Regulus

Heat **Pumps**

air-to-water models
ground-to-water models

Energy-saving solutions

www.regulus.eu

CONTENTS

Quality labels

The quality of Regulus CTC Heat Pumps was guaranteed by the European Q-Label mark.

Since June 2017, CTC Regulus Heat Pumps are among the first ones in the Czech Republic that are certified by **HP KEYMARK**, a certification mark replacing Q-Label as well as other national quality marks (e.g. French or British).

In order to be awarded the quality marks, the heat pump shall meet the given criteria that are verified by independent certification bodies or test labs. A manufacturer or distributor shall ensure the predefined levels of service.

The key requirements are primarily:

- conformity with international and national standards, rules and regulations
- meeting the requirements for minimum permissible energy efficiency and maximum permissible sound power level following Ecodesign
- an existing sales and distribution network, authorized service provider
- existing operation documentation in the local language of the country where the heat pump is distributed
- an existing functioning customer service network
- min. two year full warranty which shall include a declaration stating that the heat pump spare parts inventory will be available for at least ten years

Test results for HP Keymark are registered in a database managed by CEN (European Committee for Standardization). Meeting the parameters is regularly verified by an independent certification body.

This is a proof for a user that the product is of high quality and in compliance with the respective European standards.

Warranty

We offer a longer warranty for heat pumps. Thanks to the high quality of all components and reliability of Regulus CTC Heat Pumps, the warranty is extended to 5 years and the warranty for compressor can be even as long as 10 years.

Why to consider energy efficient heating?

Energy prices keep climbing up year by year and their further growth can be expected. Investing into a cost effective heating system will bring significant savings today and even higher in the future.

Why a Heat Pump?

If you choose any traditional heat source, it will always consume fuel, transforming it into heat with a certain efficiency, be it higher or lower. However, you will always pay for the complete energy consumption for your home.

If you choose a Heat Pump, it will be able to gain the majority of energy from the ambient environment (usually 2/3 of the energy supplied for a house), consuming only a smaller part of the energy (usually 1/3 of the energy supplied for a house). It means that the majority of energy needed will always be for free, disregarded of its price.

Is it the right time to buy a Heat Pump now?

The technical development in heat pumps has made a big progress in recent years. Heat pumps from serious European manufacturers are economic, feature a long service life and utilize smart control systems. Their price has dropped significantly due to the mass production. Moreover, you can get a state subsidy in some countries! So say goodbye to high energy bills, the right time is just now!

Why a Regulus CTC Heat Pump?

Regulus offers excellent CTC heat pumps that are manufactured by a renowned Swedish company with 80 years of tradition. CTC applies the latest technologies in its development of new models in order to reach top parameters, however the mass production enables favorable pricing.

Regulus is active in the heating branch since 1992, concentrating on renewable energy sources since 1999. Our team of engineers is ready to suggest you an optimum cost saving solution for your heating. It is not our goal to sell you a heat pump without any considerations, our aim is to calculate and design the best technical solution for you that will be suitable for your home and your needs and will bring you the highest savings, maintaining the heating comfort.

What is the range of Regulus CTC Heat Pumps and accessories?

Our offer consists not only of heat pumps alone but involves an entire system that enables the heat pump to be utilized optimally for space heating and DHW as well. Other renewable energy sources can be used together, like solar energy or biomass.

You can choose your air-source heat pump from a wide choice of performance variants and assemble an optimum heat source for your house.

Ground-coupled heat pumps can gain heat either from a deep bore or from underground loops, it is up to you which variant suits your needs better. All models feature a closed coolant circuit, filled and tested in production. The installation is then fast and easy. Each heat pump is equipped with its dedicated control electronics that controls its operation. It communicates with a smart controller, IR 12 that can also control a whole heating system and a series of heat pumps at the same time.

A complex solution is represented by EcoZenith compact unit that contains all components of a current home boiler room. It heats DHW, contains a thermal store, an electronic controller and heating elements switched on/off in steps. The EcoHeat model contains also an integrated ground-source heat pump. If you choose an IR 12 Smart Controller, you can monitor and control your heating system over the internet.

HOW IT WORKS...

» Heat pump draws low-temperature energy from the ambient environment and "pumps" it to a higher temperature «

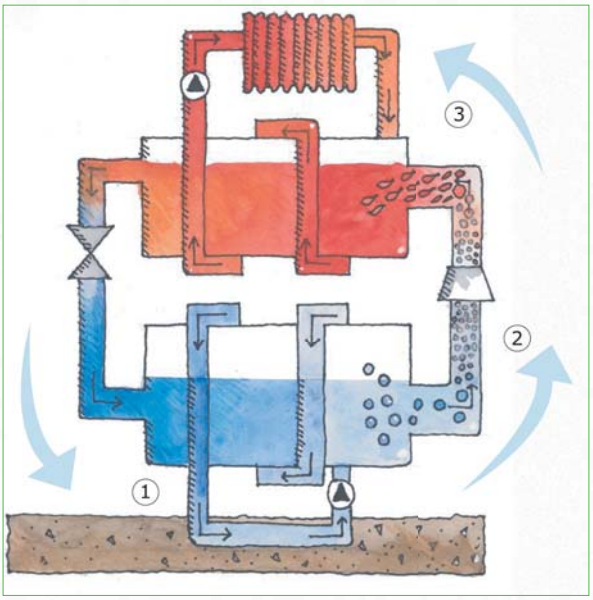
» Air or ground is usually the heat source «

How does a heat pump work?

The working principle is the same as in a current refrigerator, freezer or A/C unit. A heat pump is based on a closed circuit filled with special coolant that evaporates under low temperature and absorbs energy. Coolant vapors are compressed in a compressor, getting heated up. Under higher temperature, the gaseous coolant gives off its heat into heating water which brings it back to liquid form, and the entire cycle repeats itself.

Like a fridge can draw heat from food as cold as -20°C, a heat pump can work and draw heat from air, water or ground even under extremely low temperatures.

A COP (Coefficient of Performance) shows its efficiency, namely how many times more energy it supplies than consumes. With falling temperature of the heat source also the COP sinks.



Heat pumps use energy coming from solar radiation that remains in the air, ground and water. In an air-coupled heat pump, air passes through the heat pump, heating directly the coolant in the heat exchanger (evaporator). In a ground-coupled heat pump, biodegradable antifreeze fluid (brine) is used for heat transfer from the ground into the heat pump. This fluid circulates between the ground collector and the heat pump. When entering the heat pump, the temperature of the fluid is about 4°C. Its heat energy is transferred to the coolant circulating inside the heat pump in a closed circuit.

The heat from the ground collector causes evaporation of the coolant that has a low boiling point. Coolant vapor gets compressed by the compressor and heats up. The hot vapor then passes through a heat exchanger (condenser), condenses and gives off its heat to heating water. Then it cools down swiftly when passing through the expansion valve and the cycle repeats itself.

Air-coupled heat pumps work in the same manner, just the coolant in the evaporator is heated by passing air, not by a fluid.

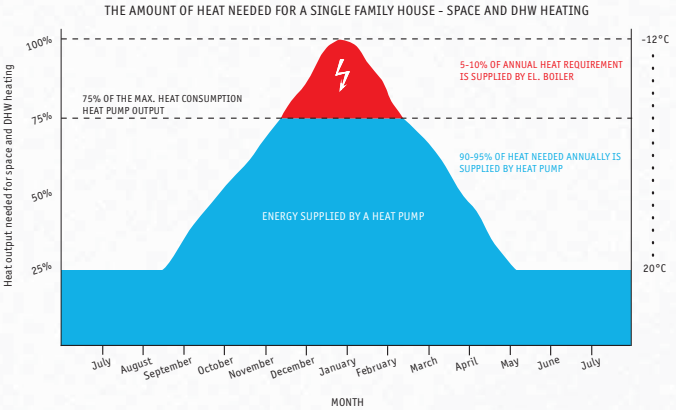
Solar collectors gain heat directly from the sun as the solar radiation heats up the fluid inside a solar collector. A solar thermal system needs almost no energy for its operation. If you combine a heat pump with a solar thermal system, you will be using solar energy directly through solar collectors for DHW and space support heating. In cool days the heat pump will utilize the solar energy indirectly. In systems with deep bores the heat from solar collectors can be stored into the bore in the summer. Then in the winter the heat pump exploits the stored heat and works with a higher COP.

In the summer, the cold from the bore can be used for direct cooling (without a heat pump), with higher cooling demands the cooling output can be increased using a heat pump.

What heat output is right?

A traditional heat source (boiler) shall be sized as equivalent to the heat loss value of the house or higher. Since the investment into a more powerful heat pump is rather high, its preferred output is usually lower. In periods of extreme frost usually traditional heat sources like electricity, gas, solid fuels etc. support the heat pump in supplying the heat demanded.

Due to a sparse occurrence of very cold days the operation of a traditional source brings very little cost increase while the investment spared is high. The recommended heat pump sizing is about 75 % of the building's heat loss that will cover as much as 95 % of the annual heat consumption.



SIZING

AIR-TO-WATER MODELS

ON/OFF - EcoAir 406-420:

SIZING BY:	energy needed for space and DHW heating				building heat loss *				multi-energy thermal store
Heat Pump	**from**		**to**		**from**		**to**		**EcoZenith connection possible?**
EcoAir 406	**0**	*kWh/year*	**16 000**	*kWh/year*	**0**	*kW*	**6**	*kW*	*Yes – i250*
EcoAir 408	**11 500**	*kWh/year*	**20 000**	*kWh/year*	**5**	*kW*	**8**	*kW*	*Yes – i250*
EcoAir 410	**18 000**	*kWh/year*	**31 500**	*kWh/year*	**7**	*kW*	**12**	*kW*	*Yes – i250*
EcoAir 415	**23 500**	*kWh/year*	**41 500**	*kWh/year*	**10**	*kW*	**16**	*kW*	*No*
EcoAir 420	**29 500**	*kWh/year*	**51 500**	*kWh/year*	**14**	*kW*	**20**	*kW*	*No*

INVERTOR - EcoAir 510M a 600M:

SIZING BY:	energy needed for space and DHW heating				building heat loss *				multi-energy thermal store
Heat Pump	**from**		**to**		**from**		**to**		**EcoZenith connection possible?**
EcoAir 510M	**0**	*kWh/year*	**20 000**	*kWh/year*	**0**	*kW*	**8**	*kW*	*Yes - i350*
EcoAir 614M	**0**	*kWh/year*	**34 000**	*kWh/year*	**0**	*kW*	**13**	*kW*	*Yes – i350*
EcoAir 622M	**21 500**	*kWh/year*	**51 500**	*kWh/year*	**9**	*kW*	**20**	*kW*	*Yes – i350*

GROUND-TO-WATER MODELS

ON/OFF – EcoPart 406-417, EcoHeat 406-412:

SIZING BY:	energy needed for space and DHW heating				building heat loss *				multi-energy thermal store
Heat Pump	**from**		**to**		**from**		**to**		**EcoZenith connection possible?**
EcoPart 406	**0**	*kWh/year*	**17 000**	*kWh/year*	**0**	*kW*	**7**	*kW*	*No*
EcoPart 408	**16 500**	*kWh/year*	**24 500**	*kWh/year*	**5**	*kW*	**10**	*kW*	*No*
EcoPart 410	**20 000**	*kWh/year*	**30 000**	*kWh/year*	**7**	*kW*	**13**	*kW*	*No*
EcoPart 412	**23 500**	*kWh/year*	**35 500**	*kWh/year*	**9**	*kW*	**15**	*kW*	*No*
EcoPart 414	**29 000**	*kWh/year*	**43 500**	*kWh/year*	**12**	*kW*	**19**	*kW*	*No*
EcoPart 417	**33 500**	*kWh/year*	**50 500**	*kWh/year*	**15**	*kW*	**22**	*kW*	*No*

For EcoHeat heat pumps the same range is valid as for EcoPart ones.

In all the cases, DHW heating for 4 persons is considered, with consumption of 40 l/person/day. The input data for heat pump sizing shall be based on a calculation. The energy consumption for space and DHW heating can be found in the respective Energy Performance Certificate, or established following EN ISO 13 790 or EN ISO 52 016-1.
The heat loss from a building is usually stated in the heating design, or it can be calculated using the EN 12 831-1 standard.
If there is another significant heat consumer in the building, heated by the heat pump (pool, ventilation…) that is not included in the above described calculations, please contact us via e-mail: poptavky@regulus.cz.

Heat pumps without a multi-energy thermal store need to be upgraded with a master **controller and a thermal store** (invertor models may be installed even without a thermal store if the conditions in the instruction manual are respected), and should they be also used for hot water supply, then with a hot water storage tank as well. A thermal store can be combined with a hot water storage tank in one combi tank - DUO, HSK, VEGA models.

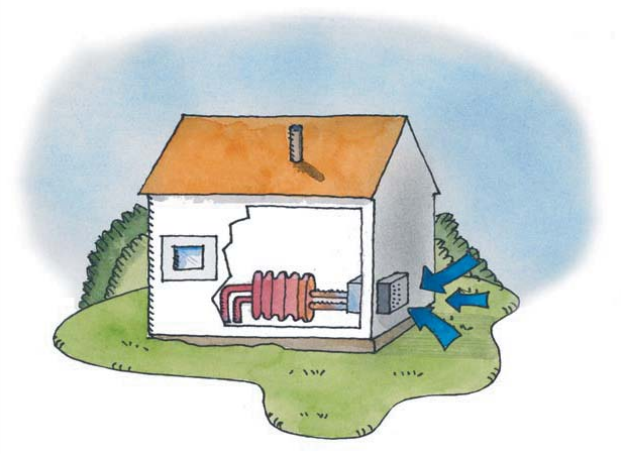
WHERE DOES A HEAT PUMP TAKE THE ENERGY FROM?

In mild climate air is the most current heat source for heat pumps. Air-source heat pumps benefit from easy installation requiring no deep bores, no groundwork.

In order to gain heat from the ground, either deep bores need to be drilled, or loops buried about 1.2m underground. In these systems the output is stable even under severe frost as the soil keeps a stable temperature.

Air-to-water heat pumps

Air-to-water heat pumps draw energy from the ambient air even when the outdoor temperature drops to -22°C. The energy gained at a low temperature is then "pumped" to a higher temperature and transferred into heating water. Electric energy is consumed just to run a compressor and fan of the heat pump. This makes about one third of the energy supplied by the heat pump, the rest is drawn from the ambient air. That's why about two thirds of the energy needed for heating can be saved. Reliability and excellent parameters of CTC heat pumps are proved by many thousands annual installations in the harsh Scandinavian climate.



Advantages of air-to-water heat pumps

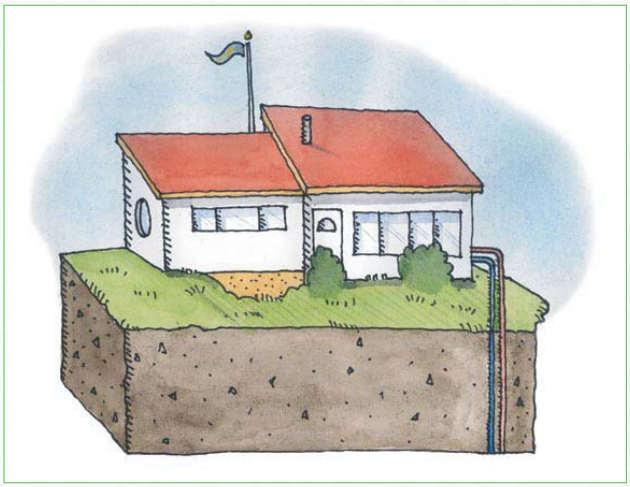
+ Low purchase costs
+ Easy installation
+ No groundwork

Drawbacks of air-to-water heat pumps

- Inconsiderate placement might cause noise disturbance
- Power output sinks at extremely low temperatures

Heat pumps with deep bore holes

In order to gain heat from deep bores, one or more boreholes need to be drilled (70-150 m deep). Their number and depth depend on the heating output of the installed heat pump and on the building to be heated. As there is a risk of influencing groundwater, it is necessary to have a geological survey performed and obtain a permission for the boreholes. The heat pump itself is located inside the building and connects to the borehole with 2 pipes. Its connection to a thermal store and a heating system is the same as that of an air-source heat pump.



Advantages of heat pumps with a deep bore

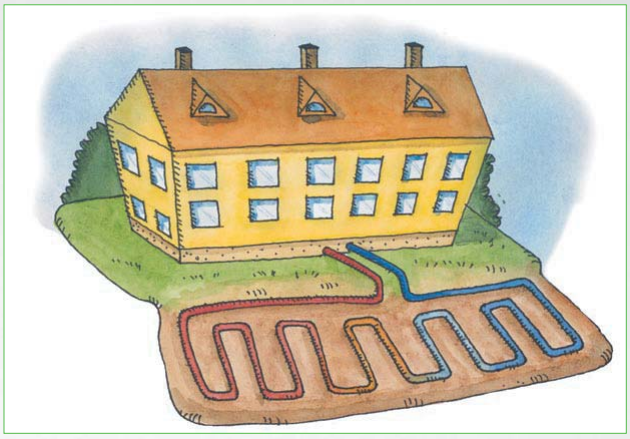
+ Stable heat source under low outdoor temperature
+ Deep bores do not require a big lot
+ Summer cooling possible

Drawbacks of heat pumps with a deep bore

- Higher installation costs
- Deep bores need a permit
- Water resources shall be taken into consideration

Heat pumps with ground collector

The sub-surface ground collector consists of loops of pipes buried 1.2m below the surface. The soil needs to be removed first and when the loop is laid, the soil is returned to its place. The other method is digging trenches where individual loops are laid in a similar method to burying e.g. electric cables. The heat pump itself is located inside the building and connects to the ground collector with 2 pipes. Its connection to a thermal store and a heating system is the same as that of an air-source heat pump.



Advantages of heat pumps with ground collector

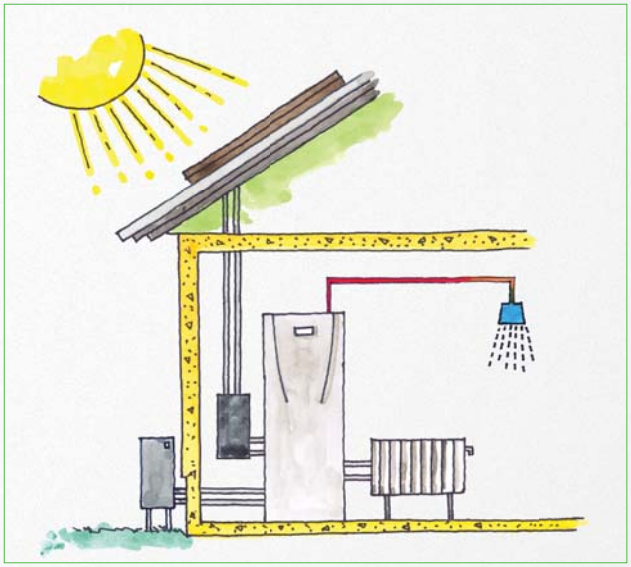
+ Lower installation costs against deep bores
+ Relatively stable heat source under low outdoor temperature
+ No special permit needed

Drawbacks of heat pumps with ground collector

- Large lot needed
- Groundwork on a large area

Combining solar energy with a Heat Pump

Solar energy can be utilized together with a heat pump, combining thus the most ecological energy sources. In the summertime solar energy can be used for DHW heating and in the heating season it helps in space heating. In a heat pump with a deep bore, solar energy can be stored in the bores.



EcoAir 406-420 Air-to-Water Heat Pump

Air-to-water heat pumps draw energy from the ambient air. The energy gained under a low outdoor temperature (as low as -22°C) is then "pumped" to a higher temperature and transferred into heating water. **Its flow temperature reaches as much as +65°C**. It is subsequently used to heat a house, prepare DHW or heat a pool.
This line of air-coupled heat pumps has been developed using the most advanced technologies in order to reach the best parameters. They are equipped with a new, extra large air heat exchanger (evaporator) for the best utilization of air energy. In order to reach a high COP and effective operation even under very low temperatures, they are fitted with the latest compressors and an electronic expansion valve.
Heat pumps of the 400 line can be sized to cover 100% of the heat needed for space and water heating, with heating needs covered by the heat pump alone without any electric backup.

EcoAir 406-420 Heat Pumps are able to communicate with IR 12 Smart Controllers that permit comfort heating system control incl. control of up to 10 heat pumps connected in series.

**Energy Efficiency Class for the set with controller under average climate conditions for low-temperature application*

Technical Data				EcoAir 406	EcoAir 408	EcoAir 410	EcoAir 415	EcoAir 420
Air/water temperature in °C	A7/W35*	Heat output	[kW]	6.22	7.83	11.45	16.19	17.52
		Power input	[kW]	1.30	1.62	2.36	3.53	4.23
		COP	[-]	4.78	4.83	4.86	4.58	4.15
	A2/W35*	Heat output	[kW]	4.69	6.02	8.80	11.42	14.55
		Power input	[kW]	1.28	1.60	2.30	3.24	4.13
		COP	[-]	3.66	3.76	3.83	3.52	3.52
	A-7/W35*	Heat output	[kW]	3.87	4.73	7.32	9.96	11.51
		Power input	[kW]	1.25	1.57	2.29	3.27	3.94
		COP	[-]	3.10	3.02	3.19	3.04	2.92
Dimensions and weight		Width	[mm]	1245	1245	1375	1375	1375
		Height	[mm]	1075	1075	1175	1175	1175
		Depth	[mm]	545	545	610	610	610
		Weight	[kg]	120	126	180	187	190
Sound power level			[dB(A)]	56	58	58	67	70
Noise level: (medium/reduced speed)		5 m distance	[dB(A)]	34-37	36-39	36-39	45-48	48-51
		10 m distance	[dB(A)]	28-31	30-33	30-33	39-42	43-46
Code				13243	13244	12994	12995	12848

*Values measured according to EN 14511 incl. defrost cycle

Each CTC Heat Pump is equipped with a max. current limiter for compressor startup.

EcoAir 400 heat pumps are supplied without circulation pumps. They shall be installed exclusively with CSE IR 12 load units – see p. 21, or with an EcoZenith i250 Multi-Energy Thermal Store – see p. 11.

EcoZenith i250 Multi-Energy Thermal Store

The Multi-Energy Thermal Store is intended for indoor installation, it features an elegant design and requires very little space. It involves a thermal store with integrated DHW heating, an el. heating element used as an auxiliary heat source for the heat pump, a 4-way bivalent mixing valve with actuator and a smart controller.

A copper heating coil inside the thermal store permits instantaneous water heating which guarantees continuous fresh water without any risk of Legionella bacteria formation.

A touchscreen enables to set parameters and display operation data in user friendly environment.

A solar thermal system, a fireplace insert with a hydronic heat exchanger, or a plate heat exchanger for pool heating can be all connected to the unit.

Technical Data for EcoZenith i250

Dimensions	Width	[mm]	595
	Height	[mm]	1652
	Depth	[mm]	672
Weight		[kg]	167
Heating water volume		[l]	223
DHW heat exchanger volume		[l]	5.7
Output of el. heating elements		[kW]	15
Code			13241

Volume of hot water supplied		EA406EZ	EA408EZ	EA410EZ
40°C hot water supply with temperatures of 58/45 °C in the Thermal Store (upper/lower)	with 8 l/min. DHW draw-off rate	182 l	239 l	287 l
	with 12 l/min. DHW draw-off rate	113 l	139 l	161 l

EcoAir 510M Inverter Air-to Water Heat Pump

An Air-to-Water Heat Pump that draws energy from the ambient air (under outdoor temperature as low as -22°C), "pumps" it to a higher temperature and transfers it into heating water. Its flow temperature can reach as much as 65°C. This is a single-phase inverter heat pump, equipped with output modulation that guarantees efficient operation adjustment depending on current conditions.

- SCOP 4.4
- Energy efficiency class with controller A+++
- Designed for use with single-phase PV panels

**Energy Efficiency Class for the set with controller under average climate conditions for low-temperature application*

These heat pumps install easily, offering a high COP and extremely low noise level. The smart defrosting function monitors the condition of the heat pump continuously, starting defrosting only for an inevitable period and only when it is really needed which contributes to high efficiency of these heat pumps.

Technical Data				EcoAir 510M
Output			[kW]	2-11
SCOP			[-]	4.4
Air/water temperature in °C	A7/W35* 20 ot./s	Heat output	[kW]	2.52
		Power input	[kW]	0.54
		COP	[-]	4.67
	A2/W35* 50 ot./s	Heat output	[kW]	4.74
		Power input	[kW]	1.37
		COP	[-]	3.47
	A-7/W35* 90 ot./s	Heat output	[kW]	6.60
		Power input	[kW]	2.42
		COP	[-]	2.73
Dimensions and weight		Width	[mm]	1245
		Height	[mm]	1080
		Depth	[mm]	530
		Weight	[kg]	119
Sound power level			[dB(A)]	59.7
Sound pressure level at distance of		5 m	[dB(A)]	40
		10 m	[dB(A)]	33
Code				15676

*Values measured according to EN 14511 incl. defrost cycle

EcoAir 500M heat pumps are supplied without circulation pumps. They shall be installed exclusively with CSE IR 12 load units – see p. 21, or with an EcoZenith i350 Multi-Energy Thermal Store – see p. 14.

EcoAir 614M and 622M Inverter Air Source Heat Pumps

A Heat Pump draws energy from the ambient air and transfers it to domestic hot water and heating water. It works down to -22°C outdoor temperature and offers heating water up to 65°C. This is a 3-phase heat pump with a scroll compressor and inverter (speed control), offering a long service life. The output of the Heat Pump keeps adjusting to the heating requirements throughout the year.

- New scroll compressor with speed control and a long service life
- Smart defrost
- Max. COP of 5.9
- Energy efficiency class with controller A+++
- Suitable for a 3-phase PV power source

**Energy Efficiency Class for the set with controller under average climate conditions for low-temperature application*

These Heat Pumps install easily, offering a high COP and an extremely low noise level. The feature of smart defrosting keeps monitoring the condition of the Heat Pump and starts defrosting for the shortest necessary time only when it is really needed. This contributes to a high efficiency of these Heat Pumps.

Technical Data				EcoAir 614M	EcoAir 622M
Output			[kW]	3-13	4-24
Maximum COP			[-]	5.92	5.65
Seasonal COP (SCOP)			[-]	4.9	4.93
Air/water temperature in °C	A7/W35* 20 ot./s	Heat output	[kW]	2.55	4.75
		Power input	[kW]	0.54	0.94
		COP	[-]	4.71	5.07
	A2/W35* 50 ot./s	Heat output	[kW]	5.31	8.27
		Power input	[kW]	1.31	2.19
		COP	[-]	4.05	3.78
	A-7/W35* 120 ot./s	Heat output	[kW]	8.69	13.99
		Power input	[kW]	3.94	6.03
		COP	[-]	2.21	2.32
Dimensions and weight		Width	[mm]	1245	1375
		Height	[mm]	1080	1180
		Depth	[mm]	545	645
		Weight	[kg]	174	192
Sound power level			[dB(A)]	52	55
Sound pressure level at distance of		5 m	[dB(A)]	33	36
		10 m	[dB(A)]	27	30
Code				17156	17157

*Values measured according to EN 14511 incl. defrost cycle

EcoAir 500M heat pumps are supplied without circulation pumps. They shall be installed exclusively with CSE IR 12 load units – see p. 21, or with an EcoZenith i350 Multi-Energy Thermal Store – see p. 14.

EcoZenith i350 Multi-Energy Thermal Store

EcoZenith i350 is an indoor unit designed for use with inverter heat pumps. It represents a complete boiler room which helps reduce the required space to minimum. Installation of this multi-energy thermal store together with heat pumps will meet all demands concerning space and DHW heating in your home.
Thanks to a new, very efficient insulation the heat loss is extremely low.

The multi-energy thermal store involves a controller for both a heat pump and a heating system, a tank for continuous water heating, auxiliary electric heat source, circulation pumps and an expansion vessel.

Parameters are adjusted and operation data displayed in a user-friendly environment via a colour touch screen in several languages. The whole system of space and DHW heating can be easily controlled via a smartphone if an internet module is added and a mobile application installed.

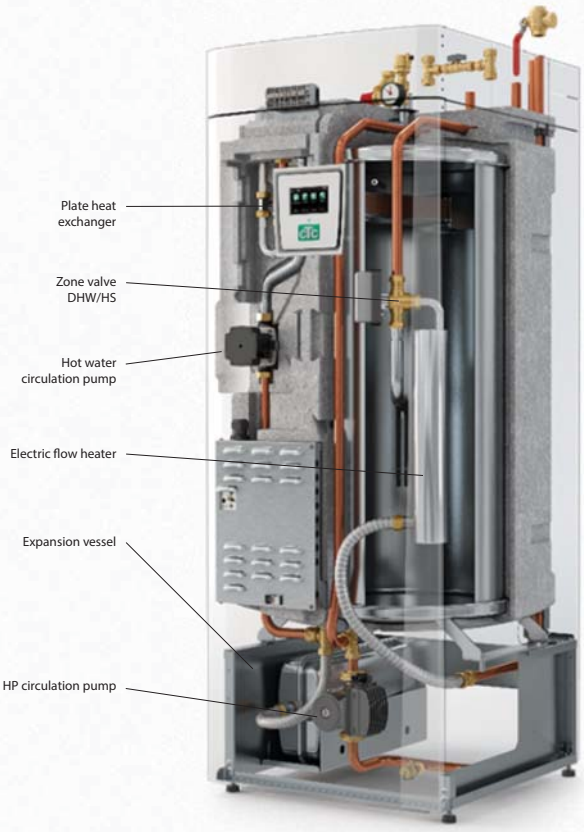
Technical Data of EcoZenith i350

Dimensions	width	[mm]	596
	height	[mm]	1676
	depth	[mm]	673
Weight		[kg]	143
Heating water volume		[l]	225
Volume of DHW plate heat exchanger		[l]	1.7
Output of el. heating elements		[kW]	11.9
Code			17192

Volume of DHW supplied

Adjusting DHW temperature in controller	Economic	Normal	Comfort
Water volume (40°C)	210 l	235 l	304 l
Load profile following EN 16 147*	XL	XL	XL

** in compliance with Commission Regulation (EU) No 813/2013*



EcoHeat 406-412 ground-to-water heat pumps

EcoHeat 400 is based on a proved compact design, bringing plenty of innovation and new technologies which ranks this model among the world's best in its class.

The heat output line involves 6, 8, 10 and 12kW models. **A high COP excels among other technical parameters, reaching as much as 5.5 in low-temperature systems! These values are reached due to the use of the most advanced technologies, namely of a new electronic expansion valve. Flow temperature can be as high as 65°C!** Domestic hot water is heated instantaneously in a copper heat exchanger inside the thermal store which guarantees always fresh water without any risk of Legionella bacteria formation that is detrimental to human health.

EcoHeat is a compact unit containing a ground source heat pump and a multi-energy thermal store incl. a smart controller with a colour touch screen and intuitive control.

EcoHeat heat pumps draw heat either from deep bores or from sub-surface ground collectors. The unit is placed inside a house and connected with the ground loops with 2 pipes. Its main advantage is a stable output and COP even under fierce frost. The multi-energy thermal store represents an entire boiler room. After easy connection to el. power supply, heating system and water mains it covers complete thermal needs of a house - heating, heat storing, DHW heating by a heat pump and integrated 9kW el. heating element. It is self-understood that also solar thermal collectors, hydronic fireplace insert or other heat sources can be connected. Its compact build excels in a low heat loss and a very small footprint.

The unit contains an electronic controller that manages to control 2 independent weather compensated heating circuits, DHW heating, heat pump operation and to switch its electric heating element. The heating system is controlled with respect to both outdoor temperature (OTC) and indoor room sensor. Temperature sensors for heating circuits and an outdoor temperature sensor are all contained in the package. Heating water is being mixed according to momentary needs in a special inbuilt 4-way valve. A possible second heating circuit shall be equipped with a 3-way mixing valve and if needed also with a second room temperature sensor (Regulus accessories).

** Energy Efficiency Class for the set with controller under average climate conditions for low-temperature application*

EcoHeat is divided into two sections for the most efficient operation of the heat pump - the lower cooler zone for pre-heating of sanitary and heating water, and upper warmer zone for DHW backup heating. The heat pump supplies the lower section for most of time, working more efficiently, just in periods of DHW demand the 3-way valve switches and the heat pump starts supplying the upper zone where pre-heated DHW is heated to the desired temperature. The el. heating element in the upper section of the thermal store gets switched only in case of a high energy demand, e.g. when plenty of DHW is needed. In order to keep the backup heating efficient and precise, the controller switches the el. heating element in small steps (300 W).

The controller in EcoHeat continuously measures current in all phases of the main circuit breaker in order to prevent tripping. Whenever the total power drawn approaches the nominal circuit breaker value, the controller will reduce the power input to the heat pump (first decreasing the power input for the el. heating element in 300W steps if on, and then turning off the heat pump itself). As soon as the power drawn sinks (the other loads turned off), the controller will restore operation of the heat pump. The current sensors (included in the package) shall be installed on the main power supply (e.g. to the mains circuit breaker) and wired to the controller. This enables using EcoHeat for heating houses with a low-sized main fuse that otherwise could not be heated with an electric boiler and a heat pump, saving also high monthly charges for an unnecessarily high value of the main circuit breaker.

Technical Data			EcoHeat 406	EcoHeat 408	EcoHeat 410	EcoHeat 412
Primary circuit/HP flow temp. at B0/W25	Heat output	[kW]	6.1	8.5	10.4	12.3
	Power input	[kW]	1.20	1.72	1.87	2.23
	COP	[-]	5.10	4.93	5.55	5.51
Primary circuit/HP flow temp. at B0/W35	Heat output	[kW]	5.9	8.2	10	11.8
	Power input	[kW]	1.29	1.79	2.17	2.57
	COP	[-]	4.57	4.58	4.60	4.60
Primary circuit/HP flow temp. at B0/W55	Heat output	[kW]	5.2	7.6	9.3	11.0
	Power input	[kW]	1.88	2.54	3.12	3.72
	COP	[-]	2.76	2.99	2.98	2.96
Dimensions and weight	Width	[mm]	595	595	595	595
	Height	[mm]	1904	1904	1904	1904
	Depth	[mm]	672	672	672	672
	Weight	[kg]	267	270	272	279
Electric backup heating in 300W steps		[kW]	0 - 9	0 - 9	0 - 9	0 - 9
Thermal store	Volume	[l]	223	223	223	223
Volume of 40°C warm DHW available at the temperatures in the thermal store of 60/40°C (upper/lower)	if 8 l/min. DHW is drawn	[l]	174	233	283	348
	if 12 l/min. DHW is drawn	[l]	107	134	157	187
Code		[-]	13441	13442	13443	13444

COP given according to EN 14511 incl. power input for both the circulation pumps.

Max. flow temperature of the heat pump is 65°C.

Each CTC Heat Pump is fitted with a max. current limiter for compressor startup.

A solar module can be connected to EcoHeat to utilize solar energy from solar thermal collectors. Solar energy can be used together with a heat pump which means combining the most ecologic energy sources (more on Page 8). Solar energy is used to heat DHW in the summer and to support space heating in the winter. At the same time, this prolongs the service life of the heat pump. For a heat pump with a deep bore, summer solar energy surplus can be stored in the bore which helps increase the operation efficiency of the heat pump.

EcoPart 406-417 ground-to-water heat pumps

EcoPart 400 is based on the proved design of the preceding generation of EcoPart V3 heat pumps, bringing some principal innovation and new technologies which ranks this model among the world's best heat pumps.

The heat output line involves 6, 8, 10, 12, 14 and 17 kW models. **A high COP excels among other technical parameters, reaching as much as 5.5 in low-temperature systems! Thanks to the use of the most advanced technologies, namely of a new electronic expansion valve, flow temperature can be as high as 65°C!** This temperature guarantees the utmost comfort in DHW heating.

It can work with a traditional PS thermal store and RBC HP hot water storage tanks. EcoPart 406-410 can also work with R2DC hot water storage tanks.

Heating control and communication with the heat pump is performed by IR 12 external controllers.

EcoPart heat pumps draw heat either from deep bores or from sub-surface ground collectors. The unit is placed inside a house and connected with the ground loops with 2 pipes. Its main advantage is a stable output and COP even under fierce frost. This heat pump provides very quiet operation.

** Energy Efficiency Class for the set with controller under average climate conditions for low-temperature application*

Technical Data			EcoPart 406	EcoPart 408	EcoPart 410	EcoPart 412	EcoPart 414	EcoPart 417
Primary circuit/HP flow temp. at B0/W25	Heat output	[kW]	6,1	8.5	10.4	12.3	14.63	--
	Power input	[kW]	1,20	1.72	1.87	2.23	2.79	--
	COP	[-]	5,10	4.93	5.55	5.51	5.25	--
Primary circuit/HP flow temp. at B0/W35	Heat output	[kW]	5,9	8.2	10	11.8	14.5	16.76
	Power input	[kW]	1,29	1.79	2.17	2.57	3.19	3.71
	COP	[-]	4,57	4.58	4.60	4.60	4.54	4.52
Primary circuit/HP flow temp. at B0/W55	Heat output	[kW]	5,2	7.6	9.3	11.0	13.4	15.9
	Power input	[kW]	1,88	2.54	3.12	3.72	4.54	5.17
	COP	[-]	2,76	2.99	2.98	2.96	2.95	3.07
Dimensions and weight	Width	[mm]	600	600	600	600	600	600
	Height	[mm]	760	760	760	760	760	760
	Depth	[mm]	672	672	672	672	672	672
	Weight	[kg]	138	143	148	164	168	172
Code		[-]	12647	12648	12649	12650	12651	12652

COP given according to EN 14511 incl. power input for both the circulation pumps.

Max. flow temperature of the heat pump is 65 °C.

Each CTC Heat Pump is fitted with a max. current limiter for compressor startup.

The Heat Pump comes with integrated primary circulation pump (for deep bore / underground collector circuit).
EcoPart 406-412 Heat Pumps are supplied without circulation pumps; they are installed exclusively with CSE IR 12 pump stations – see page 21. EcoPart 414-435 Heat Pumps are equipped with circulation pumps already integrated inside.

EcoPart 435 ground-to-water heat pump

EcoPart 435 ground-to-water heat pump is designed for space and DHW heating in large buildings of heat loss up to 44 kW. It consists of two 17 kW heat pumps connected in parallel.

Heating control and communication with the heat pump is ensured by an external IR controller.

** Energy efficiency class for a package with controller under average climate conditions for low-temperature application.*

Technical Data			EcoPart 435
Primary circuit/HP flow temp. at B0/W35	Heat output	[kW]	32.48
	Power input	[kW]	7.44
	COP	[-]	4.36
Primary circuit/HP flow temp. at B0/W45	Heat output	[kW]	32.28
	Power input	[kW]	8.94
	COP	[-]	3.61
Primary circuit/HP flow temp. at B0/W55	Heat output	[kW]	31.74
	Power input	[kW]	10.34
	COP	[-]	3.07
Dimensions and weight	Width	[mm]	596
	Height	[mm]	1760
	Depth	[mm]	680
	Weight	[kg]	359
Code		[-]	15903

COP given according to EN 14511 incl. power input for both the circulation pumps.

Controllers

IR 12 CTC Smart Controller

This Smart Controller is designed for efficient control of Regulus CTC heat pumps, enabling connection in series of up to 10 EcoAir 406-420 or EcoPart 406-417 heat pumps. Further **it is able to control heat recovery ventilation**, 2 independent mixed circuits following separate time schedules with 2 alternating temperature levels (setback/comfort), DHW heating by both a heat pump and el. heating element following preset time schedules and temperatures, DHW recirculation and an auxiliary heat source. If needed, even a solar thermal system with up to 2 solar consumers can be controlled (e.g. hot water storage tank and a thermal store). The controller involves also a PWM module for control of circulation pumps by a PWM signal. The controller **can be upgraded** to control further 4 heating circuits, a fireplace or a solid fuel boiler, or even up to 3 solar consumers, **by adding extension modules**.

The Controller is available in 2 variants, either with a Czech or an English menu and **comes with** an 8 GB SD card for important data storage, RJ45 Ethernet port to connect to a LAN, and an integrated web server for visualization of the heating system and making adjustments. The controller can be then accessed over LAN or Internet. In smartphones **the Regulus IR Client App** can also be used.

Code*: 13196*

IR 12 FV

Smart Controller for heat pumps incl. electricity meter and a SSR relay designed not only to control heat pumps but also to manage consumption of electricity surplus produced by PV panels through an electric heating element and a heat pump. The control system keeps monitoring the PV surplus and when the PV panels start producing excess energy, it manages to convert the surplus into heat and store it into a thermal store for future use.

Code: 16914 – for single-phase PV panels and EcoAir 510M heat pump
Code: 16469 – for three-phase PV panels and EcoAir 600M heat pump

Master Control Module

It is designed to permit switching EcoAir and EcoPart Heat Pumps by a master heating controller. The module ensures all protective functions. It permits connecting a heat pump to the Internet, meeting this way conditions for extended compressor warranty.

Code*: 15955*

RDC Room Unit

Room unit with a temperature sensor and control display

Code: 16888

RC21 Room Unit

Room unit with a temperature sensor, temperature adjustment dial and comfort/setback/auto switch

Code: 11280

Room sensor

Room temperature sensor in ABB Time design, white/white

Code: 16167

CSE IR 12 CTC Kit

The kit involves an IR 12 CTC Controller and a CSE TC W PWM Pump Station (insulated pump station with a Wilo high efficiency circulation pump, PWM controlled speed, 1"M connection).

Code: 17357

CSE IR 12 FV1F Kit

The kit involves an IR 12 FV1F CTC Controller and a CSE TC W PWM Pump Station (insulated pump station with a Wilo high efficiency circulation pump, PWM controlled speed, 1"M connection).

Code: 17373

CSE IR 12 FV3F Kit

The kit involves an IR 12 FV3F CTC Controller and a CSE TC W PWM Pump Station (insulated pump station with a Wilo high efficiency circulation pump, PWM controlled speed, 1"M connection).

Code: 17358

Easy connection in series

CTC Heat Pumps can be simply coupled into series which will increase their total output easily. No more expensive accessories are needed, all is managed by IR 12 over a communication line, maintaining all the other control functions for an entire heating system.

Accessories to EcoAir air-source Heat Pumps

Pump stations for Heat Pumps

Pump station for heat pumps connected in series as the second and following ones.

Code: 15874

Wall support

Pair of zinc-plated supports to hang an air-to-water heat pump to a desired height above the terrain. Incl. anti-vibration silentblocks.

Code: 17458

Backup power supply for Heat Pumps

Backup power supply for EcoAir heat pumps, incl. maintenance-free sealed 44Ah accumulator of at least 12 years of service life. In case of a power failure it monitors the temperature in a heat pump's circuit and starts its circulation pump when needed; this way the battery is not being discharged unnecessarily. The heat pump's heat exchanger is then prevented from freezing for as long time as possible.

Code: 9142

Compensator for Heat Pumps

The compensator is designed to increase protection of a heat pump heat exchanger from being torn by frost. DN25, 1" Fu/M. It is included in supply of inverter heat pumps.

Code: 16757

Hoses for Heat Pumps

Braided stainless-steel flexible hoses that prevent subtle vibrations from being transmitted to a heating system.

Braided hose 2x 1" F 500 mm – code 15493, 700 mm – code 15494, 1000 mm – code 15 495

Braided hose 1" F x 1" M 500 mm – code 15496, 700 mm – code 15497, 1000 mm – code 15 498

Braided hose 2x 5/4" F 500 mm – code 16896, 700 mm – code 16897, 1000 mm – code 16898

Braided hose 5/4" F x 5/4" M 500 mm – code 16899, 700 mm – code 16900, 1000 mm – code 16901

Heating cable

A heating cable prevents condensate freezing in the discharge tube from a heat pump.

Code: 16168

In line heater

An In line heater is designed for heating fluid continuous heating by an electric heating element. It consists of a safety valve, encased adjustable and safety thermostats with Pt1000 sensor and a wall bracket. The unit can be equipped with an el. heating element (ETT-A) of max. 7.5 kW output. It can be used as an auxiliary heat source for inverter Heat Pumps in installations with no thermal store.

Code: 16166

Accessories to EcoHeat/EcoPart ground-source Heat Pumps

Filling manifold for primary circuit

Filling kit for primary circuits is designed to be used for easy filling and air bleeding a ground circuit with bores or ground loops. It contains a dirt filter, a two-way shut-off valve, a diverter ball valve and two filling valves to connect to a filling pump.

Code: 12454 - 1"M, *12455* - 5/4"M

1"M Filling kit is suitable for EcoHeat 406-410 and EcoPart 406-410 Heat Pumps.

Fluid for primary circuits of Heat Pumps

Antifreeze heat carrier with anti-corrosion protection, for heating and cooling systems incl. primary circuits of ground-to-water heat pumps.

CONVECTheatR - concentrate

5 l Plastic container - code 11430, 25 l Plastic container - code 10769, 200 l Barrel - code 11493

Accessories to EcoHeat/EcoZenith Multi-Energy Thermal Stores

Solar module for EcoHeat/EcoZenith i250

It is intended for connection to a solar pump station, enabling utilization of solar energy in a thermal store for DHW heating or space heating support.

Code: 12622

Internet module EcoHeat / EcoZenith

The module permitting to connect the multi-energy thermal store to the Internet and to control it through the free mobile application CTC Connect+. This way it is possible to monitor and adjust the settings of the heat pump and entire heating system, e.g. to change the preferred room/DHW temperature or activate a holiday mode.
The application displays well-arranged temperature charts and receives warnings from the heat pump.

Code: 17257

Wireless room unit, with aerial, connection module and cable for EcoHeat/EcoZenith

Code: 13944

Wireless room unit, additional, for EcoHeat/EcoZenith

Code: 13945

Room sensor for EcoHeat/EcoZenith

Code: 9752

Temperature sensor with 2.5m cable for EcoHeat/EcoZenith

Code: 9583

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