Regulus

HEAT PUMPS

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

CONTENTS

QUALITY LABELS

Since 2017, CTC Regulus Heat Pumps are among the first ones in the Czech Republic that are certified by **HP KEYMARK**, a voluntary and independent European certification mark.

For users, HP KEYMARK is proof that it is a high quality product that complies with applicable European standards.

WARRANTY

We offer a longer warranty for heat pumps and their compressors. Thanks to the high quality of all components and reliability of Regulus Heat Pumps, the warranty can be extended to 5 years and the warranty for compressor to 7 or 10 years.

OTHER REGULUS ADVANTAGES

- comprehensive energy saving solutions
- heating, cooling and ventilation at your fingertip
- remote management via the web
- own service technicians
- hotline even at weekends
- 30 years on the market
- thousands of satisfied users
- really quiet heat pump
- smart combinations with PV panels

WHY TO CONSIDER ENERGY EFFICIENT HEATING?

Energy prices have seen a relatively large increase recently. Investing into a cost effective heating system will bring significant savings.

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).

With a ground source heat pump, you get even more energy for free. No matter what the energy prices will be, you'll always get most of it for free with a heat pump.

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 HEAT PUMP?

Regulus offers excellent heat pumps of Eco series that are manufactured by CTC, a renowned Swedish company with 100 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. In 2020, we also included our own RTC series. These heat pumps also allow operation in cooling mode.

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 designthe 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 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, cooling and DHW heating 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. Each heat pump is equipped with its dedicated control electronics that controls its operation. It can communicate with an IR smart controller that can also control a whole heating system and a series of up to 10 heat pumps at the same time.

A comprehensive solution is represented by RegulusHBOX indoor unit with DHW heating that contains all components of a current home boiler room. It heats DHW, contains a thermal store, an electronic controller and heating elements w. smart switching. Your home heating and parameters of your heating system can be monitored and controlled easily over the internet.

HOW IT WORKS

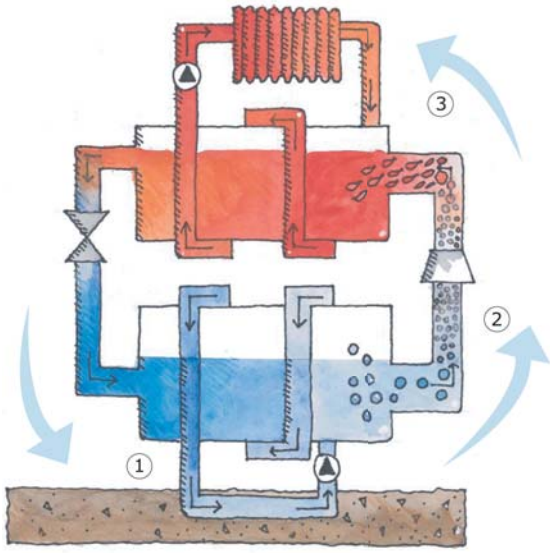
- Heat pump draws low-temperature energy from the ambient environment and “pumps“ it to a higher temperature
- Air or ground is usually the heat source

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.

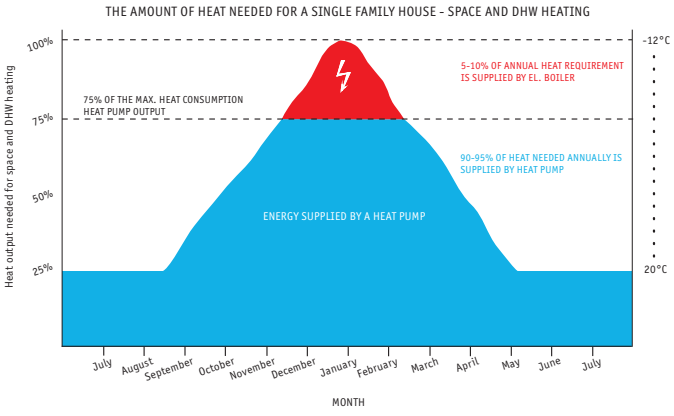
Solar collectors gain heat directly from the sun as the solar radiation heats up the fluid inside a solar collector. A solar thermal system needs almost no energy for its operation. If you combine a heat pump with a solar thermal system, you will be using solar energy directly through solar collectors 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 *			
Heat Pump	**from**		**to**		**from**		**to**	
EcoAir 406	**-**	*kWh/year*	**16 000**	*kWh/year*	**-**	*kW*	**6**	*kW*
EcoAir 408	**11 500**	*kWh/year*	**20 000**	*kWh/year*	**5**	*kW*	**8**	*kW*
EcoAir 410	**18 000**	*kWh/year*	**31 500**	*kWh/year*	**7**	*kW*	**12**	*kW*
EcoAir 415	**25 000**	*kWh/year*	**41 500**	*kWh/year*	**10**	*kW*	**16**	*kW*
EcoAir 420	**36 500**	*kWh/year*	**51 500**	*kWh/year*	**14**	*kW*	**20**	*kW*

INVERTER - EcoAir 600M and RTC:

SIZING BY:	energy needed for space and DHW heating				building heat loss *			
Heat Pump	**from**		**to**		**from**		**to**	
EcoAir 614M	**-**	*kWh/year*	**29 000**	*kWh/year*	**-**	*kW*	**11**	*kW*
EcoAir 622M	**16 000**	*kWh/year*	**44 500**	*kWh/year*	**6**	*kW*	**17**	*kW*
RTC 6i	**-**	*kWh/year*	**13 000**	*kWh/year*	**-**	*kW*	**5**	*kW*
RTC 13e	**-**	*kWh/year*	**26 000**	*kWh/year*	**-**	*kW*	**10**	*kW*
RTC 20e	**25 000**	*kWh/year*	**47 000**	*kWh/year*	**10**	*kW*	**18**	*kW*

GROUND-TO-WATER MODELS

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

SIZING BY:	energy needed for space and DHW heating				building heat loss *			
Heat Pump	**from**		**to**		**from**		**to**	
EcoPart 406	**-**	*kWh/year*	**17 000**	*kWh/year*	**-**	*kW*	**7**	*kW*
EcoPart 408	**16 500**	*kWh/year*	**24 500**	*kWh/year*	**5**	*kW*	**10**	*kW*
EcoPart 410	**20 000**	*kWh/year*	**30 000**	*kWh/year*	**7**	*kW*	**13**	*kW*
EcoPart 412	**23 500**	*kWh/year*	**35 500**	*kWh/year*	**9**	*kW*	**15**	*kW*
EcoPart 414	**29 500**	*kWh/year*	**43 500**	*kWh/year*	**12**	*kW*	**19**	*kW*
EcoPart 417	**33 500**	*kWh/year*	**56 500**	*kWh/year*	**15**	*kW*	**22**	*kW*

INVERTER - EcoPart 612M and 616M:

SIZING BY:	energy needed for space and DHW heating				building heat loss *			
Heat Pump	**from**		**to**		**from**		**to**	
EcoPart 612M	**-**	*kWh/year*	**41 500**	*kWh/year*	**-**	*kW*	**16**	*kW*
EcoPart 616M	**10 000**	*kWh/year*	**54 000**	*kWh/year*	**4**	*kW*	**21**	*kW*

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 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** (inverter 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 combination tank - DUO, HSK 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.**
- **In order to gain heat from the ground, either deep bores need to be drilled, or loops buried underground.**
  The ground keeps a stable temperature, that's why the output is stable even under severe frost.

Air-to-water heat pumps

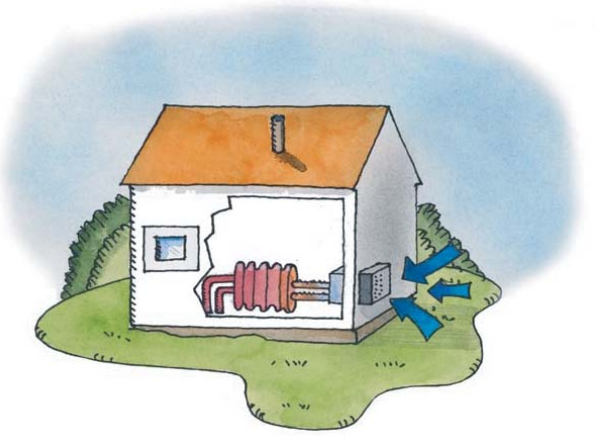
Air-to-water heat pumps draw energy from the ambient air even when the outdoor temperature drops to -22°C. The energy gained at a low temperature is then "pumped" to a higher temperature and transferred into heating water. Electric energy is consumed just to run a compressor and fan of the heat pump. 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

+ Low purchase costs
+ Easy installation
+ No groundwork

DRAWBACKS

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



Heat pumps with deep bore holes

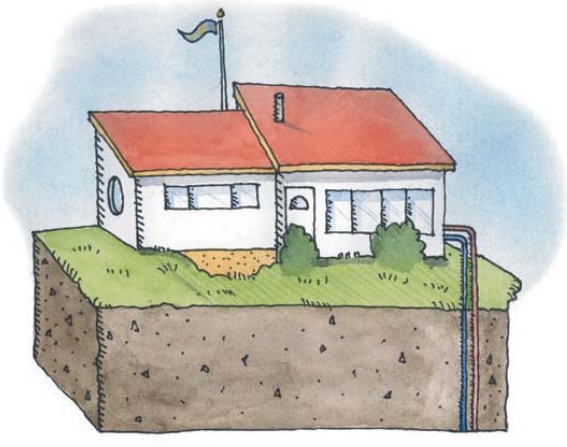
In order to gain heat from deep bores, one or more boreholes need to be drilled (70-150 m deep). Their number and depth depend on the heating output of the installed heat pump and on the building to be heated. As there is a risk of influencing groundwater, it is necessary to have a geological survey 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

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

DRAWBACKS

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



Heat pumps with ground collector

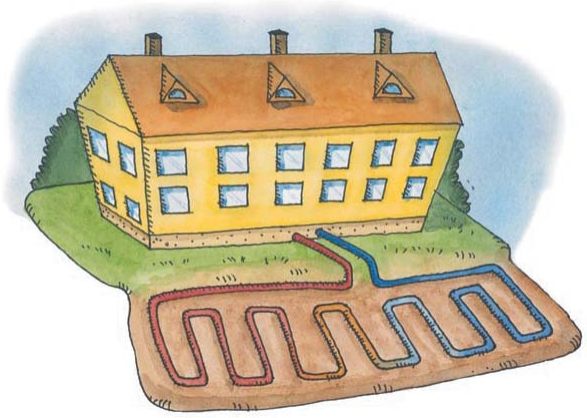
The sub-surface ground collector consists of loops of pipes buried 1.2m below the surface. The soil needs to be removed first and when the loop is laid, the soil is returned to its place. The other method is digging trenches where individual loops are laid in a similar method to burying e.g. electric 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

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

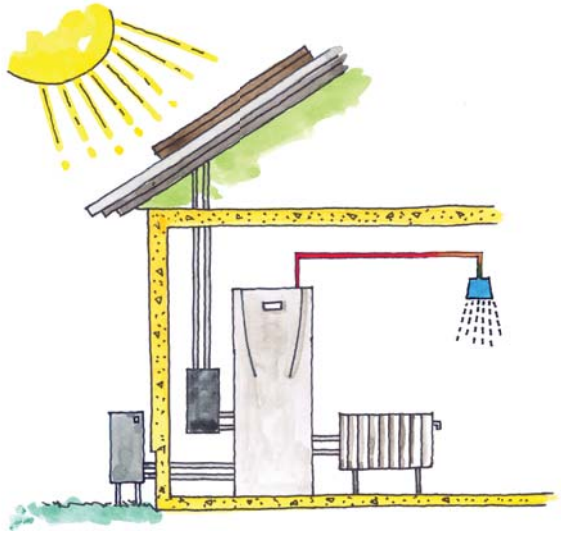
DRAWBACKS

- 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.



AIR-TO-WATER INVERTER HEAT PUMPS

RTC 6i, 13e

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

Single-phase air-to-water heat pumps **permitting reversible cooling mode.**

They extract heat from the ambient air even if the temperature drops to -25° C. The maximum flow temperature is 55° C.

The advantage of inverter heat pumps is **the adjustment of the power to the actual requirements of the house** with regard to space heating, DHW heating or space cooling through a suitable cooling system, e.g. ceiling, wall or floor heating / cooling, or ventilation. Thus, it is possible to operate the heat pump without a thermal store, unless it is required, for example, due to insufficient heat storage for defrosting or in combination with other renewable energy sources.

Another advantage **is the low starting current**, so that the heat pump can be installed even in areas where there is a connection problem (more remote areas, end-points in municipalities, etc.).

The single-phase design can serve well in combination with the use of solar energy to power a heat pump. The PV panels are able to operate the heat pump efficiently in summer for DHW heating or cooling. Thanks to their single-phase design and reasonable output from approx. 2-3 kWp they can be reasonably priced.

- Heating & Cooling
- SCOP 4.71
- Energy Efficiency Class W. Controller A+++
- To be combined w. single-phase PV systems

TECHNICAL DATA				RTC 6i	RTC 13e
Heat output			[kW]	1-6	3-12
Seasonal coefficient of performance SCOP			[-]	4.47	4.71
Air/water temperature in °C	A7/W35 low rpm	Heat output	[kW]	1.6	5.47
		Power input	[kW]	0.5	1.10
		COP	[-]	3.2	4.97
	A2/W35 medium rpm	Heat output	[kW]	3.15	5.96
		Power input	[kW]	0.75	1.46
		COP	[-]	4.2	4.08
	A-7/W35 high rpm	Heat output	[kW]	4.03	7.64
		Power input	[kW]	1.32	2.46
		COP	[-]	3.05	3.11
Dimensions and weight		Width	[mm]	924	1160
		Height	[mm]	917	1024
		Depth	[mm]	350	503
		Weight	[kg]	76	98
Sound power level			[dB(A)]	57	52
Sound pressure level at distance of:		5 m	[dB(A)]	35	30
		10 m	[dB(A)]	29	24
Code			[-]	17735	19437

RTC heat pumps are supplied without circulation pumps. They shall be installed exclusively either with CSE IR pump stations – see page 24, or with RegulusBOX indoor unit - see page 20, or with RegulusHBOX indoor unit - see page 22.

AIR-TO-WATER INVERTER HEAT PUMP

RTC 20e

Three-phase inverter air-to-water heat pump permitting reversible cooling mode. It extracts heat from the ambient air even if the temperature drops to -25° C. The maximum flow temperature is 55° C.

The advantage of an inverter heat pump is the adjustment of the power to the actual requirements of the house with regard to space heating, DHW heating or space cooling through a suitable cooling system, e.g. ceiling, wall or floor heating / cooling, or ventilation.

Another advantage is the low starting current, so that the heat pump can be installed even in areas where there is a connection problem (more remote areas, end-points in municipalities, etc.).

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

- Heating and cooling
- SCOP 4.84
- Energy efficiency class with controller A+++
- Suitable for a PV system

TECHNICAL DATA				RTC 20e
Heat output			[kW]	9.2-18.5
Seasonal coefficient of performance SCOP			[-]	4.84
Air/water temperature in °C	A7/W35 low rpm	Heat output	[kW]	9.19
		Power input	[kW]	1.83
		COP	[-]	5.02
	A2/W35 medium rpm	Heat output	[kW]	12.09
		Power input	[kW]	2.84
		COP	[-]	4.26
	A-7/W35 high rpm	Heat output	[kW]	12.57
		Power input	[kW]	3.94
		COP	[-]	3.19
Dimensions and weight		Width	[mm]	1082
		Height	[mm]	1624
		Depth	[mm]	513
		Weight	[kg]	154
Sound power level			[dB(A)]	61
Sound pressure level at distance of:		5 m	[dB(A)]	39
		10 m	[dB(A)]	33
Code			[-]	19439

RTC 20e heat pump is supplied without circulation pumps. It shall be installed exclusively either with CSE IR pump stations – see page 24, or with RegulusBOX indoor unit - see page 20.

AIR-TO-WATER INVERTER HEAT PUMPS

EcoAir 614M, 622M

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.

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

- New scroll compressor with speed control and a long service life
- Smart defrost
- SCOP 4.93
- Energy efficiency class with controller A+++
- Suitable for a 3-phase PV system

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
Heat output			[kW]	3-13	4-24
Seasonal coefficient of performance 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 600M heat pumps are supplied without circulation pumps. They shall be installed exclusively either with CSE IR pump stations – see page 24, or with RegulusBOX indoor unit - see page 20, or with RegulusHBOX indoor unit - see page 22.

AIR-TO-WATER ON/OFF HEAT PUMPS

EcoAir 406 - 420

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

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.**

TECHNICAL DATA				EcoAir 406	EcoAir 408	EcoAir 410	EcoAir 415	EcoAir 420
SCOP			[-]	3.85	3.92	3.92	3.76	3.71
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	64	66
Sound pressure level at distance of:		5 m	[dB(A)]	34	36	36	44	44
		10 m	[dB(A)]	28	30	30	39	39
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 either with CSE IR pump stations – see page 24, or with RegulusBOX indoor unit - see page 20, or with RegulusHBOX indoor unit - see page 22.

GROUND-TO-WATER ON/OFF HEAT PUMPS

EcoHeat 406 - 412

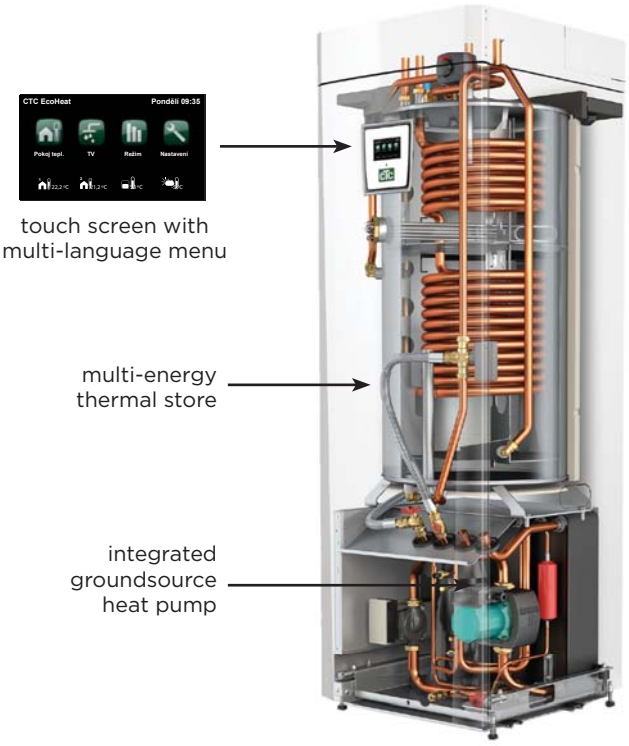
EcoHeat 400 is based on a proved compact design, bringing plenty of innovation and new technologies which ranks this model among the world's best in its class.

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.

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

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).

EcoHeat is divided into two sections for the most efficient operation of the heat pump - the lower cooler zone for preheating 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.

GROUND-TO-WATER ON/OFF HEAT PUMPS

EcoPart 406 - 417

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

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 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.**

TECHNICAL DATA			EcoPart 406	EcoPart 408	EcoPart 410	EcoPart 412	EcoPart 414	EcoPart 417
SCOP		[-]	4.7	4.7	4.7	4.8	4.6	4.7
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 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 shall be installed exclusively either with CSE IR pump stations – see page 24, or with RegulusBOX indoor unit - see page 20, or with RegulusHBOX indoor unit - see page 22. EcoPart 414-435 Heat Pumps are equipped with circulation pumps already integrated inside.

GROUND-TO-WATER ON/OFF HEAT PUMPS

EcoPart 435

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 the set with controller under average climate conditions for low temperature application

TECHNICAL DATA			EcoPart 435
SCOP		[-]	4.7
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 the circulation pumps.

GROUND-TO-WATER INVERTER HEAT PUMPS

EcoPart 612M, 616M

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

A heat pump draws energy from the ground and transfers it to heating water for space and DHW heating.

The unit is placed inside a house and connected with the ground circuits with 2 pipes. Its main advantage is a stable output and COP even under fierce frost, it also excels at a very quiet operation.

This is a 3-phase heat pump with a scroll compressor and speed control (inverter), 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
- SCOP 5.4
- Energy efficiency class with controller A+++
- Suitable for a 3-phase PV system

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.

It can operate without a thermal store, with suitable hot water tanks.
Control of the house heating and communication with the heat pump is provided by an external IR controller.

TECHNICAL DATA			EcoPart 612M	EcoPart 616M
Output		[kW]	2.5-11.8	4-16
SCOP		[-]	5.4	5.2
Primary circuit/ HP flow temp. at B0/W35, 20 rps	**Heat output**	[kW]	2.27	4.20
	Power input	[kW]	0.33	0.9
	COP	[-]	6.94	4.66
Primary circuit/ HP flow temp. at B0/W35, 50 rps	**Heat output**	[kW]	5.91	10.52
	Power input	[kW]	1.30	2.34
	COP	[-]	4.56	4.50
Primary circuit/ HP flow temp. at B0/W35, 100 rps	**Heat output**	[kW]	12.14	15.60
	Power input	[kW]	2.42	4.19
	COP	[-]	5.01	3.72
Dimensions and weight	**Width**	[mm]	596	596
	Height	[mm]	770	770
	Depth	[mm]	673	673
	Weight	[kg]	170	172
Code		[-]	18259	18290

EcoPart 406-412 Heat Pumps are supplied incl. circulation pumps. They shall be installed exclusively either with CSE IR pump stations – see page 24, or with RegulusBOX indoor unit - see page 20, or with RegulusHBOX indoor unit - see page 22.

INDOOR UNIT

RegulusBOX

Wall hung indoor hydraulic unit for a heat pump.

RegulusBOX CTC is designed for installation with CTC EcoAir and CTC Eco-Part heat pumps, models 406 to 414 and 612M, 616M. With inverter heat pumps, it can be connected directly to a heating system; with ON/OFF heat pumps or for multiple heating circuits, it shall be installed with a (combination) thermal store and a pump station for each circuit of the heating system.

RegulusBOX RTC is available in two variants, different for single-phase and three-phase RTC heat pumps.

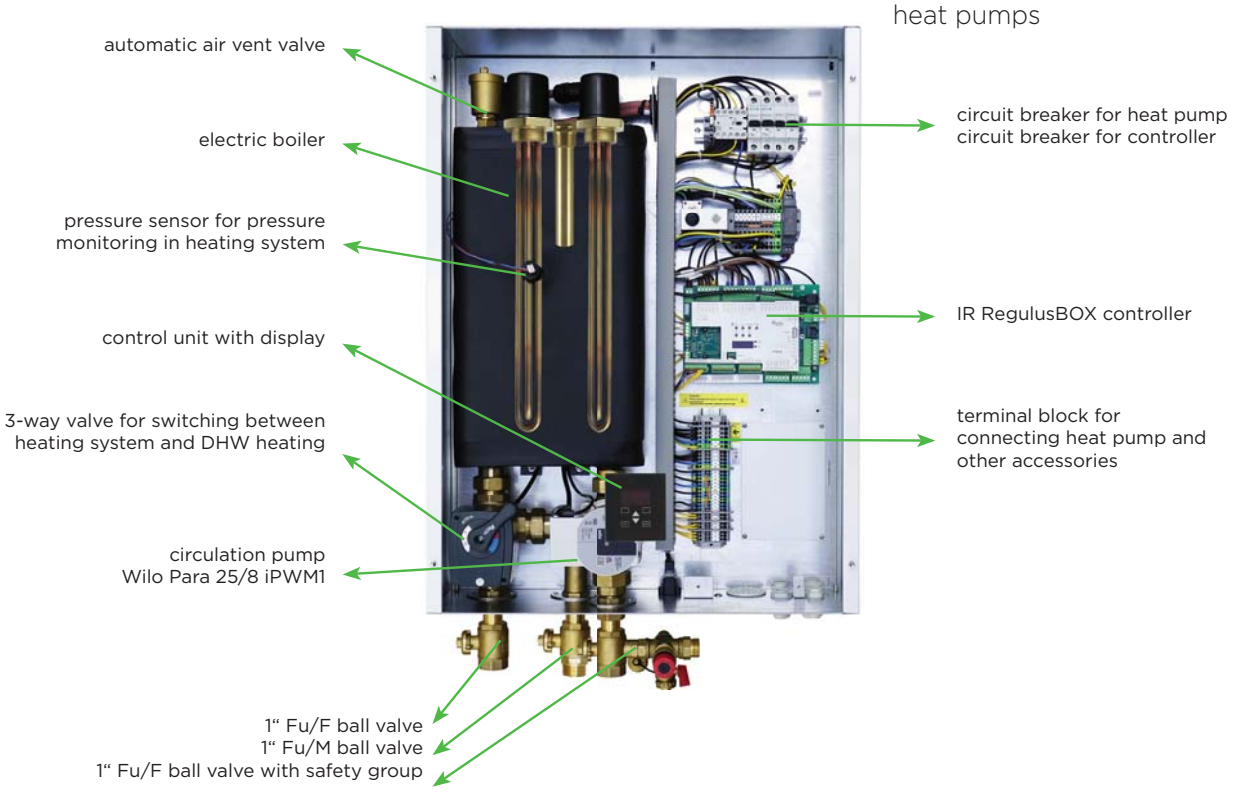
- **Intended primarily to connect inverter heat pumps directly into a heating system.**
- **Connecting a hot water tank possible, a 3-way valve inside.**
- **Electric boiler 2-12 kW, pressure sensor, circulation pump.**
- **A smart controller with internet connectivity and a control display that can be moved to the living area of the house where it can also act as a room temperature and humidity sensor.**
- **With RTC heat pumps it permits cooling into a floor, walls or a ceiling.**

TECHNICAL DATA			RegulusBOX
Dimensions	**Width**	[mm]	560
	Height	[mm]	905
	Depth	[mm]	235
Weight		[kg]	34
Heating water volume		[l]	10
Output of electric heating elements		[kW]	12

Code: 18928
RegulusBOX CTC 3/3 for EcoAir, EcoPart heat pumps

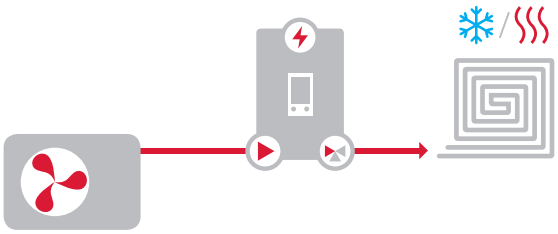
Code: 18930
RegulusBOX RTC 3/1S for RTC 6i, 13e heat pumps

Code: 20025
RegulusBOX RTC 3/3S for RTC 20e heat pumps

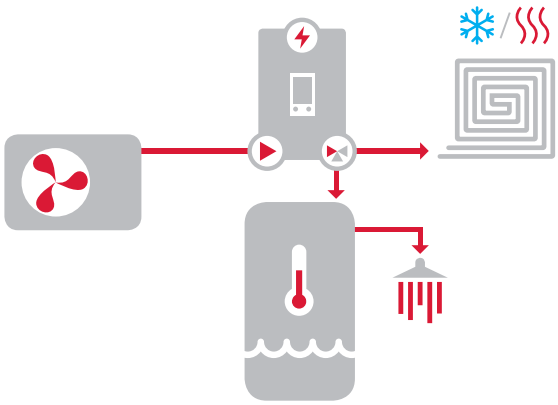


CONNECTION EXAMPLES

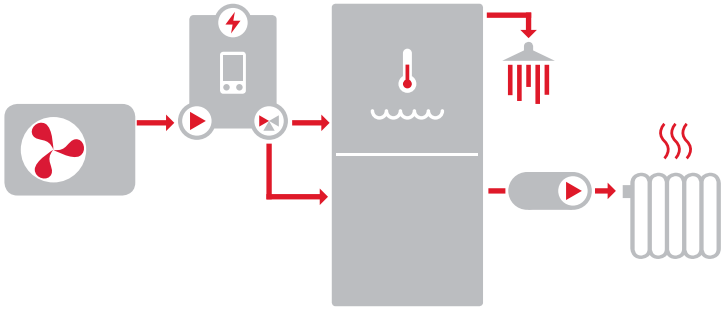
RegulusBox combined with a heat pump in heating systems.



RegulusBox combined with a heat pump and a hot water storage tank in systems for space and DHW heating.



RegulusBox combined with a heat pump and a combination thermal store in systems for space and DHW heating.



INDOOR UNIT

RegulusHBOX

Floor standing indoor unit with DHW heating.

RegulusHBOX CTC is designed for installation with inverter heat pumps CTC EcoAir 614M, 622M and EcoPart 612M, 616M.

RegulusHBOX RTC is designed for installation with single-phase heat pumps RTC 6i and 3e.

RegulusHBOX 112 - intended for direct systems (one circulation pump for both heating and flow through the heat pump).

RegulusHBOX 212 - intended for split systems and systems with multiple heating circuits (connection with a thermal store).

A solar thermal system or another heat source can be connected to the unit using optional accessories.

- **Hygienic DHW heating in a stainless steel heat exchanger**
- **Electric boiler 2-12 kW, pressure sensor, circulation pump.**
- **A smart controller with internet connectivity and a control display that can be moved to the living area of the house where it can also act as a room temperature and humidity sensor.**
- **With RTC heat pumps it permits cooling into a floor, walls or a ceiling.**

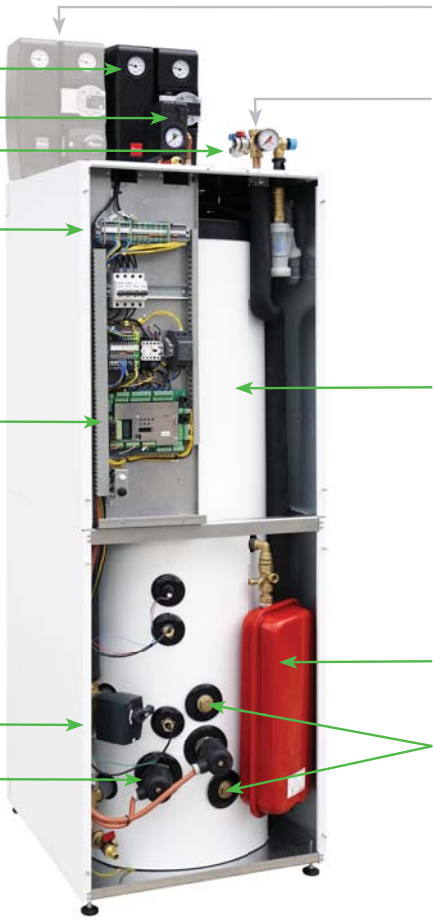
TECHNICAL DATA			RegulusHBOX
Dimensions	Width	[mm]	595
	Height	[mm]	(without safety groups/ pump stations attached)
	Depth	[mm]	650
Weight		[kg]	148
Heating water volume		[l]	49
Output of electric heating elements		[kW]	2-12

Code: 20050
RegulusHBOX 112 CTC 3/3 for EcoAir, Eco Part heat pumps

Code: 20026
RegulusHBOX 212 CTC 3/3 for EcoAir, Eco Part heat pumps

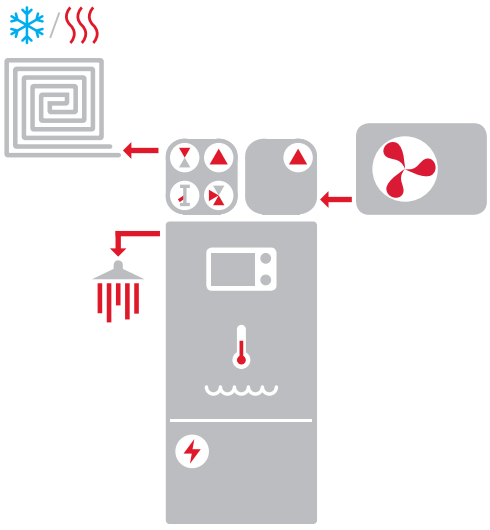
Code: 20051
RegulusHBOX 112 RTC 3/1S for RTC 6i, 13e heat pumps

Code: 20029
RegulusHBOX 212 RTC 3/1S for RTC 6i, 13e heat pumps



CONNECTION EXAMPLE

RegulusHBox combined with a heat pump in systems for space and DHW heating.



CONTROLLERS

IR 14 Smart Controller

This smart controller is designed for efficient control of Regulus heat pumps, enabling their connection in series. It can control an independent mixed heating and cooling circuit following a one's own time schedule offering 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 can be controlled. Using **add-on modules**, the controller can be **upgraded to control heat recovery ventilation**, further up to 5 heating circuits, a fireplace or a solid fuel boiler, or even up to 3 solar appliances.

The Controller is available in 2 variants, either with a Czech or an English menu. It is **equipped** with an SD card for important data storage, two RJ45 Ethernet ports to connect to the Internet and for service connection, it has 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: 18239 - IR 14 RTC
Code: 18514 - IR 14 CTC

IR 14 FV

Smart Controllers 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: 18241 - for single-phase PV panels and RTC heat pump
Code: 20027 - for three-phase PV systems and RTC heat pump
Code: 18927 - for three-phase PV systems and EcoAir 600M heat pump

CSE IR Sets

The set consists of an IR 14 controller (possibly in the FV variant for systems with PV panels) and a CSE TC W IPWM MFB pump station. The latter is an insulated pump station with a Wilo high-efficiency circulation pump (speed control, iPWM information on flow rate), with a ball valve with filter and magnet.

Code: 18242 - CSE IR 14 RTC, Code: 20028 - CSE IR 14 RTC PV3P
Code: 18923 - CSE IR 14 CTC
Code: 18926 - CSE IR 14 CTC PV3P

Soft starter for CTC EA 410-420 heat pumps

It reduces the heat pump start-up current, has a self-learning algorithm responding to the conditions of the specific installation.

Code: 18401

RC 25 Room Unit

Room unit with a temperature and humidity sensor, with a dial

Code: 18540

Room sensor

Room temperature sensor in ABB Time design, white/white

Code: 16167

RSW 30 Temperature and Humidity Room Sensor

Wireless connection via WiFi, battery- or USB-powered

Code: 18474

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 controllers over a communication line, of course while maintaining all the other control functions for an entire heating system.

ACCESSORIES TO AIR-TO-WATER HEAT PUMPS

EcoAir

Pump Station for a heat pump

A pump station for heat pumps connected in a cascade on the second position and further.

Code: 17868

Wall Support Bracket

Zinc-plated support bracket for hanging air-to-water heat pumps to the desired height above ground. Incl. silent blocks to limit vibrations.

Code: 17458, 18406

Compensator for heat pumps

The compensator is intended to increase the protection of a heat pump heat exchanger against being torn by frost. Included in supply with air-to-water inverter heat pumps.

Code: 16757 - 1“Fu/M, Code: 19754 - 5/4“Fu/M

Elbows for connecting pipes
Code: 15985 - Cu28 x 1“ M, Code: 17091 - Cu28 x 5/4“ M,
Code: 16437 - Cu28 x Cu28

Fittings for connecting pipes
Code: 13391 - Cu28 x 1“ M, Code: 17090 - Cu28 x 5/4“ M,
Code: 13394 - Cu28 x Cu28

Hoses for heat pumps

Flexible stainless-steel braided hoses preventing transmission of gentle vibrations into a heating system.

Braided hose 2x 1“ F
300 mm – code: 18621, 500 mm – code: 15493, 700 mm – code: 15494,
1000 mm – code: 15495

Braided hose 1“ F x 1“ M
300 mm – code: 18622, 500 mm – code: 15496, 700 mm – code: 15497,
1000 mm – code: 15498

Braided hose 2x 5/4“ F
300 mm – code: 19752, 500 mm – code: 16896, 700 mm – code: 16897,
1000 mm – code: 16898

Braided hose 5/4“ F x 5/4“ M
300 mm – code: 19753, 500 mm – code: 16899, 700 mm – code: 16900,
1000 mm – code: 16901

Heating Cable

Heating cable to prevent condensate freezing in the heat pump drain pipe. Available in two lengths - 3.5 and 5 m, non-heating end always 1 m.

Code: 16168 - 3.5 m for EcoAir, Code: 18104 - 5 m for EcoAir
Code: 18491 - 5 m for RTC

In Line Heater

The in line heater is designed for continuous heating of heating water by an electric heating element. It contains a safety valve, an encased adjustable&safety thermostat with a Pt1000 sensor and wall mount brackets. An ETT-A electric heating element can be installed into the in line heater. It can be used as an auxiliary heat source for an inverter heat pump in installations without a thermal store.

Code: 16166 - for heating element up to 7.5 kW, code: 19391 - for heating element up to 9 kW

ACCESSORIES
TO GROUND-TO-WATER HEAT PUMPS

EcoHeat / EcoPart

Filling Kit for primary circuit

Designed for easy filling and air venting the ground loop with deep bores or sub-surface ground collector. The filling kit involves a dirt strainer, 2-way shut-off ball valve, 3-way diverter ball valve and 2 filling valves to connect a filling station with a pump.

Code: 12454 - 1“ M, 12455 - 5/4“ M

The 1“ M filling kit is suitable for EcoHeat 406-410 and EcoPart 406-410 heat pumps.

Antifreeze fluid for primary circuits of heat pumps

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

RegulusAFheat - concentrate

Plastic container, 5 l - code: 19269, Plastic container, 25 l - code: 19270, Barrel, 200 l - code: 19271

ACCESSORIES

Blind plug and frame for using the display as a room unit

The frame is used for placing the display on a wall and the plug replaces the display in the front panel.

Code: 18248

WiFi module for IR 14 or RegulusBOX

Code: 15955

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v4.2-08/2023