

# LIFEBREATH<sup>®</sup>

CLEAN • FRESH • AIR

## OPERATION AND INSTALLATION MANUAL

*For Models:*

*500DCS ControlAir 15*

*850FD/DD Analog Controls*

*700FD/DD Analog Controls*

*1200FD/DD Analog Controls*

*500ERV ControlAir 15*

*700ERV Analog Controls*

*1200ERV Analog Controls*

**NOTE: ALTHOUGH SOME MODELS DIFFER IN OPERATION, THE BASIC STEPS ARE SIMILAR.**

**CAUTION**

Before installation, careful consideration **must** be given to how the 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 airflow's of the Heat/Energy Recovery Ventilator (HRV/ERV), by using the balancing procedure in this manual.

It is always important to assess how the operation of any HRV/ERV may interact with vented combustion equipment (ie. Gas Furnaces, Oil Furnaces, Wood Stoves, etc.).

**NEVER** install an HRV/ERV 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!!!

TO BE COMPLETED BY CONTRACTOR AFTER INSTALLATION

\_\_\_\_\_

Installing Contractor

\_\_\_\_\_

Telephone / Contact

\_\_\_\_\_

Serial Number

\_\_\_\_\_

Installation Date

\_\_\_\_\_

Model



**\* LEAVE FOR HOMEOWNER**

NOTE: Due to ongoing research and product development, specifications, ratings and dimensions are subject to change without notice.

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# INTRODUCTION

## HRV - Aluminum Core

A Heat Recovery Ventilator (HRV) is designed to provide fresh air into a building while exhausting an equal amount of stale air. During the winter months, the incoming cold fresh air is warmed by utilizing the heat recovered from the stale air before it is exhausted to the outdoors. During summer months when the indoor space is air conditioned, the Heat Recovery Ventilator will help in cooling the incoming fresh air with the stale air that is being exhausted.

## ERV - Enthalpic Paper Core

An Energy Recovery Ventilator (ERV) is designed to provide fresh air into a building while exhausting an equal amount of stale air. An ERV is designed for use in warm humid areas with heavy air conditioning use. The ERV will transfer both sensible and latent heat from the incoming fresh air to the outgoing stale air thereby reducing the load (due to ventilation) on the air conditioning system.

ERVs are not suitable for climates where the temperature drops below -4°C (25°F).

# *ERV Questions & Answers*

## ***What is the difference between an HRV and an ERV?***

The core in an HRV (Heat Recovery Ventilator) transfers heat from one air stream to the other. This is called sensible heat. The term ERV (Energy Recovery Ventilator) is usually used to describe a unit with an enthalpic core that transfers moisture as well as heat from one air stream to the other. This (moisture transfer) is called latent heat.

## ***Enthalpic - what does it mean?***

Enthalpy is the term used to describe the energy content of air. This energy is a combination of the sensible and latent heat. Therefore, a core which transfers energy is called an enthalpic core.

## ***Is an ERV better than an HRV?***

NOT NECESSARILY!! In cold climates such as most of North America, an HRV works better than an ERV. This is because the air inside the home during the winter months will be more humid than the outside air. An ERV would transfer the latent heat (humidity) from the exhaust air back into the incoming airstream. This will aggravate moisture problems in the home and encourage the growth of mold and mildew. If the air in the home is too dry for comfort, an ERV will not help. A humidifier should be used to increase the humidity to a comfortable level.

## ***Where do you use an ERV instead of an HRV?***

An ERV is recommended for warm, humid areas with heavy air conditioning use. As there is no defrost in an ERV it is not recommended for areas where the temperature drops below  $-4^{\circ}\text{C}$  ( $25^{\circ}\text{F}$ )

## ***Why transfer moisture in the summer (cooling season)?***

The enthalpic core will allow moisture to be transferred from a humid air flow to a dry air flow. This property is useful in the cooling season if an air conditioning system is used to lower the indoor humidity. You will then have dry, cool air in the exhaust of the ERV, and warm humid air in the supply stream. With these conditions, the ERV will be able to transfer the moisture and heat of the supply air to the exhaust air. In this way, the ERV will supply to the home air which is cooler and drier than outside. Remember that an ERV is not a dehumidifier, and on its own will not take moisture out of the air.

## ***So why use an ERV?***

A properly operating air conditioner will not only lower the temperature in your house, but will also lower the humidity level. This prevents an uncomfortable cold

and damp situation. In fact, about 2/3 of the energy used by the air conditioner system is to remove moisture. Therefore, when ventilating in the summer, less moisture brought into the home means less work for the air conditioner, and energy savings for you.

During the winter, an ERV recovers some humidity from the exhaust air, reducing the need for humidification, if the required ventilation rate would make the home too dry.

## ***What's the difference between this type of core and a rotary type?***

Here's a list of characteristics of the fixed plate core.

1. No rotating parts, so maintenance is easy and the unit lasts a long time.
2. It is very flexible in terms of installation.
3. The core can easily be changed.
4. Because the supply and exhaust air streams are completely separate, there is very little cross leakage of any dust or germs.

## ***Can the core become clogged with dust?***

Because the surface of the core is a turbulent flow area, dust sticks to it easily; however, because the inside of the element is a laminar flow area, virtually no dust sticks to it.

## ***What is the maintenance?***

About once a year you should use a vacuum cleaner to remove the dust from the core's surface. DO NOT WASH WITH WATER!!

## ***Is an air filter needed?***

To prevent clogging of the core, an air filter should always be installed on the supply and exhaust sides of the core.

## ***How much ventilation do I need?***

During seasons when your windows and doors are closed, the ERV should operate continuously when the dwelling is occupied, and either continuously or intermittently when not occupied.

For most installations the ERV will normally be set to operate continuously on low speed with the option of going to high speed as the need arises. For example; if you are entertaining and there is a large number of people present (some may be smoking), the unit should be switched to high speed.






Your ERV may be equipped with automatic or manual switches, but all ERVs will have a manual speed control override.

# LIFEBREATH®

**CLEAN • FRESH • AIR**

Select the correct HRV/ERV to match your climate



 <p><b>Severe Conditions</b> HRV required</p>	 <p><b>Moderate Conditions</b> HRV recommended</p>
 <p><b>Pacific Conditions</b> HRV recommended ERV optional*</p>	 <p><b>Arid Zone - Dry Climate</b> HRV recommended</p>
 <p><b>Extreme Area** - High Humidity</b> ERV recommended*</p>	

\* ERV not recommended where temperatures fall below 25°F (-4°C) for more than five days.  
 \*\* ERV's are recommended in regions where high outdoor humidity is cause for operating air conditioning/dehumidification more frequently than heating system.

# Selecting the Correct Size HRV/ERV

## Commercial and Institutional Requirements

For outdoor air requirements, ASHRAE has produced the Ventilation Standard 62-1989 that is used to determine acceptable ventilation rates. This standard is referenced directly or used as "Good Engineering Practice" in most Code documents or design criteria.

<p><b>Small restaurants, Donut Shops and Fast food stores</b></p> <p>Seats 40            Employees 5            Total 45            ASHRAE requirement 20 cfm (10L/s) per person            Ventilation required 45 x 20 = 900 cfm (450 L/s)</p>	<p><b>Bank</b></p> <p>Customers 25            Staff 9            Total 34            ASHRAE requirement 20 cfm (10L/s) per person            Ventilation required 34 x 20 = 680 cfm (320 L/s)</p>
<p><b>Bar or Tavern</b></p> <p>Seats 50            Employees 7            Total 57            ASHRAE requirement 30 cfm (15L/s) per person            Ventilation required 57 x 30 = 1710 cfm (855 L/s)</p>	<p><b>Bingo Hall</b></p> <p>Customers 180            Staff 20            Total 200            ASHRAE requirement 30 cfm (15L/s) per person            Ventilation required 200 x 30 = 6000 cfm (3000 L/s)</p>
<p><b>Classroom and School Portables</b></p> <p>Seats 29            Teacher 1            Total 30            ASHRAE requirement 15 cfm (7.5L/s) per person            Ventilation required 30 x 15 = 450 cfm (255 L/s)</p>	<p><b>Print Shop, Duplicating</b></p> <p>Square footage of shop 2000 square ft (m<sup>2</sup>)            ASHRAE requirement 0.5 cfm/ft<sup>2</sup> (2.5L/s - m<sup>2</sup>) per person            Ventilation required 2000 x 0.5 = 1000 cfm (500 L/s)</p>
<p><b>Beauty Salon</b></p> <p>Customers 12            Employees 6            Total 18            ASHRAE requirement 25 cfm (12.5L/s) per person            Ventilation required 18 x 25 = 450 cfm (255 L/s)</p>	<p><b>Swimming Pools</b></p> <p>Refer to "Pool" Models Installation Manuals.</p>

### MAKE UP HEAT REQUIREMENT at 1200 CFM (566L/s)

Outdoor Temp.		Nominal	Nominal	Nominal
C°	F°	kW Req. for 20°C (68°F) Air Delivery	kW Req. for 25°C (77°F) Air Delivery	kW Req. for 30°C (86°F) Air Delivery
0	32	7	10	14
-10	14	10	14	17
-20	-4	12	15	19
-30	-22	15	19	22
-40	-40	17	21	24

## SPECIFICATIONS

### CORES

Modular (4 section) patented aluminum heat recovery cores arranged for high efficiency crossflow ventilation.

### MOTORS

Two PSC, 5 speed double shafted, 120 VAC, 3.15 Amps each (6.3 total on high speed). HP - 1/10, 1625 RPM. Watts - total on High Speed - 610.

### FILTERS

Washable air filters in exhaust and supply air streams.

### BLOWERS

Centrifugal type rated at 530 cfm (250 L/s) free air delivery. Each air stream has two centrifugal blowers driven by two PSC motors.

### CONNECTION DUCT SIZES

Four - 14" x 8" (356 mm x 200 mm).

### MOUNTING

Unit to be set on support brackets hung by threaded rod type apparatus (brackets and rods not included).

### CASE

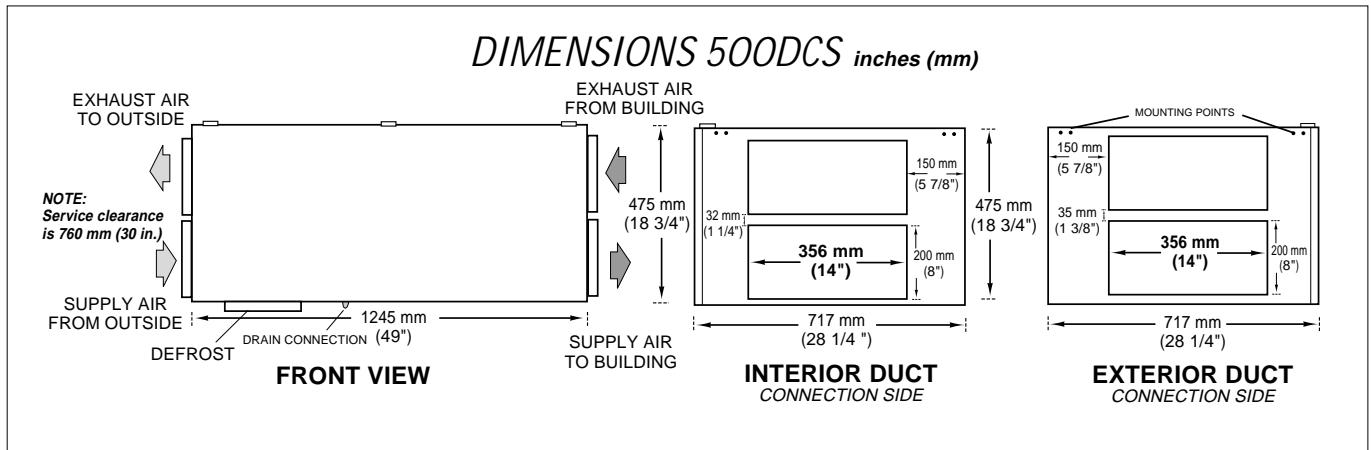
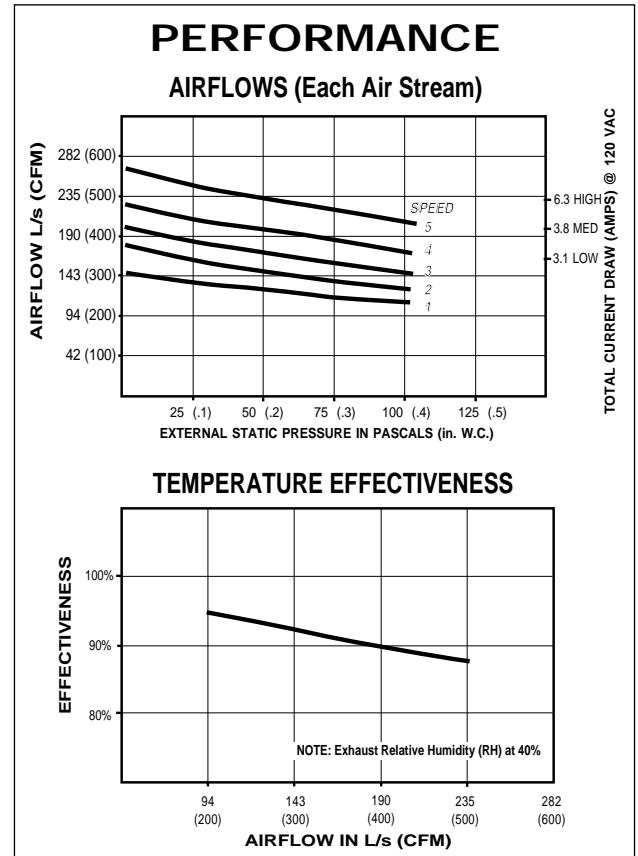
20 gauge prepainted galvanized steel (G60) for superior corrosion resistance. Insulated with foil faced insulation duct liner where required to prevent exterior condensation. Drain connection, One - 1/2" (12 mm) O.D.

### CONTROLS

### DEFROST

Supply bypass damper routes indoor air to defrost cores.

**WEIGHT** 178 lbs. (81 kg) **SHIPPING WEIGHT** 203 lbs. (92 kg)



## OPTIONS

- 99-104 **Digital Electronic Timer** - 20/40/60 min. (3 wire)
- 99-105 **Programmable Ventilation Control** includes Programmable Time Clock, Dehumidistat and Air Sentry™
- 99-109 **Air Sentry™** Air Quality Monitor designed to accept remotely mounted Control Pad
- 99-250 **Ventilation Dehumidistat** - Dehumidistat designed to accept remotely mounted Control Pad.

All units conform to CSA and UL standards.

### WARRANTY

Units carry a 15 year warranty on the heat recovery core and a 2 year replacement parts warranty.

DATE: \_\_\_\_\_

PROJECT: \_\_\_\_\_

MECHANICAL CONTRACTOR: \_\_\_\_\_

## SPECIFICATIONS

### CORES

Modular (6 section) patented aluminum heat recovery cores arranged for high efficiency crossflow ventilation.

### MOTORS

Two PSC, 3 speed double shafted, 120 VAC, 3.95 Amps each (7.9 total on high speed). HP - 1/4, 1625 RPM. Watts - total on High Speed - 848.

### FILTERS

Washable air filters in exhaust and supply air streams.

### BLOWERS

Centrifugal type rated at 950 cfm (448 L/s) free air delivery. Each air stream has one double shafted motor driving two centrifugal blowers.

### CONNECTION DUCT SIZES

Three - 20" x 8" (508 mm x 200 mm).

Stale air intake - 26" x 8" (660 mm x 200 mm).

Model 850DD - additional 20" X 8" defrost port

### MOUNTING

Unit to be set on support brackets hung by threaded rod type apparatus. (brackets and rods not provided).

### CASE

20 gauge prepainted galvanized steel (G60) for superior corrosion resistance. Insulated with foil faced insulation where required to prevent exterior condensation. Drain connections, Two - 1/2" (12 mm) O.D.

### CONTROLS

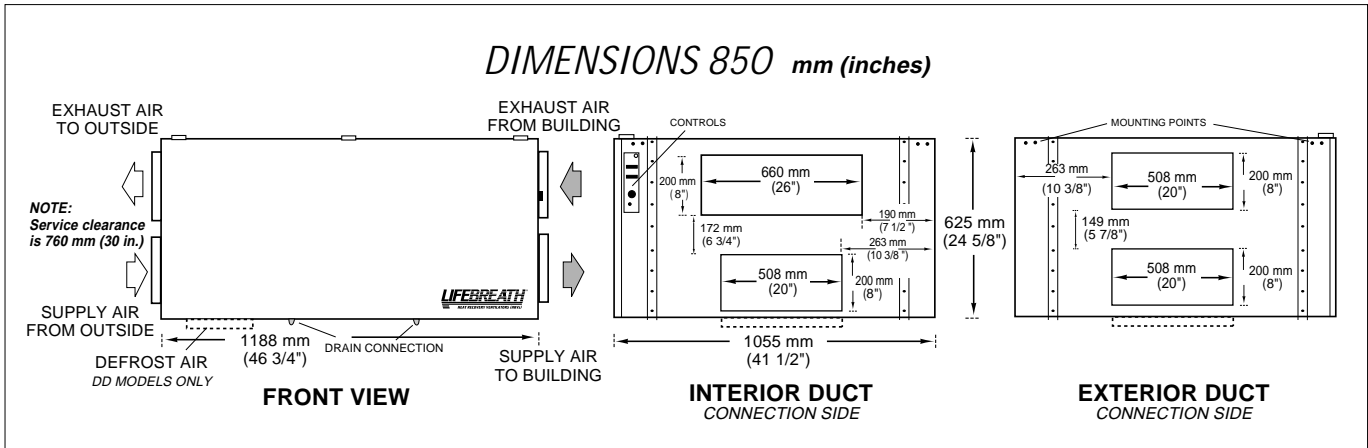
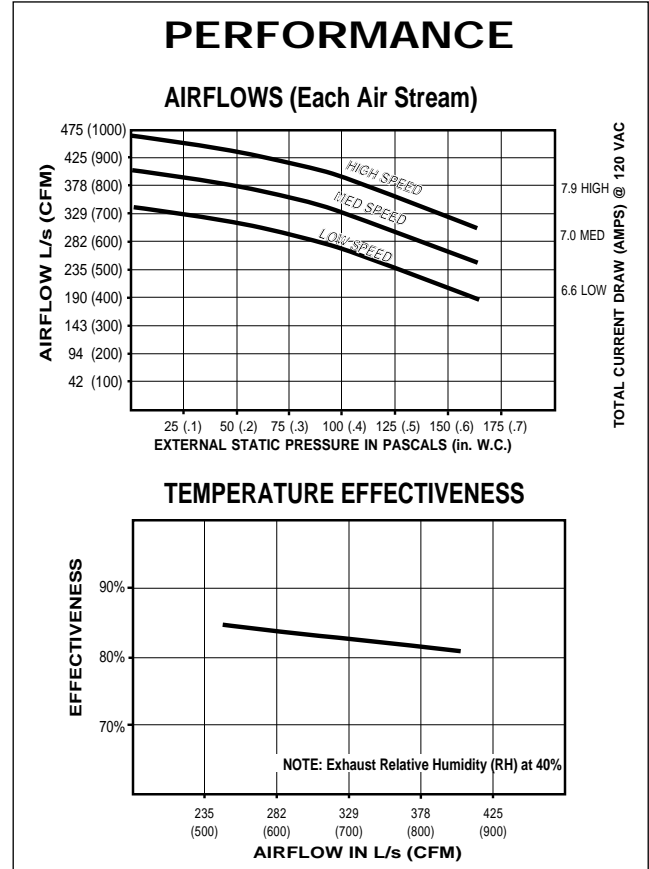
Illuminated power switch, 3 speed blower control, low voltage (24 VAC) terminals for connection of remote controls and defrost light indicating automatic operation.

### DEFROST CONTROLS

Model 850FD - Interrupts supply air while exhaust air defrosts core.

Model 850DD - Supply bypass routes indoor air to defrost core.

**WEIGHT** 255 lbs. (116 kg) **SHIPPING WEIGHT** 280 lbs. (127 kg)



### OPTIONS

99-101 **Sixty Minute Timer**

99-130 **Remote Wall Mount Dehumidistat Control**  
 24 VAC only

All units conform to CSA and UL standards

### WARRANTY

All units carry a 15 year warranty on the heat recovery cores and a 2 year replacement parts warranty.

DATE: \_\_\_\_\_

PROJECT: \_\_\_\_\_

MECHANICAL CONTRACTOR: \_\_\_\_\_

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### SPECIFICATIONS

#### CORES

Modular (2 section) patented aluminum heat recovery cores arranged for efficient cross-flow ventilation.

#### MOTORS

Two PSC, 3 speed single shafted, 120 VAC, 2.75 Amps each (5.5 total on high speed). HP - 1/10, 1625 RPM. Watts - total on high speed - 648.

#### FILTERS

Washable air filters in exhaust and supply air streams.

#### BLOWERS

Centrifugal type rated at 329 L/s (700 CFM) free air delivery. Each air stream has one single shafted motor driving a centrifugal blower.

#### CONNECTION DUCT SIZES

Four - 356 mm x 200 mm (14" x 8").

#### MOUNTING

Unit to be set on support brackets hung by threaded rod type apparatus (brackets and rods not provided).

#### CASE

20 gauge prepainted galvanized steel (G60) for superior corrosion resistance. Insulated with foil faced insulation where required to prevent exterior condensation. Drain connections; two - 12 mm (1/2") O.D.

#### CONTROLS

Illuminated power switch, 3 speed blower control, low voltage (24 VAC) terminals for connection of remote controls and defrost light indicating automatic operation.

#### DEFROST CONTROLS

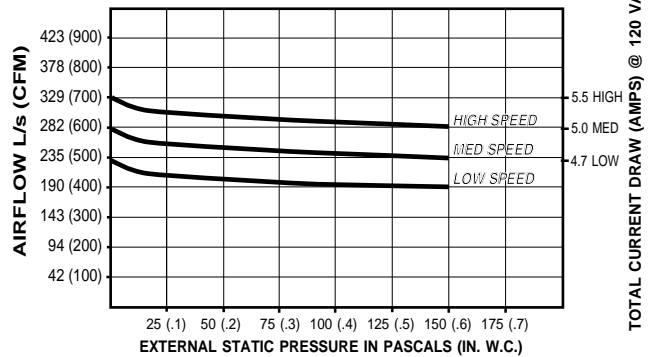
MODEL 700 FD - Interrupts supply air while exhaust air defrosts core.

MODEL 700DD - Supply bypass routes indoor air to defrost core.

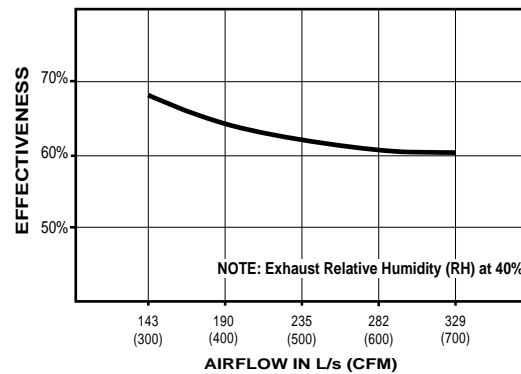
**WEIGHT** 64.4 kg (142 lbs.) **SHIPPING WEIGHT** 75.8 kg (167 lbs.)

### PERFORMANCE

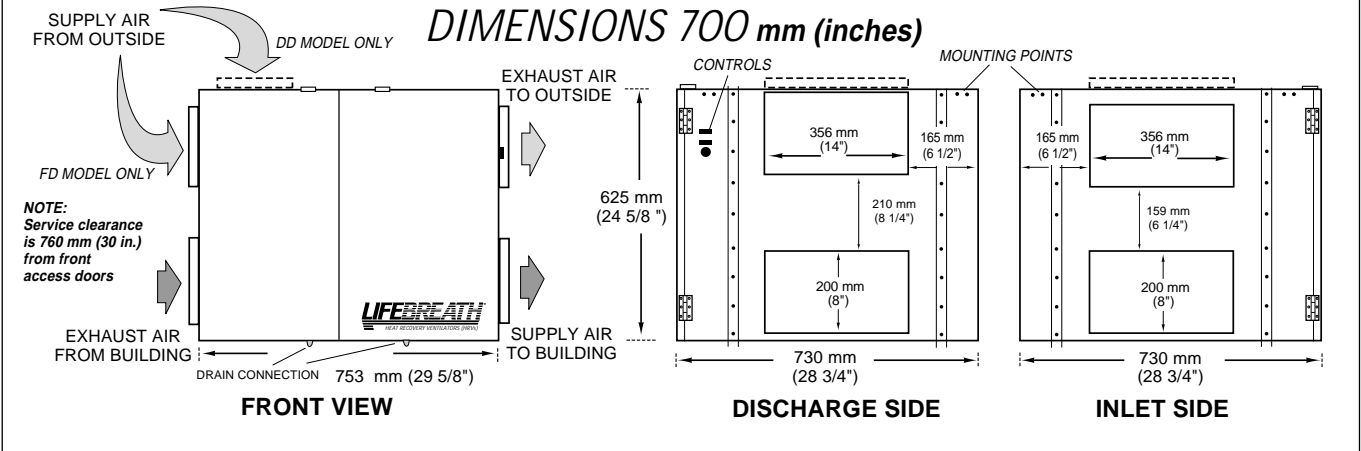
#### AIRFLOWS (Each Air Stream)



#### TEMPERATURE EFFECTIVENESS



### DIMENSIONS 700 mm (inches)



#### OPTIONS

99-101 **Sixty Minute Timer**

99-130 **Remote Wall Mount Dehumidistat Control**  
 24 VAC only

DATE: \_\_\_\_\_

PROJECT: \_\_\_\_\_

MECHANICAL CONTRACTOR: \_\_\_\_\_

All units conform to CSA and UL standards.

#### WARRANTY

All units carry a 15 year warranty on the heat recovery cores and a 2 year replacement parts warranty.



## SPECIFICATIONS

### CORES

Modular (3 section) patented aluminum heat recovery cores arranged for efficient cross-flow ventilation.

### MOTORS

Two PSC, 3 speed double shafted, 120 VAC, 4 Amps each (8.1 total on high speed). HP - 1/4, 1625 RPM. Watts - total on high speed - 972.

### FILTERS

Washable air filters in exhaust and supply air streams.

### BLOWERS

Centrifugal type rated at 1200 cfm (566 L/s) free air delivery. Each air stream has one double shafted motor driving a centrifugal blower.

### CONNECTION DUCT SIZES

Four - 20" x 8" (508 mm x 200 mm).

### MOUNTING

Unit to be set on support brackets hung by threaded rod type apparatus. (brackets and rod not provided).

### CASE

20 gauge prepainted galvanized steel (G60) for superior corrosion resistance. Insulated with foil faced insulation where required to prevent exterior condensation. Drain connections; two - 1/2" (12 mm) O.D.

### CONTROLS

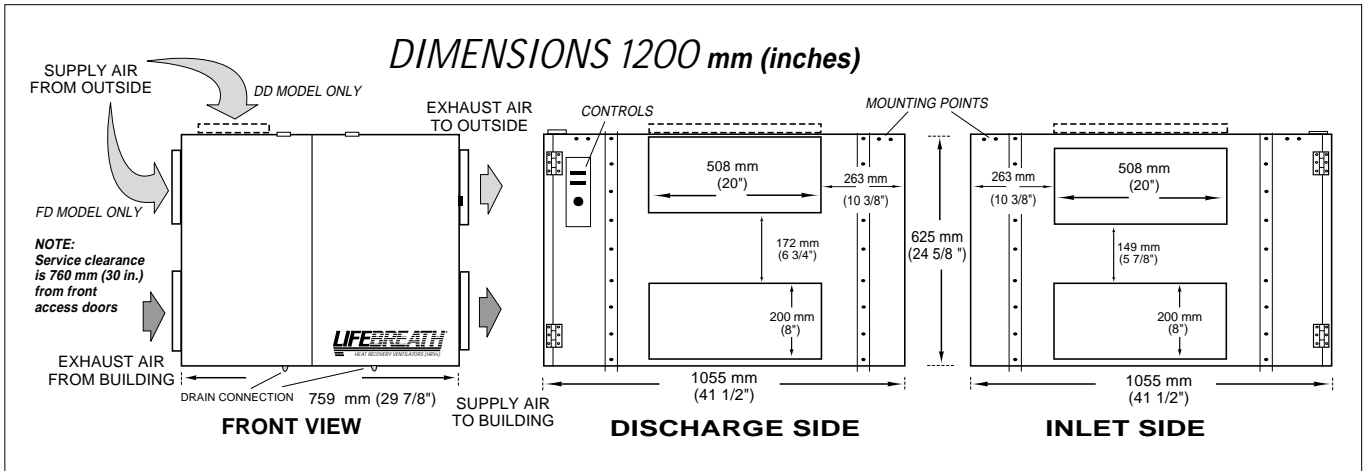
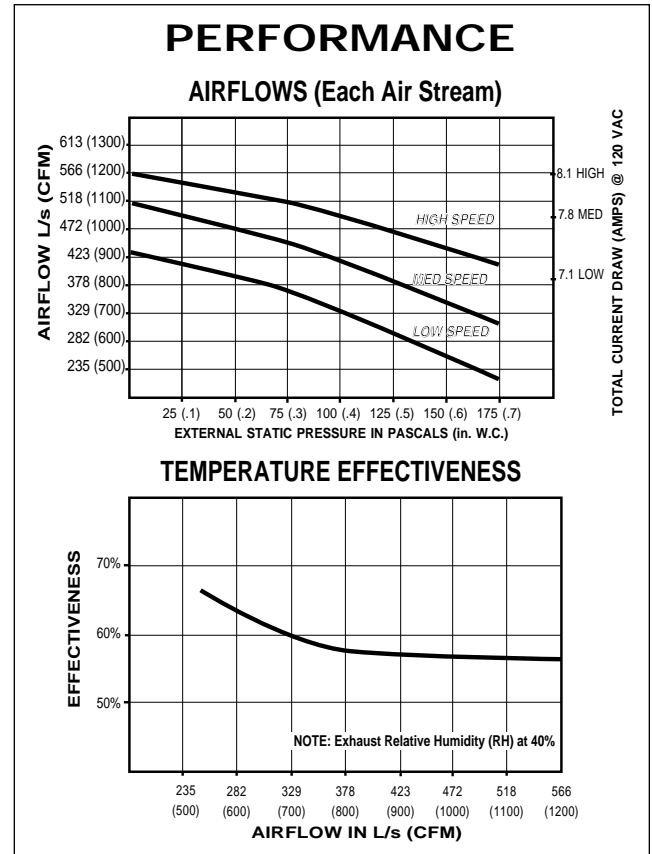
Illuminated power switch, 3 speed blower control, low voltage (24 VAC) terminals for connection of remote controls and defrost light indicating automatic operation.

### DEFROST CONTROLS

MODEL 1200FD - Interrupts supply air while exhaust air defrosts core.

MODEL 1200DD - Supply bypass routes indoor air to defrost core.

**WEIGHT** 191 lbs. (87 kg) **SHIPPING WEIGHT** 215 lbs. (98 kg)



## OPTIONS

- 99-101 Sixty Minute Remote Timer
- 99-130 Remote Wall Mount Dehumidistat Control 24 VAC only

All units conform to CSA and UL standards

## WARRANTY

All units carry a 15 year warranty on the heat recovery cores and a 2 year replacement parts warranty.

DATE: \_\_\_\_\_

PROJECT: \_\_\_\_\_

MECHANICAL CONTRACTOR: \_\_\_\_\_

## SPECIFICATIONS

### LATENT RECOVERY (MOISTURE) TRANSFER CORES

Modular (4 section) 2- Enthalpic, 2 Aluminum arranged for high efficiency crossflow ventilation.

**MOTORS** - Two PSC, 5 speed double shafted, 120 VAC, 3.15 Amps each (6.3 total on high speed). HP - 1/10, 1625 RPM. Watts - total on High Speed - 610.

**FILTERS** - Washable air filters in exhaust and supply air streams.

**BLOWERS** - Centrifugal type rated at 530 cfm (250 L/s) free air delivery. Each air stream has two centrifugal blowers driven by two PSC motors.

**CONNECTION DUCT SIZES** Four - 14" x 8" (356 mm x 200 mm).

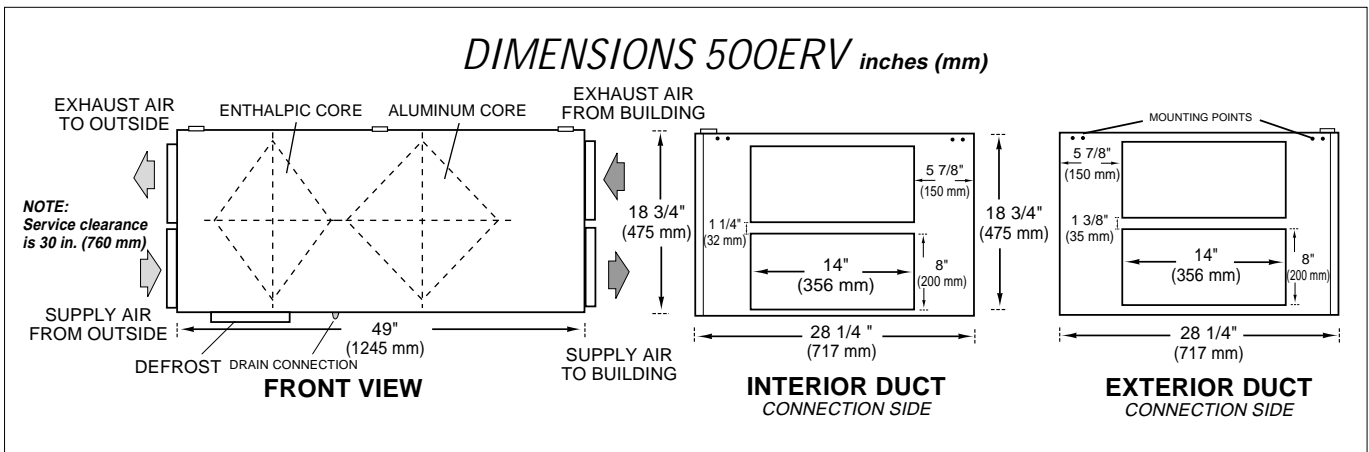
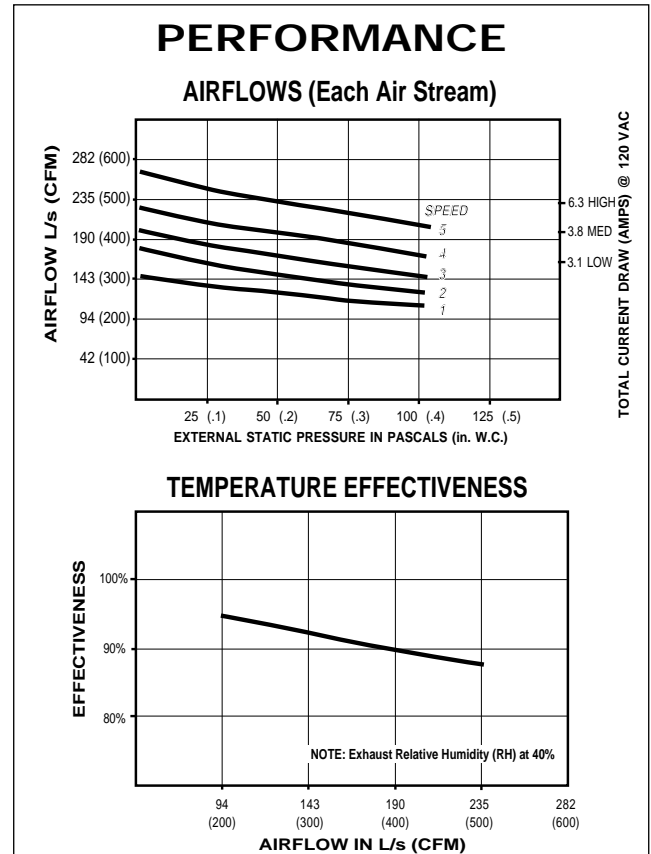
**MOUNTING** - Unit to be set on support brackets hung by threaded rod type apparatus (brackets and rods not included).

**DEFROST** - Damper defrost system.

**CASE** - 20 gauge prepainted galvanized steel (G60) for superior corrosion resistance. Insulated with foil faced insulation duct liner where required to prevent exterior condensation. Drain connection, One - 1/2" (12 mm) O.D.

**CONTROLS** - ControlAir 15

**WEIGHT** 178 lbs. (81 kg) **SHIPPING WEIGHT** 203 lbs. (92 kg)



## OPTIONS

- 99-104 **Digital Electronic Timer** - 20/40/60 min. (3 wire)
- 99-105 **Programmable Ventilation Control** includes Programmable Time Clock, Dehumidistat and Air Sentry™
- 99-109 **Air Sentry™ Air Quality Monitor** designed to accept remotely mounted Control Pad

All units conform to CSA and UL standards.

## WARRANTY

Units carry a 5 year warranty on the energy recovery cores, a 15 year warranty on aluminum cores and a 2 year replacement parts warranty.

ERVs are not recommended for regions where the design temperature is below 25°F (-4°C)

DATE: \_\_\_\_\_

PROJECT: \_\_\_\_\_

MECHANICAL CONTRACTOR: \_\_\_\_\_

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## SPECIFICATIONS

**LATENT RECOVERY (MOISTURE) TRANSFER CORES**  
 Modular (2 section) enthalpic (moisture) transfer cores arranged for efficient cross-flow ventilation.

**MOTORS**

Two PSC, 3 speed single shafted, 120 VAC, 2.75 Amps each (5.5 total on high speed). HP - 1/10, 1625 RPM. Watts - total on high speed - 648.

**FILTERS**

Washable air filters in exhaust and supply air streams.

**BLOWERS**

Centrifugal type rated at 700 CFM (329 L/s) free air delivery. Each air stream has one single shafted motor driving a centrifugal blower.

**CONNECTION DUCT SIZES**

Four - 14" x 8" (356 mm x 200 mm)

**MOUNTING**

Unit to be set on support brackets hung by threaded rod type apparatus (brackets and rods not provided).

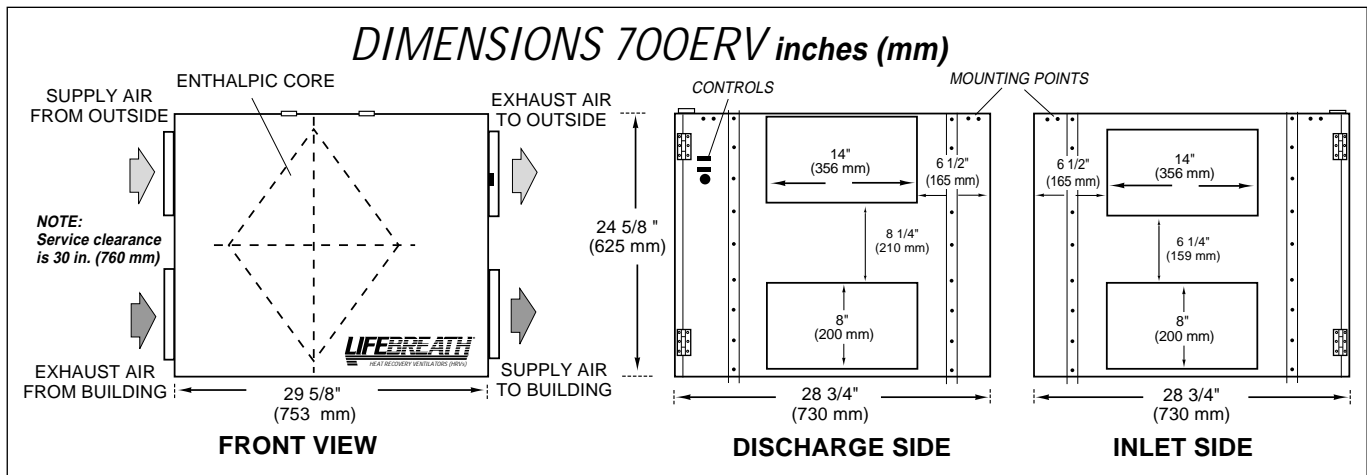
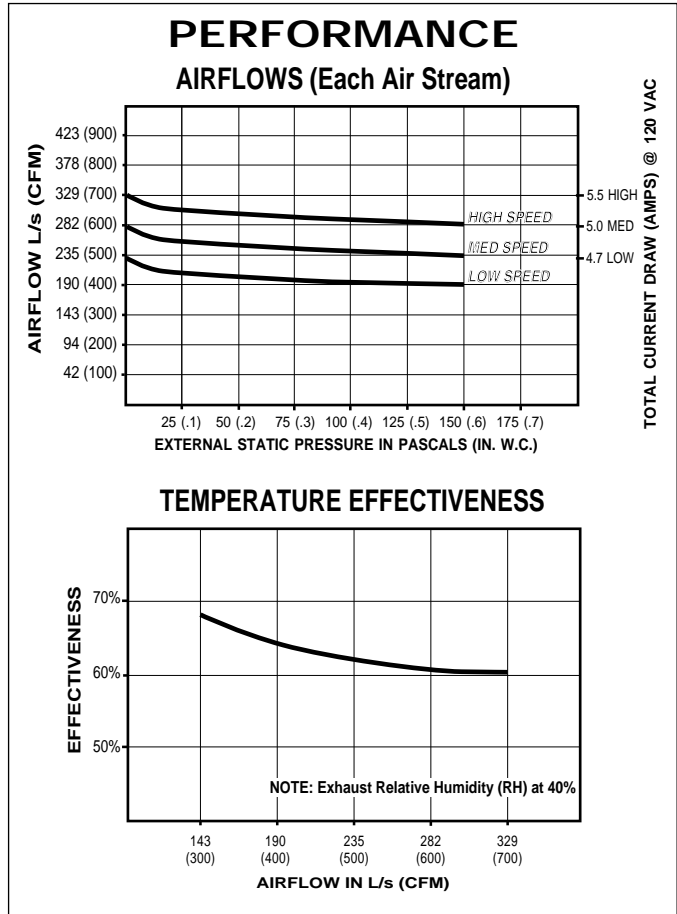
**CASE**

20 gauge prepainted galvanized steel (G60) for superior corrosion resistance. Insulated with foil faced insulation where required to prevent exterior condensation.

**CONTROLS**

Illuminated power switch, 3 speed blower control, low voltage (24 VAC) terminals for connection of remote controls.

**WEIGHT** 142 lbs (64.4 kg) **SHIPPING WEIGHT** 167 lbs. (75.8 kg)



## OPTIONS

99-101 Sixty Minute Remote Timer

All units conform to CSA and UL standards.

DATE: \_\_\_\_\_

PROJECT: \_\_\_\_\_

MECHANICAL CONTRACTOR: \_\_\_\_\_

## WARRANTY

Units carry a 5 year warranty on the energy recovery cores and 2 year replacement parts warranty.

ERVs are not recommended for regions where the design temperature is below 25°F (-4°C)

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## SPECIFICATIONS

### LATENT RECOVERY (MOISTURE) TRANSFER CORES

Modular (3 section) latent recovery (moisture) transfer cores arranged for efficient cross-flow ventilation.

### MOTORS

Two PSC, 3 speed double shafted, 120 VAC, 4 Amps each (8.1 total on high speed). HP - 1/4, 1625 RPM. Watts - total on high speed - 972.

### FILTERS

Washable air filters in exhaust and supply air streams.

### BLOWERS

Centrifugal type rated at 1200 cfm (566 L/s) free air delivery. Each air stream has one double shafted motor driving a centrifugal blower.

### CONNECTION DUCT SIZES

Four - 20" x 8" (508 mm x 200 mm).

### MOUNTING

Unit to be set on support brackets hung by threaded rod type apparatus. (brackets and rod not provided).

### CASE

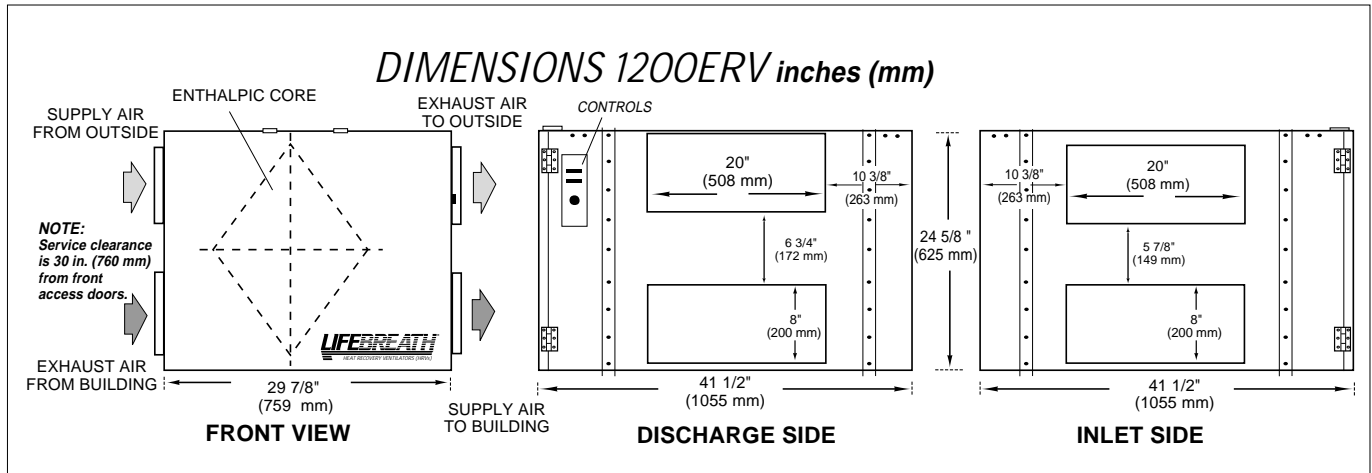
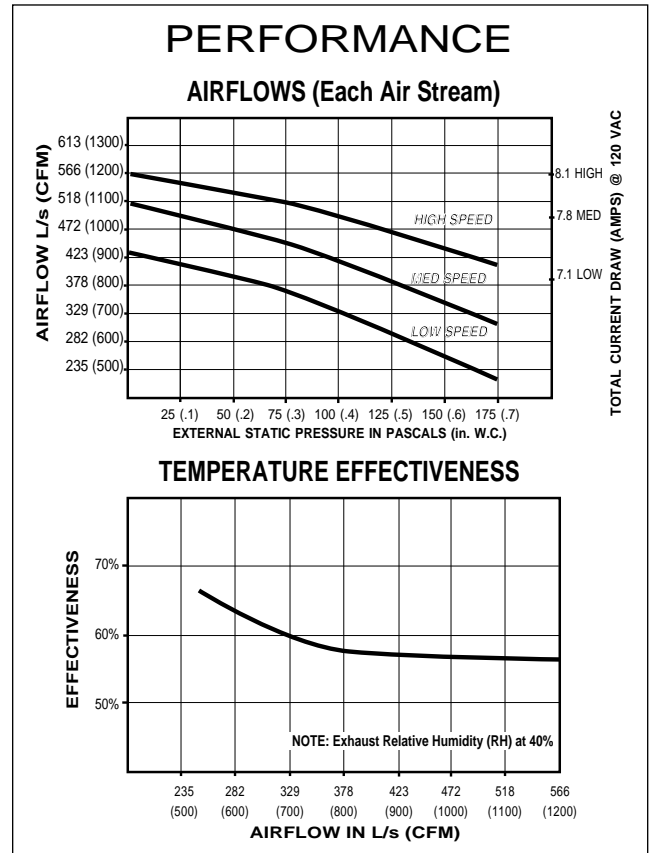
20 gauge prepainted galvanized steel (G60) for superior corrosion resistance. Insulated with foil faced insulation where required to prevent exterior condensation.

### CONTROLS

Illuminated power switch, 3 speed blower control, low voltage (24 VAC) terminals for connection of remote controls.

**WEIGHT** 191 lbs. (87 kg) **SHIPPING WEIGHT** 215 lbs. (98 kg)

# Model 1200ERV



## OPTIONS

99-101 Sixty Minute Remote Timer

All units conform to CSA and UL standards.

## WARRANTY

Units carry a 5 year warranty on the energy recovery cores and 2 year replacement parts warranty.

ERVs are not recommended for regions where the design temperature is below 25°F (-4°C)

DATE: \_\_\_\_\_

PROJECT: \_\_\_\_\_

MECHANICAL CONTRACTOR: \_\_\_\_\_

## Location for Mounting

The HRV/ERV must be located in a conditioned space where the surrounding air temperature does not fall below 60°F (16°C). The unit must be mounted level (horizontal). The warranty will be void if these conditions are not met.

Typically the HRV/ERV is positioned close to an outside wall or the roof to simplify the connections and keep the length of insulated ducting required for the fresh air intake to a minimum.

A minimum clearance of 36 inches (90 cm) in front of the HRV/ERV is recommended to service the ventilator. The HRV/ERV may be mounted on an equipment platform providing the drain hoses are clear and there is sufficient space to open the doors for servicing.

Install the drain pans in the bottom of the HRV/ERV so the drain (not on all models) connections protrude through the holes provided. Use drain hoses with hose clamps to connect the drain pan outlets to a floor drain or standpipe. Make sure the drain line slopes down to the outlet. If this is not possible a condensate pump will be required for positive removal of the water. Protect the drain line from freezing.

## The Ductwork System

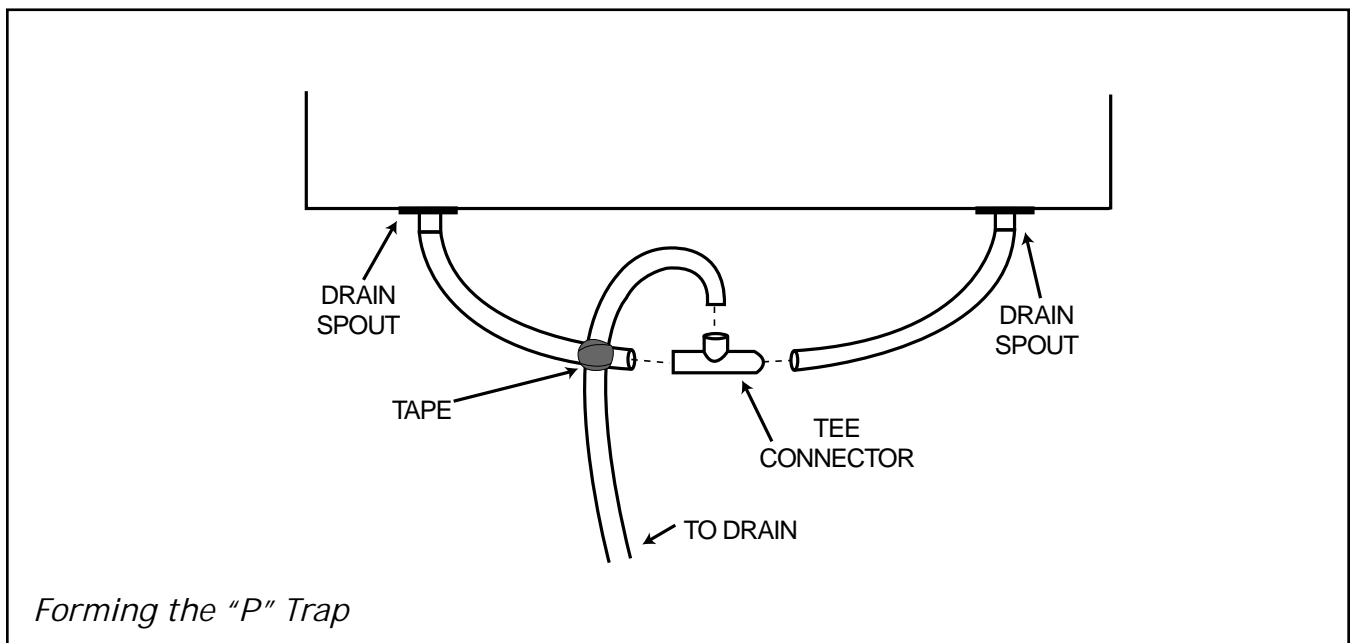
A properly designed ducting system will allow the HRV/ERV to operate at its maximum efficiency. (Air flow will be restricted by undersized ducting, use of too many elbows, tees, bends, etc.). Always try to keep duct runs as short and straight as possible.

**NOTE:** Fully insulated ducting with an integral vapour barrier must be used on all runs passing through unheated areas in order to avoid condensation problems and energy losses from the air streams.

All joints must be airtight, sealed and impervious to moisture. See specification sheets for each unit for exact duct sizes and location.

To minimize pressure drop and noise, galvanized metal ducts, properly sized, are recommended. Keep ducting as short as possible and use a minimum of elbows and tees. Connecting sections and shorter runs may be flexible ducting one size larger than the metal equivalent. Use flexible duct connectors at the HRV/ERV to avoid noise transmission.

All duct joints must be secured with screws, rivets or duct sealant and sealed with aluminum duct tape to prevent leakage.



## *Outside Weatherhoods*

The weatherhoods must have built-in “bird” screen with 1/4 in (63.5 mm) minimum mesh to prevent birds and rodents from entering into the ductwork. **Do not** use smaller mesh as it will be very susceptible to plugging up. Gravity dampers at the vents must not be used as they will restrict air flow and often “seize up”. The preferred location of the outside weatherhoods is:

- no less than 10 ft. (3 m) apart from each other
- at least 18 in (46 cm) above snow line or ground level
- away from sources of contaminants, such as automobile exhaust fumes, gas meters, garbage cans, containers, etc.
- not exposed to prevailing winds, whenever reasonable possible

The outside perimeter of the weatherhood must be caulked to prevent leakage into the building.

The design and size of the weatherhoods or louvres chosen by the installer must allow for adequate free area. Water and debris penetration of the system is minimized when the airflow does not exceed 1000 FPM (5.08 m/s) free area velocity.

## *Ducting from the Weatherhoods*

Galvanized sheet metal ducting with sufficient cross section with an integral single piece vapour barrier should be used to connect the HRV/ERV to the weatherhoods. **All ducting must meet UL Class 1 requirements.**

A minimum R value of insulation should be equal to 4 (RSI 0.75)

A good bead of high quality caulking (preferably acoustical sealant) and taping with a high quality aluminum foil tape is recommended to seal the duct to both the HRV/ERV and the weatherhood.

## *Warmside Ducting - General*

Ducting from the HRV/ERV to the different areas in the building should be galvanized metal whenever possible.

To minimize airflow losses in the ductwork system, all ducts should be as short as possible and with as few bends or elbows as possible. 45° elbows are preferred to 90° elbows. Use “Wye” (Y) fittings instead of “Tees” (T) whenever possible.

All duct joints must be fastened with screws, rivets or duct sealant and wrapped with a quality duct tape to prevent leakage. We recommend aluminum foil tape.

## *Stale Air Return System*

The stale air return system is used to draw air from the points in the building where the worst air quality problems occur. Balancing dampers and/or adjustable grilles are recommended on all return air lines which are used during installation to help balance the “draw” from different areas of the building.

Alternately, the stale air may be drawn directly from the return air duct. When this system is used, the air handler’s blower must constantly operate. The exhaust takeoff connection must be at least a 3 ft (1 m) from a directly connected HRV/ERV supply duct if both are connected to the same duct run. Static pressure of the air handlers return system should be noted and compensated for if, it is apparent that the static pressure of the return in the air handler will exceed .1 to .15” W.C.

A damper located just prior to the HRV/ERV is required to balance the stale air exhausted with the fresh air supply entering the building.

Return air suction points should be located on the opposite side of the room from the fresh air inlet. The inlets may be located in the ceiling or high on the walls and fitted with inlet grilles.

Many commercial activities produce air contaminants in the form of dusts, fumes, mists, vapours and gases. Contaminants should be controlled at the source so that they are not dispersed through the building nor allowed to increase to toxic concentration levels. The ventilator allows for economical operation of the HVAC system while effectively removing contaminants from the space. In designing the exhaust portion of the system the exhaust grilles are placed so as to remove the contaminants while not allowing them to enter the breathing zone of the occupants.

For contaminants that are lighter than air, grilles should be located high on the wall. If contaminants are heavier than air, a lower placement of the grilles will be required. Information on a contaminants specific gravity and toxicity should be available from chemical data sheets.

## Fresh Air Supply System

The fresh air supply ductwork from the HRV/ERV may be directly connected to the return air duct of the forced air system. Check the air flow balance of the HRV/ERV with the air handler blower both "ON" and "OFF" to determine that it does not imbalance the HRV/ERV more than 10%. Also, it is advisable to include a short length of flex duct or other non-metallic connector in this hard ducted line in order to keep the HRV/ERV acoustically isolated and separately grounded (electrically) from the air handler. This will avoid a possible shock hazard to service people if a short to ground develops in one of the devices.

It may be necessary to install a separate fresh air supply ductwork system if the heating is other than forced air.

When installing an HRV/ERV, the designer and installer should be aware of local codes that may require smoke detectors and/or firestats in the HVAC or HRV/ERV ductwork.

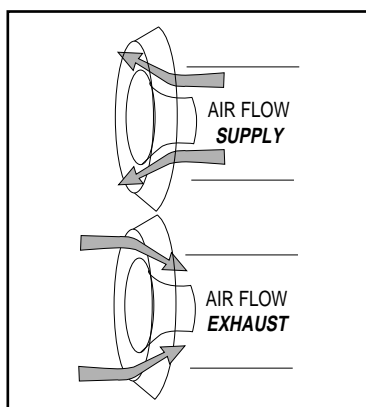
Because an HRV/ERV is designed to bring fresh air into the building, structures may require supply voltage interrupt when smoke or flame sensors are triggered, or when a central fire alarm system is activated.

Supply air grilles may be ceiling or high wall mounted. Avoid locating incoming fresh air grilles that could cause a direct draft on the occupants as the incoming air may be below room temperature. A reheat duct heater can be installed to improve occupant comfort.

The use of balancing dampers or adjustable grilles to balance the flow rates into various rooms is recommended.

The use of balancing dampers or adjustable grilles as supply air diffusers and air exhaust covers are recommended. TECHGRILLES™ are round, efficient, sound absorbing devices available in 4", 5", 6" and 8" (100, 125, 150, and 200 mm) models.

*TECHGRILLE*  
(optional)  
schematic



## The Integrated HVAC System

### Figure A and B

The HRV/ERV has become an integral component of the HVAC system. Figure A shows an HRV/ERV unit providing fresh air directly to the return air plenum of a rooftop heat/cool unit.

In the balanced airflow system, the HRV/ERV exhaust removes stale room air (eg. from lunch room, storage or copy area) and returns to the space an equal amount of fresh outdoor air, making the use of an economizer obsolete in conjunction with an HRV/ERV.

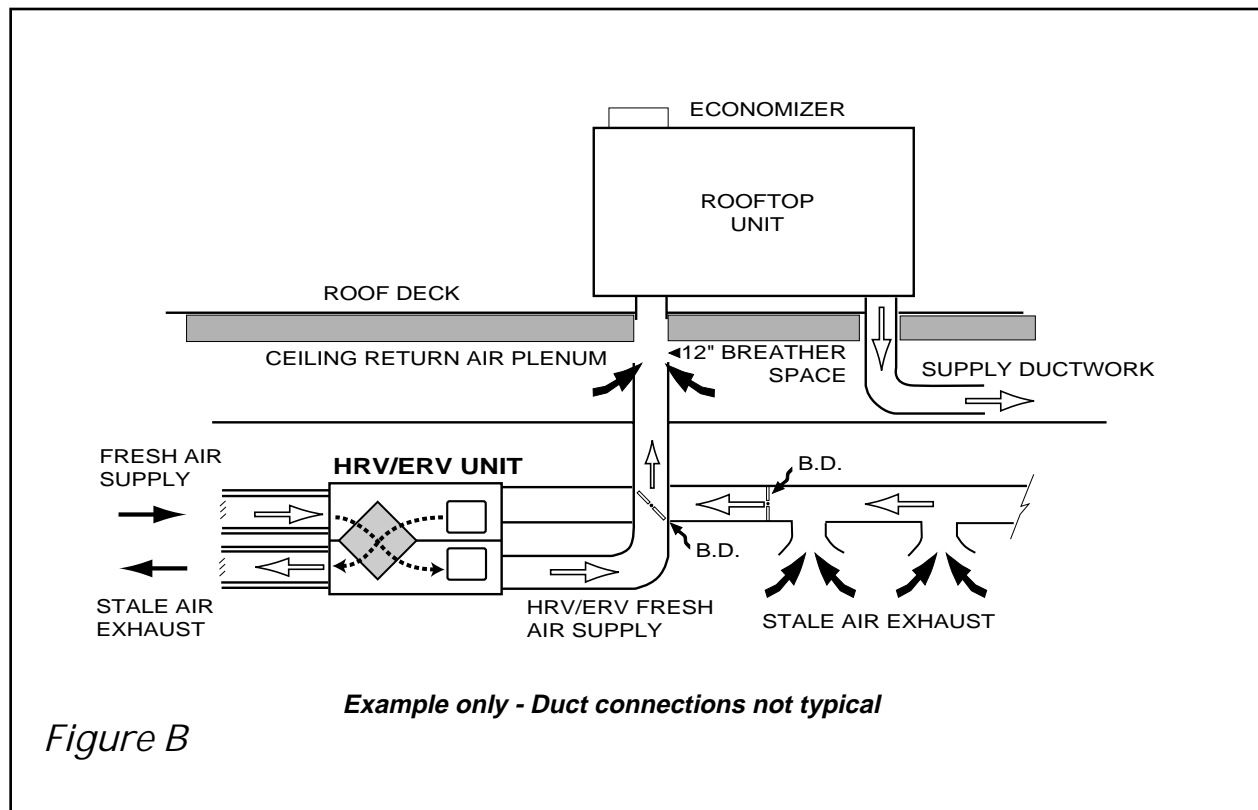
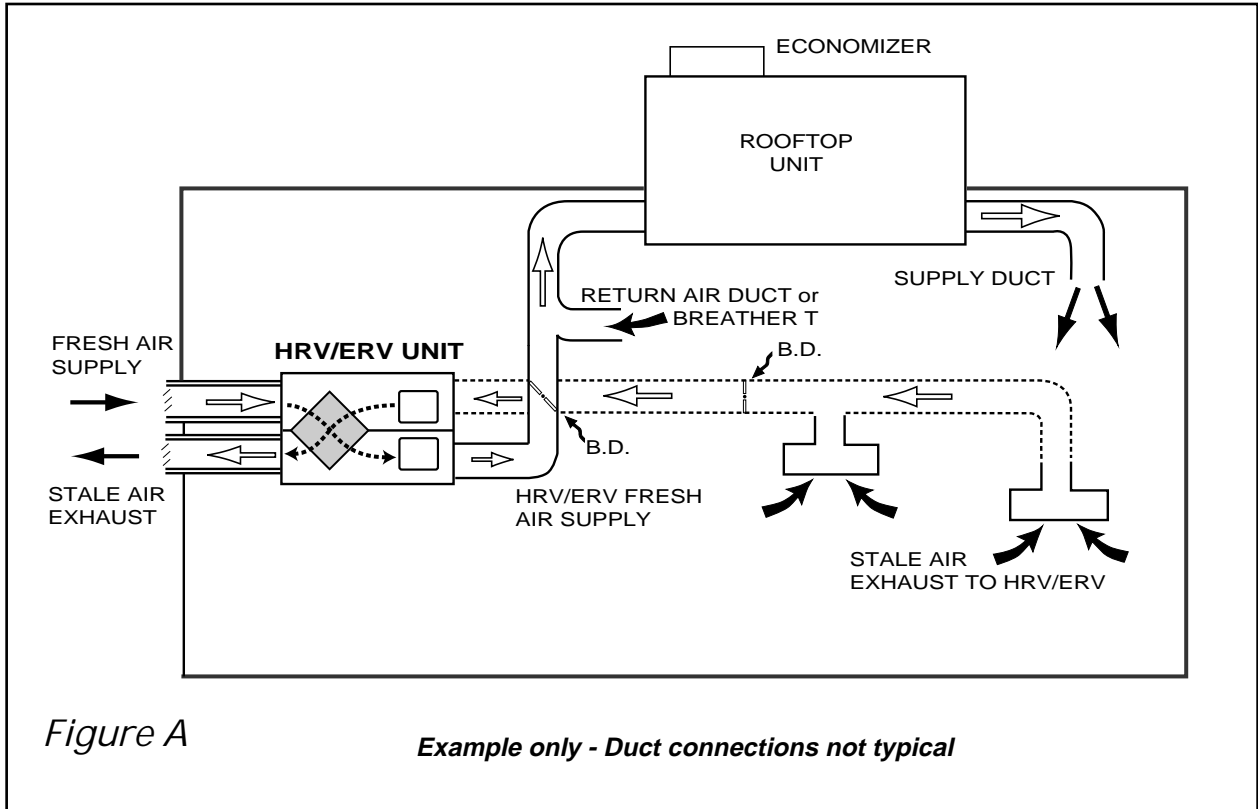
Many buildings have ceiling return air plenum as in Figure B. Fresh air from the HRV/ERV can be introduced directly into the ceiling space but this should occur near the air handler's intake.

By operating the HRV/ERV on a 24 hour/7 day battery backed timer, the unit can be set to operate only when occupancy or indoor conditions require the air exchange.

In installations where it is satisfactory to provide general exhaust from the space, the air to be exhausted may be taken directly from the return air plenum to the HRV/ERV as it is drawn back to the air handler. Fresh air supplied by the HRV/ERV is then introduced directly into the return air plenum but at a location closer to the air handler. The air handler would have a constant running blower to effectively distribute the fresh air and remove the stale air. Balancing dampers would be located in both the HRV/ERV supply and exhaust ducts between the return air plenum and the HRV/ERV.

**NOTE: At no time should the air handler T.E.S.P. on the return duct exceed that of the HRV/ERV .**

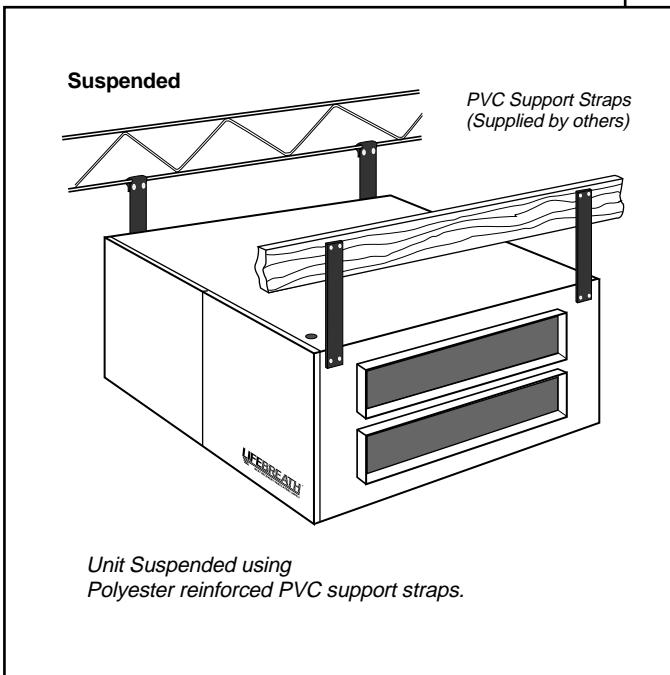
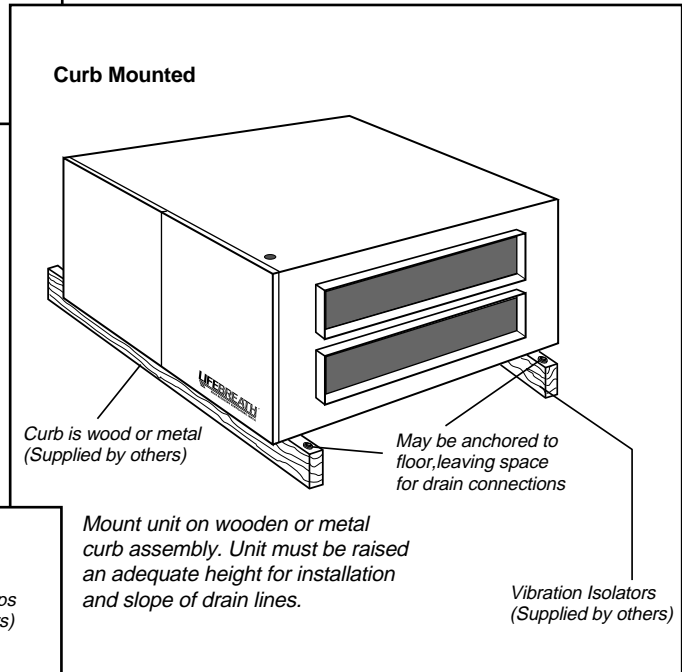
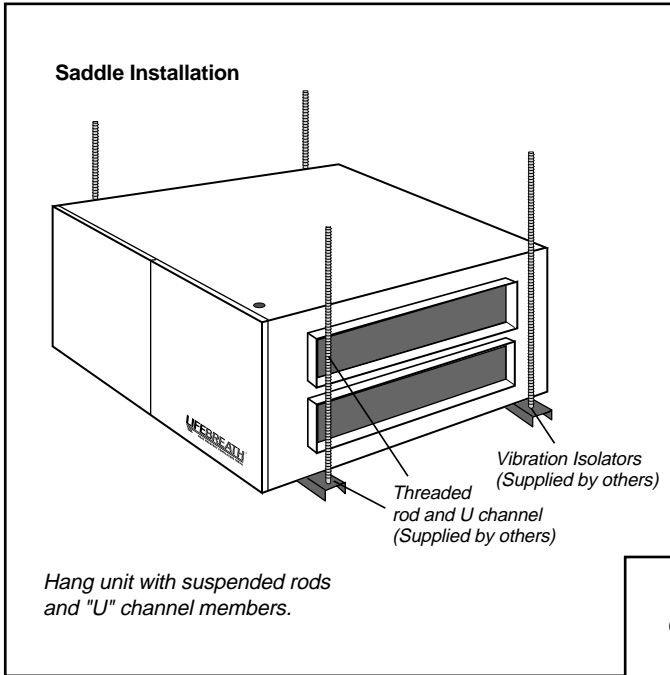
# The Integrated HVAC System





# Various Installation Types

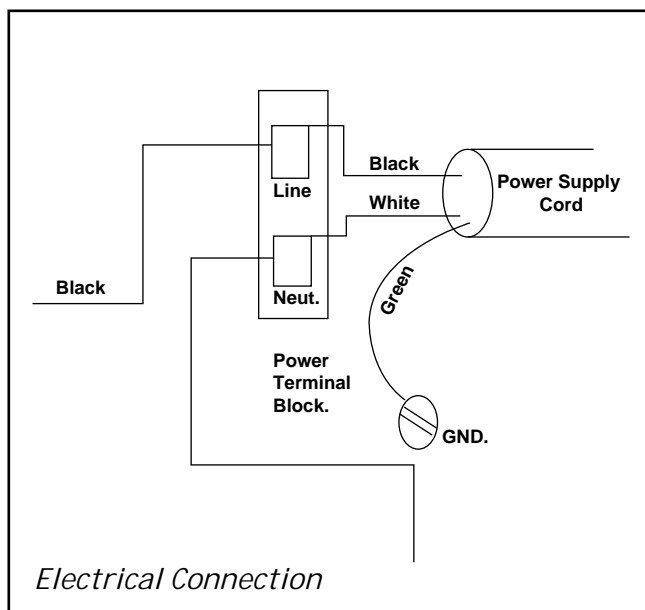
**NOTE:** When installing your HRV/ERV flexible duct connectors should be installed between the HRV/ERV and the galvanized duct work.



# Electrical Connections

It is recommended that a licensed electrician make all electrical connections. It is very important that the unit be properly grounded. It is recommended that a separate 15 amp/120 volt circuit be used.

**WARNING:** In order to prevent electric shock when cleaning or servicing the HRV/ERV, it is extremely important to confirm the polarity of the power line that is switched by the safety (disconnect) switch whose control arm is located on the outside of the electrical control box area. The hot line (black) is the proper line to be switched. To confirm the proper polarity, use a voltmeter or test lamp to make sure there is no power after the switch when the door is open. Check between that point and ground (on the cabinet). This must be done as occasionally some buildings are improperly wired. Always make sure the HRV/ERV is properly grounded.



## FAN DEFROST

### Models 700FD, 850FD, 1200FD

Fan defrost HRV's are equipped with an electronically controlled fan defrost system to remove frost that collects on the warm air side of the aluminum heat transfer surfaces of the heat exchanger core. When the outside air temperature drops below 27°F(-3°C), defrost is activated which provides for an automatic defrost cycle. During the automatic defrost cycle the fresh air supply is shut off while the exhaust fan continues to operate. This allows warm inside air to flow through the heat exchanger core melting frost

accumulation. After the defrost period, the fresh air supply fan automatically returns to the normal speed and fresh outside air continues to be drawn into the building. Water from the melted frost collects in the bottom drip pans and drains out through the bottom drain connections. The defrost cycle repeats automatically until the air temperature rises above 27°F(-3°C).

## DAMPER DEFROST

### Models 700DD, 850DD, 1200DD

These damper defrost HRV's have an electronically controlled damper defrost mechanism. If the outside temperature drops below 27°F(-3°C), the defrost timer is activated. A motor driven damper door mechanism opens the defrost port and at the same time closes off the supply air from outside. After approximately 3 minutes, the damper operates in the opposite direction to close off the defrost port and reopen the fresh air at the supply port. The 27.5 minute wait time and 3 minute defrost cycle repeat until the temperature again rises above 27°F (-3°C).

## Self Test of Defrost Systems

### Models 700, 850, 1200

If confirmation of the defrost system is needed, complete the following steps.

1. Disconnect power to the unit and open access/maintenance doors.
2. Locate the "snap disc" type temperature sensor mounted in the upper left hand corner (cold air stream) of the HRV.
3. Disconnect the two wires from the HRV to the sensor, at the sensor.
4. Using a jump wire with alligator clips, join two wires from the HRV together.
5. Close access doors and power the unit.

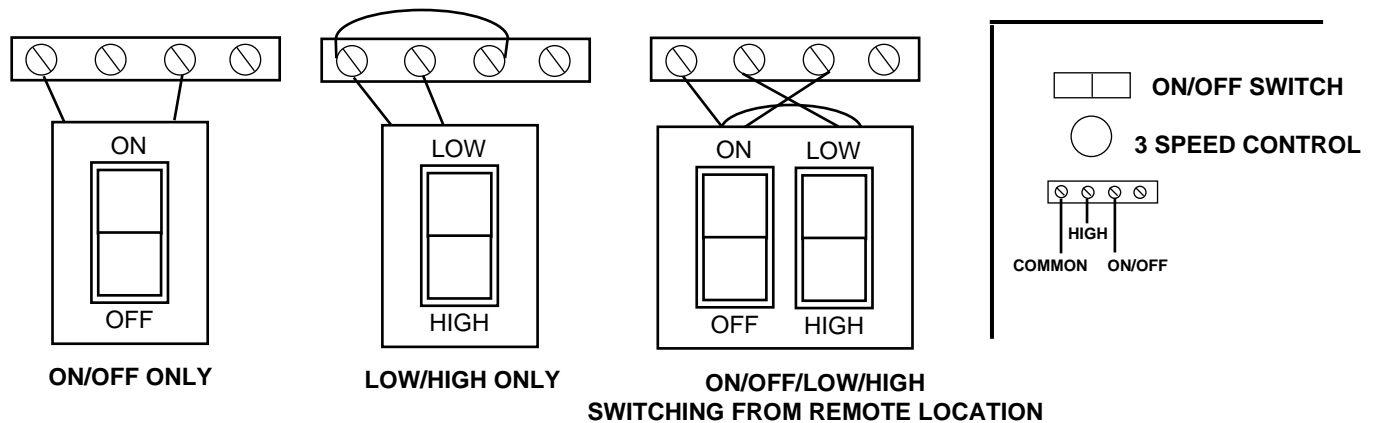
This procedure will simulate a defrost that would occur automatically in the field when the outside temperature drops below -3°C (27°F).

# Speed Selection and Controls

## Model 700, 850 and 1200 HRV/ERV only

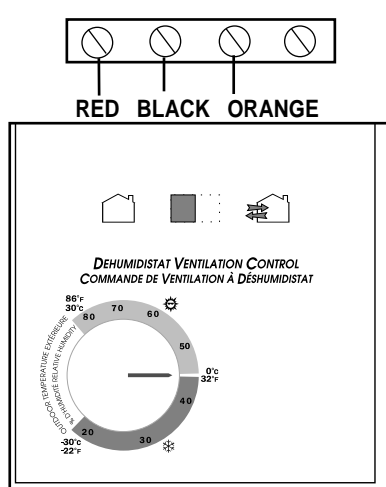
These models are equipped with a 3 speed control, low medium and high, as well as a lighted on/off switch and a 4 screw terminal strip. The terminal strip can be used to connect any low voltage device which will then jump the unit to high speed from whatever setting the speed control was on. The terminal strip can also be wired to allow the unit to be turned off from a

remote location as well as from high to low from a remote location. To wire the unit in this configuration you would need two electrical on/off switches to be installed at the remote location into a double gang electrical enclosure or side by side. One should be labeled on/off and the other should be labeled high/low.



**\*Supplied and Installed by Contractor\***

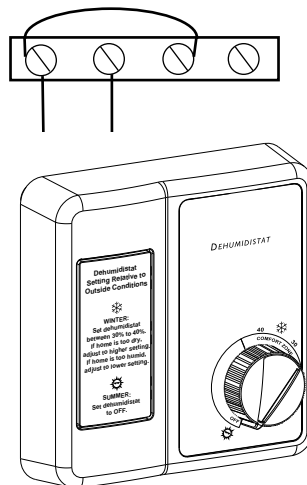
## Optional Remote Controls



**DEHUMIDISTAT VENTILATION CONTROL (DVC)**

**PART NO. 99-116**

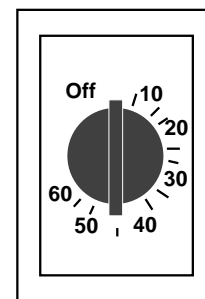
- Turns ERV ON/OFF
- Dehumidistat increases ventilation when required



**DEHUMIDISTAT**

**PART NO. 99-130W**

- Provides high speed ventilation when humidity level exceeds setting



**60 MINUTE CRANK TIMER**

**PART NO. 99-101**

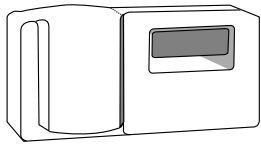
- Provides high speed ventilation for 60 minutes

This style of remote switching began approximately July 1997

# ControlAir 15

## OPTIONAL REMOTE CONTROLS Model 500 Only

### PROGRAMMABLE VENTILATION CONTROLLER (PVC)



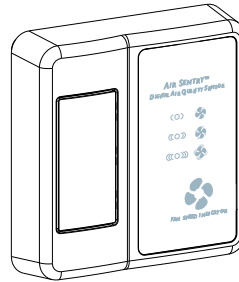
- LOCATION:** Hallway, kitchen, office & work place (connect 1/unit only)
- Advanced digital remote.
  - Digital dehumidistat.
  - Full fan speed control.
  - AIR SENTRY™ Air Quality Sensor built-in.
  - Recirculation mode (on compatible HRV/ERVs).
  - 7 day, 24 hour programmable timer.
  - Digital display and status lights.
  - 100' (30 m) maximum wire length.

**PART NO. 99-105**

Connects to **RED, ORANGE, GREEN** and **YELLOW** terminals.

**\*NOTE:** This device is **NOT** compatible with the Air Sentry.

### NEW! AIR SENTRY™ AIR QUALITY SENSOR



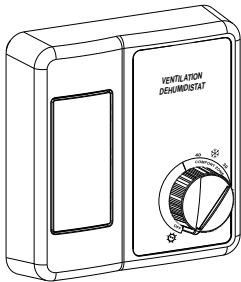
- LOCATION:** Kitchen, basement, work place (connect 1/unit only).
- Digital Air Quality Monitor.
  - Status light indicates fan speed.
  - Increases ventilation to remove odours and contaminants.
  - Among gases detected are cigarette smoke and formaldehyde.
  - 100' (30 m) maximum wire length.
  - Knockout designed to accept Control Pad when remotely mounted.

**PART NO. 99-109**

Connects to **RED, GREEN** and **YELLOW** terminals.

**\*NOTE:** This device is **NOT** compatible with the PVC.

### NEW! VENTILATION DEHUMIDISTAT



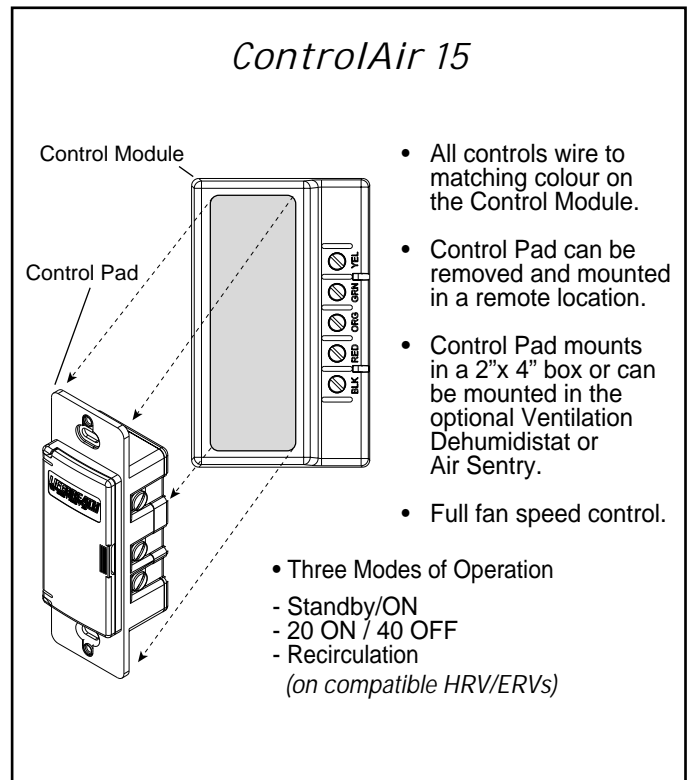
- LOCATION:** Central location in house.
- Dehumidistat activates high speed over-ride when humidity level in home exceeds setting.
  - Knockout designed to accept Control Pad when remotely mounted, giving full HRV/ERV functionality & control from remote location.

**PART NO. 99-250**

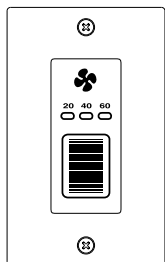
Connects to **BLACK, RED, GREEN** and **YELLOW** terminals.

\*Replaces **99-116 DVC** & **99-230 VRD**.

\*Only compatible with ControlAir 15 electronics.



### DIGITAL ELECTRONIC TIMER (DET)



- LOCATION:** Bathrooms & kitchen
- Connect up to 8 on 300' (91 m) wire max.
  - If a PVC or Air Sentry is used, connect up to 5 on 300' wire max.
  - Touch pad operation.
  - 20/40/60 minute status lights.
  - Compact wall mount unit.
  - Mounts in 2x4 box.
  - Shown with "decora" cover plate (99-107W).

**PART NO. 99-104**

Connects to **RED, GREEN** and **YELLOW** terminals.

**\*See individual control instructions for more details.**

# FUNCTION & CONTROL *Model 500 Only*

## Operating the ControlAir 15

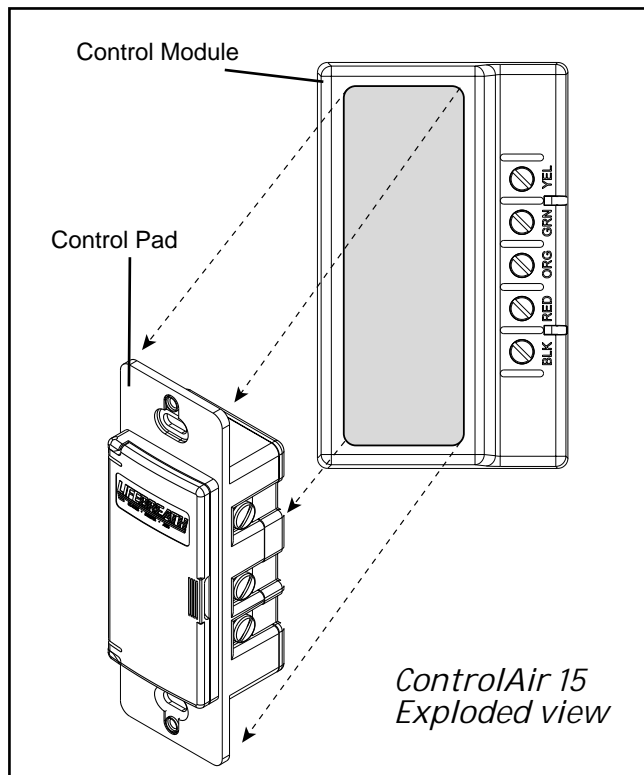
## Self Test

Plugging in the HRV/ERV energizes the unit. A self test function will be performed every time the HRV/ERV is energized (refer to "Self Test" for more details). After the self test has completed successfully the HRV/ERV will default to Speed 1. This is the factory default setting. Follow the instructions found on the HRV/ERV door to select desired mode and speed, or refer to the instructions found on the following page.

Each time the HRV/ERV is powered/energized the self test function will automatically initiate. During the self test the HRV/ERV will cycle through all the speeds available (1-5), test the damper motor operation and will default back to the previous mode/speed selection, (factory default is Speed 1). Total self test duration is approximately 1 min. 30 sec.

## Automatic Defrost Operation (Not on all models)

The advanced technology of the digital microprocessor automatically activates the defrost system only as it is needed. To be an efficient heat recovery device, the HRV/ERV must effectively provide for core defrost as well as providing efficient heat exchange. As outdoor conditions cool, the temperature sensor (thermistor) tracks the supply air temperature. The thermistor then sends its signal to the microprocessor (circuit board) which initiates only the defrost cycle time required to clear the core. On recirculating defrost models, the core is defrosted when the supply air port is automatically blocked off and exhaust air is redirected back through the HRV/ERV. On damper defrost models, the core is defrosted when the supply air port is automatically blocked off and the warm air surrounding the HRV/ERV is drawn in through the defrost port. The mode indicator will flash RED during the defrost cycle. This dramatic advance makes more energy available for recovery as the unit spends less time in defrost mode. By optimizing the defrost cycle, the HRV/ERV combines money saving performance with a well designed and reliable control system.



## Removing and relocating the Control Pad

The Control Pad can be removed and installed in a remote location (100' wire length max). The Control Pad can be installed in a 2x4 box with a "Decora" type cover plate or can be installed in the optional "Ventilation Dehumidistat" or "Air Sentry". When the Control Pad is installed in a remote location, all optional controls will still be wired to the Control Module on the HRV/ERV. When remotely mounted on its own, the Control Pad is wired to the Control Module by 3 wire (min. 20 gauge). Connect the colour coded terminals to the corresponding terminals on the Control Module. When the Control Pad is remotely mounted in the Ventilation Dehumidistat or Air Sentry, refer to optional controls page for wiring requirements.

## Glossary

**DEFROST MODE** - to ensure reliable operation during cold weather, the HRV/ERV will automatically cycle through its defrost mode as needed. (not on all models)

**DEHUMIDISTAT** - a control device that senses the amount of moisture in the air and will activate high speed fan operation when the air moisture level exceeds the control setting. The optimum air moisture level (or relative humidity [Rh]) in the typical home is in the range of 30 to 40% Rh.

**RESET** - whenever resetting of the HRV/ERV is required, simply disconnect power for 30 seconds.

**STANDBY MODE** - the HRV/ERV is energized and waiting for fan operation to be initiated by a remote device or manual override.

**THERMISTOR** - the HRV/ERV's temperature sensor which measures electrical resistance in a known manner, as outdoor temperatures fluctuate.

# *To select mode of operation for ControlAir 15*

## *Model 500 Only*

Press and hold the fan selection button on the Control Pad. After 5 seconds the control will begin to cycle each mode holding each for 2 seconds. Release the button when the desired mode of operation is reached.

### **Modes of Operation**

### **LED Indication**

**OFF**

***No LED's illuminated*** HRV/ERV is off, no controls will initiate operation.

**Standby / On**

***Steady Green LED and Yellow LED to indicate speed***  
HRV/ERV will run at speed selected in ventilation mode. Standby mode is indicated by no speed indicator illuminated. Optional remote controls will override standby or selected speed into high speed.

**20 On / 40 Off**

***Flashing Green LED and Yellow LED to indicate speed***  
HRV/ERV will operate in ventilation mode at speed selected for 20 minutes and OFF for 40 minutes.

### **To select speed**

Momentarily press fan selection button and release. HRV/ERV will move into next speed. OFF is indicated by no yellow LED illuminated. Speed 1 is the first yellow LED. Speed five is indicated by a flashing speed 4 LED.

### **Automatic Defrost**

During cold outdoor conditions the HRV/ERV will occasionally go into an automatic defrost function, which will prevent ice from forming on the core. Defrost is indicated by a flashing Red LED indicator.

# PITOT TUBE AIR FLOW BALANCING

It is necessary to have balanced air flows in an HRV/ERV. The volume of air brought in from the outside must equal the volume of air exhausted by the unit. If the air flows are not properly balanced, then;

- The HRV/ERV may not operate at its maximum efficiency
- A negative or positive air pressure may occur in the house
- The unit may not defrost properly
- Failure to balance HRV/ERV properly may void warranty

**Excessive positive pressure** may drive moist indoor air into the external walls of the building where it may condense (in cold weather) and degrade structural components. May also cause key holes to freeze up.

**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/ground contact areas. Excessive negative pressure may also cause the backdrafting of vented combustion equipment.

**Read the Application Warning on the front of this manual!**

## Prior to balancing, ensure that:

1. All sealing of the ductwork system has been completed.
2. All of the HRV/ERV's components are in place and functioning properly.
3. Balancing dampers are fully open.
4. Unit is on HIGH speed.
5. Air flows in branch lines to specific areas of the house should be adjusted first prior to balancing the unit. A smoke pencil used at the grilles is a good indicator of each branch line's relative air flow.
6. After taking readings of both the stale air to the HRV/ERV duct and fresh air to the house duct, the duct with the lower CFM ([L/s] velocity) reading should be left alone, while the duct with the higher reading should be dampered back to match the lower reading.
7. Return unit to appropriate fan speed for normal operation

## BALANCING PROCEDURE

The following is a method of field balancing an HRV/ERV using a Pitot tube, advantageous in situations when flow stations are not installed in the ductwork. Procedure should be performed with the HRV/ERV on high speed.

The first step is to operate **all** mechanical systems on high speed, which have an influence on the ventilation system, i.e. the HRV/ERV itself and the forced air furnace or air handler if applicable. This will provide the maximum pressure that the HRV/ERV will need to overcome, and allow for a more accurate balance of the unit.

Drill a small hole in the duct (about 3/16"), three feet downstream of any elbows or bends, and one foot upstream of any elbows or bends. These are recommended distances but the actual installation may limit the amount of straight duct.

The Pitot tube should be connected to a magnehelic gauge or other manometer capable of reading from 0 to 0.25 in. (0-62 Pa) of water, preferably to 3 digits of resolution. The tube coming out of the top of the pitot is connected to the high pressure side of the gauge. The tube coming out of the side of the pitot is connected to the low pressure or reference side of the gauge.

Insert the Pitot tube into the duct; pointing the tip into the airflow.

For general balancing it is sufficient to move the pitot tube around in the duct and take an average or typical reading. Repeat this procedure in the other (supply or return) duct. Determine which duct has the highest airflow (highest reading on the gauge). Then damper that airflow back to match the lower reading from the other duct. The flows should now be balanced. Actual airflow can be determined from the gauge reading. The value read on the gauge is called the velocity pressure. The Pitot tube comes with a chart that will give the air flow velocity based on the velocity pressure indicated by the gauge. This velocity will be in either feet per minute or metres per second. To determine the actual airflow, the velocity is multiplied by the cross sectional area of the duct being measured.

This is an example for determining the airflow in a 6" duct. The Pitot tube reading was 0.025 inches of water. From the chart, this is 640 feet per minute.

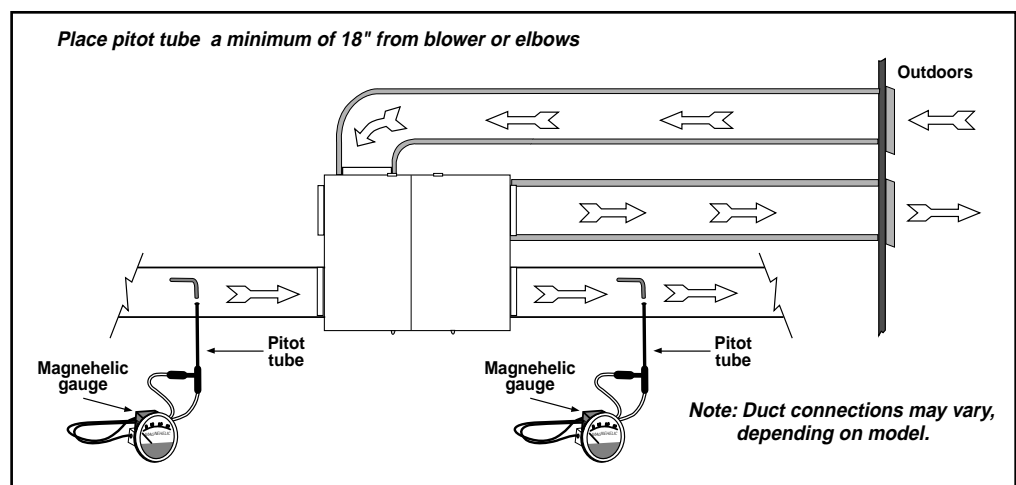
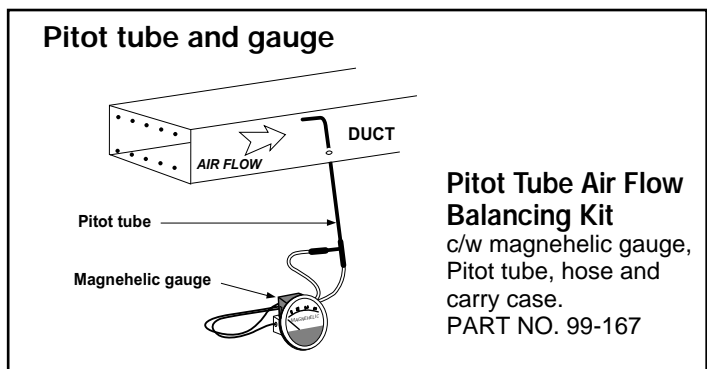
The 6" duct has a cross sectional area of  $= [3.14 \times (6" \div 12)^2] \div 4 = 0.2$  square feet

The airflow is then:  
640 ft./min. X 0.2 square feet = 128 cfm

For your convenience, the cross sectional area of some common round duct is listed below:

DUCT DIAM. (inches)	CROSS SECTION AREA (sq. ft.)
5	0.14
6	0.20
7	0.27

The accuracy of the air flow reading will be affected by how close to any elbows or bends the readings are taken. Accuracy can be increased by taking an average of multiple readings as outlined in the literature supplied with the Pitot tube.



# SERVICE/MAINTENANCE

Servicing your HRV/ERV on a regular schedule will result in optimum operating efficiencies and prolonged life of the equipment.

Due to numerous applications in which this equipment can be installed, it is difficult to predict servicing intervals. In certain situations where there is heavy smoke, servicing the equipment every one - two months may be needed; whereas ventilating a meeting room for example for carbon dioxide may only need service every six months to a year.

## MOTOR

Access to the motor is through the front service doors. Note heat exchanger core can be removed to provide more room. See **CORE** in this section.

The motor is a permanent split capacitor type (PSC) which uses a sleeve mechanism to steady the shaft. There is an oil wick beside the sleeve which supplies oil to it on a continuous basis.

If the motor does not have oil tubes, no maintenance is required.

Access to the wick is through oil tubes, (two per motor) located in the motor case itself. These oil tubes are either capped with yellow plugs, (which need to be removed for oiling) or have clear tubes protruding from them.

In either case an oiling device such as an "Oil Telespout" filled with 20 S.A.E. non-detergent electric motor oil should be used to put oil inside the tubes. A couple of drops of oil once a year will do. **DO NOT OVER OIL!**

## HRV CORE (HRV only)

The heat exchange core is accessible through the front service door. Special care and attention should be given to this component as the edges may be

sharp, and the core itself susceptible to damage if dropped.

When removing the core, the location it is removed from should be noted.

The core is removed by carefully pulling the core outward from the unit, sliding it evenly along its "H channel" supports found in each corner of the core. Note the core may have some resistance when sliding out. Avoid tilting the core as this will result in its edges catching the H channel and temporarily preventing its removal.

In most cases, washing the core in a mild detergent and warm water will be all that is needed to completely clean them. Do not use harsh chemicals as this may cause corrosion in the HRV. The time between core service will depend on the application the HRV has been installed in. It can be as often as one - two months or at the very least, cleaned every six months. **When reinstalling the core you must note foam location and drip edge location for proper core placement.** See diagram below.

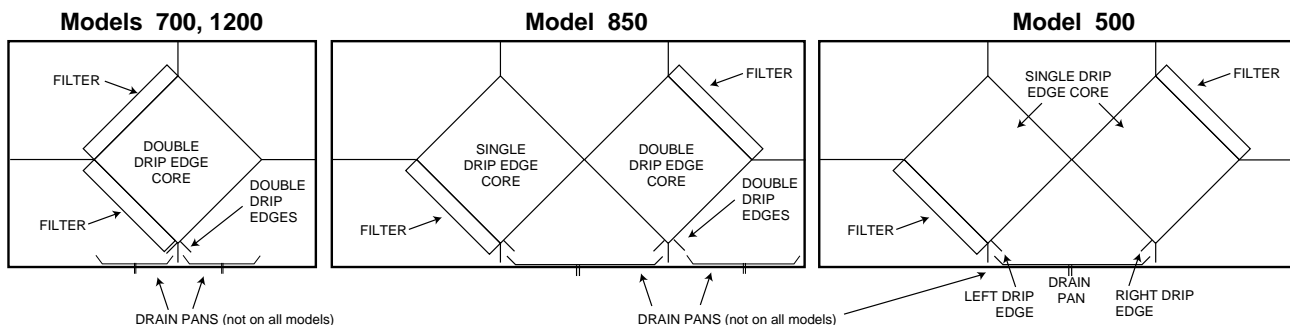
## ERV CORE (ERV only)

Remove core and vacuum or use low pressurized air to clean core. Do not wash or submerge in water.

With the core in its proper position, place the bottom flange, (approximately 1/4") into its H channel support, then place the left side, the right side and finally the top flange into place in the same fashion. Once all four corners are in place, push the core evenly into the cabinet until it reaches the back. Be sure the drip edges are overlapping the drip trays.

Note the core will protrude slightly out from the front of the cabinet, this is so the access door, when closed, ensures a tight fit.

FRONT VIEW



**Note location and arrangement of cores and filters when removing.**



## **FILTERS**

Open front service door to access the filters located in both supply and exhaust air streams. Note to remove and install filters, it may be easier to first remove the core(s). See **CORE**.

The filters are designed to stop large particles from entering in the core. The filters are fastened in place by a metal spring rod. To remove filters from core(s) simply pull the rod from one end, outward until free from core lip, and remove.

Only use warm water with a mild detergent to wash the filters. Do not use harsh chemicals.

The time between filter service will depend on the application the HRV/ERV has been installed in. It can be as often as one - two months or at the very least, cleaned every six months.

## **CONDENSATE DRAINS**

The condensate drains consist of two drain pans which may collect water after the HRV/ERV initiates a defrost cycle, and a drain line to remove the condensate.

Maintenance on this portion of the system should be done as often as possible and should not exceed six months. Note bacterial growth in standing water is a major concern to healthy indoor air quality, and should be avoided whenever possible.

To clean these components, open the front service door and flush the pans with water. Ensure that the pans drain completely and in a reasonable amount of time. Note if the water does not drain right away, check for blockage in the drain line, also check that the drain line has a good slope to it. (1/8 - 1/4" per foot)

The drain line itself should have a "P" trap in it below the HRV/ERV which is to be filled with water to prevent odours or gases from entering back into the unit. When flushing out the drain pans, this too will be flushed out, and the water that was there will be replaced with clean water.

## **DUCT WORK**

It is a good idea to inspect ducting, outside weather hoods (wall caps), and grilles for blockage and dirt buildup, at least every six months.

Outside weather hoods should be protected by a rodent screen which can plug up with debris. Also, it is a good idea to visually confirm that the fresh air supply is free from any sources of contamination, such as other vented combustion equipment added after the fact.

## **DAMPER MOTOR**

The damper motor, (if applicable) is a self contained motor and does not require service. The damper door attached to the motor could use a little lithium grease on the shaft opposite the motor, where it enters its holder, once every two - three years.

## *General Maintenance*

As a final step in a routine maintenance schedule, it is a good idea to confirm operation of the system, checking speed control functions and remote control operation, if applicable.

Wipe the inside of the cabinet to remove dust and cob webs as needed.

It is a good idea to keep a service/maintenance log of the unit.

# TROUBLESHOOTING YOUR HRV/ERV SYSTEM

## SYMPTOM

## CAUSE

## SOLUTION

Poor Air Flows

- 1/4" (6 mm) mesh on the outside hoods 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/ERV
- improper speed control setting
- HRV/ERV airflow improperly balanced

- 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 at house
- check duct installation
- increase the speed of the HRV/ERV
- have contractor balance HRV/ERV

Supply air feels cold

- poor location of supply grilles, the airflow may irritate the occupant
- outdoor temperature extremely cold

- locate the grilles high on the walls or under the baseboards, install ceiling mounted diffuser or grilles so as not to directly spill the supply air on the occupant (eg. over a sofa)
- turn down the HRV/ERV supply speed. A small duct heater (1kw) 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 is not Operating

- improper low voltage connection
- external low voltage is shortened out by a staple or nail
- check dehumidistat setting it may be on OFF

- 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

- dehumidistat is set too high
- HRV/ERV is undersized 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 washroom and kitchen areas
- condensation seems to form in the spring and fall
- HRV/ERV is set at too low a speed

- 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. Heating wood may have to be moved outside
- vent crawl space and place a vapour 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/ERV use
- increase speed of the HRV/ERV

Humidity Levels are too Low

- dehumidistat control set too low
- blower speed of HRV/ERV is too high
- lifestyle of occupants
- HRV/ERV air flows may be improperly balanced

- set dehumidistat higher
- decrease HRV/ERV blower speed
- humidity may have to be added through the use of humidifiers
- have a contractor balance HRV/ERV airflows

HRV/ERV and / or Ducts Frosting up

- HRV/ERV air flows are improperly balanced
- malfunction of the HRV/ERV defrost system

- Note: minimal frost build-up is expected on cores before unit initiates defrost cycle functions
- have HVAC contractor balance the HRV/ERV
- using the self-test feature at the Base Module, press the fan control symbol, the damper defrost unit should cycle its full travel when working properly.

Condensation or Ice Build Up in Insulated Duct to the Outside

- incomplete vapour barrier around insulated duct
- a hole or tear in outer duct covering

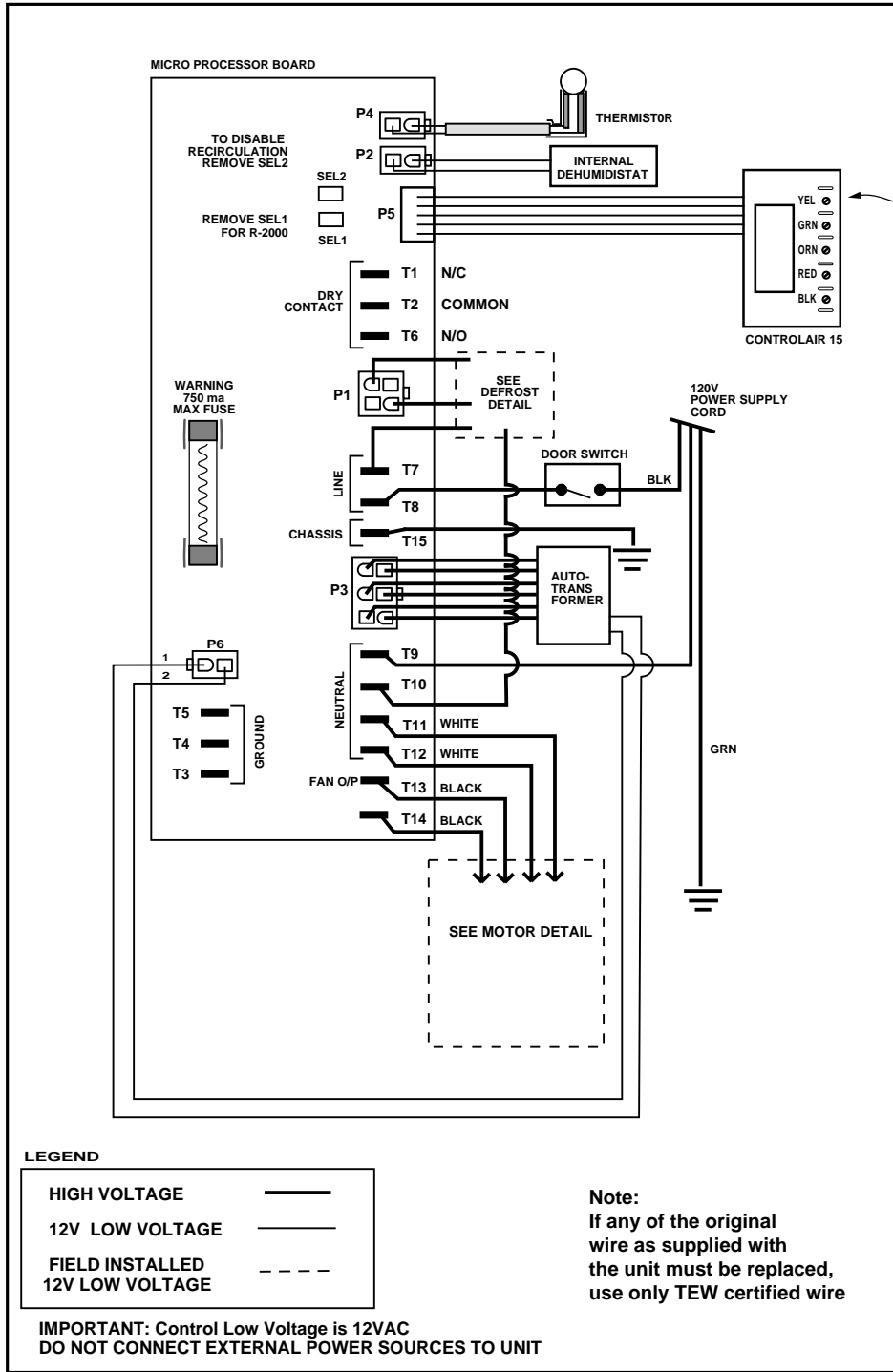
- tape and seal all joints
- tape any holes or tears made in the outer duct covering
- ensure that the vapour barrier is completely sealed

Water in the bottom of the HRV/ERV

- drain pans plugged
- improper connection of HRV/ERVs drain lines
- HRV/ERV is not level
- drain lines are obstructed
- HRV/ERV heat exchange core is not properly installed

- ensure O-Ring on drain nozzle sits properly
- look for kinks in line
- check water drain connections
- make sure water drains properly from pan

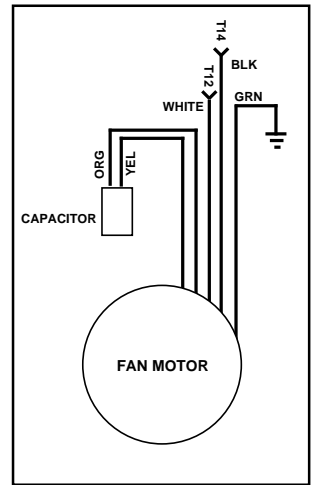
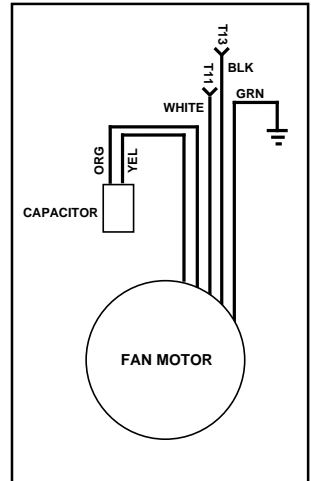
# WIRING DIAGRAM 500 (DAMPER DEFROST)



**Note:**  
All control connections are labeled by colour. Connect to corresponding colour with low voltage wire (20 gauge minimum).

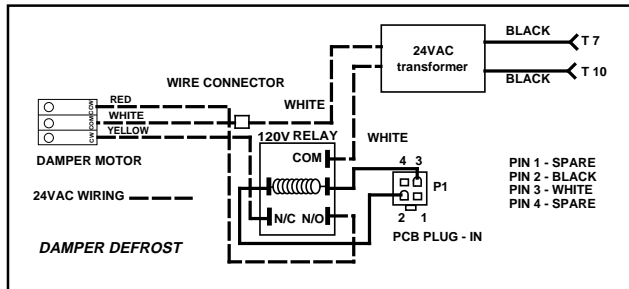
A dry contact closure between red & black will initiate high speed override.

## FAN MOTOR DETAILS

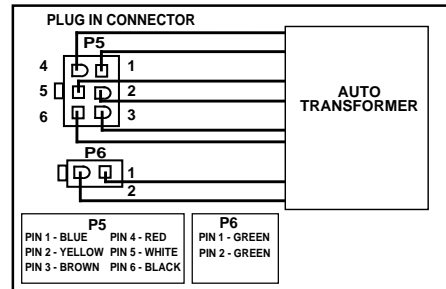


**Note:**  
If any of the original wire as supplied with the unit must be replaced, use only TEW certified wire

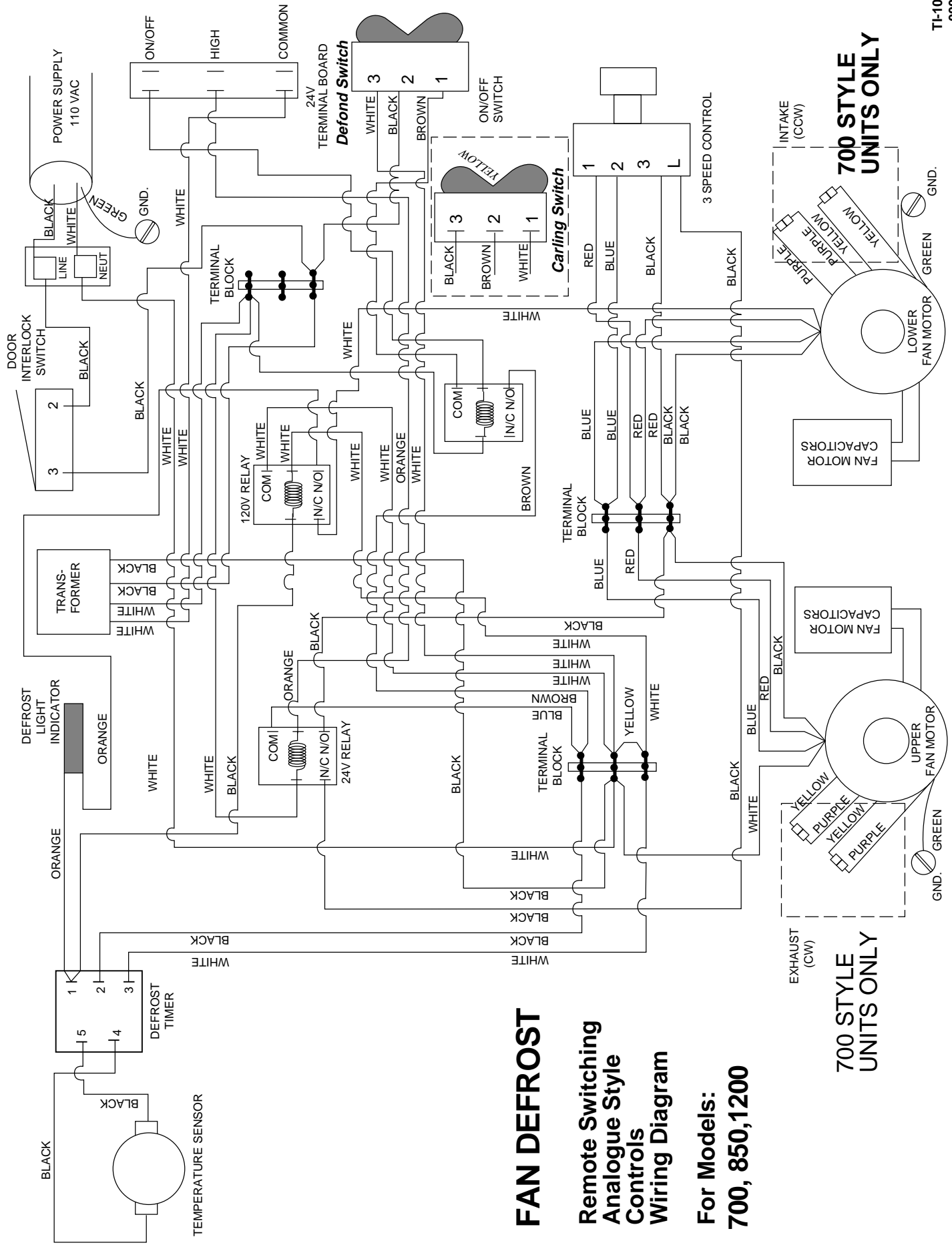
## DEFROST DETAILS



## AUTO-TRANSFORMER DETAIL



TI-126-NE  
0102



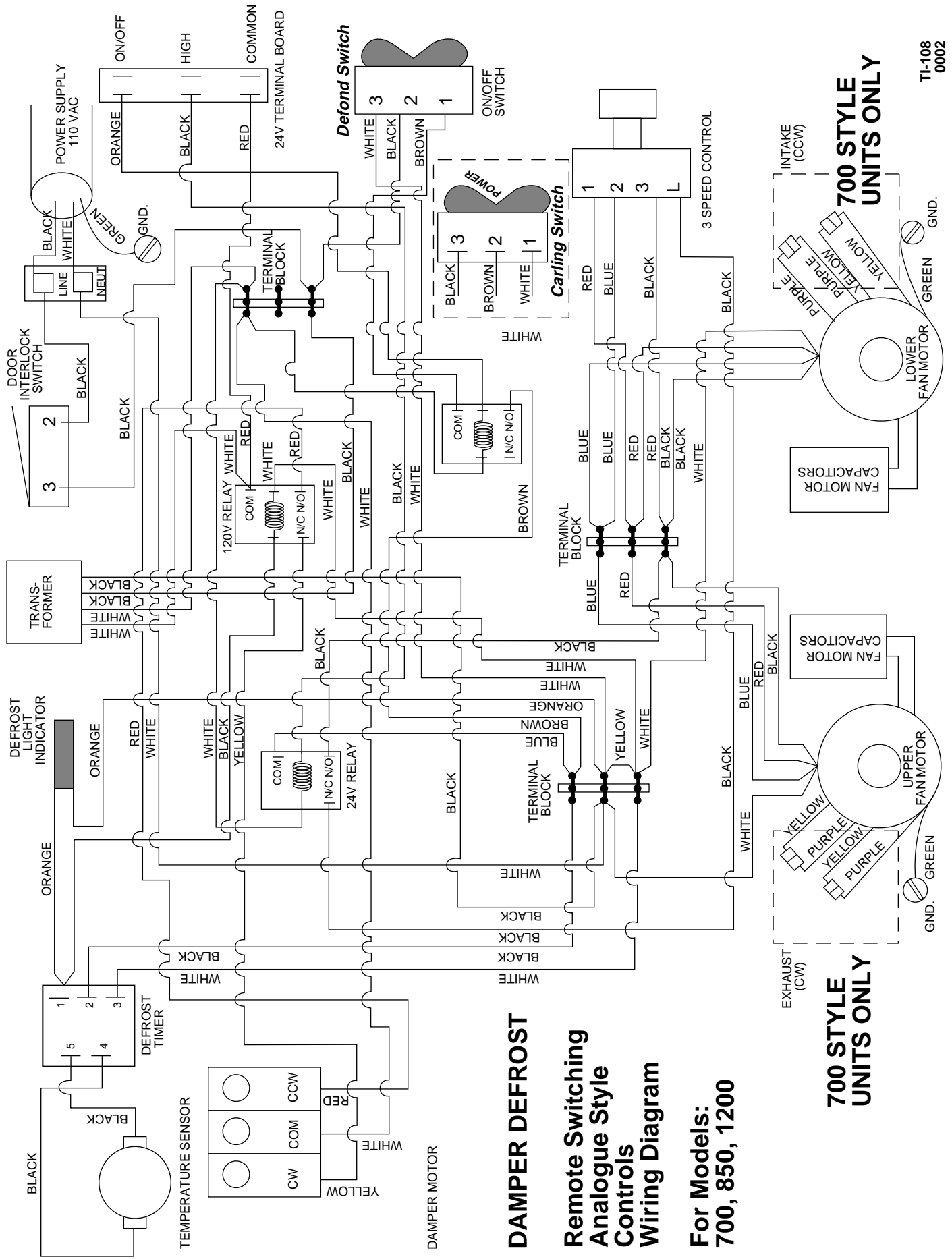
# FAN DEFROST

Remote Switching  
Analogue Style  
Controls  
Wiring Diagram

For Models:  
**700, 850, 1200**

**700 STYLE  
UNITS ONLY**

**700 STYLE  
UNITS ONLY**



**DAMPER DEFROST**  
**Remote Switching**  
**Analogue Style**  
**Controls**  
**Wiring Diagram**

**For Models:**  
**700, 850, 1200**

**700 STYLE**  
**UNITS ONLY**

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**UNITS ONLY**

**COMMERCIAL LIFEBREATH®  
HEAT/ENERGY RECOVERY VENTILATORS**

- **2 Year Limited Warranty**
- **15 Year Aluminum Core Warranty**
- **5 Year Paper Core Warranty**

NUTECH ENERGY SYSTEMS INC.® (NUTECH) warrants to the purchaser of the Commercial LIFEBREATH® model and accessories referred to below, to be free from manufacturing defects.

This Warranty is personal to NUTECH® and is in effect from the date of the original purchase for a period of two years, save and except that a 15 YEAR WARRANTY is given to the LIFEBREATH® Aluminum core & a 5 YEAR WARRANTY is given to the LIFEBREATH® Paper core should they develop a condensation leak or become damaged during normal use.

Damage resulting from all other causes, including but not limited to: lighting, hurricane, tornado, earthquake or any other acts of God; improper installation, modification, alteration or misuse of the LIFEBREATH® or its operation in a manner contrary to the instructions accompanying the unit at the time of sale; accidental or intentional damage, neglect, improper care, or other failure by the owner to provide reasonable and necessary maintenance of the product; any attempt at repair by an unauthorized service representative or not in accordance with this warranty; or any other causes beyond the control of NUTECH®, are excluded from this warranty.

If you feel that the LIFEBREATH® you purchased is not free from manufacturing defects, please contact NUTECH ENERGY SYSTEMS INC.®, 511 McCormick Blvd., London, Ontario N5W 4C8, 519-457-1904 or fax 519-457-1676 to find the name of your nearest dealer in order to repair the product. The labour required to install any replacement part(s) shall be dealt with at the option of the customer in either of the following ways:

- (a) the customer may supply labour at their own expense: or
- (b) if the product was purchased from a dealer, then the dealer will supply labour at cost to the customer.

NUTECH® reserves the right to replace the entire unit or to refund the original purchase price in lieu of repair.

**NUTECH® MAKES NO EXPRESS WARRANTIES, EXCEPT FOR THOSE THAT ARE SET FORTH HEREIN AND SHALL NOT BE LIABLE FOR ANY INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES WITH RESPECT TO LIFEBREATH® COVERED BY THIS WARRANTY. NUTECH'S COMPLETE LIABILITY AND THE OWNER'S EXCLUSIVE REMEDY BEING LIMITED TO REPAIR OR REPLACEMENT ON THE TERMS STATED HEREIN. ANY IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTY OF MERCHANTABILITY AND OF FITNESS FOR ANY PARTICULAR PURPOSE, ARE EXPRESSLY EXCLUDED.**

**NO PERSON IS AUTHORIZED TO CHANGE THE WARRANTY IN ANY WAY OR GRANT ANY OTHER WARRANTY UNLESS SUCH CHANGES ARE MADE IN WRITING AND SIGNED BY AN OFFICER OF NUTECH®.**

MODEL NO.: \_\_\_\_\_

UNIT SERIAL NO.: \_\_\_\_\_

INSTALLED BY: \_\_\_\_\_

DATE: \_\_\_\_\_

**NUTECH**  
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