



clausius

CLAUSIUS propane
New range of ground source heat
pumps with propane



CLAUSIUS propane technology

NEW!

WE ARE THE FIRST HEAT PUMP MANUFACTURER TO INCORPORATE FLOW METERS IN BRINE AND HEATING CIRCUITS.



CLAUSIUS IS THE FIRST MANUFACTURER to add **flow meters** in the propane heat pumps, which has been a constant demand from our customers in recent years. Real-time flow measurement ensures the safety and reliability of the heat pump and allows precise knowledge of its operating conditions at all times, enabling optimization of its operation and improving its efficiency and reliability.

The new CLAUSIUS propane heat pumps incorporate **ultrasonic flow meters, pressure sensors and temperature sensors** in the brine and heating circuits, allowing us to measure and use the following parameters into the control system.

- The **flow rate** circulating through the brine, heating and DHW production circuits.
- The **supply and return temperatures** in brine, heating and DHW production circuits.
- The **power** obtained in the brine circuit and transferred to the heating circuit and DHW production.
- The **pressure** in the brine and heating circuits.
- The **glycol concentration** in the brine and heating circuits.
- The **detection of air bubbles** in the brine and heating circuits.

NEW!

PROPANE AS A REFRIGERANT. Propane is the refrigerant of the future in ground source heat pumps due to its low heating potential (GWP = 3) and its excellent thermodynamic properties.



- It allows higher condensing temperatures than traditional refrigerants, so that higher flow temperatures for heating and DHW production can be obtained with a simple compression system and without the use of desuperheaters.
- CLAUSIUS ground source heat pumps with propane enable water flow temperatures between 65 and 70 °C to be achieved.
- Heat pumps with propane as a refrigerant are a key technology for the decarbonisation of climate control systems in the future.

NEW!

WE ARE THE MANUFACTURER THAT PROVIDES THE MAXIMUM POWER PER GRAM OF PROPANE. The use of the latest generation of Alfa Laval asymmetric heat exchangers, specially designed to minimise the propane load, as well as the new design of the refrigerant circuit, **minimise the amount of propane required per thermal kW obtained from** the heat pump.



NEW!

SAFETY WITH PROPANE. Propane is a flammable refrigerant (A3), so safety is a very important concern. Clausius heat pumps with propane are equipped with a propane detector and a leakage control system for indoor installation (models with a propane charge of more than 150 g).



CLAUSIUS propane technology

NEW!

WE INCORPORATE THE LATEST GENERATION OF COPELAND LOW NOISE COMPRESSORS AND NEW INVERTERS. The new Copeland low noise compressors have been specially designed and optimised to be used with propane.

- They allow a sound reduction of up to 10 dB and an increase in the seasonal efficiency of the heat pump of up to 7% due to their new electric motors, the new design of the scrolls geometry and the optimisation of the vapour flow inside the compressor.
- They have a wider operating map than R410A compressors, allowing to increase the range of the heat pump operating conditions and to achieve higher heating flow temperatures.
- The inverter system allows a linear modulation of the power produced, which results in higher seasonal efficiencies. In addition, a heat recovery and a temperature control system are incorporated into the inverter, which provides more efficiency and reliability.



NEW!

WE INCORPORATE ALFA LAVAL ASYMMETRIC PLATE HEAT EXCHANGERS, SPECIALLY DESIGNED FOR PROPANE. The most efficient heat exchange technology available, specifically designed to minimize propane load in heat pumps.



NEW!

NEW INTERNET-BASED MANAGEMENT AND VISUALIZATION SYSTEM, enabling remote access, preventive maintenance, and providing greater reliability for the heat pump.



CAREL ELECTRONIC EXPANSION VALVE, for an accurate control of the refrigerant flow in the evaporator.



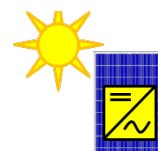
WITH HIGH EFFICIENCY VARIABLE SPEED PUMPS (CLASS A), for an optimum flow control in both brine and heating circuits.



ACCESSIBILITY. The new Clausius heat pumps with propane also incorporate our popular Clausius top-hinged opening system (patented system), allowing easy access to all components inside the heat pump.



CONNECTION WITH PHOTOVOLTAIC INSTALLATIONS, enabling the management of solar energy surplus, control of the power produced by the heat pump, control of periods with different electricity rates, and compatibility with SmartGrid systems.





CLASSIC CONFIGURATION

- Power ranges from 1 to 8 kW and from 3 to 15 kW
- COPs of 4.5 y 4.8 respectively, according to EN14511
- EERs of 4.7 y 5.3 respectively, according to EN14511
- Single-phase or three-phase power supply
- Propane refrigerant (R290)
- Ultrasonic flow meters for brine and heating circuits
- Integrated energy meters, COP, EER and SPFs
- Measurement of glycol concentration
- Air detection in brine and heating circuits
- Pressure sensors in brine and heating circuits
- Copeland “low noise” compressors, minimum noise level
- Electronic expansion valve
- Integrated class A variable-speed circulation pumps
- Integrated expansion vessels and safety valves
- Integrated 3-way valve for DHW (domestic hot water) production
- New control strategies adapted to propane
- Control with climate regulation
- Control of 2 climate zones
- Pool control
- Special programs, floor drying, air venting, etc
- Maximum power limitation via software
- Cascade connection capability of up to 6 units
- Individually tested on a test bench

Integrated flow meters and energy meters.

Minimum propane charge per kW produced.

The highest COP on the market with inverter technology since 2015.



CUSTOM CONFIGURATION

- Option to integrate a desuperheater for simultaneous DHW or pool production along with heating or cooling
- Option to integrate a passive cooling production system
- Optional control with “Clausius Advance Control”



MODELS IN TWO POWER RANGES, 1-8 KW AND 3-15 KW

H	Heating
HC	Heating and active cooling
H PC	Heating and passive cooling
HC PC	Heating, active cooling and passive cooling
H DS	Heating and desuperheater
HC DS	Heating, active cooling and desuperheater
H PC DS	Heating, passive cooling and desuperheater
HC PC DS	Heating, active cooling, passive cooling and desuperheater



ELITE CONFIGURATION

- AISI 316 stainless steel DHW tank
- DHW production system up to 65 °C
- Power ranges from 1 to 8 kW and from 3 to 15 kW
- COPs of 4.5 y 4.8 respectively, according to EN14511
- EERs of 4.7 y 5.3 respectively, according to EN14511
- Single-phase or three-phase power supply
- Propane refrigerant (R290)
- Ultrasonic flow meters for brine and heating circuits
- Integrated energy meters, COP, EER and SPFs
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- Special programs, floor drying, air venting, etc
- Maximum power limitation via software
- Cascade connection capability of up to 6 units
- Individually tested on a test bench

Integrated flow meters and energy meters.

Minimum propane charge per kW produced.

DHW up to 65 °C without electric heaters.



CUSTOMISED CONFIGURATION

- Option to integrate a passive cooling production system
- Optional control with “Clausius Advance Control”



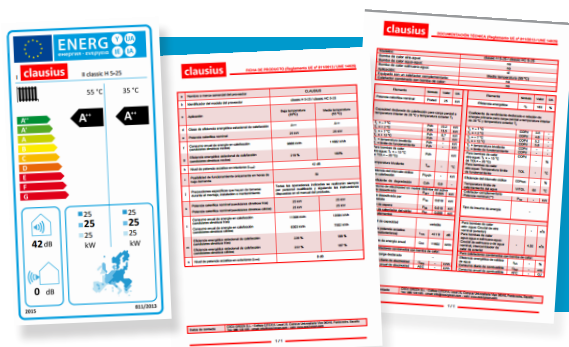
MODELS IN TWO POWER RANGES, 1-8 KW AND 3-15 KW

H	Heating and DHW production with a built-in tank
HC	Heating, DHW production with a built-in tank and active cooling
H PC	Heating, DHW production with a built-in tank and passive cooling
HC PC	Heating, DHW production with a built-in tank, active and passive cooling

TECHNICAL SPECIFICATIONS

		H 1-8 (classic/elite)	HC 1-8 (classic/elite)	H 3-15 (classic/elite)	HC 3-15 (classic/elite)	H 3-15 T (classic/elite)	HC 3-15 T (classic/elite)
Applications	Heating and DHW	•	•	•	•	•	•
	Active cooling		•		•		•
Optional applications	Passive cooling	•	•	•	•	•	•
	DHW and pool with desuperheater	-	-	• / -	• / -	• / -	• / -
Power	Heating (kW)	1 - 8	1 - 8	3 - 15	3 - 15	3 - 15	3 - 15
	Active cooling (kW)		1,5 - 9		4 - 16		4 - 16
	Electrical consumption (kW)	0.4 - 3.8	0.4 - 3.8	0.5 - 5.2	0.5 - 5.2	0.5 - 5.2	0.5 - 5.2
Power supply	230 V 1N/PE ⁻	•	•	•	•	•	•
	400 V 3N/PE ⁻	-	-	-	-	•	•
Performance	COP ¹	4.5	4.5	4.8	4.8	4.8	4.8
	EER ¹		4.7		5.3		5.3
DHW Tank		External / Integrated	External / Integrated	External / Integrated	External / Integrated	External / Integrated	External / Integrated
Refrigerant	Type	Propane (R290)					
	Load (g)	150	150	350	350	350	350
Flow	Brine Min / Max (l/h)	400 / 2200		700 / 3600			
	Heating Min / Max (l/h)	300 / 1500		500 / 2600			
Temperature	Min / Max (°C)	Brine = -15 / +20		Heating = +25 / +70			
Maximum pressure drop (kPa)	Brine/Heating	20 / 15		33 / 20			
Dimensions	Height x Width x Depth (mm)	Classic 1040 x 600 x 800 / Elite 1878 x 600 x 800					
Hydraulic connections	Brine and heating	1"					
	DHW	1"					
Weight	(kg)	147 / 227	158 / 238	163 / 243	174 / 254	168 / 248	179 / 259
Sound level	(dB)	42					

⁽¹⁾ According to EN14511 and EN14825. Certification pending.



Energy labelling, product sheets and technical documentation according to Delegated Regulation (UE) N° 811/2013.

A+++

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