AllClimate

EnerGuide Rating System Energy Modelling

Required Documents

Architectural Drawings:
- ✓ Site Plan
- ✓ Elevation
- ✓ Floor plan
- ✓ Section

Assembly & connection details:
- ✓ Ceilings
- ✓ Exterior walls
- ✓ Tall walls (engineered)
- ✓ Headers / rim joists
- ✓ Exposed floors / cantilevers
- ✓ Foundation walls
- ✓ Foundation floor, walkout slab

Windows & doors:
- ✓ Supplier's window & door schedule
- ✓ U-values (metric)
- ✓ Solar het gain coefficient (SHGC)

Air Barrier: (state primary)
- Interior drywall?
- Exterior weather-resistive barrier (WRB)?
- Interior poly?

Ventilation System: (spec sheet of each)
- ✓ Energy/heat recovery ventilator (ERV/HRV)
- ✓ Kitchen range hood
- ✓ Exhaust fans

Heating/Cooling System: (spec sheet of each)
- ✓ Energy efficiency (AFUE%) and AHRI # of each
- ✓ Indoor unit: heat pump, furnace, or boiler
- ✓ Outdoor unit: heat pump or air-conditioning
- ✓ Ground-source heat pump system
- ✓ Radiant floor system
  - Is secondary HWT connected to boiler or DHW tank?
  - Indicate area this system heats (e.g. basement slab)
- ✓ Fireplace, stoves

Domestic Hot Water System: (spec sheet of each)
- ✓ Domestic hot water tank
- ✓ Recirculation pump (if any)
- ✓ Drain water heat recovery

Solar Photovoltaic System:
- ✓ Quote from solar PV installer

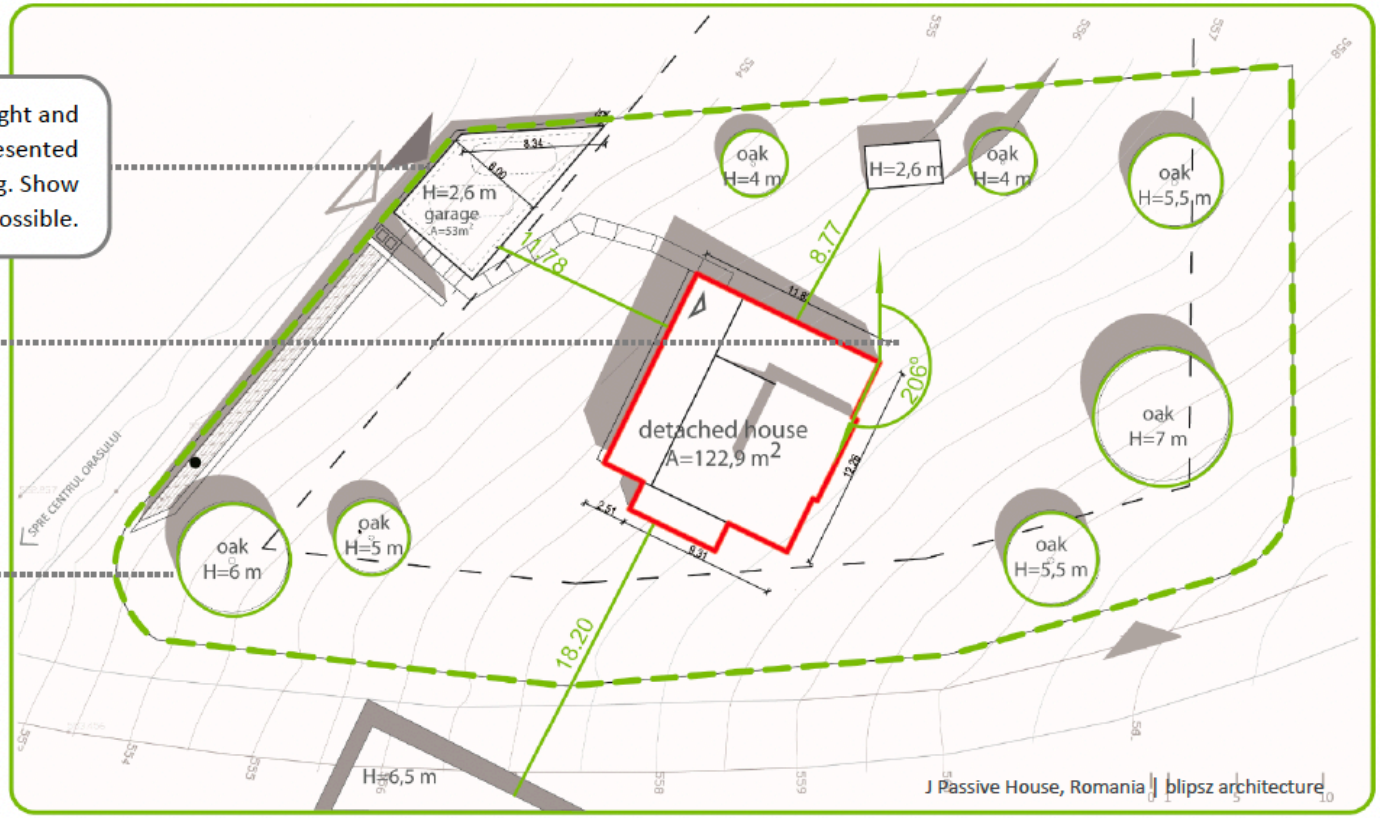
Site plan

Neighbouring buildings including their height and distance to the proposed building must be represented on the site plan if they shade the building. Show topography if possible.

Angle of deviation from North

Neighbouring vegetation or / and any other elements which shade the building, including height and type of vegetation (e.g. coniferous or deciduous) must also be shown

Graphic identification of the building envelope intended for certification



Scale:
1:200
Angle of deviation from North:
206°

Complete address:
Passive House str. 1
Passive City, 12345

Geographic coordinates:
44 °00`N, 25°30`E,
Height above the sea level:
+/-0.00=556.0m

Floor plan

Cross section

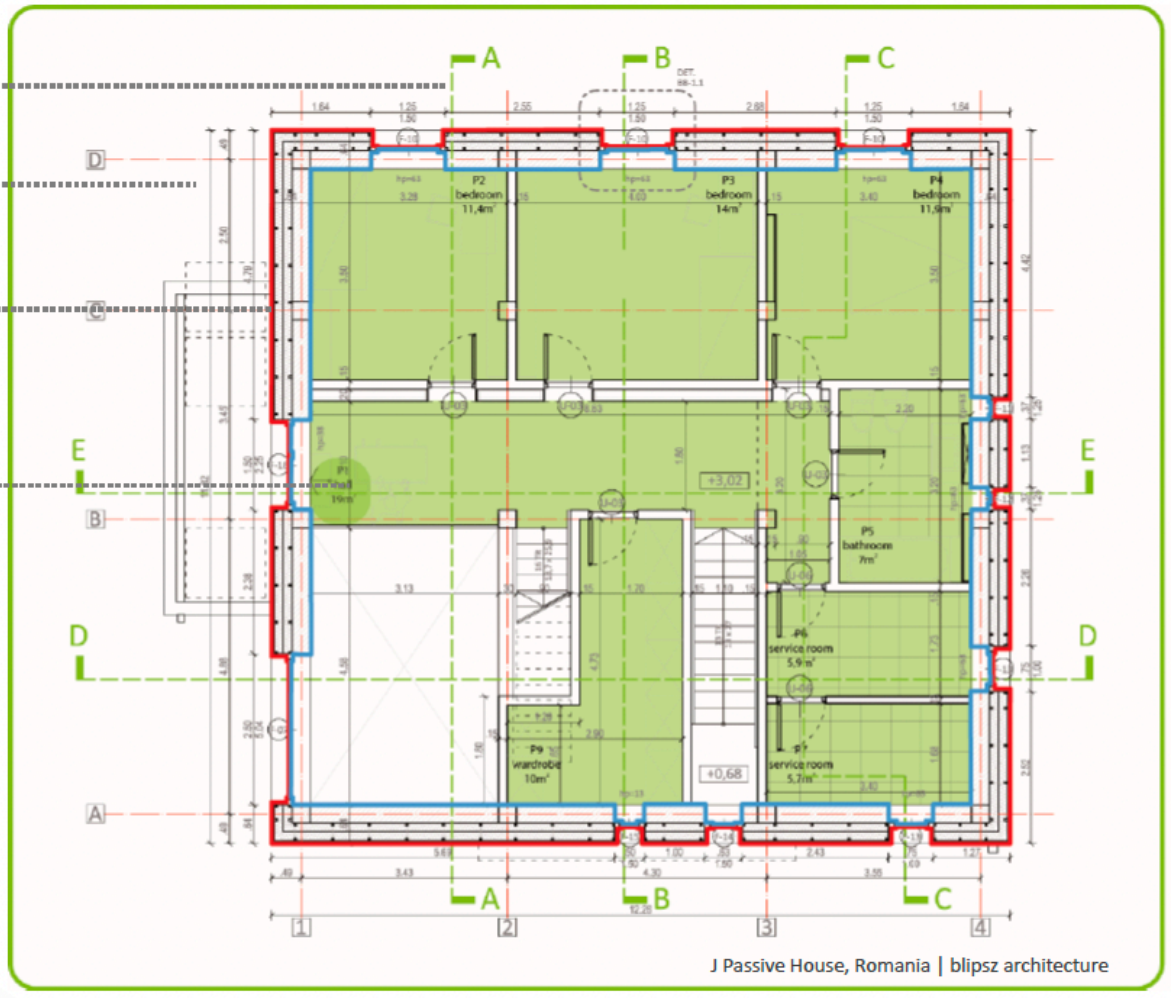
Dimensions

Clear and accurate representation of walls, windows, and doors

Graphic identification and calculation of each assigned TFA together with the surface calculated, and code names and the percentage used in the calculation

Graphic identification of areas where the room height is below 1 m or 2 m to support TFA calculation

Any unconditioned (i.e. non-heated) adjacent spaces must be marked and named accordingly



J Passive House, Romania | blipsz architecture

Scale:
1:50
or
1:100

Graphic identification and external dimensions of the thermal envelope

Graphic identification of the airtight layer

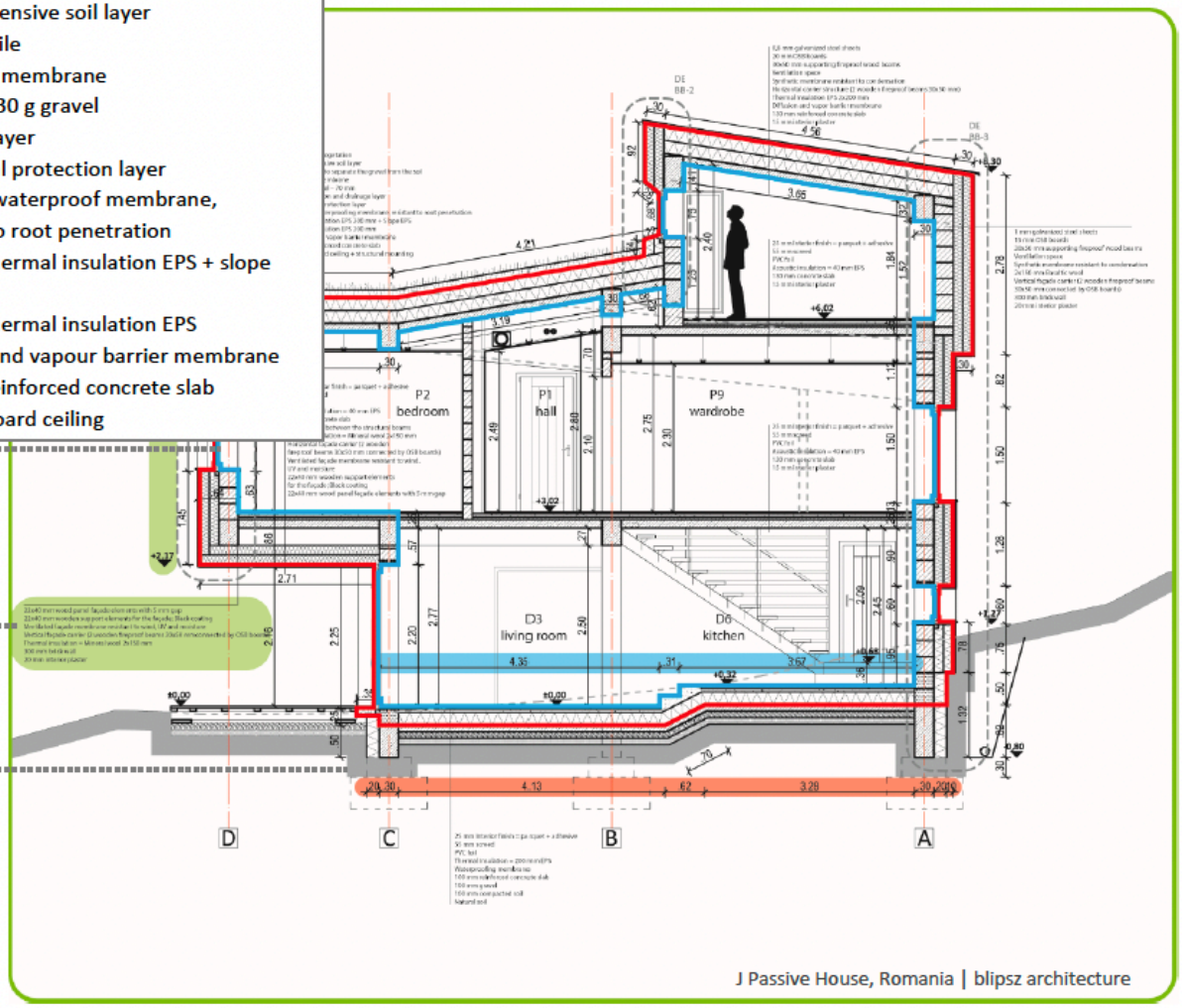
Section

Roof assembly 1 – Green roof
30 mm roof vegetation
40 mm extensive soil layer
Metal profile
Geotextile membrane
70mm 15-30 g gravel
Drainage layer
Mechanical protection layer
Synthetic waterproof membrane, resistant to root penetration
200 mm thermal insulation EPS + slope EPS
200 mm thermal insulation EPS
Diffusion and vapour barrier membrane
130 mm reinforced concrete slab
Gypsum board ceiling

Correct representation of walls, windows, doors, roofs, and floor

Description of each unique envelope assembly (including heterogeneous layers, e.g.: wood/insulation) with their features: manufacturer and product, thickness, thermal

Dimensions



J Passive House, Romania | blipsz architecture

Scale:
1:50
or
1:100

Graphic identification and external dimensions of the thermal envelope

Graphic identification of the airtight layer

Elevation

Show outdoor and exhaust air vents, grid types, distance from ground

Make sure to show clearly and to name any unheated adjacent rooms accordingly

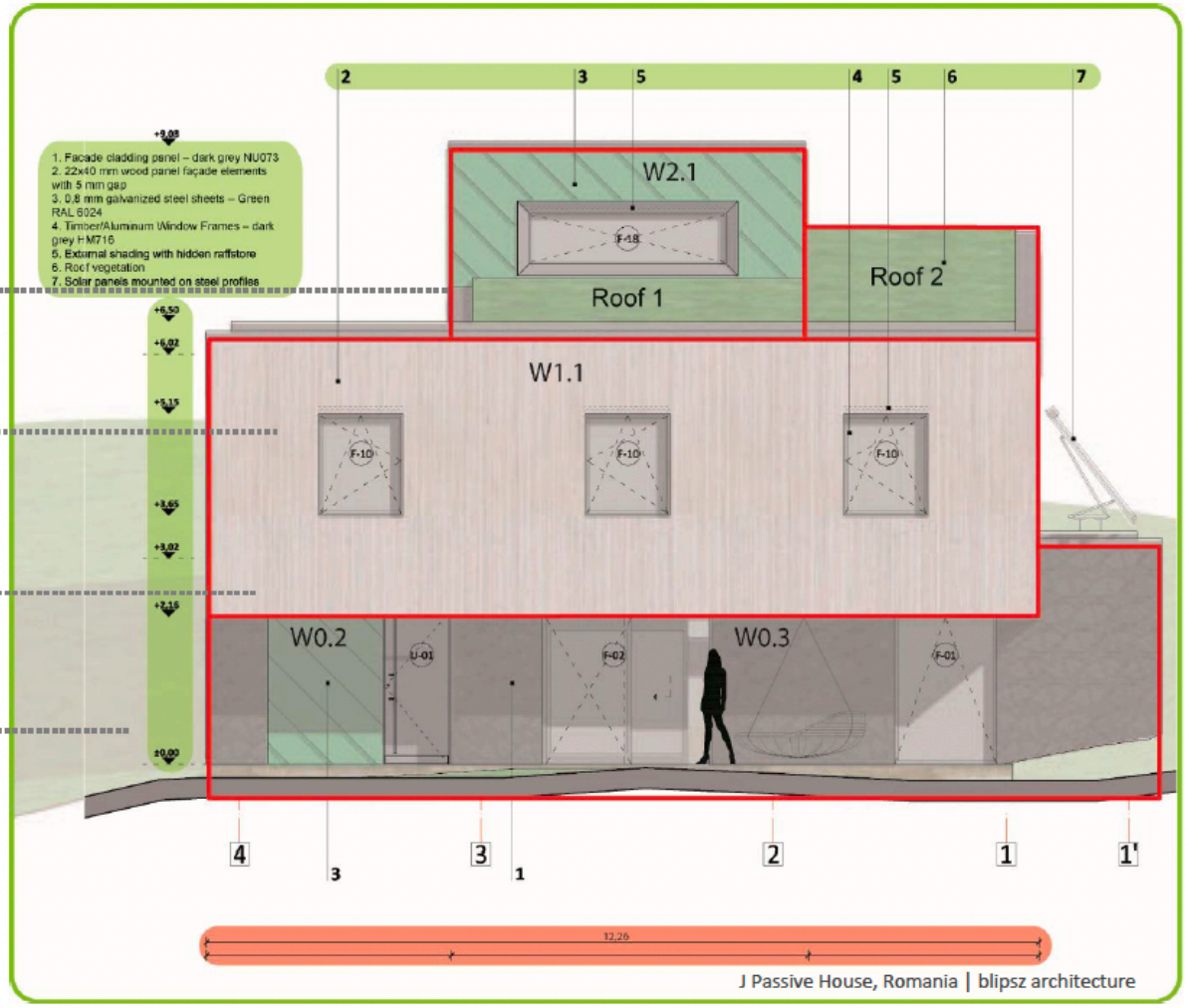
Show the different type of surfaces (e.g. cladding, stucco etc.)

Make sure to name all surfaces and windows using the same naming convention on the drawings, on the window schedule and in the PHPP

Correct representation of walls, windows, and doors

Make sure to show clearly the wall surfaces in contact with the ground as well as the ground line for semi-buried walls

Dimensions



Graphic identification and external dimensions of the thermal envelope

Scale:
1:50
or
1:100

Standard and connection details

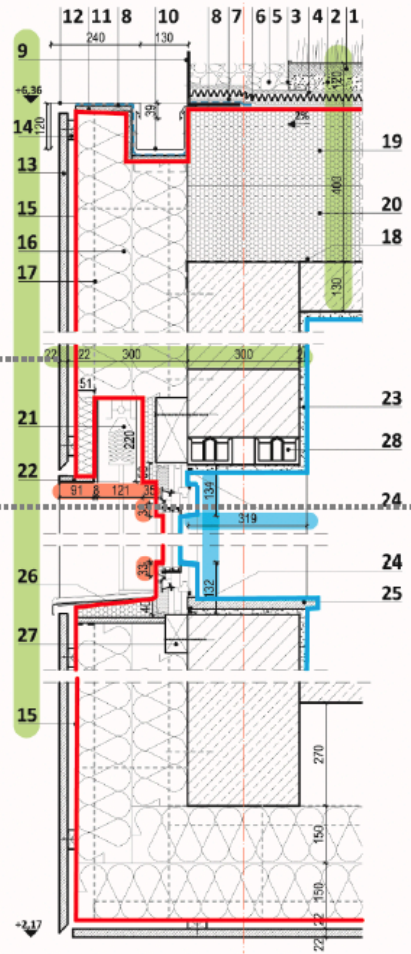
Detailed **construction drawings** should be prepared and submitted to the Certifier for **all** assemblies and connections of the building envelope. The thermal bridge details must be easily identifiable in the PHPP.

Thickness in mm of heterogeneous layers

Description of each component of the detail (incl. heterogeneous layers), product manufacturer and name, thickness [mm], thermal

For masonry/concrete materials:
a| resistance class
b| reinforcement degree
c| volume density

Scale:
1:5
or
1:10
or
1:20



1. 30 mm roof vegetation
2. 40 mm extensive soil layer
3. Metal profile to separate the gravel from the soil
4. Geotextile membrane
5. 70 mm 15-30 gr gravel
6. Water retention and drainage layer
7. Mechanical protection layer
8. Synthetic waterproofing membrane, resistant to root penetration
9. Perimetral plastic profile with side penetrations for drainage
10. 13x20 cm galvanized steel rectangular gutter
11. 15 mm OSB board
12. Drip edge - galvanized steel profile
13. 22x40 mm wood panel façade elements with 5 mm gap
14. 22x40 mm wooden support elements for the façade; Black coating
15. Ventilated façade membrane resistant to wind, UV and moisture
16. 2x150 mm thermal Insulation – Basalt wool
17. Vertical façade carrier (2 wooden fireproof beams 30x50 mm connected by OSB boards)
18. Diffusion and vapor barrier membrane
19. 200 mm thermal Insulation EPS + Slope EPS
20. 200 mm thermal Insulation EPS
21. External shading with hidden raff store
22. OSB + galvanized steel profile
23. Interior plaster applied until the concrete slab level
24. Window perimeter plaster, applied on airtight tape layer
25. 30 mm wooden interior window sill
26. Aluminum exterior window sill
27. 60x100 mm window footing wooden beam
28. Prefabricated lintel

J Passive House, Romania | blipsz architecture

Graphic identification and external dimensions of the thermal envelope

Graphic identification of the airtight layer

Window schedule

Make sure to use the same naming convention on the drawings and in the PHPP

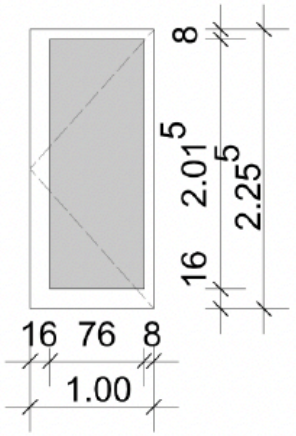
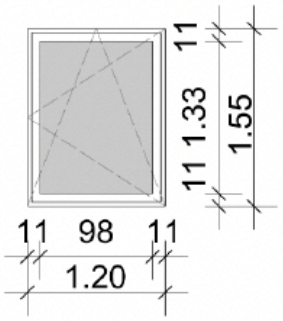
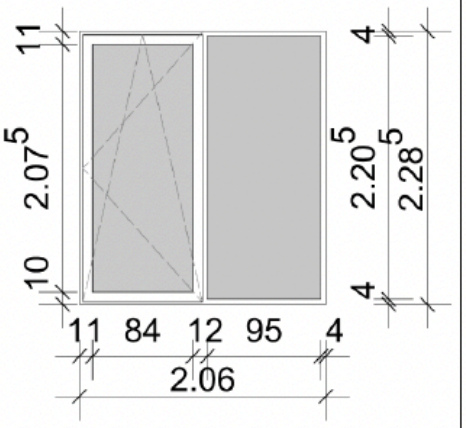
Dimensions

Type of glazing and frame (U-values, lambda)

Area

Materials

Scale: 1:50 or 1:100

Name	Door 1	Window 1	Window 2
Quantity	2	6	2
			
Dimensions	1 x 2.255 m	1.2 x 1.55 m	2.06 x 2.285 m
Area	2.255 m²	1.86 m²	4.707 m²
Glazing	„PH Glazing“	„PH Glazing“	„PH Glazing“
	U_g = 0.60 W/m²	U_g = 0.56 W/m²	U_g = 0.56 W/m²
	g-value= 0.55	g-value= 0.50	g-value= 0.50
Frame	„PH Frame, SWISSPACER Ultimate“	„PH Frame, SWISSPACER Ultimate“	„PH Frame, SWISSPACER Ultimate“
	U_f = 0.59 W/m²	U_f = 0.59 W/m²	U_f = 0.59 W/m²
	PU on wood	PU on wood	PU on wood
Facing frame width	L 0.16m; r 0.08m; t 0.08m; b 0.16m	L 0.11m; r 0.11m; t 0.11m; b 0.11m	L 0.11m; m 0.12m; r 0.04m; t 0.11m/0.04m; b 0.1m/0.04m
Glazing edge thermal bridge	$\Psi_{glazing\ edge}$ = 0.049 W/mK	$\Psi_{glazing\ edge}$ = 0.029 W/mK	$\Psi_{glazing\ edge}$ = 0.029 W/mK
Installation thermal bridge	$\Psi_{installation}$ = 0.02 W/mK	$\Psi_{installation}$ = 0.005 W/mK	$\Psi_{installation}$ = 0.005 W/mK

HEAT RECOVERY VENTILATOR
(SAMPLE DOC ONLY, NOT INTENDED AS RECOMMENDATION)

Features
- 6" (152mm) round metal duct connections with rubberized duct seals
- Removable screw terminal for easy connection with external access
- Top port design fits in tight spaces
- Includes wall mounting ***speed*** **bracket**
- Counterflow heat recovery core
- Multiple speed operation
- Internal recirculation defrost
- 59 lbs (26.55 kg) including core

Optional Controls:
- – Programmable Touch Screen Wall Control
- – Automatic IAQ Control
- – Electronic multi-function dehumidistat
- – Multi-function dehumidistat
- – Wireless 20/40/60 minute timer
- – 20 minute timer over-ride
- – 20/40/60 minute timer
- – 20/40/60 minute timer
- – Dehumidistat

Specifications
- Duct size – 6" (152 mm) round
- Voltage/Phase – 120/1
- Power rated – 210 W
- Amp – 2.0 A
- Average airflow – 203 cfm (96 L/s) @ 0.4 in. wg (100 Pa)

Fans
Two (2) factory-balanced fans with backward curved blades. Motors come with permanently lubricated, sealed ball-bearings to guarantee long life and maintenance-free operation.

Heat Recovery Core
Counterflow heat recovery exchanger built from thermoformed polymer plates covered by a limited lifetime warranty. Core dimensions are 14.4" x 14.4" (366 x 366 mm) with a 14" (355 mm) depth. Our heat exchangers are designed and manufactured to withstand extreme temperature variations.

Winterguard™ Defrost
The unit incorporates a unique and quiet internal recirculation defrost that does not depressurize the home during the defrost cycle. A preset defrost sequence is activated when the outdoor temperature falls below 23° F (-5° C) and automatically adjusts itself based on operating conditions. The fan speed is also adjusted automatically to provide a smooth and quiet transition between Ventilation & Defrost mode.

Serviceability
Core, filters, fans and electronic panel can be accesses easily from the access panel. Core conveniently slides out with only 16" (406 mm) clearance.

Duct Connections
6" (152mm) round metal duct connections with rubberized seal.

Case
22 gauge galvanized steel cabinet with a pre-painted steel corrosion resistant door.

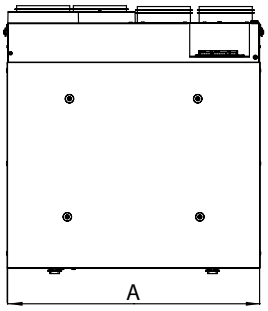
Insulation
Cabinet is fully insulated with 3/4" (20 mm) high density expanded polystyrene.

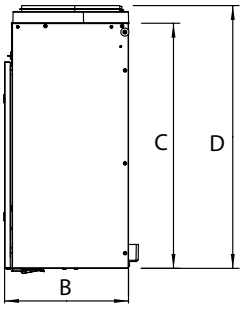
Filters
Two (2), UL900 Certified, washable electrostatic panel type air filters 7.87" (200 mm) x 13.77" (350 mm) x 0.125" (3 mm).

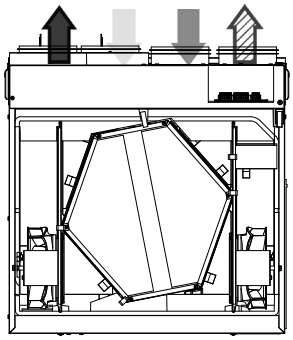
Balancing and commissioning
Balancing must be completed using the Programmable Touch Screen Wall Control.

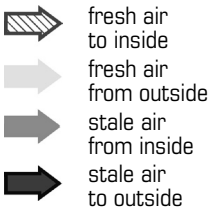
Warranty
Limited lifetime on counterflow exchanger, 7 year on motors, and 5 year on parts.

Dimensions & Airflow









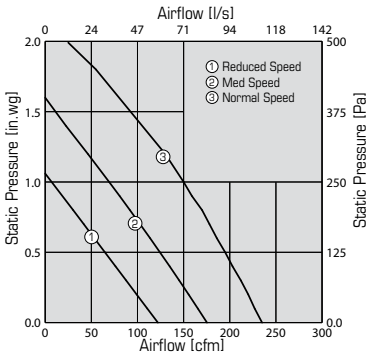
Model	A		B		C		D	
	in	mm	in	mm	in	mm	in	mm
	27 7/8	707	15 3/8	391	23	285	24 7/8	626

Dimensional information is in inches. Clearance of 16" (406 mm) in front of the unit is recommended for removal of core. All units feature three foot plug-in power cord with 3-prong plug.

Ventilation Performance

in. wg. (Pa)	0.2 (50)	0.3 (75)	0.4 (100)	0.5 (125)	0.6 (150)	0.7 (175)	0.8 (200)	0.9 (225)	1.0 (250)
	cfm (L/s)	cfm (L/s)	cfm (L/s)	cfm (L/s)	cfm (L/s)	cfm (L/s)	cfm (L/s)	cfm (L/s)	cfm (L/s)
Net supply airflow	220 (104)	212 (100)	203 (96)	195 (92)	186 (88)	178 (84)	170 (80)	159 (75)	150 (71)
Gross supply airflow	229 (108)	222 (105)	212 (100)	203 (96)	195 (92)	186 (88)	176 (83)	167 (79)	157 (74)
Gross exhaust airflow	239 (113)	229 (108)	218 (103)	208 (98)	197 (93)	186 (88)	176 (83)	165 (78)	153 (72)

[1] Balancing Range : 120 cfm (57 L/s) to 280 cfm (132 L/s) if a balanced flow outside the above range is required, please revisit our product offerings to ensure a properly sized unit is selected



Energy performance

Heating	Supply temperature		Net airflow		Consumed power	Fan efficacy	Sensible recovery efficiency	Adjusted Sensible recovery efficiency	Latent recovery/moisture transfer
	°F	°C	cfm	L/s	W	cfm/W	%	%	-
	32	0	85	40	98	0.8	80	88	0.00
	32	0	140	66	136	1.0	77	83	0.00
	32	0	195	92	192	1.0	74	81	0.00
	-13	-25	87	41	133	0.6	67	71	0.13

Requirements and standards

- Complies with the UL 1812 requirements regulating the construction and installation of Heat Recovery Ventilators
- Complies with the CSA C22.2 no. 113 Standard applicable to ventilators
- Complies with the CSA F326 requirements regulating the installation of Heat Recovery Ventilators
- Technical data was obtained from published results of test relating to CSA C439 Standards.
- HVI and ENERGY STAR® certified*

* This product earned the ENERGY STAR® by meeting strict efficiency guidelines set by Natural Resources Canada and the US EPA. It meets ENERGY STAR® requirements only when used in Canada.

HEAT RECOVERY VENTILATOR

(SAMPLE DOC ONLY, NOT INTENDED AS RECOMMENDATION)

Certificate of Product Ratings

AHRI Certified Reference Number : 123456789 **Model Status :** Active
Product : Water-to-Water and Brine-to-Water
Model Number : I **Brand Name :**

Rated as follows in accordance with ANSI/AHRI/ASHRAE/ISO Standard 13256-2: 1998 (RA 2012), Water-source heat pumps - Testing and rating for performance - Part 2: Water-to-water and brine-to-water heat pumps and subject to verification of rating accuracy by AHRI-sponsored, independent, third-party testing:

	Full Load	Part Load1	Part Load2	Part Load3
Air Flow Rate - Cooling:				
Air Flow Rate - Heating:				
WLHP (Water-Loop Heat Pumps)				
Cooling Capacity (Btuh)	69000/69000			
Cooling EER Rating (Btuh/watt)	14.60/14.60			
Cooling Fluid Flow Rate (gpm)	21.00			
Heating Capacity (Btuh)	96400/96400			
Heating Cop (watt/watt)	4.80			
Heating Fluid Flow Rate (gpm)	21.00			
GWHP (Ground Water-Heat Pumps)				
Cooling Capacity (Btuh)	72800/72800			
Cooling EER Rating (Btuh/Watt)	19.60/19.60			
Cooling Fluid Flow Rate (gpm)	21.00			
Heating Capacity (Btuh)	77600/77600			
Heating COP (watt/watt)	4.00/4.00			
Heating Fluid Flow Rate (gpm)	21.00			
GLHP (Ground -Loop Heat Pumps)				
Cooling Capacity (Btuh)	70700/70700			
Cooling EER Rating (Btuh/Watt)	16.40/16.40			
Cooling Fluid Flow Rate (gpm)	21.00			
Heating Capacity (Btuh)	60100/60100			
Heating COP (watt/watt)	3.20/3.20			
Heating Fluid Flow Rate (gpm)	21.00			

Indoor Blower Motor Fan Type : **Sold In? : USA, Canada**

†"Active" Model Status are those that an AHRI Certification Program Participant is currently producing AND selling or offering for sale; OR new models that are being marketed but are not yet being produced."Production Stopped" Model Status are those that an AHRI Certification Program Participant is no longer producing BUT is still selling or offering for sale.

Ratings that are accompanied by WAS indicate an involuntary re-rate. The new published rating is shown along with the previous (i.e. WAS) rating.

ᶠ This refers to the federal tax credit that may be known to consumers as "Inflation Reduction Act (IRA) of 2022 Tax Credit," "25D Tax Credit," or "Residential Clean Energy Credit." This is not intended to constitute tax or legal advice. Instead, it is for general informational purposes only. AHRI makes no representation or warranty, express or implied or assumes any legal liability or responsibility for the accuracy, completeness, any third party's use of, or the results of the use of potential eligibility for tax credit disclosed on the AHRI Directory of Certified Product Performance and AHRI Certificate of Product Ratings. Potential eligibility for tax credit may not constitute the most up to date information. AHRI is unable to advise or confirm tax credit eligibility. Individuals considering eligibility for the tax credit are advised to confirm eligibility with their equipment installers, tax attorneys, or preparers." is added following rerate definition.

CERTIFICATE NO.:

AIR SOURCE HEAT PUMP
(SAMPLE DOC ONLY, NOT INTENDED AS RECOMMENDATION)

Indoor Unit

Outdoor Unit

Remote Controller

Indoor Unit								
Outdoor Unit								
Cooling	Capacity	Rated [1]	BTU/H	6,000	9,000	12,000	15,000	17,200
	Capacity Range	Min-Max	BTU/H	1,700–9,000	1,700–12,000	2,500–13,600	6,450–19,000	6,450–21,000
	Power Input	Rated [1]	W	315	560	870	1,200	1,375
	Moisture Removal	Pints/h		0.2	0.6	1.9	4.0	4.8
	Sensible Heat Factor			0.960	0.920	0.830	0.700	0.690
Heating	Capacity at 47ºF	Rated [2]	BTU/H	8,700	10,900	13,600	18,000	20,300
	Capacity Range	Min-Max	BTU/H	1,600–14,000	1,600–18,000	3,700–21,000	5,150–24,000	5,150–30,000
	Power Input at 47ºF	Rated [2]	W	545	710	950	1,300	1,720
	Capacity at 17ºF	Rated [3]	BTU/H	5,900	6,700	8,000	11,000	13,700
		Max	BTU/H	10,700	12,200	13,600	18,000	20,300
	Capacity at 5ºF	Max [4]	BTU/H	8,700	10,900	13,600	18,000	20,300
Efficiency	SEER			33.1	30.5	26.1	22.0	21.0
	EER			19.1	16.1	13.8	12.5	12.5
	HSPF			13.5 (12.5)	13.5 (12.5)	12.5 (11.5)	12.0 (11.0)	12.0 (11.0)
	COP			4.68	4.5	4.2	4.06	3.46
	ENERGY STAR® Certified			Yes	Yes	Yes	Yes	Yes
Indoor Unit	Air Flow Rate - Cooling (Quiet-Lo-Med-Hi-SHi)	Dry	CFM	137–167–221–304–381	137–167–221–304–381	137–167–221–304–398	225–262–304–355–411	225–262–304–355–459
		Wet	CFM	117–143–190–261–328	117–143–190–261–328	117–143–190–261–342	194–225–261–305–354	194–225–261–305–395
	Air Flow Rate - Heating (Quiet-Lo-Med-Hi-SHi)	Dry	CFM	140–167–225–325–437	140–167–225–325–437	140–167–225–325–454	201–254–317–394–497	201–254–317–394–514
	Sound Pressure Level (Quiet-Lo-Med-Hi-SHi)	Cooling	dB(A)	20–23–29–36–40	20–23–29–36–40	21–24–29–36–41	27–31–35–39–44	27–31–35–39–47
		Heating	dB(A)	20–24–29–36–42	20–24–29–36–42	21–24–29–36–42	25–29–34–39–46	25–29–34–36–46
	External Static Pressure		In. W.G.	—	—	—	—	—
	Condensate Lift Mechanism	Max Distance	In. [mm]	—	—	—	—	—
	Dimensions	H	In. [mm]	12 (+11/16) [305 (+17)]	12 (+11/16) [305]	12 (+11/16) [305 (+17)]	12 (+11/16) [305 (+17)]	12 (+11/16) [305 (+17)]
		W	In. [mm]	36-7/16 [925]	36-7/16 [925]	36-7/16 [925]	36-7/16 [925]	36-7/16 [925]
		D	In. [mm]	9-3/16 [234]	9-3/16 [234]	9-3/16 [234]	9-3/16 [234]	9-3/16 [234]
	Weight	lbs [kg]		29 [13.5]	29 [13.5]	29 [13.5]	29 [13.5]	29 [13.5]
Outdoor Unit	MCA	A		11.0	11.0	11.0	16.0	16.0
	MOCP	A		15	15	15	20	20
	Dimensions	H	In. [mm]	21-5/8 [550]	21-5/8 [550]	21-5/8 [550]	34-5/8 [880]	34-5/8 [880]
		W	In. [mm]	31-1/2 [800]	31-1/2 [800]	31-1/2 [800]	33-1/16 [840]	33-1/16 [840]
		D	In. [mm]	11-1/4 [285]	11-1/4 [285]	11-1/4 [285]	13 [330]	13 [330]
	Weight	lbs [kg]		81 [37]	81 [37]	83 [38]	124 [56]	124 [56]
	Air Flow Rate (Cooling/Heating)	CFM		1074/1202	1074/1202	1074/1202	1692/1634	1692/1634
	Sound Pressure Level	Cooling	dB(A)	47	48	49	51	52
		Heating	dB(A)	48	49	51	55	55
Piping	Diameter	Gas (O.D.)	In. [mm]	1/4 [6.35]	1/4 [6.35]	1/4 [6.35]	1/4 [6.35]	1/4 [6.35]
		Liquid (O.D)	In. [mm]	3/8 [6.35]	3/8 [6.35]	3/8 [6.35]	1/2 [12.7]	1/2 [12.7]
		Indoor Drain	In. [mm]	5/8 [15.88]	5/8 [15.88]	5/8 [15.88]	5/8 [15.88]	5/8 [15.88]
	Max. Length	ft [m]		65 [20]	65 [20]	65 [20]	100 [30]	100 [30]
	Max. Height	ft [m]		40 [12]	40 [12]	40 [12]	50 [15]	50 [15]
Electrical	Outdoor-Indoor [5]	V, ph, Hz		208/230, 1, 60	208/230, 1, 60	208/230, 1, 60	208/230, 1, 60	208/230, 1, 60
	Recommended Breaker Size	A		15	15	15	20	20
Refrigerant Type				R410A	R410A	R410A	R410A	R410A
Guaranteed Temperature Operation Range	Cooling [6]	ºF DB [ºC DB]		14.0 to 115.0 [-10.0 to 46.0]	14.0 to 115.0 [-10.0 to 46.0]	14.0 to 115.0 [-10.0 to 46.0]	14.0 to 115.0 [-10.0 to 46.0]	14.0 to 115.0 [-10.0 to 46.0]
	Heating	ºF DB [ºC DB]		-13.0 to 75.0 [-25.0 to 24.0]	-13.0 to 75.0 [-25.0 to 24.0]	-13.0 to 75.0 [-25.0 to 24.0]	-13.0 to 75.0 [-25.0 to 24.0]	-13.0 to 75.0 [-25.0 to 24.0]

Notes:

AHRI Rated Conditions (Rated data is determined at a fixed compressor speed) Conditions

[1]Cooling (Indoor // Outdoor) °F 80 DB, 67 WB // 95 DB, 75 WB

[2]Heating at 47°F (Indoor // Outdoor) °F 70 DB, 60 WB // 47 DB, 43 WB

[3]Heating at 17°F (Indoor // Outdoor) °F 70 DB, 60 WB // 17 DB, 15 WB

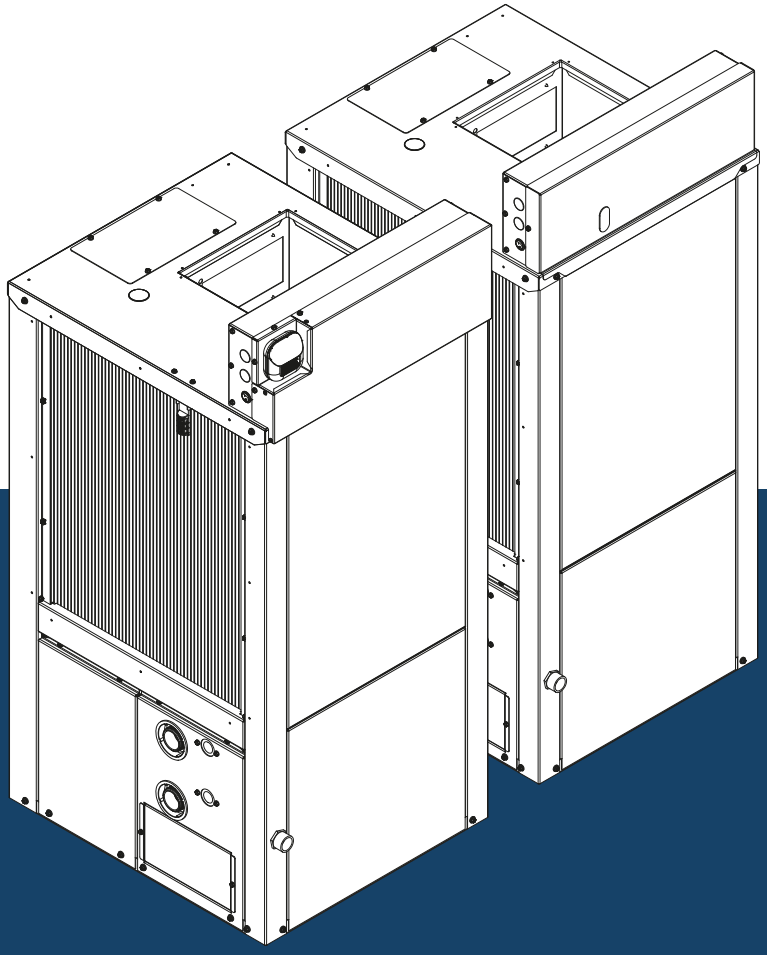
[4]Heating at 5°F (Indoor // Outdoor) °F 70 DB, 60 WB // 5 DB, 4 WB

[5]Indoor units receive power from outdoor units through field-supplied interconnected wiring.

[6]Applications should be restricted to comfort cooling only; equipment cooling applications are not recommended for low ambient temperature conditions.

GROUND SOURCE HEAT PUMP

(SAMPLE DOC ONLY, NOT INTENDED AS RECOMMENDATION)



Multi-Positional Vertical Packaged

2-STAGE GEOTHERMAL SYSTEM

Most Efficient 2024
ENERGY STAR
www.energystar.gov

GROUND SOURCE HEAT PUMP

(SAMPLE DOC ONLY, NOT INTENDED AS RECOMMENDATION)

Compatibility is central to It works with most pre-existing 24 VAC heat pump thermostats and current WiFi network.

A simple, guided setup process ensures that error is minimized and significantly expedites the installation process.

Access to over-the-air updates ensures that each component is future-proofed and running with the latest software.

Energy monitoring offers unprecedented transparency into the performance of the unit, while diagnostic tools give the dealer valuable insight into potential operational issues.

View unit performance data on virtually any device using myUplink Pro on desktop, tablet, or your mobile device.

Capacity and Efficiency Ratings

GROUND LOOP HEAT PUMP

Model	Capacity	Cooling		Heating	
		BTU/H	EER	BTU/H	COP
	Full Load	26,500	21.1	18,000	4.4
	Part Load	20,100	31.4	14,800	5.1
	Full Load	39,700	21.0	27,900	4.3
	Part Load	30,400	29.5	23,000	4.9
	Full Load	51,900	19.2	36,700	4.1
	Part Load	39,100	26.6	29,000	4.6
	Full Load	63,100	18.7	49,100	4.0
	Part Load	47,700	26.4	38,300	4.5
	Full Load	70,300	17.1	57,800	3.8
	Part Load	55,900	23.9	46,600	4.4

Certified in accordance with ISO Standard 13256-1 which includes pump penalties. Heating capacities based on 68.0°F DB, 59.0°F WB entering air temperature. Cooling capacities based on 80.6°F DB, 66.2°F WB entering air temperature. Entering water temperatures Full Load: 32°F heating / 77°F cooling. Entering water temperatures Part Load: 41°F heating / 68°F cooling.

Unit Information

Model	W	D	H	Weight (lbs)
	23.0"	26.5"	46.0"	300
	25.4"	30.5"	54.0"	415
	25.4"	30.5"	54.0"	450
	25.4"	30.5"	58.4"	475
	25.4"	30.5"	58.4"	480

Physical dimensions exclude control box and return/discharge air duct flanges

Available Cabinet Finishes:

Carbon Grey with Stainless Steel Front Panel
Residential Models

Galvanized
Commercial Series only

Available Voltages

208/230V, 60Hz, 1Ph/3Ph
460V, 60Hz, 3Ph

of right hand return air with minimal effort and tools.

Factory installed desuperheater (hot water generator) allows the capture of free unused heat, which is used to heat domestic water. This application can cut hot water costs 25% - 40%.

Front or rear connection points for condensate drain allow for field conversion, making installation easier.

Next generation **2-stage scroll compressor** allows the unit to match itself to the weather to deliver the best comfort at very high efficiencies.

The **composite anti-microbial drain pan** won't rust or corrode, while a **condensate overflow sensor** guards against clogged condensate drains.

The TXV **(thermal expansion valve)** and **filter drier** are located together in the air handler section to ensure easy access if service is required.

Improved **blower mount** allows for air discharge flexibility. Structural enhancements help reduce transportation stress. A removable **venturi ring** allows for easy maintenance of blower motor.

An optional electric **auxiliary heater** provides back-up heat in emergencies and on extremely cold days.

Side or back discharge factory option for added installation flexibility.

Meets ENERGY STAR® requirements and qualifies for the US 30% federal tax credit. Other rebates and incentives may be available in your area.

ENERGY STAR

BOILER

(SAMPLE DOC ONLY, NOT INTENDED AS RECOMMENDATION)

Technical Data Manual

Model Nos. and pricing: see Price List

(with preinstalled coaxial vent pipe adaptor)

Gas-Fired Wall-Mounted Condensing Boiler
with modulating stainless steel MatriX cylinder burner and stainless steel Inox-Radial heat exchanger for room air independent operation (using a direct vent system) or room air dependent operation

BOILER

(SAMPLE DOC ONLY, NOT INTENDED AS RECOMMENDATION)

Technical Data

Boiler Model	Model No.		Standard heating boiler
Natural gas and LPG			
CSA input	MBH	37-91	37-118
	kW	10.8-26.7	10.8-34.6
CSA output/DOE *1	MBH	34-83	34-108
heating capacity	kW	9.9-24.3	9.9-31.6
Net I=B=R rating *2	MBH	72	94
Heat exchanger surface area	$ft.^2$	10.23	10.23
	m^2	0.86	0.86
Min. gas supply pressure			
Natural gas	"w.c.	4	4
LPG	"w.c.	10	10
Max. gas supply pressure *3			
Natural gas and LPG	"w.c.	14	14
A.F.U.E.	%	94.0	94.0
Weight	lbs	78	78
	kg	34.1	34.1
Shipping weight	lbs	95	95
	kg	43	43
Boiler water content	USG	0.87	0.87
	ltr	3.3	3.3
Boiler max. flow rate *4	GPM	6.2	6.2
	ltr/h	1400	1400
Max. operating pressure	psig	45	45
at 210°F / 99°C	bar	3	3
Boiler water temperature			
– Adjustable high limit (AHL) range			
– space heating (steady state)	°F / °C	86 to 176 / 30 to 80	
– DHW production (set-point)	°F / °C	172 / 78	
– Fixed high limit (FHL)	°F / °C	210 / 99	
Boiler connections			
Boiler heating supply and return	NPTM (male) "	¾	¾
Pressure relief valve	NPTF (female) "	¾	¾
Drain valve	(male thread)	¾	¾
Dimensions			
Overall depth	inches	$14\frac{1}{8}$	$14\frac{1}{8}$
	mm	360	360
Overall width	inches	15¾	15¾
	mm	400	400
Overall height	inches	28½	28½
	mm	725	725

*1 *Output based on 140°F / 60°C, 120 °F / 49°C system supply/return temperature.*

*2 *Net I=B=R rating based on piping and pick-up allowance of 1.15.*

*3 *If the gas supply pressure exceeds the maximum gas supply pressure value, a separate gas pressure regulator must be installed upstream of the heating system.*

*4 *See "Maximum Flow Rates" on pages 15 to 17 in this manual.*

FURNACE
(SAMPLE DOC ONLY, NOT INTENDED AS RECOMMENDATION)

PRODUCT SPECIFICATIONS — GAS FURNACE

LIMITED PARTS 10-YEAR WARRANTY

CONFIGURATIONS
- Upflow/Horizontal
- Downflow

HEAT EXCHANGER DESIGN
- Aluminized steel design primary heat exchanger with crimped no weld construction
- AL 29-4C Stainless steel secondary heat exchanger

BURNER
- Aluminized steel inshop burners for smooth fit

CABINET DESIGN
- Compact 33" height
- Standardized widths for easy coil fit

AIR DELIVERY SYSTEM
- Multi-speed PSC blower motor
- Easily removable slide-out blower design

CONTROLS
- Single Stage Gas Valve
- Self diagnostics saves last 5 fault codes regardless of power interruption
- Control features electronic air cleaner and humidifier terminals

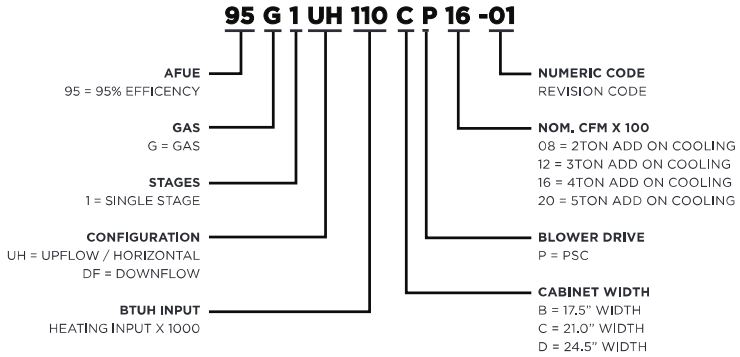
VENTING
- Designed certified for direct and non direct applications

INSTALLATION FEATURES
- Left or right utility connection
- Designed certified for direct and non-direct vent applications
- Zero step horizontal conversion
- Removable floor base for bottom return air

WARRANTY
10 year limited parts warranty / lifetime heat exchanger warranty available. See limited warranty document for details.

FURNACE
(SAMPLE DOC ONLY, NOT INTENDED AS RECOMMENDATION)

MODEL NUMBER GUIDE



PHYSICAL AND ELECTRICAL DATA

	Model	Input (Btuh)	Output (Btuh)	AFUE (ICS)	Nom. Cooling Capacity	Gas Inlet (in.)	Volts/ Hz/ Phase	Max. Time Delay Breaker or Fuse	Nominal F.L.A.	Trans. (V.A.)	Approx. Shipping Weight (lbs.)
UPFLOW / HORIZONTAL		44,000	41,000	95.0%	1.5 - 2	1/2	120 - 60 - 1	15	3.1	40	121
		44,000	42,000	95.0%	2 - 3	1/2	120 - 60 - 1	15	6.1	40	123
		66,000	64,000	95.0%	2 - 3	1/2	120 - 60 - 1	15	6.1	40	128
		88,000	85,000	95.0%	2 - 3	1/2	120 - 60 - 1	15	6.1	40	145
		88,000	85,000	95.0%	3 - 4	1/2	120 - 60 - 1	15	8.2	40	148
		110,000	106,000	95.0%	3 - 4	1/2	120 - 60 - 1	15	8.2	40	157
		110,000	106,000	95.0%	4 - 5	1/2	120 - 60 - 1	15	10.0	40	163
		132,000	126,000	95.0%	4 - 5	1/2	120 - 60 - 1	15	10.0	40	180
DOWNFLOW		44,000	42,000	95.0%	2 - 3	1/2	120 - 60 - 1	15	6.1	40	125
		66,000	64,000	95.0%	2 - 3	1/2	120 - 60 - 1	15	6.1	40	129
		88,000	85,000	95.0%	4 - 5	1/2	120 - 60 - 1	20	11.5	40	148
		110,000	106,000	95.0%	4 - 5	1/2	120 - 60 - 1	20	11.5	40	165

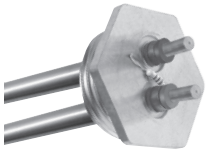
Note: For vent length and clearances to combustibles, please reference installation instructions.

DOMESTIC HOT WATER
(SAMPLE DOC ONLY, NOT INTENDED AS RECOMMENDATION)

Professional *Classic*® electric water heaters are engineered for longer life – resistored heating elements and premium grade anode rod

Efficiency

- .90 - .93 UEF
- Isolated tank design reduces conductive heat loss
- Resistored stainless steel upper and lower heating elements to prolong anode rod and tank life



Performance

- FHR: 44 - 72 gallons, based on gallon capacity
- Recovery: 21 GPH at a 90° F rise†

Longer Life

- Premium grade anode rod provides long-lasting tank protection

Features

- Electric junction box located above heating elements for easy installation
- Over-temperature protector cuts off power in excess temperature situations
- Automatic thermostat keeps water at desired temperature

Plus…

- tank lining resists corrosion and prolongs tank life
- helix diffuser reduces sediment improving tank life and efficiency

- Enhanced-flow brass drain valve
- Temperature and pressure relief valve included
- Models are compliant to HUD Standards for manufactured housing and modular construction
- Low lead compliant

Warranty

- 6-Year limited tank and parts warranty*
- With ProtectionPlus™ the 6-year limited tank warranty becomes 10-year

*See Residential Warranty Certificate for complete information

Units meet or exceed ANSI requirements and have been tested according to the AHRI Operations Manual and D.O.E. procedures. Units meet or exceed the energy efficiency requirements of NAECA, ASHRAE standard 90, ICC Code and all state energy efficiency performance criteria.

Professional *Classic*
19.9 to 55-Gallon Capacities
240 Volt AC/Single Phase
Double and Single Element Models
Electric

See specifications chart on back.

DOMESTIC HOT WATER
(SAMPLE DOC ONLY, NOT INTENDED AS RECOMMENDATION)

Professional *Classic*® Specifications

DESCRIPTION				FEATURES		ROUGHING IN DIMENSIONS (SHOWN IN INCHES)				ENERGY INFO.
TYPE	NOMINAL GALLON CAPACITY	RATED GALLON CAPACITY	MODEL NUMBER	FIRST HOUR RATING (GALLONS)	RECOVERY IN G.P.H. 90° F RISE	TANK HEIGHT A	HEIGHT TO WATER CONN. B	DIAMETER C	APPROX. SHIP WT. (LBS.)	UNIFORM ENERGY FACTOR (UEF)
Tall	30	27		44	21	47-1/2	50-3/8	19	92	0.92
Tall	40	36		55	21	60-3/4	63-5/8	19-1/4	109	0.93
Tall	50	45		63	21	58-5/8	61-5/8	20-1/4	121	0.93
Tall	55	55		72	21	57	59-3/4	22-1/4	128	0.92
Med.	30	27		45	21	37-1/2	40-1/2	20-1/4	92	0.90
Med.	40	36		55	21	48-1/4	50-1/2	20-1/4	106	0.93
Med.	50	45		62	21	48	50-1/2	23	132	0.93
Short	19.9	–		–	21	31-1/2	31-1/2	17	62	–
Short	28	25		45	21	30	31-1/8	23	95	0.92
Short	28	26		45	21	30	32-1/4	19-3/4	95	0.92
Short	36	33		46	21	31-1/2	33	24-1/4	118	0.92
Short	38	35		51	21	31-1/2	34	23	108	0.92
Short	47	43		54	21	32	34	26-1/4	149	0.93

Uniform Energy Factor and rated gallon capacity based on Department of Energy (DOE) requirements.

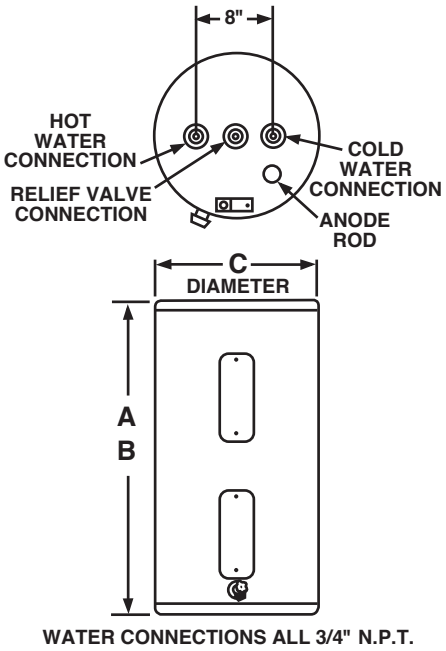
*Insulation blanket(s) required to achieve UEF value. Water heater dimensions prior to installing insulation blanket(s). Blanket(s) will be included with water heater. The blanket(s) add 2-1/2 inches to the tank height and 5 inches to tank diameter.

**Insulation blanket(s) required to achieve UEF value. Water heater dimensions prior to installing insulation blanket(s). Blanket(s) will be included with water heater. The blanket(s) add 2 inches to the tank height and 4 inches to tank diameter.

- Heaters furnished with standard 240 volt AC, single phase non-simultaneous wiring, and 4500 watt upper and lower heating elements.
- **If heating elements of different wattages than those shown are demanded by zone requirements, they must be specifically requested.**
- Single element models available on special order (6000W max.). Substitute "1" for "2" in model number.
- Special Wiring Options – A limited number of special wiring options are available. Consult factory for price and availability.
- All models equipped with heat traps.

†Recovery = wattage/2.42 x temp. rise °F.
Example: $\frac{4500W}{2.42 \times 90°}$ = 21 GPH

†Recovery calculations used are based on 4500 watt elements used in non-simultaneous operation.



WATER CONNECTIONS ALL 3/4" N.P.T.

In keeping with its policy of continuous progress and product improvement, Rheem reserves the right to make changes without notice.

SOLAR PV SYSTEM
(SAMPLE DOC ONLY, NOT INTENDED AS RECOMMENDATION)

Solar System Technical Details

Name:
Contact:
Address:
Install Date:

Hi, we have put together some technical details of your solar system for you in the table below. In case you need this information for any future purposes. Like the MB Efficiency Solar Rebate Application, and the Greener Homes grant requires this information upon submission. You can keep this form in your archives or records..

Solar PV System Information DC/AC

Total DC Output: 9.23kW	**Total AC Output:** 8.32kW-AC

Module Information

Module Make:		**Module Model:**	
Module Type: Monocrystalline		**Number of Modules:** 26	**DC Power Rating (watts):** 355W

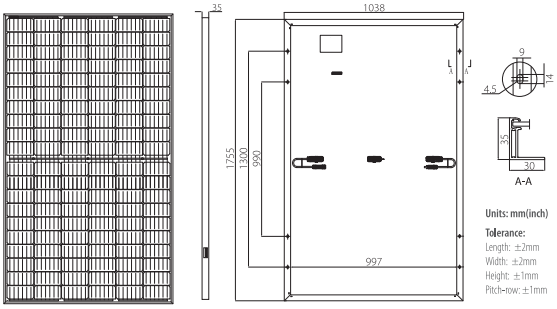
Orientation (degrees): 125, 179		**Shading:** 0.7%	
Tilt (degrees): 41	**Battery System (Y/N):** No	**Battery Size(kWh):** N/A	
Misc Array Losses: 12.2%	**Module Efficiency:** 19.5%	**Normal Cell Operating Temp:** 45+2°C	**Temp Coeffient Efficiency:** -0.350%/°C
PV System Monitoring (Y/N): Yes	**Grid Absorption Rate:** 99%		
Array Type (1-axis-tracking, 2-axis tracking, fixed (building integrated), fixed (open rack), fixed (roof mount) : Fixed (roof mount)			

Inverter Information

Inverter Make:		**Inverter Model:**	
Inverter Type: Micro-Inverter	**Inverter Efficiency:** 97%	**Number of Inverters:** 13	**Expected Max AC Output(kW):** 8.32k

SOLAR PV SYSTEM
(SAMPLE DOC ONLY, NOT INTENDED AS RECOMMENDATION)

Design （mm）



Mechanical Parameters

Cell Orientation: 120（6×20）
Junction Box: IP68, three diodes
Output Cable: 4mm², 300mm in length, length can be customized
Glass: Single glass 3.2mm coated tempered glass
Frame: Anodized aluminum alloy frame
Weight: 19.5kg
Dimension: 1755×1038×35mm
Packaging: 30pcs per pallet 180pcs per 20'GP 780pcs per 40'HC

Operating Parameters

Operational Temperature: -40℃~+85℃
Power Output Tolerance: 0~+5 W
Voc and Isc Tolerance: ±3%
Maximum System Voltage: DC1000V (IEC/UL)
Maximum Series Fuse Rating: 20A
Nominal Operating Cell Temperature: 45±2℃
Safety Class: Class Ⅱ
Fire Rating: UL type 1 or 2

Electrical Characteristics

Test uncertainty for Pmax: ±3%

Model Number												
Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)	345	255.6	350	259.3	355	263.0	360	266.7	365	270.4	370	274.1
Open Circuit Voltage (Voc/V)	40.2	37.5	40.4	37.7	40.6	37.9	40.8	38.1	41.0	38.3	41.2	38.5
Short Circuit Current (Isc/A)	11.06	8.92	11.16	8.99	11.25	9.06	11.33	9.13	11.41	9.20	11.50	9.27
Voltage at Maximum Power (Vmp/V)	34.2	31.6	34.4	31.8	34.6	32.0	34.8	32.1	35.0	32.3	35.2	32.5
Current at Maximum Power (Imp/A)	10.09	8.09	10.18	8.16	10.27	8.23	10.35	8.30	10.43	8.36	10.52	8.43
Module Efficiency(%)	18.9		19.2		19.5		19.8		20.0		20.3	

STC (Standard Testing Conditions): Irradiance 1000W/m², Cell Temperature 25℃, Spectra at AM1.5

NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m², Ambient Temperature 20℃, Spectra at AM1.5, Wind at 1m/S

Temperature Ratings（STC）

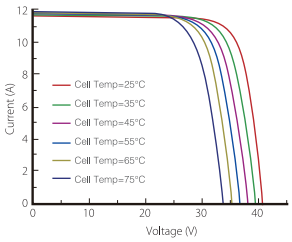
Temperature Coefficient of Isc	+0.048%/℃
Temperature Coefficient of Voc	-0.270%/℃
Temperature Coefficient of Pmax	-0.350%/℃

Mechanical Loading

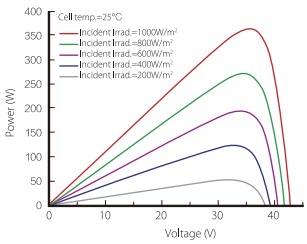
Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Hailstone Test	25mm Hailstone at the speed of 23m/s

I-V Curve

Current-Voltage Curve



Power-Voltage Curve



Current-Voltage Curve