User manual

NeoRé TG

Heat pump air-water

NeoRé 5TG
NeoRé 8TG
NeoRé 11TG
NeoRé 14TG
NeoRé 8TG HP
NeoRé 11TG HP
NeoRé 14TG HP
NeoRé 16TG HP

Quick start

The quick start guide can only be used if the heat pump installation has been completed, properly started and tested by the installation company.

Division and description of the basic control screen

1. **Object section** - Displays heating / cooling mode, building temperature, circulating pump operation and building states. To turn the heating and cooling on and off, use the `H/C` button.
2. **DHW section** - Displays the DHW temperature, circulating pump operation and heating states. To turn on the DHW heating, use the `DHW` button.
3. **Overview section** - Displays values and parameters of selected temperatures, operating states and the outdoor unit power. You can also switch to an extended overview using the `More..` button, which contains more values, a fault history, measurement of supplied heat and more. To return to the main menu, press `Menu`.
4. **Information bar section** - This part displays the time and state of the device. On the right side, you can see if the heat pump is connected to an Ethernet network (ETH1) and the Neota Route remote access service (CLOUD)

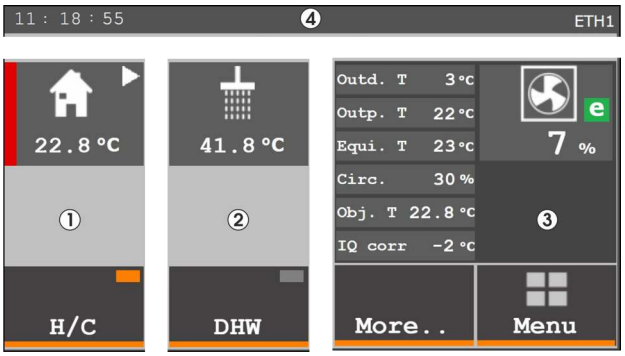

Figure 1: Basic division of sections (H/C on, DHW off)

Basic operation of the controller

To operate the heat pump, use the graphical user interface on the touch panel. The main menu will be displayed immediately after switching on the device or after pressing the Menu button. A complete description of the functions and operation is given in Chapter 4 Description of the user interface (page 15).

Overview is used for basic control – activation of heating, DHW heating, overview of temperatures and energies, list of states and errors.

Object is used for advanced setting of the requirements for building heating or cooling.

DHW is used for advanced setting of the requirements for DHW heating, its circulation and disinfection.

Graphs displays the course of important temperatures

Settings is used for general setting of the device behaviour and remote access.

More is used to set additional systems such as a secondary source or pool circuit.

Winter operation

On the **Overview** screen, switch on the `H/C` icon (the rectangle on the button is orange).
You can set the equithermal curve in a simplified mode after pressing the house icon in the first column. It is the **SIMPLE NEO** function.

H/C is used to switch heating/cooling on or off like on the previous screen.

More.. is used for initial selection of the equithermal curve according to the energy class of the building. Just press the coloured label in the right column and the weather compensation curve will automatically readjust (Fig. 3)

Back.. is used to return to the **Overview**

Menu is used to return to the default screen

Plus Minus is used to increase/decrease the desired temperature of heating/cooling water by a maximum of 9 °C from the default temperature

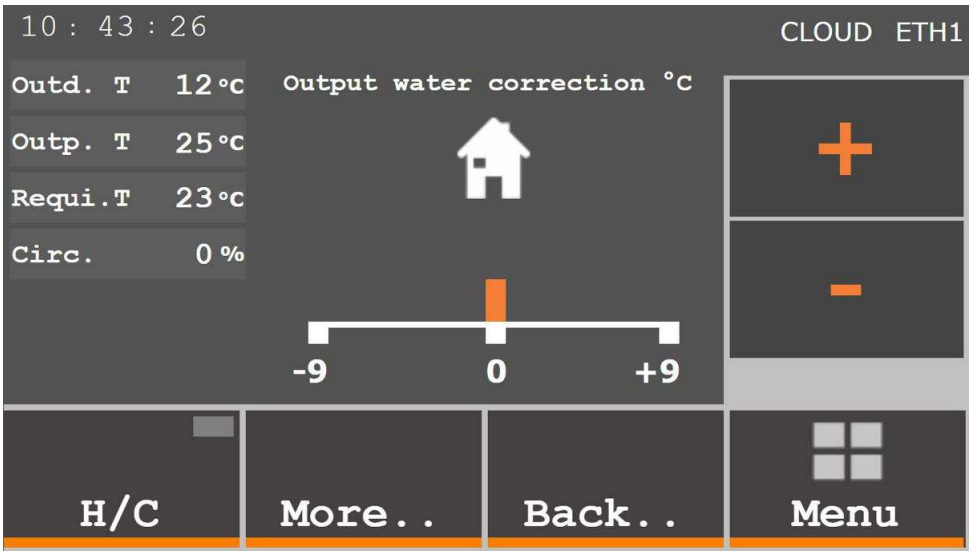

Figure 2: Basic screen SIMPLE NEO for equithermal curve correction

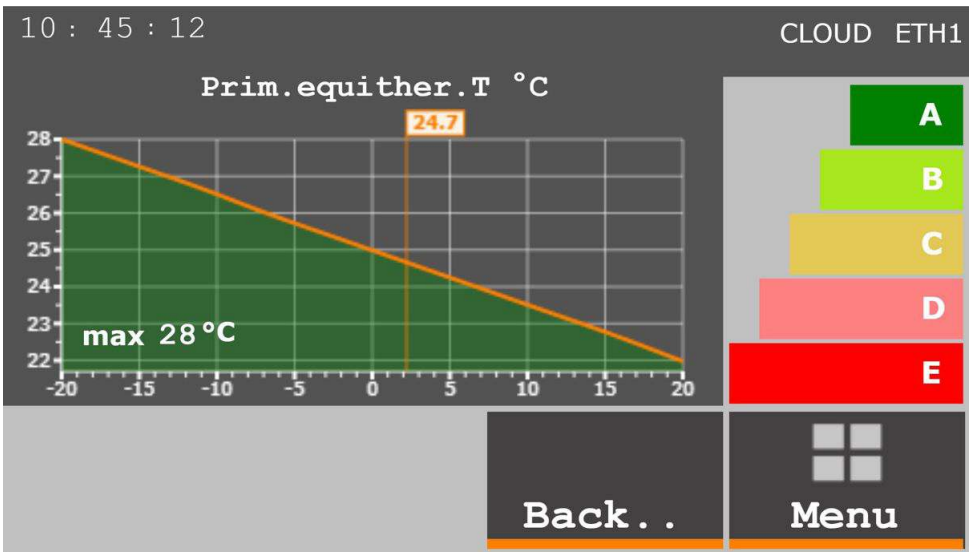

Figure 3: Initial selection of the equithermal curve according to the energy class of the building

For experts: More accurate but complex setting of the equithermal curve according to Table 1 on page 4 can be made in the **Object** settings. Then use automatic equithermal curve correction to adjust the heating water temperature according to your needs.

Equithermal setting		
Outdoor temperature	**Heating water temperature for:**	
	Floor or ceiling heating	**Radiators**
19°C	22°C	25°C
6°C	28°C	40°C
−7°C	33°C	45°C
−20°C	38°C	50°C

Table 1: Equithermal curve setting

If it is too hot or too cold in the heated area, adjust the equithermal curve using the `Automatic correction` function (Object ➞ Primary weather comp. curve). For example, if the room temperature is 2°C higher than desired, enter a value of equithermal curve automatic correction of −3°C. If, on the other hand, the room temperature is 1°C lower than desired, enter a correction of 2°C. The minimum correction value is ±3°C for one entry. Remember that the change requires some time to take effect. In the case of floor heating, this time during which the room temperature changes is approximately 3–6 hours. In the case of radiators, this time is shorter.

Summer operation

To switch to the cooling mode in summer, use the `Mode - heating/cooling` selector on the **Object** section screen (Fig. 4.8 page 22). In the cooling mode, the selector is blue and, on the basic Overview screen, there is a blue stripe next to the house icon.

DHW heating

On the overview screen (section **Overview**), set the `DHW` icon to ON. In the **DHW** settings, set the desired DHW temperature and delay of electric heating according to Table 2 on page 4. DHW heating operates independently in both modes, heating as well as cooling.

Setting the delay of DHW electric heating	
Vessel size	**Delay time**
200 l	40 min
300 l	60 min
400 l	90 min

Table 2: Setting the delay of DHW electric heating

Contents

1. Safety instructions

1.1 Safety warning

Read the manual carefully before installing, putting into operation or maintaining the device. Adherence to the described procedures for the installation and operation of the device is important for long-term and trouble-free operation. Faults and defects caused by non-compliance with the safety instructions, installation procedures and operating rules will not be taken into account, not even damage or destruction of other related equipment. The device may only be installed by persons with appropriate qualifications in the field of heating, cooling and electrical engineering.

In addition, observe all applicable safety regulations related to the actual installation and operation of the NeoRé heat pump.

The device may only be operated by a person familiar with this manual and older than 15 years. Persons with limited physical, sensory and mental capabilities or with lack of experience and/or knowledge may operate the device only if they are supervised or trained in the safe use of the device by the person responsible for their safety and if they understand the dangers involved. Children must not play with the device or clean or maintain it.

The R32 refrigerant is a class A2L flammable gas.

To install the indoor unit, observe the minimum floor area requirement. More in *Installation Manual, Table Minimum floor area when using A2L gas in Chapter Refrigerant piping*.

The heat pump must be installed in a room without continuous open flame operation (e.g. running gas appliance) and ignition sources (e.g. operating electric heater).

1.2 Safety precautions

The heat pump is an electric device working with a voltage of 400 V! The device may only be installed and serviced by an authorized electrician. In case of fire, do not extinguish with water or foam. Use only a powder or snow extinguisher!

In the event of a refrigerant leak, turn off all circuit breakers located on the indoor unit and contact the service organization indicated on the plate on the indoor unit. The R32 refrigerant is slightly flammable, non-toxic. Under no circumstances should you try to stop the refrigerant leak yourself. It reaches very low temperatures (up to −50°C). In the event of a leak in the interior of a building, ventilate the room. In case of inhalation of refrigerant vapours or fire fumes, take the affected person to a ventilated place and call for medical help: phone number 112. In case of contact with liquid refrigerant, dry the area immediately and warm it, for example with a blanket. In case of contact with eyes, rinse immediately with plenty of lukewarm water and call for medical help: phone number 112.

In case of fire, disconnect the device from the mains and extinguish with a snow or powder fire extinguisher.

In the event of a heating water leak, turn off all circuit breakers located on the indoor unit and contact your service organization.

When handling the refrigerant piping (cleaning, maintenance), use personal protective equipment (gloves, goggles, protective clothing, ...).

Do not put your hands or other objects in the fan area of the outdoor unit, there is a risk of serious injury!.

Do not expose yourself to the airflow from the outdoor unit for a long time. There is a risk of severe hypothermia!

- Perform the installation only in accordance with the installation manual, which is available at https://www.neota.cz/en/downloads/.
- Connect the outdoor and indoor unit (refrigerant, electric) only with the material specified in the installation manual.
- Installation work on the refrigerant and electric circuit must be performed by an appropriately authorized person.
- Do not use flexible inlets and piping to connect the units.
- Do not operate a device that is not completely installed.
- Do not use refrigerants whose quality and purity you are not sure about. Observe the safety precautions on the refrigerant packaging.
- Do not add refrigerant to increase performance.
- Always use a vacuum pump before filling the refrigerant.
- Pay attention to work safety and personal protective equipment during installation.
- The device must be installed by a specialist company authorized by the manufacturer. Do not attempt to install the device yourself. You can destroy the device or cause injury.
- Do not mix two types of refrigerant. Use only the refrigerant specified on the label.

1.3 Legal conditions

Legal conditions that must be observed when handling the device.

ČSN EN 378-4+A1:2020 Art. 6.5.x
All parts of refrigeration equipment, e.g. refrigerant, heat-transfer medium, filter, dehydrator, insulation material, compressor and the whole refrigerant circuit system must be recovered, reused and/or properly disposed of in connection with maintenance, repair and decommissioning. Maintenance and disposal must be performed by a person professionally qualified for the disposal of refrigerants and oils.

ČSN EN 378-4+A1:2020 Art. 6.2.x
Used refrigerant that is not intended for reuse must be treated as waste for safe disposal. Prevent emissions to the environment. Any handling of the refrigerant must be performed by a person professionally qualified for the disposal of refrigerants and oils.

ČSN EN 378-4+A1:2020 Art. 6.2.x
Used oil recovered from refrigeration equipment that cannot be regenerated must be stored in a suitable separate container and must be treated as waste for safe disposal. Oil must be drained by a qualified person.

ČSN EN 378-4+A1:2020 čl. 6.6
All activities related to recovery, reuse of refrigerant and refrigerant source must be recorded in the refrigeration equipment's operating log (see En 378-4 Art. 4.2). If required, it must be provided by the refrigerant supplier or service company.

1.4 Storage and transport conditions

Indoor unit NeoRé IU16-20

Environment	dust-free, non-aggressive
Temperature range	-10 to 45°C
Relative humidity	max 70%

Outdoor unit OU GMx or OU GPx

Environment	dust-free, non-aggressive
Temperature range	-10 to 45°C
Relative humidity	max 90%

The outdoor unit must be stored and transported in a vertical position in the original packaging and properly secured. If necessary, protect fragile parts, especially the evaporator, from damage. Overturning or leaking refrigerant may lead to injury.

During transport, all components of the device must be secured with straps or other technical means to prevent overturning and injury.

If damage or refrigerant leakage occur during transport, do not attempt to stop the leak improperly. Evaporation of the refrigerant significantly cools the affected areas and may cause injury in contact with the skin.

2. Product specification

2.1 Product designation

The NeoRé series heat pump is designed for heating family houses or smaller industrial buildings.

The product is intended for connection to a low-temperature heating system. The ideal heating system is mainly floor, wall and ceiling heating. Connection of conventional wall-mounted radiators is possible, but it is limited by the maximum heating water outlet temperature 55°C. (60°C for the HP version) and reduced efficiency. The heat pump can also be used for cooling. For cooling, the outlet temperature is limited by the condensation temperature. The heat pump is not suitable for cooling with a cooling water temperature below the condensation temperature, e.g. fan coils. Condensation occurs on the internal equipment of the indoor unit and leads to its damage. A suitable cooling system is cooling ceilings where condensation does not occur.

Read the manual carefully before installing, putting into operation or maintaining the device. Adherence to the described procedures for the installation and operation of the device is important for long-term and trouble-free operation. Faults and defects caused by non-compliance with the safety instructions, installation procedures and operating rules will not be taken into account, not even damage or destruction of other related equipment.

2.2 Connection to the mains

The NeoRé series heat pump is intended for discounted tariffs of electricity distributors, either a tariff for heat pumps or tariff for direct heating.

Before connecting the system to the mains, the relevant distribution plant must issue a permit.

2.3 Package contents

Each indoor unit package contains the following components:

- heat pump NeoRé, indoor unit IU16-20, outdoor unit OI GMx or OU GPx
- user manual
- outdoor temperature sensor
- DHW temperature sensor
- building temperature sensor (optional accessory)

2.4 Indoor unit description

The indoor unit is designed for wall mounting indoors. Its heart is a high-quality refrigerant / water exchanger that transfers heat to the heating system. An essential part is the sophisticated Teco controller and its software, which not only

controls the operation of the heat pump itself, but also takes care of the thermal comfort inside your building. It provides cascade control of the heat pump together with a bivalent source, which switches on the bivalent source in two stages when the heat pump's power is insufficient. The NeoRé heat pump can also work with other heat sources and multiple heating circuits. All this is secured by means of safety, measuring and control elements.

For comfortable and convenient operation, the NeoRé heat pump can also be connected via a web browser to a computer, mobile phone or tablet, even remotely thanks to the Neota Route service.

NeoRé COMFORT series	NeoRé HIGH POWER series
NeoRé 5 TG	NeoRé 8 TG HP
NeoRé 8 TG	NeoRé 11 TG HP
NeoRé 11 TG	NeoRé 14 TG HP
NeoRé 14 TG	NeoRé 16 TG HP

Table 2.1: Model series NeoRé COMFORT and NeoRé HIGH POWER for all types of NeoRé heat pumps

COMFORT - outlet water temperature up to 55°C and outdoor temperature operating range −15° to 24°C

HIGH POWER (HP) - outlet water temperature up to 60°C and outdoor temperature operating range −27° to 24°C

2.5 Outdoor unit description

The outdoor unit is made of steel plates with high-quality anti-corrosion treatment by electrostatic powder coating. The heart of the unit is a compressor unit with a DC inverter compressor, which is a progressive novelty in the area of heat pumps and a guarantee of reliability and long life. It also contains an evaporator with anti-corrosion treatment. Variable-speed fans control the air flow through the evaporator and ensure low noise levels. The outdoor unit also features an electronically controlled expansion valve, control electronics and measuring elements.

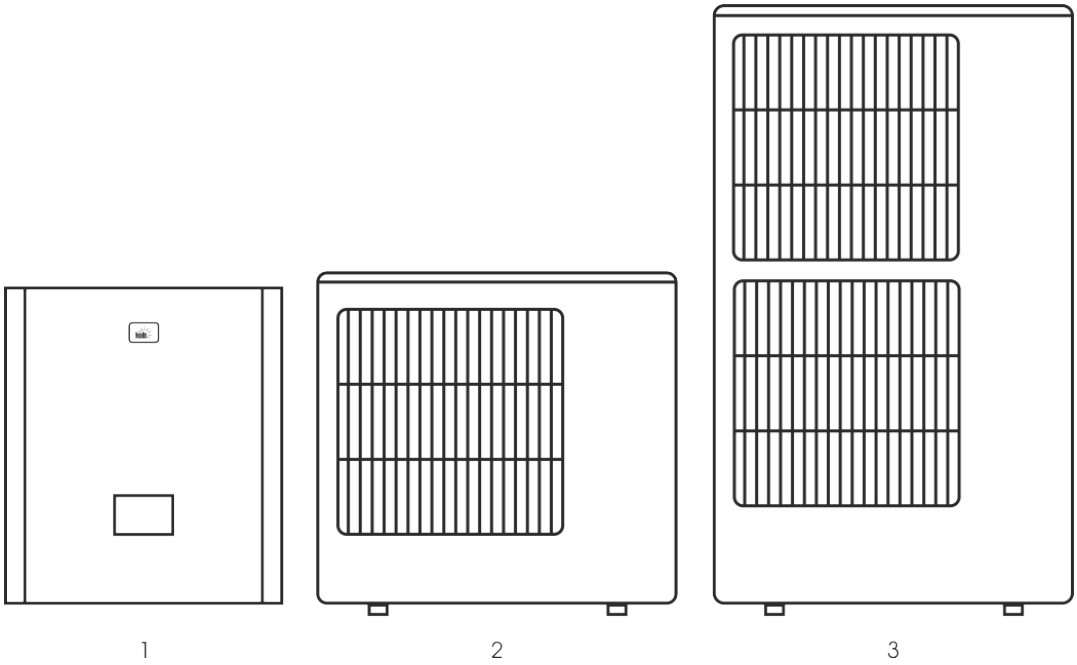

Figure 2.1: 1 - Indoor unit; 2 - Single fan outdoor unit; 3 - Double fan outdoor unit

2.6 Table of technical parameters

SERIES NAME				COMFORT SERIES				HIGH POWER SERIES			
Type				NeoRé 5 TG	NeoRé 8 TG	NeoRé 11 TG	NeoRé 14 TG	NeoRé 8 TG HP	NeoRé 11 TG HP	NeoRé 14 TG HP	NeoRé 16 TG HP
Building heat loss	Low-temperature (35 °C)		kW	5	6	7	9	6	9	11	13
	Medium-temperature (55°C)		kW	4	5	6	6	5	8	10	11
Bivalent temperature	Low-temperature		°C	-7							
	Medium-temperature		°C	-7							
Seasonal energy efficiency (Eu 811,813/2013)	Low-temperature		%	174	176	175	173	194	192	186	184
	Medium-temperature			121	124	123	120	133	134	127	124
	Low-temperature class			A++	A+++	A++	A++	A+++	A+++	A+++	A+++
	Medium-temperature class			A+	A+	A+	A+	A++	A++	A++	A+
Seasonal coefficient of performance SCOP	Low-temperature class			4,42	4,48	4,45	4,39	4,92	4,88	4,71	4,67
	Medium-temperature class			3,09	3,16	3,14	3,07	3,4	3,42	3,26	3,18
+2°C / +35°C (EN 14511) - compressor power 100%	Heat output		kW	4,5	7,5	10	13	8	10	13	16
+2°C / +35°C (EN 14511)	Heat output / compressor power		kW/%	3,5 / 45	4,3 / 45	4,9 / 45	5,41 / 45	3,8 / 45	5,2 / 45	6,6 / 55	7,6 / 60
	COP* / compressor power			3,65 / 45	3,7 / 45	3,65 / 45	3,5 / 45	4,07 / 45	4,15 / 45	3,95 / 55	3,8 / 60
+7°C / +35°C (EN 14511)	Heat output / compressor power		kW/%	3,8 / 45	5,2 / 45	6,0 / 45	7,25 / 45	5,2 / 45	7,05 / 45	8,9 / 55	10,25 / 63
	COP* / compressor power			4,7 / 45	4,75 / 45	4,7 / 45	4,65 / 45	5,5 / 45	5,61 / 45	5,47 / 55	5,29 / 63
+7°C / +55°C (EN 14511)	Heat output / compressor power		kW/%	3,8 / 55	5,6 / 55	6,2 / 55	7,4 / 55	6,81 / 60	9,34 / 60	11,89 / 70	13,56 / 78
	COP* / compressor power			2,7 / 55	2,8 / 55	2,74 / 55	2,7 / 55	3,16 / 60	3,3 / 60	3,1 / 70	2,95 / 78
Annual energy consumption	Low-temperature		kWh	2102	2813	3361	4241	2466	3809	4821	5747
	Medium-temperature		kWh	2339	3321	3714	4214	2921	4831	6337	7157
Cooling power	+40 °C / +15 °C		kW	3,9	6,33	9,47	11,46	7,1	10	11,5	13
EER				3,9	3,9	3,56	3,31	5,18	5,26	5	4,3
INDOOR UNIT											
Backup heat source	Power		kW	6,0 (3×2 kW)							
Noise level (acoustic power)			dB(A)	32,5 dB							
Indoor unit dimensions	H x W x D		cm	65 x 57 x 30							
Indoor unit weight			kg	48 net							
Condensing exchanger				stainless steel plate – soldered							
Max. water column height			m	18							
Safety overpressure			MPa	0,25							
Heating circuit connection				G1" female thread							
Pumping power	(indoor unit)		m	6,8							
Nominal flow of heating water			l/h	850	950	1360	2400	950	1360	2400	2700
Circulating pump				ErP low-energy							
Supply cable protection			A	3x20	3x20	3x25	3x25	3x20	3x25	3x25	3x25
OUTDOOR UNIT											
Outdoor unit voltage				1ph 230V							3ph 400V
Current	Max.		A	13,1	17,5	18,5	20	17,5	18,5	20	10,5
Fan motor				DC – variable speed							
Noise level (acoustic power)			dB(A)	60	60	62	62	58	59,5	59,5	60,5
Sound pressure level at 5m**			dB(A)	38	38	40	40	36	38	38	39
Outdoor unit dimensions	H x W x D		cm	63x87x30	89x90x32	89x90x32	89x90x32	105x101x37	155x101x37	155x101x37	134x90x32
Outdoor unit weight	(net)		kg	45	68	68	68	74	104	104	95
Refrigerant				R32(GWP=675)							
Refrigerant quantity			kg	1,35	2,1	2,1	2,1	1,9	3,1	3,1	3,1
Connecting pipes – Diameter		Liquid	mm	ø 6,4	ø 9,52						
		Gas	mm	ø 12,7	ø 15,88						
Connecting pipes – Length		Min. / Max.	m	5/25	5/25	5/25	5/25	3/30	3/40	3/40	3/40
Connecting pipes – Length (without addition)		Max.	m	30	30	30	30	30	30	30	30
Connecting pipes – Height difference		Max.	m	10	10	10	10	10	10	10	10
Operating range			°C	-15 ~ 24				-27 ~ 24			
Max. output water temperature			°C	55				60			
Min. output water temperature			°C	20							
Compressor				DC - inverter (with variable speed)							
Refrigerant circuit control				electronic expansion valve							
Evaporator				Al-Cu vertical							
Air flow	m^3/h			2250	4080	4080	4200	3180	6180		
Defrosting				hot gas through reverse valve							
Limits for relative humidity				15-95%							

* The value is measured according to ČSN14511 (measured including defrosting, consumption of the complete pump system included)

** Value measured according to EN12102-1 at 5m, direction coefficient 2 | The seasonal thermal efficiency values are determined for the average temperature range.

Figure 2.2: Table of technical parameters

3. Principle of operation and correct use

3.1 Principle of heat pump operation

The basic prerequisite for the operation of a heat pump is a heat transfer medium with suitable properties for changing the state at a given pressure and temperature. All these basic components are indicated in the figure below – Schematic diagram of the heat pump operation.

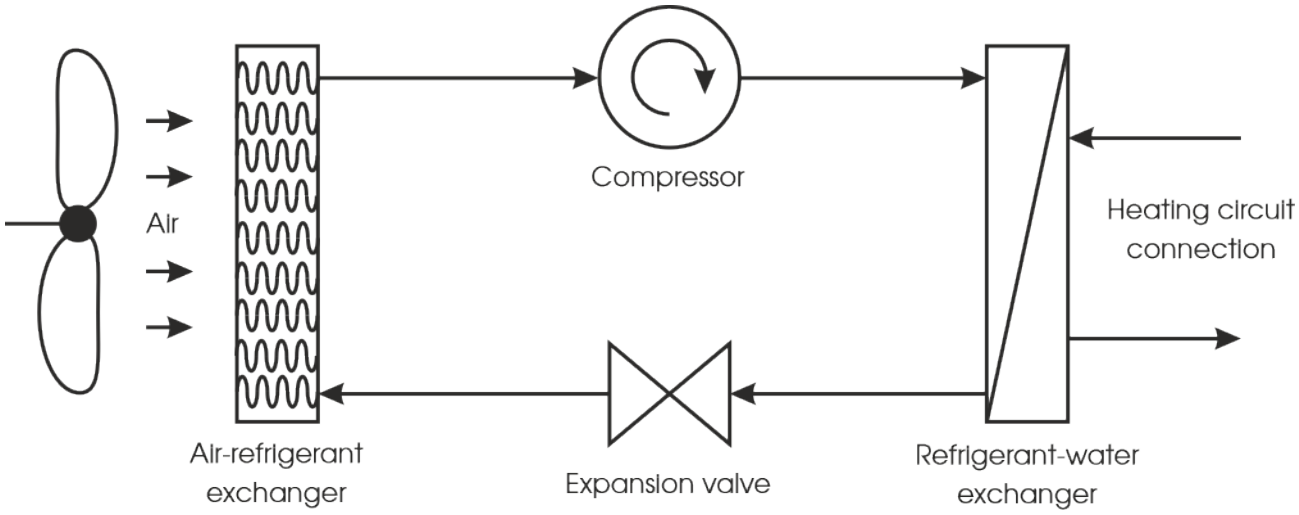

Figure 3.1: Principle of heat pump operation

In the first phase The refrigerant enters the air-refrigerant heat exchanger and changes its state to gas. As a result, the refrigerant receives energy from the air. The refrigerant continues through the piping to the compressor, where it is compressed. This converts it to a higher temperature level. The last phase is the transfer of the obtained energy to the heating circuit in the refrigerant-water exchanger. Here, the gaseous refrigerant condenses and transfers energy to the heating medium. The liquid refrigerant then passes through the expansion valve again and is again evaporated in the air-refrigerant exchanger.

3.2 Hot water heating systems

! This section contains general facts of recommendations in the field of heating systems. It cannot be used to design a heating system. The system must always be designed by an experienced professional. Likewise, the choice of the heat pump power and type must be made on the basis of a calculation of building's heat losses by an expert.

The NeoRé series heat pump is designed for hot water heating systems. For this reason, some of them are described in the following paragraphs. The characteristics of individual heating systems differ, and therefore must be taken into account when choosing a heat pump, whether it is a new or existing heating system. In general, however, we can say that in a heating system we try to maximize the surface area of the heater and thus reduce the temperature of the heating water required to transfer the required amount of energy.

3.2.1 Low-temperature heating system

Examples of a low-temperature heating system:

- floor heating
- ceiling heating/cooling
- wall heating

Large-area radiant systems are best suited for use with a heat pump. The heat pump is maximally efficient with these systems and its service life is longer. They are also the most comfortable type of heating for habitable rooms.

With these systems, it is possible to induce natural thermal comfort and avoid heat build-up and large thermal differences upwards, as is the case with traditional convective heating systems.

3.2.2 Medium-temperature heating system

Examples of a medium-temperature heating system:

- radiators
- fan coils

This heating method is less advantageous when used with a heat pump, but still usable. The small radiant surface of the radiator plates and thus the higher temperature requirement of the heating medium reduces the efficiency of the heat pump. The maximum heating water temperature for radiators is 55°C (60°C for HP). Using the maximum temperatures continuously can reduce the service life of the product.

3.3 Cooling system

The heat pump can also be used for cooling. For cooling, the outlet temperature is limited by the condensation temperature in the given environment. The heat pump is not suitable for cooling with a cooling water temperature below the condensation temperature, e.g. fan coils. Condensation occurs on the internal equipment of the indoor unit and leads to its damage. A suitable cooling system is cooling ceilings where condensation does not occur.

3.4 Correct principles of using a heat pump

A heat pump is a low-temperature heat source that pumps thermal energy between two temperature levels. Based on physical principles, the more distant these levels are, the more energy must be put into the process. For higher efficiency of the heat pump, these levels have to be brought as close as possible.

In practice, this means that we have to keep the heating water temperature as low as possible and the outdoor air temperature as high as possible. The outdoor air temperature can only be affected by the correct placement of the outdoor unit so that it has a sufficient air supply (pay attention to installation in enclosed yards, valleys, etc.). The heating water temperature can be affected by a correct design and use of the heating system.

It is more advantageous to use the heat pump to heat continuously to a lower heating water temperature than spasmodically to a higher temperature, where the heat pump is less efficient.

4. Description of the user interface

Before making changes to the device settings, carefully read what each function means and what the settings affect. Improper adjustment can result in uncomfortable and uneconomical operation, which is associated with unnecessarily higher equipment wear and higher operating costs.

4.1 Default screen

For the control, activation, deactivation and setting of the heat pump, use the touch screen on the front of the product cover. The default screen (Fig. 4.1 Page 15) offers six icons, each for controlling or setting one of the heat pump functions.

Overview is used for basic control of the device, activation of heating, DHW heating, overview of temperatures and energies, list of status and error messages.

Object is used for advanced setting of the requirements for building heating or cooling.

DHW is used for advanced setting of the requirements for DHW heating, its circulation and disinfection.

Graphs displays the course of important temperatures

Settings is used for general setting of the device behaviour and remote access.

More is used to set additional systems such as a secondary source or pool circuit.

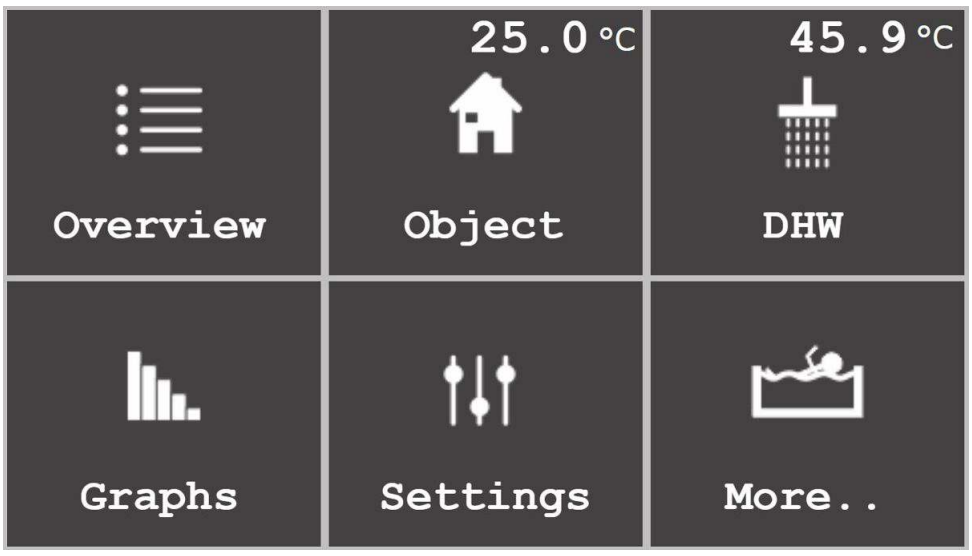

Figure 4.1: Default screen of the touch screen

Sections `DHW` and `More..` are displayed only if the appropriate temperature sensors are connected. I.e. a DHW temperature sensor for the `DHW` section and at least one of the storage tank or pool temperature sensors for the `More..` section.

Elements on the display that can be used to change values, turn functions on and off or link to another page have an orange background. Pressing the element displays the linked page or the panel for editing the variable, which dynamically changes according to its type.

4.2 Overview

The overview screen (Fig. 4.2 page 16) is divided into four columns.

In the **first column** from the left, there is a section at the top in which the heating mode is displayed (heating – red, cooling – blue). Furthermore, it displays the current temperature of heating water, the operation of the circulating pump using a triangular pictogram and whether the silent mode is active (speaker icon). In addition, the letter **h** may appear here if the cooling water temperature is automatically limited due to approaching the dew point.

At the bottom, there is the `H/C` control button that activates/deactivates the device. If the rectangle in the upper right is orange, the device is operating, if the rectangle is grey, the function is switched off.

The **second column** shows the current temperature of domestic hot water (DHW) and, at the bottom, a button for switching DHW heating on and off. It also contains a signalling rectangle similar to the H/C button.

The **third column** shows a list of the most important temperatures and power of the circulating pump. Pressing the `More..` button displays the next screen containing a more detailed list of current temperatures and other device status values.

The upper part of the **fourth column** shows whether heating uses the heat pump, bivalent or secondary source, percentage of the current heat pump power and other details about the current operating mode. The `Menu` button at the bottom can be used to return to the default screen.

The time is displayed on the left side of the **top bar**. The right part may display two text abbreviations. If `CLOUD` is displayed, the Neota Route remote management cloud service is activated. If `ETH1` is displayed, the device is connected to an Ethernet network and can be controlled within the local network using a computer, smartphone or tablet.

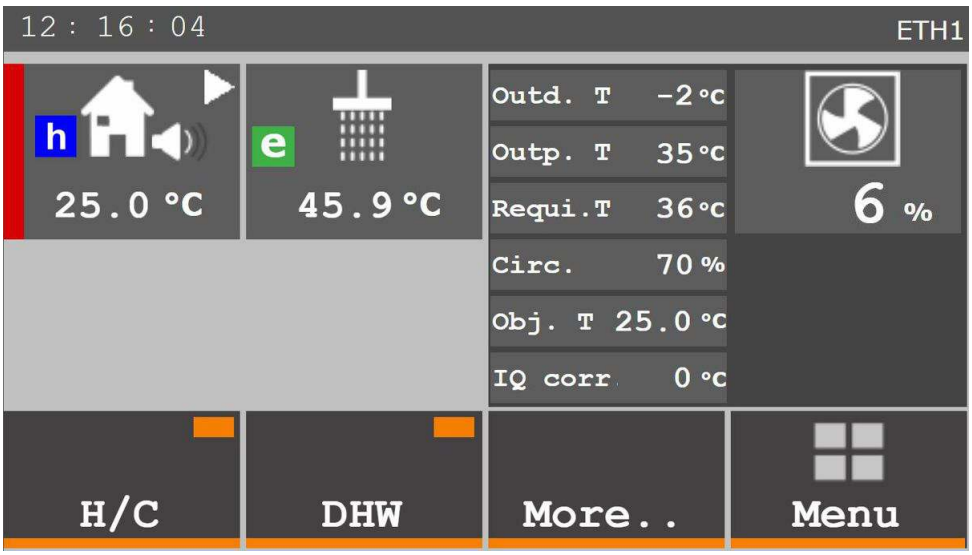

Figure 4.2: Overview section

The `More..` menu screen (Fig. 4.3 page 17) displays a detailed list of sensed data about the device and its operation. The upper left section displays information about the secondary circuit, the storage tank and the pool. The left centre section displays data about the operation of the outdoor unit. Data displayed in the right section is identical to the overview screen. The meaning of individual abbreviations is explained in Chapter 4.2.1 (page 19). Press `Energy` and `Status Error` to switch to other screens.

The left part of the Energy screen (Fig. 4.4 page 17) shows the quantities needed to calculate the current supplied power, the current supplied power as well as a counter of the total supplied energy. This counter can be reset with the

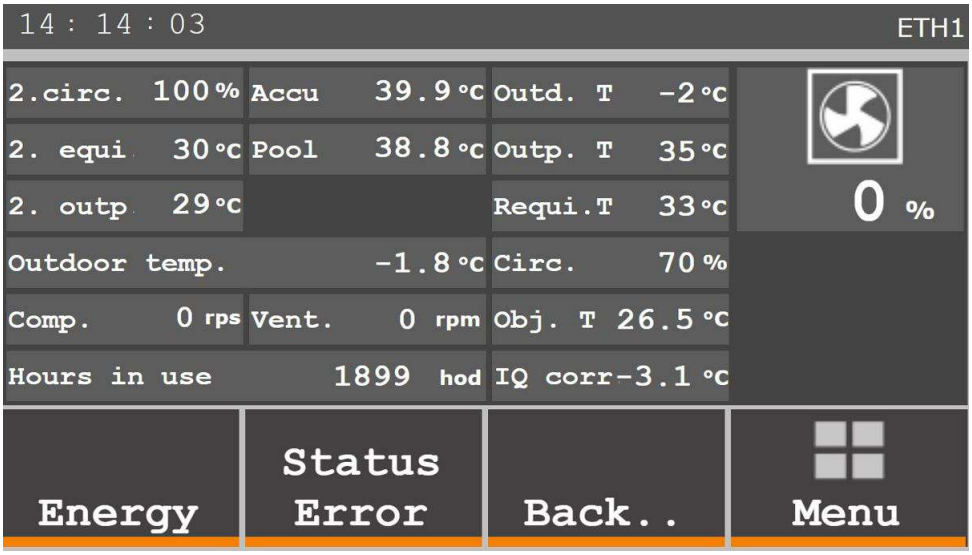

Figure 4.3: Overview section ➞ More..

`Reset Energy` button, e.g. before the start of the heating season.

The right side of the screen is again identical to the previous window.

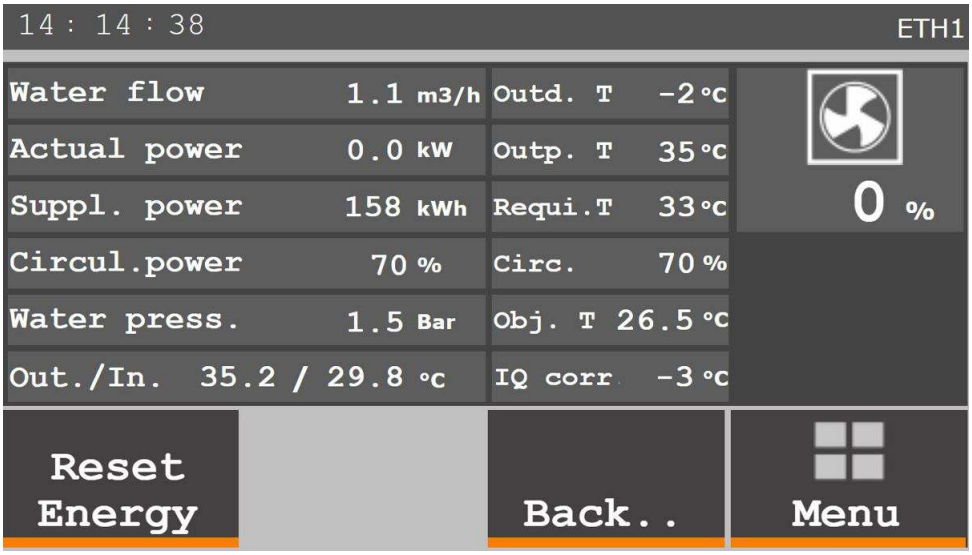

Figure 4.4: Overview section ➞ More.. ➞ Energy

If the current power value is negative, heat is being removed from the building. This is common, for example, when the outdoor unit is defrosting and an ice layer forms on the evaporator, which needs to be removed to maintain good heat transfer. This is achieved by taking part of the energy of the building and heating this evaporator.

The left part of the status and error screen (Fig. 4.5 page 18) shows a history of the last ten recorded problems. You can clear the error history table using the `Reset history` button. This deletes data from the screen, but the complete record of the operating data remains saved and is accessible from a web browser in the device settings.

The last fault that occurred is shown at the top of the right part of the screen. The white window below lists faults that occurred and then disappeared. When a fault disappears, the device returns to normal operation thanks to the **autoreset** function. However, this function resumes operation a maximum of 5 times. If a fault occurs more than 5 times, it is likely a more serious problem that needs to be eliminated. You can use the `Autoreset` button to reactivate or deactivate this function.

Figure 4.5: Overview section ⟶ More.. ⟶ Error status

> **!** Stored operating data must never be deleted or modified. The data record is used to analyse the operation and faults of the device. Damage or deletion of the records may affect the validity of warranty claims.

4.2.1 Meaning of graphic symbols and text abbreviations

Heat pump operation – the heat pump is used for heating / cooling / DHW heating.

Secondary source operation – the secondary source is used for heating, the heat pump is used for DHW heating

Defrosting – the outdoor unit (exchanger) is defrosting, heating / cooling / DHW heating is interrupted

Outdoor air temperature too low – the outdoor temperature is lower than the permissible operating temperature, the bivalent source (integrated electric boiler) is completely used for heating and DHW heating

Economical operation – the icon is displayed if the output water temperature is lower than 45°C and the outdoor unit power is lower than 50%

DHW heating is blocked by the time schedule – in the DHW → DHW heating time schedule section, DHW heating is not enabled for this time

Antilegionella – the DHW tank is electrically heated to eliminate Legionella (disinfection of the hot water tank by a temperature of 60°C)

Protection of the outdoor unit exchanger from damage – in case of frost protection or low water flow through the indoor unit, the outdoor unit is shut down for 10 minutes.

Activated limitation of the cooling water temperature when it is approaching the dew point.

Activated silent mode.

Attenuation – Attenuation is active, the parameters can be set in the `Building` → `Attenuation time schedule` section

High tariff – device operation is blocked due to a high energy tariff

DHW heating – the DHW tank is being heated by the heat pump

DHW el. heating – the DHW tank is being heated by the electric heater

Drying – activated floor drying mode

Pool heating – the pool circuit is being heated by the heat pump

Bival 1st st. 2nd st. – the bivalent source (integrated electric boiler) is running (1st st. – first stage (2 kW); 2nd st. – second stage (4 kW))

Outd.T – outdoor air temperature

Output – output (heating) water temperature

Weather compensation – temperature calculated by the weather compensation curve for the main circuit

Circulation – circulating pump power percentage

Building – air temperature in the reference room of the building

IQ cor. – correction value applied to the weather compensation curve

2nd circuit – opening value of the secondary circuit mixing valve

W.com. 2 – temperature calculated by the weather compensation curve for the secondary circuit

Outp. 2 – temperature of the output (heating) water for the secondary circuit

Outdoor temperature – outdoor air temperature

Comp. – current compressor speed

Vent. – current fan speed

Hours in use – number of operating hours of the device

Water flow – current water flow in the indoor unit

Current power – current heat output supplied by the heat pump

Suppl. power – total heat output supplied from the last energy reset

Circul. power – circulating pump power percentage

Water press. – current water pressure in the heating system

Out./In. – temperature of the output (heating) water / temperature of the return water

The meaning of error codes is described in a separate chapter 7 – Faults and status messages (page 38).

4.2.2 Simplified setting of the weather compensation curve – SIMPLE NEO

Pressing the house icon on the `Overview` screen (Fig. 4.2 page 16) displays simplified setting of the weather compensation curve – SIMPLE NEO (Fig. 4.6 page 21). In simplified setting of the weather compensation curve (**SIMPLE NEO**), you can find:

H/C is used to switch heating/cooling on or off like on the previous screen.

More.. is used for initial selection of the weather compensation curve according to the energy class of the building. Just press the coloured label in the right column and the weather compensation curve will automatically readjust (Fig. 4.7)

+ and - is used to increase/decrease the desired temperature of heating/cooling water by a maximum of 9 °C from the default temperature

Back.. is used to return to the **Overview**

Menu is used to return to the default screen

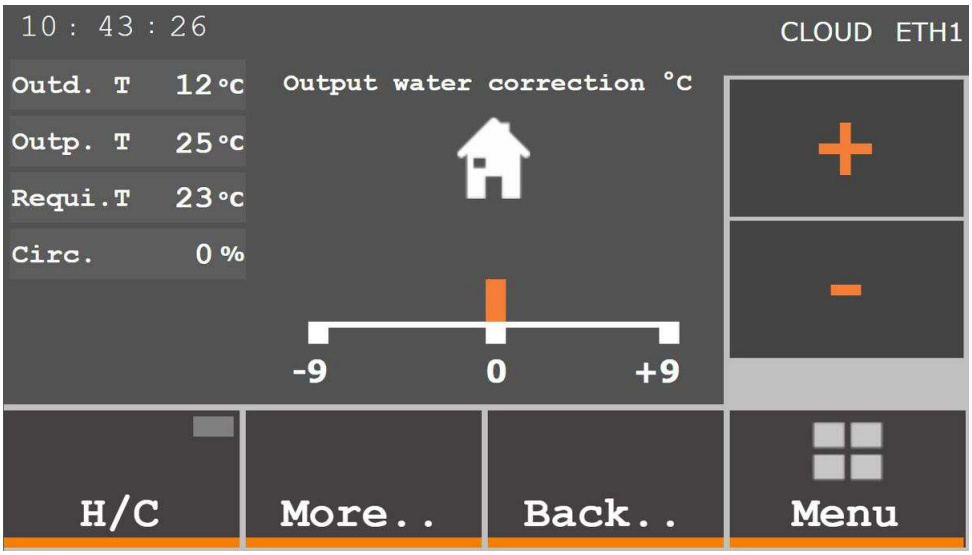

Figure 4.6: Overview section ➞ SIMPLE NEO

During first start, choose the energy class of the building under the `More..` button, which will automatically adjust the weather compensation curve (Fig. 4.7 page 21). You can then fine-tune the weather compensation curve according to the situation by pressing `Plus` or `Minus` on the previous screen (Fig. 4.6 page 21).

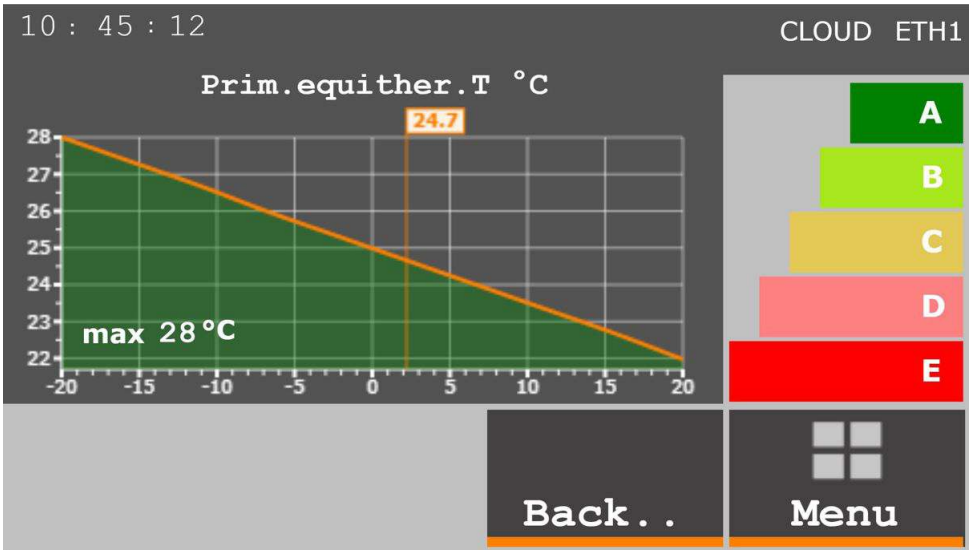

Figure 4.7: Overview section ➞ SIMPLE NEO ➞ More..

4.3 Object

The right part of the screen (Fig. 4.8 Fig. 22) is reserved for navigation. You can use the `up arrow`, `down arrow` and `Menu` buttons to scroll through the section windows. Next to the arrows is a slide that indicates which screen of the section is currently displayed. This method of navigation is common to all sections.

Activating `Follow energy tariff (heat/cool)` will cause the heating/cooling of the building to start only at low tariff times. To use this item, you have to have two-tariff electricity measurement and the signal wire from the DSM must be connected to the blue XNS terminal in the indoor unit.

`Block only bivalent` is tied to `Follow energy tariff (heat/cool)`. If activated, tariff monitoring will only be applied to bivalent source switching, not to the operation of the heat pump itself.

`Mode - heating/cooling` switches the heat pump operation mode. If the selector is red, the heating mode is selected. A blue selector indicates the cooling mode.

If information about the temperature inside the building should be used to control the building temperature, first install an indoor temperature sensor and then activate `Uses a building sensor`.

If an indoor temperature sensor is used and activated, you can click on the values of `Required building T °C` to set the desired building temperature.

Similarly, by clicking on the value of `Req. T cooling water °C`, you can set the desired cooling water temperature.

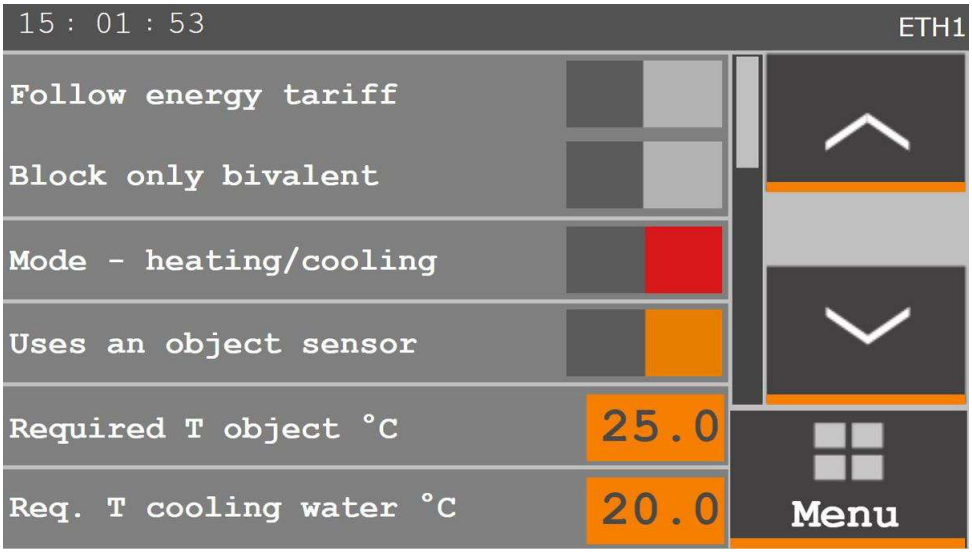

Figure 4.8: Building section – screen 1

The first item of the second screen (Fig. 4.9 page 23) is `Output water correction °C`. The set value is directly applied to the calculated output water value. It is therefore increased or decreased by this value. The correction is used for quick and short-term adjustment of the output water temperature in the event of sudden temperature fluctuations in the building due to, for example, a high concentration of people, solar gains or strong wind. For long-term adjustment of the heating water temperature, change the values of the weather compensation curve, according to which the heating water temperature is calculated.

The `IQ correction gain (x)` is available only if an indoor temperature sensor is connected. The set value of the coefficient expresses the permitted rate of automatic changes of the heating water temperature.

The `IQ correction °C` item displays the current calculated and applied value of correction for the output heating water. The correction value is determined according to the following formula:

IQ correction = - ((current building T - required building T) x IQ correction gain) + T calculated by the eq. curve

I.e. if the building temperature is 22.8°C, the required building temperature is 22°C, the IQ correction gain is 2 and the output water temperature calculated according to the weather compensation curve is 23°C, the actual temperature of the output water after an IQ correction change will be: - ((22.8 - 22) x 2) + 23 = - (0.8 x 2) + 23 = - 1.6 + 23 = 21.4°C

The permitted change value (value of the set coefficient) is related to speed of reaction to temperature changes. A higher coefficient means faster reactions, but too high a value can cause unpleasant temperature fluctuations.

`Prim.w.comp.T °C` shows the current calculated output water temperature. Click the orange square to move to the next screen, where you can adjust the weather compensation curve.

`Sec.w.comp.T °C`, just like the previous item, displays the temperature calculated using the weather compensation curve for the secondary circuit (if connected) and pressing the orange square displays its setting.

`Attenuation time schedule` allows you to display the attenuation table screen.

The weather compensation curve describes the building and for each building it must be correctly set.

The weather compensation curve says what temperature the heating water must have in order to keep the building temperature constant during changes in the outdoor temperature. At a higher outdoor temperature, a lower heating water temperature is sufficient to maintain the same temperature in the building. This leads to significant savings in conjunction with a heat pump, which loses efficiency with increasing heating water temperature. **Weather compensation**, when correctly set, also provides thermal comfort in habitable rooms in the form of a stable temperature without fluctuations.

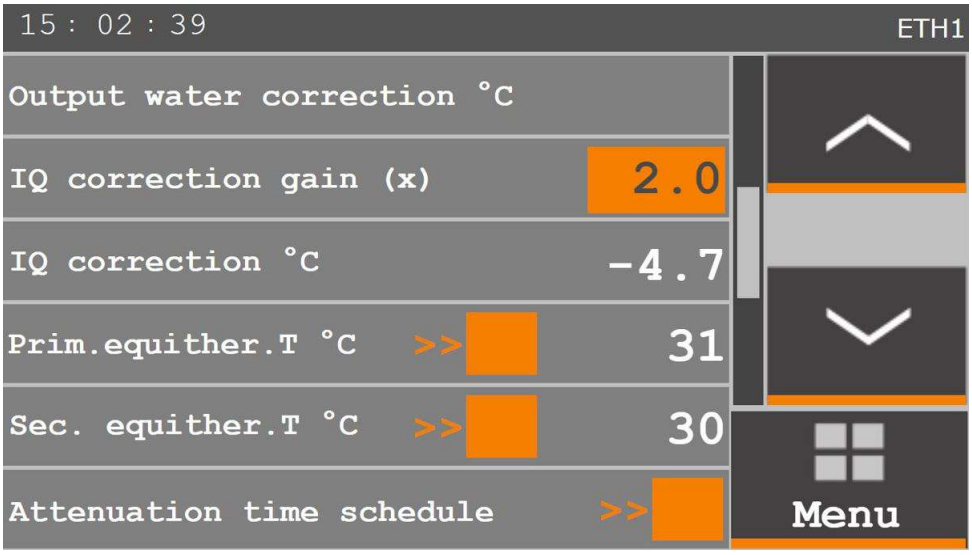

Figure 4.9: Building section – screen 2

The weather compensation curve setting screen (Fig. 4.10 page 24) is identical for the primary weather compensation curve and the secondary circuit curve.

The `Primary weather comp. curve °C` item shows the current calculated output water temperature.

The following four items `Weather comp.T for` are used to set the individual points of the weather compensation curve. The curve is set using four key points, which are indicated in the graph in (Fig. 4.11 page 24). These points are individual for each building, but the default settings can be made according to the following table. To enter individual values, press the orange rectangle, enter a number and confirm it using `Enter`.

Weather compensation curve setting		
Outdoor temperature	Heating water temperature for:	
	Floor heating	Radiators
19°C	22°C	25°C
6°C	28°C	40°C
−7°C	33°C	45°C
−20°C	38°C	50°C

Table 4.1: Weather compensation curve setting

The weather compensation curve must then be adjusted to match the nature of the heated building. For this tuning, use `Automatic correction +/- 3°C`. Entering the correction value adjusts the output water temperature in the weather compensation curve according to the current outdoor temperature. The maximum value of automatic correction that can be applied in one step is ±3°C. After the adjustment, it takes at least 3 hours for the change to affect the indoor temperature. After this period, you can make further adjustments.

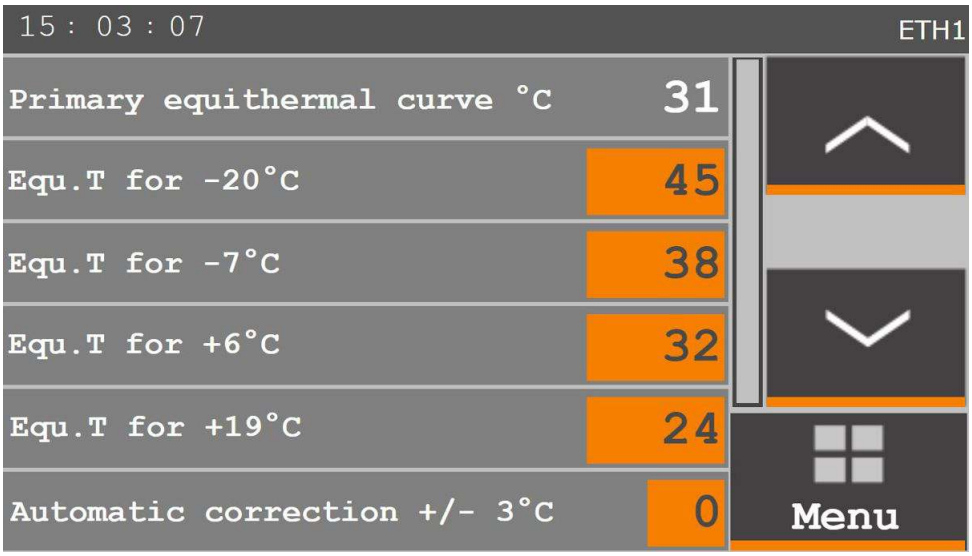

Figure 4.10: Building section – screen 2 ➞ Primary weather comp. curve °C

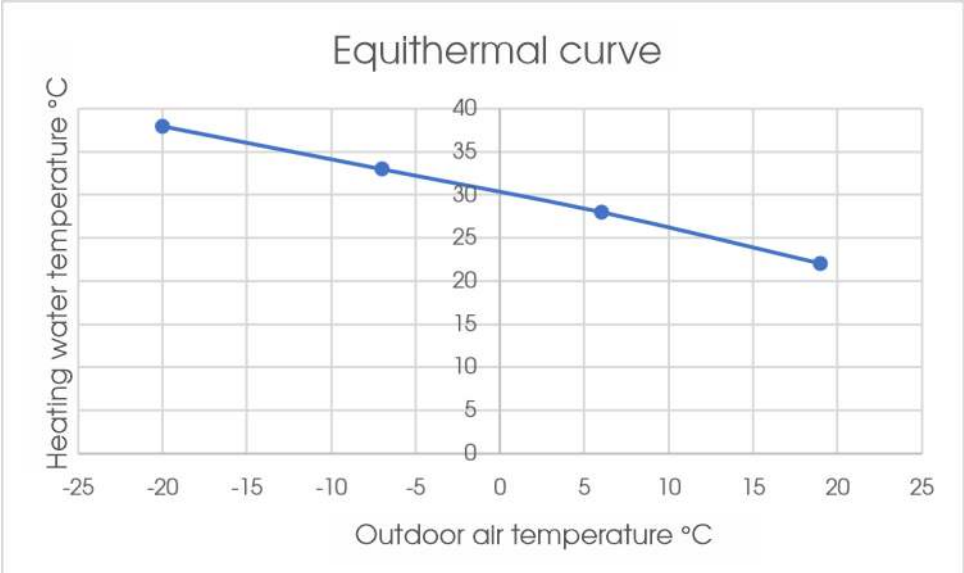

Figure 4.11: Graph – Weather compensation curve

`Attenuation time schedule` allows you to set a decrease of the heating water output temperature. In the settings (Fig. 4.12 page 25), there are two time slots available for each day of the week. Click on the orange rectangles to set the desired times. The heating water temperature will not be affected in the selected time slots. Outside these time slots, attenuation is active and the heating water temperature is reduced by the value set in the last window of attenuation time schedule settings. Attenuation values (decrease of the heating water temperature) are set for the primary circuit and the secondary circuit separately. If the device is currently in the middle of an active attenuation time slot, this is indicated on the overview screen.

Figure 4.12: Building section – screen 2 ➞ Attenuation time schedule

`Dew Point Sensors` in the Building section on screen 3 (Fig. 4.13 page 25) can be pressed to enter a detailed overview of data from dew point sensors. Press the item to display available data from the dew point sensor (Fig. 4.14 page 26). The screen shows the relative humidity, air temperature and dew point. It contains values from all connected sensors. Up to 4 dew point sensors can be connected.

The dew point sensor must first be professionally connected and then activated using service settings. The sensor must be installed and activated by a qualified installation company.

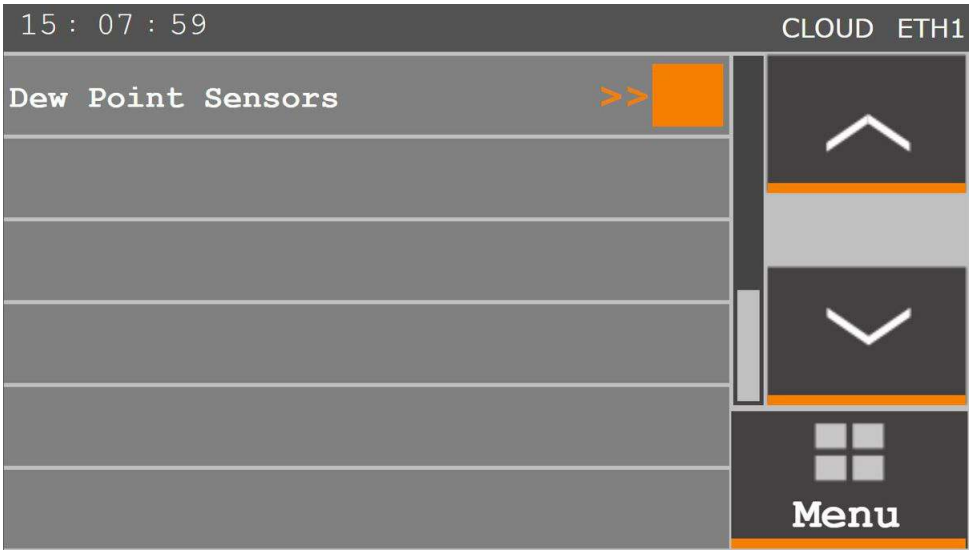

Figure 4.13: Building section – screen 3

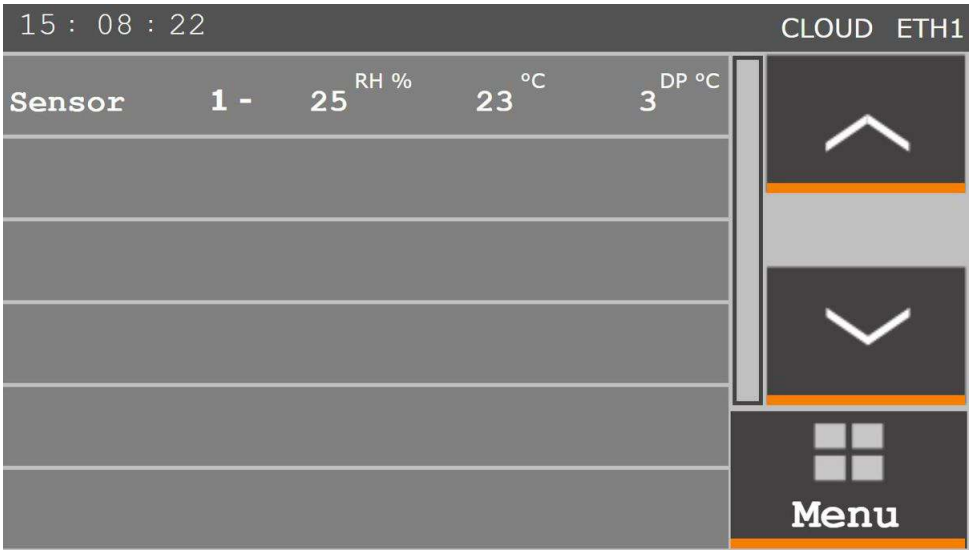

Figure 4.14: Building section – screen 3 ➞ Dew point sensors

4.4 DHW

The first item in the DHW section (Fig. 4.15 page 26) is Required DHW temperature °C, which shows and allows the adjustment of the desired temperature of the hot water in the tank.

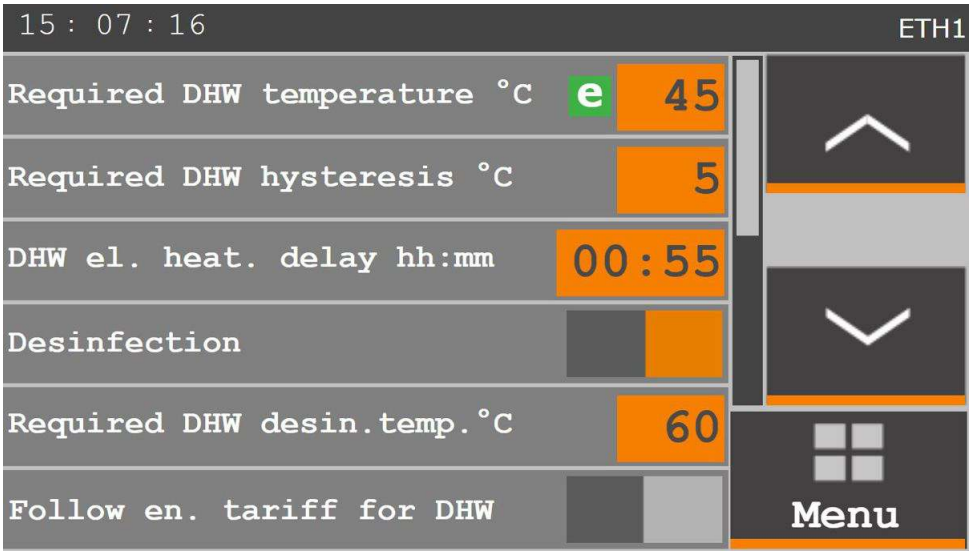

Figure 4.15: DHW section – screen 1

`Required DHW hysteresis °C` allows you to set the hysteresis (decrease from the requirement) of the temperature of the hot water in the tank. I.e. if the required water temperature in the DHW tank is 45°C and the DHW hysteresis value is 5°C, DHW heating will be activated when the tank temperature drops to 45 - 5 = 40°C.

`DHW el. heat. delay hh:mm` allows you to set the time after which hot water will be heated purely electrically. Electric heating will be activated only if the hot water tank does not reach the desired temperature in the set time. When hot water is heated by the electric heater, the heat pump operates normally and heats hot water in the heating system.

If `Disinfection` is active (orange), it means that the electric heating of hot water in the tank is switched on regularly once a week on Friday from midnight and switched off when the temperature set in `Required DHW disin. temp. °C` is reached. This temperature must be set to at least 60°C. If this temperature is not reached even after eight hours of electric heating, the disinfection program is terminated.

If `Follow en. tariff for DHW` is active, hot water heating is only possible at times of low electricity tariff.

On the second screen of the `DHW` section (Fig. 4.16 page 27), you can activate DHW circulation. This activates hot water circulation in the piping, which is controlled by the time schedule.

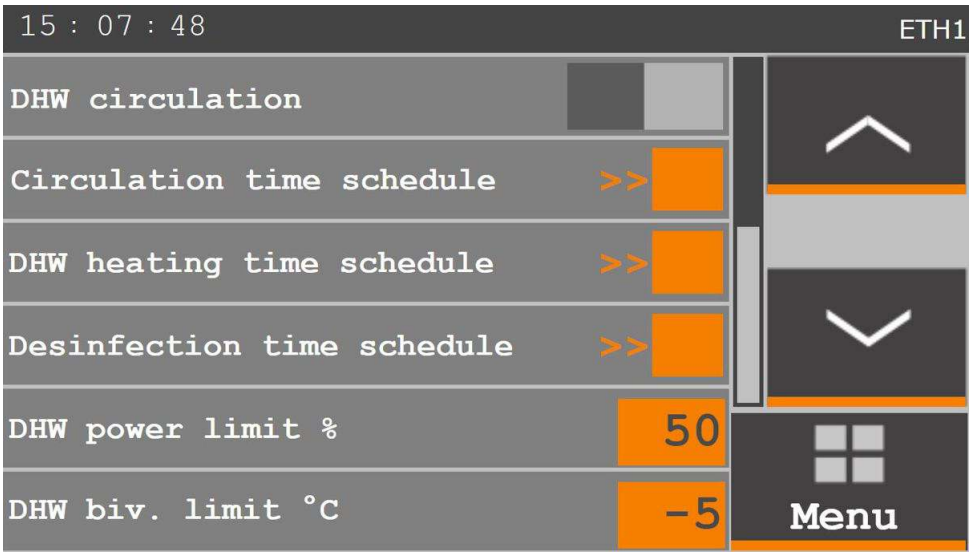

Figure 4.16: DHW section – screen 2

`Circulation time schedule` allows you to set two time periods for each day of the week when water will circulate in the piping.

`DHW heating time schedule` allows you to set one time period for each day of the week when hot water in the tank is heated.

`Disinfection time schedule` allows you to set one time period for each day of the week when the hot water tank is disinfected.

`DHW power limit %` allows you to set the power of the heat pump to heat hot water in the DHW tank.

`DHW biv. limit °C` allows you to set the outdoor temperature below which hot water is heated only by the electric heater. This measure affects the life of the outdoor unit, as heating the water to a high temperature at a low outdoor temperature puts an unnecessary strain on it.

To use DHW circulation, hot water distribution systems must be specially prepared.

Appropriate setting of the time schedules of hot water circulation and DHW heating can cause significant savings if hot water is only needed in the building at certain times. For example, hot water is not required at all in the morning, evening or some days.

The power limit for DHW heating must be set in accordance with the properties of the heat exchanger in the hot water tank. If the DHW heating power is higher than the power that the heat exchanger can transfer to the DHW tank, it may cause the outdoor unit to cycle and reduce its service life.

4.5 Graphs

The Graphs section (Fig. 4.17 page 28) consists of 5 screens, between which you can switch using the navigation keys. Individual screens show clear records from the last ten hours of heat pump operation. Individual graphs plot the courses of `output water temperature`, `required power`, `outdoor air temperature`, `DHW temperature` and `building indoor tempe` All operating data is then stored in memory and accessible via a web browser.

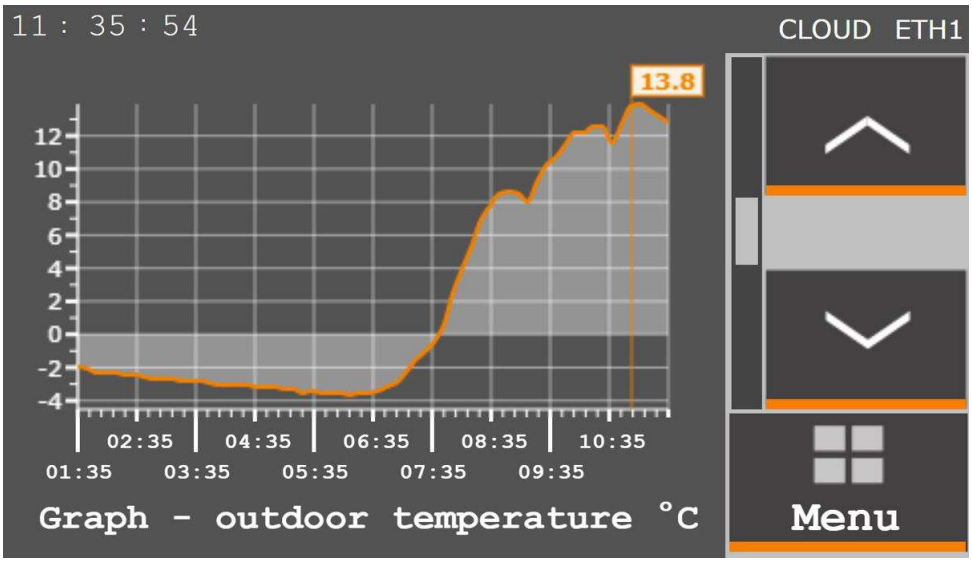

Figure 4.17: Graphs section – screen 2

4.6 Settings

The Settings section (Fig. 4.18 page 29) is used for general setting of heat pump parameters or special settings in the Service Access section.

“Current limit 1st phase” is intended primarily for devices with a single-phase outdoor unit (information about the outdoor unit is given in Chapter 2.5 – Table of power parameters (page 8). Activating this item limits the current flowing through the first phase in such a way that the first phase of the supply (terminal X1:L1) is not used during the operation of the bivalent source (integrated electric boiler).

Using the “Secondary circuit” item, you can activate operation with a second heating circuit (mixing valve control). This operation requires appropriate connection between the heating circuits, a mixing valve and a temperature sensor of the secondary circuit.

“Outdoor unit max power %” allows you to set the limit of the outdoor unit’s maximum power. Due to lower wear and longer service life, a setting of 100 % is not recommended.

“Only during attenuation” is related to the outdoor unit’s maximum power setting. If activated, maximum power limitation will only be applied when the attenuation mode is active. Outside attenuation, the outdoor unit’s maximum power is fixed at 100 %.

“Bivalent operation °C” determines the outdoor air temperature at which the outdoor unit stops operating and heating is fully provided by the bivalent source (integrated electric boiler). Outdoor unit operation at very low temperatures is no longer effective.

“Cooling water °C” is intended primarily for heating/cooling ceilings. If the heat pump is switched to cooling mode (Building ➞ Heating/cooling mode), this item sets the temperature of the cooling water for building cooling.

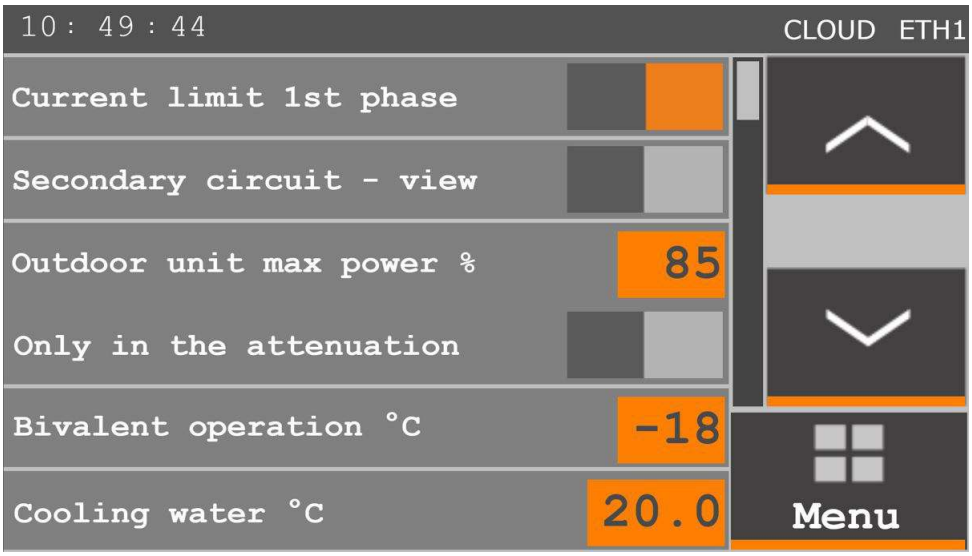

Figure 4.18: Settings section – screen 1

On the second screen of the settings section (Fig. 4.19 page 30), the first item `Date / time` can be used to set the date and time of the device. This is important for the correct operation of time programs.

`Webserver - name` sets the login name for accessing the heat pump via a web browser by entering the IP address in the address bar of the browser (the device from which the heat pump is accessed must be connected to the same Ethernet network as the heat pump).

`Webserver - pass.` sets the login password for accessing the heat pump via a web browser.

`Saved data` allows you to view the complete history of recorded information about the heat pump operation (data is only available when accessed via a web browser).

`Network settings` allows you to set network addresses, reports and remote access (Fig. 4.20 page 30, Fig. 4.21 page 31 and Fig. 4.22 page 31).

`Language setting` allows you to set the default language of the device (Fig. 4.25 page 33).

`Silent mode` allows you to activate/deactivate the silent mode.

`Only during attenuation` enables the silent mode only during the attenuation time.

At the bottom of the screen, **Service access** can be used to log into the service settings section. The last page of the `Settings` section contains `Logout`, which can be used to log out of the service section.

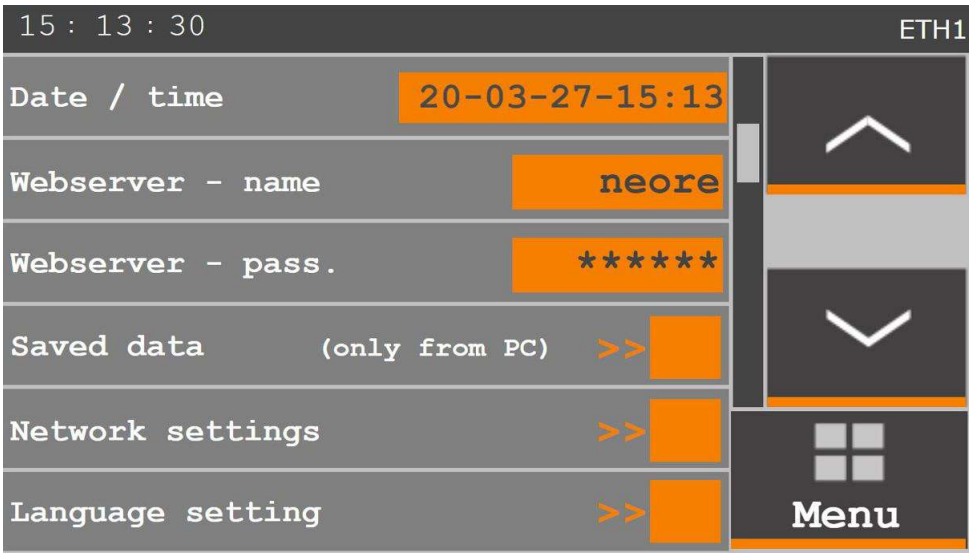

Figure 4.19: Settings section – screen 2

The first four items of the `Network settings` screen (Fig. 4.20 page 30) can be used to set a static IP address, mask, gateway and DNS for connection to an Ethernet network. If these settings are changed, they must be saved using `Use new network settings`.

If a DHCP server is active in the Ethernet network, you can automatically set network connection by activating `DHCP client`. Once activated, the device automatically connects to the network.

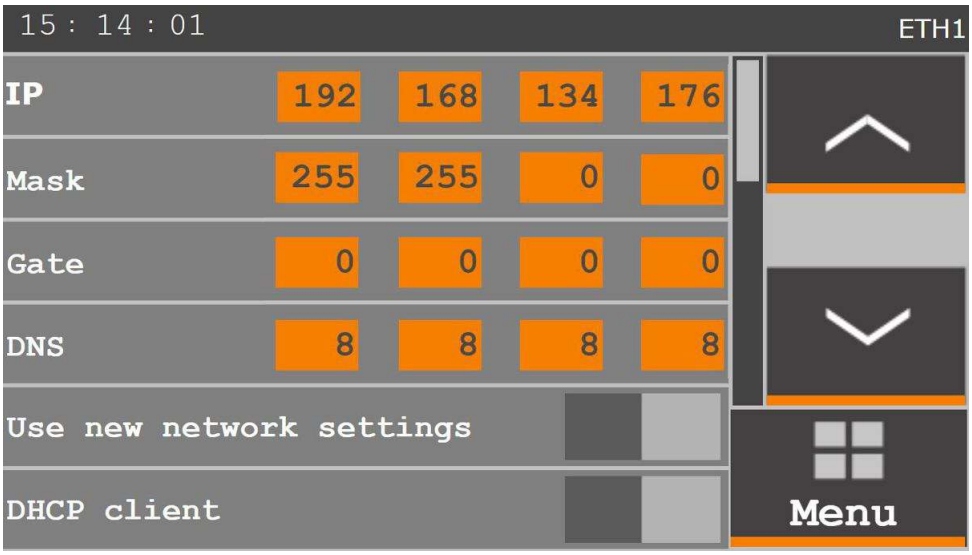

Figure 4.20: Settings section – screen 2 ➞ Network settings 1

The second screen (Fig. 4.21 page 31) contains settings for `Neota Route (cloud)`. This service is described in more detail in Chapter 4.9 - Neota Route (cloud) (page 35).

The first item `NR server` sets the address of the Neota Route server.
`User name NR` can be used to enter the user name for logging in Neota Route. The user name is pre-set as the pump serial number.
`Password NR` can be used to enter the password for the user name. The password is pre-set, just request the activation of Neota Route via e-mail at podpora@neota.eu
`Status` displays Neota Route connection information.
`NR service (cloud)` can be used to activate Neota Route.

When changing Neota Route settings, these changes must be registered by activating `Use new settings NR`.

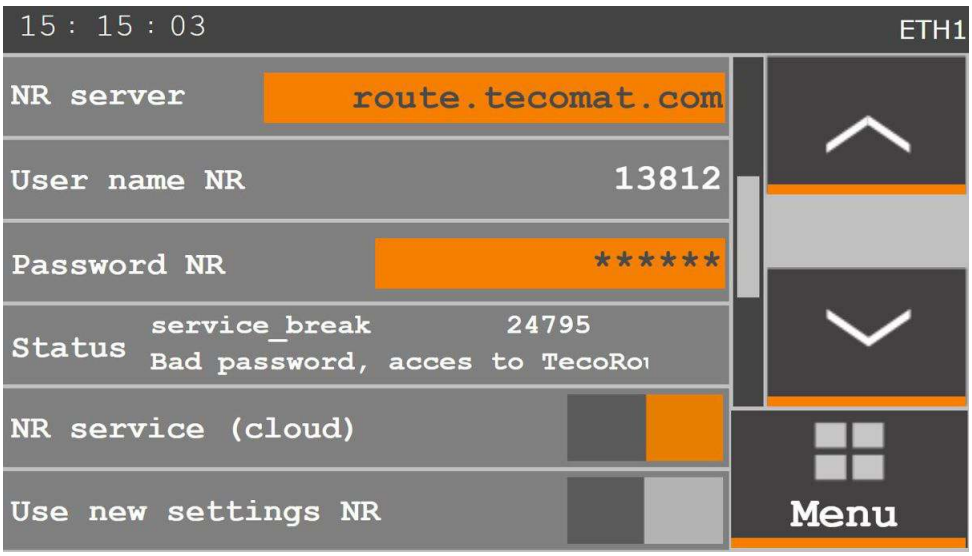

Figure 4.21: Settings section – screen 2 ➞ Network settings 2

The third screen (Fig. 4.22 page 31) contains `E-mail settings`, which can be used to set the parameters for sending error e-mails.

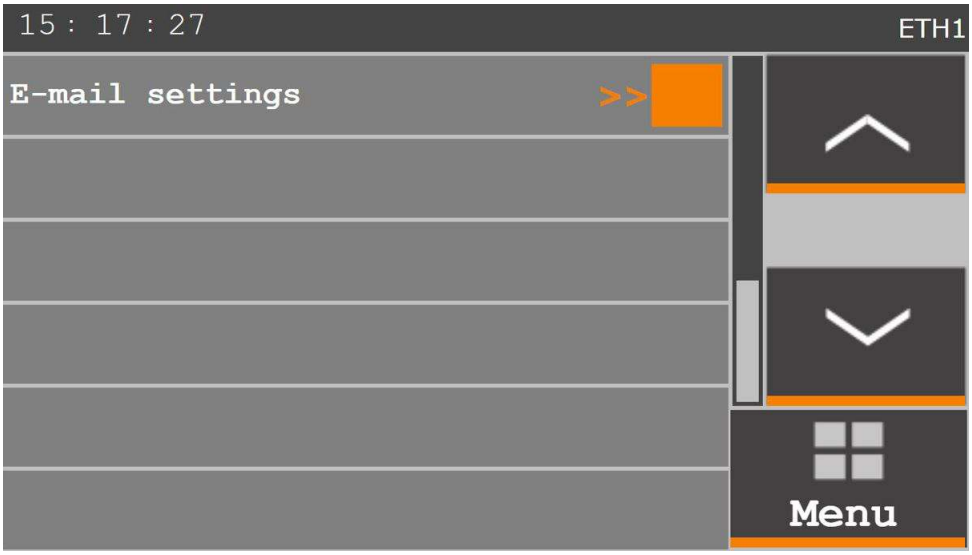

Figure 4.22: Settings section – screen 2 ➞ Network settings 3

The e-mail settings screen (Fig. 4.23 page 32) can be used to set e-mail sending.

`Send err email` can be used to activate sending of error e-mails. `Recipient` sets the e-mail address to which the error message will be sent.
`Subject` sets the subject of the error e-mail.

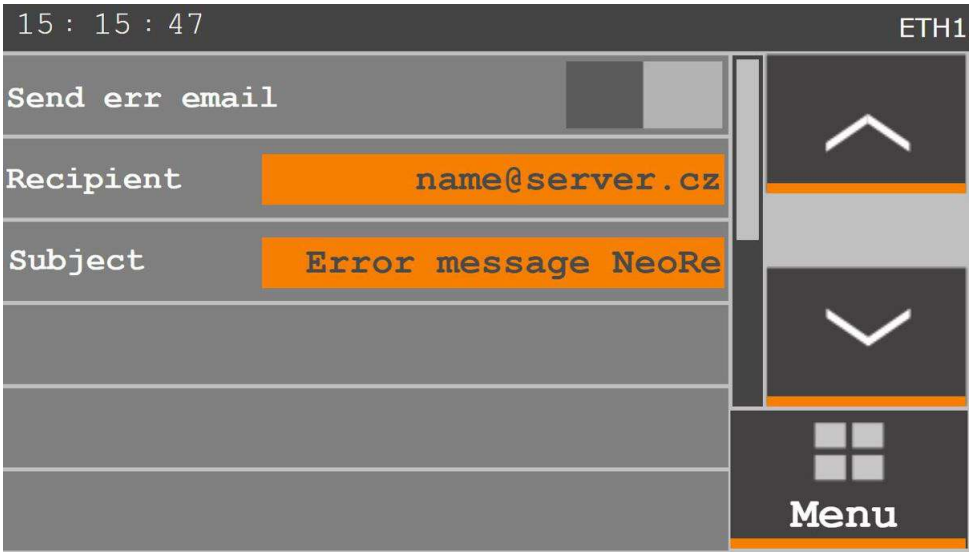

Figure 4.23: Settings section – screen 2 ➞ Network settings 1 ➞ E-mail settings

The second screen of e-mail settings shows statistics about the sent error e-mails. The first item `Send test email` can be used to send a test e-mail. (Fig. 4.24 page 32)

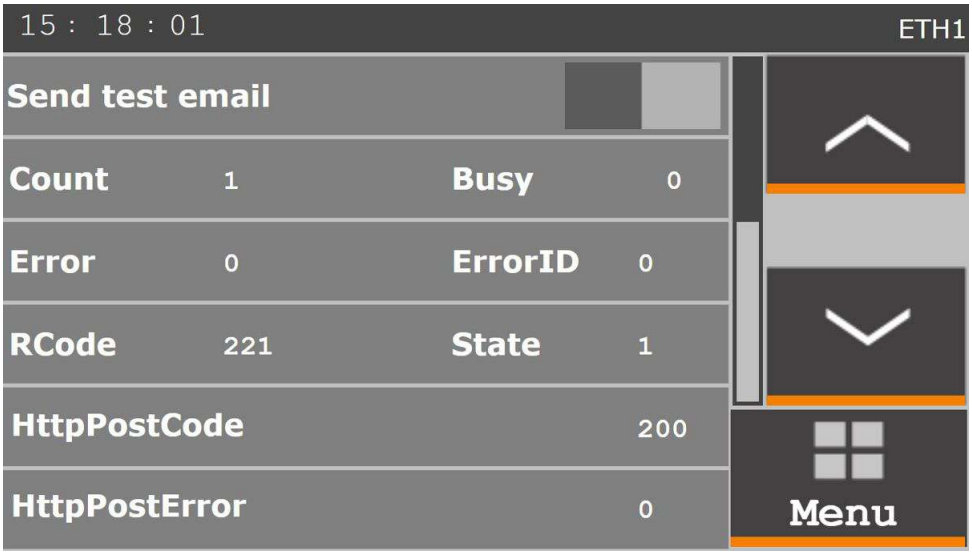

Figure 4.24: Settings section – screen 2 ➞ Network settings 3 ➞ E-mail statistics

The language settings screen (Fig. 4.25 page 33) offers several languages for the user interface. Press a language to select it.

The silent mode screen (Fig. 4.26 page 33) can be used to activate the silent mode, which limits the fan and compressor speed so that the maximum noise of the outdoor unit is decreased by 5 dB.

`Silent mode` allows you to activate/deactivate the silent mode.
`Only during attenuation` enables the silent mode only during the attenuation time. The attenuation time can be set on the Building screen – `Attenuation time schedule` (Fig. 4.9 page 23).

4.7 More

The `More..` section (Fig. 4.27 page 34) contains the settings of other technical options available to the device.

`Secondary source` must be active if there is another heat source in the heating system. The secondary source must be connected through the storage tank and therefore the item can only be activated after connecting the storage tank temperature sensor.

Figure 4.25: Settings section – screen 2 ➞ Language settings

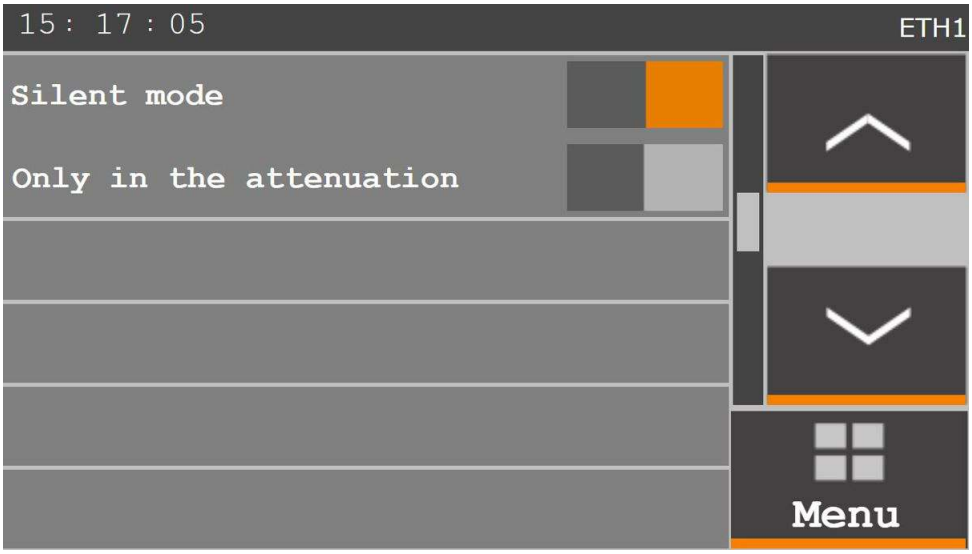

Figure 4.26: Settings section – screen 3 ➞ Silent mode

`Second. source tank temp °C` displays the current temperature in the secondary source storage tank.
`Second. source hyster. °C` sets the limit temperature for using the secondary source. If the temperature in the storage tank is higher than the set limit, the secondary source is used for heating. If, on the other hand, the temperature is lower than the set limit, the heat pump is used for heating.
`Pool` can be activated after connecting a pool temperature sensor. The pool will then be heated.
`Pool temperature °C` shows the current temperature of the pool.
`Required pool temp. °C` sets the desired temperature to which the pool is to be heated.

The first item of the second screen of the `More..` section (Fig. 4.28 page 34) is `Req. pool hysteresis °C`, which sets the pool temperature hysteresis. It therefore sets the temperature value by which the pool water temperature can decrease before heating is reactivated.
`T pool heating water` sets the value of temperature by which the pool water will be heated. A higher value means the desired temperature will be reached faster, but too high a temperature will reduce the efficiency of the heat pump.
`Pool heating time schedule` can be used to set the time intervals in which the pool is to be heated. You can set one time period for each day.
`2nd circ. for pool` must be set if you wish to use the secondary source to heat the pool water. Therefore, if there is a storage tank in the system, water for pool heating is mixed using the mixing valve for the secondary circuit to which the pool is connected.

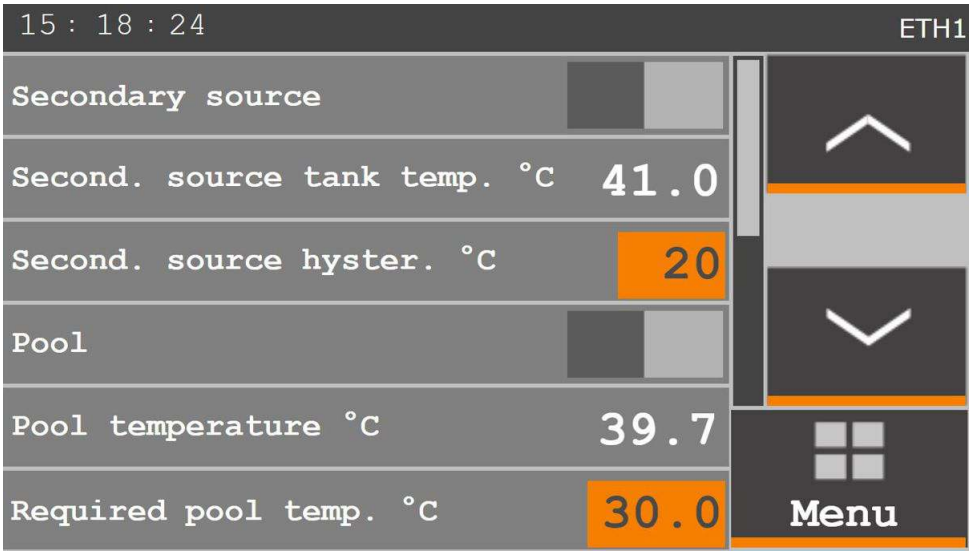

Figure 4.27: More section – screen 1

If the time period for pool heating is too short, the power might not be sufficient to achieve the desired temperature.

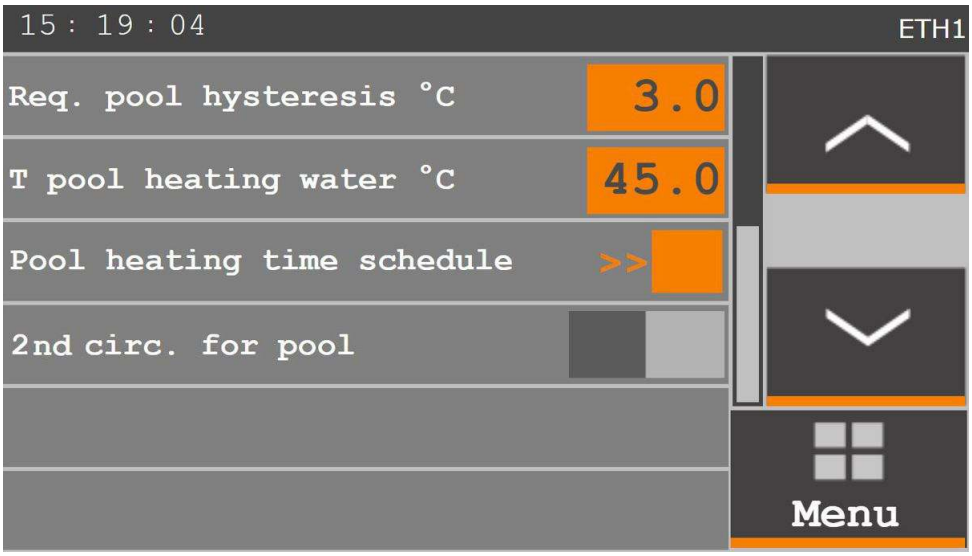

Figure 4.28: More section – screen 2

4.8 Web server operation

Operation of the heat pump via a web server is the same as control via the controller panel. To connect to the heat pump web server, the heat pump controller must be connected to the Ethernet network and configured correctly. You can then access the web interface from a computer web browser that supports the XML standard
(e.g. Firefox), by entering its IP address in the browser's address bar. This computer must be in the same physical Ethernet network as the heat pump. If you wish to control the heat pump from an external internet network, contact your internet service provider.

- The default IP address of the heat pump is `192.168.134.176`
- The user name is "neore" and the password is "neore"

This address and other settings can be changed in the `Settings` section in the heat pump controller.

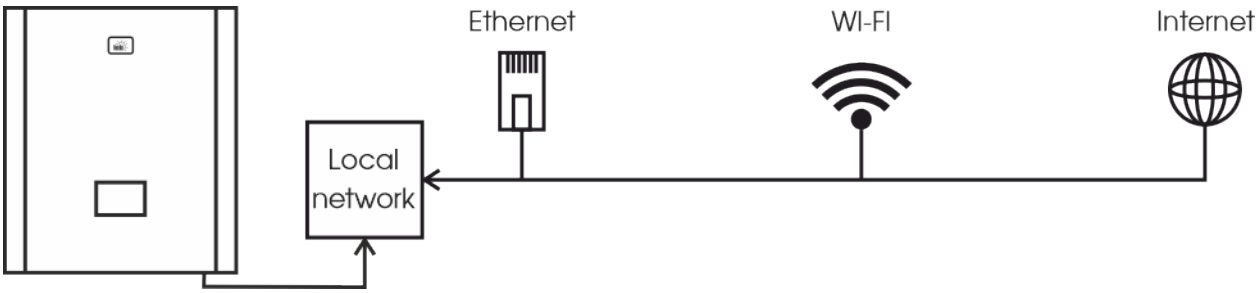

Figure 4.29: NeoRé heat pump connection options

4.9 Neota Route (cloud)

Neota Route is a service for NeoRé heat pumps, which provides user access to a web server over the internet without the need for a public IP address and accurate router mapping (as is the case for operating a web server over the internet). It is enough if the heat pump has access to the internet, just like any other computer in the household. You can then access the heat pump via a web browser of any device (computer, mobile phone). In addition, if Neota Route is active, the heat pump can be remotely accessed by a service organization, which can then eliminate some problems without being physically present or analyze failures and reduce the time and cost of any repairs.

To connect the heat pump to Neota Route, contact your heat pump supplier or request an account via the form at www.neota.cz or e-mail at support@neota.cz. Neota Route is a paid service. After paying the one-time fee, you will receive login details, which must be entered into the heat pump system in the web server section (Settings → Network settings).

For the Neota Route service to be available, the router through which the heat pump is connected to the internet must have outgoing TCP port 8080 enabled.

4.10 Local network connection

To connect the heat pump to a local network, it must be connected to the Ethernet network using a cable. The connector is located at the bottom of the control board. After connecting the cable, make sure the network settings in the heat pump are correct. This can be done in two ways. If a DHCP server is active in the local network, just activate `DHCP client` (Fig. 4.20 page 30). The local network will then be set automatically.
The second method is to set the network parameters manually in the Network settings section – screen 2 → Network settings 1 (Fig. 4.20 page 30). This method requires at least basic knowledge of computer networks.
Then follow the instructions in the “Web server operation” chapter 4.8 page 34.

You can find out the IP address of the heat pump in “Network settings” – screen 2 → “Network settings 1”, using a network scanner in your router or using an application (e.g. Network Scanner), where the heat pump will be shown as a TECO device.

A technician can find out the IP address by pressing and holding a button on the control board. The small display shows the current IP address one digit at a time.

5. Commissioning

5.1 Commissioning of the heating system

Before starting the circulating pump, the circuit must be filled with water. Water should be filled to a basic pressure of 1–1.5 bar. From a water column height of 14 m, the basic pressure increases by 0.1 bar per metre of height. The maximum water column height is 18 m. The maximum operating pressure is 2.1 bar. After increasing the pressure, the circuit must be completely vented. Venting of the indoor unit can be performed on the upper right side of the plate exchanger. After starting the circulating pump, the plate exchanger must be completely vented, which is indicated by smooth running of the circulating pump. Before starting the compressor, it is recommended to let the circulating pump run for at least 10 min.

For more information, see the **Installation Manual**, Chapter **Connection of the heat pump to the heating system**.

5.2 Activation

After filling and venting, you can test the electrical equipment of the heat pump.

Switch on the TECHNOLOGY circuit breaker and, after the controller system initializes, press the H/C button in the "Overview" section. This activates the circulating pump. Check the state of the hydraulic system. If the flow and pressure are OK, you can switch on the remaining circuit breakers. Check the settings and check the operation of all heat pump devices, especially the outdoor unit (for DHW heating settings, see the DHW chapter in the User Manual).

- BIVALENT – bivalent source circuit breakers
- OUTDOOR UNIT – outdoor unit circuit breakers
- TECHNOLOGY – circuit breaker of the indoor unit (control, 3-way valve, circ. pump...)
- DHW EL. HEATER – circuit breaker of DHW heating

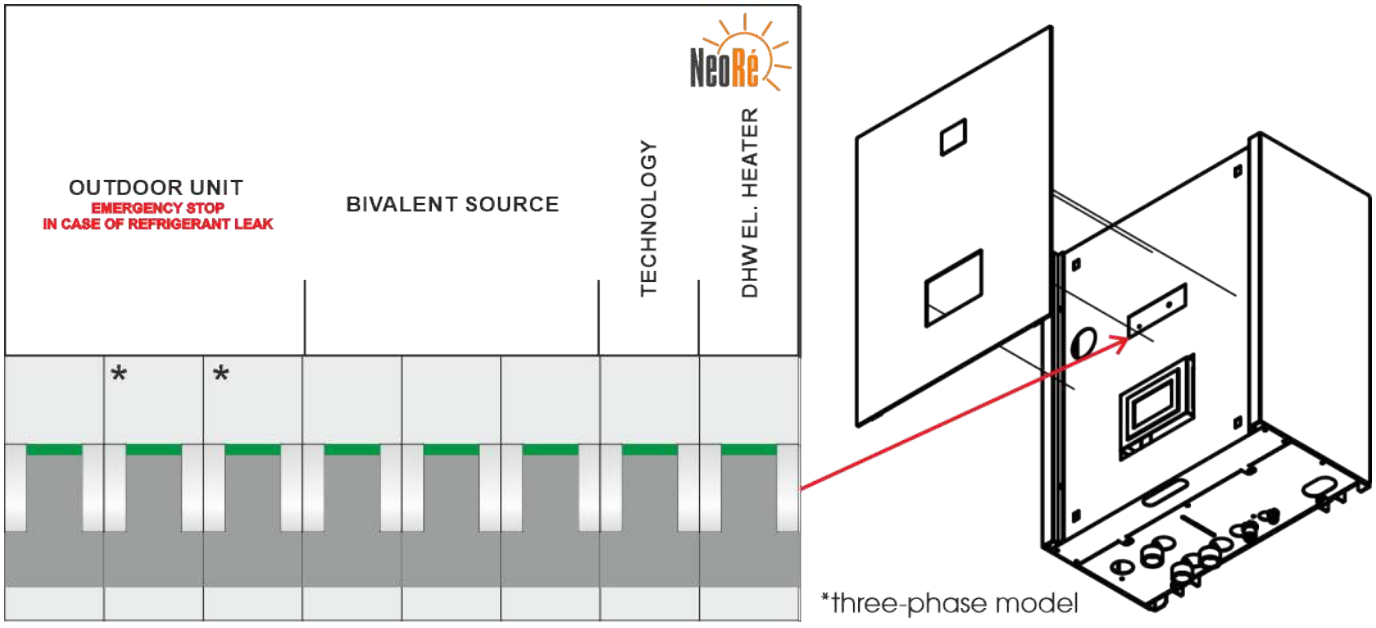

Figure 5.1: Circuit breakers of the heat pump

6. Shutdown

Attention! When shutting down the system completely, the heating system and the heat pump can be damaged or completely destroyed in winter due to freezing.

6.1 Short-term shutdown

If you need to turn off the heat pump briefly, press `H/C` and/or `DHW` so that the orange indicator in the upper right corner of the button turns grey. Do not turn off the heat pump using the circuit breaker! The circulating pump turns off 15 minutes after the operation is switched off. To reactivate, use again `H/C` (`DHW`)

6.2 Long-term shutdown

If you need to turn off the heat pump for a long time, press `H/C` and/or `DHW` so that the orange indicator in the upper right corner of the buttons turns grey. Do not turn off the heat pump immediately using the circuit breaker! The circulating pump turns off 15 minutes after deactivation. You can then switch off all circuit breakers. When shutting down the system for more than 6 months, you must switch on the TECHNOLOGY circuit breaker after this time and leave it on for at least 24 hours. Otherwise, the backup battery may be depleted and all user settings may be lost. When shutting down the system e.g. from spring to autumn, we recommend using the method described in Chapter 5.1 – Short-term shutdown (page 30). The heat pump consumes only 13 W of energy and the circulating pump regularly flushes the heating system. This reduces clogging and the possibility of the circulating pump being jammed.

7. Faults and status messages

7.1 Error code structure

A fault code consists of four digits. **The first two digits** indicate critical errors. These are faults that cause the heat pump to stop running. **The other two digits** indicate the status of the connected temperature sensors. Faults of temperature sensors do not affect the operation of the heat pump. However, the lack of information may decrease the quality of control and impair thermal comfort inside the building.

Figure 7.1: Division of heat pump faults and states

7.2 Overview of faults and status messages

The following section describes what values the fault codes can have and what these values mean. When reading the code, we proceed from left to right. The order of the digits determines their meaning.

1st digit

0 - No fault

1 - Frost protection (the output water temperature dropped below the safe level)

2 - Insufficient flow (the water flow through the heat pump dropped below the minimum level)

3 - Fault of the outdoor unit or communication

4 - Low water pressure (the water pressure in the system is lower than 0.8 bar)

5 - Faulty temperature sensor of the MX communication unit

If the value of the first digit is not 0, the heat pump stops running.

2nd digit

0 - No fault

1 - Faulty temperature sensor of heating (output) water – the sensor is disconnected

2 - Faulty temperature sensor of heating (output) water – the sensor is short-circuited

3 - Faulty temperature sensor of return (input) water – the sensor is disconnected

4 - Faulty temperature sensor of return (input) water – the sensor is short-circuited

If the value of the second digit is not 0, the heat pump stops running.

3rd digit

0 - No fault

1 - Faulty outdoor temperature sensor – the sensor is disconnected

2 - Faulty outdoor temperature sensor – the sensor is short-circuited

3 - Faulty building temperature sensor – the sensor is disconnected

4 - Faulty building temperature sensor – the sensor is short-circuited

5 - Faulty DHW temperature sensor – the sensor is disconnected

6 - Faulty DHW temperature sensor – the sensor is short-circuited

7 - Faulty storage tank temperature sensor – the sensor is disconnected

8 - Faulty storage tank temperature sensor – the sensor is short-circuited

If the value of the 3rd digit is not 0, some of the sensors are defective and the quality of temperature control may be reduced. However, the operation of the heat pump is uninterrupted.

4th digit

0 - No fault

1 - Faulty pool temperature sensor – the sensor is disconnected

2 - Faulty pool temperature sensor – the sensor is short-circuited

3 - Faulty secondary circuit temperature sensor – the sensor is disconnected

4 - Faulty secondary circuit temperature sensor – the sensor is short-circuited

If the value of the 4th digit is not 0, some of the sensors are defective and the quality of temperature control may be reduced. However, the operation of the heat pump is uninterrupted.

7.3 Faults and troubleshooting

If the heat pump signals any of the critical errors (any of the first two digits is not 0), it stops operating. The following text describes typical causes of these errors and how to correct them. If the application of these procedures is not successful, contact a service organization, which will take care of your problem.

During the operation of the heat pump, cooling of the heat exchanger of the outdoor unit causes it to freeze. When the evaporator is frozen, the outdoor unit automatically evaluates this state and starts the defrosting process. The frequency of defrost cycles depends on several factors, the most important of which are air temperature, humidity and required power.
During the evaporator defrosting process, the evaporator is reheated using the energy stored in the heating water and at the same time the fans start running at full speed, which dries the evaporator. During this process, you can see water vapour rising from the evaporator, which may seem like the unit is burning. However, in this case, it is not a dangerous state but a normal operating condition, so do not disconnect the outdoor unit from the power supply.

The heat pump user interface in the `States and faults` lists the last ten fault states (codes) of the heat pump. Complete operating data is accessible via the heat pump's web interface.

The controller has the `Fault autoreset` function. Thanks to this function, the heat pump can resume operation after a critical fault has been removed, e.g. a sufficient system flow restored. If the autoreset is activated 5 times, it is clear that this is not a random fault. The heat pump remains in a fault state and requires professional attention. The autoreset function can be restored in the `States and faults` section, which should only be done after consultation with a service organization.

Fault 1xxx

Frost protection. A fault occurs if the output water temperature is lower than the safe limit. The default limit for frost protection is 15 °C. When the output water temperature is lower, the heat pump stops running until the output water temperature reaches a safe level again. Meanwhile, bivalent operation is started. The heat pump starts 30 minutes after reaching a safe temperature.

This fault typically occurs when the system is started, when the system is filled with cold water from the water main.

Another typical situation where this fault occurs is the cooling of the heating water during the defrosting process of the outdoor unit. This can have two causes.

1. Low temperature of heating water (below 25 °C) in the system, where heating water does not carry enough energy to defrost the outdoor unit.
2. The second possible cause is a reduced flow of heating water through the heat pump, e.g. due to a clogged heating water filter.

If the frost protection fault occurs repeatedly, contact a service organization.

Fault 2xxx

Insufficient flow. The insufficient heating water flow fault occurs when the current water flow is lower than required. The value of the required flow directly depends on the current power of the outdoor unit, i.e. the higher the power of the outdoor unit, the higher the required value of the heating water flow. This is also the reason why the fault can occur seemingly randomly, e.g. only when heating the heat water tank, when high power and therefore high heating water flow is required.

A typical cause of a flow fault is clogging of the heating system with dirt. The second possible cause is that the heating system contains a constricted point. This point with an insufficient cross-section (e.g. control valve) affects the total flow, even if the cross-section of all other parts of the heating system is sufficient. Random and short-term faults can also be caused by aeration of the heating system or low pressure of heating water.

All these cases require the attention of a service organization, which locates and eliminates the cause of the fault.

Fault 3xxx

Fault of the outdoor unit or communication. The outdoor unit signals a fault state. If this fault occurs once, it is advisable to try to restart the entire system by switching off all heat pump circuit breakers and switching them on again. If the outdoor unit or communication fault persists after the user interface restarts, call a service organization.

Fault 4xxx

Low water pressure. If the heating system pressure is lower than 0.8 bar, the device stops operating in order to avoid damage to the circulating pump.

The usual cause is leaking heating water. There may also be damage to the expansion vessel or air leak from its bag. To remove the fault, increase the water pressure in the heating system to 1.1–1.5 bar.

If the pressure drop reoccurs, contact a service organization.

Error 4000 may also result in a clogged pressure sensor restrictor. This sensor has a millimetre hole as protection against pressure shocks of the sensor. If water contains too many free minerals, they settle on this hole and block the sensor. The hole must be cleaned and the heating water quality checked and, if necessary, improved.

Fault 5xxx

Faulty temperature sensor of the MX communication module. This fault means that the temperature sensor of the outdoor unit exchanger exhibits values outside the valid range and it is apparently faulty. For this reason, the heat pump stops running, as the loss of information about the exchanger temperature may lead to its damage.

In the event of this fault, contact a service organization.

Fault x1xx a x2xx

Faulty temperature sensor of output water. If the heating water temperature sensor fails, the heat pump stops running, because the indoor unit can be damaged due to an unknown temperature of output water.

The temperature sensor must be repaired or replaced with a new one, so contact a service organization.

Fault x3xx a x4xx

Faulty temperature sensor of return water. If the return water temperature sensor fails, the heat pump stops running, because the indoor unit can be damaged due to an unknown temperature of return water.

The temperature sensor must be repaired or replaced with a new one, so contact a service organization.

7.4 Status messages

Status messages are displayed in the same section as faults, but in the third and fourth position when reading from the left. If the code of any status message is active, it is only an informative message about the given fact. The operation of the heat pump is not interrupted. The displayed states are sorted by priority, where the number 1 has the highest priority. If state 7 is active, it means that no status with a lower numerical value is active.
Status 0 means that all available temperature sensors are connected and working correctly.

Status xx1x and xx2x

This status means that the outdoor temperature sensor is disconnected or faulty. When operating without an outdoor temperature sensor, the output water temperature is not controlled according to the set weather compensation curve, but

is heated continuously to the temperature set by the weather compensation curve for an outdoor temperature of +19 °C. To correct this, contact a service organization.

Status xx3x and xx4x

This status means that the indoor temperature sensor is disconnected or faulty. The indoor temperature sensor is not a standard part of the heat pump installation and it is therefore possible that this status will be displayed permanently. When operating without an indoor temperature sensor, the automatic weather compensation curve correction function is not available, but the heat pump operation is not interrupted.

To repair or add the temperature sensor, contact a service organization.

Status xx5x and xx6x

This status means that the DHW tank temperature sensor is disconnected or faulty. When operating without a DHW temperature sensor, the tank will not be heated.

To correct this, contact a service organization.

Status xx7x and xx8x

This status means that the storage tank temperature sensor is disconnected or faulty. If the storage tank is not part of the heat pump installation, this status may be displayed permanently. When operating the heat pump with a faulty storage tank temperature sensor, storage tank heating will be stopped until the fault is removed. Other functions of the heat pump remain unchanged.

To correct this, contact a service organization.

Status xxx1 and xxx2

This status means that the pool circuit temperature sensor is disconnected or faulty. If your installation includes a pool water heating circuit, the heating will be stopped until the fault is removed. However, other circuits of the heat pump remain unchanged.

To correct this, contact a service organization.

Status xxx3 and xxx4

This status means that the secondary circuit temperature sensor is disconnected or faulty. If your installation includes a secondary heating circuit, this circuit is stopped until the fault is removed. However, other circuits of the heat pump remain unchanged.

To correct this, contact a service organization.

7.5 Protective functions

! All protective functions are active only when the indoor unit is powered and device circuit breakers are on.

These are protective mechanisms that take care of the safety of the heat pump and protect it from damage or destruction. The following overview lists and explains these safety functions. This list primarily aims to explain the behaviour of the heat pump to the end user or to aid a service organization. In no case it encourages making changes to the product itself or in the service offer. Improper handling can damage or destroy the product.

Frost protection – static (output water temperature)

If the indoor unit is powered, the temperature of the indoor unit's output water sensor is monitored. If the water temperature drops below +5 °C, it activates the circulating pump and the first stage of the integrated bivalent source (2 kW). As soon as the water temperature in the heating system rises above +5 °C, both the circulating pump and the bivalent source stop.

This protection is active even if heating is turned off.

Frost protection – during operation

If during operation (heating) the temperature of output water drops below the set value (the default value is 11 °C), the outdoor unit stops and the integrated bivalent source activates to heat the heating water. After achieving an output water temperature of 11 °C, the bivalent source keeps heating the heating water for another 30 minutes. After this period, the device keeps operating as standard with the outdoor unit.

This protection usually activates when the outdoor unit is defrosting and the flow is insufficient (or when there is low thermal energy in the system).

The value can be set in the service settings as parameter T frost. This protection is linked to the autoreset function.

Flow monitoring – monitoring depending on the outdoor unit power

To maintain the declared efficiency of the heat pump and safe operation, it is necessary to maintain a sufficient flow of heating water. The minimum flow is given by the relationship between the outdoor unit power and the required power of the circulating pump. Values of minimum flow for individual types of heat pumps are listed in the table in ch. "Design documents".

This protection is linked to the autoreset function.

Flow monitoring – monitoring of critical flow

If during the operation of the circulating pump the flow value drops below 300 l/h (fixed value) or below the min. flow according to Figure **Minimum water flow for individual power types** in the *Installation Manual, ch. Hydraulic Circuit*, a flow error is triggered and the circulating pump automatic venting program is started.

Venting is performed in cycles, where in each cycle the circulating pump first idles for 10 seconds and then works at full power for 10 seconds. These cycles are repeated continuously until the required minimum flow value is achieved.

Flow monitoring – flow change during defrosting and cooling

When the outdoor unit is defrosting, the power of the circulating pump is automatically increased to 100 %. If the heat pump is switched to cooling, the circulating pump is not controlled proportionally, but continuously running at full 100 % power.

Water pressure monitoring – heating/cooling water pressure

The loss of pressure in the heating system is a serious problem, so when the pressure in the heating system drops below the set value, the entire system stops.

The critical pressure value can be set in the service settings under `Minimum water pressure`.

This protection is linked to the autoreset function.

Sensor monitoring – critical sensors

The operation of the heat pump requires two temperature sensors. The output water temperature sensor and the return water temperature sensor. If the values indicated by the sensor fall outside the range (-50 °C to +120 °C), the heat pump stops.

This protection is linked to the autoreset function.

Sensor monitoring – other sensors

A fault of other non-critical sensors is only signalled. It does not affect the primary operation of the heat pump. It affects only the relevant section to which the temperature sensor belongs. For example, if the DHW sensor shows a fault, DHW heating will be interrupted.

Outdoor unit failure

A fault of the outdoor unit is only signalled. It does not affect the primary operation of the heat pump. If the outdoor unit supplies insufficient or no power, the system automatically uses the integrated bivalent source and signals a fault of the outdoor unit.

Compressor heating

After switching on the heat pump or restoring its power after an outage, only the bivalent source is used for a certain time. During this time, the outdoor unit is in compressor box heating mode.

By default, this protection is not active (set to zero time), but it is recommended to set this protection in installations where longer power outages often occur.

This protective function can be set in the service settings under “Delayed start”.

Output water temperature limits

It limits the user setting of desired temperatures to a pre-set range. The range can be set in the service settings under `Minimum output water temperature` and `Maximum output water temperature`. The default values are 20 °C for minimum temperature and 60 °C for maximum temperature.

Restart

Protection of the compressor against frequent starts that happen during unit cycling. This occurs when the minimum power that the heat pump can deliver is higher than the instantaneous loss of the building. This function prevents overly frequent starts and thus prolongs the service life of the compressor. The default setting is 10 minutes and 5 %. This means that the outdoor unit starts up again after 10 minutes at the earliest and after an increase in the outdoor unit power requirement by more than 5 %.

Both parameters can be set in the service settings as Restart and Restart Threshold.

Cooling water temperature deficit

Protection against low water temperature during cooling, when the cooling water temperature drops below the set limit. The limit temperature for shutting down the outdoor unit and cooling is set as the cooling water temperature minus the cooling water temperature deficit. After the output water again reaches a higher temperature than the set cooling water temperature, the heat pump resumes cooling.

The `Cooling water temperature deficit` parameter can be changed in the service settings.

Fault autoreset

Automatic resumption of operation after some faults have subsided is a function that helps eliminate random problems on the device. It can automatically restore operation up to 5 times. If the fault or faults occur more than 5 times, the operation of the heat pump will not be resumed until the operator or service technician has intervened.

7.6 Service organization

If you need to contact a service organization, primarily contact the organization that installed the heat pump.

8. Maintenance of the device and components

Thanks to its design, the heat pump is easy to maintain. Basic maintenance is to be performed by a service organization during regular annual inspection. During this inspection, the service organization shall check all important parts of the heat pump, especially the operation of the refrigerant circuit.

Regular inspections and maintenance of the indoor and outdoor unit of the heat pump and heating system help prevent more serious faults and damage. We recommend having a service organization perform a general inspection once a year.

To maintain correct and, above all, efficient operation, we recommend checking the condition of the whole system at least once a month. This means checking the indoor unit display for a fault or abnormal sounds or behaviour. Similarly, make sure the outdoor unit is operating correctly and does not make unusual noises. It is also important to check the condition and cleanliness of the outdoor unit exchanger and regularly check the state of the hot water tank.

8.1 Maintenance of the outdoor unit

For proper function and the required efficiency, make sure that the outdoor unit always has good air access. Therefore, it is necessary to regularly check the condition of the fin heat exchanged for clogging, e.g. by leaves/blossoms fallen from trees, dust, snow or ice. Clean the fin exchanger carefully with non-pressurized water. The fins are very fine and could be damaged. The refrigerant and electrical system may only be inspected by a certified service technician.
If the unit is snow-covered so that the snow prevents the air from flowing freely, remove the snow. If the evaporator is covered with a layer of ice, remove this ice by pouring hot water over it until all the ice has melted.

Do not use high-pressure cleaners or any mechanical aids (brushes, etc.). Before cleaning the fins of the outdoor unit, switch off the main circuit breaker in the indoor unit!

Maintenance and cleaning of all components must be performed in the non-powered state.

If the outdoor unit exchanger is obstructed (dust, leaves, ice) or the entire outdoor unit is covered with snow, the device loses power, efficiency, or cannot be operated at all.

8.2 Maintenance of the indoor unit

The indoor unit requires only minimum maintenance. The device does not contain components that require maintenance by the user. Use only a damp cloth to clean its surface. Take extra care when the device is in operation and powered. We recommend performing maintenance on the indoor unit outside the heating/cooling season in the non-powered state.

We recommend having the entire heat pump inspected regularly once a year by a service technician of the installation company.

Maintenance and cleaning of all components must be performed in the non-powered state.

8.3 Maintenance of the DHW tank

To maintain the correct and, above all, efficient operation of the DHW tank, check the sediment content in the tank at least once every 2 years. Once every two years (once a year for stainless steel tanks), also check the condition of the anode rod and replace it if necessary.

In addition, observe the requirements of the tank manufacturer.

8.4 Maintenance plan

	every month	every year	every 2 years	every 5 years
Check failures, status messages, operation	●			
Clean heating water filters, check the flow of heating water		●		
Check the pressure of expansion tank			●	
Check the safety valve function		●		
Check, desludge the DHW tank			●	
Check, replace the DHW tank anode rod – enamel tank			●	
Check, replace the DHW tank anode rod – stainless steel tank		●		
Check the circulating pump function		●		
Check the outdoor unit exchanger		●		
Check the indoor unit exchanger				●
Check the heating water quality				●
Check the bivalent source function				●
Check the wiring and hydro equipment (ser. organisation)		●		

● required maintenance ● recommended maintenance

Figure 8.1: Maintenance plan

9. Disposal of the device

9.1 Disposal of the packaging

The EKO-KOM system is based on the cooperation of industrial enterprises (clients), cities and municipalities. This non-profit system ensures that waste from packaging is sorted by the consumer, collected by collection vehicles, resorted and finally used as a secondary raw material.

NEOTA CZ s.r.o. is registered in the EKO-KOM Collective Compliance System and thus fulfils its legal obligation to take back and reuse packaging waste. In practice, this means that for all NeoRé heat pumps sold, we have a prepaid take-back of packaging, which will be reused.

Therefore, we ask you to carefully sort the packaging materials and dispose of them in coloured containers with the EKO-KOM label.

Figure 9.1: EKO-KOM label

Plastic cover foils and other plastic parts of the packaging may become a dangerous toy for children, so never leave them lying around and make sure children cannot reach them.

9.2 Disposal of the indoor unit

Due to the refrigerant inside, the indoor unit must be disposed of as hazardous waste by an authorized organization. Alternatively, contact the installation organization or the manufacturer.

9.3 Disposal of the outdoor unit

Due to the refrigerant inside, the outdoor unit must be disposed of as hazardous waste by an authorized organization. Alternatively, contact the installation organization or the manufacturer.

10. Manufacturer contact

MANUFACTURER NEOTA CZ s.r.o.
Štefánikova 75/8
602 00 Brno, Czech Republic
Company ID No. 27759431
VAT ID No. CZ27759431

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10.1 Documents for download

All product documentation is also available online at www.neota.cz/en/downloads in PDF format.

10.2 Online manuals

You can use QR codes to quickly load manuals in your mobile phone.

USER MANUAL
NeoRé TG

INSTALLATION MANUAL
NeoRé TG