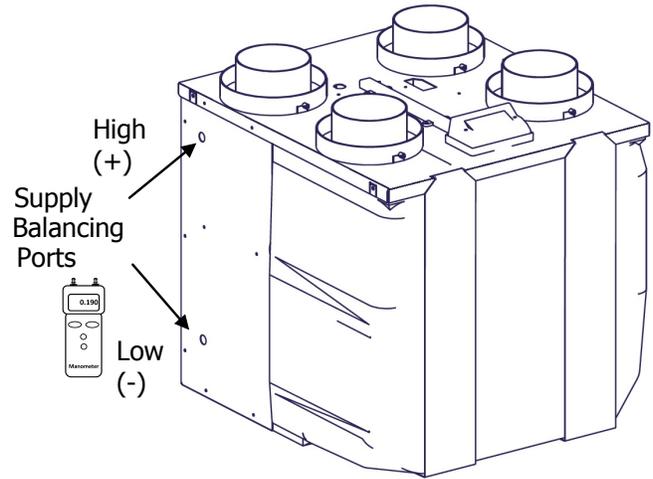
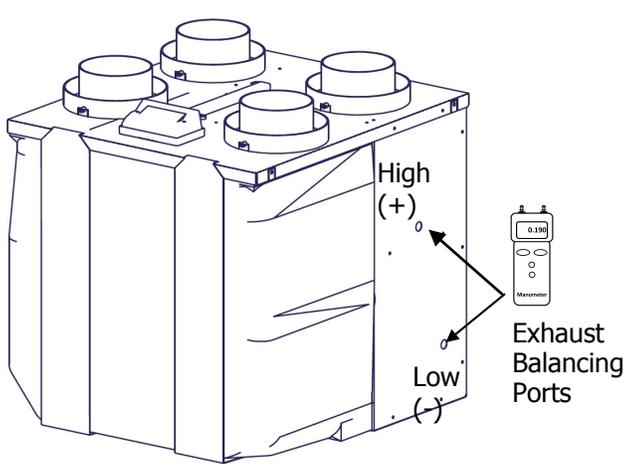
Step 9: Remove the tape and rubber fittings and reinstall the 4 Door Port Covers.

Attention

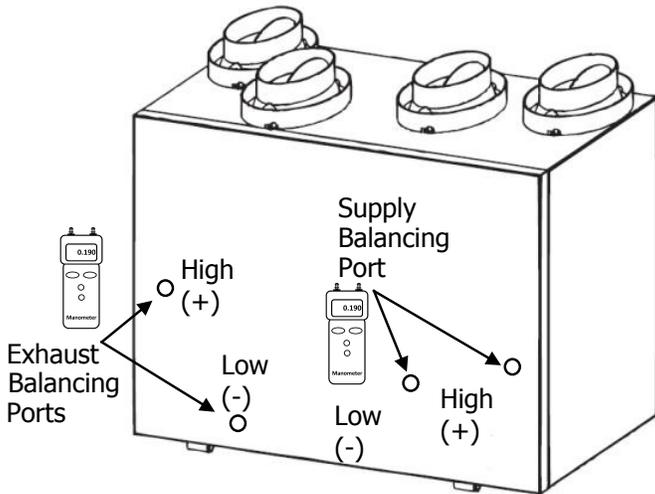
- **Reverse Flow Models:** Step 5 and Step 6 stale air and stale air ports will be reversed.

Balancing Door Port illustrations

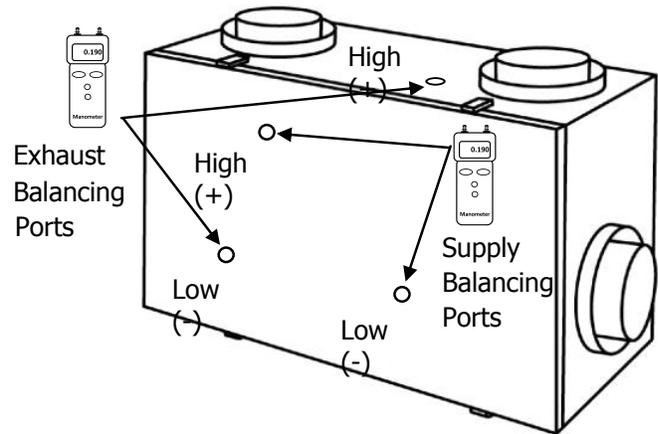
Balancing Ports for RNC4-TPD and TPF



Balancing Ports for RNC5-TPD/FD/RNC6-ES RNC5-HEX-TPD/TPF and RNC205 Models

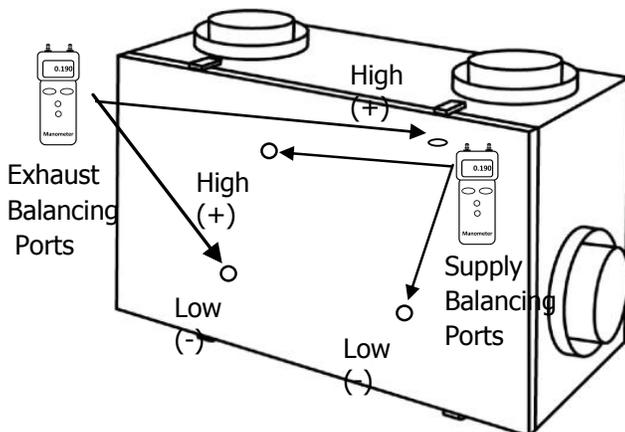


Balancing Ports for RNC155 Model



Digital manometer connection overview

Balancing Ports for RNC200 Model



Airflow Reference Charts RNC4-TPD Model

RNC4-TPDmodels have 3 airflow charts for their installer adjustable high speed settings. Refer to “Installer Selectable High Speed Settings” in this manual for instructions on how to adjust the circuit board DIP switches.

Hi 3			
Pressure Drop		Supply Airflow	Exhaust Airflow
("w.g.)	(Pa)	(cfm)	(cfm)
0.400	100		74
0.410	103		74
0.420	105		73
0.430	108		73
0.440	110		72
0.450	113		71
0.460	115	75	71
0.470	118	75	70
0.480	120	75	69
0.490	123	74	69
0.500	125	74	68
0.510	128	74	67
0.520	130	74	66
0.530	133	73	65
0.540	135	73	65
0.550	138	73	64
0.560	140	72	63
0.570	143	72	62
0.580	145	71	61
0.590	148	70	60
0.600	150	69	59
0.610	153	69	58
0.620	155	68	57
0.630	158	67	56
0.640	160	66	54
0.650	163	65	53
0.660	165	64	52
0.670	168	62	51
0.680	170	61	50
0.690	173	60	48
0.700	175	58	47
0.710	178	57	46
0.720	180	56	44
0.730	183	54	43
0.740	185	52	41
0.750	188	51	40
0.760	190	49	39
0.770	193	47	37
0.780	195	45	36
0.790	198	43	34
0.800	200	41	32
0.810	203	39	31
0.820	205	37	29
0.830	208	35	27
0.840	210	33	26
0.850	213	31	24
0.860	215	28	22
0.870	218	26	21
0.880	220	23	
0.890	223	21	

Hi 2			
Pressure Drop		Supply Airflow	Exhaust Airflow
("w.g.)	(Pa)	(cfm)	(cfm)
0.330	83		73
0.340	85		72
0.350	88	73	72
0.360	90	73	71
0.370	93	73	70
0.380	95	73	69
0.390	98	73	69
0.400	100	72	68
0.410	103	72	67
0.420	105	72	66
0.430	108	71	65
0.440	110	71	64
0.450	113	70	63
0.460	115	70	62
0.470	118	69	62
0.480	120	69	61
0.490	123	68	60
0.500	125	67	58
0.510	128	67	57
0.520	130	66	56
0.530	133	65	55
0.540	135	64	54
0.550	138	63	53
0.560	140	62	52
0.570	143	61	51
0.580	145	60	50
0.590	148	59	48
0.600	150	58	47
0.610	153	57	46
0.620	155	56	45
0.630	158	54	43
0.640	160	53	42
0.650	163	52	41
0.660	165	50	39
0.670	168	49	38
0.680	170	47	36
0.690	173	46	35
0.700	175	44	34
0.710	178	43	32
0.720	180	41	31
0.730	183	39	29
0.740	185	37	28
0.750	188	36	26
0.760	190	34	24
0.770	193	32	23
0.780	195	30	21
0.790	198	28	20
0.800	200	26	18
0.810	203	24	
0.820	205	22	
0.830	208	19	

Hi 1			
Pressure Drop		Supply Airflow	Exhaust Airflow
("w.g.)	(Pa)	(cfm)	(cfm)
0.280	70		69
0.290	73		69
0.300	75		68
0.310	78		67
0.320	80	71	66
0.330	83	71	65
0.340	85	71	64
0.350	88	70	63
0.360	90	69	62
0.370	93	69	61
0.380	95	68	60
0.390	98	68	59
0.400	100	67	58
0.410	103	66	57
0.420	105	65	56
0.430	108	65	55
0.440	110	64	54
0.450	113	63	52
0.460	115	62	51
0.470	118	61	50
0.480	120	60	49
0.490	123	59	48
0.500	125	58	46
0.510	128	57	45
0.520	130	56	44
0.530	133	55	42
0.540	135	54	41
0.550	138	53	40
0.560	140	52	38
0.570	143	51	37
0.580	145	49	36
0.590	148	48	34
0.600	150	47	33
0.610	153	45	31
0.620	155	44	30
0.630	158	43	28
0.640	160	41	27
0.650	163	40	25
0.660	165	38	24
0.670	168	37	22
0.680	170	35	20
0.690	173	34	19
0.700	175	32	17
0.710	178	30	
0.720	180	29	
0.730	183	27	
0.740	185	25	
0.750	188	24	
0.760	190	22	
0.770	193	20	
0.780	195	18	

Airflow Reference Charts RNC4-TPF Model

RNC4 Models have 3 airflow charts for their installer adjustable high speed settings. Refer to “Installer Selectable High Speed Settings” in this manual for instructions on how to adjust the circuit board DIP switches.

Hi 3			
Pressure Drop		Supply Airflow	Exhaust Airflow
("w.g.)	(Pa)	(cfm)	(cfm)
0.300	75	96	
0.310	78	94	
0.320	80	93	
0.330	83	91	
0.340	85	90	98
0.350	88	88	96
0.360	90	87	95
0.370	93	85	93
0.380	95	84	91
0.390	98	83	90
0.400	100	82	88
0.410	103	80	87
0.420	105	79	86
0.430	108	78	84
0.440	110	77	83
0.450	113	76	82
0.460	115	75	81
0.470	118	74	80
0.480	120	74	79
0.490	123	73	78
0.500	125	72	78
0.510	128	71	77
0.520	130	70	76
0.530	133	70	75
0.540	135	69	75
0.550	138	68	74
0.560	140	67	73
0.570	143	67	72
0.580	145	66	72
0.590	148	65	71
0.600	150	65	70
0.610	153	64	70
0.620	155	63	69
0.630	158	62	68
0.640	160	62	67
0.650	163	61	66
0.660	165	60	65
0.670	168	60	64
0.680	170	59	63
0.690	173	58	62
0.700	175	57	61
0.710	178	56	59
0.720	180	55	58
0.730	183	54	56
0.740	185	53	55
0.750	188	52	53
0.760	190	51	51
0.770	193	50	50
0.780	195	49	48
0.790	198	48	45
0.800	200	47	43
0.810	203	46	41
0.820	205	44	38
0.830	208	43	36
0.840	210	41	33
0.850	213	40	30
0.860	215	38	
0.870	218	37	
0.880	220	35	
0.890	223	33	
0.900	225	31	

Hi 2			
Pressure Drop		Supply Airflow	Exhaust Airflow
("w.g.)	(Pa)	(cfm)	(cfm)
0.280	70	81	
0.290	73	80	
0.300	75	79	
0.310	78	79	
0.320	80	78	
0.330	83	77	83
0.340	85	76	82
0.350	88	75	81
0.360	90	75	80
0.370	93	74	80
0.380	95	73	79
0.390	98	72	78
0.400	100	72	77
0.410	103	71	76
0.420	105	70	75
0.430	108	70	74
0.440	110	69	74
0.450	113	68	73
0.460	115	67	72
0.470	118	67	71
0.480	120	66	70
0.490	123	65	69
0.500	125	65	68
0.510	128	64	67
0.520	130	63	66
0.530	133	62	66
0.540	135	62	65
0.550	138	61	64
0.560	140	60	63
0.570	143	59	62
0.580	145	58	60
0.590	148	58	59
0.600	150	57	58
0.610	153	56	57
0.620	155	55	56
0.630	158	54	55
0.640	160	53	53
0.650	163	52	52
0.660	165	51	51
0.670	168	50	49
0.680	170	49	48
0.690	173	48	46
0.700	175	47	45
0.710	178	46	43
0.720	180	45	42
0.730	183	44	40
0.740	185	43	38
0.750	188	42	36
0.760	190	40	34
0.770	193	39	32
0.780	195	38	30
0.790	198	36	28
0.800	200	35	26
0.810	203	34	24
0.820	205	32	22
0.830	208	31	
0.840	210	29	
0.850	213	27	
0.860	215	26	
0.870	218	24	

Hi 1			
Pressure Drop		Supply Airflow	Exhaust Airflow
("w.g.)	(Pa)	(cfm)	(cfm)
0.300	75	72	
0.310	78	72	
0.320	80	71	
0.330	83	70	
0.340	85	69	75
0.350	88	69	74
0.360	90	68	72
0.370	93	67	71
0.380	95	66	70
0.390	98	66	69
0.400	100	65	68
0.410	103	64	67
0.420	105	63	66
0.430	108	63	65
0.440	110	62	64
0.450	113	61	63
0.460	115	60	61
0.470	118	59	60
0.480	120	59	59
0.490	123	58	58
0.500	125	57	57
0.510	128	56	56
0.520	130	55	55
0.530	133	55	54
0.540	135	54	53
0.550	138	53	52
0.560	140	52	51
0.570	143	51	50
0.580	145	50	49
0.590	148	49	48
0.600	150	48	46
0.610	153	47	45
0.620	155	46	44
0.630	158	45	43
0.640	160	44	41
0.650	163	43	40
0.660	165	42	38
0.670	168	41	37
0.680	170	40	35
0.690	173	39	34
0.700	175	37	32
0.710	178	36	30
0.720	180	35	28
0.730	183	34	27
0.740	185	32	25
0.750	188	31	23
0.760	190	30	21
0.770	193	28	
0.780	195	27	
0.790	198	25	
0.800	200	24	
0.810	203	22	
0.820	205	21	

Airflow Reference Charts RNC5 TPD/TPF Models

RNC5-TPD models have 3 airflow charts for their installer adjustable high speed settings. Refer to "Installer Selectable High Speed Settings" in this manual for instructions on how to adjust the circuit board DIP switches.

Hi 3			
Pressure Drop		Supply Airflow	Exhaust Airflow
(" w.g.)	(Pa)	(cfm)	(cfm)
0.580	145		177
0.590	148		174
0.600	150		172
0.610	153		169
0.620	155		167
0.630	158		164
0.640	160		162
0.650	163		159
0.660	165		157
0.670	168		154
0.680	170		152
0.690	173		149
0.700	175		147
0.710	178		144
0.720	180		142
0.730	183		139
0.740	185		137
0.750	188	175	134
0.760	190	172	132
0.770	193	169	129
0.780	195	167	127
0.790	198	164	124
0.800	201	161	121
0.810	203	158	119
0.820	206	155	116
0.830	208	153	114
0.840	211	150	111
0.850	213	147	109
0.860	216	144	106
0.870	218	141	104
0.880	221	139	101

Hi 2			
Pressure Drop		Supply Airflow	Exhaust Airflow
(" w.g.)	(Pa)	(cfm)	(cfm)
0.360	90		160
0.370	93		158
0.380	95		156
0.390	98		154
0.400	100		151
0.410	103		149
0.420	105		147
0.430	108		144
0.440	110	155	142
0.450	113	153	140
0.460	115	151	138
0.470	118	149	135
0.480	120	147	133
0.490	123	145	131
0.500	125	144	129
0.510	128	142	126
0.520	130	140	124
0.530	133	138	122
0.540	135	136	119
0.550	138	134	117
0.560	140	132	115
0.570	143	130	113
0.580	145	129	110
0.590	148	127	108
0.600	150	125	106
0.610	153	123	104
0.620	155	121	101
0.630	158	119	99
0.640	160	117	97
0.650	163	115	94
0.660	165	114	92

Hi 1			
Pressure Drop		Supply Airflow	Exhaust Airflow
(" w.g.)	(Pa)	(cfm)	(cfm)
0.280	70		140
0.290	73		138
0.300	75		135
0.310	78		133
0.320	80		131
0.330	83		129
0.340	85		126
0.350	88		124
0.360	90		122
0.370	93	139	120
0.380	95	137	117
0.390	98	135	115
0.400	100	133	113
0.410	103	131	111
0.420	105	129	108
0.430	108	127	106
0.440	110	125	104
0.450	113	123	102
0.460	115	121	99
0.470	118	119	97
0.480	120	117	95
0.490	123	115	93
0.500	125	113	90
0.510	128	111	88
0.520	130	109	86
0.530	133	107	84
0.540	135	105	81
0.550	138	102	79
0.560	140	100	77
0.570	143	98	75
0.580	145	96	72

Airflow Reference Charts RNC5 TPD/TPF Models Continued

RNC5-TPD models have 3 airflow charts for their installer adjustable high speed settings. Refer to "Installer Selectable High Speed Settings" in this manual for instructions on how to adjust the circuit board DIP switches.

0.890	223	136	99
0.900	226	133	96
0.910	228	130	94
0.920	231	127	91
0.930	233	125	89
0.940	236	122	86
0.950	238	119	84
0.960	241	116	81
0.970	243	113	79
0.980	246	111	76
0.990	248	108	74
1.000	251	105	71
1.010	253	102	69
1.020	256	100	66
1.030	258	97	
1.040	261	94	
1.050	263	91	
1.060	266	88	
1.070	268	86	
1.080	271	83	
1.090	273	80	
1.100	276	77	
1.110	278	74	

0.670	168	112	90
0.680	170	110	88
0.690	173	108	85
0.700	175	106	83
0.710	178	104	81
0.720	180	102	79
0.730	183	100	76
0.740	185	99	74
0.750	188	97	72
0.760	190	95	69
0.770	193	93	67
0.780	195	91	65
0.790	198	89	63
0.800	200	87	60
0.810	203	85	58
0.820	205	84	56
0.830	208	82	54
0.840	210	80	51
0.850	213	78	
0.860	215	76	
0.870	218	74	
0.880	220	72	
0.890	223	70	
0.900	225	69	
0.910	228	67	
0.920	230	65	
0.930	233	63	
0.940	235	61	
0.950	238	59	
0.960	240	57	
0.970	243	55	
0.980	245	54	
0.990	248	52	
1.000	250	50	

0.590	148	94	70
0.600	150	92	68
0.610	153	90	66
0.620	155	88	63
0.630	158	86	61
0.640	160	84	59
0.650	163	82	57
0.660	165	80	54
0.670	168	78	52
0.680	170	76	50
0.690	173	74	48
0.700	175	72	45
0.710	178	70	43
0.720	180	68	41
0.730	183	66	39
0.740	185	64	
0.750	188	62	
0.760	190	60	
0.770	193	58	
0.780	195	56	
0.790	198	54	
0.800	200	52	
0.810	203	50	
0.820	205	48	
0.830	208	45	
0.840	210	43	
0.850	213	41	

Airflow Reference Charts RNC6-ES Model

RNC6-ES models have 3 airflow charts for their installer adjustable high speed settings. Refer to “Installer Selectable High Speed Settings” in this manual for instructions on how to adjust the circuit board DIP switches.

HI 3			
Pressure Drop		Supply Airflow	Exhaust Airflow
(" w.g.)	(Pa)	(cfm)	(cfm)
0.70	174		158
0.71	177		155
0.72	179		152
0.73	182		149
0.74	184		146
0.75	187		143
0.76	189		140
0.77	192		137
0.78	194		134
0.79	197		131
0.80	199		128
0.81	202		125
0.82	204		122
0.83	207		119
0.84	209		116
0.85	212		113
0.86	214		110
0.87	217	155	107
0.88	219	149	104
0.89	222	144	101
0.90	224	139	98
0.91	227	134	95
0.92	229	129	92
0.93	232	125	89
0.94	234	120	87
0.95	237	115	84
0.96	239	111	81
0.97	242	106	78
0.98	244	102	75
0.99	247	98	72
1.00	249	94	69
1.01	252	90	66

HI 2			
Pressure Drop		Supply Airflow	Exhaust Airflow
(" w.g.)	(Pa)	(cfm)	(cfm)
0.57	142		140
0.58	145		137
0.59	147		134
0.60	150		131
0.61	152		127
0.62	154		124
0.63	157		121
0.64	159		118
0.65	162		115
0.66	164		112
0.67	167		109
0.68	169		106
0.69	172		103
0.70	174	141	100
0.71	177	136	97
0.72	179	131	94
0.73	182	126	92
0.74	184	121	89
0.75	187	116	86
0.76	189	111	83
0.77	192	107	80
0.78	194	103	77
0.79	197	98	75
0.80	199	94	72
0.81	202	90	69
0.82	204	86	66
0.83	207	83	64
0.84	209	79	61
0.85	212	75	58
0.86	214	72	56
0.87	217	68	53
0.88	219	65	51

HI 1			
Pressure Drop		Supply Airflow	Exhaust Airflow
(" w.g.)	(Pa)	(cfm)	(cfm)
0.50	125		124
0.51	127		120
0.52	130		117
0.53	132		114
0.54	135		110
0.55	137		107
0.56	140		104
0.57	142		101
0.58	145		98
0.59	147		94
0.60	150	126	91
0.61	152	121	88
0.62	154	116	85
0.63	157	111	83
0.64	159	107	80
0.65	162	102	77
0.66	164	98	74
0.67	167	93	71
0.68	169	89	69
0.69	172	85	66
0.70	174	81	63
0.71	177	78	61
0.72	179	74	58
0.73	182	70	56
0.74	184	67	53
0.75	187	64	51
0.76	189	61	48
0.77	192	58	46
0.78	194	55	44
0.79	197	52	42
0.80	199	50	
0.81	202	47	

Airflow Reference Charts RNC6-ES Model Continued

RNC6-ES model have 3 airflow charts for their installer adjustable high speed settings. Refer to "Installer Selectable High Speed Settings" in this manual for instructions on how to adjust the circuit board DIP switches.

1.02	254	86	63
1.03	257	82	60
1.04	259	78	57
1.05	262	75	54
1.06	264	71	51
1.07	267	68	48
1.08	269	64	45
1.09	272	61	42
1.10	274	58	
1.11	277	55	
1.12	279	52	
1.13	282	49	
1.14	284	46	
1.15	287	44	
1.16	289	41	
1.17	292	39	

0.89	222	62	48
0.90	224	59	45
0.91	227	56	43
0.92	229	53	40
0.93	232	51	
0.94	234	48	
0.95	237	46	
0.96	239	43	
0.97	242	41	

0.82	204	45	
0.83	207	43	
0.84	209	41	

Airflow Reference Charts RNC5-HEX-TPD/TPF Models

RNC5-HEX-TPD and TPF models have 3 airflow charts for their installer adjustable high speed settings. Refer to "Installer Selectable High Speed Settings" in this manual for instructions on how to adjust the circuit board DIP switches.

Hi 3			
Pressure Drop		Supply Airflow	Exhaust Airflow
("w.g.)	(Pa)	(cfm)	(cfm)
0.200	50	113	108
0.210	52	113	108
0.220	55	112	107
0.230	57	112	107
0.240	60	111	106
0.250	62	110	106
0.260	65	110	106
0.270	67	109	105
0.280	70	108	105
0.290	72	108	104
0.300	75	107	103
0.310	77	106	103
0.320	80	105	102
0.330	82	105	102
0.340	85	104	101
0.350	87	103	100
0.360	90	102	100
0.370	92	101	99
0.380	95	100	98
0.390	97	99	97
0.400	100	98	97
0.410	102	97	96
0.420	105	96	95
0.430	107	95	94
0.440	110	94	93
0.450	112	93	93
0.460	115	92	92
0.470	117	91	91
0.480	120	90	90
0.490	122	89	89
0.500	125	88	88
0.510	127	87	87
0.520	129	85	86
0.530	132	84	85
0.540	134	83	84
0.550	137	82	83
0.560	139	80	81
0.570	142	79	80
0.580	144	78	79
0.590	147	76	78
0.600	149	75	77

Hi 2			
Pressure Drop		Supply Airflow	Exhaust Airflow
("w.g.)	(Pa)	(cfm)	(cfm)
0.200	50		104
0.210	52	104	103
0.220	55	104	102
0.230	57	103	101
0.240	60	102	100
0.250	62	102	99
0.260	65	101	98
0.270	67	100	97
0.280	70	99	96
0.290	72	98	95
0.300	75	97	94
0.310	77	96	93
0.320	80	96	92
0.330	82	95	91
0.340	85	94	90
0.350	87	93	89
0.360	90	92	88
0.370	92	91	87
0.380	95	90	86
0.390	97	89	85
0.400	100	87	84
0.410	102	86	83
0.420	105	85	82
0.430	107	84	81
0.440	110	83	80
0.450	112	82	79
0.460	115	80	77
0.470	117	79	76
0.480	120	78	75
0.490	122	77	74
0.500	125	75	73
0.510	127	74	71
0.520	129	73	70
0.530	132	71	69
0.540	134	70	68
0.550	137	68	67
0.560	139	67	65
0.570	142	65	64
0.580	144	64	63
0.590	147	62	62
0.600	149	61	60

Hi 1			
Pressure Drop		Supply Airflow	Exhaust Airflow
("w.g.)	(Pa)	(cfm)	(cfm)
0.200	50	97	96
0.210	52	96	95
0.220	55	95	93
0.230	57	94	92
0.240	60	93	91
0.250	62	93	90
0.260	65	92	88
0.270	67	91	87
0.280	70	90	86
0.290	72	89	85
0.300	75	87	84
0.310	77	86	82
0.320	80	85	81
0.330	82	84	80
0.340	85	83	79
0.350	87	82	78
0.360	90	81	76
0.370	92	80	75
0.380	95	78	74
0.390	97	77	73
0.400	100	76	71
0.410	102	75	70
0.420	105	73	69
0.430	107	72	68
0.440	110	71	67
0.450	112	69	65
0.460	115	68	64
0.470	117	67	63
0.480	120	65	62
0.490	122	64	60
0.500	125	63	59
0.510	127	61	58
0.520	129	60	57
0.530	132	58	55
0.540	134	57	54
0.550	137	55	53
0.560	139	54	52
0.570	142	52	51
0.580	144	50	49
0.590	147	49	48
0.600	149	47	47

Airflow Reference Charts RNC5-HEX-TPF and TPF Models *(Continued)*

0.610	152	73	75
0.620	154	72	74
0.630	157	71	73
0.640	159	69	72
0.650	162	68	70
0.660	164	66	69
0.670	167	65	68
0.680	169	63	66
0.690	172	62	65
0.700	174	60	63
0.710	177	58	62
0.720	179	57	61
0.730	182	55	59
0.740	184	53	58
0.750	187	52	56
0.760	189	50	54
0.770	192	48	53
0.780	194	46	51
0.790	197	45	50
0.800	199	43	48
0.810	202	41	46
0.820	204		45
0.830	207		43
0.840	209		41
0.850	212		40

0.610	152	59	59
0.620	154	58	58
0.630	157	56	56
0.640	159	54	55
0.650	162	53	54
0.660	164	51	52
0.670	167	49	51
0.680	169	48	49
0.690	172	46	48
0.700	174	44	47
0.710	177	42	45
0.720	179	41	44
0.730	182		42
0.740	184		41
0.750	187		40

0.610	152	46	46
0.620	154	44	44
0.630	157	42	43
0.640	159	41	42

Airflow Reference Charts RNC155 Model

155 models have 3 airflow charts for their installer adjustable high speed settings. Refer to "Installer Selectable High Speed Settings" in the installation manual for instructions on how to adjust the circuit board DIP switches. Hi 3 is the factory setting (the highest high speed). Refer to the specification sheet for high speed airflows.

Hi 3			
Pressure Drop		Supply	Exhaust
	Airflow	Airflow	
(" w.g.)	(Pa)	(cfm)	(cfm)
0.000	0		40
0.005	1		45
0.010	3		50
0.015	4		54
0.020	5		59
0.025	6		63
0.030	8		68
0.035	9		72
0.040	10		76
0.045	11		81
0.050	13	39	85
0.055	14	43	89
0.060	15	46	93
0.065	16	49	97
0.070	18	53	101
0.075	19	56	105
0.080	20	59	109
0.085	21	62	113
0.090	23	65	117
0.095	24	68	120
0.100	25	71	124
0.105	26	74	128
0.110	28	76	131
0.115	29	79	135
0.120	30	81	138
0.125	31	84	141
0.130	33	86	145
0.135	34	89	148
0.140	35	91	151
0.145	36	93	154
0.150	38	96	157
0.155	39	98	160
0.160	40	100	163
0.165	41	102	166
0.170	43	104	169
0.175	44	106	172
0.180	45	108	174
0.185	46	110	177
0.190	48	112	180
0.195	49	114	182
0.200	50	116	185

Hi 2			
Pressure Drop		Supply	Exhaust
	Airflow	Airflow	
(" w.g.)	(Pa)	(cfm)	(cfm)
0.000	0		35
0.005	1		40
0.010	3		44
0.015	4		49
0.020	5		54
0.025	6		59
0.030	8	35	63
0.035	9	38	68
0.040	10	41	72
0.045	11	43	77
0.050	13	46	81
0.055	14	49	85
0.060	15	52	90
0.065	16	54	94
0.070	18	57	98
0.075	19	60	102
0.080	20	62	106
0.085	21	65	110
0.090	23	67	114
0.095	24	70	118
0.100	25	73	122
0.105	26	75	126
0.110	28	78	129
0.115	29	80	133
0.120	30	83	137
0.125	31	85	140
0.130	33	88	144
0.135	34	90	147
0.140	35	93	150
0.145	36	95	154
0.150	38	97	157
0.155	39	100	160
0.160	40	102	163
0.165	41	104	166
0.170	43	107	169
0.175	44	109	172
0.180	45	111	175
0.185	46	113	178
0.190	48	116	181
0.195	49	118	184
0.200	50	120	186

Hi 1			
Pressure Drop		Supply	Exhaust
	Airflow	Airflow	
(" w.g.)	(Pa)	(cfm)	(cfm)
0.000	0		39
0.005	1		44
0.010	3		48
0.015	4		53
0.020	5		58
0.025	6		62
0.030	8		67
0.035	9		71
0.040	10		76
0.045	11	38	81
0.050	13	42	85
0.055	14	45	90
0.060	15	49	94
0.065	16	52	99
0.070	18	55	104
0.075	19	58	108
0.080	20	61	113
0.085	21	64	117
0.090	23	67	122
0.095	24	70	127
0.100	25	73	131
0.105	26	76	136
0.110	28	79	140
0.115	29	82	145
0.120	30	84	149
0.125	31	87	154
0.130	33	89	158
0.135	34	92	163
0.140	35	94	167
0.145	36	97	172
0.150	38	99	176
0.155	39	102	181
0.160	40	104	
0.165	41	107	
0.170	43	109	
0.175	44	111	
0.180	45	113	
0.185	46	116	
0.190	48	118	
0.195	49	120	
0.200	50	123	

Airflow Reference Charts RNC155 Model Continued

155 models have 3 airflow charts for their installer adjustable high speed settings. Refer to "Installer Selectable High Speed Settings" in the installation manual for instructions on how to adjust the circuit board DIP switches. NOTE: Hi 3 is the factory setting (the highest high speed). Refer to the specification sheet for high speed airflows.

0.205	51	118	187
0.210	53	120	189
0.215	54	122	192
0.220	55	123	194
0.225	56	125	196
0.230	58	127	198
0.235	59	129	200
0.240	60	131	202
0.245	61	132	
0.250	63	134	
0.255	64	136	
0.260	65	138	
0.265	66	139	
0.270	68	141	
0.275	69	143	
0.280	70	145	
0.285	71	146	
0.290	73	148	
0.295	74	150	
0.300	75	152	
0.305	76	154	
0.310	78	156	
0.315	79	158	
0.320	80	159	
0.325	81	161	
0.330	83	163	
0.335	84	165	
0.340	85	167	
0.345	86	170	
0.350	88	172	
0.355	89	174	
0.360	90	176	
0.365	91	178	
0.370	93	181	
0.375	94	183	
0.380	95	185	
0.385	96	188	
0.390	98	190	
0.395	99	193	
0.400	100	196	
0.405	101	198	
0.410	103	201	

0.205	51	122	189
0.210	53	124	192
0.215	54	127	
0.220	55	129	
0.225	56	131	
0.230	58	133	
0.235	59	135	
0.240	60	137	
0.245	61	139	
0.250	63	141	
0.255	64	143	
0.260	65	145	
0.265	66	147	
0.270	68	149	
0.275	69	151	
0.280	70	153	
0.285	71	154	
0.290	73	156	
0.295	74	158	
0.300	75	160	
0.305	76	162	
0.310	78	163	
0.315	79	165	
0.320	80	167	
0.325	81	169	
0.330	83	170	
0.335	84	172	
0.340	85	174	
0.345	86	175	
0.350	88	177	
0.355	89	179	
0.360	90	180	
0.365	91	182	
0.370	93	183	
0.375	94	185	
0.380	95	186	
0.385	96	188	
0.390	98	189	
0.395	99	191	
0.400	100	192	

0.205	51	125	
0.210	53	127	
0.215	54	129	
0.220	55	132	
0.225	56	134	
0.230	58	136	
0.235	59	138	
0.240	60	141	
0.245	61	143	
0.250	63	145	
0.255	64	148	
0.260	65	150	
0.265	66	152	
0.270	68	155	
0.275	69	157	
0.280	70	160	
0.285	71	162	
0.290	73	165	
0.295	74	167	
0.300	75	170	
0.305	76	173	
0.310	78	176	
0.315	79	178	
0.320	80	181	

Airflow Reference Charts RNC205 Model

205 models have 3 airflow charts for their installer adjustable high speed settings. Refer to “Installer selectable High Speed Settings” in the installation manual for instructions on how to adjust the circuit board DIP switches. Hi 3 is the factory setting (the highest high speed). Refer to the specification sheet for high speed airflows.

Hi 3			
Pressure Drop		Supply Airflow	Exhaust Airflow
("w.g.)	Pa	(cfm)	(cfm)
0.65	162	210	
0.66	164	208	
0.67	167	206	
0.68	169	204	
0.69	172	201	204
0.70	174	199	202
0.71	177	197	200
0.72	179	194	197
0.73	182	192	195
0.74	184	190	193
0.75	187	188	191
0.76	189	185	188
0.77	192	183	186
0.78	194	181	184
0.79	197	179	182
0.80	199	176	179
0.81	202	174	177
0.82	204	172	175
0.83	207	170	173
0.84	209	167	171
0.85	212	165	168
0.86	214	163	166
0.87	217	160	164
0.88	219	158	162
0.89	222	156	159
0.90	224	154	157
0.91	227	151	155
0.92	229	149	153
0.93	232	147	150
0.94	234	145	148
0.95	237	142	146
0.96	239	140	144
0.97	242	138	142
0.98	244	136	139
0.99	247	133	137
1.00	249	131	135
1.01	252	129	133
1.02	254	126	130

Hi 2			
Pressure Drop		Supply Airflow	Exhaust Airflow
("w.g.)	Pa	(cfm)	(cfm)
0.47	117	177	
0.48	120	175	
0.49	122	172	
0.50	125	169	
0.51	127	167	
0.52	130	164	177
0.53	132	161	174
0.54	135	159	171
0.55	137	156	168
0.56	140	154	165
0.57	142	151	162
0.58	145	149	159
0.59	147	146	156
0.60	150	144	153
0.61	152	141	150
0.62	154	139	147
0.63	157	137	144
0.64	159	134	141
0.65	162	132	138
0.66	164	129	136
0.67	167	127	133
0.68	169	125	130
0.69	172	122	128
0.70	174	120	125
0.71	177	118	122
0.72	179	116	120
0.73	182	113	117
0.74	184	111	115
0.75	187	109	112
0.76	189	107	110
0.77	192	105	108
0.78	194	102	105
0.79	197	100	103
0.80	199	98	101
0.81	202	96	98
0.82	204	94	96
0.83	207	92	94
0.84	209	90	92

Hi 1			
Pressure Drop		Supply Airflow	Exhaust Airflow
("w.g.)	Pa	(cfm)	(cfm)
0.40	100	153	
0.41	102	150	
0.42	105	147	
0.43	107	144	
0.44	110	141	
0.45	112	138	152
0.46	115	136	148
0.47	117	133	145
0.48	120	130	141
0.49	122	128	138
0.50	125	125	135
0.51	127	123	131
0.52	130	120	128
0.53	132	117	125
0.54	135	115	122
0.55	137	112	119
0.56	140	110	116
0.57	142	108	113
0.58	145	105	110
0.59	147	103	107
0.60	150	100	105
0.61	152	98	102
0.62	154	96	99
0.63	157	94	97
0.64	159	91	94
0.65	162	89	92
0.66	164	87	89
0.67	167	85	87
0.68	169	83	85
0.69	172	81	82
0.70	174	79	80
0.71	177	77	78
0.72	179	75	76
0.73	182	73	74
0.74	184	71	72
0.75	187	69	70
0.76	189	67	68
0.77	192	65	67

Airflow Reference Charts RNC205 Model Continued

205 models have 3 airflow charts for their installer adjustable high speed settings. Refer to "Installer Selectable High Speed Settings" in the installation manual for instructions on how to adjust the circuit board DIP switches. Hi 3 is the factory setting (the highest high speed). Refer to the specification sheet for high speed airflows.

1.03	257	124	128
1.04	259	122	126
1.05	262	120	124
1.06	264	117	121
1.07	267	115	119
1.08	269	113	117
1.09	272	111	115
1.10	274	108	113
1.11	277	106	110
1.12	279	104	108
1.13	282	102	106
1.14	284	99	104
1.15	287	97	101
1.16	289	95	99
1.17	292	92	97
1.18	294	90	95
1.19	297	88	92
1.20	299	86	90
1.21	302	83	88
1.22	304	81	86
1.23	306	79	84
1.24	309	77	81
1.25	311	74	79
1.26	314	72	77
1.27	316	70	75
1.28	319	68	72
1.29	321	65	70
1.30	324	63	68
1.31	326	61	66
1.32	329	58	63
1.33	331	56	61
1.34	334	54	59
1.35	336	52	57
1.36	339	49	54
1.37	341	47	52
1.38	344	45	50
1.39	346	43	48
1.40	349	40	46
1.41	351		43
1.42	354		41

0.85	212	88	90
0.86	214	86	88
0.87	217	84	86
0.88	219	82	83
0.89	222	80	82
0.90	224	78	80
0.91	227	76	78
0.92	229	74	76
0.93	232	72	74
0.94	234	70	72
0.95	237	69	70
0.96	239	67	69
0.97	242	65	67
0.98	244	63	65
0.99	247	61	63
1.00	249	59	62
1.01	252	58	60
1.02	254	56	59
1.03	257	54	57
1.04	259	53	56
1.05	262	51	54
1.06	264	49	53
1.07	267	48	51
1.08	269	46	50
1.09	272	44	49
1.10	274	43	47
1.11	277	41	46
1.12	279	40	45
1.13	282		44
1.14	284		43
1.15	287		41
1.16	289		40

0.78	194	63	65
0.79	197	61	63
0.80	199	60	62
0.81	202	58	60
0.82	204	56	59
0.83	207	54.398493	57.228845
0.84	209	52.729472	55.862029
0.85	212	51.088325	54.552617
0.86	214	49.475052	53.300611
0.87	217	47.889653	52.106009
0.88	219	46.332128	50.968811
0.89	222	44.802477	49.889018
0.9	224	43.3007	48.86663
0.91	227	41.826797	47.901646
0.92	229	40.380768	46.994067
0.93	232		46.143893
0.94	234		45.351123
0.95	237		44.615758
0.96	239		43.937797
0.97	242		43.317241
0.98	244		42.754089
0.99	247		42.248342
1	249		41.8
1.01	252		41.409062
1.02	254		41.075529
1.03	257		40.799401
1.04	259		40.580677
1.05	262		40.419358

Airflow Reference Charts RNC200 Model

Door port balancing can be achieved by using these charts. Balance these Models on their factory circuit board DIP settings (Hi 3).

MODEL 200			
Reading from Manometer		Airflow Numbers	
Water Column (inches)	Pressure (Pa)	Supply (CFM)	Exhaust (CFM)
0.100	24.9	98	91
0.110	27.4	102	96
0.120	29.9	107	101
0.130	32.4	111	107
0.140	34.9	115	112
0.150	37.4	120	117
0.160	39.9	124	122
0.170	42.4	128	127
0.180	44.9	133	132
0.190	47.3	137	137
0.200	49.8	141	142
0.210	52.3	145	147
0.220	54.8	149	152
0.230	57.3	153	156
0.240	59.8	157	161
0.250	62.3	161	166
0.260	64.8	165	171
0.270	67.3	169	175
0.280	69.8	173	180
0.290	72.3	177	184
0.300	74.8	181	189
0.310	77.2	185	193
0.320	79.7	189	198
0.330	82.2	192	202
0.340	84.7	196	207
0.350	87.2	200	211
0.360	89.7	203	215

Troubleshooting

SYMPTOM	CAUSE	SOLUTION
Poor airflows	<ul style="list-style-type: none"> • 1/4 in (6 mm) mesh on outside hood is plugged • Filters plugged • Core obstructed • House grilles closed or blocked • Dampers are closed if installed • Poor power supply at site • Ductwork is restricting HRV • Improper speed control setting • HRV airflow improperly balanced 	<ul style="list-style-type: none"> • Clean exterior hoods or vents • Remove and clean filter • Remove and clean core • Check and open grilles • Open and adjust dampers • Have electrician check supply voltage • Check duct installation • Increase the speed of the HRV • Have contractor balance HRV
Supply air feels cold	<ul style="list-style-type: none"> • Poor location of supply grilles, the airflow may irritate the occupant • Outdoor temperature extremely cold 	<ul style="list-style-type: none"> • Locate the grilles high on the walls or under the baseboards, install ceiling mounted diffuse or grilles so as not to directly spill the supply air on the occupant (i.e. over a sofa) • Turn down the HRV supply speed. A small duct heater (1 kW) could be used to temper the supply air. • Placement of furniture or closed doors is restricting the movement of air in the home • If supply air is ducted into furnace return, the furnace fan may need to run continuously to distribute ventilation air comfortably
Dehumidistat in not operating	<ul style="list-style-type: none"> • Outdoor temperature is above 15°C (59°F) • Improper low voltage connection • External low voltage is shortened out by a staple or nail • Check dehumidistat setting it may be on OFF 	<ul style="list-style-type: none"> • Dehumidistat is functioning normally (see Auto Dehumidistat Disable in this manual) • Check that the correct terminals have been used • Check external wiring for a short • Set the dehumidistat at the desired setting
Humidity levels are too high condensation is appearing on the windows	<ul style="list-style-type: none"> • Dehumidistat is set too high • HRV is not sized to handle a hot tub, indoor pool etc. • Lifestyle of the occupants • Moisture coming into the home from an unvented or unheated crawl space • Moisture is remaining in the wash room and kitchen areas • Condensation seems to form in the spring and fall • HRV is set at too low a speed 	<ul style="list-style-type: none"> • Set dehumidistat lower • Cover pools, hot tubs when they are not in use • Avoid hanging clothes to dry, storing wood and venting clothes dryer inside. Firewood may have to be moved outside • Vent crawl space and place a vapor barrier on the floor of the crawl space • Ducts from the washroom should be sized to remove moist air as effectively as possible, use of a bathroom fan for short periods will remove additional moisture • On humid days, as the seasons change, some condensation may appear but the homes air quality will remain high with some HRV use • Increase speed of the HRV
Humidity levels are too low	<ul style="list-style-type: none"> • Dehumidistat control set too low • Blower speed of HRV is too high • Lifestyle of occupants • HRV airflows may be improperly balanced 	<ul style="list-style-type: none"> • Set dehumidistat higher • Decrease HRV blower speed • Humidity may have to be added through the use of humidifiers • Have contractor balance HRV airflows
HRV and/or ducts frosting up	<ul style="list-style-type: none"> • HRV airflows are improperly balanced • Malfunction of the HRV defrost system 	<ul style="list-style-type: none"> • Note: minimal frost build-up is expected on cores before unit initiates defrost cycle functions • Have HVAC contractor balance the HRV • Ensure damper defrost is operating during self-test
Condensation or ice build up in insulated duct to the outside	<ul style="list-style-type: none"> • Incomplete vapor barrier around insulated duct • A hole or tear in outer duct covering 	<ul style="list-style-type: none"> • Tape and seal all joints • Tape any holes or tears made in the outer duct covering, ensure that the vapor barrier is completely sealed
Excess water in the bottom of the HRV	<ul style="list-style-type: none"> • Drain pans plugged • Improper connection of HRV's drain lines • HRV is not level • Drain lines are obstructed • HRV heat exchange core is not properly installed 	<ul style="list-style-type: none"> • Look for obstructions in the drain line • Look for kinks in the drain line
Excessive Vibration	<ul style="list-style-type: none"> • Dirt on fan wheels 	<ul style="list-style-type: none"> • Have contractor service HRV