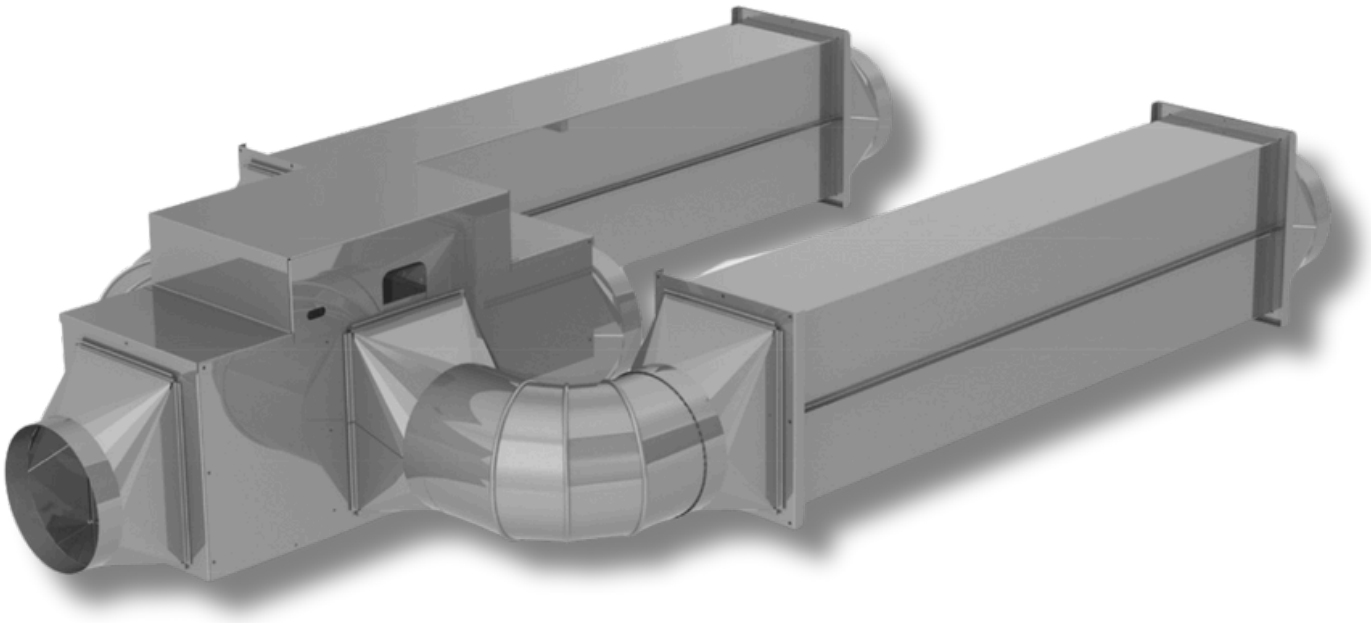
Installation and Maintenance Manual

RGSP-K Series



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Attention

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.

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 by 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.

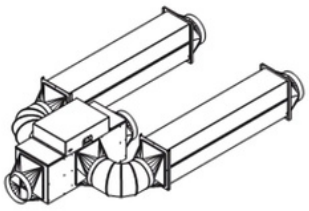
Mounting Configurations

The HRV can be mounted on a support frame, suspended from floor joists in a mechanical room or above a dropped ceiling. Optional mounting kits are available at time of order.

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

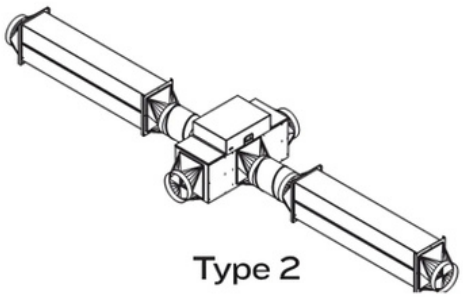
The control compartment on the fan-damper box needs to be accessible for startup and servicing. For drop ceiling installations, the fan-damper box can be rotated upside-down to gain bottom access to the controls.

Figure 1. Mounting Configurations



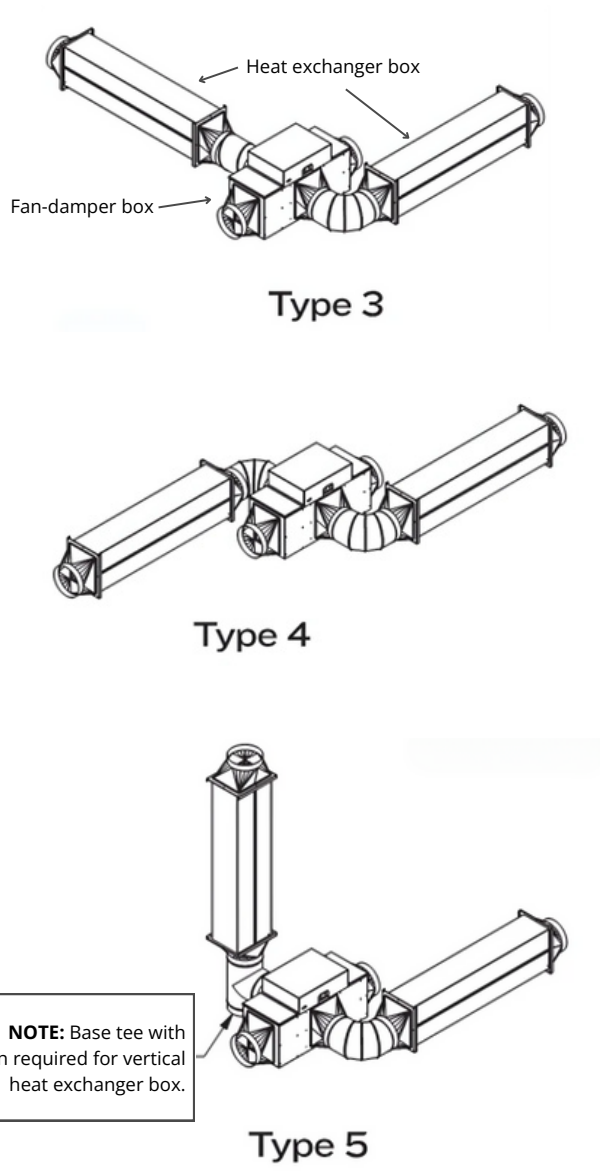
NOTE: For ceiling mount, fan-damper box can be inverted to allow service access.

Type I



Type 2

Figure 1. Mounting Configurations (continued)



NOTE: Base tee with drain required for vertical heat exchanger box.

Mounting – Fan-Damper Box

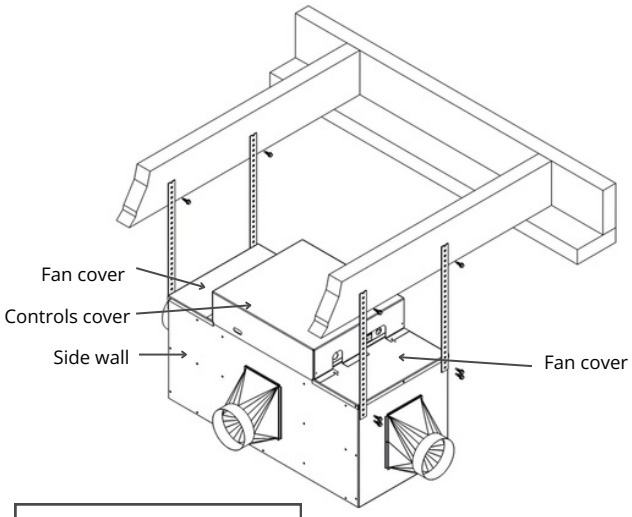
The fan-damper box can be installed on a structural frame, or suspended using perforated metal strapping or twisted chain, screwed to the ends where the supply air and return air ducts connect to the HRV. It is recommended to use threaded rod and Unistrut channel for box weights above 150 lb.

Warning

Attach perforated metal strapping or twisted chain to casing. Screws must extend less than ¾" into the casing. When required, Unistrut channel or structural supports shall be placed at both ends.

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

Figure 2. Mounting – Fan-Damper Box



Service access: Allow min. 12" clearance above the control cover. Controls and fans are accessed through the top.

Mounting – Heat Exchanger Boxes

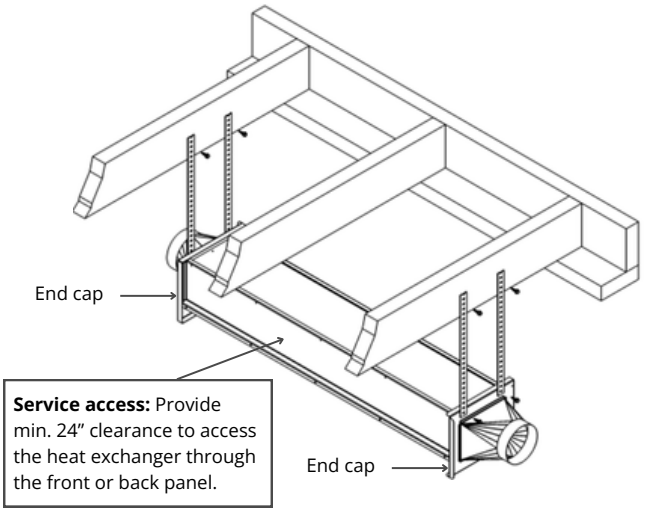
The heat exchanger boxes can be installed on a structural frame, or suspended using perforated metal strapping or twisted chain, screwed to the end caps. It is recommended to use threaded rod and Unistrut channel for box weights above 150 lb.

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.

Figure 3. Mounting – Heat Exchanger Boxes



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.

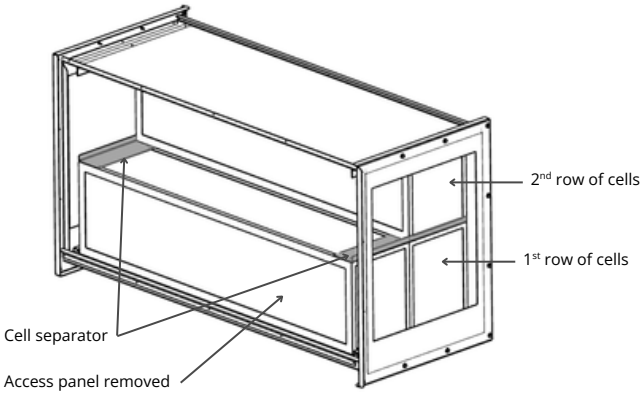
Do not screw into the top, bottom, or side walls to prevent damage to the exchanger.

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.

Figure 4. Installation of Heat Exchanger Cells



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 for proper condensate drainage during winter operation.

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.

Figure 5. Ducting

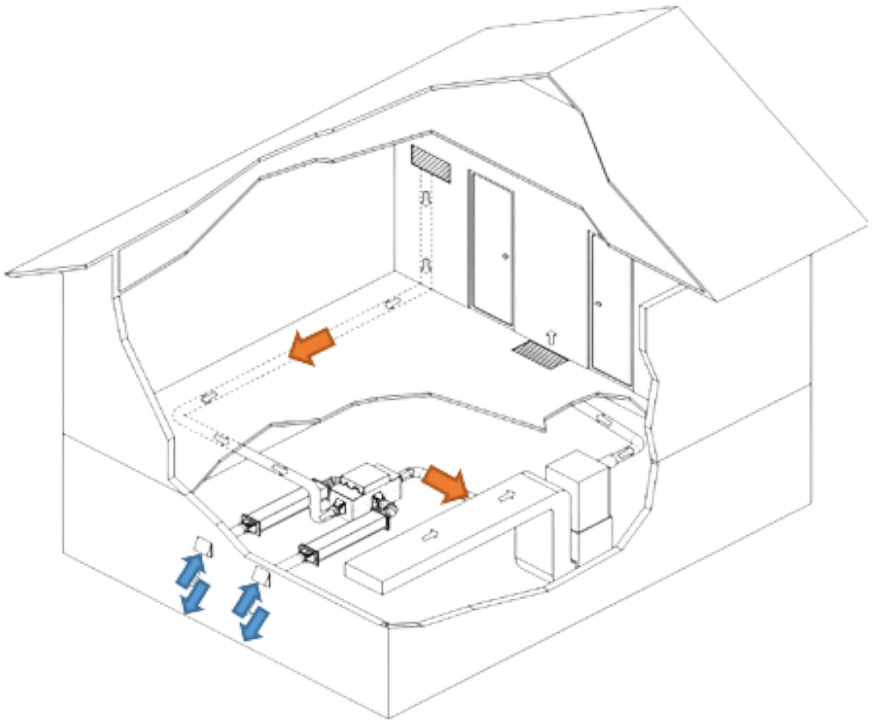
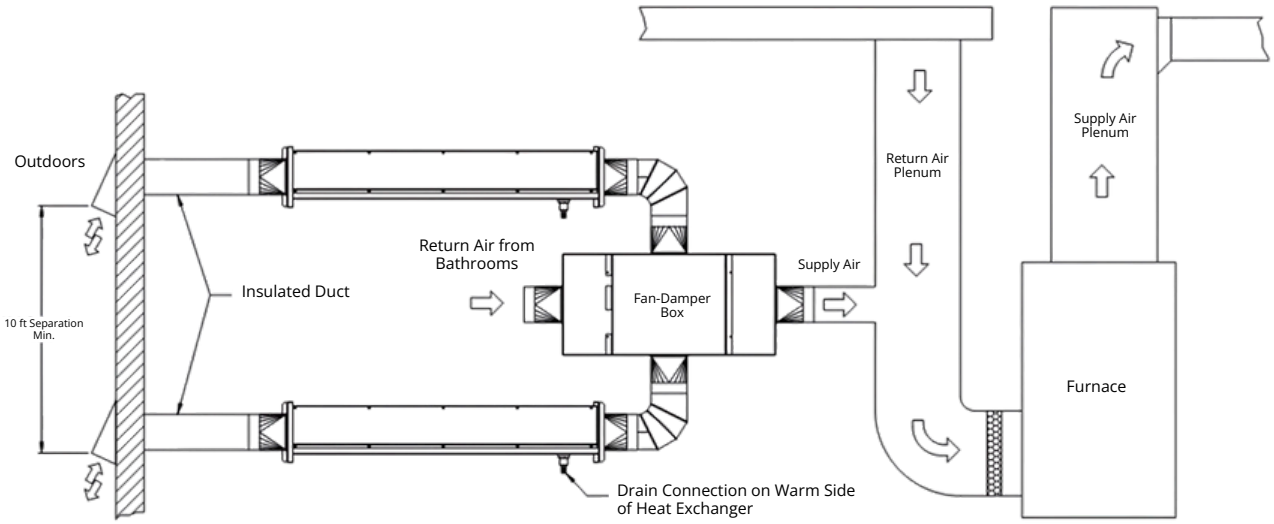


Figure 6. Typical Installation



Warning

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

Duct Design

It is recommended to use round, rigid ductwork for all connections to optimize system performance. When using rectangular duct for higher airflow, stronger material and/or stiffeners may be necessary to minimize duct noise. Note, airflow across the heat exchanger is reversed every damper switchover. Ducts connected to the HX boxes experience alternating positive and negative static pressure.

At a minimum it is recommended a **multiple factor of 4** be used to calculate the static pressure differential the duct must handle.

Examples:

1. Pressure drop at steady state through OA/EA duct is 0.1". This means the duct will alternate from -0.1" to +0.1" WC when airflow is reversed, or 0.2" WC differential. Duct should be designed to withstand at a minimum 0.8" WC variation (must withstand positive and negative cycling).

2. Pressure drop at steady state through SA duct is 0.4". This means the duct will alternate from -0" to +0.4" WC, or 0.4" WC differential. Duct should be designed to withstand at a minimum 1.6" WC variation.

Attention

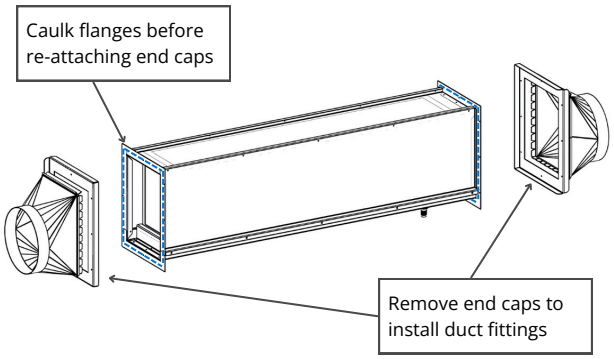
To minimize duct noise, design all ducts to handle at least 4X expected static pressure. Account for alternating positive & negative static pressure.

Duct Connections

Connections on the fan-damper and heat exchanger boxes are sized for commonly-used side take-off fittings. The optional dedicated path damper and filter box use the same connection size.

Heat exchanger boxes come with removable end caps to attach the duct fittings. Before re-attaching the end caps, caulk both flanges to ensure airtight connections.

Figure 7. Duct connections

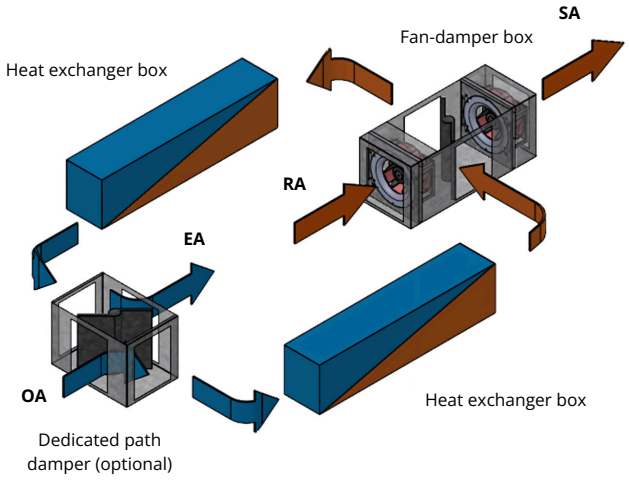


Dedicated Path - Option

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

Figure 8. Dedicated Path - Option



Airflows:

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

Dedicated path damper is controlled and powered by the controller inside the fan-damper box. Use shielded twisted-pair cable and keep the run as short as possible to prevent intermittent damper alarms.

Warning

To prevent nuisance alarms, use shielded twisted-pair cable for dedicated path damper wiring. Keep the wire run as short as possible.

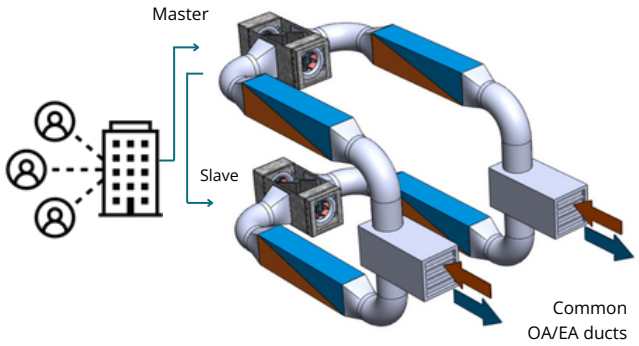
Master-Slave - Option

The Master-Slave option is intended for applications where two units are ducted to a common fresh air and exhaust ducts.

The BMS/Customer needs to control the Master unit only. The Slave unit follows the damper and fan speed signals from the Master unit. Both units shut down in case of a damper alarm to prevent exhaust air transfer into the supply airstream.

Note, Master-Slave control is only available for units with ECM fans. The larger unit must be Master.

Figure 9. Master-Slave - Option



Attention

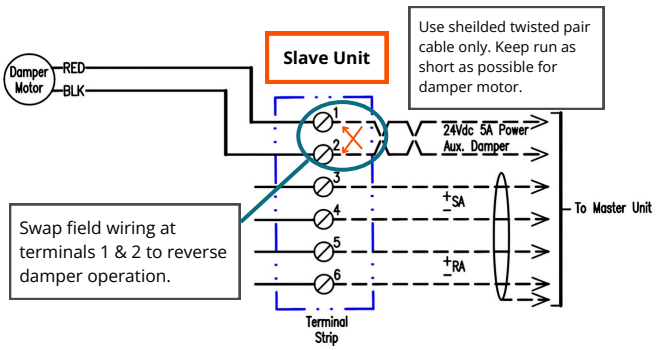
Both units will shut down in case of damper or low limit alarm. Master will not operate without the Slave unit and vice versa.

Warning

Fans on both units run at the same speed setpoints. Review fan curves and ducting to ensure balanced fan static between both units to avoid air balancing issues.

If site ducting requires the Master and Slave damper to operate opposite of each other, damper rotation on the Slave unit can be reversed on site.

Figure 10. Master-Slave - Option



Warning

Damper motor operates on high-frequency PWM. Used shielded twisted-pair cable and keep the wire run as short as possible to avoid nuisance damper alarms.

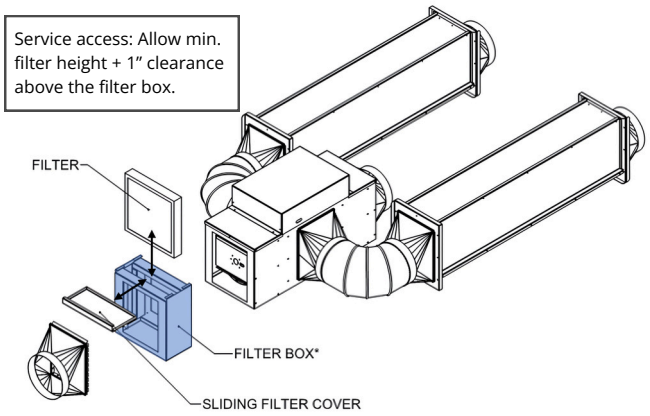
Filtration

In a typical installation, the HRV delivers tempered supply air to a furnace/air handler where the air is filtered before entering the space. Applications with high dust loading may require a return air filter.

Filter Box - Option

An optional filter box with a 2" deep filter can be attached to the fan-damper box. In a tight mechanical room, the filter box can be duct-mounted using side take-off fittings, same size as unit duct connections.

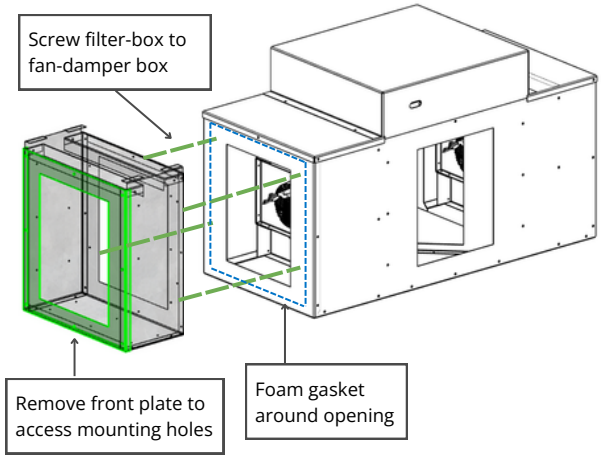
Figure 11. Filter Box - Option



The filter box has pre-punched mounting holes to attach it the fan-damper box.

- Apply foam gasket/caulk around the duct opening to prevent air leaks.
- Remove front plate and screw the filter box to fan-damper box.
- Re-install front plate.
- Slide filter into filter rack.
- Install filter cover.

Figure 12. Filter Box - Option



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 bi-directional airflow.

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

Installation Guidelines

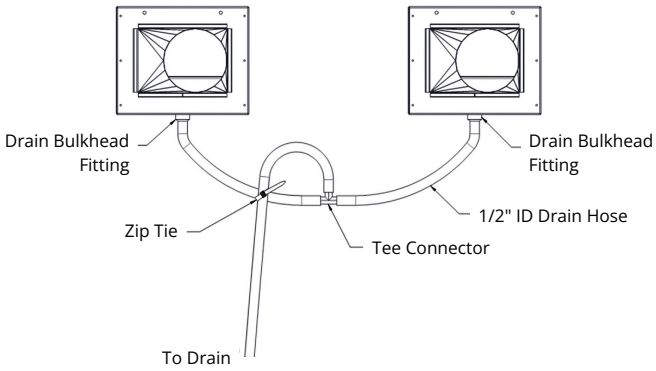
- Install hoods minimum 10 ft apart. Locate hoods at least 6 ft away from dryer vents, furnace exhaust, driveways, oil fill pipes, gas meters, or garbage containers. Check local codes for minimum separation distances and clearances.
- Do not locate weather hoods in garage, attic, or crawl space.
- Seal fresh air/exhaust air ducts and insulation vapor barrier to the weather hoods.
- 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 a pre-punched hole for the drain bulkhead fitting (shipped loose).

- Remove heat exchanger cell(s) from exchanger 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.

Figure 13. Condensate Drain



Insulation

It is recommended to insulate both heat exchanger boxes to prevent condensation on the outside of the casing during winter operation. Optional insulation kit (foil-faced fiberglass) is available at time of order.

OA/EA ducts transport cold air in the winter and should be insulated as well. Check local codes/authorities having jurisdiction for acceptance.

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/analog 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 controller (printed circuit board) is factory wired and must not be modified.

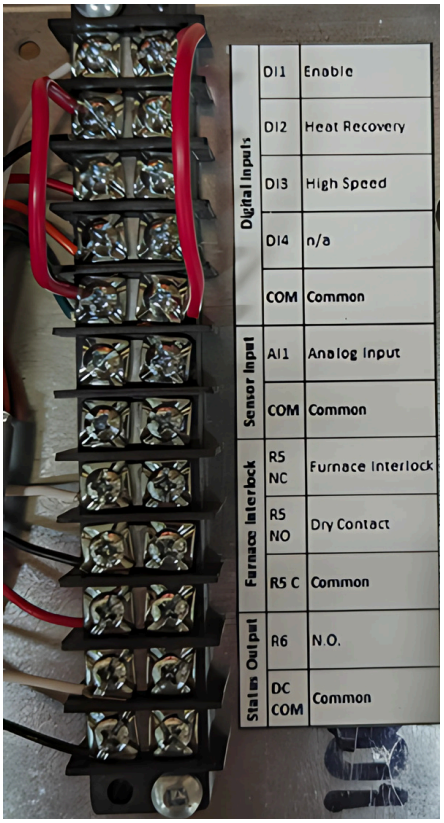
Digital Inputs

- 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 h cycle)	Heat recovery (60 sec cycle)
DI 3	Fan low speed	Fan high speed*
DI 4	No function	

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

Figure 14. Customer terminal strip



DIP Switches

- DIP switches 1 to 3 are preset from the factory.
- DIP switch 4 is used for set up only. It must be OFF during normal operation.
- 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 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 controller inside the fan-damper box is designed with four status LEDs which indicate current operating status and assist with troubleshooting.

Normal Operation

	LED	OFF	ON	FLASHING
Operating Status	Green	No power	OK to start	Enabled
	Yellow	Free cooling	Heat recovery	Core cleansing cycle
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

If unit has shut down unexpectedly, red status LED QED3 flashes to indicate alarm on main damper. LED QD4 indicates alarm on optional dedicated path damper.

Alarm Code

RED LED	OFF	1-FLASH	2-FLASH	3-FLASH
Main damper - QD3	No alarm	No feedback voltage; open-circuit (motor/wiring)	Actuator cycle time exceeded; damper loose	Actuator cycle time too short; damper jammed
Ded path damper - QD4				

Interlocking the HRV

It is recommended to wire the HRV to a furnace, air handler, or duct heater to bring supply air temperature to comfort condition.

Follow the wiring diagram below to interlock the HRV.

Figure 15. Standard Furnace Interlock Wiring

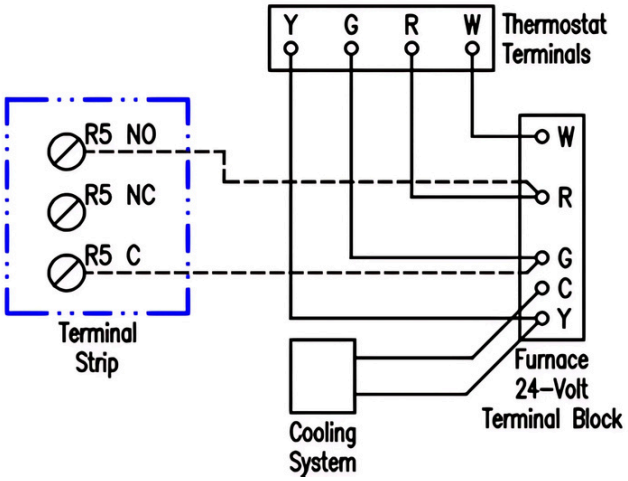
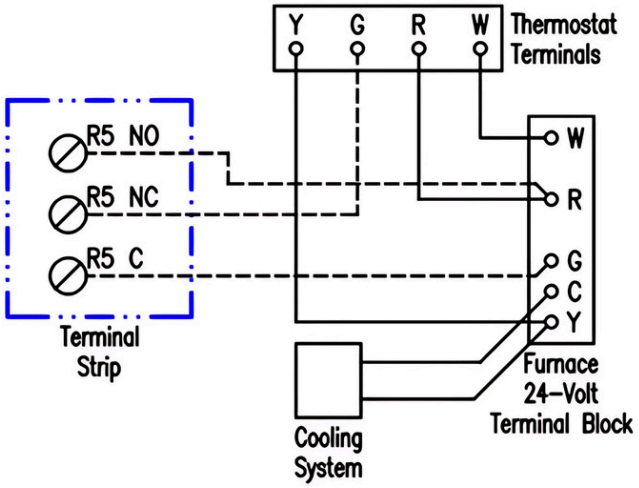


Figure 16. Alternate Furnace Interlock Wiring

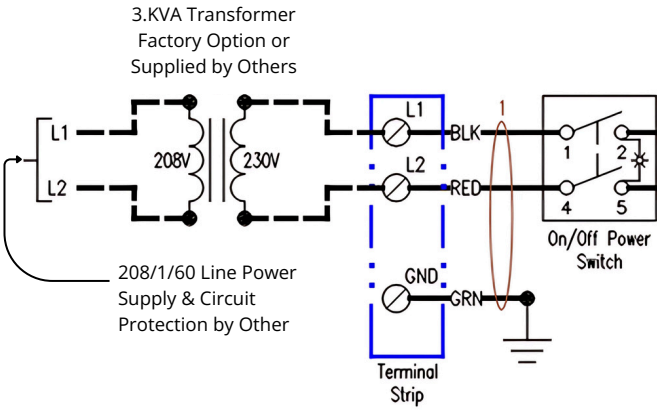


208 Volt Main Power Supply - Option

An optional step-up transformer is available to allow the unit to run off a 208-volt power supply. The field-installed 3 kVA transformer can be ordered as an accessory option, or supplied by others at the time of installation.

See the wiring diagram below.

Figure 17. 208 Volt Main Power Supply - Option



Low Limit / Freeze Protection - Option

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 at time of order. The low limit thermostat is shipped loose, to be field-installed in the supply air duct and wired to the main control board as per wiring diagram below.

Sequence:

- Should supply air temperature fall below setpoint (default 35°F) for 5 minutes, the fans are disabled and the HRV shuts down.
- The low limit requires a manual reset to restart the HRV.

Figure 18. Low limit wiring with 120V power

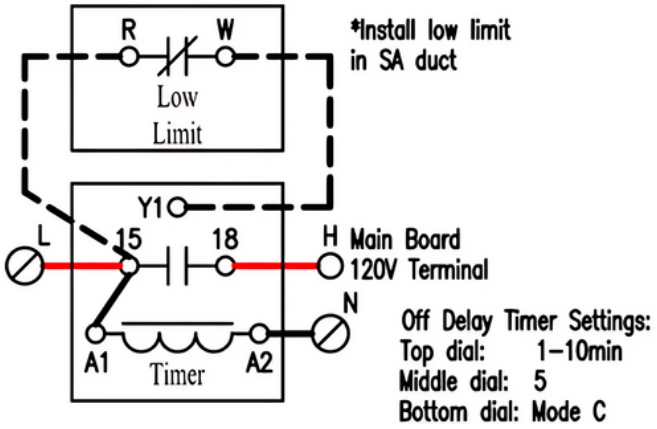
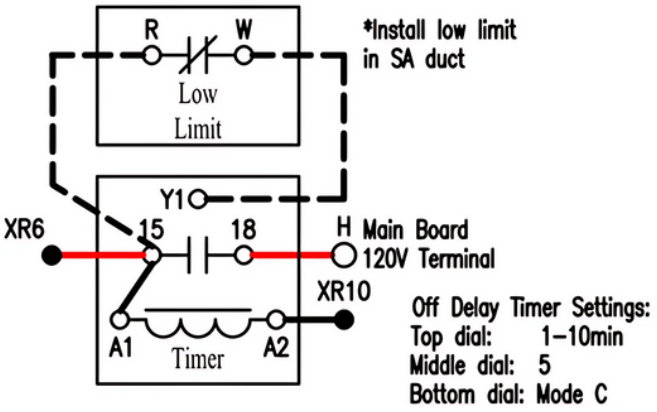


Figure 19. Low limit wiring with 230V power



Attention

Test low limit during start-up to verify field-installation, low limit thermostat, and delay timer operation. Contact Tempeff factory if HRV fails to shut down when low limit has tripped.

Warning

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

Temperature Sensor - Option

If equipped with optional supply (SA) and return air (RA) temperature sensors, the HRV will control heat recovery and free cooling internally. Sensors are factory-mounted inside the control box.

Temperature setpoints are factory-set to SA = 59°F (15°C), and RA = 68°F (20°C). When DIP switch 1 is OFF and DIP 2 set to ON, the sequence of operation will be as follows.

Sequence:

- If return air < 68°F (20°C), HRV operates in heat recovery (switching every 60 seconds).
- If return air > 68°F (20°C) and supply air > 59°F (15°C), free cooling mode enabled (switching every 3 hours).
- If return air > 68°F (20°C) and supply air < 59°F (15°C), HRV operates in heat recovery until supply air > 59°F (15°C), then it will revert to free cooling mode.

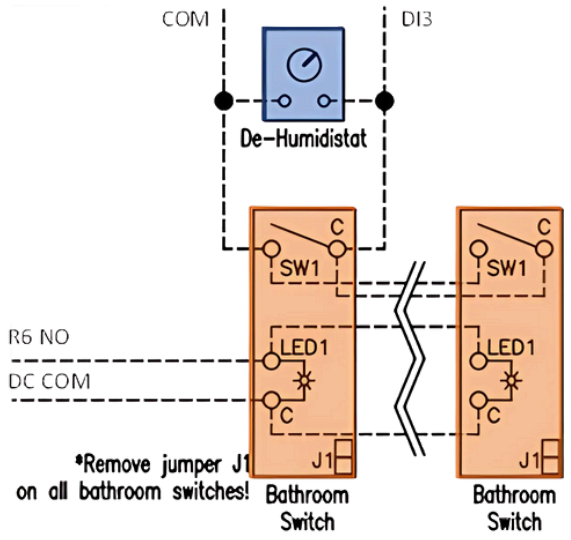
Dehumidistat - Option

An optional dehumidistat can be used to switch the HRV to high speed to exhaust stale humid air. See wiring diagram for details.

Dehumidistat contacts close when space humidity is above setpoint, forcing the fans to high speed. When humidity level drops below setpoint, dehumidistat contacts open, and after another 20 minutes the fans resume normal operation.

Fan speeds are factory-set. High and Low speed setpoints can be field-adjusted independently.

Figure 20. Dehumidistat - Option



Bathroom Switch - Option

The optional bathroom switch is a momentary push-button used to switch the HRV to high speed for 20 minutes. Multiple bathroom switch(es) can be wired in parallel with the dehumidistat. See wiring diagram for details.

When the controller registers a 1 second pulse at input DI3, the fans ramp up to high speed for 20 minutes. The LED on the bathroom switch turns ON to indicate high speed. If pushed again during the 20 minute Off-delay, the call for high speed is cancelled and the fans resume normal operation.

BACnet via MSTP - Option

The unit can be controlled with an optional BACnet field device. Refer to BACnet points list below.

Binary input 3 & 4 can be used to monitor other dry-contact field devices, such as external damper end switches, current sensors, or CO2/humidity switch.

Control Functions:

- Enable & disable unit.
- Heat recovery/free cooling.
- Select High/Low fan speed.

Status Feedback:

- Furnace/AHU interlock.
- Fan high speed.
- Damper alarm (R6: 2sec flash).

BACnet Settings:

- Protocol: BACnet MS/TP only.
- Address: set via DIP switches.
- Baud rate: set via DIP switches.
- Device instance: default is 277XXX, where XXX is the MSTP address.
- Device will appear with network name “Functional Devices BACnet RIB”.

Figure 21. BACnet Field Device

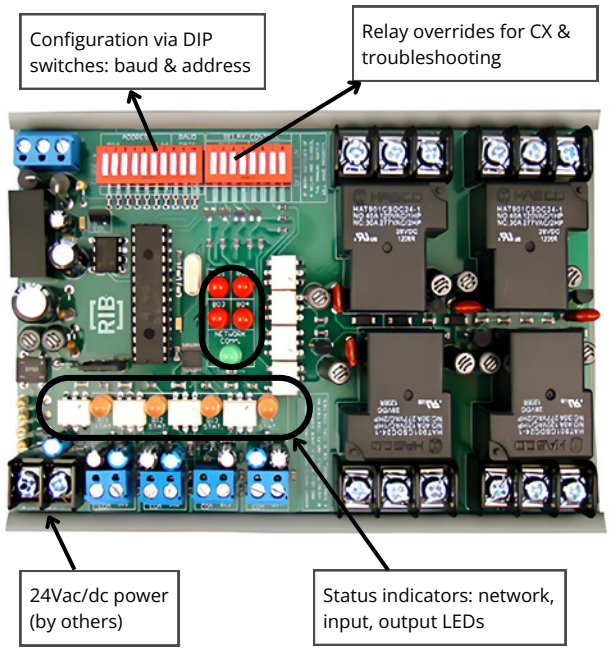


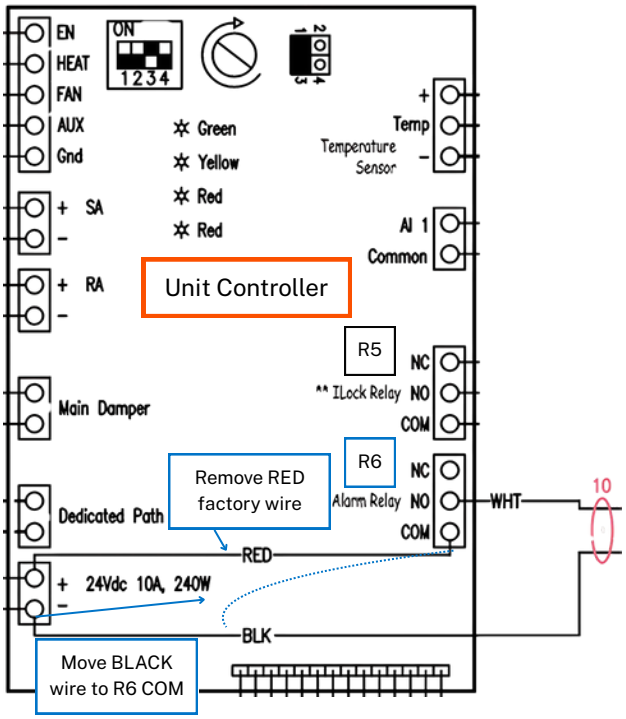
Figure 22. BACnet Points List

Point Name	Type	Instance	R/W	Description
BINARY_OUTPUT:1	BO	1	R/W	Unit Enable
BINARY_OUTPUT:2	BO	2	R/W	On = Heat Recovery; Off = Free Cooling
BINARY_OUTPUT:3	BO	3	R/W	On = High Speed; Off = Low Speed
BINARY_OUTPUT:4	BO	4	R/W	Not Used
BINARY_INPUT:1	BI	1	R	On = Fans at High Speed; 2 sec on/ 2 sec off = Damper Alarm
BINARY_INPUT:2	BI	2	R	Furnace/ AHU Interlock
BINARY_INPUT:3	BI	3	R	Dry-contact input to monitor other field devices
BINARY_INPUT:4	BI	4	R	Dry-contact input to monitor other field devices

Field Installation:

- Install MT4-6 mounting track (provided) to mount BACnet device.
- Power supply: 24Vdc 0.4A / 24Vac 0.19A, 1A fuse.
- Wire BACnet device I/O to unit terminal strip. Refer to field wiring diagram.
- Connect network wiring.
- Modify relay R6 wiring on unit controller. See below.

Figure 23. Unit Controller



Attention

Relay R6 wiring must be changed to dry-contact to prevent damage to BACnet field device inputs.

Warning

Binary inputs must be dry-contact type to prevent damage to the controller.

Variable-Speed Control

2 Constant Speeds - High/Low

All units come with 2-speed fan speed control. Low speed for normal operation. High speed to boost ventilation rate if there is an increase in space humidity, CO2, occupancy, etc. High and Low fan speeds are factory-set, but can be field-adjusted independently.

System Requirements:

- High speed dry-contact (switch, momentary push-button, dehumidistat, or BMS relay).

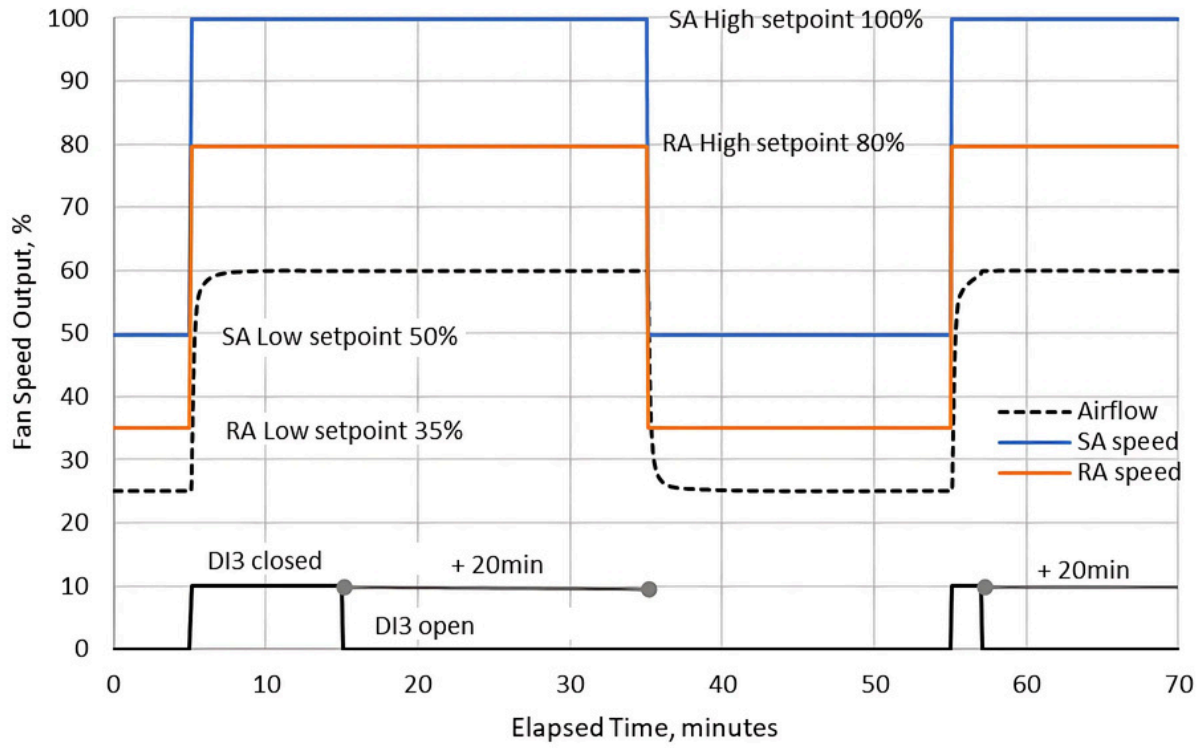
Control Wiring:

- Wire High speed contacts to digital input DI3 and COM.

Sequence:

- RA & SA fan(s) start at Low speed when unit enabled.
- If DI3 is closed, fans run at High speed.
- If DI3 opens, fans run at High speed for another 20 minutes; then revert back to Low speed.
- Controller will stop the fans in case of an internal alarm.

Figure 24. 2 Constant Speeds - High/Low



Synchronous VAV - Option

Units with optional VAV control can be set up for synchronous fan speed control, using a single analog input signal as speed reference for both SA and RA fan(s).

System Requirements:

- 0-10 or 2-10Vdc input signal (speed reference) from BMS.

Control Wiring:

- Wire external fan speed signal to analog input AI1 and COM.

Sequence:

- When unit enabled, RA and SA fan(s) modulate proportional to analog input signal.
  - 0 to 2V input: Low speed.
  - 2 to 9.9V: Fan speed ramps up proportional to input signal.
  - 10V: High speed.
  - High-speed contact overrides analog input.
- Controller will stop the fans in case of an internal alarm.

Figure 25. Customer terminal strip.

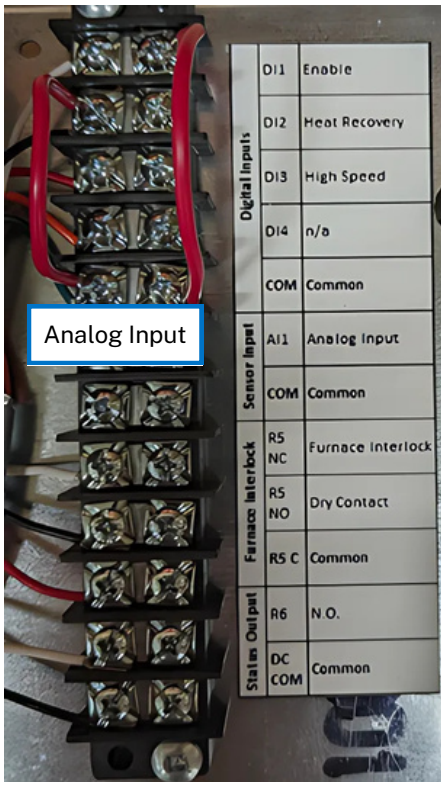
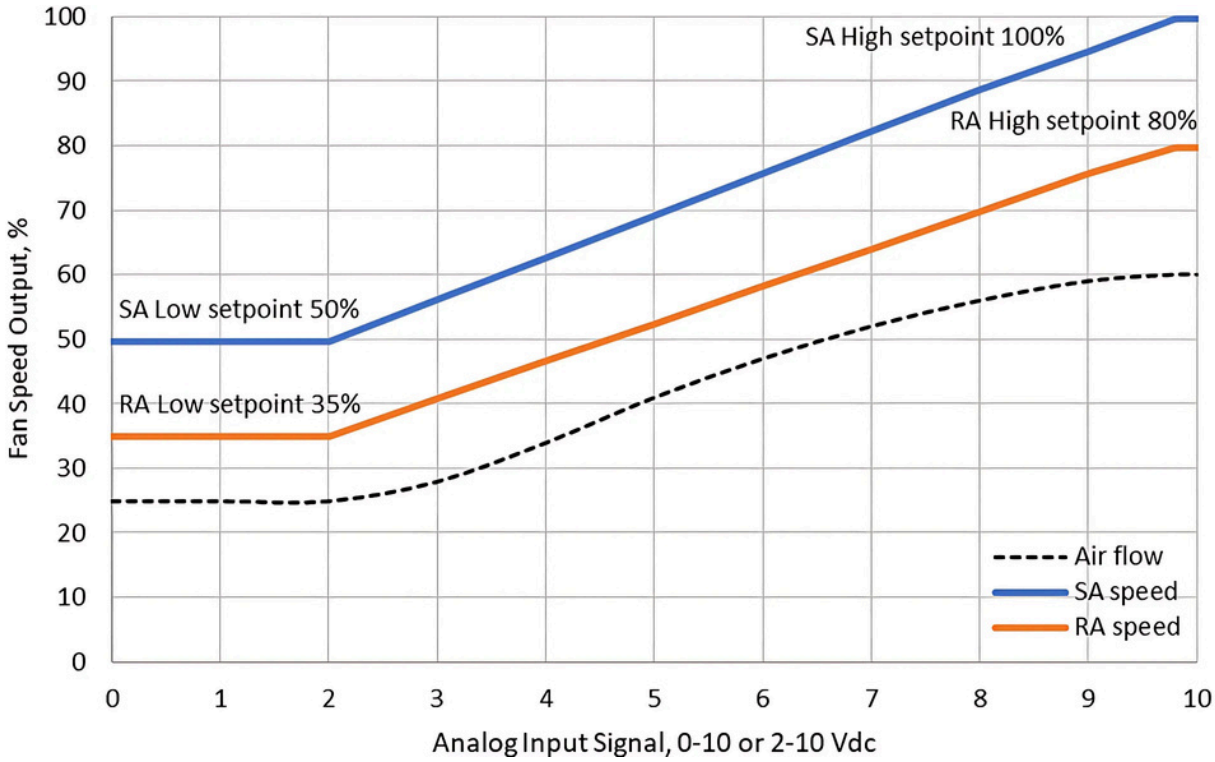


Figure 26. Synchronous VAV - Option



Independent VAV

Requires complex interlocks supplied & designed by others.

Units with ECM fans can be configured for independent SA and RA fan speed control, using two analog input signals as speed reference.

System Requirements:

- ECM fans only.
- Independent 0-10Vdc signals wired directly to SA & RA fan(s).
- Interlocks:
  - Start/stop 0-10 signals when unit enabled/disabled.
  - Stop unit and 0-10 signals if alarm relay R6 flashes 2sec on, 2sec off.
- High speed input DI3 not available.

Control Wiring:

- Remove SA & RA fan wires from controller terminals, labelled “SA” and “RA”.
- Connect external 0-10 signals directly to SA and RA fan wires.
- Wire alarm relay R6 to BMS.

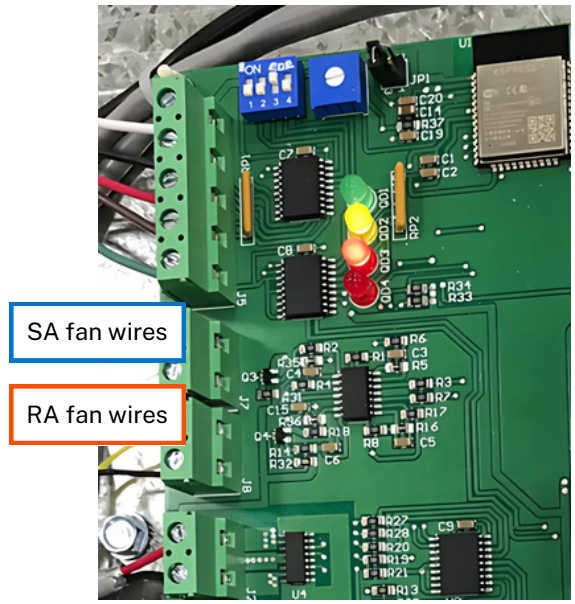
Sequence:

- BMS to start/stop fans when unit is enabled/disabled.
- SA fan(s) follows SA speed signal.
- RA fan(s) follows RA speed signal, independent of SA fan(s).
- BMS must stop the fans in case of any internal/external alarm.

Warning

Risk of freezing damage to other HVAC equipment and/or building if fans continue to run when unit in alarm. All fan speed signals must be disabled in case of alarm.

Figure 27. Independent VAV

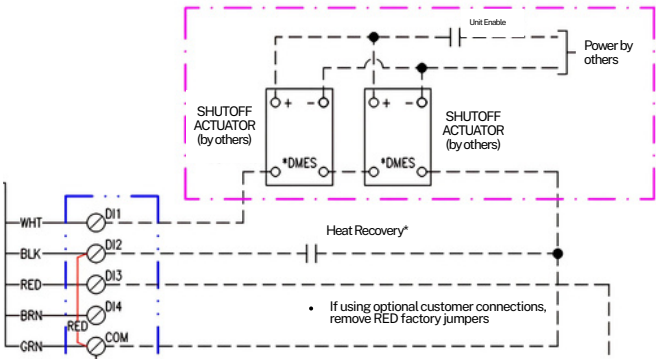


External Shut Off Dampers (By Others)

Requires shut off dampers and 2 position damper actuators supplied & designed by others.

To integrate shut off dampers into the RGSP-K controls, follow the wiring diagram below.

Figure 28. External Shut Off Dampers



Warning

External damper motors MUST NOT be tied into, or powered by, the TEMPEFF controls or control board. Irreparable damage will occur, and warranty will be voided.

Airflow Balancing

The HRV recovers energy from the exhaust air stream. It is important to balance supply and exhaust air flow 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.

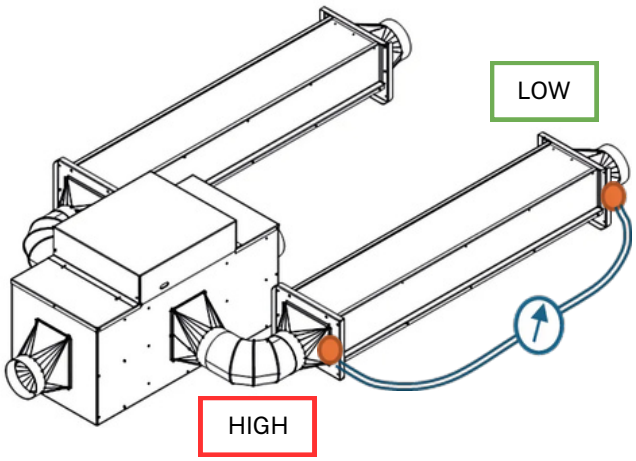
To prepare for airflow balancing, make sure the duct work is sealed, confirm the HRV is properly installed, and any shut-off/zone dampers are open.

A bi-directional differential pressure gauge or handheld manometer is required to balance the air flows. Refer to the airflow charts at the end of this section to determine supply and exhaust airflow rates.

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 reading = exhaust air flow, negative reading = supply air flow.
7. If 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 the following section.
8. After low-speed balancing, jumper DI3 to COM on the terminal strip and repeat steps 1 to 7 to balance the HRV at high speed.

Figure 29. Airflow Balancing



Fan Speed Adjustment

Low and high speed setpoint for the supply and the exhaust air fans can be field-adjusted independently.

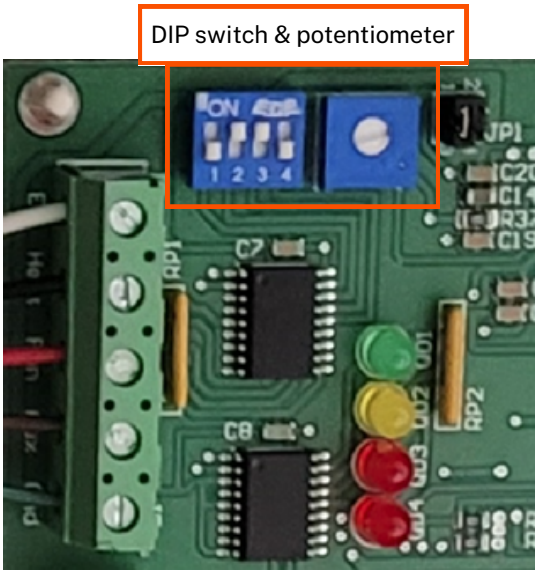
Remove the controls cover to access the DIP switches and potentiometer on the controller.

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

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.

Figure 30. Fan Speed Adjustment



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	

Airflow Charts

Supply and exhaust airflow can be determined from differential pressure measurements across the heat exchanger (HX), using the following graphs.

Example: RGSP-K 200 with 0.5" WC differential pressure across HX correlates to 180 CFM.

Figure 31.1. Airflow Charts

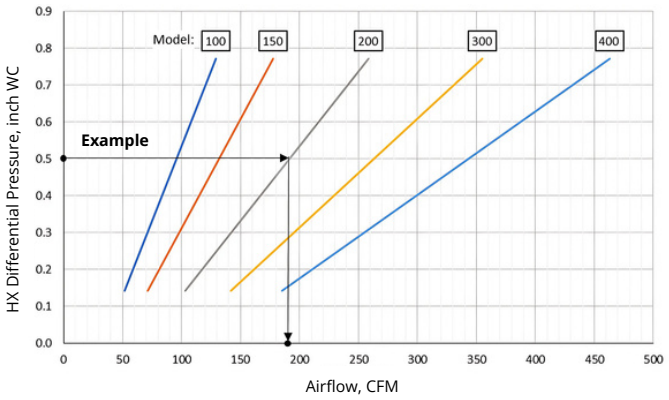
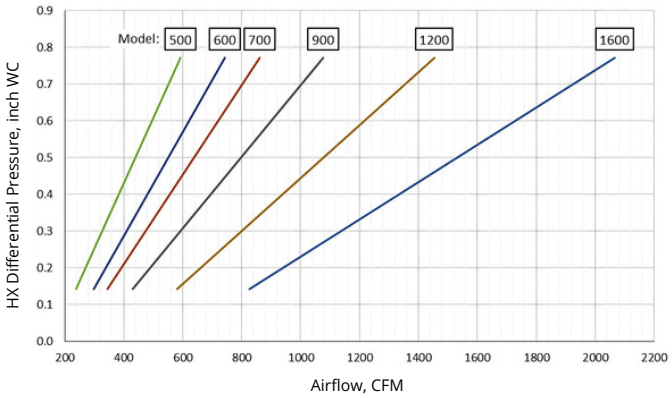


Figure 31.2. Airflow Charts



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 quarterly 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 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	• Internal alarm • Blown fuse • Field-Installed relay or sensor screws interfere with damper blade	• Look up alarm code in “Status LED” section of this manual. • Reset power to clear alarm. • Replace blown fuse. Refer to wiring diagram inside control box cover. • Relocate field-installed relay/sensor
HRV does not start & all status LEDs off	• Disconnect switch turned off • Brownout or power surge • Blown fuse or tripped breaker	• Turn disconnect switch on • Check main breaker or fuses • Replace blown fuse(s). Refer to wiring diagram inside control box cover.
Poor airflows	• Plugged hoods • Filter plugged (if equipped) • External shut-off/zone dampers closed • Restrictive duct work • Air flows not set up	• Clean exterior hoods • Remove & clean filter • Open/adjust dampers • Check duct static P at connections • Balance HRV
Could supply air	• Poor location of supply grilles • Cold outdoor temperature • Improper furnace interlock wiring • Imbalanced air flow	• Locate supply grilles high on the wall, or ceiling mounted diffusers • Run HRV in low speed. • Check furnace interlock wiring • Balance air flows
Humidity levels too high causing condensation on the windows	• Dehumidistat set too high • Lifestyle of occupants • HRV is set at too low speed	• Set dehumidistat lower as outdoor temperature drops. • Cover indoor pools/hot tubs when not use. Avoid hanging clothes to dry or storing firewood inside. • Increase HRV speed to bring in more dry outside air
Humidity too low	• Dehumidistat set too low • Lifestyle of occupants	• Set dehumidistat higher • May need to add a humidifier
Condensation/ice buildup on insulated duct	• Incomplete vapor barrier on duct to outside • High space humidity	• Tape and seal all joints • Lower dehumidistat setpoint
Excessive vibration	• Dirt/debris on fan wheels	• Inspect and clean fan wheels, if required.

Product Warranty

Warranty on Tempeff Heat Recovery devices is one (1) year from unit start-up date or 18 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.

TEMPEFF

RGSP-K Series

Learn more about how Tempeff's RGSP-K and DualCore® solution offer a respectable payback for their investment, while solving unique building and mechanical design challenges.

www.tempeff.com

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