GHT SOLUTIONS

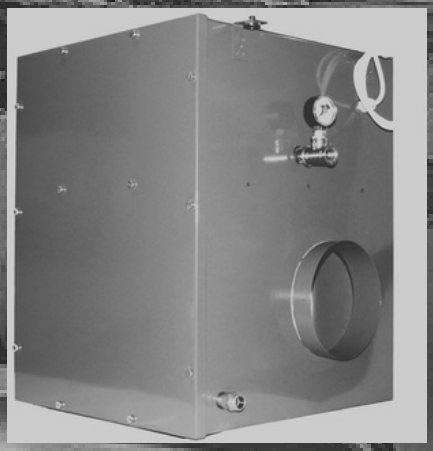
Technical Information

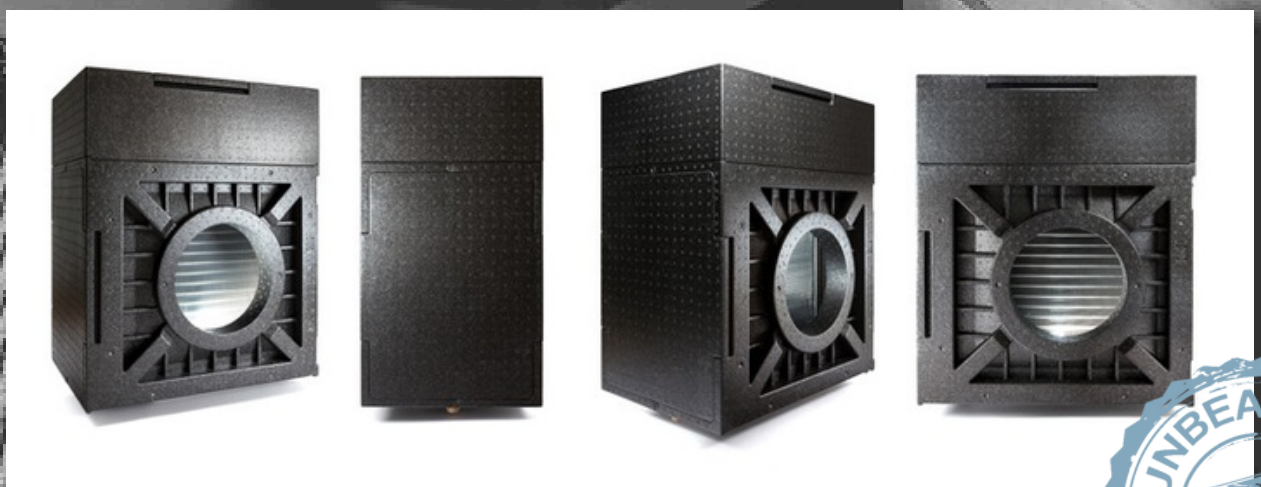
Evolution

Over two years leading up to 2014, we focused on research and development, which led to the advanced technology in our GHT unit.

GHT stands for Geothermal Technology and represents a top-tier pre-heater/ cooler for HRV/ERVs.

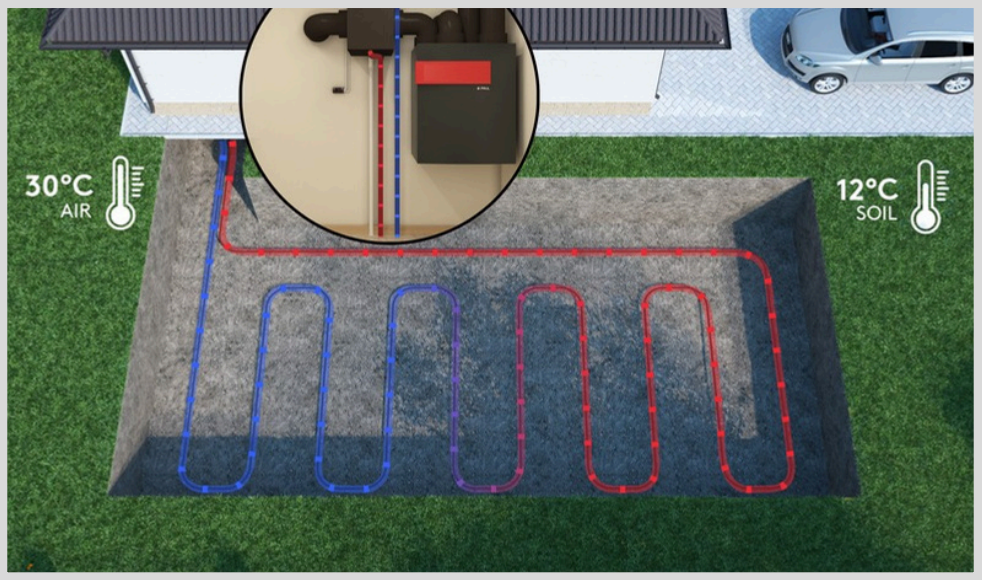
Steel box designing into thermal bridge free EPP enclousure. This evolution has resulted in a lighter, better-insulated, and more efficient solution, making our GHT unit stand out in the market.





Technology

SUMMER

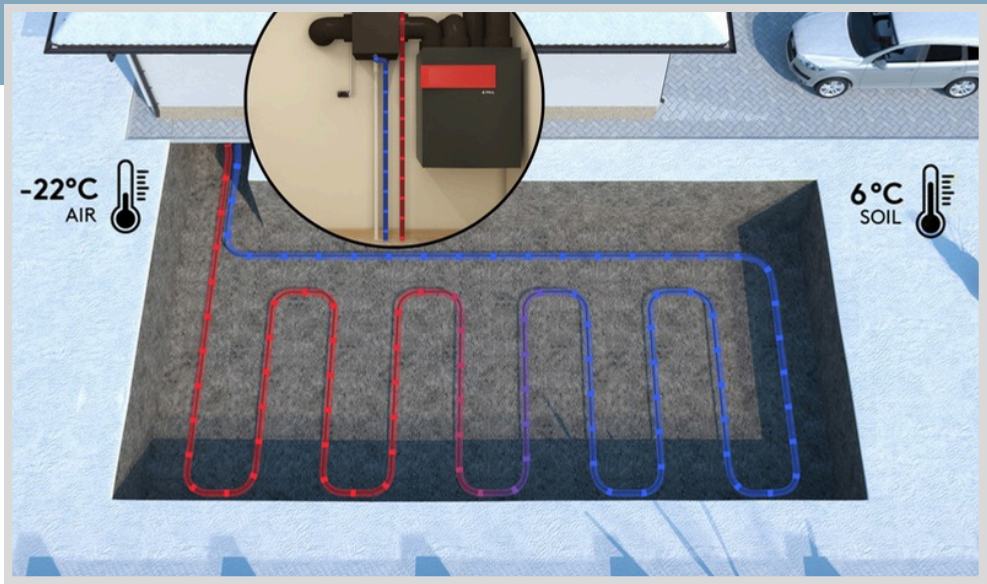


The ground-source heat exchanger leverages ground coolness, with temperatures about 12°C (54°F) at depths of 1,5m to 2m (5 to 8ft), to cool incoming air.

- Increased comfort through cooled air
- Cooled incoming air will prevent the building from overheating in summer
- Energy saving
- Reduction of noise from open windows
- Less outside pollution influence on inside climate

Technology

WINTER



During extremely cold winters, the ground-source heat exchanger heats incoming air to ensure the proper functioning of the ventilation unit. It utilizes ground heat at depths of 1,5m to 2m (5 to 8ft), where temperatures range around +6°C (+40°F).

- Brine defroster and heat recovery unit achieves high efficiency pre-heating
- Ventilation unit is protected from freezing
- No de-icing function in the ventilation unit is required and year-round operation is possible
- Energy saving
- Non-reliance on fossil fuels

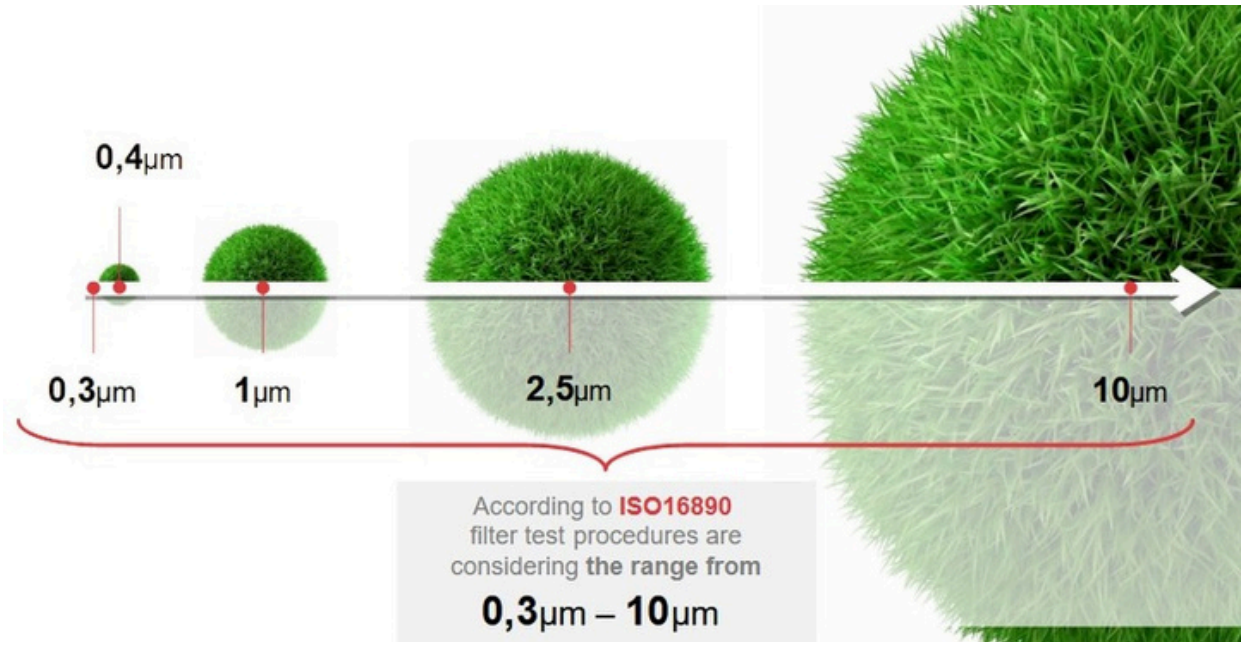
No fresh air without filters

Why Regular Monitoring and Replacement of Air Filters is Essential

Air filters play a crucial role in maintaining indoor air quality and ensuring the efficient operation of ventilation systems. Here are the key reasons why regular attention to air filters is necessary:

- **Improved Air Quality:** Clean filters effectively trap dust, allergens, and pollutants, providing fresher and healthier air for occupants. Neglected filters can lead to recirculation of contaminants, negatively affecting well-being.
- **Optimal System Performance:** A clogged filter restricts airflow, forcing the system to work harder. This can reduce efficiency, increase energy consumption, and lead to higher operational costs.
- **Extended Equipment Lifespan**: Regular filter maintenance prevents dust and debris from accumulating in the system, reducing wear and tear on components and extending the lifespan of the equipment.
- **Energy Savings:** Clean filters ensure smooth airflow, minimizing energy usage. A dirty filter can increase energy consumption by up to 15%, directly impacting utility bills.
- **Compliance with Standards:** Regular filter changes align with ISO16890 standards, ensuring the system operates within recommended guidelines for air filtration and safety.

For optimal results, it's recommended to replace filters every 3-6 months, depending on usage and environmental conditions. Regular maintenance not only ensures cleaner air but also contributes to the long-term efficiency and reliability of the system.



Source of Energy

Horizontal Ground Collectors: Essence and Operating Principle

Horizontal ground collectors are an essential component of geothermal energy systems, providing an efficient and environmentally friendly solution for heating and cooling. These collectors are installed beneath the ground surface, typically at a depth of 1.5–2.5 meters, where the temperature remains stable and suitable for heat exchange.

Key Features and Operating Principle:

- **Energy Source:** Horizontal collectors utilize ground heat, which accumulates from solar energy and the Earth's internal heat. This energy is transferred to the geothermal system via a heat carrier (e.g., glycol mixture).
- **Installation Depth**: Collectors are installed at a depth of 1.5–2.5 meters, ensuring optimal heat transfer. The best results are achieved when collectors are located below the groundwater level.
- **Efficiency:** The efficiency of the collectors depends on the soil type – clay or moist soil provides better heat transfer compared to sandy soil.
- **Eco-Friendliness:** This system reduces energy consumption and CO2 emissions, making it a sustainable solution for heating and cooling needs.

Advantages:

- **Energy Efficiency:** Horizontal ground collectors significantly reduce energy consumption compared to traditional systems.
- **Longevity:** The system's lifespan is virtually unlimited if properly maintained.
- **Low Operating Costs:** Maintenance costs are minimal after installation.
- **Wide Applicability:** Suitable for both residential and public buildings.

Horizontal ground collectors are an effective solution that combines modern technology with a sustainable approach to energy use.

Source of Energy

Vertical Boreholes: Essence and Operating Principle

Vertical boreholes are another essential component of geothermal energy systems, offering high efficiency and broad applicability in various climatic conditions. This method involves drilling deep boreholes into the ground to access stable underground temperatures suitable for heat exchange.

Key Features and Operating Principle:

- **Energy Source:** Vertical boreholes extract the Earth's internal heat, which is transferred to the geothermal system using a heat carrier (e.g., glycol mixture or antifreeze).
- **Installation Depth:** Borehole depths typically range from 50 to 200 meters, depending on soil and geological conditions. Deeper layers provide more stable and efficient heat exchange temperatures.
- **Efficiency:** Vertical boreholes are particularly suitable for areas with limited land space, as they require less surface area compared to horizontal collectors.
- **Sustainability:** This method significantly reduces energy consumption and CO2 emissions, making it an environmentally friendly solution.

Advantages:

- **High Efficiency:** Vertical boreholes provide consistent energy production regardless of seasonal changes or surface soil temperatures.
- **Compact Solution:** Ideal for areas with limited available land.
- **Longevity:** The system is highly durable and can last for decades with minimal maintenance.
- **Wide Applicability:** Suitable for residential, commercial, and public building projects.

Vertical boreholes are a sustainable and efficient solution, ensuring high energy efficiency and adaptability for various projects.

Source of Energy

Minimal Requirements for Ground Collectors

This table includes information on the minimal ground collector length. Detailed and accurate calculations must be performed by the installer's engineer based on local conditions.

UNITS	GROUND TYPE	COLLECTOR LENGTH [M] (FT)	PIPE DIMENSION	BRINE CONTENT APPROX [L]
G-2000/G-2001	Dry Sand	300 (984ft)	DN32	175
	Damp Sand	150 (490 ft)	DN32	95
	Dry Loam	150 (490 ft)	DN32	95
	Damp Loam	150 (490 ft)	DN32	80
G-4000/G-4001	Dry Sand	500 (1640 ft)	DN32	280
	Damp Sand	250 (820ft)	DN32	145
	Dry Loam	200 (656 ft)	DN32	130
	Damp Loam	170 (557 ft)	DN32	100
G-6000/G-6001	Dry Sand	600 (1968 ft)	DN32	340
	Damp Sand	300 (984 ft)	DN32	175
	Dry Loam	270 (885ft)	DN32	160
	Damp Loam	200 (656ft)	DN32	120
G-8000/G-8001	Dry Sand	1000 (3280ft)	DN40	560
	Damp Sand	500 (1640 ft)	DN40	285
	Dry Loam	450 (1476 ft)	DN40	250
	Damp Loam	320 (1049 ft)	DN40	185

As a rough estimate, you can work on the basis of 0.5 m brine piping per 1 m^3/h air quantity. However, a minimum of 100 m with smaller system. To be able to securely rule out the possibility of damage to the pipe, the collector pipes must be placed in a bed of 0.4 m of sand (depending on type of PE pipe).

Description

Ground-source heat exchanger is specifically developed for use with heat recovery ventilation units. It features exceptional energy efficiency, high heating and cooling capacity, and a high coefficient of performance (COP). The casing, fully made of EPP, ensures thermal insulation and eliminates thermal bridges. Additionally, the lightweight design allows for easy installation on-site.

G-2000
G-4000
G-6000

G-8000

G-2001
G-4001
G-6001

G-8001

COMPONENTS	G-2000-G-8000	G-2001-G-8001
EPP casing	Yes	Yes
Heat exchanger coil	Yes	Yes
G4 (Z-PLEAT L COARSE 70%)/MERV8 filter	Yes	Yes
High efficient circulation pump	Yes	No
Filling group	Yes	No
Expansion vessel	Yes	No
NTC sensor	Yes	No

Technical specification

DESCRIPTION	G-2000/G-2001	G-4000/G-4001	G-6000/G-6001	G-8000/G-8001
Weight	15kg/8kg	18kg/11kg	23kg/13kg	28kg/18kg
Unit dimension (LxWxH)	590x390x720mm/ 590x390x530mm			
Air duct connection	DN 250			
Operating temperature	-22°C to 60°C / -7.6°F to 140°F			
Coil fin type	Aluminum			Copper
Power consumption	20W	20W	30W	40W
Heating power	2.48kW	3.83kW	5.44kW	8.10kW
Cooling power (including condnesation)	2.62kW	4.01kW	6.02kW	8.72kW
Maximum airflow	300m3/h 176 CFM	450m3/h 265 CFM	600m3/h 353 CFM	1000m3/h 588 CFM
Glycol flow l/h	370 l/h	560 l/h	1350 l/h	2100 l/h
Glycol total pressure drop (coil)	19.4 kPa	13.3 kPa	37 kPa	11 kPa
Glycol temperature (winter/summer)	+6°C / +12°C 43°F / 54°F			
Brine connection	¾ inch external thread			
Condensate drain connection	D40 external thread			
Supply voltage	230 V, 50 Hz /115 V, 60 Hz			

Product range

At GHT, we are dedicated to providing innovative and energy-efficient solutions for ventilation and air quality improvement. Our products are designed with precision, sustainability, and performance in mind to meet the needs of both residential and commercial applications.

In this catalog, you will find a comprehensive selection of our products, detailed technical specifications, and transparent pricing to help you make informed decisions. From top-tier pre-heater/cooler for HRV/ERVs to high-performance filter boxes, every product reflects our commitment to quality and reliability.

We invite you to explore our offerings and discover how GHT can enhance your indoor air quality while promoting energy efficiency. Thank you for choosing GHT – where innovation meets sustainability

G-2000/G-2001

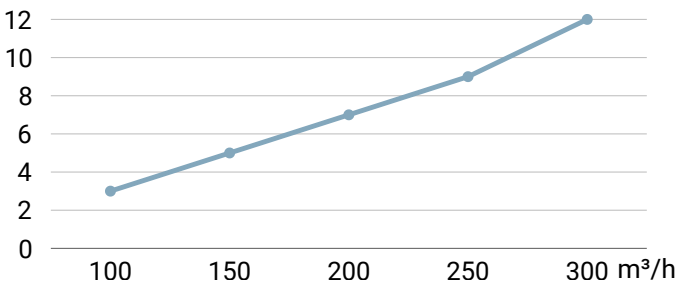
DESCRIPTION

Heating power 2.48kW, cooling power 2.62 kW; Air flow up to 300m³/h - 175CFM

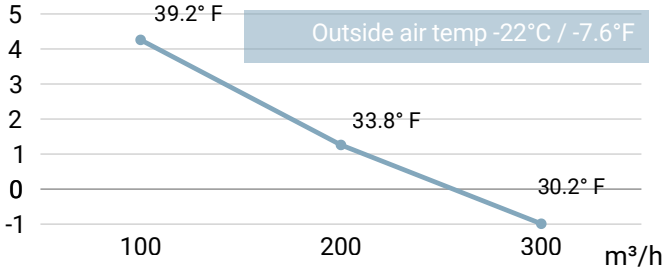
G-2000

Solution for HRV/ERV with airflow up to 300m³/h - 175CFM

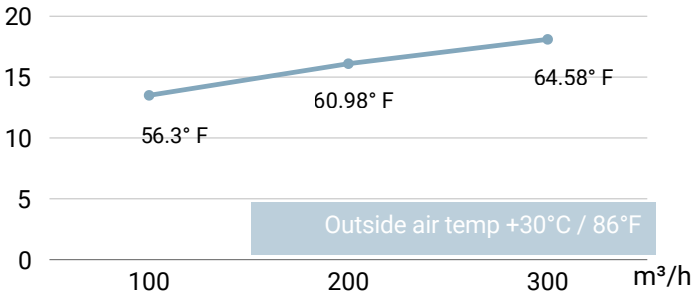
Pressure drop [Pa]



Supply air temp. winter [°C]



Supply air temp. summer [°C]



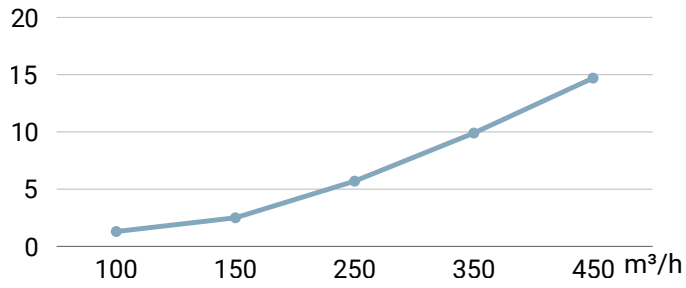
Glycol temp. winter +6°C/42.8°F, summer +12°C/53.6 °F

G-4000/G-4001

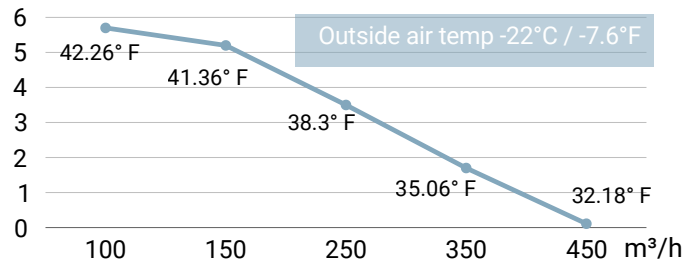
DESCRIPTION

Heating power 2.83kW, cooling power 4.01 kW; Air flow up to 450m³/h - 265CFM

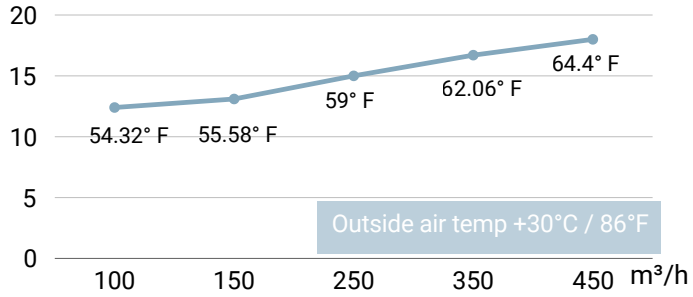
Pressure drop [Pa]



Supply air temp. winter [°C]



Supply air temp. summer [°C]



Glycol temp. winter +6°C/42.8°F, summer +12°C/53.6 °F

G-4000

Solution for HRV/ERV with airflow up to 450m³/h - 265CFM

G-6000/G-6001

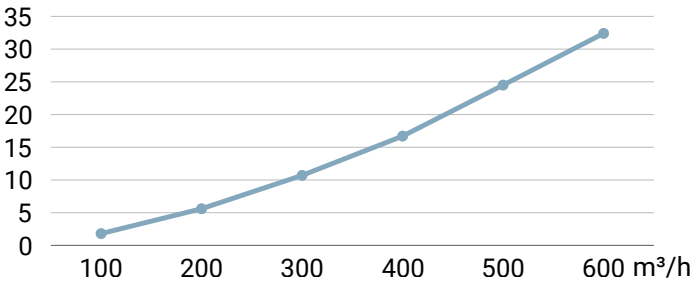
DESCRIPTION

Heating power 5.44kW, cooling power 6.02kW; Air flow up to 600m³/h - 350CFM

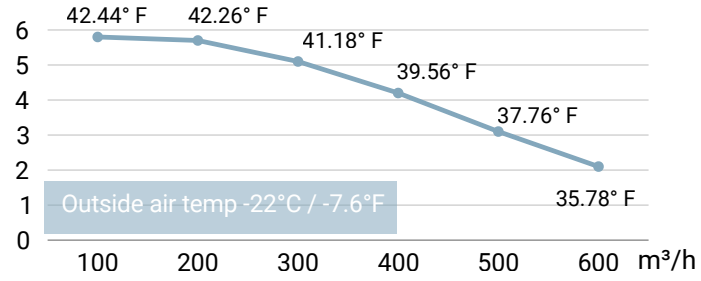
G-6000

Solution for HRV/ERV with airflow up to 600m³/h - 350CFM

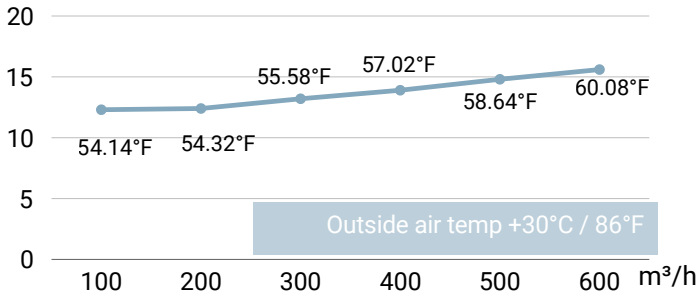
Pressure drop [Pa]



Supply air temp. winter [°C]



Supply air temp. summer [°C]



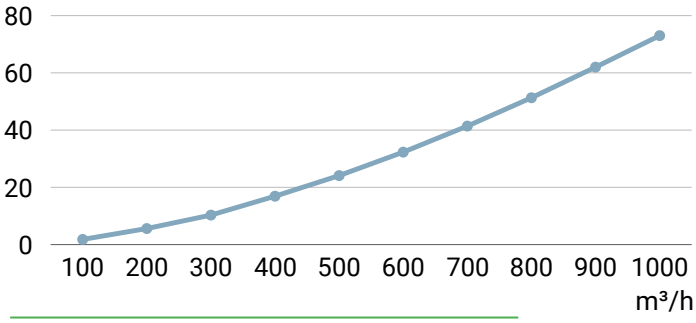
Glycol temp. winter +6°C/42.8°F, summer +12°C/53.6 °F

G-8000/G-8001

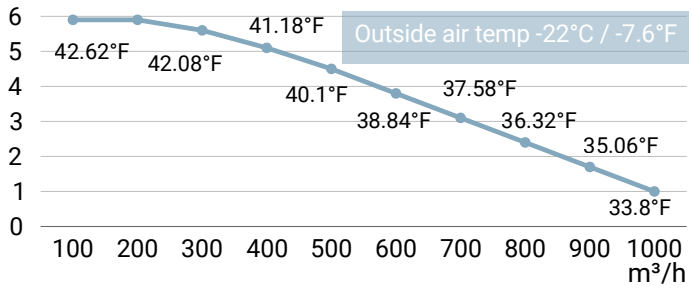
DESCRIPTION

Heating power 8.1kW, cooling power 8.72kW; Air flow up to 1000m³/h - 600CFM

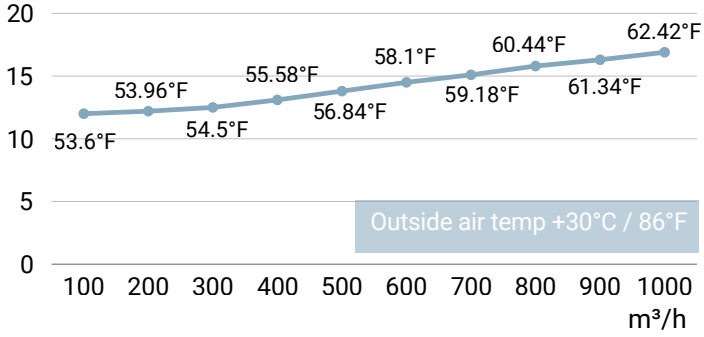
Pressure drop [Pa]



Supply air temp. winter [°C]



Supply air temp. summer [°C]



Glycol temp. winter +6°C/42.8°F, summer +12°C/53.6 °F

G-8000

Solution for HRV/ERV with airflow up to 1000m³/h - 600CFM