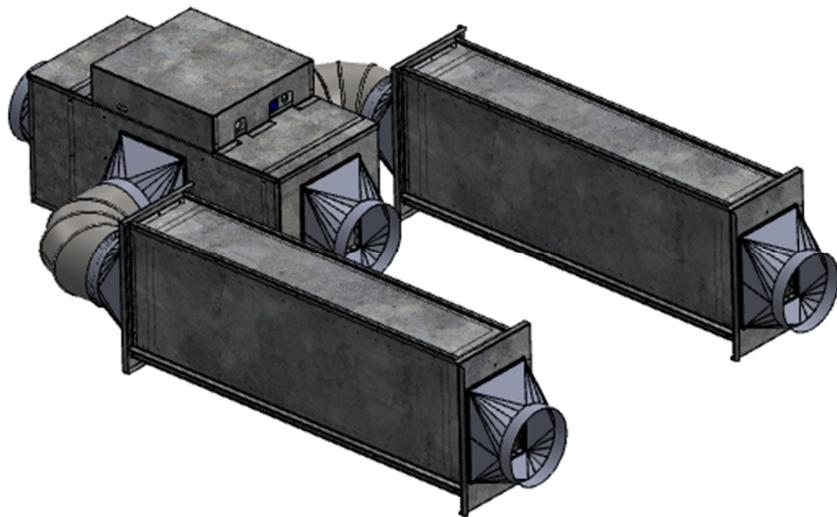




## Installation and Maintenance Manual

### RGSP-K Series



For long term reliability and proper function of Tempeff equipment,  
it is essential that these instructions are followed.

These are general instructions, valid where applicable.



**Tempeff Inc.**  
675 Washington Ave  
Winnipeg, MB, R2K 1M4  
Ph: (204) 783-1902  
[www.tempeff.com](http://www.tempeff.com)

Bulletin No. IM 2-2  
February 2022

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## General

The instructions for assembly, operation, and maintenance must be followed carefully in order to achieve short and long term function and reliability. It is also a prerequisite for the warranty to apply.

This manual shall be accessible to the homeowner/staff responsible for the operation of this HRV.

If the product is modified or changed without consent or instruction from Tempeff the ETL listing (if applicable) may no longer be valid, and the warranty may no longer be valid. In cases where special items are included in the product, specific instructions can be obtained from the local authorized Tempeff representative, or be contacting the Tempeff factory.

## Intended Use

The unit is intended for ventilation use only with no mixing of corrosive or flammable gases. Installation must be done by a qualified person in accordance with all applicable codes and standards.

## Storage

Failing to follow the enclosed instructions may cause damage to the equipment, and void warranty.

- When storing both indoor and outdoor units, opening and access doors must be sealed.
- Equipment must be adequately protected from weather until final installation is complete. Equipment stored outdoors must be heated and ventilated.
- During extended periods of storage, it is important to rotate the fan and motor bearings at least once per month to prevent bearing damage.
- To ensure equipment stays in as-shipped condition, and to avoid corrosion, inspect the equipment weekly while in storage. If moisture or condensation is discovered on the surface of the equipment, immediately heat and ventilate the equipment to prevent corrosion.

### **ATTENTION**

Factory packaging, shrink wrap or poly is not considered sufficient protection against the weather when stored in an area exposed to the elements. The contractor is responsible for fully tarping and heating the equipment to prevent damage from weather or construction damage.

## Installation Notes

### Location

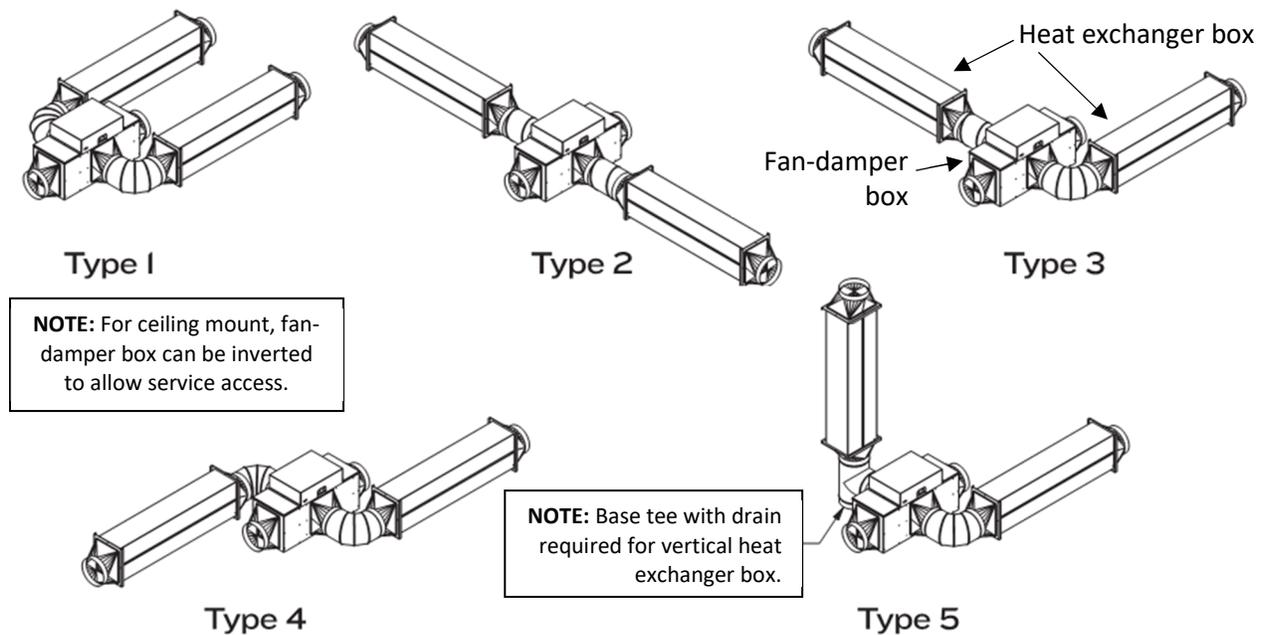
Choose an appropriate location for the HRV:

- In a heated space where ambient temperature is kept between 10°C (50°F) and 40°C (104°F).
- Attic installations are not recommended.
- A typical location is in a mechanical room, away from occupied areas.
- So as to provide service access to the heat exchangers and control panel side of the HRV.
- Close to an exterior wall to limit length of duct runs to the outside.

### Mounting Configurations

The HRV can be mounted on a support frame, suspended from floor joists in a mechanical room or above a dropped ceiling.

To fit within the available space, the damper-fan box and two heat-exchanger boxes can be configured in many different ways.



The control compartment on the damper-fan box needs to be accessible for startup and servicing. For drop ceiling installations, the damper-fan box can be rotated upside-down to gain bottom access to the controls.

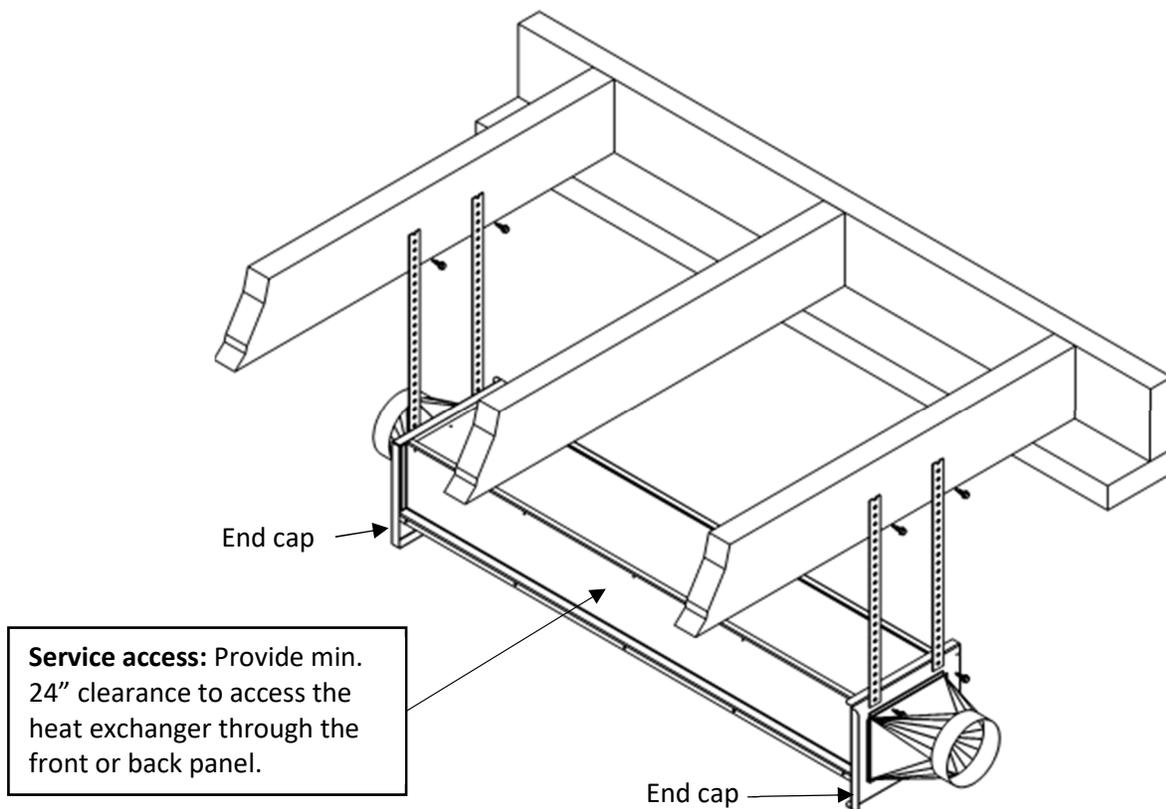
## Mounting – Heat Exchanger Boxes

The heat exchanger boxes can be installed on a structural frame or suspended from floor or ceiling joists using perforated metal strapping or twisted chain. It is recommended to use threaded rod and Unistrut channel for box weights above 150lb.

Ensure heat exchanger boxes are level with drain fitting pointing down to provide proper condensate drainage. Make sure drains are accessible at the bottom of each heat exchanger box. If necessary, heat exchanger boxes can be installed vertically with a base tee and drain fitting.

### WARNING

Condensate drains must be on warm side of the heat exchanger for proper condensate drainage during winter operation.



### WARNING

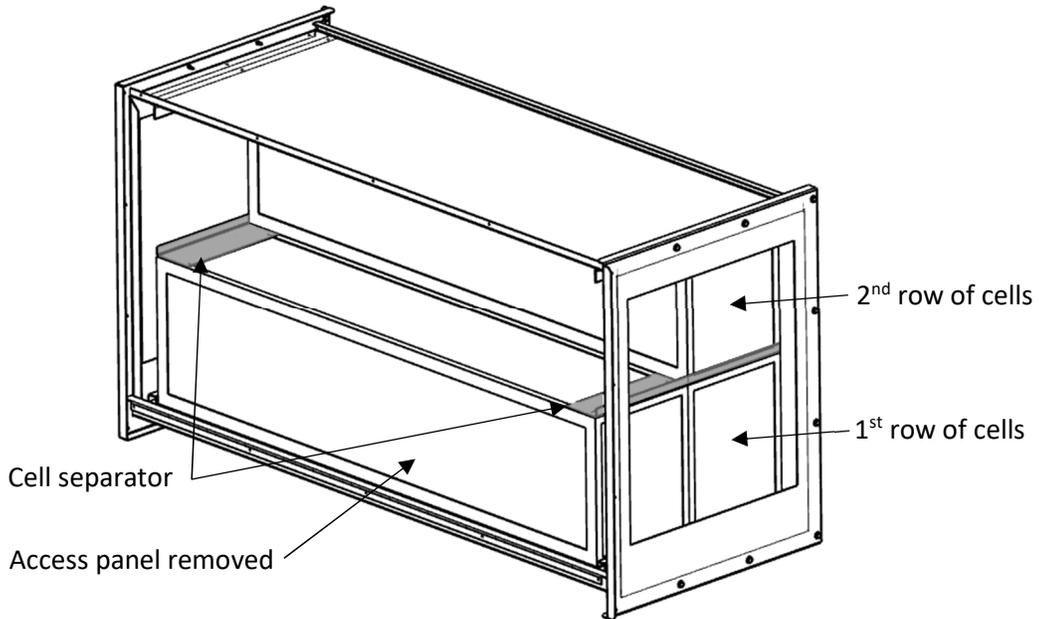
Attach perforated metal strapping or twisted chain to end caps. When required, Unistrut channel or structural supports shall be placed at both ends of the box, within 6 inches of the end caps.

Do not screw into the top, bottom, or side walls to prevent damage to the exchanger.

## Installation of Heat Exchanger Cells

Heat exchangers above 50 lb are split into multiple cells to help with handling and installation. Check the cell layout label on the outside of the heat exchanger box. Then remove the access panel and slide cell(s) into the heat exchanger box, following the cell layout.

Larger units with two rows need cell separators at the ends of the first row, short angle facing up, so the second row of cells slide in on the angles.



### WARNING

Handle heat exchanger cells with care. When unwrapping, ensure that the cells do not fall. If they do fall and deform, push the cell frame back to square to make sure it will fit into the exchanger box. This must be done by hand.

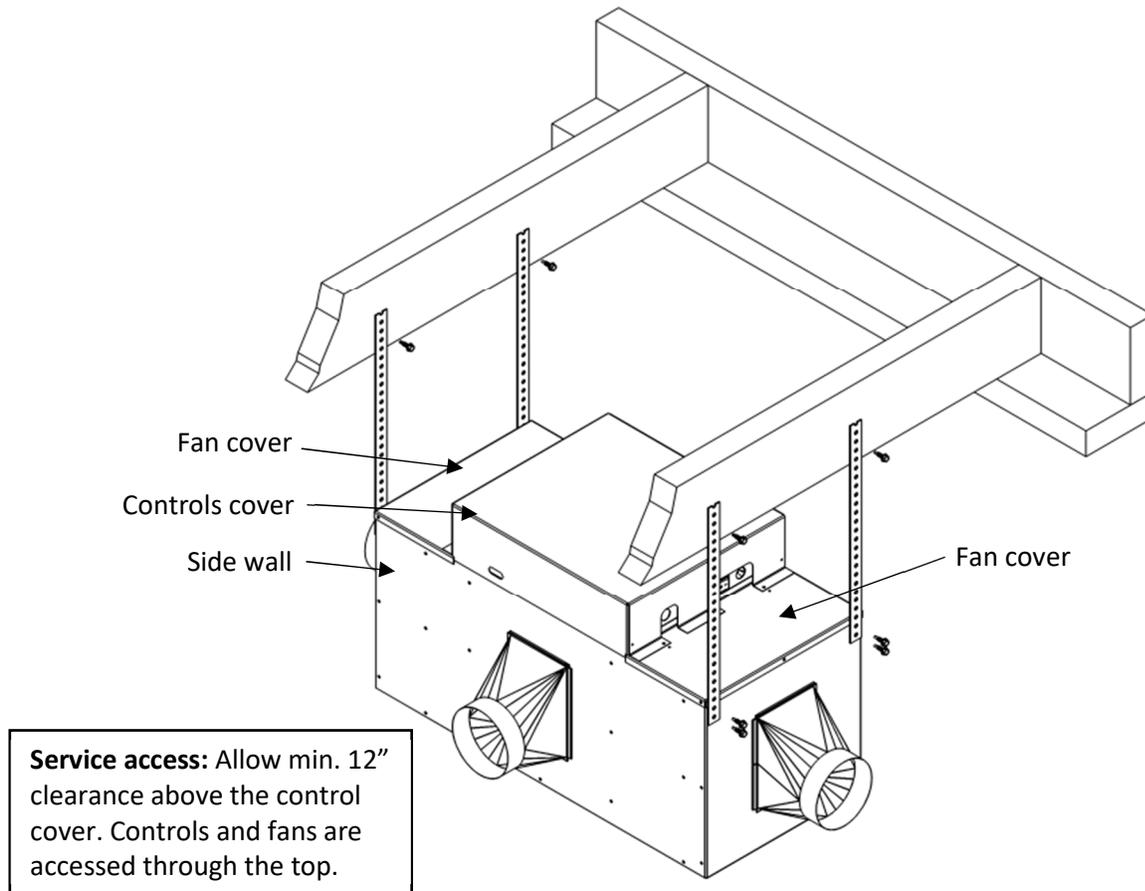
### WARNING

The aluminum baffles inside the heat exchanger cells must be in the vertical plane to ensure proper condensate drainage during winter operation.

## Mounting – Fan-Damper Box

The fan-damper box can be installed on a structural frame or suspended from floor or ceiling joists using perforated metal strapping or twisted chain. It is recommended to use threaded rod and Unistrut channel for box weights above 150lb.

The damper-fan box can be suspended using perforated metal strapping screwed to the ends where the supply air and return air ducts connect to the HRV.



### WARNING

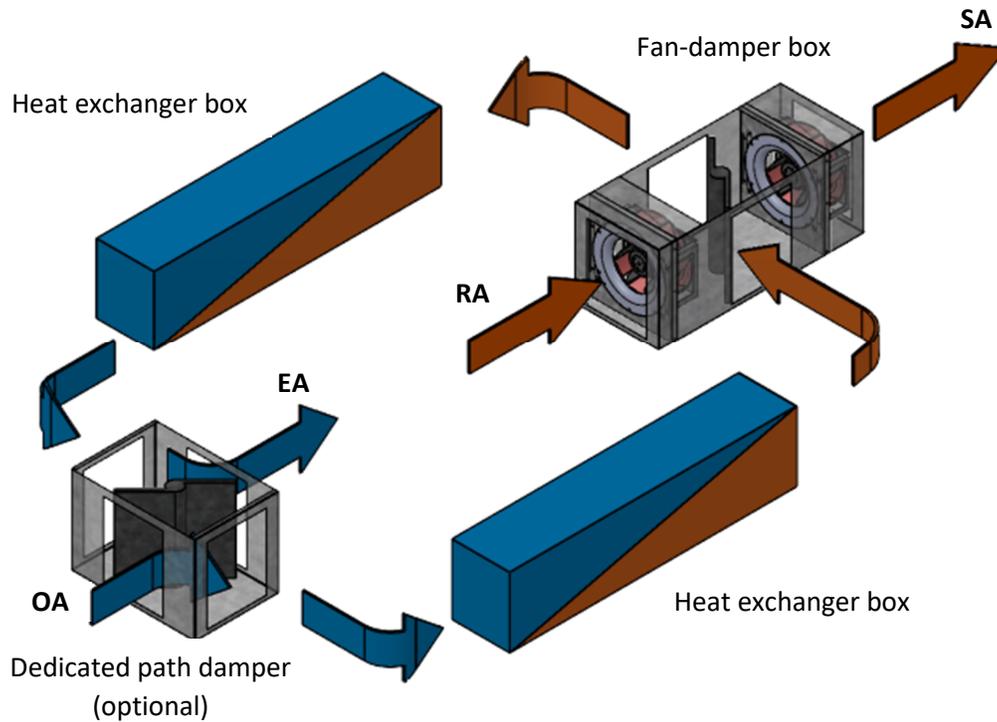
Attach perforated metal strapping or twisted chain to casing. Screws must extend less than  $\frac{3}{4}$ " into the casing. When required, Unistrut channel or structural supports shall be placed at both ends.

Do not screw into the fan covers, control panel, or side walls.

## Dedicated Path

It is recommended to install the HRV as close as possible to the exterior walls. Incoming fresh air and leaving exhaust ducts should be 25ft, or shorter.

If site conditions require longer duct runs, a dedicated path damper would be one option to minimize exhaust air carryover. Contact your local Tempeff representative.



Airflows:

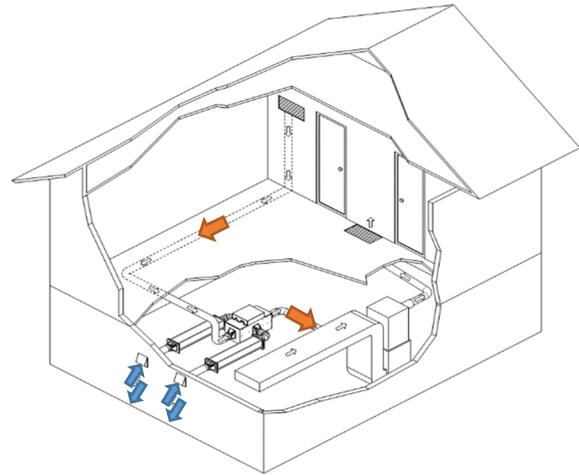
- OA = outside air entering the HRV
- SA = supply air to building
- RA = space return air entering the HRV
- EA = exhaust air to outside

## Ducting

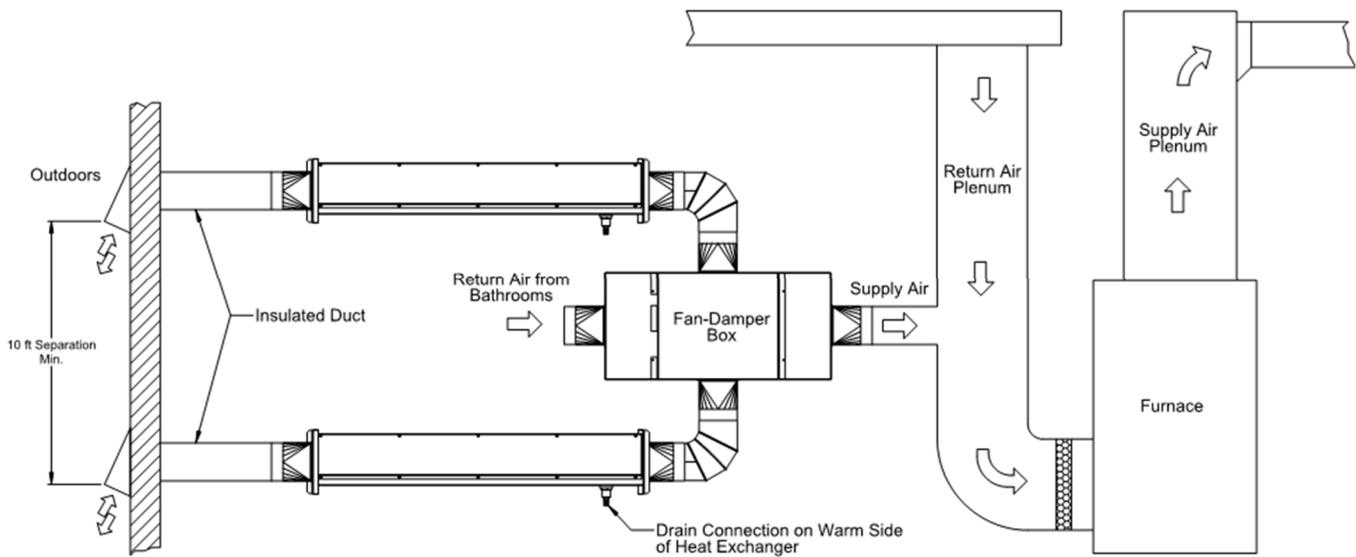
The HRV recovers energy from stale exhaust air ducted to various parts of the building. This could be bathroom(s), kitchen, laundry, etc.

The exhaust air energy is then transferred to the fresh air which is ducted to the return air side of a furnace or air handling unit to condition the supply air to comfort conditions.

The diagram below shows a typical installation. If required, the HRV can be ducted directly to the space with an auxiliary heater and filter (if necessary) placed in the supply air duct work.



In colder climates, motorized shut-off dampers may be required for the fresh air/exhaust air ducts if the HRV does not run continuously.



### WARNING

The fan-damper box reverses airflow through the heat exchangers every minute to recover energy. Do not install backdraft dampers in any duct connect to the heat exchanger boxes.

If required, backdraft dampers may be installed in the return or supply air duct.

### ATTENTION

The HRV must be balanced. It is recommended to balance the system at low and high flow, using the balancing procedure found in this manual.

## Weather Hoods

Weather hoods need to have a 1/4 in. (6 mm) mesh bird screen to prevent foreign objects, birds, and insects from entering the ductwork.

The fan-damper box alternates fresh air and exhaust between the two heat exchangers. Make sure the weather hoods allow air flow in both directions: incoming fresh air and leaving exhaust air. Conventional exhaust vents with backdraft flaps may cause damage to the HRV and connecting duct work.

### **WARNING**

Intake & exhaust hoods must allow bidirectional airflow.

Do not use vent caps with backdraft flaps to prevent damage to the HRV & ductwork.

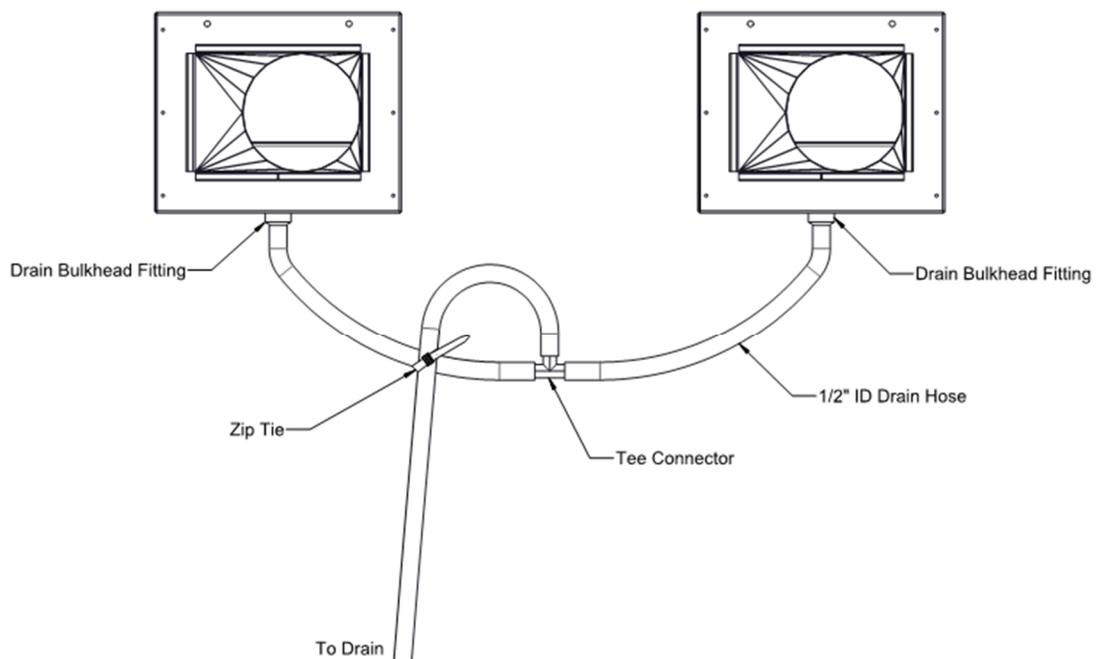
## Installation Guidelines

- Install hoods minimum 10ft apart. Locate hoods at least 6ft away from dryer vents, furnace exhaust, driveways, oil fill pipes, gas meters, or garbage containers. Check local codes for minimum separation distances and clearances.
- Do not locate weather hoods in garage, attic, or crawl space.
- Seal fresh air/exhaust air ducts and insulation vapor barrier to the weather hoods.
- Insulated flexible duct may be used for duct runs from the outside to the heat exchanger boxes, less than 10 ft (3.3 m) in length. Stretch flexible ducts slightly. Twisting or folding restricts airflow.
- Check local codes/authorities having jurisdiction for acceptance.

## Condensate Drain

The HRV produces condensation during winter operation and requires a condensate drain for each heat exchanger box. The heat exchanger box has pre-punched holes for the drain fittings (shipped loose).

- Remove the heat exchanger from exchange box.
- Install drain bulkhead fitting.
- Run ½" ID clear tubing from both bulkhead fittings to a common Tee.
- Make a water trap loop in the tube to prevent HRV from drawing unpleasant odors from the drain source. Top of the loop must be at least 4" lower than the exchanger boxes.
- Add water to the loop to prevent noise or hiss.
- Route common drain to a nearby floor drain or condensate pump.



## Controls

The HRV is factory-wired to run 24/7 in heat recovery mode when power is turned on. Additional control features are available, including digital inputs, relay outputs, DIP switches, and on-board status LEDs.

All control wires must be wired to the customer terminal strip. Use minimum 18ga conductors. The printed circuit board is factory wired and must not be modified.

### Digital Inputs

- Must be dry-contact (voltage free)
- Wire dry-contact between DI and COM terminal. Make sure to use the COM terminal in the digital input group.

Digital Input	Contact Open	Contact Closed
DI 1	HRV disabled	HRV enabled
DI 2	Free cooling (3 hour cycle)	Heat recovery (60sec cycle)
DI 3	Fan low speed	Fan high speed*
DI 4	No function	

\* Fans continue to run in high speed for 20min after contact is opened.

### Analog Input

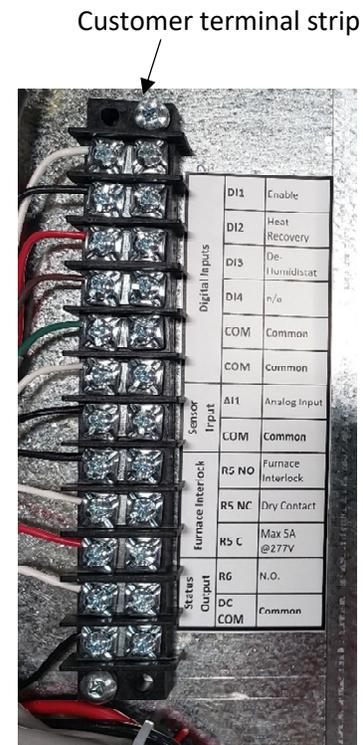
- 0-10Vdc input signal for variable air volume applications
- This feature is still under development and currently unavailable.

### DIP Switches

- DIP switches 1 to 3 are preset from the factory.
- Make sure HRV is disabled prior to changing any DIP switches. Temporarily remove factory jumper between DI1 and COM. If enable contact is field-wired, open this contact to disable.

DIP Switch	ON	OFF
Switch 1	No function	Default
Switch 2	Temp sensor input enabled*	Temp sensor input disabled
Switch 3	0-10Vdc signal for ECM fans	Triac control for AC fans
Switch 4	Enter set up routine	Default

\* If equipped with optional supply and exhaust temperature sensors to select heat recovery or free cooling mode.



## Relay Outputs

- Relay outputs can be used for interlock and status feedback.
- Relay outputs are rated for 5Amp @ 250Vac, 10Amp @ 125Vac.

Relay Output	Description	Function
R5	Furnace interlock	Relay contact is energized when HRV is enabled.
R6	Status/alarm feedback	Relay contact is energized when fans in high speed. Contact flashes ON/OFF every 2 sec in case of an alarm.

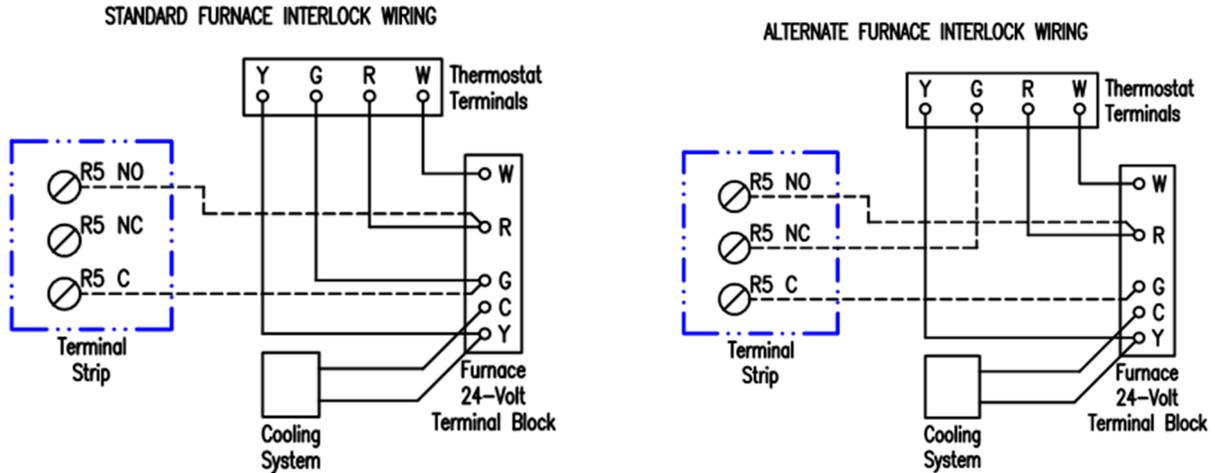
## Status LEDs

The main control board on the fan-damper box is designed with four status LEDs. The LEDs indicate current operating status and assist with troubleshooting.

	LED	OFF	ON	FLASHING
Operating Status	Green	No power	OK to start	Enabled
	Yellow	Free cooling	Heat recovery	--
Damper Position	Red	Not in position 1	In position 1	Moving to position 1
	Red	Not in position 2	In position 2	Moving to position 2

## Interlocking the HRV

It is recommended to wire the HRV to a furnace, air handler, or duct heater to bring up the supply air temperature to room condition. Follow the wiring diagram below to interlock the HRV.



## Bathroom Timer and Dehumidistat

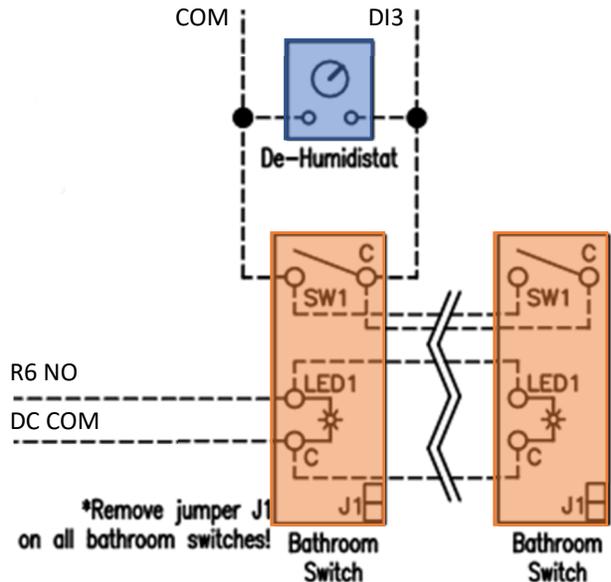
The bathroom timer and dehumidistat switch the HRV to high speed to exhaust stale, humid air. Follow the wiring diagram below.

The bathroom timer is a momentary push-button. It sends a pulse to digital input DI 3. When the control board registers a 1 second pulse, the fans will switch to high speed for 20 minutes. The LED on the timer button turns ON to indicate high speed.

If the timer button is pushed again during the 20 minutes, the call for high speed is cancelled and the fans resume normal operation.

The dehumidistat contacts close when space humidity is above setpoint. The HRV switches to high speed to bring in dry air and exhaust humid stale air.

When humidity level drops below setpoint, dehumidistat contacts open and after another 20 minutes the fans resume normal operation.



## Freeze Protection

An HRV is a mechanical ventilation device that brings in fresh outside air to replace stale indoor air. If freezing is a concern during winter operation, freeze protection should be installed to prevent damage in case of a mechanical or electrical malfunction.

An optional low-limit kit is available. See unit wiring diagram for installation details.

### **WARNING**

In cold climates where freezing is a concern, install freeze protection to prevent damage to other HVAC equipment and/or building.

## Airflow Balancing

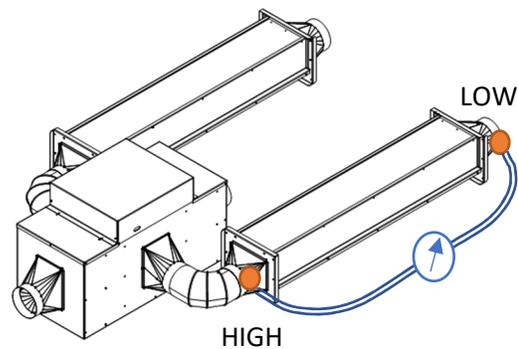
The HRV recovers energy from the exhaust air stream. It is important to balance supply and exhaust air flow rates at normal and high fan speed to ensure operating efficiency. Balancing the airflows is critical to prevent over-pressure or under-pressure in the space.

To prepare for airflow balancing, make sure the duct work is sealed, confirm the HRV is properly installed, and any shut-off/zone dampers are open.

A bi-directional differential pressure gauge or handheld manometer is required to balance the air flows.

### Balancing Steps:

- 1) Drill a ¼" hole in the duct fitting at both ends of the core.
- 2) Insert a ¼" high pressure probe at the HIGH location, and a low pressure probe at the LOW location. See diagram on the right.
- 3) Connect the pressure probes to the pressure gauge/manometer.
- 4) Temporarily set DIP switch 1 to ON to operate in heat recovery mode.
- 5) Turn on power and enable the HRV.
- 6) Monitor differential static pressure for a couple cycles. Positive readings indicate exhaust air flow. Negative readings are supply air flow.
- 7) If the magnitude of the positive pressure reading is more than 0.1" WC below the negative reading, the exhaust fan speed needs to be increased to balance the air flow. Follow fan speed adjustment steps in following section.
- 8) After low speed balancing, jumper DI1 to COM on the terminal strip and repeat steps 1 to 7 to balance the HRV at high speed.



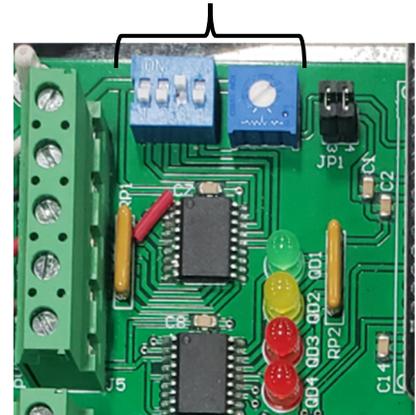
## Fan Speed Adjustment

The low and high speed setpoint can be adjusted individually for the supply and the exhaust air fans.

Remove the controls cover to access the DIP switches and potentiometer on the control board.

Select the desired setpoint using the DIP switch table below and rotate the potentiometer with a flat screw driver to adjust the setpoint.

DIP switch & potentiometer on main control board



### Setpoint Adjustment Steps:

- 1) Record/take a picture of the factory DIP switch setting.
- 2) HRV must be disabled. Temporarily remove red factory jumper between digital input DI1 and COM, or open the Enable contact (if field-wired).
- 3) Identify desired setpoint and set DIP switches 1 to 3 based on the table below.
- 4) Turn DIP switch 4 to ON to enter set up routine. The selected fan will start to run.
- 5) Turn the potentiometer CW to increase, CCW to decrease the setpoint.
- 6) Turn switch 4 to OFF to save the new setpoint.
- 7) If required, set DIP switches 1 to 3 to next setpoint that needs adjustment. Repeat steps 3) to 7).
- 8) When complete, reset DIP switches to factory settings.

Fan Speed Setpoint	DIP Switch Position			
	SW 1	SW 2	SW 3	SW 4
Supply – low	OFF	OFF	OFF	Turn ON after DIP 1 to 3 are set.
Supply – high	ON	OFF	OFF	
Exhaust – low	ON	ON	OFF	
Exhaust – high	OFF	ON	OFF	

# Maintenance

## Recommended Quarterly Maintenance

- Disconnect power to the unit.
- Check the exterior hoods. Remove any leaves, twigs, ice, or snow.
- Remove the fan covers and rotate the blower wheels by hand. If a blower does not rotate easily, contact your installer.
- Clean or replace air filters (if equipped).
- Replace the fan covers and connect power to start HRV.

## Recommended Yearly Maintenance

- Perform the monthly maintenance recommended.
- Remove the fan covers to inspect the blower wheels and clean if necessary. Remove any dust using a vacuum cleaner with a soft brush attachment.
- Inspect damper for any wear or play.
- Remove the side wall panel from the heat exchanger box. Inspect heat exchanger core and clean if necessary. Follow the heat exchanger maintenance steps below.
- Reassemble the components and connect power to start the HRV.

## Heat Exchanger Maintenance

Typically, the HRV can operate for 3-5 years before the cores need to be cleaned.

- If the heat exchangers require cleaning, remove the heat exchanger front or back access panel.
- Pull out the heat exchangers. Depending on unit size, the heat exchanger may be split into multiple cells.
- Wash the heat exchanger/cells using a pressure washer. Then allow them to drip dry.
- Install the heat exchanger/cells back into the unit. Follow the orientation labels on the inside of the heat exchanger access panel. Don't forget to alternate the rivets and replace the cell separators!

## Troubleshooting

Refer to the following table for troubleshooting the HRV.

Symptom	Potential Cause	Solution
HRV stopped & red LED flashing	<ul style="list-style-type: none"> <li>• Internal alarm</li> <li>• Blown actuator fuse</li> </ul>	<ul style="list-style-type: none"> <li>• Reset power to clear alarm.</li> <li>• Replace blown fuse. Refer to wiring diagram inside control box cover.</li> </ul>
HRV does not start & all status LEDs off	<ul style="list-style-type: none"> <li>• Disconnect switch turned off</li> <li>• Brownout or power surge</li> <li>• Blown control board fuses</li> </ul>	<ul style="list-style-type: none"> <li>• Turn disconnect switch on</li> <li>• Check main breaker or fuses</li> <li>• Replace blown fuse(s). Refer to wiring diagram inside control box cover.</li> </ul>
Poor airflows	<ul style="list-style-type: none"> <li>• Plugged hoods</li> <li>• Filter plugged (if equipped)</li> <li>• External shut-off/zone dampers closed</li> <li>• Restrictive duct work</li> <li>• Air flows not set up</li> </ul>	<ul style="list-style-type: none"> <li>• Clean exterior hoods</li> <li>• Remove &amp; clean filter</li> <li>• Open/adjust dampers</li> <li>• Check duct static P at connections</li> <li>• Balance HRV</li> </ul>
Cold supply air	<ul style="list-style-type: none"> <li>• Poor location of supply grilles</li> <li>• Cold outdoor temperature</li> <li>• Improper furnace interlock wiring</li> <li>• Imbalanced air flow</li> </ul>	<ul style="list-style-type: none"> <li>• Locate supply grilles high on the wall, or ceiling mounted diffusers</li> <li>• Run HRV in low speed.</li> <li>• Check furnace interlock wiring</li> <li>• Balance air flows</li> </ul>
Humidity levels too high causing condensation on the windows	<ul style="list-style-type: none"> <li>• Dehumidistat set too high</li> <li>• Lifestyle of occupants</li> <li>• HRV is set at too low speed</li> </ul>	<ul style="list-style-type: none"> <li>• Set dehumidistat lower as outdoor temperature drops.</li> <li>• Cover indoor pools/hot tubs when not use. Avoid hanging clothes to dry or storing firewood inside.</li> <li>• Increase HRV speed to bring in more dry outside air</li> </ul>
Humidity too low	<ul style="list-style-type: none"> <li>• Dehumidistat set too low</li> <li>• Lifestyle of occupants</li> </ul>	<ul style="list-style-type: none"> <li>• Set dehumidistat higher</li> <li>• May need to add a humidifier</li> </ul>
Condensation/ice buildup on insulated duct	<ul style="list-style-type: none"> <li>• Incomplete vapor barrier on duct to outside</li> <li>• High space humidity</li> </ul>	<ul style="list-style-type: none"> <li>• Tape and seal all joints</li> <li>• Lower dehumidistat setpoint</li> </ul>
Excessive vibration	<ul style="list-style-type: none"> <li>• Dirt/debris on fan wheels</li> </ul>	<ul style="list-style-type: none"> <li>• Inspect and clean fan wheels, if required.</li> </ul>

## Product Warranty

Warranty on Tempeff Heat Recovery devices is one (1) year from unit start-up date or 15 months from date of shipment from our factory, whichever comes first. Tempeff heat exchanger cells are warranted against material or manufacturing defects for a period of 10 years.

Our warranty applies for original shipment on all parts and components fabricated by or installed by us with the exception of air filters, and blower belts.

Within the one-year warranty, replacement parts will be shipped collect and charged to customer account with credit being issued after receipt of, and examination of the returned parts: freight prepaid to the factory.

This warranty does not include freight, labor, or sales tax that may be incurred by the purchasers and is subject to the following conditions:

- 1) The unit shall be installed by a qualified heating or ventilation contractor in accordance with the provisions of the service manual.
- 2) The unit shall have been installed in accordance with all national and local codes.
- 3) The unit shall have been subject to only normal use in service and shall not have been misused, neglected, altered or otherwise damaged.
- 4) The unit shall have been operated within its published capacity and with the prescribed fuel.
- 5) All automatic controls shall have been operative at all times.
- 6) The heat exchanger has not been subjected to corrosive environments
- 7) There is no evidence of tampering or deliberate destruction.
- 8) Frost damage to coils is not covered by this warranty

No representative of Tempeff or any of its distributors or dealers is authorized to assume for Tempeff any other obligations or liability in connection with this product, nor alter the terms of this warranty in any way. This warranty is limited to the express provisions contained herein and does not extend to liability for labor or travel costs incurred in replacing defective parts.

Authorization to return any alleged defective parts must be obtained from the factory before the part is transported and the owner shall prepay the transportation charges for any alleged defective parts. Tempeff will not accept charges for parts purchased unless the conditions of this warranty have been satisfied.

The express warranties herein contained are in lieu of other warranties, expressed or implied, including the warranty of merchantability and of fitness for any particular purpose. Tempeff shall not be liable for damages, including special, incidental, or consequential damages arising out of or in connection with the performance of the heat recovery devices, or its use by the owner. Tempeff liability is limited exclusively to repair and or replacement of the defective part. Parts can be obtained from Tempeff, 675 Washington Ave, Winnipeg, Manitoba, R2K 1M4, on the basis that credit will be issued if defective parts returned qualify for replacement pursuant to the terms and conditions of this warranty.