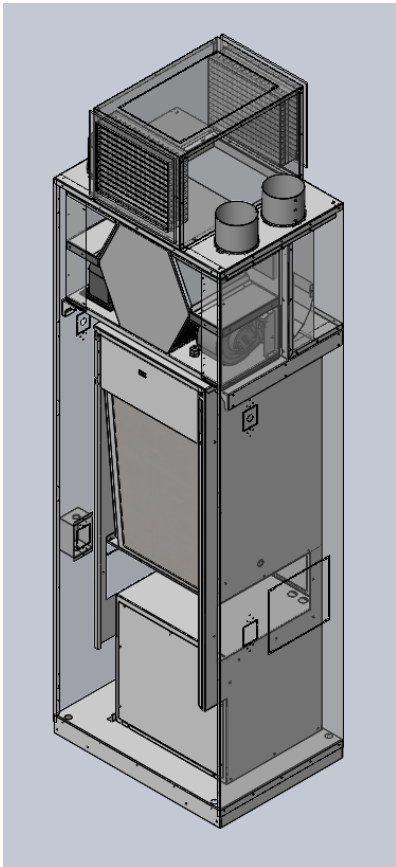




Generation 4

ERV

ERV Design v4.0



Featuring 81% sensible effectiveness

Electrical & Fan Performance

QTY 2 Fans – 1 Exhaust & 1 Supply

Per Fan

Name Plate Watts: 73W

Operating Watts @ 50 cfm: 35W

Operating Watts @ 100 cfm: 50W

With 2 Fans per ERV

Name Plate Watts: 146W

Operating Watts @ 50cfm: 70W

Operating Watts @ 100 cfm: 100W

FLA for each ERV Fan = 0.77 A

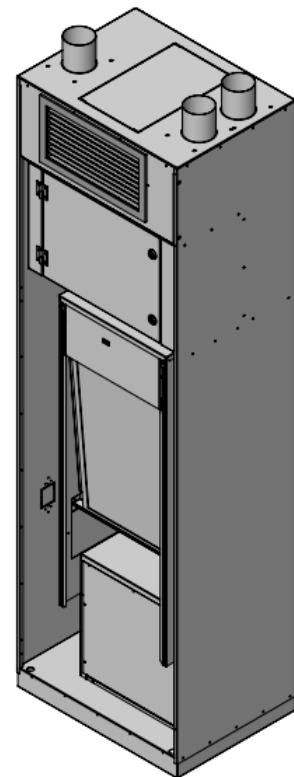
Unit FLA = 1.54 A

Each ERV operates at 0.6 amps

Air Flow Capability

50 cfm @ 1" ESP

100 cfm @ 0.8" ESP



50 CFM Winter

Results

	Winter	
Temperature efficiency	86.0	%
Humidity efficiency	68.5	%
Outside air:		
Temperature	-10.0	°F
Rel. humidity	70	%
Supply air:		
Temperature	58.8	°F
Rel. humidity	32	%
Extract air:		
Temperature	70.0	°F
Rel. humidity	30	%
Exhaust air:		
Temperature	1.2	°F
Rel. humidity	100	%
Pressure drop	0.143	in.W
Condensate	0.17	lbs/h

50 CFM Summer

Results

	Summer	
Temperature efficiency	86.4	%
Humidity efficiency	67.6	%
Outside air:		
Temperature	90.0	°F
Rel. humidity	42	%
Supply air:		
Temperature	77.0	°F
Rel. humidity	54	%
Extract air:		
Temperature	75.0	°F
Rel. humidity	52	%
Exhaust air:		
Temperature	88.0	°F
Rel. humidity	41	%
Pressure drop	0.143	in.W
Condensate	0.00	lbs/h

100 CFM Winter

Results

	Winter	
Temperature efficiency	80.1	%
Humidity efficiency	53.4	%
Outside air:		
Temperature	-10.0	°F
Rel. humidity	70	%
Supply air:		
Temperature	54.1	°F
Rel. humidity	30	%
Extract air:		
Temperature	70.0	°F
Rel. humidity	30	%
Exhaust air:		
Temperature	5.9	°F
Rel. humidity	100	%
Pressure drop	0.387	in.W
Condensate	0.52	lbs/h

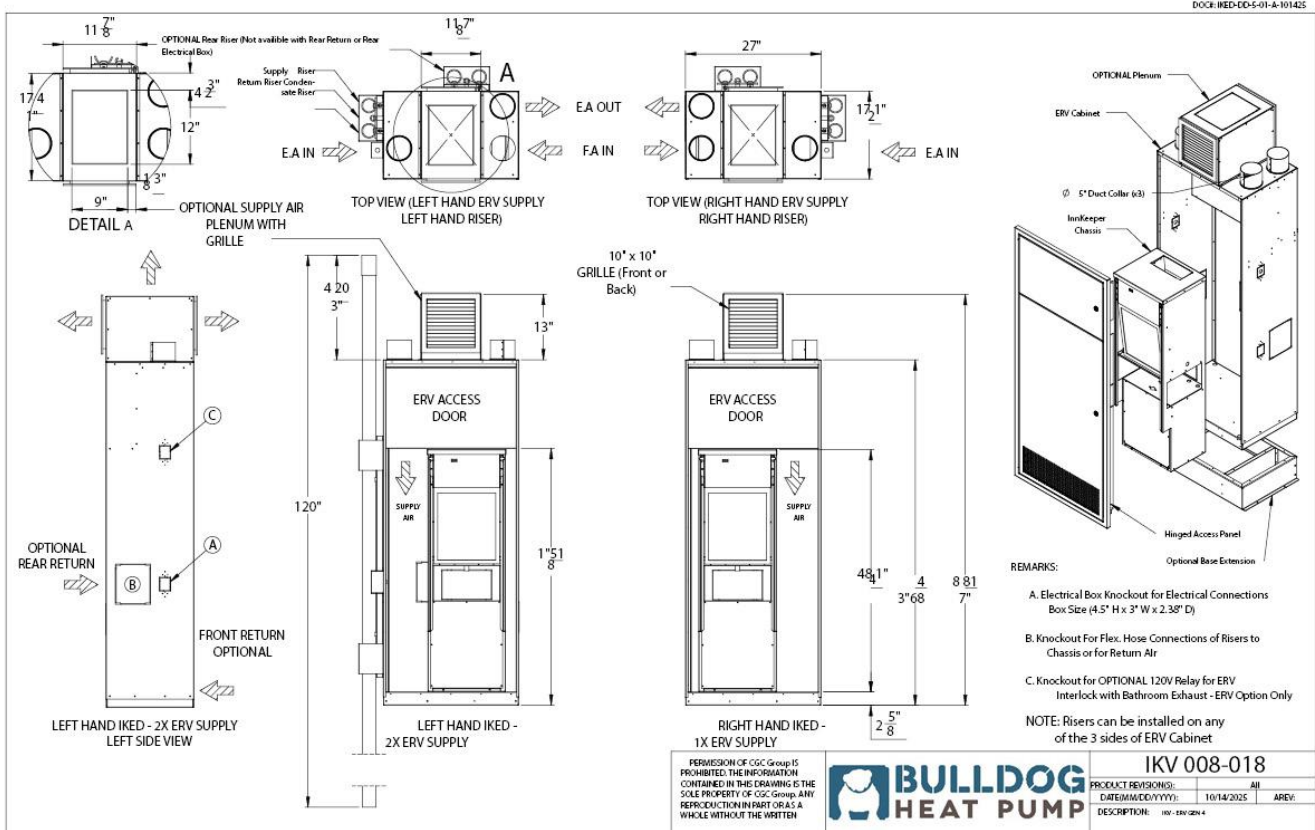
100 CFM Summer

Results

	Summer	
Temperature efficiency	81.3	%
Humidity efficiency	51.8	%
Outside air:		
Temperature	90.0	°F
Rel. humidity	42	%
Supply air:		
Temperature	77.8	°F
Rel. humidity	55	%
Extract air:		
Temperature	75.0	°F
Rel. humidity	52	%
Exhaust air:		
Temperature	87.2	°F
Rel. humidity	41	%
Pressure drop	0.387	in.W
Condensate	0.00	lbs/h

ERV Gen 4 Detailed Cabinet Drawing

Dimensional Data for an InnKeeper unit

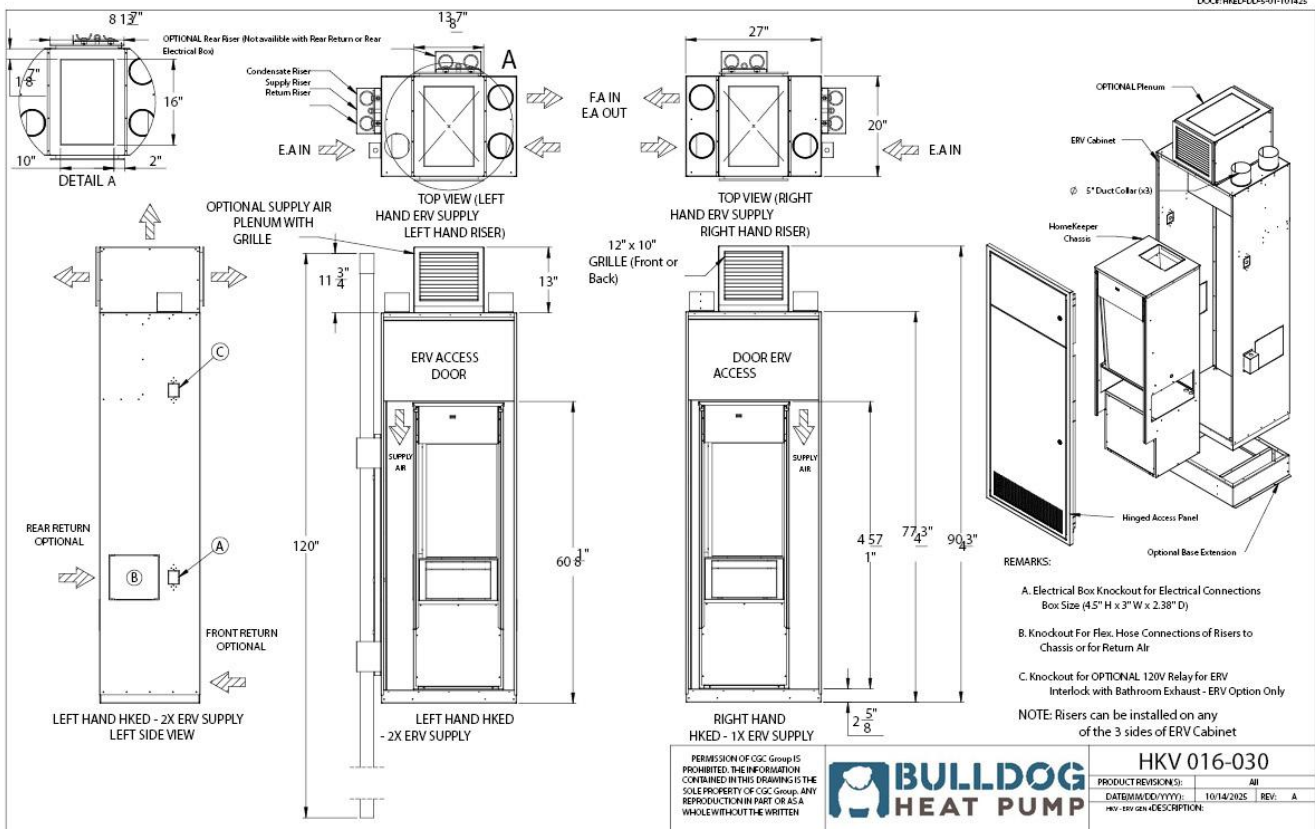


Last saved on Tuesday, October 14, 2025. In the interest of continuous improvement, drawing subject to change without notice.

ERV Gen 4 Detailed Cabinet Drawing

Dimensional Data for a HomeKeeper unit

DOC:HKED-00-01-101425



Last saved on Tuesday, October 14, 2025. In the interest of continuous improvement, drawing subject to change without notice.

Guide Specifications: Integral ERV (Optional)

6.1 System Description

- 6.1.1 The Energy Recovery Ventilators shall be an integrated part of the Vertical Stack Cabinet and are based on the **BULLDOG Reversing Heat Pump System**. The integrated ERV will consist of a fan box with an exhaust and fresh air fan and an ERV core.
- 6.1.2 The entire ERV unit shall be completely removable and accessible from the cabinet's front panel.
- 6.1.3 The system will automatically provide fresh air to the space when the Vertical Stacked chassis main supply fan operates. The integrated ERV utilizes an exhaust and fresh air fan as well as a passive energy recovery core. The ERV fans will operate whenever there is a call for heating or cooling from the thermostat, when the thermostat fan selector switch is in the "ON" position or when a remote, field supplied and installed by others, dry contact switch is closed. (Remote switch is optional).
- 6.1.4 Airflow system:
- The exhaust air enters the top of the integrated ERV whenever the exhaust air fan is operational. If the Vertical Stack chassis main supply fan is off, air from the washroom exhaust fan (by others) bypasses the ERV core and is expelled outside. If the Vertical Stack main supply fan is on, the exhaust bypass damper closes forcing exhaust air to pass through the integrated ERV core which is then expelled outside. The ERV fresh air fan draws outside air into the integrated ERV core and heat, and moisture (from the exhaust air) is passed through to the fresh air.
 - The fresh air is released inside the Vertical Stack unit cabinet where the main supply fan draws it into the chassis and distributes it to the space.
 - In the unlikely event of frost build up on the ERV core, a fresh air discharge air temperature sensor will momentarily stop the fresh air fan unit the air returns to the normal limit.
- 6.1.5 Model selection and performance shall be in accordance with the schedule on the drawings. The InnKeeper (008-018) Integrated ERV is designed to exhaust 50 CFM (23 L/s) of air at an ESP of 0.25" (62 Pa) W.C.
- 6.1.6 The HomeKeeper (016-048) Integrated ERV is designed to exhaust 100 CFM (47 L/s) of air at an ESP of 0.25" (62 Pa) W.C.
- 6.1.7 Each ERV shall be run tested to verify proper operation.
- 6.1.8 The Integrated ERV/Chassis assembly shall be safety certified and bear a seal of approval from one of UL/ULC/ETL or ESA.
- 6.1.9 Manufacturer shall warrant the parts only of each unit for a period of 12 months from the start-up date or 18 months from the unit shipment date whichever occurs first.
- 6.1.10 The system shall never be used during the construction phase as fine dust can permeate the ERV core resulting in loss or performance, or failure.
- 6.1.11 Alternate proposals shall include consideration for equipment space requirements accessibility, pipe and equipment sizing electrical installation impact, operation costs, sound implications and redesign fees.

6.2 Cabinet

- 6.2.1 The Integrated ERV Cabinet shall be constructed from heavy gauge galvanized steel and has internal channels to direct air from the exhaust and fresh air through the ERV core.

6.3 ERV Fan Box

- 6.3.1 The Integrated ERV fan box shall be fabricated from heavy gauge galvanized steel.
- 6.3.2 The ERV Fan Box connected electrically to the vertical stacked chassis via a two-piece pin and socket interconnection. Connection by others.

6.4 ERV Core

- 6.4.1 The ERV Core consist of a membrane constructed from a composite polymer material that allows heat and water vapor to transfer from one air stream to the other while preventing cross contamination.
- 6.4.2 The core shall be encased in a heavy gauge galvanized steel shell and all exterior shell sides are insulated with 1/4" neoprene insulation.
- 6.4.3 The openings of the core shall be treated with a gasket to ensure tight seal with the air stream channels in the cabinet.

6.5 Blower and Motor

- 6.5.1 The ERV fresh air and exhaust air blowers shall be statically and dynamically balanced.
- 6.5.2 The complete blower section including motor shall be easily accessible and removable for service.
- 6.5.3 The blower motors shall be direct drive EC motor, single phase with integral thermal overload protection.
- 6.5.4 The blower wheels shall be a forward curbed, SWSI centrifugal blower.
- 6.5.5 The fresh air and exhaust air fans speeds are controlled by a single fan speed controller that is adjustable in the field.

6.6 Filter

- 6.6.1 Both the exhaust and supply air stream entering the ERV core is filtered.
- 6.6.2 The filters shall be a cleanable wire frame type and easily accessible. They are shipped with the ERV fan box.

6.7 System

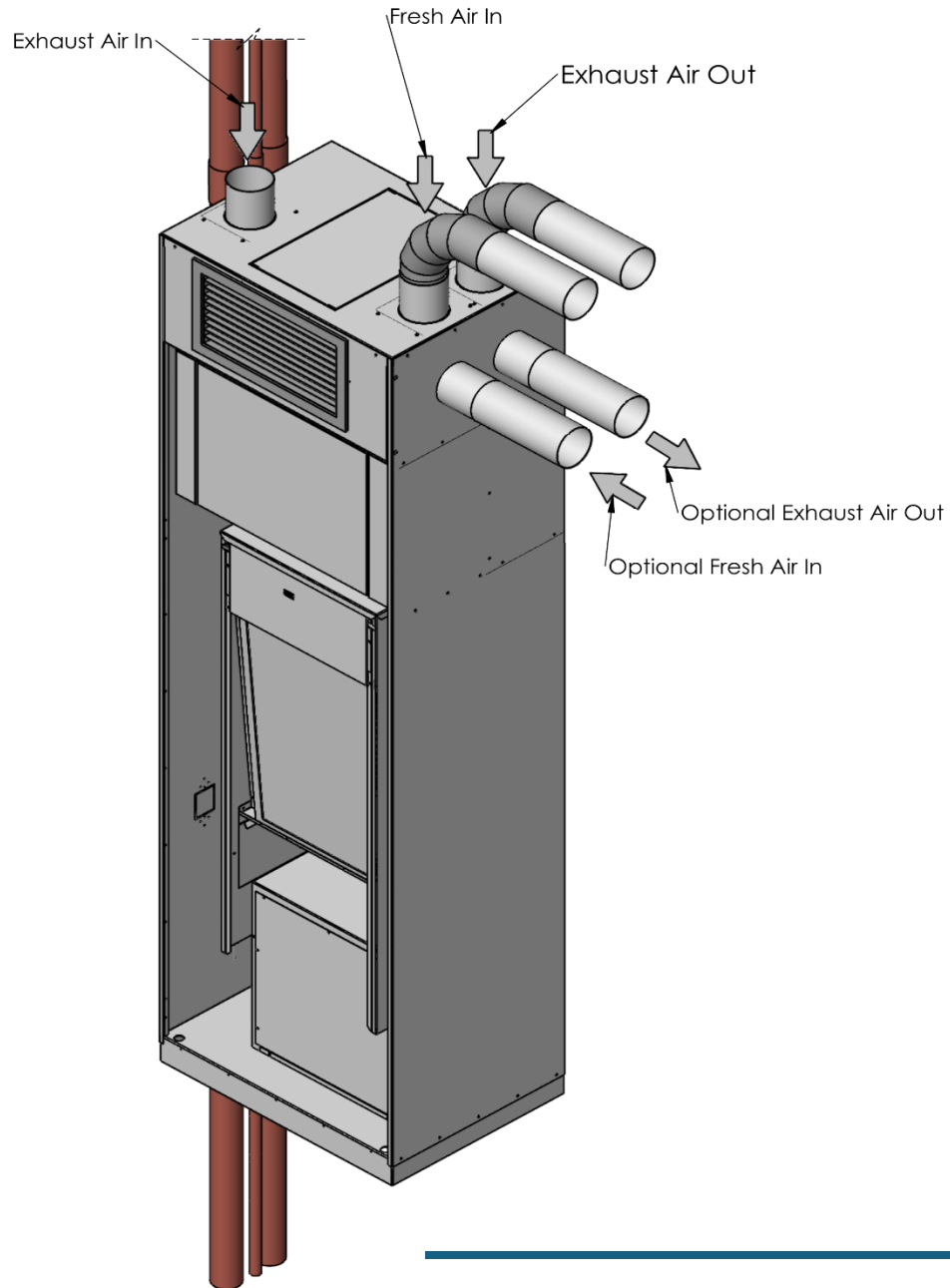
- 6.7.1 The ERV unit shall be controlled by the Vertical Stack unit chassis. The Vertical Stack main supply fan must be operating for the ERV apparatus to operate. Other sequence of operations are available as options.
- 6.7.2 ERV fans will be enabled to operate:
- On a call for heating from the thermostat
 - On a call for cooling from the thermostat
 - When thermostat fan selector switch is placed in the "ON" mode
 - When a field mounted remote-control switch, by others is closed (wired by others, for 120 volt by others).
- 6.7.3 The ERV fan box is powered by line voltage supplied from the Vertical Stack unit chassis.
- 6.7.4 The defrost sensor will detect a frost build up on the heat exchanger based on temperature and will terminate the operation of the fresh air fan until the temperature restores to normal limits (above 45°F).

6.8 Dynamic Air Balancing

Building codes that require a specified amount of outside air be introduced to each occupied suite. Since differential pressure measurements will be unworkable with stack effect the Bulldog 's approach to dynamic air balancing is to rely on Constant CFM ECM.

The constant CFM fans will best provide code specified airflows under the variances of the stack effect. The constant CFM fans have smart electronics that measure power (watts), torque, and the RPM and thru a complex algorithm calculate the CFM based on mass flow. In effect we are delivering the weight of air as requested by the voltage signal input.

ERV Gen 4 Duct Connections



Mirror image of the duct connections is possible