

EcoPart 406 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 | 12647 |

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⁾ | 5,9 kW |
| Power input ²⁾ | 1,29 kW |
| COP ²⁾ | 4,57 |
| Nominal current | 5,8 A |
| Power supply | 3/N/PE ~ 400V 50 Hz |
| Recommended circuit breaker | B10A 3f |
| IP rating | IPX1 |
| Compressor | Scroll |
| Refrigerant | R 407C (GWP 1774) |
| Refrigerant quantity | 1,9 kg |
| CO2 equivalent ³⁾ | 3,370 t |
| Compressor oil | FV50S |
| 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 | 2,3 l |
| Brine system min. flow ($\Delta t = 5$ K) | 790 l/h |
| Brine system nominal flow ($\Delta t = 3$ K) | 1330 l/h |
| Brine pump | UPM2K 25-70 180 |
| Brine circuit connection | 2 x Cu 28 x 1,5 |
| Max. heat pump flow temperature | 65 °C |
| Max. heating water temperature in space heating system | 110 °C |
| Max. working pressure of heating water | 3 bar |
| Heating water volume in heat pump | 2,3 l |
| Min. surface area of heat exchanger in tank | 2 m ² |
| Min. flow rate through heat pump ($\Delta t = 10$ K at 0/35 °C) | 500 l/h |
| Nom. flow rate through heat pump ($\Delta t = 5$ K at 0/35 °C) | 1010 l/h |
| Heating system connection | 2 x Cu 22 x 1 |
| Weight | 138 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) | 1,91 kW |
| Heat output ⁴⁾ | 5,9 kW |
| Steady current ⁴⁾ | 2,1 A |
| Starting current | 16,6 A |
| Nominal voltage / number of phases | 400 V 3f |

4) 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 | 179% |
| Energy Efficiency Class | A+++ |
| SCOP | 4,7 |

Sound data

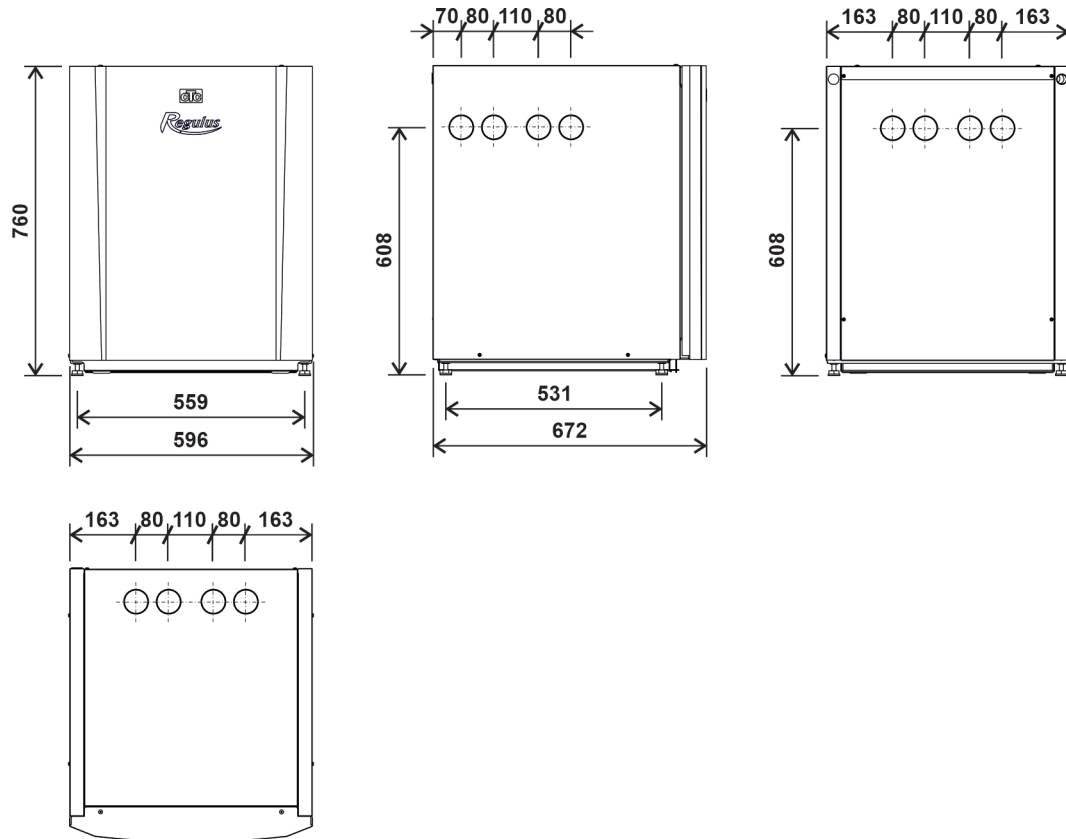
| | |
|--------------------------------|------------|
| Sound power level by EN 12 102 | 43,0 dB(A) |
|--------------------------------|------------|

Output parameters⁵⁾

| Brine system temperature | Flow temperature | Output [kW] | Power input [kW] | COP [-] |
|--------------------------|------------------|-------------|------------------|---------|
| 5 °C | 35 °C | 6,81 | 1,30 | 5,24 |
| | 45 °C | 6,49 | 1,56 | 4,16 |
| | 55 °C | 6,08 | 1,91 | 3,18 |
| 0 °C | 25 °C | 6,10 | 1,20 | 5,08 |
| | 35 °C | 5,90 | 1,29 | 4,57 |
| | 45 °C | 5,48 | 1,55 | 3,54 |
| | 55 °C | 5,17 | 1,87 | 2,76 |
| -5 °C | 45 °C | 4,68 | 1,52 | 3,08 |

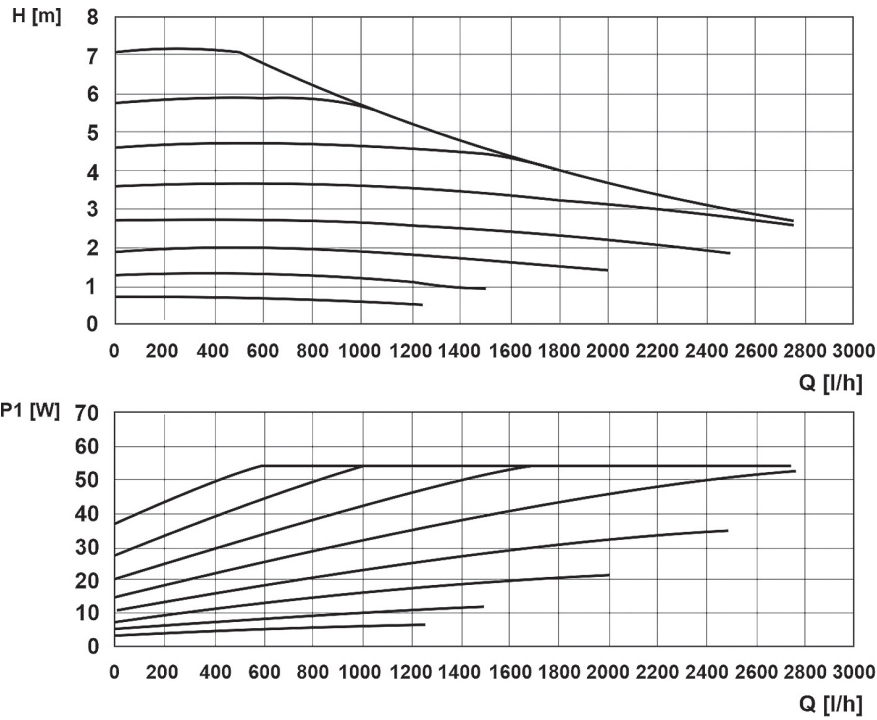
5) The values of working parameters are measured according to EN 14 511 at the manufacturer's test lab.

Dimensions



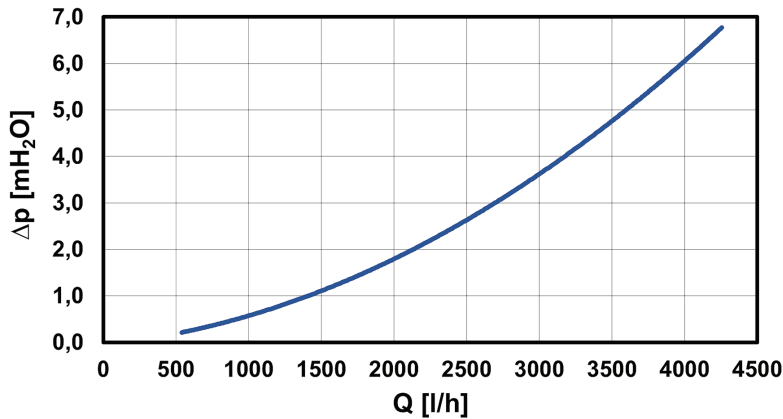
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Brine pump performance curves

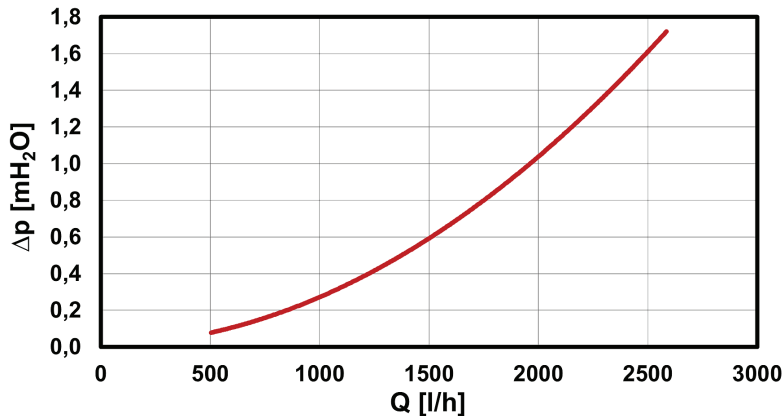


Heat pump pressure drop

Pressure drop on the brine side



Pressure drop on the heating system side



PRODUCT FICHE

EcoPart 406 Ground-to-water Heat Pump

Supplier's name *REGULUS spol. s r. o.*
 Supplier's model identifier *CTC EcoPart 406*

| Parameter | low temperature | medium temperature |
|---|------------------|--------------------|
| The seasonal space heating energy efficiency class | A+++ | A++ |
| Average climate | | |
| The rated heat output including any supplementary heaters | 7 kW | 6 kW |
| The seasonal space heating energy efficiency | 179 % | 130 % |
| The annual energy consumption | 2 967 kWh | 3 743 kWh |
| Cold climate | | |
| The rated heat output including any supplementary heaters | 6 kW | 6 kW |
| The seasonal space heating energy efficiency | 183 % | 133 % |
| The annual energy consumption | 3 332 kWh | 4 107 kWh |
| Warm climate | | |
| The rated heat output including any supplementary heaters | 6 kW | 6 kW |
| The seasonal space heating energy efficiency | 176 % | 128 % |
| The annual energy consumption | 1 860 kWh | 2 209 kWh |
| The sound power level LWA, outdoors | 43 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 406 |
| 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} | 6 | kW | Seasonal space heat. ener. efficiency | η_s | 130 | % |
| <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} | 5,30 | kW | Tj = -7 °C | COP_d | 3,10 | - |
| Tj = +2 °C | P_{dh} | 5,50 | kW | Tj = +2 °C | COP_d | 3,52 | - |
| Tj = +7 °C | P_{dh} | 5,60 | kW | Tj = +7 °C | COP_d | 3,91 | - |
| Tj = +12 °C | P_{dh} | 5,80 | kW | Tj = +12 °C | COP_d | 4,32 | - |
| Tj = bivalent temperature | P_{dh} | 5,30 | kW | Tj = bivalent temperature | COP_d | 3,16 | - |
| 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} | -6 | °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} | 1,10 | kW |
| Thermostat-off mode | P_{TO} | 0,003 | kW | Type of energy input | | electric | |
| Standby mode | P_{SB} | 0,018 | kW | For air-to-water heat pumps: | | - | m ³ /h |
| 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, | | 1,50 | m ³ /h |
| Sound power level, indoors / outdoors | L_{WA} | 43 / - | 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 $C_{dh} = 0,9$.