

EcoPart 412 Ground-to-water Heat Pump


Main features	
Application	space heating and hot water heating
Description	heat pumps extract energy from ground; this energy gained from deep bores or ground collectors is then "pumped" to a higher temperature and transferred into heating water; the flow temp. may reach up to 65 °C
Installation ¹⁾	brine circuit surge tank and brine circuit filler kit are included in the delivery, installation shall be done with Pump Station Kit w. Smart Controller (for codes see Catalogue)
Working fluid	R407C (refrigerant), antifreeze fluid (brine circuit), water (heating system)
Certification	HP Keymark – European Committee for Standardization quality label
Code	12650

1) In case of installation in series, the first heat pump in series shall be installed with Pump Station Kit w. Smart Controller, all the heat pumps following in series shall be installed with CSE TC W PWM pump station (for codes see Catalogue).

Technical data	
Output ²⁾	11,75 kW
Power input ²⁾	2,55 kW
COP ²⁾	4,61
Nominal current	9,6 A
Power supply	3/N/PE ~ 400V 50 Hz
Recommended circuit breaker	B16A 3f
IP rating	IPX1
Compressor	Scroll
Refrigerant	R 407C (GWP 1774)
Refrigerant quantity	2,3 kg
CO2 equivalent ³⁾	4,080 t
Compressor oil	Polyoester (POE)
Refrigerant max. working pressure	31 bar
Brine system min./max. temperature	-5 °C / 20 °C
Brine system min./max. pressure	0,2 bar / 3,0 bar
Antifreeze fluid volume in heat pump	3,4 l
Brine system min. flow ($\Delta t = 5$ K)	1585 l/h
Brine system nominal flow ($\Delta t = 3$ K)	2630 l/h
Brine pump	UPMXL GEO 25-125 180 PWM
Brine circuit connection	2 x Cu 28 x 1,5
Max. heat pump flow temperature	65 °C
Max. heating water temperature in the space heating system	110 °C
Max. working pressure of heating water	3 bar
Heating water volume in heat pump	3,4 l
Min. surface area of heat exchanger in tank	3 m ²
Min. flow rate through heat pump ($\Delta t = 10$ K at 0/35 °C)	1010 l/h
Nom. flow rate through heat pump ($\Delta t = 5$ K at 0/35 °C)	2020 l/h
Heating system connection	2 x Cu 22 x 1
Weight	164 kg

2) At B0/W35 temperatures. 3) Is not covered by the annual check for leaking refrigerant (EU No 517/2014).

Parameters for distribution tariff change	
Nominal power input (required input)	3,75 kW
Heat output ⁴⁾	11,75 kW
Steady current ⁴⁾	4,1 A
Starting current	23,5 A
Nominal voltage / number of phases	400 V 3f

4) At B0/W35 temperatures.

EcoPart 412 Ground-to-water Heat Pump

Energy efficiency data

(for low-temperature applications under average climatic conditions, others see the Product Fiche)

Seasonal Energy Efficiency	182%
Energy Efficiency Class	A+++
SCOP	4,8

Sound data

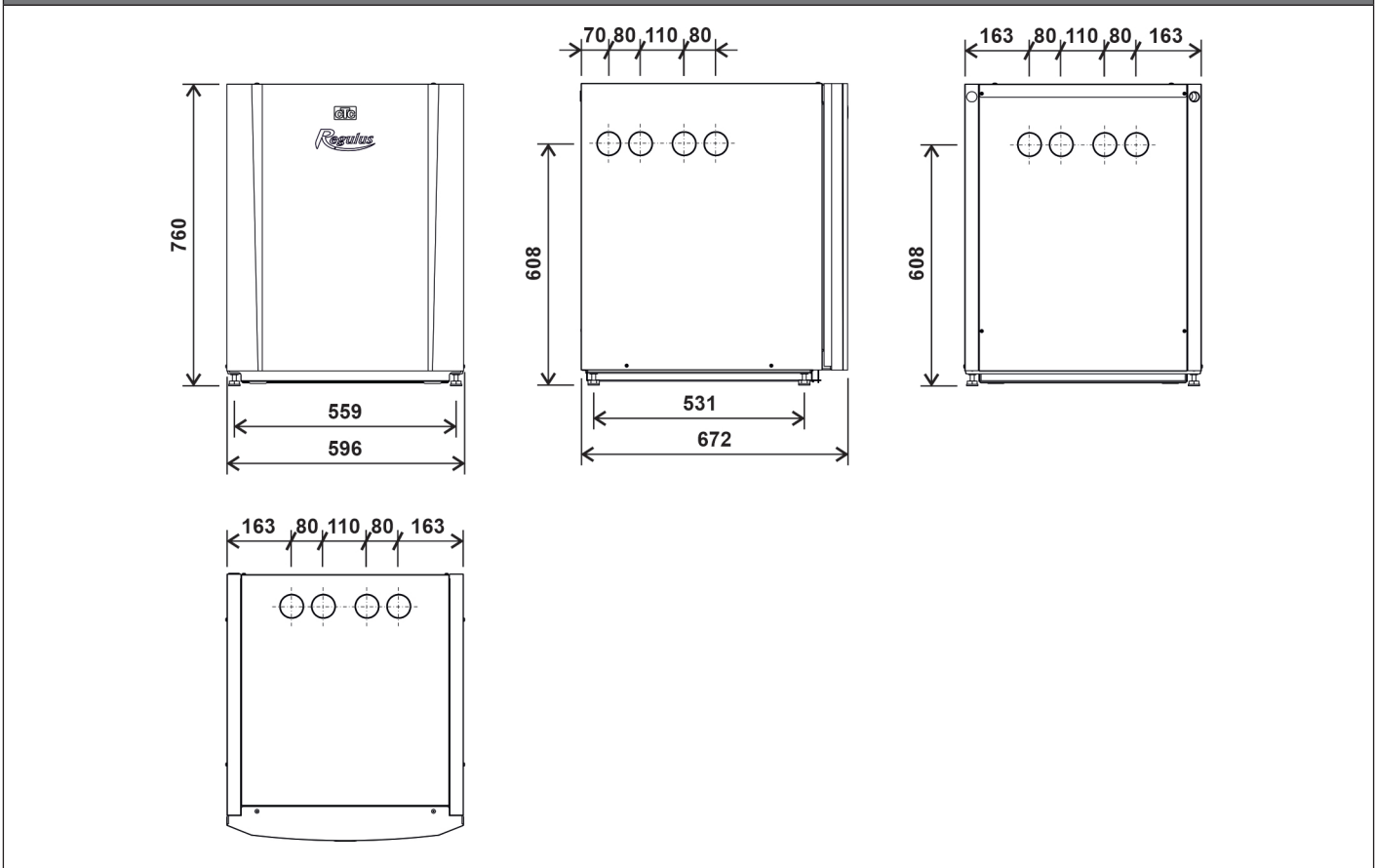
Sound power level by EN 12 102	50,0 dB(A)
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Output parameters⁵⁾

Brine system temperature	Flow temperature	Output [kW]	Power input [kW]	COP [-]
5 °C	35 °C	13,53	2,65	5,11
	45 °C	12,95	3,15	4,11
	55 °C	12,57	3,75	3,35
0 °C	25 °C	12,30	2,23	5,52
	35 °C	11,75	2,55	4,61
	45 °C	11,24	3,07	3,66
	55 °C	10,97	3,71	2,96
-5 °C	45 °C	9,88	2,99	3,30

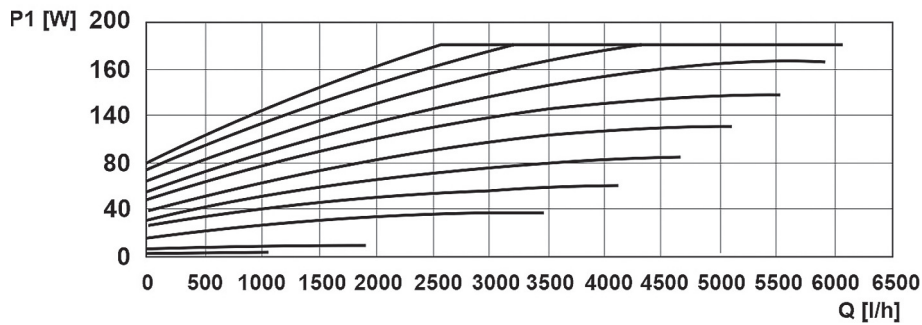
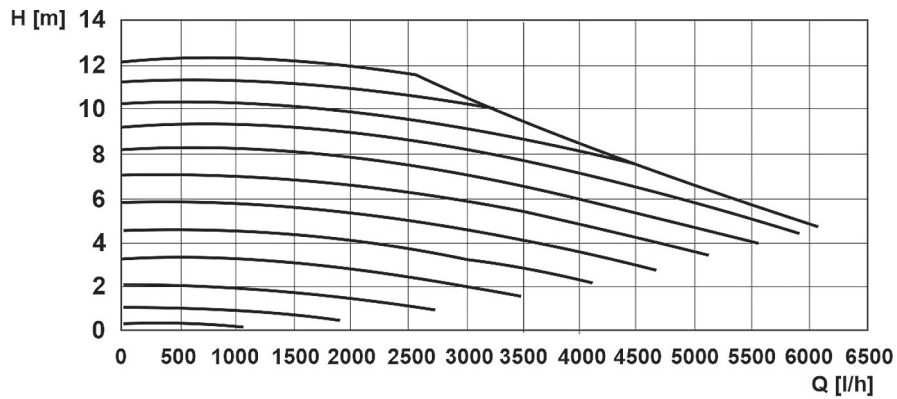
5) The values of working parameters are measured according to EN 14 511 at the manufacturer's test lab.

Dimensions



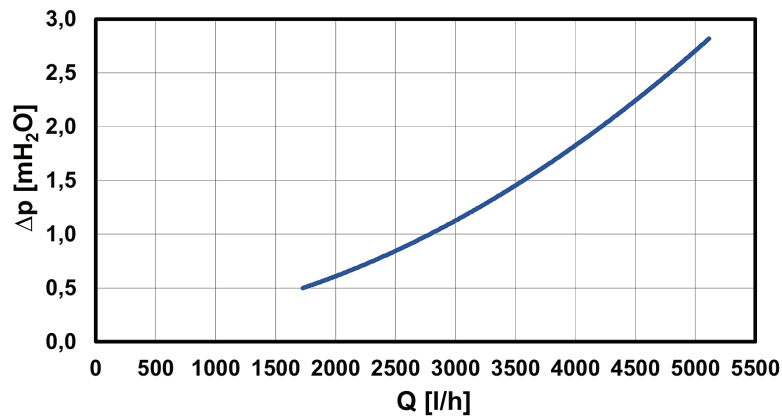
EcoPart 412 Ground-to-water Heat Pump

Brine pump performance curves

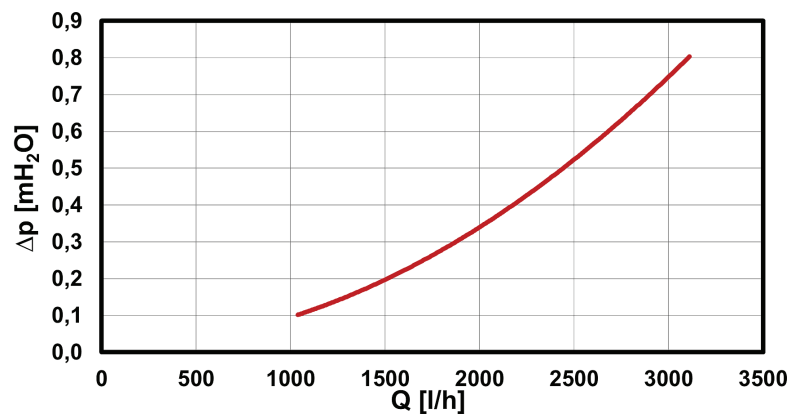


Heat pump pressure drop

Pressure drop on the brine side



Pressure drop on the heating system side



EcoPart 412 Ground-to-water Heat Pump

Supplier's name *REGULUS spol. s r. o.*
Supplier's model identifier *CTC EcoPart 412*

Parameter	low temperature	medium temperature
The seasonal space heating energy efficiency class	A++	A++
Average climate		
The rated heat output including any supplementary heaters	13 kW	12 kW
The seasonal space heating energy efficiency	182 %	138 %
The annual energy consumption	5 814 kWh	7 084 kWh
Cold climate		
The rated heat output including any supplementary heaters	12 kW	12 kW
The seasonal space heating energy efficiency	185 %	141 %
The annual energy consumption	6 373 kWh	8 195 kWh
Warm climate		
The rated heat output including any supplementary heaters	13 kW	12 kW
The seasonal space heating energy efficiency	180 %	137 %
The annual energy consumption	3 618 kWh	4 364 kWh
The sound power level LWA, outdoors	50 dB	

Any specific precautions that shall be taken when the space heater is assembled, installed or maintained are stated in the manual that is a part of the supply.

Model:	CTC EcoPart 412
Air-to-water heat pump:	no
Water-to-water heat pump:	no
Brine-to-water heat pump:	yes
Low-temperature heat pump:	no
Equipped with supplementary heater:	no
Heat pump combination heater:	no

Parameters declared for medium-temperature application and average climate.

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output (*)	P_{rated}	12	kW	Seasonal space heat. ener. efficiency	η_s	138	%
<i>Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature Tj:</i>				<i>Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature Tj:</i>			
Tj = -7 °C	P_{dh}	11,00	kW	Tj = -7 °C	COP_d	3,25	-
Tj = +2 °C	P_{dh}	11,20	kW	Tj = +2 °C	COP_d	3,64	-
Tj = +7 °C	P_{dh}	11,40	kW	Tj = +7 °C	COP_d	4,02	-
Tj = +12 °C	P_{dh}	11,60	kW	Tj = +12 °C	COP_d	4,4	-
Tj = bivalent temperature	P_{dh}	11,00	kW	Tj = bivalent temperature	COP_d	3,25	-
Tj = operation limit temperature	P_{dh}	-	kW	Tj = operation limit temperature	COP_d	-	-
For air-to-water heat pumps:	P_{dh}	-	kW	For air-to-water heat pumps:	COP_d	-	-
Tj = -15 °C, pokud TOL < -20 °C	P_{dh}	-	kW	Tj = -15 °C, pokud TOL < -20 °C	COP_d	-	-
Bivalent temperature	T_{biv}	-7	°C	For air-to-water heat pumps:	T_{OL}	-	°C
Cycling interval capacity for heating	P_{cyc}	-	kW	operation limit temperature	COP_{cyc}	-	-
Degradation co-efficient (**)	C_{dh}	0,99	-	Cycling interval efficiency	W_{TOL}	65	°C
<i>Power consumption in modes other than active mode:</i>				<i>Supplementary heater:</i>			
Off mode	P_{OFF}	0,018	kW	Rated heat output (*)	P_{sup}	1,50	kW
Thermostat-off mode	P_{TO}	0,005	kW	Type of energy input	electric		
Standby mode	P_{SB}	0,018	kW	For air-to-water heat pumps:	-		
Crankcase heater mode	P_{CK}	0,000	kW	rated air flow rate, outdoors	-		
<i>Other items:</i>				For water/brine-to-water heat pumps:	-		
capacity control		fixed		Rated brine or water flow rate,	2,10	m³/h	
Sound power level, indoors / outdoors	L_{WA}	50 / -	dB	outdoor heat exchanger	-		

Contact details **Enertech AB, Box 309, SE-341 26 Ljungby, Sweden** www.ctc.se

(*) For heat pump space heaters and heat pump combination heaters, the rated heat output P_{rated} is equal to the design load for heating $P_{designh}$, and the rated heat output of a supplementary heater P_{sup} is equal to the capacity for heating $sup(Tj)$.

(**) If C_{dh} is not determined by measurement then the default degradation is $C_{dh} = 0,9$.