

Regulus

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RTC 12i

RTC 12i Heat Pump | **EN**
Installation and Operation Manual

RTC 12i

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1. GENERAL INSTRUCTIONS

Read this manual carefully before operating and retain it for future reference. In case of loss, the manual can be downloaded in pdf format from <http://www.regulus.eu/>.

1.1. Related Documentation

- Instructions for installation and operation of the heating controller according to the selected application. Connection variants are shown in Chapter 2.
- Instructions for installation and operation of components that belong to the equipment (hot water storage tanks, thermal stores, valves and actuators, etc.).
- Heat Pump Commissioning Report - issued by an authorized person authorized by the service organization.

1.2. Safety Instructions

- Turn off the power with an omnipolar switch before doing any work on the product.
- The heat pump must be connected to protective earth.
- The product is classified as IP X4.
- When handling the product with a hoist ring or similar device, make sure that the lifting equipment, eyebolts and other parts are not damaged. Never stand under the hoisted product.
- Never jeopardise safety by removing bolted covers, hoods or similar.
- Never jeopardise safety by deactivating safety equipment.
- Any work on the product's cooling system should be carried out by authorised personnel only.
- The product's electrical systems should only be installed and serviced by a qualified electrician.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- This device can be used by children from the age of eight years and above and by people with reduced physical, sensory or mental ability or lack of experience or knowledge if they have been taught, either with supervision or with the instructions provided, how to use the device safely and understand the risks involved. Children should not play with the device. Cleaning and maintenance should not be carried out by children without supervision.
- If these instructions are not followed when installing, operating and maintaining the system, manufacturer's commitment under the applicable warranty terms is not binding.

1.3. Cleaning & Maintenance

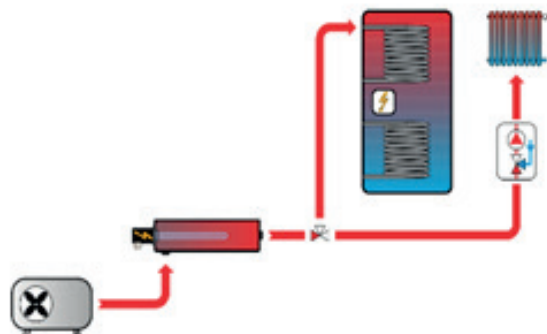
- Use a wet cloth to clean the outer metal and plastic parts. Do not use abrasive cleaners or solvents.
- Check the condensate drain regularly (visual check).
- **The condensate tray is included in the delivery of the heat pump. The delivery also includes a heating cable intended for installation in a condensate tray. A heating cable for the condensate drain pipe (code 18491) can be ordered as an optional accessory.**
- Protect the air inlets and outlets from snow, fallen leaves and other dirt. Check them regularly, and remove dirt with a soft brush very carefully if needed.
- The fan stops during defrosting. Water flows from the evaporator and hisses are heard. Steam may escape from the heat pump. After defrosting, the fan starts again and the heat pump returns to normal operation.
- **The heat pump is NOT subject to regular refrigerant leakage checks.**

2. CONNECTION VARIANTS

The heat pump is part of the energy system of the house. The correct design of a heat pump depends on the energy needs of the building and should be carried out by a specialist. These methods of connection are the most commonly used and serve as a basis for the project. If project documentation exists, follow it.

2.1. Direct connection to a heating system, DHW heating in a hot water storage tank

The accessory is represented by an additional heat source in the form of an in line heater (code 16166) equipped with an electric heating element of up to 7.5 kW output and an optional indirect heated hot water storage tank with a heat exchanger surface of **min. 1.5 m²** (e.g. **Regulus RDC 300 – code 12759**). The larger the heat exchange area of the HW storage tank, the faster the DHW heating will be and the heat pump will be able to prepare hot water more economically, or it will be able to heat DHW to a higher temperature.

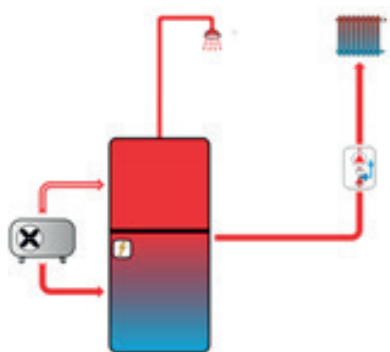


In this direct connection to the heating system, it is necessary to keep the minimum flow through the heat pump at the level of **min. 790 l/h** with sufficient heat supply for defrosting, i.e. it is necessary to have a part of the heating system without shut-off valves installed, e.g. thermostatic valves. Approximately it is at least 5 radiators of normal size (e.g. 0.6 x 0.9 m), or at least 30 m² of underfloor heating without the possibility to be shut off.



For system control, it is necessary to use an **IR 14 RTC** smart controller which controls the entire heating and hot water system. It is equipped with an integrated web server permitting control through a web browser, or via a smartphone or tablet with the IR Client application (for Android and iOS).

2.2. Connection with a thermal store (combination with other renewable heat sources)



The accessories consist of a thermal store for heating only (Regulus PS series), or a combination thermal store with immersed DHW tank (Regulus DUO series), or a thermal store with stainless steel tube DHW exchanger (Regulus HSK series).

This connection is suitable for combining a heat pump with other heat sources, such as biomass boilers, fireplace inserts and stoves with a hydronic heat exchanger, solar thermal systems, solar photovoltaic systems, etc. The thermal store shall be sized depending on the selected type and output of the combined heat source, e.g. for combination with PV panels, the total volume of the thermal store can be calculated using the relationship 180 l / 1 kWp PV output. For example, for an array of PV panels with a peak output of 5 kWp, the tank volume shall be 900 litres. Always have the size and type of the thermal store determined by a specialist!



For system control, it is necessary to use an **IR 14 RTC** smart controller which controls the entire heating and hot water system. It is equipped with an integrated web server permitting control through a web browser, or via a smartphone or tablet with the IR Client application (for Android and iOS).

3. CONSTRUCTION READINESS & INSTALLATION

The installation may only be carried out by a person with a valid manufacturer's authorization. If any of the subsidy titles are used to acquire a subsidy for the heat pump (e.g. boiler subsidies, or the New Green Savings program), the installation company must meet the requirements of current legislation.

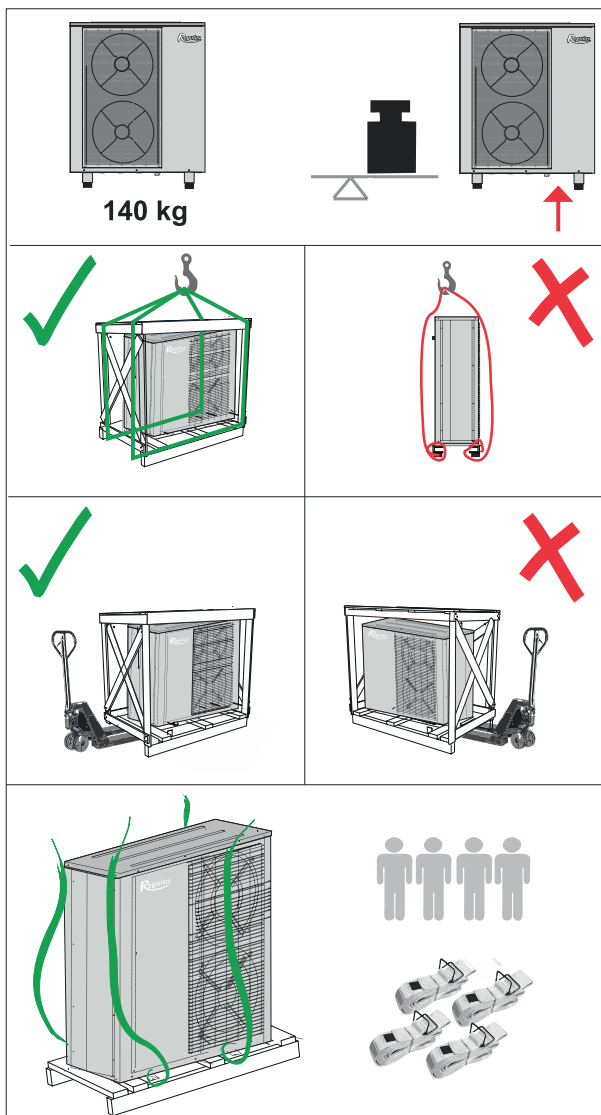
3.1. Scope of supply

- RTC 12i Heat Pump
- Installation and Operation Manual
- 2 compensators to protect the heat pump heat exchanger against frost rupture
- 2 G 1" M nipples incl. gaskets

3.2. Installation preparation and transport

The installation must be carried out by a qualified person in accordance with the applicable standards and all regulations concerning occupational safety must be observed.

- The heat pump shall be transported and stored in an upright position only.
- Check that the product has not been damaged in transit. Report any transport damage to the carrier.
- Transport the unit to the installation site before removing the packaging.
- Move the product with a pallet truck or forklift if possible.
- It is possible to use lifting straps tied around the pallet, however only if the packaging (the wooden frame) had not been removed.
- **MIND THE DIFFERENT WEIGHT OF THE RIGHT AND LEFT SIDE OF THE HEAT PUMP!**



3.3. Minimum distances

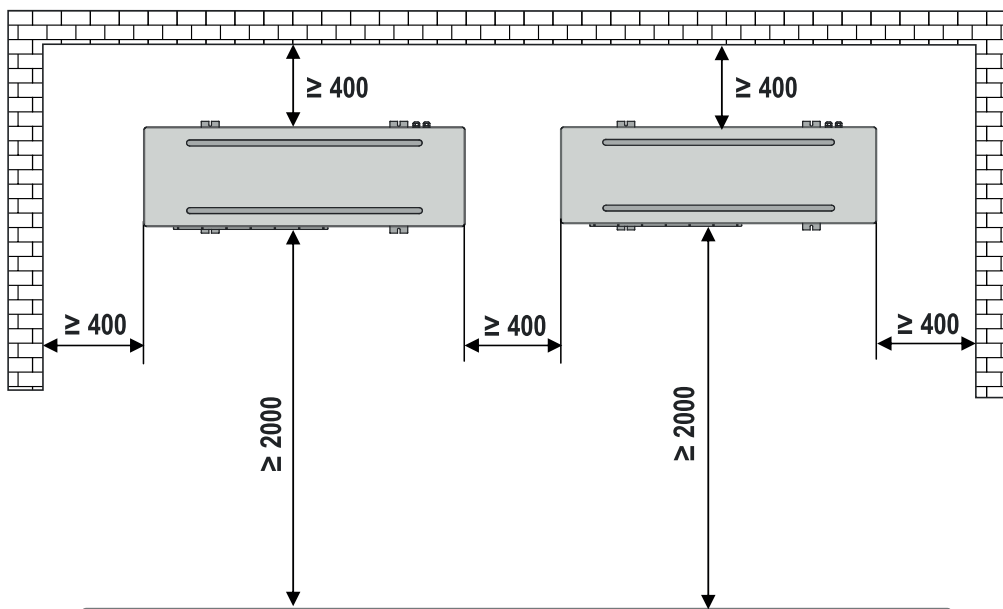
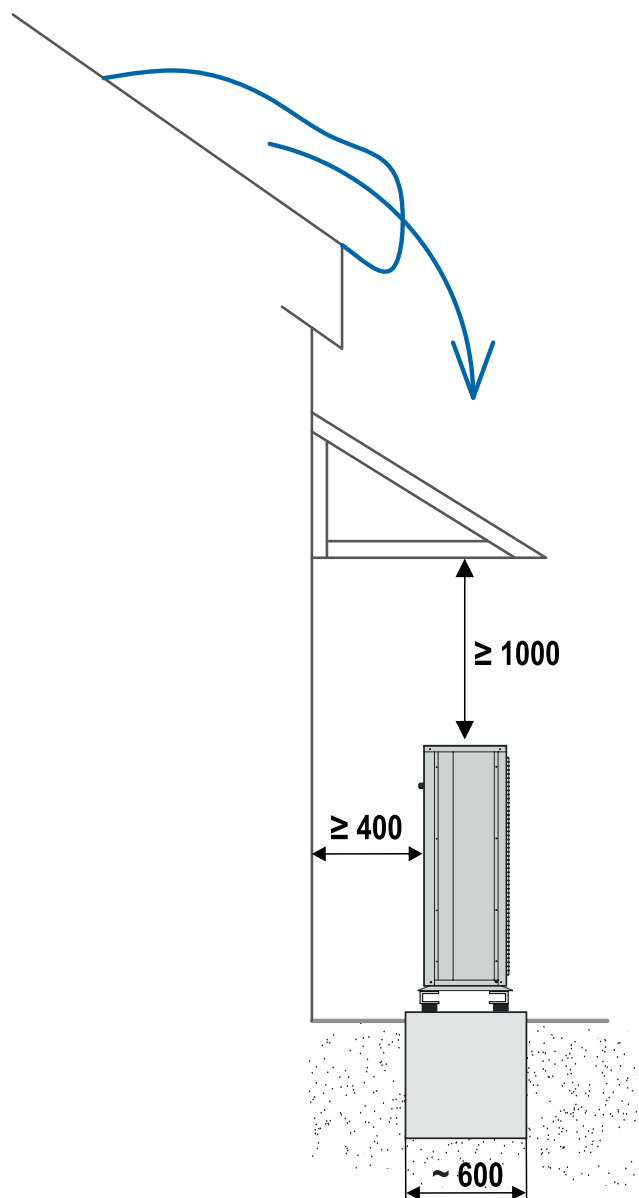
The heat pump itself is intended for outdoor installation, it is usually placed to the outer wall of the building, with the fan facing away from the building. At least 2 m of free space must be maintained in front of the heat pump. The location must be chosen so that the air can flow completely freely through the heat pump. Used cold air should not be sucked again into the inlet on the back as this will cause the performance parameters of the heat pump deteriorate.

The heat pump does not need an additional roof. If the product is placed in an area where it will be exposed to particularly harsh weather conditions or if there is a risk of damage from snow falling from a roof, the product can be installed underneath a small awning.

Follow the recommendations below when choosing a heat pump location:

Location: make sure that the heat pump does not disturb you or your surroundings with noise, avoid installation at a bedroom window, patio or fence; if possible, we recommend not installing the heat pump in a corner; when placed in a corner, the resulting sound pressure level may increase due to reflections from the surrounding walls.

Material of surrounding surfaces: avoid using materials with increased sound reflectivity; it is unsuitable, for example, to line the surrounding surfaces with ceramic tiles.

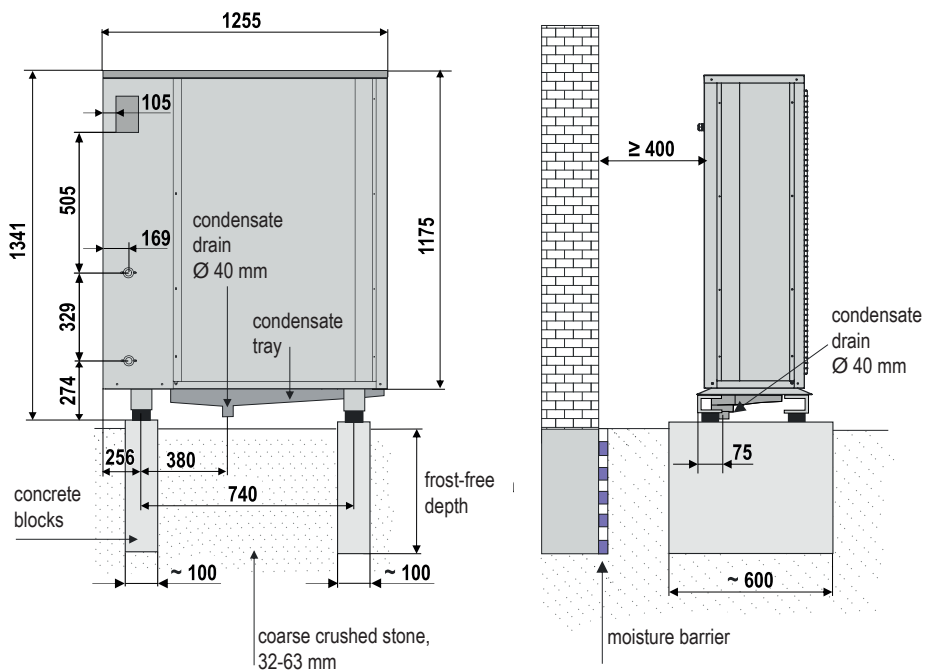


3.4. Placement of the heat pump

a) Installation on concrete blocks

The heat pump is placed on the legs at the factory and flexibly mounted on anti-vibration rubber silent blocks. The heat pump supplied in this way shall be installed on concrete blocks. The foundations of concrete blocks should reach a frost-free depth.

The heat pump is placed on the prepared foundation structure and levelled with a spirit level so that it is placed perfectly horizontally. It is not necessary to anchor the heat pump to the base or to the outer wall of the building.



b) Installation on wall brackets

The other option is to place the heat pump on the house structure using wall brackets (code 17458).

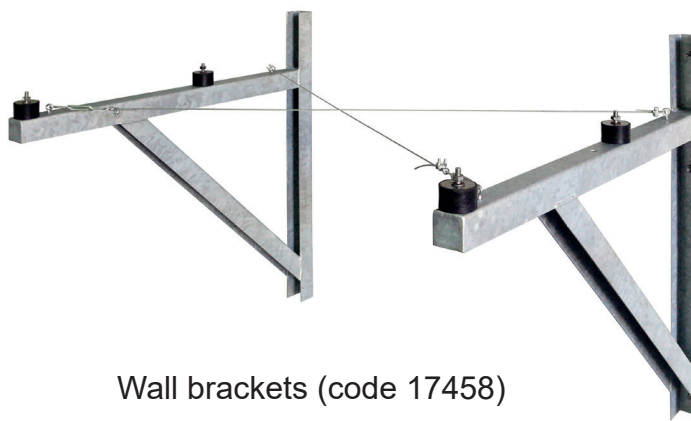
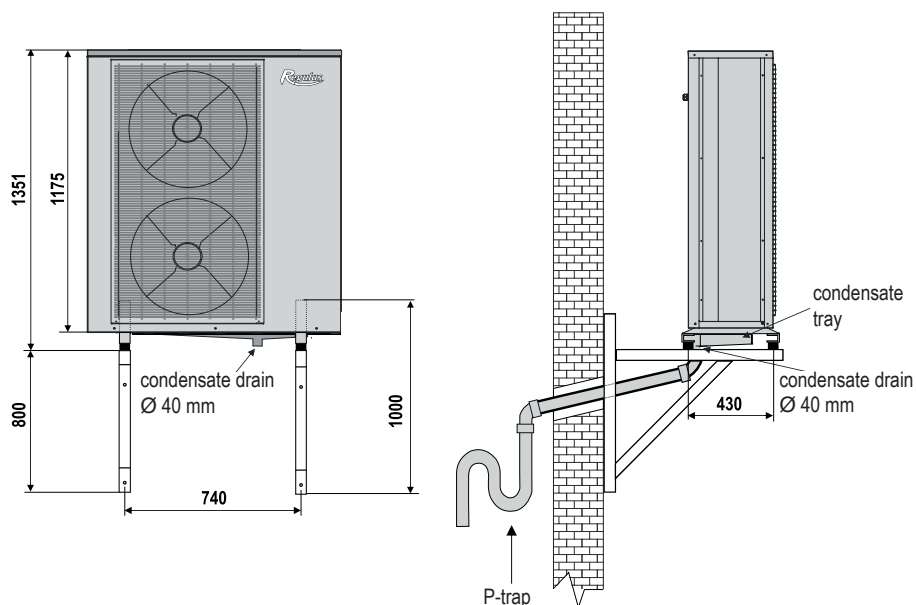
Before mounting the bracket on the wall, it is important to verify its load-bearing capacity. Depending on the composition and thickness of the wall, it is recommended to use a chemical anchor or a through-wall anchor for installation.

The brackets are galvanized and the complete support is supplied including steel ropes ensuring its spatial rigidity.

Follow the instructions for the wall mounting brackets.

Prior to placing the heat pump on the brackets, unscrew the silent blocks (30 mm high) that come with the heat pump from production and replace them with silent blocks designed for brackets (40 mm high). These silent blocks are included in the supply of wall mounting brackets.

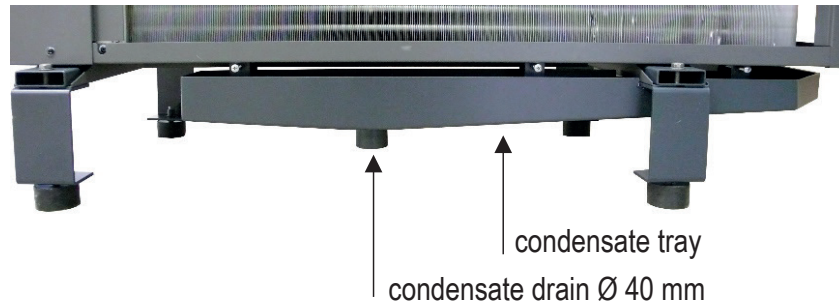
Level the heat pump with a spirit level so that it is placed perfectly horizontally.



Wall brackets (code 17458)

3.5. Condensate drain

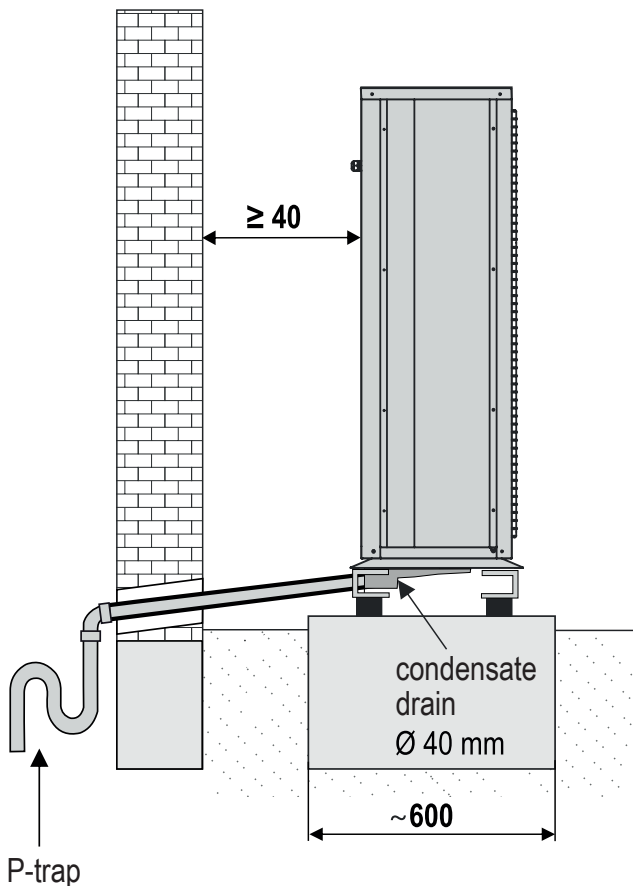
Water condensation normally occurs during heat pump operation; up to 50 liters of condensate can be generated per day, depending on the operating conditions. The heat pump is equipped with a condensate tray. A heating cable is installed in the condensate tray as a protection against freezing. The condensate tray shall be connected to a drain pipe for condensate drainage. If necessary, it is possible to place a heating cable in the drain pipe. The heating cable to the drain pipe is not included in supply and can be ordered as an optional accessory (code 18491).



The drain pipe can be run:

- a) to the ground to a frost-free depth** – the outlet and the space around the pipe must be filled with crushed stone to ensure sufficient condensate drain, the underground section of the pipe can be perforated,
- b) into the building, in its sewage system** – the through-wall passage shall be above the ground and a water trap shall be installed inside (see Fig. below),
- c) to the building's drainage system, e.g. downpipe drains or eaves**

It is recommended to insulate the drain pipe with thermal insulation.



3.6. Pipe installation

The hydraulic connection of the heat pump may only be carried out by a qualified specialist.

The horizontal sections of the connecting pipe shall always be routed so that they can be air bled. The connecting pipe shall be insulated. Pipes laid in the exterior of the building shall be provided with thermal insulation resistant to moisture with a minimum thickness of 19 mm. Indoors the piping shall be provided with insulation at least 13 mm thick.

The connection dimensions of the heat pump pipes are G 1" F. Compensators shall be fitted to these pipes to increase the frost protection of the heat pump heat exchanger. Compensators are included in supply. A G 1" M nipple, which is included in supply (incl. gaskets), is used to connect the heat pump outlet pipe to the compensator.

To limit the transmission of vibrations to the house structure, it is recommended to connect the heat pump using braided diffusion-tight hoses of suitable length. Hoses are included in the delivery only for heat pumps supplied as a Special Offer, otherwise they must be ordered separately. Braided diffusion-tight hoses with F/F or M/F threads for RTC 12i heat pumps can be ordered in lengths of 500, 700 and 1000 mm. To eliminate the transmission of vibrations to the adjoining pipeline and possibly also to the house structure, it is recommended to run the braided hose loose in a slight bend.

When installing compensators and braided hoses, follow the instructions in the separate Installation Manuals that will come with these products.

Continue after the braided hose with copper, stainless steel or other pipes of suitable size. The appropriate dimension of the pipe is prescribed by the heating designer, the dimension specified by him is binding and must be observed during installation. Below are only indicative recommended pipe dimensions:

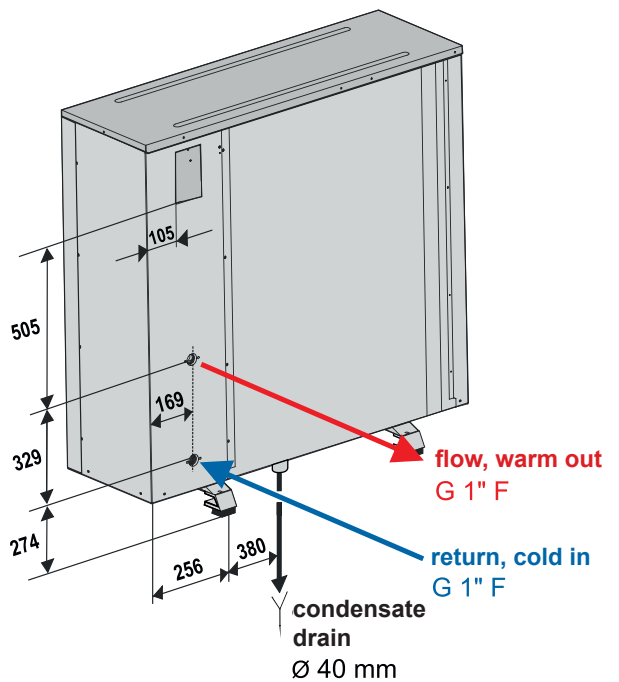
Distance (total length of piping)	< 30 m	30 - 40 m	> 40 m
Indicative recommended pipe diameter	Cu 28x1,5 (DN25)	Cu 35x1,5 (DN32)	Calculation needed

For the correct operation of the device, it is necessary to keep the minimum flow through the heat pump at the level of **min. 790 l/h.**

3.7. Electrical wiring

Electrical connection and any interventions in it may only be carried out by a qualified person with the appropriate authorization!

- Check that the power supply to the utility room is sufficient and in accordance with the project documentation, resp. according to valid standards and regulations. The cross-section of the supply cable for the entire heating technology depends on the application and the output of the auxiliary heat source.
- Connection of other devices (**IR14 RTC controller, auxiliary heat source, circulation pumps, valve actuators, etc.**): connect according to the relevant instructions or project documentation.



4. COMMISSIONING

4.1. Initial start up

Commissioning must be carried out by a service provider with a valid authorization issued by REGULUS.

Commissioning checklist:

- Check that the heat pump and system are filled with water, air bled.
- Check connections for leaks.
- Check that both the sensors and the circulation pump are connected to the power supply.
- Switch on the heat pump through the controller.
- When the system heats up, check that the connections are properly tight, the system is vented, supplying heat and possibly hot water (heating test and leak test).
- Set the required heating curves and time programs.
- Inform the future user about the location of the main switches, circuit breakers and their function.
- Inform the future user about other safety features and indicators (safety valves, pressure gauges, analogue thermometers, etc.) and their functions.
- Inform the future user about the controller control, user menu, etc.

The service provider shall fill in **the Checklist** and the heat pump owner shall sign it.

4.2. Troubleshooting

If a fault occurs, you should always contact the installation company that installed your unit. If the supplier considers that the fault is caused by a material or design defect, the installation company will contact the supplier and repair the defect. Always report the serial number of the heat pump (indicated on the label on the back of the heat pump).

Air in system

If you hear a raspy sound from the heat pump, make sure that it is completely air bled. If necessary, top up the system to operating pressure. If the problem persists, call a technician to determine the cause.

Error messages

All error messages and information texts are displayed on the controller that controls the heat pump. For more information, consult the instructions for the corresponding controller.

Heating water circulation

If the circulation between the indoor unit and the outdoor unit slows down or stops completely, the high pressure switch closes. Possible causes are:

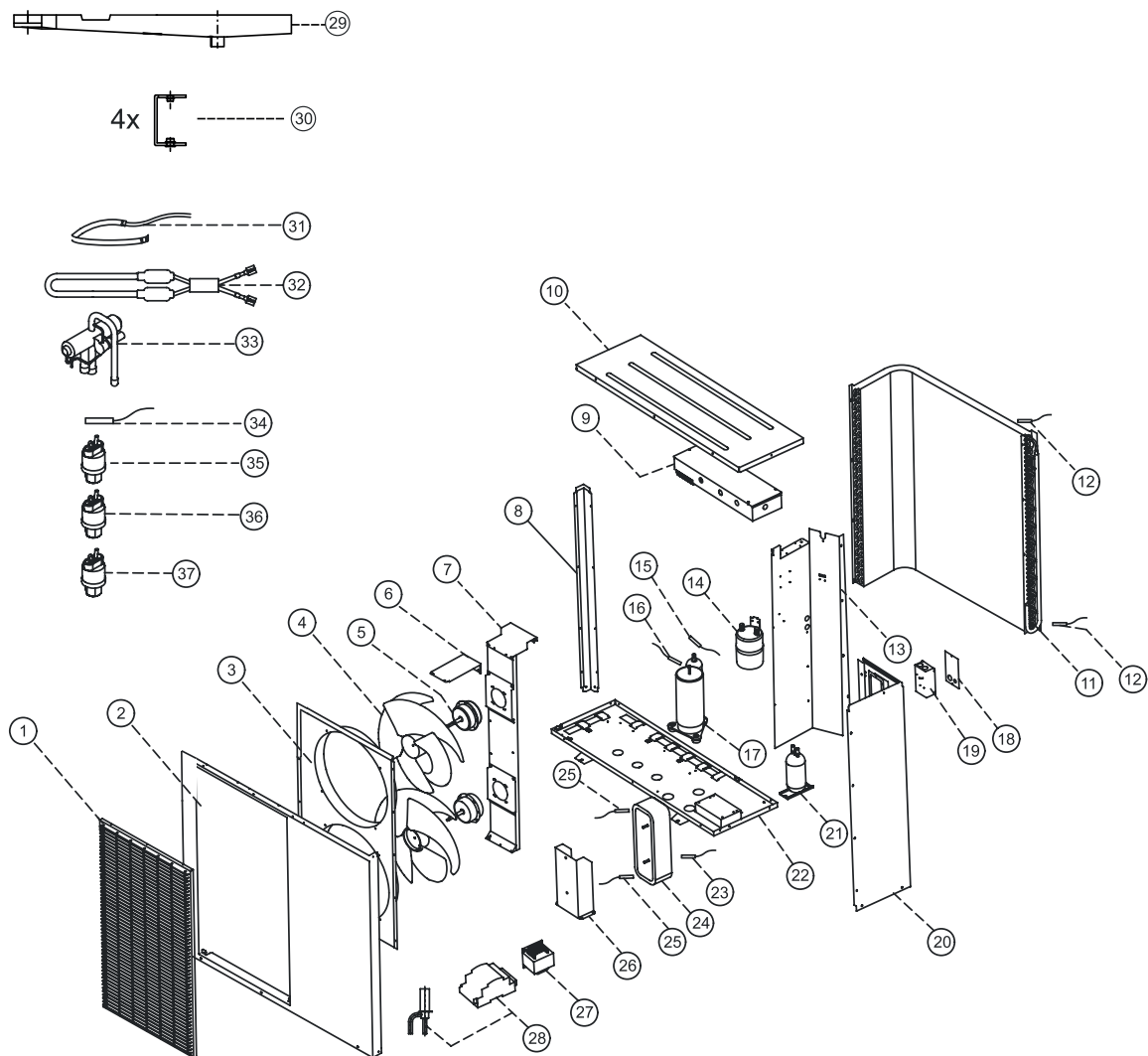
- defective / undersized circulation pump
- air in pipes
- clogged condenser
- other obstacles to water flow

Defrosting

The fan stops during the defrosting cycle, but the compressor is still running. Melted ice flows into the condensate tray under the heat pump. As soon as defrosting is completed, the fan starts up again and a cloud of fumes formed by moist air may form for a short time. This is a perfectly normal phenomenon that disappears after a few seconds. On frosty days, check for ice in unusual places (heat pump legs, condensate tray, fan, etc.). Possible causes can be: defective defrosting automation, lack of refrigerant (leakage), extreme weather conditions.

APPENDIX

Exploded View



Pos.	Name	Pos.	Name	Pos.	Name
1	Cover grille	14	Liquid refrigerant separator	27	PFC, power factor correction
2	Front cover panel	15	Suction gas sensor	28	Electronic expansion valve actuator
3	Front of fan housing	16	Hot gas sensor	29	Condensate tray
4	Fan propeller	17	Compressor	30	Legs for RTC 12i
5	Fan motor	18	Wiring box cover	31	Heating element
6	Connecting part	19	Electric wiring box	32	Condenser heating element
7	Rear of fan housing	20	Side cover panel	33	Four-way valve
8	Support	21	Refrigerant collector	34	Electronic expansion valve sensor
9	Installation box	22	Bottom cover panel	35	High pressure sensor
10	Top cover panel	23	Liquid refrigerant sensor	36	Low pressure sensor
11	Finned heat exchanger - evaporator	24	Plate heat exchanger - condenser	37	High pressure switch
12	Outdoor temperature sensor	25	Water temperature sensors		
13	Baffle	26	Condenser mounting part		

Internal Wiring Diagram

