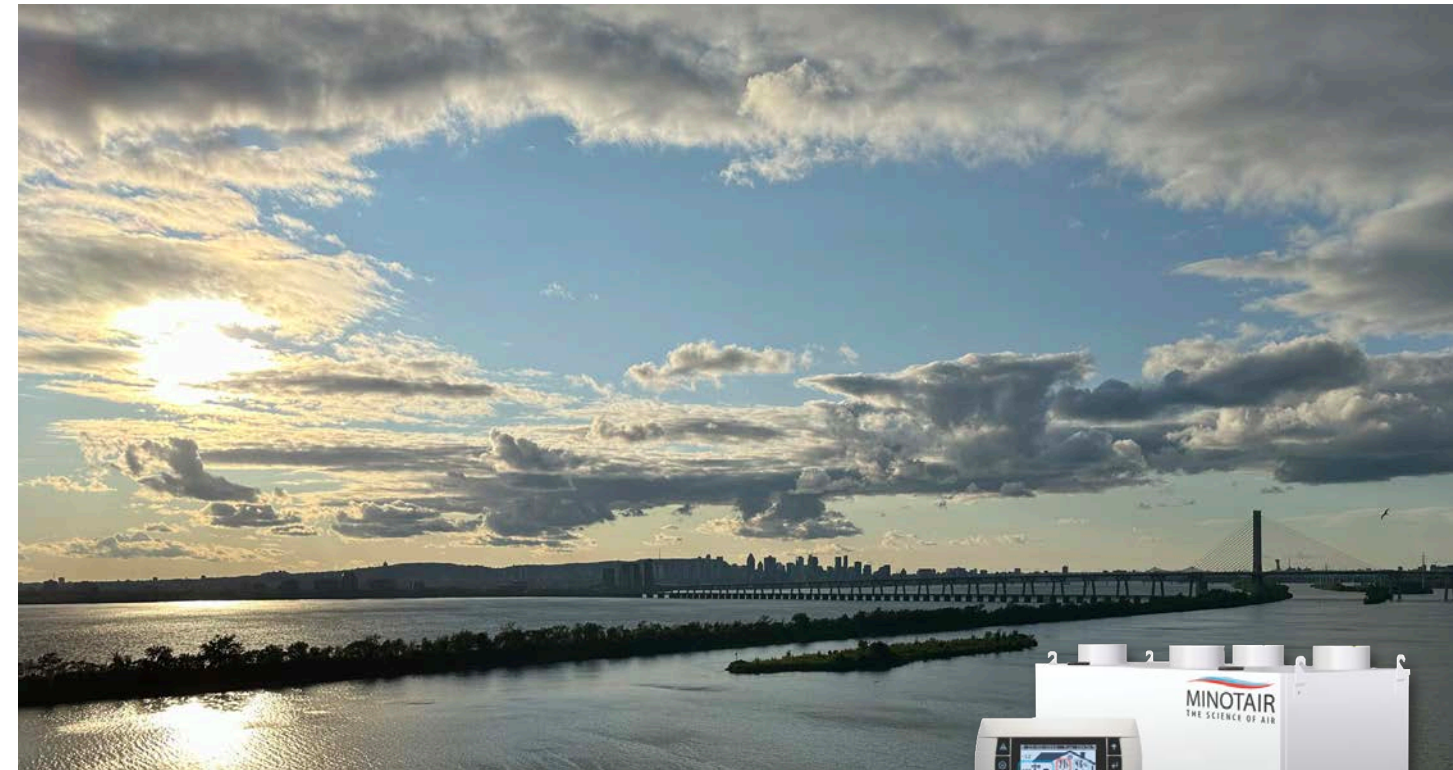


PentaCare V12 Compact Air Treatment Unit Series



With balanced fresh-air CATU performances certified by HVI

Ventilation Temperature Humidity



PentaCare V12 Units are 4 machines in 1:

- Dehumidifier
- Ducted Air Source Heat Pump
- High Efficiency Medical-Grade Air Filtration Device
- Compressor-based Fresh-Air Appliance providing Heat + Energy Recuperation

The all-in-one-box compact HVAC/D solution providing:

Fresh air + Heating + Cooling + Humidity + Air filtration



Increase your indoor wellness: our PentaCare Series takes care of 5 elements

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BASIC INFORMATION

1 Fresh Air

Fresh Air Supply With Air Pollutants Reduction: the **PentaCare V12** brings in balanced fresh air and gets rid of the pollutants contained in stale air by getting them out of your home. More info here at the bottom right: **“Get your home better with the most comfortable ventilation possible”**.

2 Air Filtration

With our **High-Efficiency Medical-Grade air filtration:** great air filtration comes from the combination of a MERV 8 filter and our **Medical-Grade*** HEPA MERV 15/F9 filter. What that gives you is an impressive level of air filtration to breathe better and to protect your household against unwanted fine particulates like **wild fire smoke particles that we’re facing more and more**.

It’s made possible by our unique gasketed rigid metallic frame and the high-tech filter air media made in the USA (HEPA MERV 15), plus our powerful energy efficient ECM fan technology.

Increase your indoor wellness: our **MultiPass Filtration Process** filters the air when coming from outdoor and also once indoor with multiple filtration cycles.

*according to ASHRAE STANDARD 170 “Ventilation of Health Care Facilities”.

3 Humidity Management

Automatic Dehumidification: the **PentaCare V12** uses its **HUMIWATCH 365®** exclusive system to eliminate excessive moisture better than all other HRV, ERV or heat pump based air exchangers. It gets rid of up to 38 liters (80 pints) of water per day (this is about 50% more than our closest competitor).

Automatic Shower Usage Detector® : a first in the market as our feature permits recirculation of warm and moist air from your shower automatically when the indoor air is too dry during the heating season, or simply exhaust it outside the rest of the time.

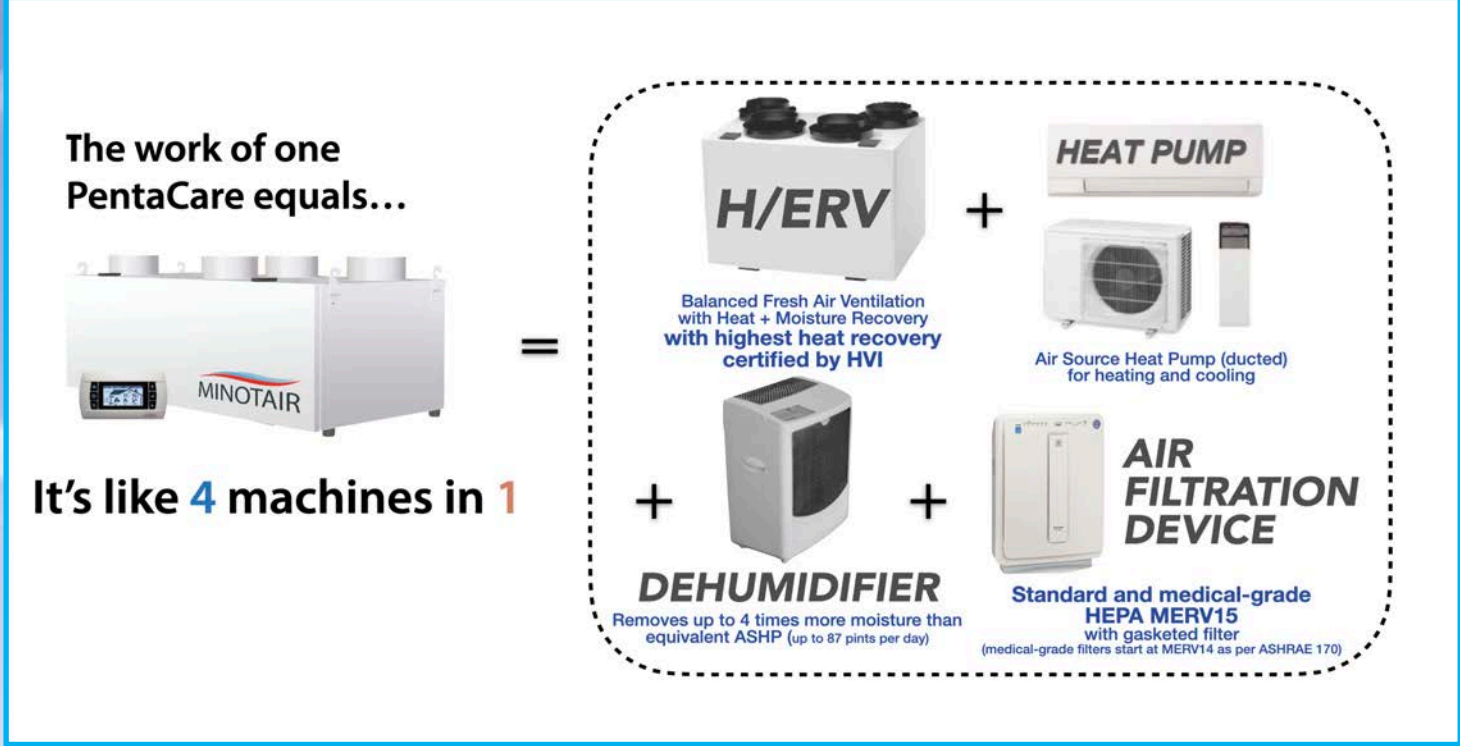
4 Heating + 5 Cooling

Normal ducted heat pump operations: the **PentaCare V12** performs a very precise and efficient distribution of refiltered cooled or heated or dehumidified air directly to all the rooms serviced by the ductwork.

Fresh Air Along With “Net Btu“ Cooling & Heating: the **PentaCare V12** performs a very precise and efficient distribution of treated fresh air (filtered + cooled or heated or dehumidified) directly to all the rooms serviced by the ductwork. That means a healthier and more comfortable place to live. In a certain temperature range, the **PentaCare V12** performs like no other by supplying conditioned fresh air with surplus heat (or cooling in summer) that will reduce the heating load, all while ventilating.

Energy-Friendly Free Cooling and Turbo Cooling Modes

Useful during some cool nights (in summer for example) to both cool and freshen your home naturally at almost no cost using only the fans! And for a maximum effect the unit can also use the **Turbo Cooling mode** (making good use of the compressor) that will add cooling to that already naturally cool night air!



Get your home better with the most comfortable ventilation possible

Live better in your great new indoor climate, thanks to the best fresh-air appliance performances in North America with results certified by HVI

- 1 The **PentaCare V12** produces the best SRE performances of all HRVs and ERVs available in North America using state-of-the-art active heat and energy recovery, with the most efficient recovery technology from our proprietary **Triple HEAT Recovery System®**;
- 2 **The most comfortable air during the heating season** with another first: the **ever-highest SRE of the industry, now at 129%** (previously at 116% in 2019) when moving 97 CFM indoor of 32°F/0°C outdoor air while it's 72°F/22°C indoor. Real-life results from the “Science of Air” of Minotair;
- 3 All that with, again, a **record-breaking ASE of 196%**, providing fresh air indoor around 102°F/39°C **which helps heat your home at the same time**. That means warmer, much more comfortable fresh air getting in your home for best comfort and wellness;

“Distributed systems are the future”

“.....The compartmentalization principle (in multifamily buildings) also can be extended to heating, cooling and domestic hot water. Unit space heating and cooling and hot water is provided by individual mechanical systems located in each unit.
Distributed systems are the future— remember computing...”

Dr. Joseph Lstiburek, Ph.D., P.Eng., ASHRAE Fellow
From an article in the ASHRAE Journal of July 2019

If you do not know Dr Joseph Lstiburek, he's one of the experts of the industry writing ASHRAE mechanical codes used across Canada and the USA. And according to the *Wall Street Journal*, he's the “Dean of Building Science in North America”.

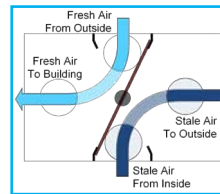
And “Distributed systems” is exactly what Minotair does for more than a decade by combining in one single product the equivalent of 4 different products to cover HVAC/D needs.

ADVANCED TECHNICAL INFORMATION

The 2 positions of our Axis Damper[®]

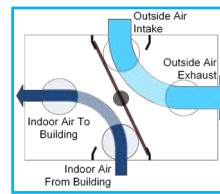
VENTILATION / AIR EXCHANGE MODE

For fresh air, pollutants removal, active heat recovery “net BTU” heating & cooling and summer fresh air free cooling & turbo cooling.



RECIRCULATION MODE

For indoor air heating, cooling, dehumidification and added filtration.



TOP VIEW

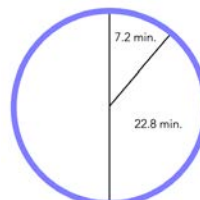
Modes of operation with our Axis Damper[®]

We use a half-hour work windows where every 30 minutes the same prescriptive amount of fresh air (per ASHRAE 62.2) is provided when using Smart Mode on top of cooling, heating and dehumidification. Lets see one of many scenarios our advanced algorithms has computed:

Regular HRVs/ERVs
Running 60 CFM x 30 minutes =
1,800 Cubic Feet of filtered fresh air



PentaCare Series
Running 250 CFM x 7.2 minutes =
1,800 Cubic Feet of filtered fresh air



+ 22.8 min. of **heating**
OR 22.8 min. of **cooling**
OR 22.8 min. of **dehumidification**
+ **additional medical-grade HEPA MERV15 air filtration**

NOTE: that's one of many scenarios. But in Smart Mode all of them will provide the prescriptive amount of fresh air as required by ASHRAE 62.2

This example above is **one of many multiple scenarios** on how the **PentaCare V12** effectively manage all the aspects of indoor climate with our advanced algorithms making a great difference!

FASTER + EASIER + LESS EXPENSIVE: HIGH-QUALITY, COMMERCIAL-GRADE:

- NO roof curb to install;
- NO refrigeration lines to pass;
- NO more long inefficient ductwork nor fire damper to install;
- NO enclosure to install outdoor resulting in a longer-lasting product being installed inside;
- NO visual annoyance on facades
- World-class, durable product;
- Multifamily remote control & monitoring with Modbus[®] (option);
- Compliant with ASHRAE 62.1 & 62.2;
- Fully compliant with PHIUS;
- For PHI: please put pressure on them!

MINO-CONTROL: OUR UPDATABLE CONTROLLER

Our controller is the only one in the industry to be updatable and of industrial grade. Over time, not only will you benefit from the latest features and updates, but you will also stay away from obsolescence. In this regard the **PentaCare V12** is in a league of its own once again! Updates done by USB key or over-the-air (OTA) with our upcoming wireless MinoBMS

REAL-TIME CALIBRATION OF INTAKE & EXHAUST AIRFLOWS

Once only seen in commercial applications, you can count on our constant airflow ECM fans to deliver the right amount of fresh air in your ducts up to 1.5 inch of static pressure. As a result, our fans will do real-time adjustments to help your home achieve balanced air flow pressure.

5 KW ELECTRICAL DUCT HEATER (EDH)

Totally controlled by our microcontroller, the heat intensity is fully variable to generate the precise amount of auxiliary heat required the heating season. Minotair makes the EDH mandatory when the PentaCare V12 is used as the main heating source such as in a passive house or apartment.

MINOTAIR DYNAMIC CALCULATOR[®]

To provide data to insert into your Passive House modeling tools (PHPP and WUFI Passive) based on the design conditions of the fresh air, heating and cooling requirements. Gives also useful validation data for heating and cooling loads for all types of buildings (including non-Passive House buildings).(FREE).

VOC AND CO² POLLUTANT SENSORS

Available from renown and specialized manufacturers and easily connect them to our machines. So you can do precise IAQ Multi-Room Sensing. Like monitoring a new-born bedroom in priority. (OPTION)

MinoBMS: State-of-the-Art and robust wireless BMS (for Fall 2024)

MinoBMS is a comprehensive and easy to use Building Management System (BMS) for multifamily buildings tuned for our PentaCare Series units. MinoBMS improves building performance and comfort by streamlining management of Minotair units through a robust, commercial-grade wireless mesh network.

Based on the Embue smart building for multifamily platform, MinoBMS can manage all aspects of the Minotair unit through a desktop browser or mobile app, including:

- Temperature and humidity monitoring and control;
- Remote temperature monitoring via remote sensor;
- Remote management of control functions including operating modes and fresh air intake;
- Error logging;
- Remote over-the-air firmware upgrades;
- Remote monitoring of filters life;
- Leak detection in units (optional);
- Window open/closed (optional).

MINOTAIR AUTHORIZED MECHANICAL DESIGNERS FOR DUCTWORK DESIGN + LOAD CALCULATIONS SERVICES

With firms like Energy Vanguard and Engineered Projects Consulting, you can rely on professionals to take care of these very important details.

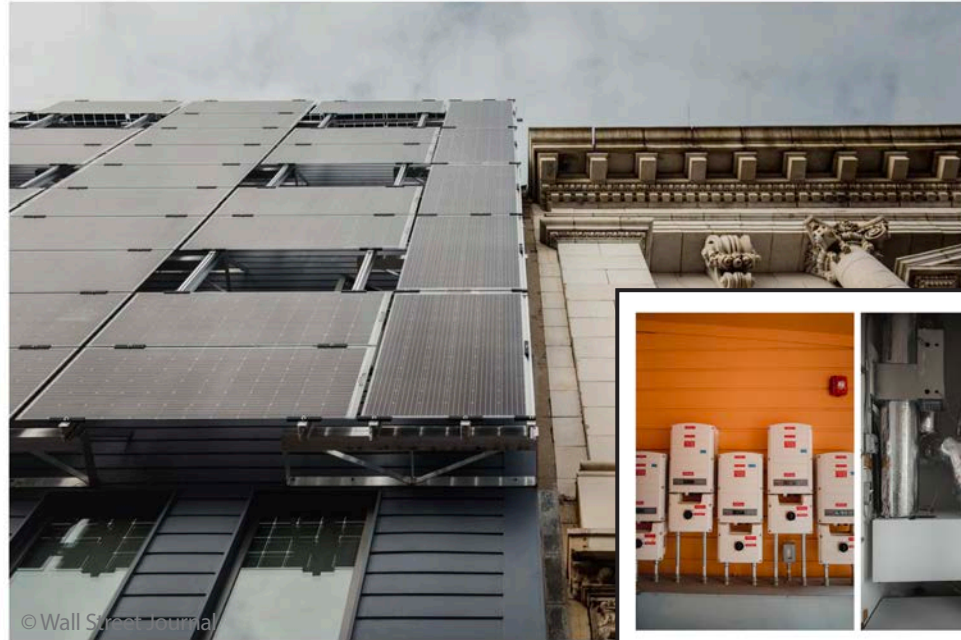
Service available throughout the USA and Canada (FEES APPLICABLE):

energyvanguard.com engdproj.com

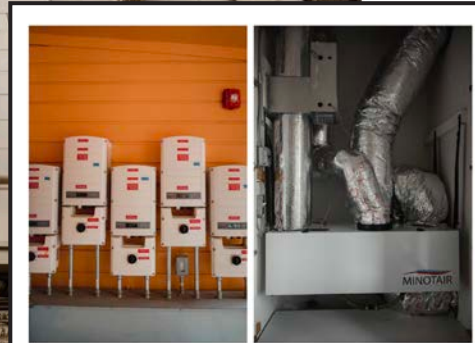
THE FUTURE OF EVERYTHING | ENERGY & CLIMATE

AN ARCHITECTURE FIRM'S PUSH TO BUILD NET-ZERO APARTMENTS—ON A BUDGET

Philadelphia's Onion Flats is constructing low-cost buildings that use design, mechanical equipment and residents' behavior to slash fossil fuel consumption



© Wall Street Journal
Apartments at Front Flats, a new rental building in Philadelphia, left, are powered by 492 translucent, two-sided solar panels. PHOTO: HANNAH YOON FOR THE WALL STREET JOURNAL



Solar inverters sit on the rooftop of Front Flats. Air ducts that allow heat and cold air to stay in the building are built into the units. PHOTOS: HANNAH YOON FOR THE WALL STREET JOURNAL (2)

The firm has built several residential buildings in Philadelphia over the years and plans to keep going. The principals have learned that actual energy consumption is often greater than what the models predict. The culprit is "plug load"; people plug in bigger televisions and more electricity gobbling devices than expected.

National 2021 R&D Awards from AIA Architect Journal
Won by Onion Flats for their Net-Zero + PH-level building "Front Flats"
28 apartments using 28 PentaCare V12 units.
Philadelphia, PE, USA

MULTIFAMILY - DEEP ENERGY RETROFIT



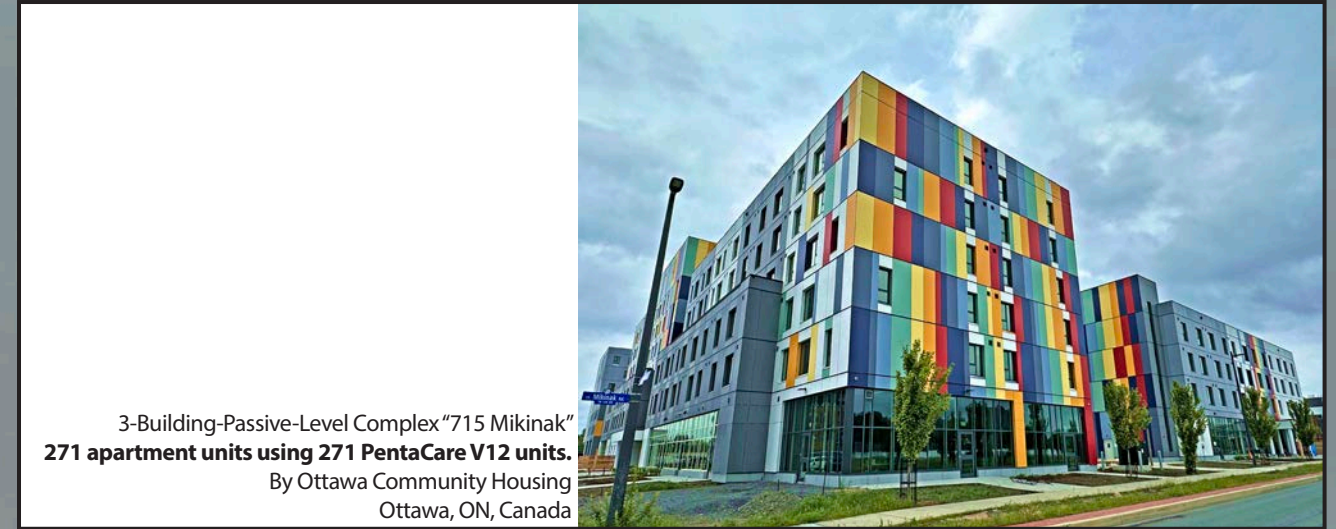
Deep-Energy Retrofit of 2 frat-houses
11 apartments using 11 PentaCare V12 units.
Harvard University
Cambridge, MA, USA

PentaCare V12 Compact Air Treatment Unit Series

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HERE ARE SOME OF OUR CUSTOMERS PROJETS

MULTIFAMILY - NEW CONSTRUCTION



3-Building-Passive-Level Complex "715 Mikinak"
271 apartment units using 271 PentaCare V12 units.
By Ottawa Community Housing
Ottawa, ON, Canada

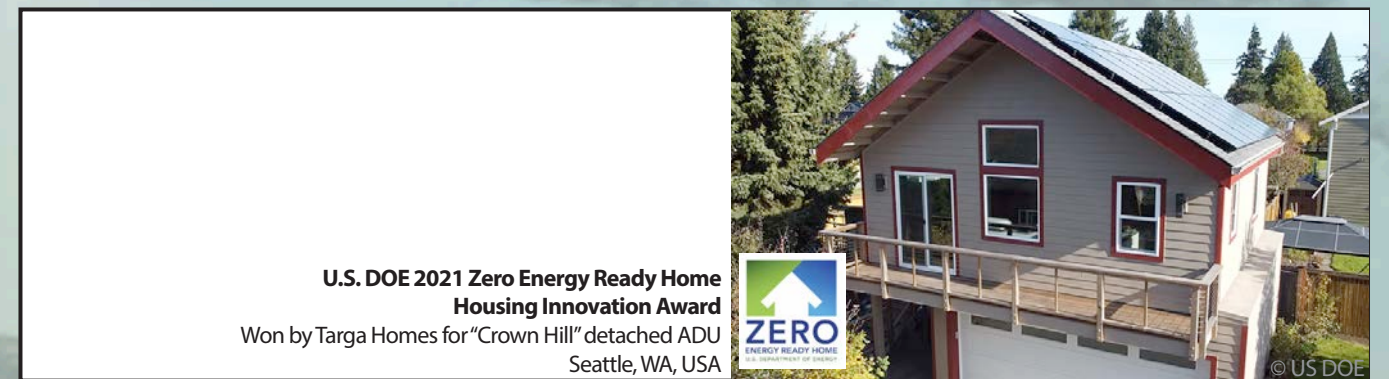
SINGLE FAMILY - NEW CONSTRUCTION



Green Builder Magazine 2021 Home of the Year Awards
Mainstream Green Category
Won by Celebration Green Design & Build for the
"Guildford Zero Energy Passive House"
Guildford, CT, USA





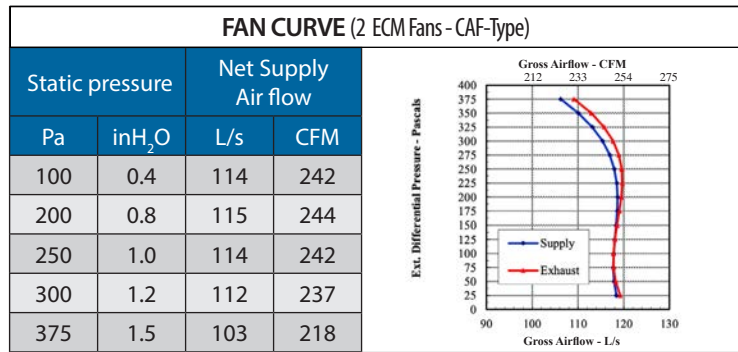
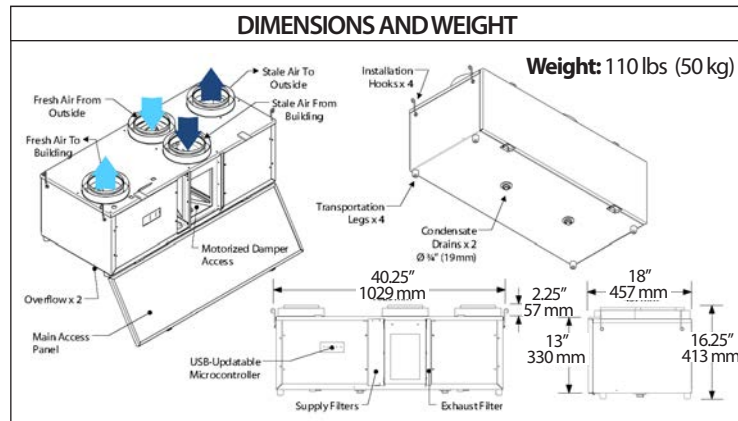
ACCESSORY DWELLING UNIT - NEW CONSTRUCTION



U.S. DOE 2021 Zero Energy Ready Home
Housing Innovation Award
Won by Targa Homes for "Crown Hill" detached ADU
Seattle, WA, USA



CERTIFICATIONS AND COMPLIANCE			
		ANSI/UL STD 1995 ASHRAE 62.1	CSA F326 PHIUS
		ASHRAE 62.2 2016 CAN/CSA 22.2 No 236	
		259823	CAN/CSA C439-18



COOLING + HEATING IN RECIRCULATION (Calculated using AHRI 210/240 Protocol)

Heat pump heating test conditions	BTU/H	COP	HSPF					
			Reg. I	Reg. II	Reg. III	Reg. IV	Reg. V	Reg. VI
Outdoor 47°F/43°F Indoor 70°F/60°F Airflow 250 CFM, 1 H ₂ O	8,740	3.0						
Outdoor 35°F/33°F Indoor 70°F/60°F Airflow 250 CFM, 1 H ₂ O	6,734	2.7	10.6	10.4	10.0	9.5	8.6	10.4
Outdoor 17°F/15°F Indoor 70°F/60°F Airflow 250 CFM, 1 H ₂ O	5,606	2.4						
Heat pump cooling test conditions	BTU/H	EER	SEER					
Outdoor 95°F/75°F Indoor 80°F/67°F Airflow 250 CFM, 1 H ₂ O	8,734	11.6	14.1					
Outdoor 82°F/65°F Indoor 80°F/67°F Airflow 250 CFM, 1 H ₂ O	9,005	13.4						

Electrical Specifications				Electronically Commutated Motor Fans [x2]			Fresh Air Range ASHRAE 62.2 & CSA F326 Compliant	Hermetic Rotary Compressor			Refrigerant
Tension	Phase/Hz	Circuit	Breaker	Power	FLA	Airflow Range		Power	RLA	LRA	R-410A
120 V	1/60	12.3 A	15 A	136 W max.	2 A	80-250 CFM ± 9 %	20-180 CFM	725 W	6.6 A	39 A	
Coils Filters rating		High Efficiency Filter rating		Casing		Color	Round Ports [x4]				
MERV 8 (EN G4)		HEPA MERV 15 (EN F9)		100% Aluminium		Glossy White	ø 6-8 in (150-200 mm)				

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SPECIFICATIONS

PentaCare V12[®] Compact Air Treatment Unit

VENTILATION/AIR EXCHANGE MODE: ENERGY PERFORMANCE

CAN/CSA-C439-18 Standard, results tested and verified by Element Lab and certified by HVI	Sensible Recovery Efficiency (SRE) "The Benchmark"	Adjusted Sensible Recovery Efficiency (ASRE) "Mostly used by PHIUS"	Apparent Sensible Effectiveness (ASE) "A.K.A. the thermal efficiency"
Certified + published online by HVI	YES	YES	No more published
Lab results from Element Lab	YES	YES	YES

HEAT RECOVERY PERFORMANCE (fresh air from outside)

°F	°C	CFM	L/s	%	%	%
32	0	97	46	129	133	196
32	0	242	114	85	92	113
-13	-25	100	47	68	69	95

CFM = Cubic Feet per Minute L/s = Liter per Second

MOISTURE REMOVAL (Calculated using AHAM DH-1 Protocol)

Test conditions	Gallons per day	Pints per day	Liters per day
Outdoor 80°F/60% RH Indoor 80°F/60% RH Airflow @ 180 CFM (in Cooling)	11	88	41

SOUND PRESSURE LEVELS (SPL)
(Measured 3.28 ft (1 m) away)

Test conditions with compressor ON and fully ducted	SPL
100 CFM @ 0.2 H ₂ O	35 dB(A)
150 CFM @ 0.3 H ₂ O	37 dB(A)
180 CFM @ 0.4 H ₂ O	39 dB(A)
250 CFM @ 0.7 H ₂ O	43 dB(A)

CANADA AND USA CUSTOMER SUPPORT

WWW.MINOTAIR.COM
INFO@MINOTAIR.COM
 TOLL FREE: 1.855.888.2292
 HEAD OFFICE: 1.819.777.2454

5-YEAR LIMITED WARRANTY
Please refer to the User Guide for more detail.