

## EcoPart 412 Ground-to-water Heat Pump

v1.8\_01/2021



### 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 <sup>1</sup>	primary circuit surge tank and primary 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 circuit)
Certification	HP Keymark - European Committee for Standardization quality label
<b>Code</b>	<b>12650</b>

<sup>1</sup> 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 <sup>2</sup>	11,75 kW
Power input <sup>2</sup>	2,55 kW
COP <sup>2</sup>	4,61
Nominal current	9,6 A
Power supply	3/N/PE ~ 400V 50Hz
Recommended circuit breaker	B16A 3f
IP rating	IPX1
Compressor	Scroll
Refrigerant	R 407C (GWP 1774)
Refrigerant quantity	2,3 kg
CO2 equivalent <sup>3</sup>	4,080 t
Compressor oil	Polyoester (POE)
Refrigerant max. working pressure	31 bar
Brine system min./max. temp.	-5 °C / 20 °C
Brine system min./max. pressure	0,2 bar / 3,0 bar
Antifreeze fluid volume in HP	3,4 l
Brine system min. flow ( $\Delta t = 5$ K)	1585 l/h
Brine system nom. flow ( $\Delta t = 3$ K)	2630 l/h
Brine pump	UPMXL GEO 25-125 180 PWM
Brine circuit connection	2 x Cu 28x1,5
Max. heat pump flow temp.	65 °C
Max. heating water temp. in system	110 °C
Max. working pressure of heat. water	3 bar
Heating water volume in heat pump	3,4 l
Min. surface area of heat exchanger in tank	3 m <sup>2</sup>
Min. flow rate through HP ( $\Delta t = 10$ K at 0/35 °C)	1010 l/h
Nom. flow rate through HP ( $\Delta t = 5$ K at 0/35 °C)	2020 l/h
Heating circuit connection	2 x Cu 22x1
Weight	164 kg

<sup>2</sup>) at B0/W35 temperatures <sup>3</sup>) 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 <sup>4</sup>	11,75 kW
Steady current <sup>4</sup>	4,1 A
Starting current	23,5 A
Nominal voltage / number of phases	400 V 3f

<sup>4</sup>) at B0/W35 temperatures

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### 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

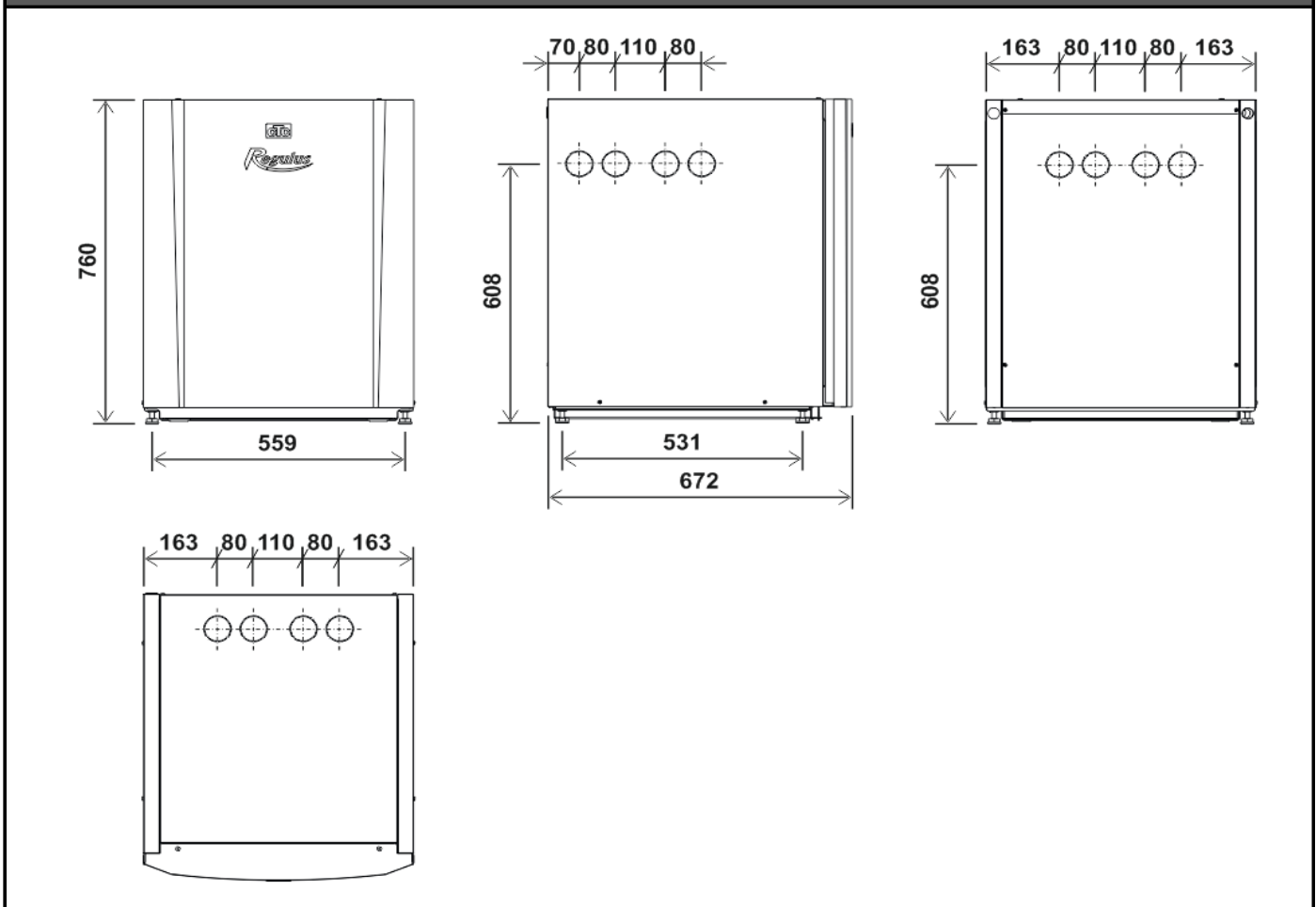
Sound power level by EN 12 102	50,0 dB(A)
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### Output parameters <sup>5</sup>

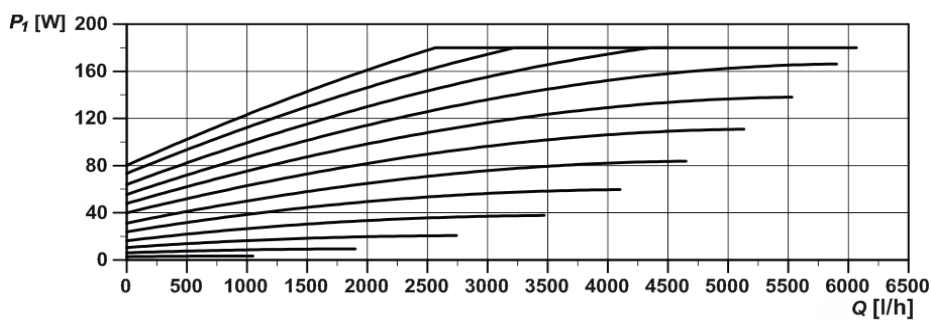
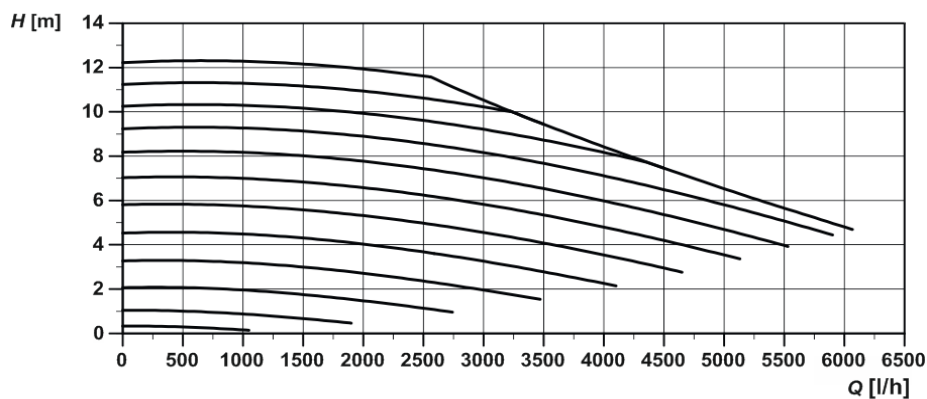
Brine system temperature	Flow temperature	Output [kW]	Power input [kW]	COP [-]
5 °C	35 °C	13,53	2,65	5,11
	45 °C	12,95	3,15	4,11
	55 °C	12,57	3,75	3,35
0 °C	25 °C	12,30	2,23	5,52
	35 °C	11,75	2,55	4,61
	45 °C	11,24	3,07	3,66
-5 °C	55 °C	10,97	3,71	2,96
	45 °C	9,88	2,99	3,30

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

### Dimensions

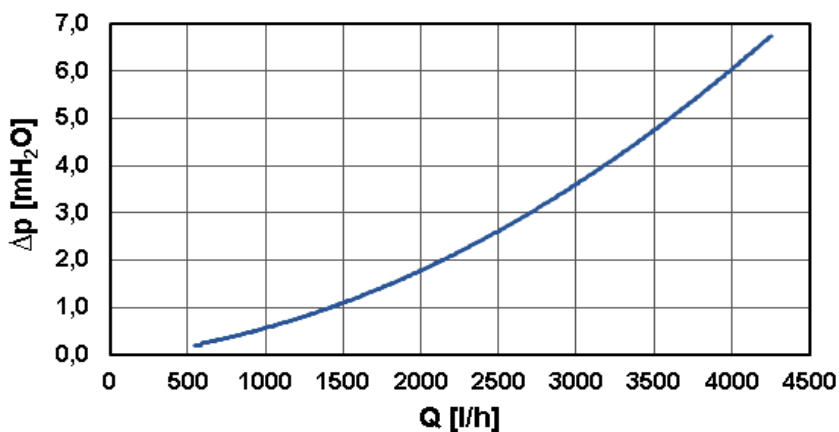


Brine pump performance curves

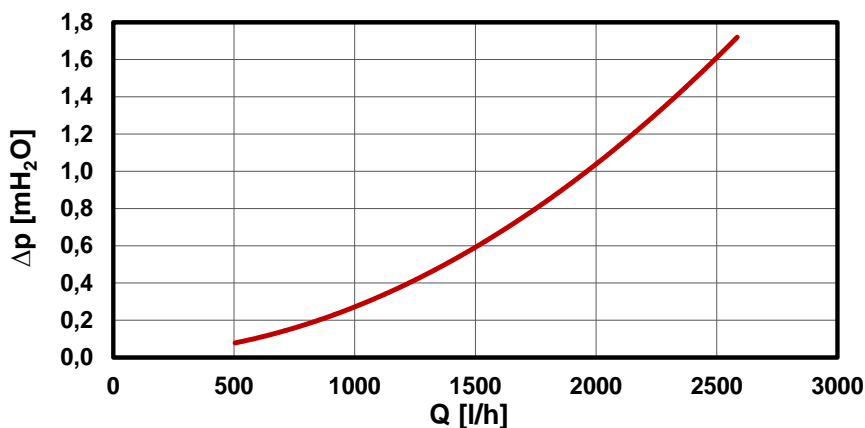


Evaporator + condenser pressure drop

Evaporator pressure drop



Condenser pressure drop



**EcoPart 412 Ground-to-water Heat Pump**

v1.0\_02/2018

**Dodavatel** REGULUS spol. s.r.o.  
**Model** CTC EcoPart 412

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

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.

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

**Parameters declared for medium-temperature application and average climate.**

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

Contact details **Enertech AB, Box 309, SE-341 26 Ljungby, Sweden** [www.ctc.se](http://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  $sup(T_j)$ .

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