

Development Services

From Concept to Construction

Phone: 503-823-7300 Email: bds@portlandoregon.gov 1900 SW 4th Ave, Portland, OR 97201

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APPEAL SUMMARY

Status: Decision Rendered

Appeal ID: 27925	Project Address: 430 NE Skidmore St
Hearing Date: 8/3/22	Appellant Name: Jodee Varney
Case No.: M-002	Appellant Phone: 9788537934
Appeal Type: Mechanical	Plans Examiner/Inspector: Derek Wildermuth
Project Type: residential	Stories: 2 Occupancy: R-3 Construction Type: V-B
Building/Business Name:	Fire Sprinklers: No
Appeal Involves: Alteration of an existing structure	LUR or Permit Application No.: 21-059900-RS
Plan Submitted Option: pdf [File 1] [File 2] [File 3] [File 4] [File 5] Proposed use: Single Family Residential / Private Dwelling	

APPEAL INFORMATION SHEET

Appeal item 1

Code Section	603.6.1
Requires	Oregon Mechanical Specialty Code section 603.6.1 specifies that Flexible air ducts, both metallic and nonmetallic, shall be tested in accordance with UL 181. Such ducts shall be listed and labeled as Class 0 or Class 1 flexible air ducts and shall be installed in accordance with Section 304.1.
Code Modification or Alternate Requested	Allow use of an flexible air duct that is commonly used in Europe but not UL approved, for a whole-house high-efficiency heat recovery ventilation system.
Proposed Design	I propose installing a Zehnder ComfoAir 350 HRV, ComfoAir 200 HRV, and associated Zehnder ductwork to provide a whole-house balanced air distribution system in a renovated single-family residence. This system will provide ventilation above and beyond that required by code,
Reason for alternative	<p>In order to update a house originally built in the 1910s to one that has a much tighter building envelope and is much more efficient, I am introducing an extremely efficient ventilation system.</p> <p>The Zehnder ComfoAir 200/350 and associated ducting has the European Conformity seal, a history of over 250,000 successful installations, and the manufacturer has a number of ISO quality ratings.</p> <p>It is our opinion that the proposed system is superior to available listed products and meets the intent of the code and we respectfully request an approval of this appeal.</p>

Appeal item 2

Code Section	M1302
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Requires	Appliances shall be listed and labeled.
Code Modification or Alternate Requested	I propose installing a Zehnder ComfoAir 350 HRV, ComfoAir 200 HRV, and associated Zehnder ductwork to provide a whole-house balanced air distribution system in a renovated single-family residence. This system will provide ventilation above and beyond that required by code,
Proposed Design	We propose installing a Zehnder ComfoAir 350 Heat Recovery Ventilator (also appealed) which provides balanced, continuous ventilation with 100% outdoor air (no recirculation). A return air diffuser will be located in the kitchen providing 35 cfm continuous exhaust ventilation. In addition, a recirculating range hood will be provided with charcoal filter to collect airborne particulates.
Reason for alternative	<p>In order to update a house to meet more stringent energy efficiency standards, I need to include an extremely efficient ventilation system. Research performed by previous appeal applicants (included as reference material) has shown that the Zehnder ComfoAir 350 HRV provides higher efficiency with lower energy consumption than other available UL or ETL listed products.</p> <p>The Zehnder ComfoAir 350 has the European Conformity seal, a history of over 250,000 successful installations, and the manufacturer has a number of ISO quality ratings.</p> <p>It is our opinion that the proposed system is superior to available listed products and meets the intent of the code and we respectfully request an approval of this appeal.</p>

Appeal item 3

Code Section	M1503.1, M1503.4
Requires	Range hoods to exhaust directly outdoors at 150 cfm intermittent.
Code Modification or Alternate Requested	Provide required range ventilation using heat recovery ventilation system that includes a continuous return air diffuser located in the kitchens.
Proposed Design	<p>I propose installing a Zehnder ComfoAir 350 and ComfoAir 200 Heat Recovery Ventilators (also appealed) which provides balanced, continuous ventilation with 100% outdoor air (no recirculation).</p> <p>The ComfoAir 350 will provide ventilation to the 1st and 2nd floors and the ComfoAir 200 to the basement. A return air diffuser will be located in the 1st floor and basement kitchens, providing 35 cfm and 20 cfm respectively, of continuous exhaust ventilation.</p> <p>In addition, a recirculating range hood will be provided for each range, with charcoal filter to collect airborne particulates.</p>
Reason for alternative	<p>The proposed design provides a much higher level of actual ventilation. A code-required range hood running at 150 cfm for an hour a day would result a daily exchange of 9,000 cubic feet of air (150 cfm x 60 minutes = 9,000).</p> <p>As proposed, the 1st floor kitchen exhaust of 35 cfm continuous, provided by the HRV results in a daily exchange of 50,400 cubic feet of air (35 cfm x 60 minutes x 24). The proposed recirculating hood with charcoal filter will filter out the grease and particulates created by the cooking process.</p> <p>As proposed, the basement kitchen exhaust of 20 cfm continuous provided by the HRV results in a daily exchange of 28,800 cubic feet of air (20 cfm x 60 minutes x 24). Again, the proposed recirculating hood with charcoal filter will filter out the grease and particulates created by the cooking process.</p>

APPEAL DECISION

1. Use of non-listed and labeled whole-house high-efficiency heat recovery ventilation system: Granted as proposed.

2. Use of non-listed and labeled heat recovery ventilator: Granted as proposed.

3. Use of recirculating range ventilation with heat recovery system: Granted as proposed.

The Administrative Appeal Board finds that the information submitted by the appellant demonstrates that the approved modifications or alternate methods are consistent with the intent of the code; do not lessen health, safety, accessibility, life, fire safety or structural requirements; and that special conditions unique to this project make strict application of those code sections impractical.

Pursuant to City Code Chapter 24.10, you may appeal this decision to the Building Code Board of Appeal within 90 calendar days of the date this decision is published. For information on the appeals process, go to www.portlandoregon.gov/bds/appealsinfo, call (503) 823-7300 or come in to the Development Services Center.

Ventilation unit

Zehnder ComfoAir 350

Use

The ComfoAir (CA) 350 ventilation unit was specially developed for use in residential and commercial buildings with high ventilation demand. It combines maximum comfort, simple operation and high efficiency with flexible integration into building services. The CA 350 ventilation unit moves 218 cfm of air at an external pressure of 0.80" wc.

Efficiency

The integrated cross-counterflow heat exchanger achieves efficiencies of more than 90%. For user comfort this means no unpleasant draft effects, because the supply air is heated almost to room temperature even when external temperatures are around freezing.

Fans

The two supply and extract fans are driven by efficient DC motors. Differential pressures in the supply and extract air distribution systems can be compensated thanks to direct control. The especially quiet fans can be adjusted to the required volumetric flow in 1% increments. The air volumes of the selectable stages can be set to between 29 cfm and 218 cfm on the Zehnder CA 350.

Filters

The CA 350 ventilation unit is equipped with a class G4 filter (MERV 7/8). An optional F7 pollen filter (MERV 13) is available for outside air.

Installation

The Zehnder CA 350 ventilation unit is characterised by its extra compact design. All air connections are located on the top. The air connections provide all the possible flexible connection options. The insulating, sound-absorbing pipe connections can be rotated to suit your needs, thus simplify installation of the ventilation tubes to the unit and simultaneously offer acoustic decoupling from the air distribution system.

Operation

The ventilation unit is controlled using a control unit commonly employed in living areas. The ComfoAir 350 is controlled by the CC-Ease control unit as standard.

Servicing

Servicing of the Zehnder ComfoAir CA 350 ventilation unit is limited to regular replacement and cleaning of the filter integrated in the front of the unit. The heat exchanger should be cleaned every 3-4 years depending on how dirty the outside air is. Please see the unit manual for additional servicing tasks.

Frost protection

If the ventilation unit is operated without a geothermal heat exchanger, the condensate in the extract air may freeze. The frost protection setting prevents this by variably reducing the supply air volume. Conventional units must reduce the supply air volume by an entire step from 26.6 °F or switch off the supply air completely. Optional electric preheater prevents the heat exchanger freezing even at the lowest temperatures.



ComfoAir 350



CC-Ease remote control



Remote-controlled unit

Bypass

During summer nights and in the transition periods with strong sunshine, the house often becomes too warm, while the outside air remains pleasantly cool. In such cases heat removal by what is known as *free cooling* helps: The cooler outside air is fed to the rooms in the living area, bypassing the heat recovery system. The Zehnder CA 350 ventilation unit is equipped with an automatic bypass for just this purpose. The bypass is a standard component and takes 100% of the extract air past the heat exchanger.

Options

- **Moisture recovery with the Zehnder enthalpy exchanger**
The Zehnder enthalpy plate exchanger provides a hygienic ideal solution for excessively dry air in winter. Not only heat, but also up to 65% of the moisture contained in the extract air is transferred from the extracted air to the supply air. Supply and extract air flows are kept completely separate so there is no transfer of odors or bacteria.
- **Pollen filter**
A large pollen filter installed in the supply air line keeps the inside of the house pollen-free and reduces the particulate, spore and germ load: breathe freely in times of increasing allergies.
- **Zehnder ComfoFond-L brine geothermal heat exchanger**
The Zehnder ComfoFond-L utilises the ground as passive storage via a brine loop. In summer, it transfers heat to the ground and in winter it withdraws heat again and uses it to preheat the supply air. A control unit is available as both an external and an internal controller.
- **Electric air heater and hot water postheater**
An external electric air heater or hot water postheater guarantees a defined supply air temperature, even in extreme climatic conditions and on systems without a geothermal heat exchanger. A control unit is available as both an external and an internal controller.
- **Wireless remote control**
More installation freedom. With the Zehnder wireless remote control the ventilation unit can be wirelessly controlled from several switches distributed throughout the house or flat.

Benefits

- Comfort ventilation up to 218 cfm
- Heat recovery with an efficiency of more than 90%
- Moisture recovery with the Zehnder enthalpy exchanger (optional)
- Low power consumption thanks to DC motors
- Automatic 100% summer bypass
- Frost protection function: Efficient even at low temperatures
- Quick, safe installation and servicing
- Simple operation
- Integrated preheater and humidity control (optional)
- Wireless remote control and filter replacement indicator
- Geothermal heat exchanger control
- Electrical and hot water postheater integration possible
- Small minimum air volume, specially designed for single family houses
- Digital Ease control unit
- CO₂ control (optional)

Ventilation unit

Zehnder ComfoAir 350

Article numbers

L = supply air left, R = supply air right, V = preheater
Luxe = advanced controls

Product	Article number	Reference number
ComfoAir 350 L Luxe	471 239 520	9244
ComfoAir 350 R Luxe	471 239 525	9245
ComfoAir 350 VL Luxe	471 239 540	9304
ComfoAir 350 VR Luxe	471 239 545	9452
ComfoAir 350 L Luxe Enthalpy	471 239 530	9246
ComfoAir 350 R Luxe Enthalpy	471 239 535	9247
ComfoAir 350 VL Luxe Enthalpy	471 238 540	9428
ComfoAir 350 VR Luxe Enthalpy	471 238 545	9429

Accessories

ComfoControl CC-Ease control unit	655 010 100	9257
Housing for surface mounting for CC-Ease control unit	659 000 250	9259
Wireless remote control	655 000 755	9238
ComfoAir 550 assembly base	642 300 140	9287

Filters

Filter for ComfoAir 350 G4 (MERV 7/8)	006 040 201	9240
Filter for ComfoAir 350 F7 (MERV 13)	006 040 211	9241

Description

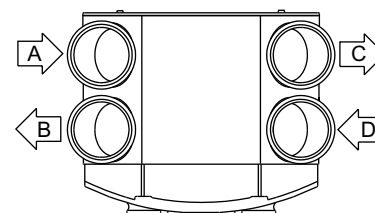
Comfort ventilation unit Zehnder ComfoAir 350

with plastic cross-counterflow heat exchanger, thermal efficiency of more than 90%, direct control in 1% increments variable supply and extract fans with EC direct current motors, automatically controlled, integrated 100% bypass, housing with rotating insulated pipe connections, maximum air volume 218 cfm at 0.4 in. w.c., H x W x D: 31.5" x 24.6" x 22.5", version left/right unit with preheater, CO₂ control, humidity, timer, postheater and geothermal heat exchanger possible.

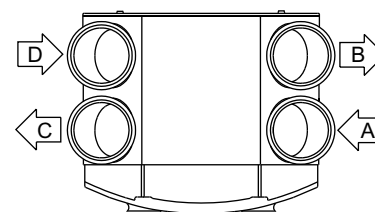
Air directions

The figures on the right show the air directions (top view).

A = extract air
B = supply air
C = exhaust air
D = outside air



Version supply air left (L)



Version supply air right (R)

Ventilation unit

Zehnder ComfoAir 350

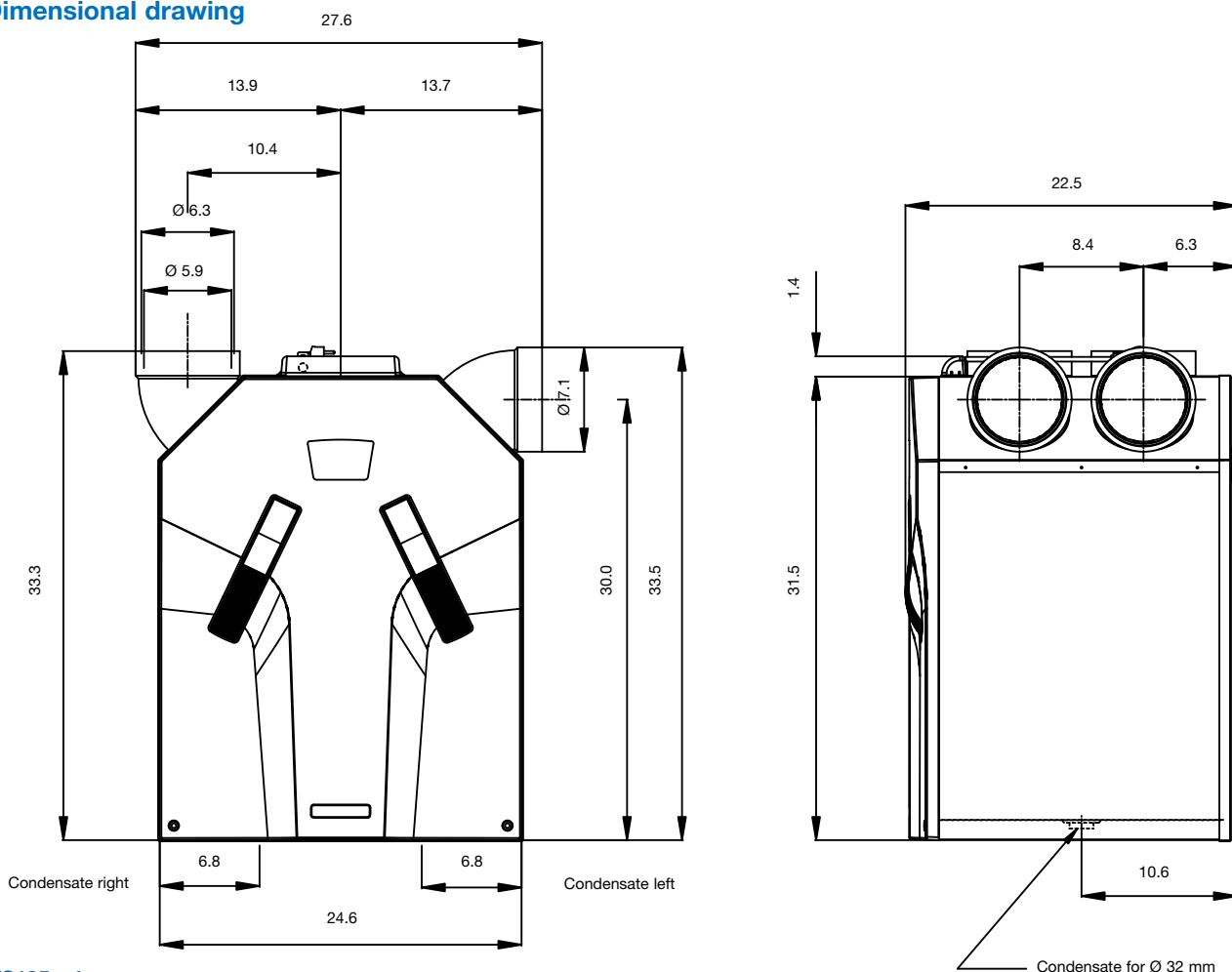
Technical specifications

Dimensions	
Height (")	31.5
Overall height (")	33.9
Width (")	24.6
Overall width (")	27.6
Depth (")	22.5
Electrical connection	230 V, 50-60 Hz

Specification

HR exchanger material	Polystyrene
Interior lining material	(E) PP / PA / PA
Thermal output	Up to 95 %
Weight	77.2 lb

Dimensional drawing



Ventilation unit

Zehnder ComfoAir 350

Certificates

- General Building Regulations [Germany] approval applied for
- HVI listed
- Passive House Certified

Equipment

Equipment	CA 350 Luxe	CA 350 V Luxe
Bypass	x	x
Preheater		x
Digital clock with weekly programme	x	x
Right-handed version	x	x
Pipe connections DN 150/160	x	x
Rotating pipe connections	x	x
Geothermal heat exchanger controller, NE, filter	x	x
Ready to plug in design	x	x
CC-Ease control unit	x	x
Wireless remote control unit (optional)	x	x

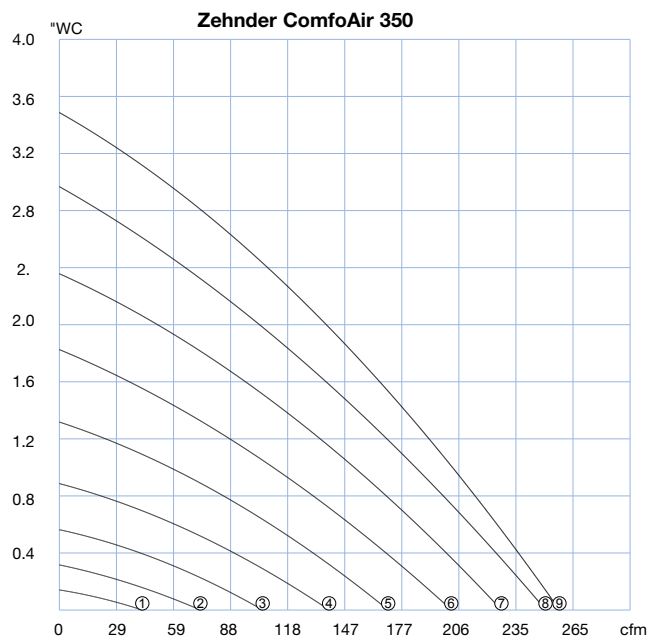
Function

- Frost protection function/automatic defrost
- Supply and extract air separate and infinitely variably programmable
- Switch on and off delay for bathroom switch
- Adjustable comfort temperature
- Controller for geothermal heat exchanger
- Controller for electrical air heater
- Controller for hot water postheater
- Fault indicator interface
- Filter replacement indicator
- Supply air + extract air can be switched off
- Fast heat-up (using postheater)
- Fireplace circuit

Ventilation unit

Zehnder ComfoAir 350

Switch setting	Speed	Air volume	Pressure	Power consumption	Current consumption	COS ϕ	Acoustic performance		Weight
Factory setting		Qv	ΔP_{st}				Extract air	Supply air	
(speed)	%	cfm	"WC	W	A	(-)	dB(A)	dB(A)	lb
ComfoAir 350									
(1)	15	24	0.016	10	0.08	0.50	34	32	77.2
(2)	30	59	0.080	17	0.13	0.57	37	45	
(3)	40	82	0.161	27	0.21	0.56	43	53	
(4)	50	106	0.261	44	0.35	0.55	47	59	
(5)	60	132	0.402	70	0.55	0.55	52	64	
(6)	70	153	0.562	105	0.81	0.56	54	68	
(7)	80	177	0.703	145	1	0.58	57	71	
(8)	90	191	0.863	198	1.42	0.60	59	74	



Ventilation unit

Zehnder ComfoAir 350

Technical specifications

Sound, supply air

Acoustic performance at the supply air connection at a distance of 0 ft

Ventilation unit								
Type	Speed	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
ComfoAir350	1	46	35	23	11	4	5	13
ComfoAir350	2	55	49	40	33	22	12	12
ComfoAir350	3	60	59	49	43	35	25	12
ComfoAir350	4	66	64	56	50	43	34	22
ComfoAir350	5	71	68	62	56	49	42	29
ComfoAir350	6	74	70	66	60	53	47	35
ComfoAir350	7	76	73	69	64	57	51	39
ComfoAir350	8	78	76	72	68	61	55	43
ComfoAir350	9	79	76	74	69	62	57	45

Sound, extract air

Acoustic performance at the extract air connection at a distance of 0 ft

Ventilation unit								
Type	Speed	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
ComfoAir350	1	50	34	3	23	10	7	12
ComfoAir350	2	51	41	30	30	12	7	12
ComfoAir350	3	53	49	39	39	22	10	11
ComfoAir350	4	55	54	45	45	29	19	7
ComfoAir350	5	57	56	51	51	34	25	13
ComfoAir350	6	60	60	54	54	38	29	19
ComfoAir350	7	63	61	57	57	42	33	23
ComfoAir350	8	65	64	59	59	44	36	27
ComfoAir350	9	65	65	61	61	46	38	29

Sound, unit emission

Ventilation unit								
Type	Speed	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	dB (A)	
ComfoAir350	1	27	17	17	14	4	19	
ComfoAir350	2	32	29	24	19	16	26	
ComfoAir350	3	36	36	32	29	27	35	
ComfoAir350	4	41	40	39	36	35	41	
ComfoAir350	5	46	44	44	42	41	47	
ComfoAir350	6	50	47	50	46	45	52	
ComfoAir350	7	52	49	52	50	49	55	
ComfoAir350	8	53	52	55	54	52	58	
ComfoAir350	9	53	53	56	55	54	59	

ZA-CSY-FLYERTS105, V1211, en_us, subject to changes

Ventilation unit

Zehnder ComfoAir 200

Use

The Zehnder ComfoAir 200 comfort ventilation unit was developed for use in residential settings with high ventilation demand. It combines maximum comfort, simple operation and high efficiency with flexible integration into building services. The ComfoAir 200 ventilation unit moves 118 cfm of air at an external pressure of 0.80" wc.

Efficiency

The integrated cross-counterflow heat exchanger achieves efficiencies of up to 95%. For user comfort this means no unpleasant draft effects, because the supply air is heated almost to room temperature even when external temperatures are around freezing.

Fans

The two supply and extract fans are driven by efficient DC motors. Differential pressures in the supply and extract air distribution systems can be compensated thanks to direct control. The especially quiet fans can be adjusted to the required volumetric flow in 1% increments. The air volumes of the selectable stages can be set to between 29 cfm and 118 cfm on the Zehnder ComfoAir 200.

Filters

The ComfoAir 200 ventilation unit is equipped with a class G4 filter (MERV 7/8). An optional F7 pollen filter (MERV 13) is available for outside air.

Installation

The Zehnder ComfoAir 200 ventilation unit is characterised by its compact design. The supply and extract air connections are located on the top of the unit, those for the outside and exhaust air are on the bottom. The ventilation unit is suitable for ceiling and wall installation.

Operation

The ventilation unit is controlled using a control unit commonly employed in living areas. The ComfoAir 200 is controlled by the CC-Ease control unit as standard.

Servicing

Servicing of the Zehnder ComfoAir CA 200 ventilation unit is limited to regular replacement and cleaning of the filter integrated in the front of the unit. The heat exchanger should be cleaned every 3-4 years depending on how dirty the outside air is. Please see the unit manual for additional servicing tasks.



CC-Ease remote control



Remote-controlled unit

Frost protection

If the ventilation unit is operated without preheating, the condensate in the extract air may freeze. The frost protection setting prevents this by variably reducing the supply air volume. In order to ensure reliable operation even at extreme outside temperatures, an optional integrated, electrical preheater register is available.

Bypass

During summer nights and in the transition periods with strong sunshine, living areas often become too warm, while the outside air remains pleasantly cool. In this case heat removal by what is known as *free cooling* helps: The cooler outside air is fed to the rooms in the living area, bypassing the heat exchanger. The Zehnder ComfoAir 200 ventilation unit is equipped with an automatic bypass for just this purpose. The bypass is a standard component and takes 100% of the extract air past the heat exchanger. The personal comfort temperature is adjustable.

Options

- **Moisture recovery with the Zehnder enthalpy exchanger**

The Zehnder enthalpy plate exchanger provides a hygienic ideal solution for excessively dry air in winter. Not only heat, but also up to 65% of the moisture contained in the extract air is transferred from the extracted air to the supply air. Supply and extract air flows are kept completely separate so there is no transfer of odors or bacteria.

- **Wireless remote control**

More installation freedom. With the Zehnder wireless remote control the ventilation unit can be wirelessly controlled from several switching points distributed throughout the house or flat.

-

- **Chimney sweep control**

The ventilation system can be installed in a home with an open flue fireplace. This must be registered in the control unit. This prevents a controller-related negative pressure. In a frost protection situation both fans are stopped. Pure supply or extract air mode is not possible and the intact fan is also switched off if a fault occurs.

Ventilation unit

Zehnder ComfoAir 200

Technical specifications

Unit dimensions	
Max. air volume	118 cfm
Min. air volume	29 cfm
Height	47.25"
Width	21.40"
Depth	12.50"

Benefits

- Comfort ventilation up to 118 cfm
- Heat recovery with an efficiency of up to 95%
- Low power consumption thanks to EC direct current motors
- Automatic 100% summer bypass
- Infinitely variable frost protection function: efficient even at low temperatures
- Quick, safe installation and servicing
- Simple operation
- Integrated preheater (optional)
- Controls can be expanded by wireless remote control
- Digital control unit: CC-Ease
- CO₂ control (optional)
- With weekly timer as standard
- Chimney sweep control

Article numbers

L = supply air left, R = supply air right, V = integrated electric preheater register

Product	Article number	Reference number
ComfoAir 200 L Luxe	471 229 710	9280
ComfoAir 200 R Luxe	471 229 715	9276
ComfoAir 200 VL Luxe	471 229 810	9281
ComfoAir 200 VR Luxe	471 229 815	9338
ComfoAir 200 L Luxe Enthalpy	471 229 959	9357
ComfoAir 200 R Luxe Enthalpy	471 229 955	9364
ComfoAir 200 VL Luxe Enthalpy	471 229 470	9422
ComfoAir 200 VR Luxe Enthalpy	471 229 475	9423

Accessories

ComfoControl Ease control unit	655 010 100	9257
Housing for on-wall mounting for CC-Ease control unit	659 000 250	9259
Wireless remote control	655 000 755	9238

Filters

Filter for ComfoAir 200 G4 (MERV 7/8)	400 100 015	9282
Filter for ComfoAir 200 F7 (MERV 13)	400 100 018	9283

Ventilation unit

Zehnder ComfoAir 200

Function

- Frost protection function/automatic defrost
- Supply and extract air separate and infinitely variably programmable
- Switch on and off delay for bathroom switch
- Adjustable comfort temperature
- Filter replacement indicator
- Supply and extract air can be switched off separately

Description

Comfort ventilation unit ComfoAir 200 Luxe

The Zehnder ComfoAir 200 is a centralised, compact ventilation unit with heat recovery and integrated summer bypass. This ventilation unit is eminently suited to new buildings as well as in renovation projects. The ComfoAir 200 can be installed as a wall-hanging unit or horizontally below the ceiling. It is connected by 4 DN 5"/6"/6.3" pipe connections on the top and bottom of the unit. The housing, made of galvanised or painted sheet steel, is acoustically and thermally insulated. EC direct current fans guarantee power-saving operation and provide high electrical efficiency. Supply and exhaust fans can be controlled separately and can be precisely adjusted to the balance air volume to within one percent. The core of the ComfoAir 200 is the plastic cross-counterflow heat exchanger with up to 95% heat recovery. It is controlled by the cabled ComfoControl Ease control unit, which is connected to the ventilation unit by an on site cable. All operating statuses and error messages can be read from the control unit display. The filters are replaced easily from the front by the user without opening the unit.

Options:

- Integrated electrical preheater (CA 200 VL and CA 200 VR)
- Remote control via wireless remote control (3 stages and intermittent ventilation)
- Class F7 pollen filter (MERV 13) available

Controller features:

- Automatic frost protection controller
- Timer-controlled filter servicing display
- With automatic and temperature-controlled 100% summer bypass
- Fault history including the last three error messages
- Supply and extract fans can be activated separately.
- Connection option for external intermittent ventilation switch
- Comfort temperature controller
- Chimney sweep control
- Weekly timer programmes

Ventilation unit

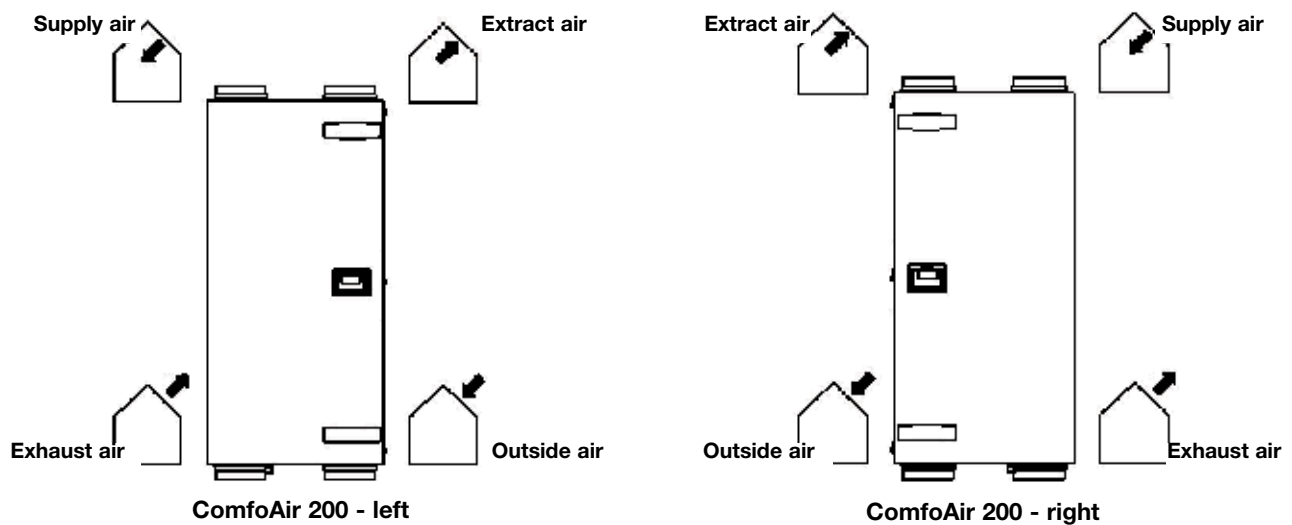
Zehnder ComfoAir 200

Descriptions

Technical specifications

Heat exchanger:	Plastic
Fans:	EC direct current radial fans
Filters:	Extract air: G4 (MERV 7/8) Outside air: G4 (MERV 7/8) (optional F7 pollen filter (MERV 13))
Condensate connection:	20 mm
Air duct connections:	2x top, 2x bottom DN 5"/6"/6.3"
Electrical connection:	230 V, 50-60 Hz
Temperature range:	44.6 °F to 104 °F
Acoustic performance (min./max.):	Extract air 30 dB(A)/57 dB(A) Supply air 36 dB(A)/73 dB(A)
Heat recovery:	Up to 95%
Volumetric flow:	Maximum 150 cfm at 0.50" wc external Minimum 29 cfm at 0.02" wc external
Power consumption:	Maximum 143 Watt Minimum 9 Watt
Dimensions:	Height: 43.5" (with connections: 47.3") Width: 21.4", Depth 12.7"
Weight:	66.2 lb

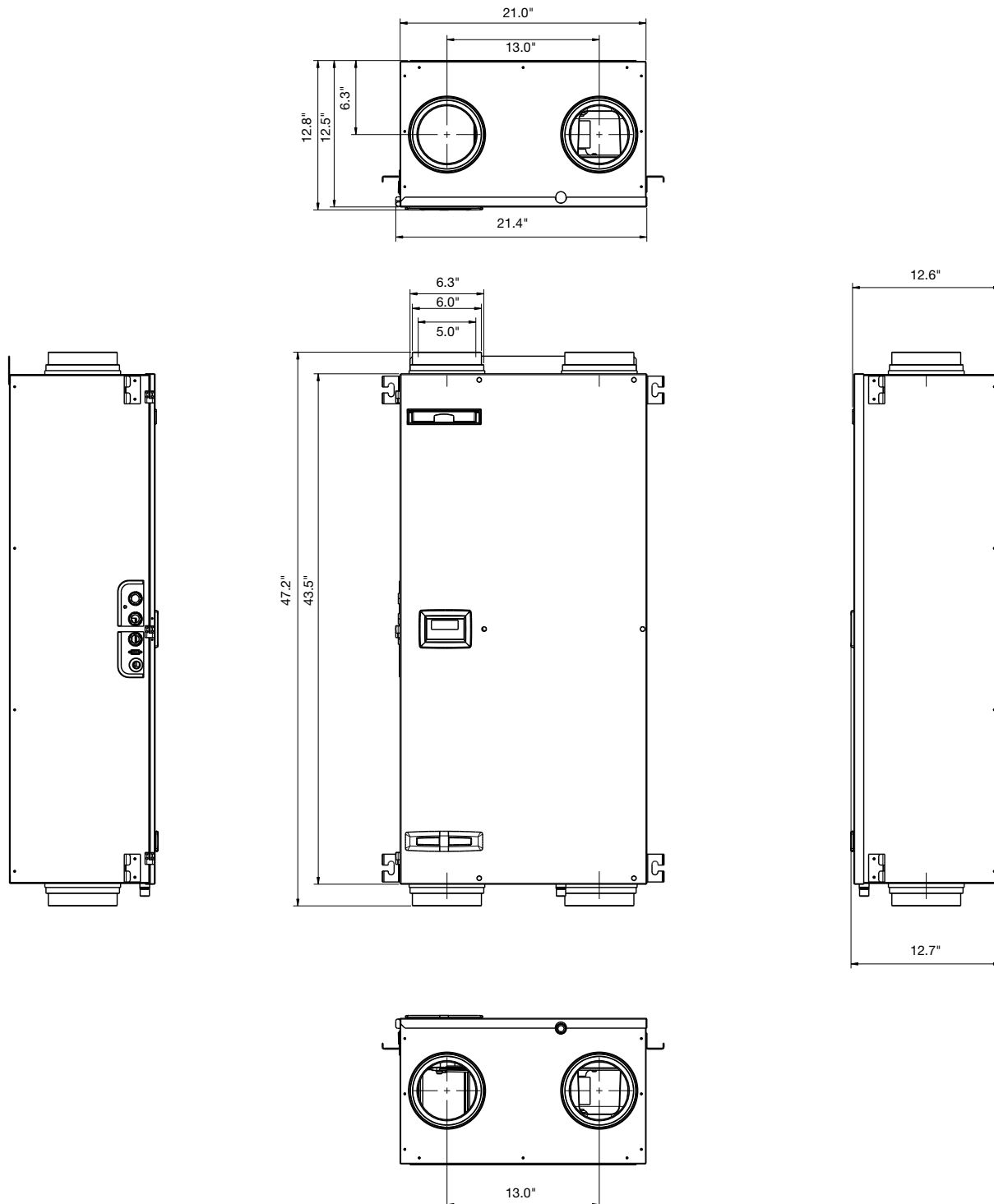
Air direction



Ventilation unit

Zehnder ComfoAir 200

Dimensions



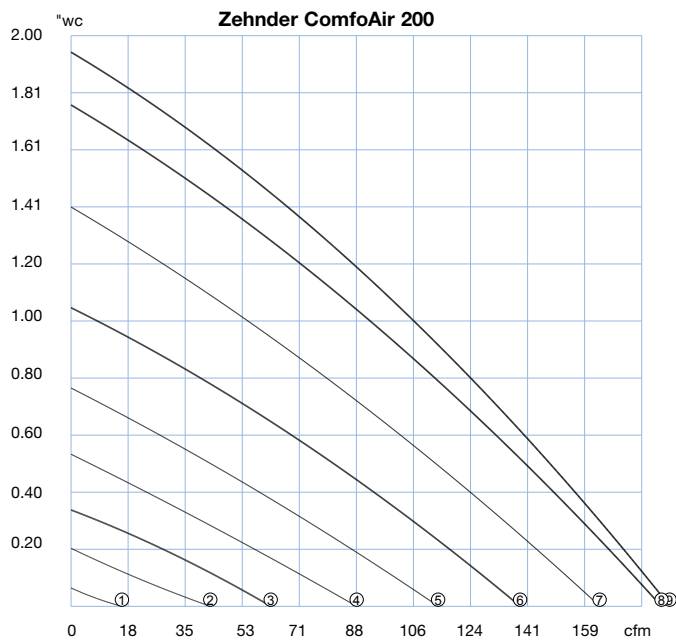
Ventilation unit

Zehnder ComfoAir 200

Stage	Setting	Capacity	Pressure	Power consumption	Current consumption	COS ϕ	Installed noise level		Weight lb
	Percent	Qv	ΔP_{st}				Extract air	Supply air	
	%	cfm	" wc	W	A	(-)	dB(A)	dB(A)	

Zehnder ComfoAir 200

(1)	15%	12	0.012	9	0.08	0.48	30	36	66.2
(2)	30%	35	0.028	14	0.11	0.54	35	46	
(3) Low	40%	53	0.060	20	0.16	0.55	37	53	
(4)	50%	71	0.120	30	0.25	0.52	43	59	
(5)	60%	91	0.180	46	0.37	0.55	47	63	
(6) Medium	70%	109	0.281	68	0.55	0.54	51	66	
(7)	80%	127	0.402	98	0.77	0.55	54	69	
(8) High	90%	144	0.482	128	0.99	0.56	56	72	
(9) Maximum	100%	150	0.502	143	1.1	0.57	57	73	



Ventilation unit

Zehnder ComfoAir 200

Sound, supply air

Ventilation unit	Speed	Acoustic performance at the supply air connection at a distance of 0ft						
Type		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
ComfoAir 200	1	41.1	39.6	35.2	30	20.8	12.9	8.7
ComfoAir 200	2	50.3	48.8	44.4	39.2	30	22.1	17.9
ComfoAir 200	3	56	54.8	50.7	48.3	39.4	33.7	24.6
ComfoAir 200	4	61.3	60.4	54.7	54.9	46.1	42.2	35.7
ComfoAir 200	5	66.5	65.4	58.1	58.6	51.8	48.1	43.5
ComfoAir 200	6	69.4	69.3	61.1	61.1	56.5	52.5	49
ComfoAir 200	7	73.2	72.2	63.8	63.4	60.9	56.4	53.6
ComfoAir 200	8	74.9	75.2	66.2	64.9	64	59.1	57
ComfoAir 200	9	75.9	75.9	67.5	65.7	64.8	60.1	58.1

Sound, extract air

Ventilation unit	Speed	Acoustic performance at the extract air connection at a distance of 0ft						
Type		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
ComfoAir 200	1	43.4	35.2	18.4	12.8	3.2	7.3	14.9
ComfoAir 200	2	47.6	39.4	22.6	17	7.4	11.5	19.1
ComfoAir 200	3	47.5	43.6	28.2	24.7	11.5	11.5	19
ComfoAir 200	4	52	50.1	33.1	31.2	17.4	12.4	18.7
ComfoAir 200	5	57	53.4	39.9	34.4	22.8	14.5	18.8
ComfoAir 200	6	60.1	58	40.6	37	27.3	18.4	19.2
ComfoAir 200	7	63.1	60.8	41.7	38.5	30.5	22.2	19.6
ComfoAir 200	8	65.1	62.8	44.9	40.4	33.3	25.9	20.3
ComfoAir 200	9	65.2	63.9	46.3	41.3	34.3	27.3	21

Sound, unit emission

Ventilation unit	Speed	Acoustic performance at the extract air connection at a distance of 0ft					
Type		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	db(A)
ComfoAir 200	2	28.5	35.2	23.1	14.5	10.5	23.9
ComfoAir 200	3	34.6	39.4	27.3	19.8	11.8	29.1
ComfoAir 200	4	40.3	43.6	32.4	24.9	18.9	34.6
ComfoAir 200	5	45.3	50.1	35.6	28.7	24.5	39
ComfoAir 200	6	46.8	53.4	43.5	31.9	28.5	43.3
ComfoAir 200	7	49.7	58	41.4	34.1	31.9	44.3
ComfoAir 200	8	52.3	60.8	43.6	36	34.6	46.7
ComfoAir 200	9	53.8	62.8	44.7	36.7	35.5	47.9

ZA-CSY-FLYERTS106, V1211, en_us, subject to changes

ZA-CSY-FLYERTS106, V1211, en_us, subject to changes

always
around you



Ventilation tube

Zehnder ComfoTube

Benefits

- Fast installation
- Smooth inside
- Easy to clean
- Air tight
- Easy handling
- Robust tube (ring stiffness greater than 1.16 psi)
- 100% pure material
- Low weight
- Corrosion-resistant



Article numbers

* on request

Product	Article number	Reference number
ComfoTube 75, 20 m roll	990 328 001	9271
ComfoTube 75, 50 m roll	990 328 007	9272

Description of ComfoTube-75

Flexible, corrugated exterior, smooth interior, robust air distribution pipe, gastight to DIN EN 60529. The ComfoTube-75 can be simply concreted in place, laid directly in the ground, or in riser shafts and false ceilings.

Specifications:	Material:	Pure HDPE
	Minimum bending radius:	1D
	Allowable operating temperature:	-13 F to 140°F

Do not store tubes outside without protective film!

Technical specifications

Data	
Outside diameter ["]	3.0
Inside diameter ["]	2.5
Weight per running length [lb/ft]	0.23
Running length per roll [ft]	162.5
Weight per roll [lb]	37.5
Roll height [ft]	1.05
Roll diameter [ft]	4.33

always
around you



Ventilation tube

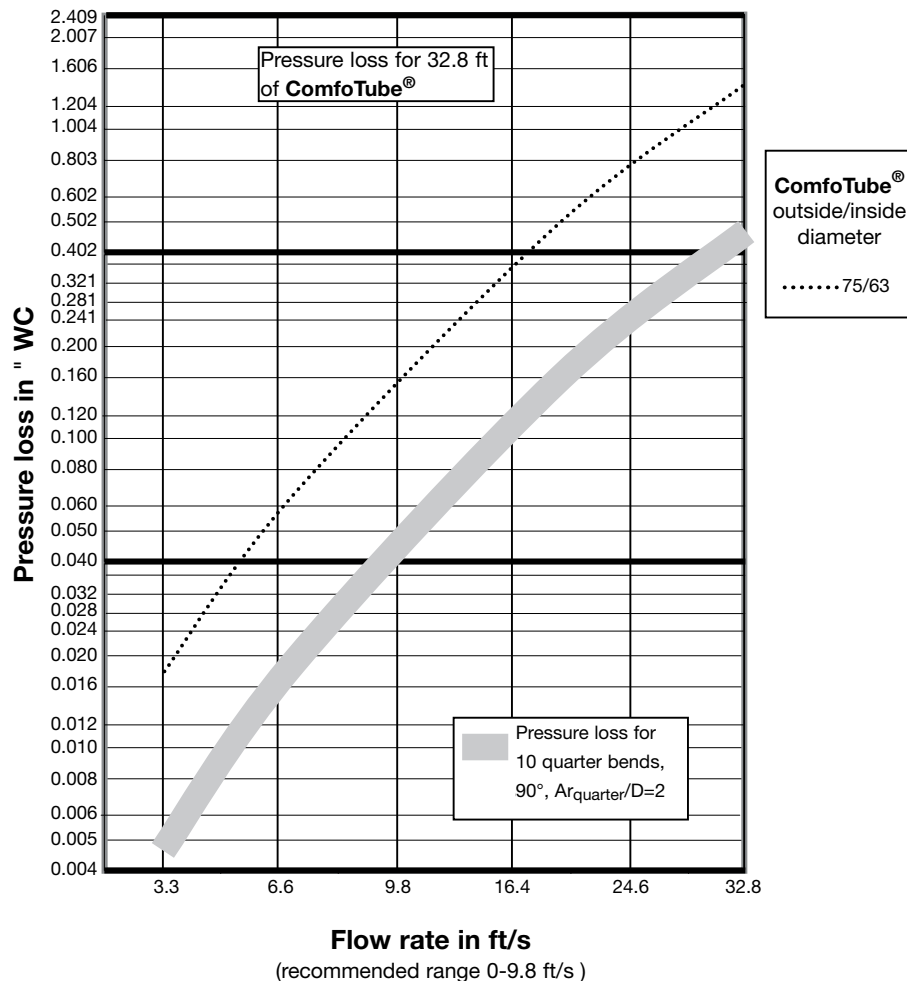
Zehnder ComfoTube

Volumetric flow in ComfoTube in cfm

ComfoTube	3'
Inside diameter [ft]	2.5
Air velocity: 1.6 ft/s	3.0
Air velocity: 3.3 ft/s	6.0
Air velocity: 4.9 ft/s	9.0
Air velocity: 6.6 ft/s	12.0
Air velocity: 8.2 ft/s	15.0
Air velocity: 9.8 ft/s	19.0
Air velocity: 13.1 ft/s	25.0
Air velocity: 16.4 ft/s	31.0

Pressure loss diagram

Guide values for pressure loss in 32.8 ft of ComfoTube®



Ventilation tube

Zehnder ComfoTube

ComfoTube sound attenuation

Octave range [Hz]	125	250	500	1000	2000	4000
Attenuation of 3.3 ft of ComfoTube 75 [dB]	0.4	0.6	0.4	0.2	0.3	0.1

Heat and temperature losses of ComfoTube 75 (3") in concrete layer

Assumptions:

- Mean temperature below the cellar ceiling or in the ground: 50°F
- Thermal conductivity of the insulating hose: 0.56 $\frac{\text{Btu}}{\text{ft} \cdot \text{K}}$

* The temperature loss per feet tube is twice as high at half the air flow.

Heat loss can be reduced if the tubes are wrapped in a foil. Because the ComfoTube are double walled, the foil can prevent the concrete coming into direct contact with the grooves in the inner tube wall. It can be reduced further by placing the tube in the ComfoTube-Isol thermal insulating hose. If ComfoTube tubes with larger diameters and greater volumetric air flows are used, the air temperature falls less quickly than with smaller diameters.

ComfoTube nominal size		75 (3")
Nominal air volume	cfm	18
Air velocity	ft/s	8.9

Tube wrapped in foil		
Heat loss of 3.28 ft of tube (Δt 21.6°F)	Btu	46
Temperature loss of 3.28 ft of tube at nominal air volume (Δt 21.6°F)	°R	2.3°R

Tube wrapped in 0.5" thick insulating hose		
Heat loss of 3.28 ft of tube (Δt 21.6°F)	W	22
Temperature loss of 3.28 ft of tube at nominal air volume (Δt 21.6°F)	°R	1.20

Buoyancy of ComfoTube in concrete

If the tubes are installed with an insulating hose the buoyancy is increased due to the extra volume.

ComfoTube nominal size		75
Buoyancy in concrete	lbf /ft	59
Buoyancy in concrete with 0.5" insulating hose	lbf /ft	110

Ventilation tube

Zehnder ComfoTube

ComfoTube accessories

Tube diameter	Click sleeve	Reference No.	Dust cap/contents	Reference No.	O-ring seal/contents	Reference No.
75	990 328 107	9273	990 328 262	9275	990 328 362	9274

Click sleeves

PE-MD click sleeves for simple ComfoTube connections.
The joint is sealed using two O-rings and shrink tape.



O-rings

O-ring seals suitable for click sleeves, housings, connection and joining plates.



Dust caps

Dust caps for dust-tight ComfoTube sealing during the construction phase.



ZA-CSY-FLYERTS010, V1211, en_us, subject to changes

Zehnder Comfosystems Quote

8036 River Drive SE STE200 Tumwater WA 98501.
105-334 East Kent Ave South Vancouver BC
USA - (360) 866-8779 Canada (778)-378-8700



Quote number: **-2-2429-01** Customer: **Jodee Varney**
Created by: **MGR** Attention:
Date: **3/8/2022** Phone: **978-853-7934**
Revision #: **1** Email: **javarney@gmail.com**
Revision Date: **5/3/2022**
Updated by:

Project: **430 NE Skidmore**
Street: **430 NE Skidmore St**
City: **Portland**
State, ZIP: **OR**

COVER PAGE SUMMARY

See additional pages for system design(s) and line item quote(s).

Q350 - Main Residence

LIST TOTAL	\$ 8,674.80
Contractor Discount	
EQUIPMENT TOTAL	\$ 8,674.80
Commissioning	\$ -
Shipping	FOB ORIGIN
TOTAL COST/SYS.	\$ 8,674.80
Quantity	1
SYS. TYPE TOTAL	\$ 8,674.80

CA200 -ADU

LIST TOTAL	\$ 5,434.08
Contractor Discount	
EQUIPMENT TOTAL	\$ 5,434.08
Commissioning	\$ -
Shipping	FOB ORIGIN
TOTAL COST/SYS.	\$ 5,434.08
Quantity	1
SYS. TYPE TOTAL	\$ 5,434.08

TOTAL PROJECT COST	\$14,108.88
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Terms

Remarks:	Revised quote to add ADU and modify flowrates per customer request. Different types of supply registers can be discussed with Small Planet Supply. The amount of ComfoFlex Duct (for distribution ducting) has been estimated as carefully as possible and ComfoPipe (for intake/exhaust ducting) can be added as an option. Boost switches for each bathroom are included. Standard sheetmetal ducting for connecting the HRV/ERV to the Silencer/Distribution Boxes (if needed) and to the exterior connections is not included. Prior to ordering => Confirm layouts, LEFT/RIGHT version of ERV/HRV (Q Units can be programmed to LH or RH during commissioning), amounts of ducting (if included) have been estimated site unseen based only on assumptions and averages and must be confirmed by customer. If no system commissioning value is expressed in this quote, it is an extra charge at the time of service. Prior to purchasing verify code compliancemarks
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Installation Notes:

Provided floor area is approximate.
Installer is responsible for verifying that flowrates listed in the Air Distribution Schedule meet all local and state codes.
Kitchen exhaust register is to help remove pollutants and circulate ventilation air and not meant to meet kitchen exhaust code
Installer is responsible for verifying the system is installed per the Installation Manual and per all local and state codes.
Code compliance is the responsibility of the purchaser.
A P-trap is essential for proper operation, install one as shown in the manual.
A CA200 can be mounted either vertically on a wall or horizontally under a ceiling (see Manual).
Each Comfoflex duct flows around 10-13 cfm continuous, two or more are needed for higher continuous flowrates.
Lower air flow than designed may occur when the length of ComfoTube/ComfoFlex exceed 35 ft per run
Luna Extract Diffusers - Mount in ceiling or high on wall (min. 8' from cooktop surface - "string-line" distance and not above shower).
Luna Supply Diffusers - Mount in the ceiling or wall (min. 3' from adjacent wall/ceiling, use air blocker when mounted on wall).
TVA75 Diffuser and CLD Register Boxes have 2 ports, use provided cap to plug extra port if only one duct is connected.
CLD Supply Registers - Mount in wall, floor or ceiling.
Transfer Grills (ComfoDucts) are needed to ensure adequate flow in rooms if door undercuts are too small.
CA200: General Sheetmetal Duct Sizes: 5" from HRV/ERV to exterior exhaust/supply connections (6" for ducts greater than 10').
Q350: General Sheetmetal Duct Sizes: 6" from HRV/ERV to exterior exhaust/supply connections (7" for ducts greater than 15').
Supply/Return air ducting in non-conditioned spaces must be insulated to a min of R5.
Ducting from ERV/HRV to exterior connections must be insulated (vapor tight) to a min of R5 when in the conditioned space.
The buyer must request commissioning by logging in at <http://zehnderamerica.com/request-a-commissioning/>.

Conditions:	Quotation valid for 30 days from date above. This quotation is applicable solely for the materials listed and in the quantities shown and is based upon the system design as understood at the time of the quotation. Changes to the system design, deviations in the actual construction or in the expected installation process may result in additional material requirements which are not included in this quotation. A 15% restocking fee will be charged for returned items. A \$50/line change fee will be assessed on changes made after an order has been placed.
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Zehnder Comfosystems Quote

8036 River Drive SE STE200 Tumwater WA 98501.
105-334 East Kent Ave South Vancouver BC
USA - (360) 866-8779 Canada (778)-378-8700



Quote number:	-2-2429-01	Customer:	Jodee Varney	Project:	430 NE Skidmore
Created by:	MGR	Attention:		Street:	430 NE Skidmore St
Date:	3/8/2022	Phone:	978-853-7934	City:	Portland
Revision #:	1	Email:	javarney@gmail.com	State, ZIP:	OR

Shipping:	FOB Our Warehouse. Shipments are rated based on weight, location and carrier and will be quoted at the time of the release.
Payment:	Credit Card, Check, Net 30 days w/ Open Account. payment terms

Zehnder Comfosystems Quote

8036 River Drive SE STE200 Tumwater WA 98501.
105-334 East Kent Ave South Vancouver BC
USA - (360) 866-8779 Canada (778)-378-8700



Quote number: **-2-2429-01**
Created by: **MGR**
Date: **3/8/2022**
Revision #: **1**
Revision Date: **5/3/2022**
Updated by:

Customer: **Jodee Varney**
Attention:
Phone: **978-853-7934**
Email: **javarney@gmail.com**

Project: **430 NE Skidmore**
Street: **430 NE Skidmore St**
City: **Portland**
State, ZIP: **OR**

Q350 - Main Residence Air Distribution Schedule

Purchaser: Ensure that your installation crew has this page on site!

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Floor	Room	Area	Height	Volume	# of Tubes	Continuous Flow Rate (CFM)		Termination			Control/Sensor
						Supply	Extract	Register box	Valve or grille	Location	
Basement	Storage/Utility Rm				1		13	TVA-2T	Luna-E	Ceiling	
Main Floor	Kitchen				3		33	TVA-3T	Luna-E	High Wall	
Main Floor	Bathroom				2		20	TVA-2T	Luna-E	High Wall	Boost Switch
Main Floor	Bedroom				2	20		CLD-2T	Roma (WT)	Wall	
Main Floor	Living Rm - Register 1				2	21		CLD-2T	Roma (WT)	Wall	
Main Floor	Living Rm - Register 2				1	11		CLD-2T	Roma (WT)	Wall	
Upper Floor	Bathroom				2		26	TVA-2T	Luna-E	High Wall	Boost Switch
Upper Floor	Bedroom				2	20		CLD-2T	Roma (WT)	Wall	
Upper Floor	Bedroom				2	20		CLD-2T	Roma (WT)	Wall	
Total		1,847		15,700	17	92	92				

Fan speed for design: Medium (2)

System Quantity: 1

Unit Size:

Q350

Air Changes/Hour: 0.35

Est. Ave. Ceiling Ht.: 8.5 ft.

Houseside Ducting: ComfoFlex

Est. Ave. Duct Run: 34 ft.

CFM/Tube: 12

Unit Type: HRV

Unit Orientation:

Preheat Option:

Unit Mount: Wall

Unit Ducting: Metal (by others)

Quantities: Standard

Control Options

ComfoConnect:	Included
KNX-C Interface:	
ComfoSense:	

Description: The ComfoConnect LAN C allows the user to completely control the unit using the Zehnder App on their smart device.

ComfoWell Manifold Air Distribution Strategy

Category: Direct

Description: The supply and extract ComfoWell Silencer/Manifold assemblies are mounted directly to the unit using a specified mounting kit. MANUALLY SELECT MOUNTING KIT BELOW.

Additional ComfoWell notes:

Filtration

Category: Standard

Description: Inside the unit an F7 (MERV 13) filter is provided for improved filtration of the outdoor air and a G4 (MERV 7/8) filter is provided for basic filtration of the extract air.

Commissioning

Category:

Description:

Provide all of the information above to the system installer.

Download the General Installation Manual at <https://zehnderamerica.com>

Zehnder Comfosystems Quote

8036 River Drive SE STE200 Tumwater WA 98501.
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Quote number: **-2-2429-01**
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Customer: **Jodee Varney**
Attention:
Phone: **978-853-7934**
Email: **javarney@gmail.com**

Project: **430 NE Skidmore**
Street: **430 NE Skidmore St**
City: **Portland**
State, ZIP: **OR**

Detailed Parts List - System 1

Article No.	Description	Quantity	Unit Price	Total
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Section 1: ComfoAir Ventilation Unit and Required Components

Contains the HRV or ERV unit, the preheating component, the drainage component, and the unit filters. Please verify unit orientation before completing order.

9648-01	ComfoAir Q350 SI TR HRV	1	\$ 3,663.00	\$ 3,663.00
9637-00	Waterless P-Trap Compact	1	\$ 79.92	\$ 79.92

Section 2: ComfoSense and Other Controls

Contains the required unit controller, bathroom boost switches, and other sensor options. Locations are shown on the Air Distribution Schedule above.

9619-00	ComfoConnect Lan C	1	\$ 280.83	\$ 280.83
9556-00	Hard-wired boost switch (white)	2	\$ 52.80	\$ 105.60
9620-00	Optionbox CAQ	1	\$ 517.26	\$ 517.26

Section 3: ComfoPipe and Exterior Grills (Optional)

Contains all components needed to penetrate the building envelope and connect the unit to the outside. The Exterior Wall Grills, Roflex Gasket, and single piece of ComfoPipe are necessary for rough in.

9631-00	ComfoPipe 160mm Straight 1m (39")		\$ 22.20	
9632-00	ComfoPipe 160mm 45° Bend		\$ 12.21	
9633-00	ComfoPipe 160mm Directional Coupler		\$ 7.77	
9712-00	ComfoPipe 160mm Coupler		\$ 9.99	
9445-00	Roflex 200 Gasket PR w/tape (package of 2)		\$ 63.27	
9641-00	Exterior Wall Grill 160mm (6.3")		\$ 145.41	

Section 4: ComfoWell Components

Contains the components required to connect the internal ducting to the unit, including the silencer and manifold.

9716-00	ComfoWell Mounting Kit CW-K 520 (for Q 350/450)	1	\$ 202.02	\$ 202.02
9320-00	ComfoWell silencer CW-S 520	2	\$ 365.19	\$ 730.38
9592-00	ComfoWell manifold CW-M 520-T (10 ports)	2	\$ 145.41	\$ 290.82

Section 5: ComfoFresh Ducting

Contains the ducting from the ComfoWell to the rooms. Ducting lengths are approximated, please verify quantities. This entire section is necessary for rough in.

9501-01	ComfoFlex Duct 50 feet	12	\$ 120.99	\$ 1,451.88
9511-00	ComfoTube Marking tags (10 Red, 10 Blue)	2	\$ 15.54	\$ 31.08

Section 6: ComfoFresh Register Boxes

Contains register boxes shown in the Air Distribution Schedule above. This entire section is necessary for rough in.

9591-00	Diffuser box TVA2-T (2 ports)	3	\$ 84.36	\$ 253.08
9590-00	Diffuser box TVA3-T (3 ports)	1	\$ 133.20	\$ 133.20
9588-00	Register box CLD2-T (2 ports)	5	\$ 71.04	\$ 355.20

Section 7: ComfoFresh Register Covers

Contains the register cover styles shown in the Air Distribution Schedule above.

9764-00	Extract Valve Luna-E	4	\$ 47.73	\$ 190.92
9264-00	Register cover ROMA (white)	5	\$ 45.51	\$ 227.55
9594-00	ComfoSet 75T Damper	5	\$ 18.87	\$ 94.35

Section 8: Filtration

Contains all filters and filter accessories.

9672-00	Filter Set F7+G4 (MERV 13 + MERV 7/8) ComfoAir Q	1	\$ 34.41	\$ 34.41
9334-00	ComfoWell Filter Casing CW-F 520		\$ 401.82	
9344-00	ComfoWell fine particles filter CW-F9 520 (MERV 15)		\$ 112.11	
9356-00	ComfoWell activated carbon filter CW-FC 520		\$ 94.35	
9352-00	Filter 125mm cone (for extract valves)	5	\$ 6.66	\$ 33.30

Color Key:	Customer to Verify Orientation	
	Customer to Verify Quantity	

EQUIPMENT TOTAL	\$ 8,674.80
Commissioning Fee	\$ -
Shipping	FOB ORIGIN
PROJECT TOTAL	\$ 8,674.80

Zehnder Comfosystems Quote

8036 River Drive SE STE200 Tumwater WA 98501.
105-334 East Kent Ave South Vancouver BC
USA - (360) 866-8779 Canada (778)-378-8700



Quote number: **-2-2429-01**
Created by: **MGR**
Date: **3/8/2022**
Revision #: **1**
Revision Date: **5/3/2022**
Updated by:

Customer: **Jodee Varney**
Attention:
Phone: **978-853-7934**
Email: **javarney@gmail.com**

Project: **430 NE Skidmore**
Street: **430 NE Skidmore St**
City: **Portland**
State, ZIP: **OR**

CA200 -ADU Air Distribution Schedule

Purchaser: Ensure that your installation crew has this page on site!

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Floor	Room	Area	Height	Volume	# of Tubes	Continuous Flow Rate (CFM)		Termination			Control/Sensor
						Supply	Extract	Register	Cover	Location	
Basement	Kitchen				2		22	TVA-2T	Luna-E	Ceiling	
Basement	Bathroom				2		20	TVA-2T	Luna-E	Ceiling	Boost Switch
Basement	Laundry Closet				1		8	TVA-2T	Luna-E	Ceiling	
Basement	Bedroom				2	25		TVA-2T	Luna-S	Ceiling	
Basement	Living Rm				2	25		TVA-2T	Luna-S	Ceiling	
Total		475			9	50	50				

Fan speed for design: Medium (2)

System Quantity: 1

Unit Size:

Air Changes/Hour: 0.90

Est. Ave. Ceiling Ht.: 7.0 ft.

Houseside Ducting: ComfoFlex

Est. Ave. Duct Run: 25 ft.

CFM/Tube: 12

CA200

Unit Type: HRV

Unit Orientation: Left

Preheat Option:

Unit Mount: Wall

Unit Ducting: Metal (by others)

Quantities: Standard

Control Options

ComfoConnect:		These options are only available with the Q Series
KNX-C Interface:		
ComfoSense:	Included	

Description: The CA units are controlled by the ComfoSense Controller, a wall mounted control unit that gives the user access to the system's functions, and is hard wired back to the unit.

ComfoWell Manifold Air Distribution Strategy

Category: Direct

Description: The supply and extract ComfoWell Silencer/Manifold assemblies are mounted directly to the unit using a specified mounting kit. MANUALLY SELECT MOUNTING KIT BELOW.

Additional ComfoWell notes:

Filtration

Category: Standard

Description: Inside the unit an F7 (MERV 13) filter is provided for improved filtration of the outdoor air and a G4 (MERV 7/8) filter is provided for basic filtration of the extract air.

Commissioning

Category:

Description:

Provide all of the information above to the system installer.

Download the General Installation Manual at <https://zehnderamerica.com>

Zehnder Comfosystems Quote

8036 River Drive SE STE200 Tumwater WA 98501.
105-334 East Kent Ave South Vancouver BC
USA - (360) 866-8779 Canada (778)-378-8700



Quote number: **-2-2429-01**
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Customer: **Jodee Varney**
Attention:
Phone: **978-853-7934**
Email: **javarney@gmail.com**

Project: **430 NE Skidmore**
Street: **430 NE Skidmore St**
City: **Portland**
State, ZIP: **OR**

Detailed Parts List - System 2

Article No.	Description	Quantity	Unit Price	Total
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Section 1: ComfoAir Ventilation Unit and Required Components

Contains the HRV or ERV unit, the preheating component, the drainage component, and the unit filters. Please verify unit orientation before completing order.

9280-01	ComfoAir 200 Ventilation device HRV Left	1	\$ 2,680.65	\$ 2,680.65
9637-00	Waterless P-Trap Compact	1	\$ 79.92	\$ 79.92

Section 2: ComfoSense and Other Controls

Contains the required unit controller, bathroom boost switches, and other sensor options. Locations are shown on the Air Distribution Schedule above.

9257-01	ComfoSense Controller	1	\$ 243.09	\$ 243.09
9556-00	Hard-wired boost switch (white)	1	\$ 52.80	\$ 52.80

Section 3: ComfoPipe and Exterior Grills (Optional)

Contains all components needed to penetrate the building envelope and connect the unit to the outside. The Exterior Wall Grills, Rolflex Gasket, and single piece of ComfoPipe are necessary for rough in.

9628-00	ComfoPipe 125mm Straight 1m (39")		\$ 19.98	
9629-00	ComfoPipe 125mm 45° Bend		\$ 12.21	
9630-00	ComfoPipe 125mm Directional Coupler		\$ 7.77	
9713-00	ComfoPipe 125mm Coupler		\$ 9.99	
9446-00	Roflex 150 Gasket PR w/tape (package of 2)		\$ 51.06	
9411-00	Exterior Wall Grill 125mm (4.9")		\$ 133.20	

Section 4: ComfoWell Components

Contains the components required to connect the internal ducting to the unit, including the silencer and manifold.

9325-00	ComfoWell Mounting Kit CW-K 320 (for CA 200)	1	\$ 206.46	\$ 206.46
9319-00	ComfoWell silencer CW-S 320	2	\$ 304.14	\$ 608.28
9586-00	ComfoWell manifold CW-M 320-T (6 ports)	2	\$ 99.90	\$ 199.80

Section 5: ComfoFresh Ducting

Contains the ducting from the ComfoWell to the rooms. Ducting lengths are approximated, please verify quantities. This entire section is necessary for rough in.

9501-01	ComfoFlex Duct 50 feet	5	\$ 120.99	\$ 604.95
9511-00	ComfoTube Marking tags (10 Red, 10 Blue)	1	\$ 15.54	\$ 15.54

Section 6: ComfoFresh Register Boxes

Contains register boxes shown in the Air Distribution Schedule above. This entire section is necessary for rough in.

9591-00	Diffuser box TVA2-T (2 ports)	5	\$ 84.36	\$ 421.80
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Section 7: ComfoFresh Register Covers

Contains the register cover styles shown in the Air Distribution Schedule above.

9609-00	Supply Valve Luna-S	2	\$ 47.73	\$ 95.46
9764-00	Extract Valve Luna-E	3	\$ 47.73	\$ 143.19

Section 8: Filtration

Contains all filters and filter accessories.

9282-00	Filter G4 (MERV 7/8) ComfoAir 200		\$ 26.64	
9283-00	Filter F7 (MERV 13) ComfoAir 200	2	\$ 31.08	\$ 62.16
9333-00	ComfoWell Filter Casing CW-F 320		\$ 352.98	
9343-00	ComfoWell fine particles filter CW-F9 320 (MERV 15)		\$ 84.36	
9355-00	ComfoWell activated carbon filter CW-FC 320		\$ 64.38	
9352-00	Filter 125mm cone (for extract valves)	3	\$ 6.66	\$ 19.98

Color Key:	Customer to Verify Orientation		EQUIPMENT TOTAL	\$ 5,434.08
	Customer to Verify Quantity		Commissioning Fee	\$ -
			Shipping	FOB ORIGIN
			PROJECT TOTAL	\$ 5,434.08



**City of
Portland, Oregon
Bureau of Development Services**

1900 SW 4th Avenue, Suite 5000
Portland, Oregon 97201
503-823-7300
Fax 503-823-6983
TTY 503-823-6868
www.portlandonline.com/bds

To: Charlie Stephens and Tad Everhart

From: Alternative Technology Advisory Committee:

Edward Vranizan (chair)	Samir Mokashi (vice-chair)
Aron Faegre	Joshua Klyber
Ron Hays	Kathy Bash
Peter Dusicka	

RE: Application #09-001 (Everhart) – Final Recommendation

Date: July 30, 2009

Summary of Proposal: The applicants request to install Zehnder/JE StorkAir ComfoAir 350 Heat Recovery Ventilators (StorkAir 350 HRV) in several houses being designed using the high-efficiency Passive House standards. The StorkAir 350 HRV is not yet listed by Underwriters Laboratories (UL) or ETL SEMKO.

Applicable Building Code Section(s): M1302.1 Listed and labeled

Committee Findings:

1. The background data provided by the applicant shows that the HRV has been certified in accordance with European standards, and used in several thousand homes in Europe.
2. The manufacturer of the HRV is in the process is working on US certification through the ETL.
3. The applicant's Electrical Engineer provided information describing the minor modifications that would need to be made to the unit to make it compatible for installation in the United States. The Committee did not find that any of these modifications would create issues with the safety or operation.
4. The applicant provided an energy comparison that showed that the StorkAir 350 HRV is far more efficient than the UL listed HRV's currently available in the United States. Therefore should be supported as a sustainable technology based on the potential energy savings it can offer.

Final Committee Recommendation:

Based on these findings the Alternative Technology Advisory Committee recommends approval of this technology. The Bureau of Development Services' Administrative Appeal Board is encouraged to approve subsequent building code appeals based on the information provided in this application.

Please note: BDS and the Administrative Appeal Board is not bound by the recommendations of the Committee. A favorable recommendation of a technology by the Committee does not guarantee approval of a building code appeal.

Further instructions for the applicant:

You may submit your building code appeal to use this technology in a site-specific project at any time by following the [instructions](#) found on the BDS website. A building code appeal must be approved by BDS to be able to use this technology in a project. Please submit a copy of this committee recommendation with your appeal application. Please contact the Appeal Board Secretary at (503) 823-7335 if you have any additional questions about the appeal process.