

# enEX EcoCute

CO<sub>2</sub> Heat Pump for sanitary hot water production



## EcoCute geo 25

ground or water heat source

## EcoCute air 25

air heat source

### Maximum security and environmental care

Carbon Dioxide, the operation fluid is non toxic, non flammable, has zero ambient impact (ODP = 0 and GWP = 1)

### High efficiency COP 4,5 \*

1 unit of electrical power + 3,5 units of energy absorbed from ground or air provide: **4,5 units of energy available to heat water.**

\* Temp. sanitary water in/out 10°/65°C, Temp. water in/out from heat exchangers into the ground 3°/6°C

### High temperature of water output: up to 90°C

Water is heated with high efficiency up to temperatures much higher than traditional heat pumps working with HFC (R410A, R134a, ...).

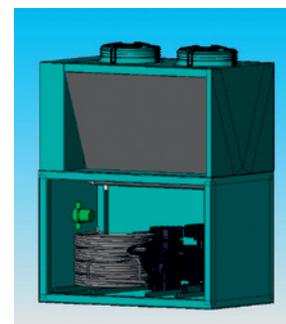
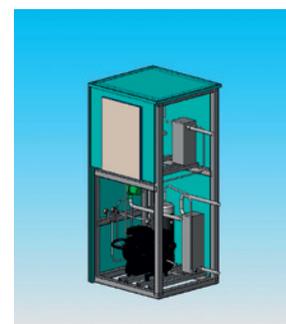
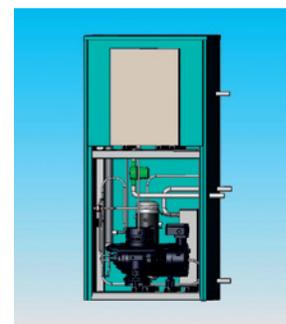
### Low storage volumes

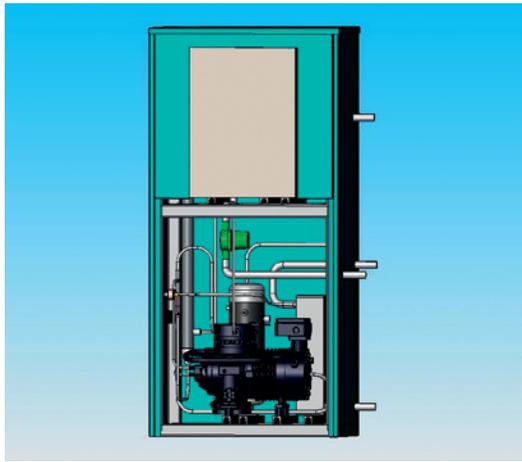
The high temperatures reached together in one passage (**once through**) make possible the usage of **stratified storage tanks**. This allows:

- Extremely reduced storage volumes
- Stratification makes it possible to produce hot water during nights (reduced costs)
- High storage temperature deletes risks of legionella and the related periodical maintenance and remediation.

### Easy to install and service

- Only water and electrical power connection
- Programmable working times
- Panel adjustable water temperature
- Dedicated spaces are not needed since no chimneys, gas connections or flammable storages are required.





EcoCute geo 25



EcoCute air 25

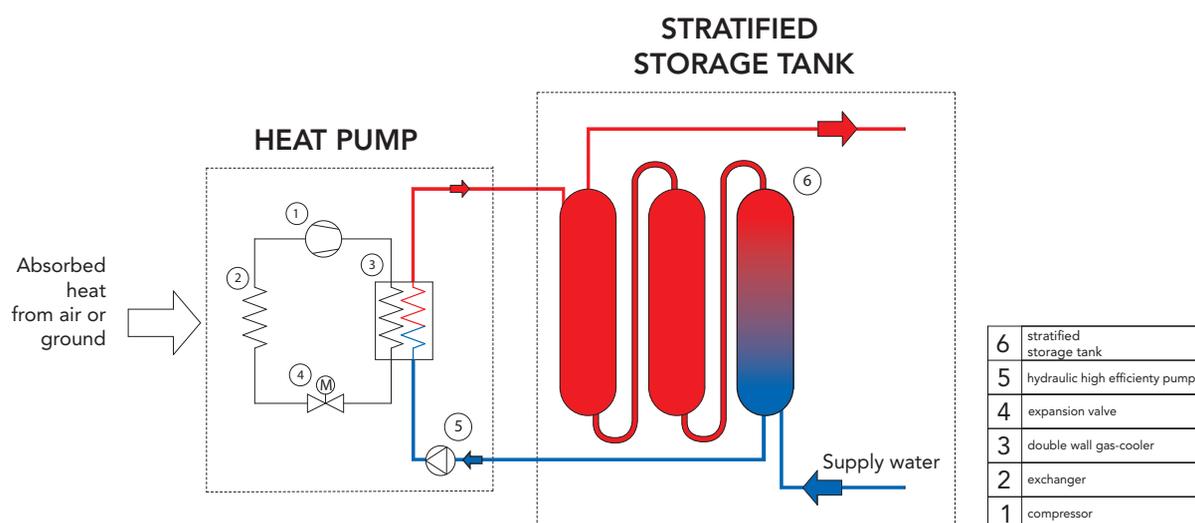
## Where to use enEX EcoCute ?

Whenever big quantities of hot water are needed and/or big peaks of absorption are present.

- Restaurants
- Laundries
- Hospitals
- Hotel
- Residential Complex
- Agrifood industry
- Canteens
- Sport Centers
- Gyms

## How does it work?

Transcritical cycle operated by CO<sub>2</sub> is ideal for efficient use of the high temperature glide of refrigerant for heating water from a low temperature. High pressure CO<sub>2</sub> at high temperature circulates in one heat exchanger -single or double wall- and heats up in a single passage (once-through) mains water, circulated with a variable speed pump whose velocity is optimized, together with the gas high pressure system, to reach the set water temperature in the most efficient way. The high water temperature makes it possible to store it in a special vessel, so avoiding, as with normal heat pumps, to mix water at different temperatures. By using this kind of water storage it is possible to operate the heat pump at night time, taking advantage of lower energy costs.



## Economic evaluation

Figures related to one-year operation with a production of 3500 litres per day of sanitary hot water at 65°C.

### Energy costs hypothesis:

Methane 0,57 €/m<sup>3</sup> calorific power 10,6 kWh /m<sup>3</sup>

Diesel 0,88€/l calorific power 9,54 kWh/ l

Electrical power 0,14 €/ kWh

### Performance:

Methane boiler performance 0,90

Diesel boiler performance 0,85

**COP enEX EcoCute geo :4,5** reached with an in/out water temp coming from ground tubes 3°/6 °C and an in/out sanitary hot water temp of 10°/65°C

### Definitions

**Energy efficiency related to primary energy:** energy released to water starting from 1 kWh of primary energy. The conversion factor used to convert primary energy in electrical power is 1:0,4 , typical value related to the italian situation (source ENEL).

**Efficiency increase:** ratio between achieved energetic efficiency and energetic efficiency of reference

**Indirect global warming potential:** production of greenhouse gases given in annual use of the plant.

Methane: 1,96 kg CO<sub>2</sub>/m<sup>3</sup>

Diesel: 2,6 kg CO<sub>2</sub>/l

Electrical power: 0,57 kg of CO<sub>2</sub> to produce 1 kWh of electrical power (reference Italy - source: ENEL)

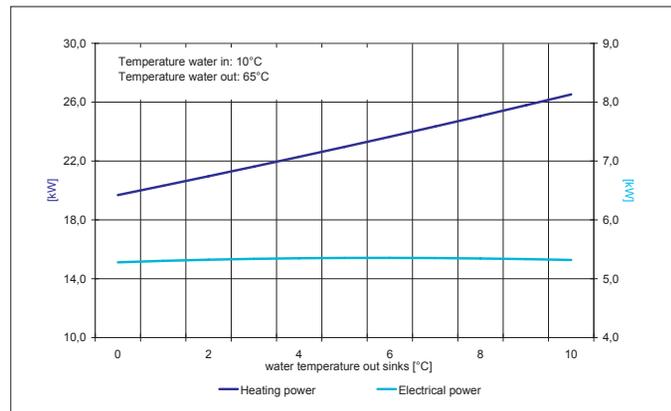
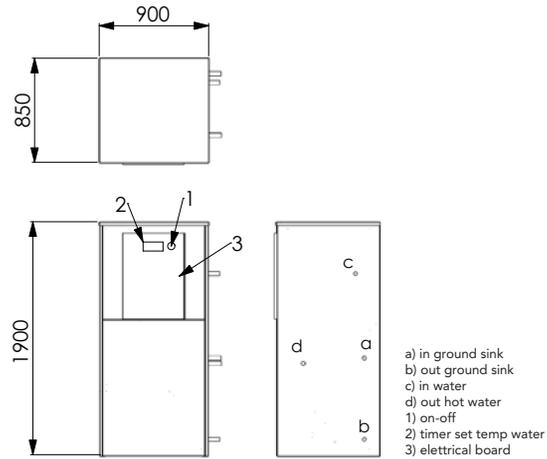
Heating System	Primary Energy Efficiency	efficiency improvement %	Indirect greenhouse gas emission (CO <sub>2</sub> ) Kg/year	Running Cost €/year
Methane Boiler	0,90	-	16.785	4.881
Diesel Boiler	0,85	-6%	26.195	8.866
Electrical Energy	0,46	-49%	46.977	11.438
enEX EcoCute	2,07	+130%	10.439	2.542
Conventional HFC Heat Pump*	1,33	+48%	16.199	3.944

\* Water out temp. max 60°C

## Technical data and dimensions

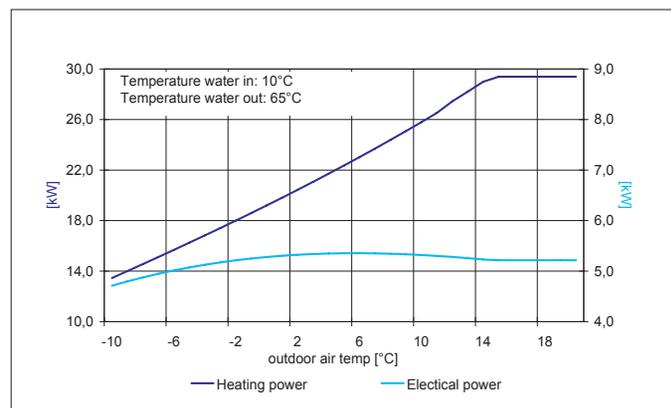
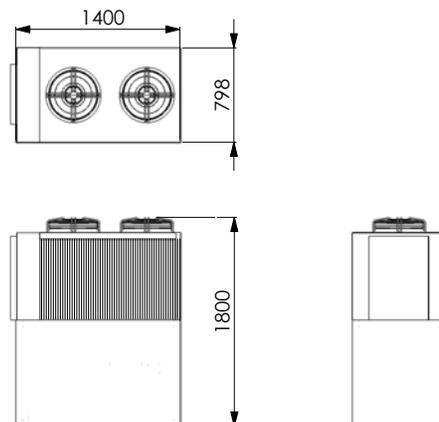
# EcoCute geo 25

Voltage supply	380 V - 50 Hz
Dimensions [mm]	900 x 800 x 1900
Temp. water in range [°C]	5-25
Temp. water out range [°C]	from 50 to 85
Evaporator type	plate
Gas cooler	forced circulation single or double wall
PS [bar]	60/120
Temp. sink range [°C]	0 - 15
Temp. in/out water 10°/65°C Temp. in/out sinks 3°/6°C	
Heating capacity [kW]	23,7
Power input [kW]	5,3
COP	4,5
Hot water production [l/min]	6,1



# EcoCute air 25

Voltage supply	380 V - 50 Hz
Dimensions [mm]	1400 x 800 x 1800
Temp. water in range [°C]	10-25
Temp. water out range [°C]	from 50 to 85
Evaporator type	finned coil
Gas cooler	forced circulation single or double wall
PS [bar]	60/120
Temp. outdoor air [°C]	-10 / +30
Temp. in/out water 10°/65°C Temp. outdoor air 5°C	
Heating capacity [kW]	22,4
Power input [kW]	5,4
COP	4,2
Hot water production [l/min]	5,82



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