

## EcoPart 435 Ground-to-water Heat Pump

v1.3\_02/2021



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 temperature may reach up to 65 °C; consists of two heat pumps KM417EP (output 2x17 kW)
Installation <sup>1</sup>	the heat pump shall be installed with a Smart Controller (for codes see Catalogue); filling kit for primary circuit is included in delivery and circulation pumps for brine and heating circuits are integrated in the heat pump
Working fluid	R407C (refrigerant), antifreeze fluid (brine c.), water (heating c.)
Certification	HP Keymark - EU Committee for Standardization quality label
<b>Code</b>	<b>15903</b>

<sup>1)</sup> in case of installation in series, it is necessary to order Smart Controller (for codes see Catalogue) that shall be installed with the first heat pump in series – circulation pumps for both brine and heating circuits are already included in the heat pumps

Technical data	EcoPart 435	
	KM417EP	KM417EP
Output <sup>2</sup>	16,24 kW	16,24 kW
Power input <sup>2</sup>	3,72 kW	3,72 kW
COP <sup>2</sup>	4,36	4,36
Nominal current	27,8 A	
Max. compressor operating current (total)	23,0 A	
Max. compressor operating current (partial)	11,5 A	11,5 A
Starting current	32,0 A	32,0 A
Power supply	3/N/PE ~ 400V 50 Hz	
IP rating	IPX1	
Compressor	Scroll	
Refrigerant (GWP)	R407C (1774)	
Refrigerant quantity	2,7 kg	2,7 kg
CO <sub>2</sub> equivalent <sup>2</sup>	4,790 t	4,790 t
Compressor oil	Polyoester (POE)	
Refrigerant max.working pressure	31 bar	31 bar
Min./max. working fluid temperature in brine circuit	– 5°C / 20°C	
Min./max.working fluid pressure in brine circuit	0,2 bar / 3 bar	
Antifreeze fluid volume in HP	4,07 l	4,07 l
Min. antifreeze fluid flow through HP (Δt=5K)	2270 l/h	2270 l/h
Nom.antifreeze fluid flow through HP (Δt=3 K)	3780 l/h	3780 l/h
Brine circuit pumps	2 x UPMXL GEO 25-125 180	
Brine circuit connections	2x Cu 28x1,5	2x Cu 28x1,5
Max.heating water output	65 °C	
Max. heating water temperature in heating circuit	110 °C	
Max. heating water pressure	3 bar	
Heating water flow rate in HP (Δt = 5K at 0/35 °C)	2920 l/h	2920 l/h
Nom. heating water flow rate in HP (Δt = 10K at 0/35 °C)	1440 l/h	1440 l/h
Heating circuit circulation pumps	2 x UPM GEO 25-85 130	
Heating circuit connections	2 x Cu 28x1,5	2 x Cu 28x1,5
Total weight	359 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)	10,74 kW
Heat output <sup>4</sup>	32,48 kW
Steady current <sup>4</sup>	10,4 A
Starting current	32 A
Nominal voltage / number of phases	400 V / 3f

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

### Energy efficiency data for EcoPart 435

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

Seasonal Energy Efficiency	181%
Energy Efficiency Class	A+++
SCOP	4,70

### Sound data according to EN 12 102

Sound power level $L_{WA}$	56 dB
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#### Heating water circuit pumps



2 x  
Grundfos  
UPM GEO  
25-85 130

#### Brine circuit pumps



2x  
Grundfos  
UPMXL GEO  
25-125 180

#### Total power

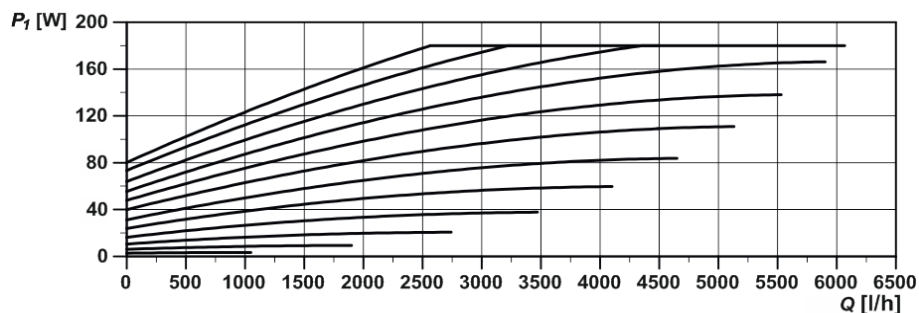
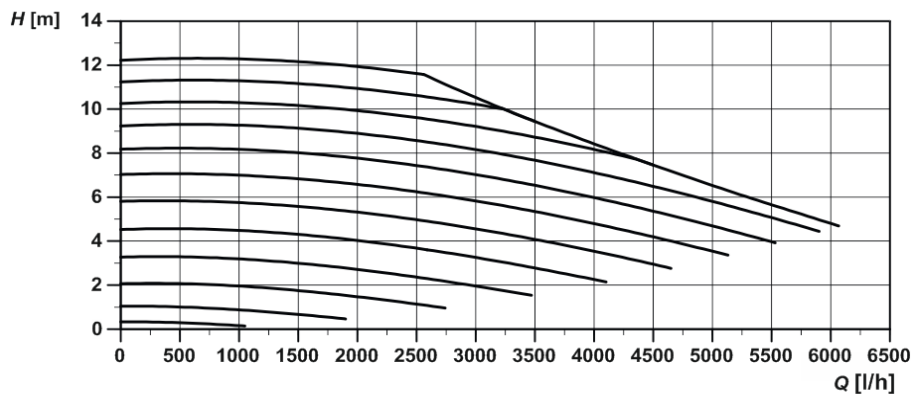
Brine system temperature	Flow temperature	Total power [kW]
5 °C	35 °C	38,50
	45 °C	36,84
	55 °C	36,32
0 °C	35 °C	32,48
	45 °C	32,28
	55 °C	31,74
-5 °C	45 °C	28,10

#### Output parameters <sup>5</sup>

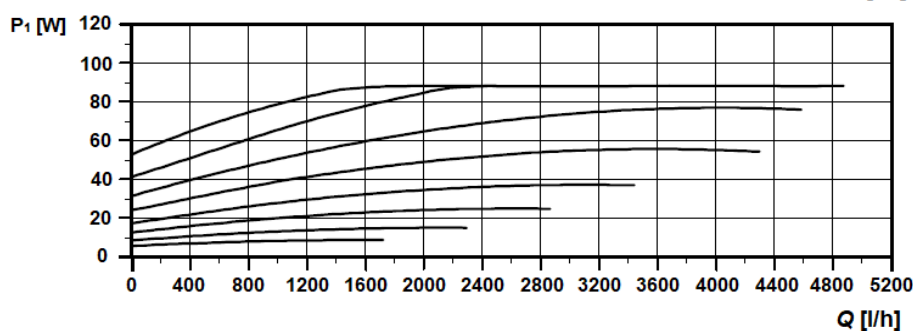
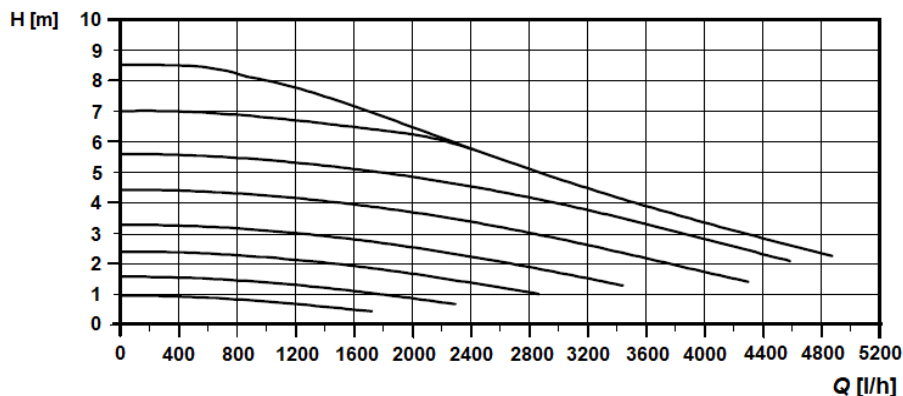
Brine system temperature	Flow temperature	Output [kW]		Power input [kW]		COP [-]	
		KM417EP	KM417EP	KM417EP	KM417EP	KM417EP	KM417EP
5 °C	35 °C	19,25	19,25	3,83	3,83	5,02	5,02
	45 °C	18,42	18,42	4,55	4,55	4,05	4,05
	55 °C	18,16	18,16	5,37	5,37	3,38	3,38
0 °C	35 °C	16,24	16,24	3,72	3,72	4,36	4,36
	45 °C	16,14	16,14	4,47	4,47	3,61	3,61
	55 °C	15,87	15,87	5,17	5,17	3,07	3,07
-5 °C	45 °C	14,05	14,05	4,40	4,40	3,19	3,19

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

#### Brine pump performance graph

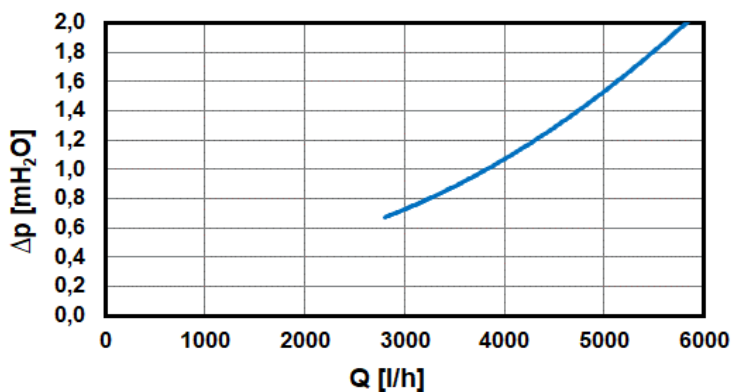


### Heating water circuit pumps performance graph

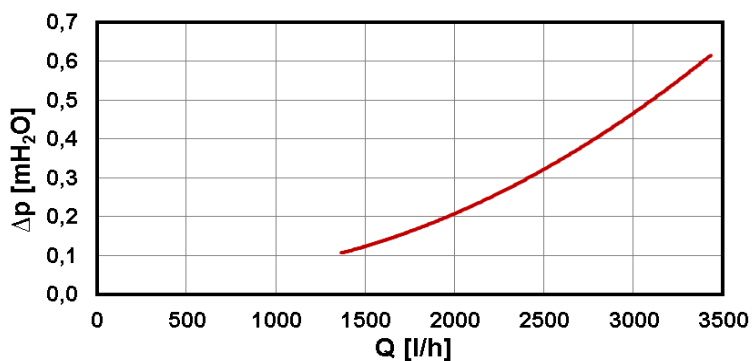


### Evaporator and Condenser pressure drop

Evaporator pressure drop

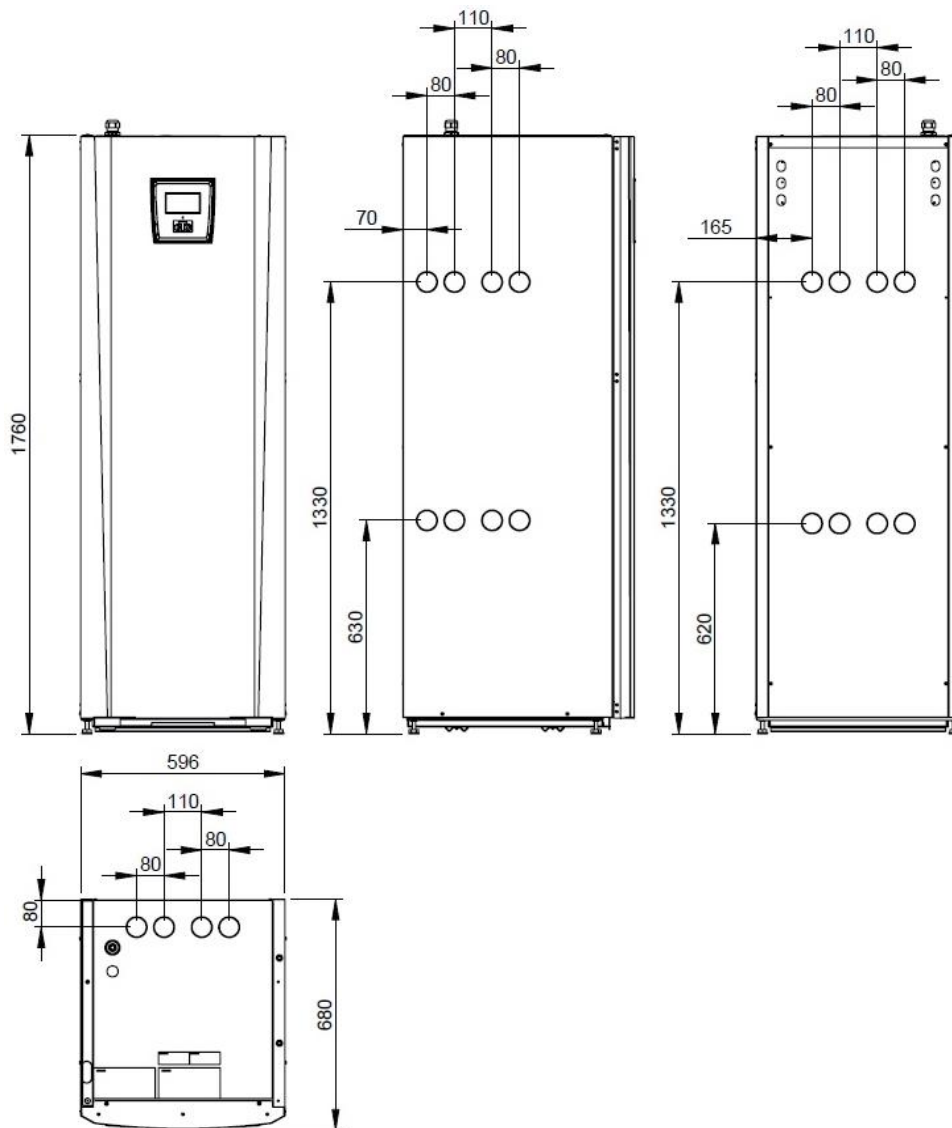


Condenser pressure drop



*EcoPart 435 Heat Pump is composed of 2 KM417EP heat pumps, connected in parallel. The graphs depict pressure drop of evaporator and condenser of one KM417EP heat pump.*

### Dimensions



## EcoPart 435 Ground-to-water Heat Pump

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Supplier's name REGULUS spol. s r.o.  
Supplier's model identifier CTC EcoPart 435

Parameter	low temperature	medium temperature
The seasonal space heating energy efficiency class	A+++	A++
<b>Average climate</b>		
The rated heat output including any supplementary heaters	38 kW	36 kW
The seasonal space heating energy efficiency	181%	137%
The annual energy consumption	16 724 kWh	5826 kWh
<b>Cold climate</b>		
The rated heat output including any supplementary heaters	36 kW	34 kW
The seasonal space heating energy efficiency	184%	140%
The annual energy consumption	18 332 kWh	23 108 kWh
<b>Warm climate</b>		
The rated heat output including any supplementary heaters	36 kW	34 kW
The seasonal space heating energy efficiency	180%	137%
The annual energy consumption	10 360 kWh	12 630 kWh
<b>The sound power level <math>L_{WA}</math>, indoors</b>	<b>56 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 435</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 are declared for medium-temperature application and average climate

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
Rated heat output (*)	Prated	36	kW	Seasonal space heat.ener. efficiency	$\eta_s$	137	%
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 temp. 20 °C and outdoor temp. $T_j$ .			
$T_j = -7$ °C	$P_{dh}$	32,00	kW	$T_j = -7$ °C	$COP_d$	3,23	-
$T_j = +2$ °C	$P_{dh}$	32,20	kW	$T_j = +2$ °C	$COP_d$	3,60	-
$T_j = +7$ °C	$P_{dh}$	32,80	kW	$T_j = +7$ °C	$COP_d$	3,97	-
$T_j = +12$ °C	$P_{dh}$	33,40	kW	$T_j = +12$ °C	$COP_d$	4,36	-
$T_j$ = bivalent temperature	$P_{dh}$	32,00	kW	$T_j$ = bivalent temperature	$COP_d$	3,23	-
$T_j$ = operation limit temperature	$P_{dh}$	-	kW	$T_j$ = operation limit temperature	$COP_d$	-	-
For air-to-water heat pumps: $T_j = -15$ °C, if TOL < -20 °C	$P_{dh}$	-	kW	For air-to-water heat pumps: $T_j = -15$ °C, if TOL < -20 °C	$COP_d$	-	-
Bivalent temperature	$T_{biv}$	-7	°C	For air-to-water heat pumps: operation limit temperature	$T_{OL}$	-	°C
Cycling interval capacity for heating	$P_{cyc}$	-	kW	Cycling interval efficiency	$COP_{cyc}$	-	-
Degradation coefficient	$C_{dh}$	0,99	-	Heating water operating limit temp.	$W_{TOL}$	65,00	°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 (*)	$P_{SUD}$	4,40	kW
Thermostat off-mode	$P_{TO}$	0,008	kW	Type of energy input	electric		
Standby mode	$P_{SB}$	0,018	kW	For air-to-water heat pumps: rated air flow rate, outdoors			
Crankcase heater mode	$P_{CK}$	0,000	kW	For water/brine-to-water heat pumps: rated brine or water flow rate, outdoor heat exchanger			
<i>Other items</i>							
Capacity control		fixed					
Sound power level, indoors / outdoors	$L_{WA}$	56 / -	dB				

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  $Prated$  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  $C_{dh} = 0,9$ .