ecocycle

HEATPUMPS

M & PM SERIES USER MANUAL

INTRODUCTION

In addition to information about operating and use of the ECOCYCLE heat pump, you will also find information about installing the heat pump. There are also some sections explaining the overall operation of heat pumps. In addition, you will get back ground information and advice that can assist in designing the entire system around the heat pump.

Caution for danger!

Please read this manual carefully before using the heat pump.

PICTOGRAMS

In this guide, different pictograms are used to point the reader to items that require extra attention or potential dangers. Below are the following icons:

Hint!

Instructions that help you safely use and maintain the device.

Pay attention!

Indicates situations or actions that can damage the unit.

Danger warning!

Indicates situations or actions that may cause (serious) injury.

TARGET AUDIENCE

This manual gives the user information about the operation and maintenance of the heat pump. In addition, the manual serves as a reference for the installer during commissioning.

Caution for danger!

The installation and maintenance of the heat pump must only be carried out by qualified personnel.

SAFETY

General

Caution for danger!

The installation and maintenance of the heat pump must only be carried out by qualified personnel.

- When a negativity occurs, (excessive noise, smoke, smell, etc.), the device must be turned o fffrom the fuse, and the service must be called.
- The inner parts of the board must not contact with water; if it does, call the service.
- Do not drink the water produced by or discharged from the device.
- Do not touch the device or any other part connected to it with wet hands.

Caution for danger!

The heat pump housing may only be opened by qualified personnel.
Improper operation can cause injury and / or damage.
Danger of injury due to parts under tension!
The electrical connection of the device must be cut o ffduring cleaning and maintenance.

- Do not manually pull or crush the electric cables, otherwise you may suffer from electric shocks.
- Electrical connections must comply with the electrical connection diagrams specified in the manual.
- The voltage of the grid must be suitable for the device. It must be checked to see it complies. The rules of grounding must be definitely followed. Otherwise, it may cause electric shocks. Our company is not liable for damages and failures that may occur in case the device is not operated in line with the current-voltage values specified in the table of technical characteristics regarding the operation of the device.
- Do not connect the grounding cable to the lightning rod, gas pipe, water pipe or telephone cable.
- Electrical connections must comply with the electrical connection diagrams specified in the manual.

Caution for danger!

Work on the refrigerant circuit may only be carried out by qualified and certified personnel.

Caution for danger!

In case of leakage of the refrigerant circuit, do not inhale gases and vapors. Avoid contact with the gas.
When the leak outlet of the refrigerant is touched, there is a danger of freezing.

Caution for danger!

When R32 & R290 is exposed to an open flame, toxic degradation products form. Evacuate the space immediately.
Persons with poisoning symptoms should be brought to fresh air immediately.

Caution for danger!

The refrigerant is a gas that is heavier than air at room temperature. Provide adequate ventilation when operating in a cool room with a coolant to avoid choking hazard.

INDEX

1. DATA HEAT PUMP INSTALLATION

1.1 Required documents of this documentation

Contact details owner / user

Name .....
Street address .....
City .....
Zip code .....
.....
Phone number .....
E-mail address .....
Name of contact person .....

Contact details installer

Registration number .....
Company name .....
Street address .....
City .....
Zip code .....
Phone number .....
E-mail address .....
Maintenance contract number .....

Contact details manufacturer

Registration number .....
Company name .....
Street address .....
City .....
Zip code .....
Phone number .....
E-mail address .....
Order number .....

Notes:

Date	Company Reg. number	Type of service	Work ticket number	Refrigerant activities	
				Refilled	Tapped

1.1.1 Work registration

- Registration of management must correspond to the existing work tickets.
- At each visit to the installation, the work performed must be described and can be referred to the individual job registration, provided that it is attached.

Serial number:

1.1.2 Leak density certificate

The installation has been checked for correct operation and leakage density after commissioning. The leak detection is performed with a leak detector whose detection limit is at least 5 ppm.

Leak density control in accordance with NEN-EN378: 2008 performed by:

Name of supplier / installer .....

F-gases business certificate number .....

Name mechanic .....

F-gas diploma number mechanic .....

Implementation date: Signature:

Serial number:

1.1.3 Pressure proof document

During the test, the installation has been checked for leakage and deformation.
The leakage density control is performed by means of Visual inspection of the pressures and by means of Leak tracking devices.
The installation is leakproof and no deformations have been detected.

Pressure proof: Final pressure = 1,1x design pressure (EN378-2 § 6.3.3)

		Bar(a)		Bar(a)
Design pressure:	LP=		HP=	
Final testing pressure:	LP=		HP=	

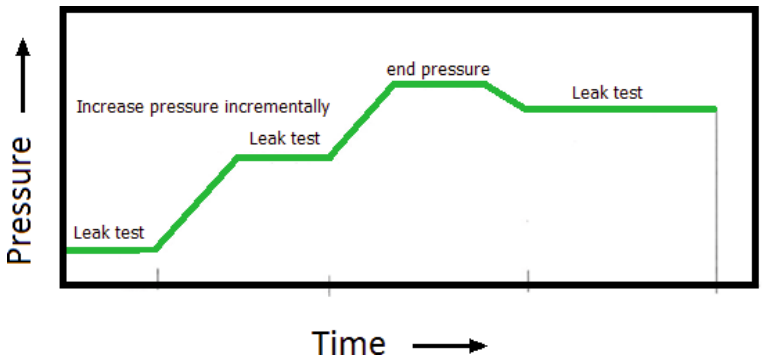
Ambient temperature: °C

Press medium: Dry nitrogen (N_2)

Total time pressure test (hours):

Gauge number: Calibration valid until:

Gradient pressure test: (EN378-2 § 6.3.4)



Name of supplier / installer

F-gases business certificate number

Name mechanic

F-gas diploma number mechanic

Implementation date: Signature:

Serial number:

1.1.4 Vacuum and Filling Procedure Document

The complete installation has been pulled vacuum in accordance with NEN-EN378: 2008

Installations with refrigerant content <30 kg.

Reached vacuum pressure:		Pa/Torr/Micron*		
Stand time**		Uren		Minutes
Times broken with N2:		(2 times minimal)		
Ambient temperature:		°C		

During filling, the following amount of refrigerant is added.

Type of refrigerant		
Refrigerant mass		kg

Vacuuming and filling is performed by:

Name of supplier / installer _____

F-gases business certificate number _____

Name mechanic _____

F-gas diploma number mechanic _____

*) *Cross out what is not applicable. (270 Pa = 2 Torr = 2000 Micron)*
**) *Time that vacuum is maintained*

Implementation date: Signature:

Serial number:

1.1.5 CE – Declaration of conformity

According to Machine guidelines 2006/42/EG

Here by we declare that ECOCYCLE heat pumps that are built

with: Cooling components, electric cabinets, circulation pumps,
Safety switches, temperature sensors and other components,

are intended for incorporation in homes, offices and commercial premises, such as
Defined in the EC Machinery Directive 2006/42 / EC and installation regulations are provided by ECOCYCLE.

In accordance with the following applicable guidelines:

Machinery Directive (2006/42 / EC) and amendments
Low Voltage Directive (2006/95 / EC) and amendments
EMC Directive (2004/108 / EC) and amendments
Pressure Equipment Directive (97/23 / EC) and amendments

And complies with the following harmonized European standards:

NEN-EN-ISO 12100-2010	Safety for machine - General design principles Risk assessment and risk reduction EN ISO 14121-1: 2007
NEN-EN 842:1996+A1:2008	Machine Safety - Visual Hazard Signals - General Requirements, Design Principles and Test Methods
NEN-EN 953:1997+A1.2009	Machine Safety - Shielding - General requirements for design and constitution of fixed and movable shielding
NEN-EN 1299:1997+A1:2008	Mechanical vibration and shock vibration isolation of machines - Data for the application of source isolation
NEN-EN-IEC 20529:1992/A2:2013	Degree of protection of electrical equipment coverings. (EP Encoding)
NEN-EN-IEC 60204-1	Machine safety - Electrical equipment of machinery - Part 1: General requirements

However, it is not allowed to operate our ECOCYCLE heat pumps until the installation in which they are incorporated or which they are part of the whole, including the product of this statement, does not conform with the statutory requirements.

Management of EKOTURK

Implementation date: Signature:

2. INSTALLATION CONDITIONS

2.1. General installation instructions

When installing the heat pump, the installer must comply with European Standard and Legislation.

Please pay attention to the following points:

Item	Action
1.	All instructions contained in the applicable manuals and / or instructions must be followed strictly!
2.	Place the unit in such a way that mechanical damage caused by external causes is not possible.
3.	Do not put the heat pump in an aggressive and / or explosion hazardous area (s). The heat pump must be placed in a clean and dust-free area at all times. So that the heat pump, including components, cannot be damaged and / or defective.
4.	The heat pump must be installed in accordance with the installation instructions, so that the engine can properly reach the heat pump in case of malfunction and operation. The heat pump must be easily accessible and there must be sufficient work space around the heat pump. This means that the heat pump must be at least 1 meter in space and one of the two side panels must be able to drain, even with 1 meter of work space. See Annex 4.2. ***If this is not the case, ECOCYCLE will charge additional costs if the mechanic is prevented from labour during his time.***
5.	Conduits must be connected to the unit in such a way that no voltages of any kind can occur. The connection must also be vibration damping (flexible hoses, rubber anti-vibration gaskets, etc.). Conduits must be connected properly. Use the enclosed appendix 3.2. The conduits must be clean and equipped with dirt filters.
6.	Operation, Maintenance, Checks and Service may only be carried out by authorized and skilled engineers.
7.	The filling of water must be carried out in accordance with the regulations. Always use the prescribed and / or calculated water / glycol percentage.
8.	The electrical installations must be properly connected to the heat pump, see attached Annexes 5.2 and 5.3.
9.	Commissioning must not take place before installation complies with local regulations and legislation. The ECOCYCLE directive on commissioning is also required. (see annex 2.2.)
10.	The installer must inform the end user regarding the legal commissioning in accordance with Amending Decision I (339) and Periodic Revision in accordance with Amending Decision II (387)
11.	All points and / or activities not specifically mentioned must be performed to ensure safe and responsible commissioning and management.

3. SPECIFICATIONS

Series		Ecocycle M12	Ecocycle M16
Heating Condition-Air Temp. (DT/WT) 7/6°C , Water Temp. (In/Out) 30/35°C			
Heating Capacity Range	kW	4,18-12,1	5,40-15,63
Power Input Range	kW	0,86-2,59	1,10-3,27
COP at 60 RPS		4,68	4,72
Cooling Condition-Air Temp. (DT/WT) 35/24°C , Water Temp. (In/Out) 12/7°C			
Cooling Capacity Range	kW	3,74-9,60	4,60-11,80
Power Input Range	kW	1,03-3,25	1,38-3,98
EER at 60 RPS		3,19	3,23
Maximum-Minumum Compressor Speed	RPS	26-60	32-74
Compressor		CRSS (Panasonic-Sanyo)	
Compressor Type		DC Twin Rotary	
Compressor Driver		STEP	
Heat Exchanger		SWEP Brazed Plate	
Fan Type		BLDC Fan Motor	
Main Control Board		Siemens POL468.65/STD	
Control Panel		Siemens POL895.51/STD HMI	
Circulation Pump		Wilo Para 25-130/8-75	
Refrigerant / Charge Weight (kg)		R32 / 2,2	R32 / 2,7
GWP / CO_2 Equivalent (ton)		675 / 1,48	675 / 1,82
Max. Operation Pressure (Refrigerant Circuit)	bar	42	
Min. Operation Pressure (Refrigerant Circuit)	bar	2,3	
Maximum Water Outlet Temperature		61°C	
Operation Ambient Temperature		-25/+45°C	
Water Connection		1 1/4"	
Maximum Water Pressure Drop	kPa	25	
Circulation Pump Flow Rate	m^3/h	2,5	
Sound Power Level (EN 12102)	dB(A)	56	
Dimensions			
Length	mm	1215	
Depth	mm	500	
Height	mm	830	
Weight	kg	105	115
Electrical Connections			
Voltage	V	220 (380 optional)	
Phase	~	Mono	
Maximum Current	A	19	25
Frequency	Hz	50	
Circuit Breaker	A	25	
Electrical Cable Connections	mm	3x6	

Series		Ecocycle M35	Ecocycle M55
Heating Condition-Air Temp. (DT/WT) 7/6°C , Water Temp. (In/Out) 30/35°C			
Heating Capacity Range	kW	12,10-29,20	16,10-44,10
Power Input Range	kW	2,52-6,63	3,42-10,50
COP at 60 RPS		4,52	4,44
DHW Condition-Air Temp. (DT/WT) 20°C , Water Temp. 15/55°C			
DHW Capacity Range	kW	17,90-35,30	23,90-53,10
Power Input Range	kW	3,65-7,51	4,87-11,20
COP at 60 RPS		4,7	4,73
Cooling Condition-Air Temp. (DT/WT) 35/24°C , Water Temp. (In/Out) 12/7°C			
Cooling Capacity Range	kW	10,50-22,50	13,9-33,75
Power Input Range	kW	3,28-7,50	4,34-12,05
EER at 60 RPS		3,12	3,06
Maximum-Minumum Compressor Speed	RPS	30-60	40-90
Compressor		CRSS (Panasonic-Sanyo)	
Compressor Type		DC Rotary	
Compressor Driver		Sanhua	
Heat Exchanger		Sanhua	
Fan Type		BLDC Axial Fan	
Main Control Board		Siemens POL468.65/STD	
Control Panel		Siemens POL895.51/STD HMI	
Refrigerant / Charge Weight (kg)		R32 /	R32 / 9
GWP / CO_2 Equivalent (ton)		675 / 5,40	675 / 6,08
Max. Operation Pressure (Refrigerant Circuit)	bar	42	
Min. Operation Pressure (Refrigerant Circuit)	bar	2,3	
Maximum Water Outlet Temperature		61°C	
Operation Ambient Temperature		-25/+45°C	
Water Connection		1 1/4"	
Sound Power Level (EN 12102)	dB(A)	61	
Dimensions			
Length	mm	1055	1110
Depth	mm	854	1150
Height	mm	1382	1500
Weight	kg	210	280
Electrical Connections			
Voltage	V	380	
Phase	~	Three	
Maximum Current	A	19	25
Frequency	Hz	50	
Circuit Breaker	A	25	

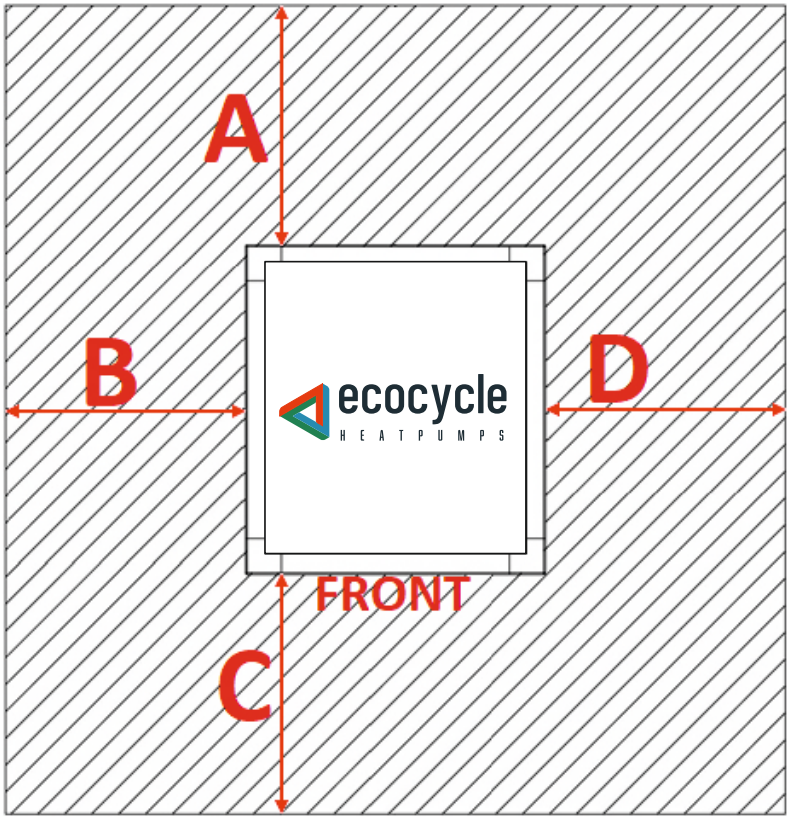
Series		Ecocycle M40	Ecocycle M65
Heating Condition-Air Temp. (DT/WT) 7/6°C , Water Temp. (In/Out) 30/35°C			
Heating Capacity Range	kW	13,60-39,80	24,30-60,80
Power Input Range	kW	2,94-8,62	5,23-13,10
COP at 60 RPS		4,62	4,64
Cooling Condition-Air Temp. (DT/WT) 35/24°C , Water Temp. (In/Out) 12/7°C			
Cooling Capacity Range	kW	12,10-31,30	12,40-47,10
Power Input Range	kW	3,74-9,70	3,80-14,45
EER at 60 RPS		3,23	3,26
Compressor		Panasonic	
Compressor Type		DC Scroll	
Compressor Driver		STEP	
Expansion Valve		SANHUA EEV	
Heat Exchanger		SANHUA BPHE	
Fan Type		EC FAN	
Main Control Board		Siemens POL468.65/STD	
Control Panel		Siemens POL895.51/STD HMI	
Circulation Pump		External	
Refrigerant / Charge Weight (kg)		R410A / 12	R410A / 12
GWP / CO_2 Equivalent (ton)		2088 / 25,05	2088 / 25,05
Max. Operation Pressure (Refrigerant Circuit)	bar	42	
Min. Operation Pressure (Refrigerant Circuit)	bar	2,3	
Maximum Water Outlet Temperature		60°C	
Operation Ambient Temperature		-25/+45°C	
Water Connection		1 1/2"	
Dimensions			
Length	mm	1210	
Depth	mm	1090	
Height	mm	1700	
Weight	kg	400	405
Electrical Connections			
Voltage	V	380	
Phase	~	Three	
Maximum Current	A	40	55
Frequency	Hz	50	
Circuit Breaker	A	50	60

Series		Ecocycle PM8	Ecocycle PM12	Ecocycle PM16
Heating Condition-Air Temp. (DT/WT) 7/6°C , Water Temp. (In/Out) 30/35°C				
Heating Capacity Range	kW	3,20-8,70	3,20-12,60	5,60-15,90
Power Input Range	kW	0,69-1,89	0,69-2,73	1,19-3,45
COP at 60 RPS		4,69	4,62	4,71
Cooling Condition-Air Temp. (DT/WT) 35/24°C , Water Temp. (In/Out) 12/7°C				
Cooling Capacity Range	kW	2,40-7,10	2,40-9,50	4,52-12,30
Power Input Range	kW	0,75-2,25	0,77-3,05	1,38-3,88
EER at 60 RPS		3,15	3,11	3,18
Compressor		GMCC		
Compressor Type		DC Twin Rotary		
Compressor Driver		Sanhua		
Expansion Valve		SANHUA EEV		
Heat Exchanger		SWEP BPHE		
Fan Type		BLDC		
Main Control Board		Siemens POL468.65/STD		
Control Panel		Siemens POL895.51/STD HMI		
Circulation Pump		Wilo Yonos Para 25/8		
Refrigerant / Charge Weight (kg)		R290 / 1,15	R290 / 1,15	R290 / 1,3
GWP		3		
Max. Operation Pressure (Refrigerant Circuit)	bar	31		
Min. Operation Pressure (Refrigerant Circuit)	bar	0,7		
Maximum Water Outlet Temperature		75°C		
Operation Ambient Temperature		-30/+50°C		
Water Connection		1 1/4"		
Dimensions				
Length	mm	1214		
Depth	mm	500		
Height	mm	830		
Weight	kg	120	120	135
Electrical Connections				
Voltage	V	220	220	380
Phase	~	Mono	Mono	Three
Maximum Current	A	16	22	12
Frequency	Hz	50		
Circuit Breaker	A	20	25	16

3.2. PLACEMENT OF THE MACHINES

The value's below are the minimal distance from side to wall/edge. Minimal height of the room where the heat pump is installed is 2000mm. Place the ECOCYCLE heat pump on a solid floor.

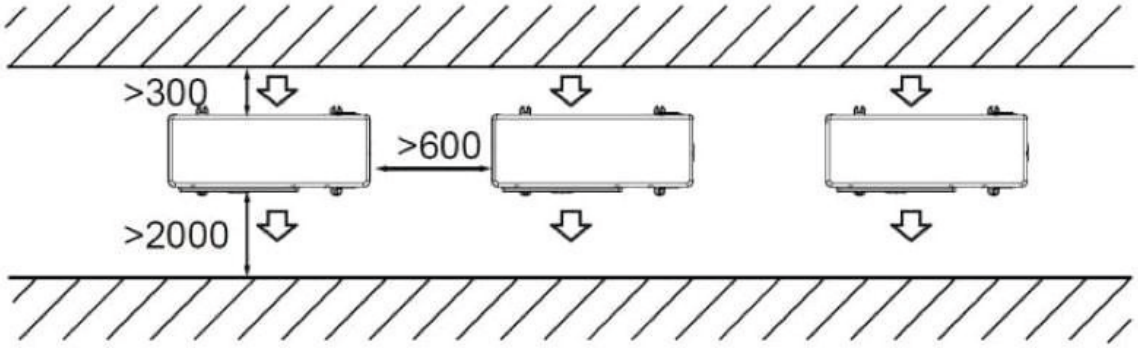
For service and maintenance it is important that the heat pump is accessible at all times. Therefore, we recommend a minimum distances of:



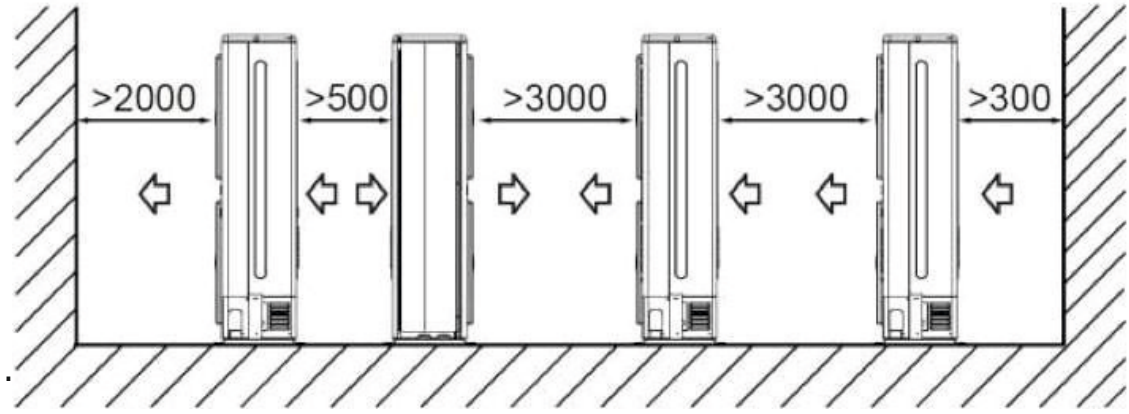
3.2.1 ECOCYCLE M & PM Series

A = 500mm
B = 500mm
C = 2000mm
D = 750mm

3.2.2 Air-water heat pumps side by side placement



3.2.3 Air-water heat pumps double-sided placement



4. TRANSPORT AND INSTALLATION OF THE HEAT PUMP

4.1. General

This chapter provides guidelines and advice for the correct installation of the ECOCYCLE heat pump. The heat pump will always be part of a heating and / or cooling system. The efficiency of the entire installation can or may be matched with the correct components. ECOCYCLE provides information, but it is the installer who will choose and assemble the appropriate components. The installer is therefore responsible for the optimal functioning of the installation as a whole. This does not affect ECOCYCLE willingness to support her knowledge and expertise in building an installation.

4.2. Transport

The heat pump must be transported upright. Use proper lifting belts to lift the heat pump. Prevent the heat pump from being exposed to shock or vibration during transport.

Warning for danger!

Only use approved lifting devices for lifting the heat pump.

4.3. Installing the heatpump

Installing and commissioning
Before installing an ECOCYCLE heat pump, it is important to observe a number of advice.

Warning for danger!

The heat pump installation may only be carried out by qualified personnel.

When designing the ECOCYCLE heat pumps, care is taken to prevent annoying vibrations and noise. Nevertheless, a heat pump remains a machine with moving parts. Any resonance is therefore not entirely excluded. To minimize this we advise to use flexible hoses between the heat pump and the further piping system.

4.3.1. Requirements for the delivery system

We recommend installing dirt filters in the return pipes to the heat pump. These will prevent the heat exchangers from being clogged by contamination that may have occurred during the installation of the system. When the filters are mounted, they have to be checked regularly during the first months of using the heat pump. If, for example, one year does not accumulate any pollution in the filters, it may be considered to remove it. The improved flow will benefit from the heat pump performance.

It is important that (automatic) air chambers are placed in each system's circuit, at the highest point. Air is often the cause of malfunctions in the systems.

Make sure that expansion vents are placed on the delivery and Source side with a corresponding filling point.

The ECOCYCLE heat pumps can be supplied with built-in circulation pumps. For both the source system and the delivery system. It is important that the total resistance of each system does not exceed the capacity of the built-in circulation pump. Each installation has a certain resistance. For the efficiency of the installation it is important that the correct circulation pump is applied. A too small pump will cause insufficient power to be delivered. An excessive pump is negative for the overall efficiency of the installation. In the relevant tab at the end of this documentation you will find information about the standard applied pumps and the internal resistance in the heat pump. As an option, the heat pump can be equipped with other circulation pumps, if that is beneficial to the total efficiency of the installation.

Pay attention!

It is the responsibility of the installer to select the optimal circulation pump(s) for the installation that he installs.

4.3.2. Checklist installation and first boot

Item	Action
12.	Check that the pipework around the heat pump is properly installed.
13.	Check the pipework for leaks.
14.	Check that the electrical connections are made correctly.
15.	Check in the heat pump whether all components are properly seated.
16.	Check the electrical connections and wiring in the heat pump.
17.	Check the heat pump internally for leaks. Pay particular attention to leaking refrigerant.
18.	Check the pressure in the source system and delivery system.
19.	Check the glycol content of the liquid in the source.
20.	Check that expansion vessels are provided in the correct places.
21.	Inspect the filters in the pipes and clean them if necessary.
22.	Be 100% sure there is no air left inside the piping system

After this first checklist, the heat pump can be switched on. Further points can be considered.

Item	Action
23.	Check the settings of the heat pump for deviations.
24.	Check if all functions of the heat pump work properly.

4.3.3. Water connections Air-Water heat pumps

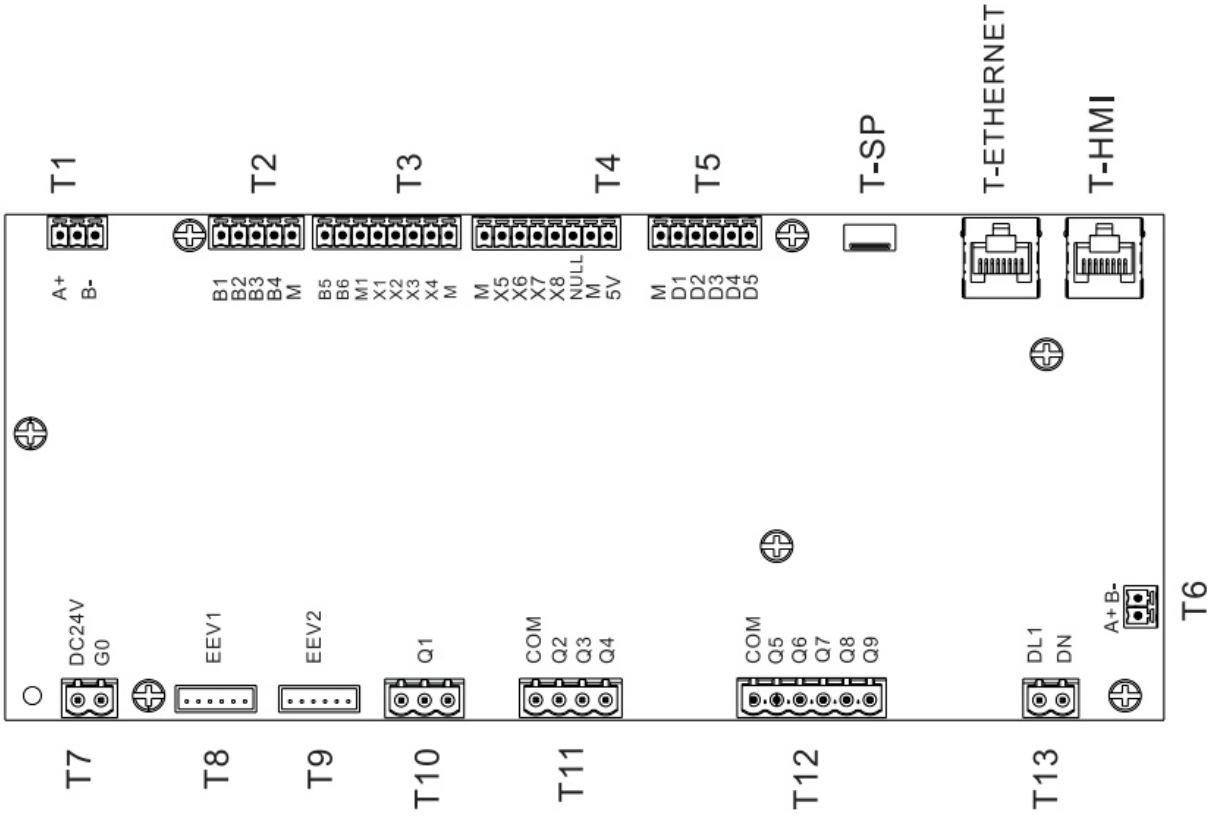
ECOCYCLE M & PM Series have outer thread water connection points, the lower is inlet, the upper one is the outlet.

5. ELECTRICAL CABLE CONNECTION

In this part of the documentation you will find electrical schedules and how to connect your heat pump in your setup.

5.1 Main control board

For the main controller the Siemens POL468.65/STD is used, see image below for an example:



All electrical operations and installations should be carried out by authorized persons. National electricity standards must be complied with while carrying out the electricity assembly.

Pay attention!

Maximum 2A, 230 V electricity can be obtained from all relay outputs on the control card.

Pay attention!

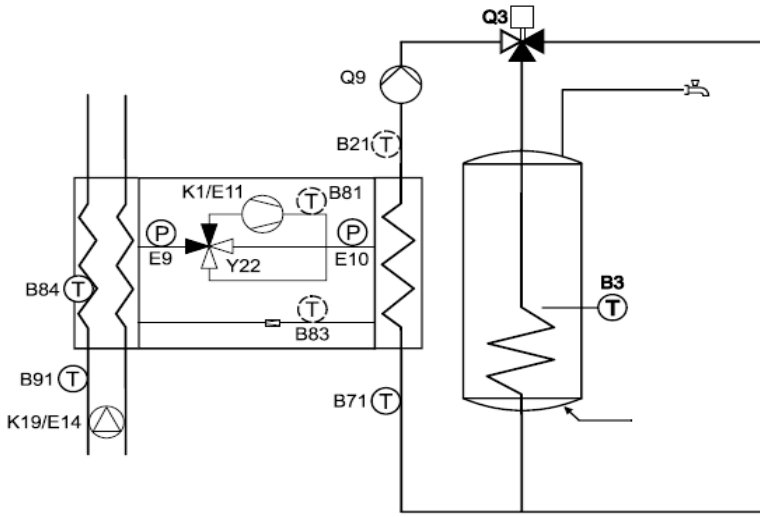
The connections of the tools and sensors to be connected to the control card during the installation must be carried out as shown in the diagram as per their purpose of use.

Notes:

5.2 Electrical connection diagrams Air-Water heat pumps

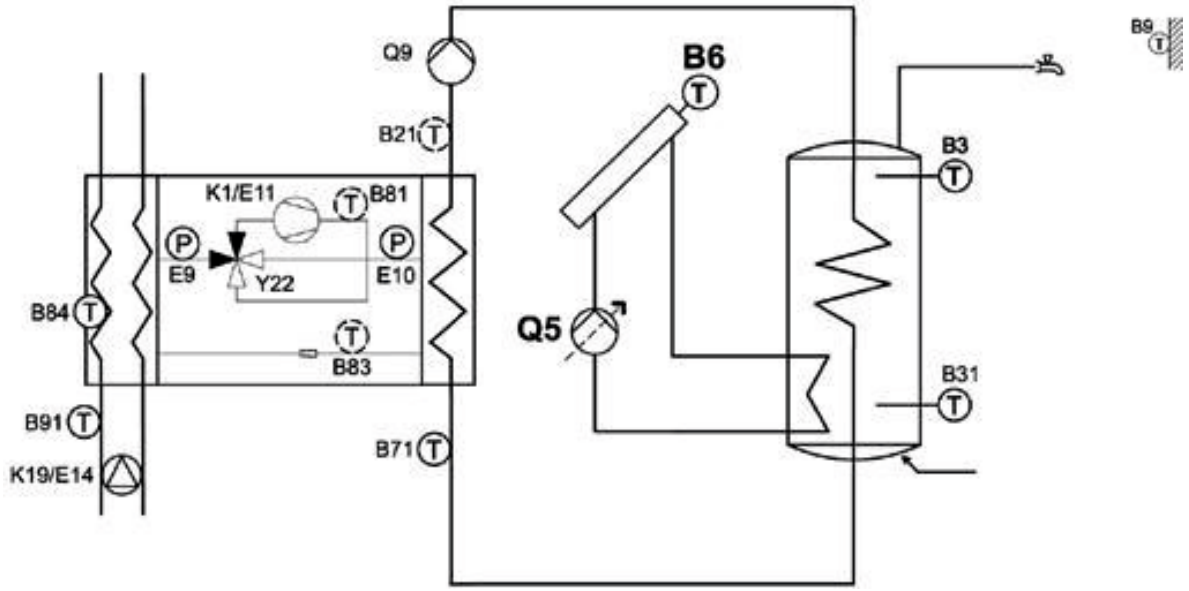
ECOCYCLE Heat pumps can be used in five ways as only hot water, hot water and solar energy, only heating-cooling, heating-cooling and hot water and heating-cooling-hot water-solar energy. Drawings for five types of use are shown.

5.2.1 Only Hot Water Setting:



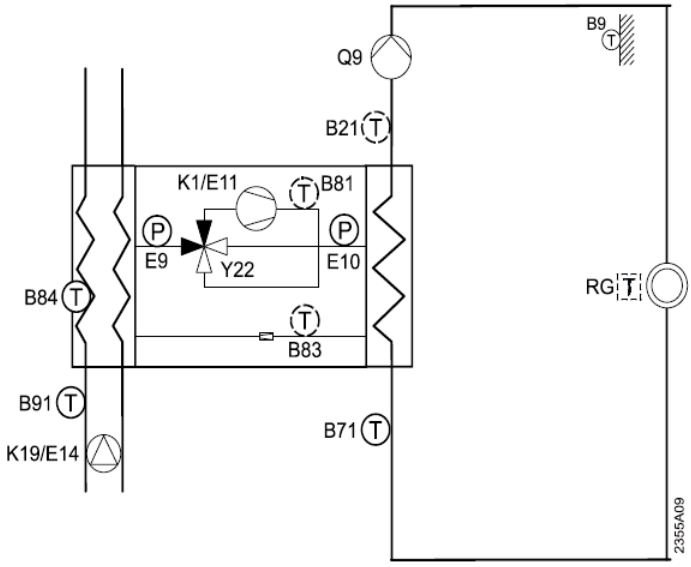
Connection Point	Socket	Terminals	Remark	Connection Status
T11	Q2		Compressor Return Sensor	Factory-connected
T3	X3	3-4	Boiler Sensor B3	Connection during installation
T2	B1		Hot Gas Sensor B81	Factory-connected
			Outer Air Sensor B9	Connection during installation
T2	B2		Hot Water Stream Sensor B21	Factory-connected
T2	B3		Hot Water Return Sensor B71	Factory-connected
T3	B5		Air Inlet Temperature Sensor B91	Factory-connected
T2	B4		Air Outlet Temperature Sensor B92	Factory-connected
T11	Q4		Four-Way Valve Relay Outlet Y22	Factory-connected
T12	Q6	8	Extra Heater Element	Connection during installation (Optional)
T12	Q7	7	Boiler Resistance	Connection during installation (Optional)
T12	Q8		Compressor Crank Heater K40	Factory-connected
T12	Q5	10	3 Way Valve Q3	Connection during installation
T11	Q2		Compressor Relay Outlet K1	Factory-connected
T11	Q3		Fan Relay Outlet K19	Factory-connected
T10	Q1	11	Boiler Circulation Pump Q9	Connection during installation (contactor should be used more than 2 amperes stream or three phase pumps)
T5	D1		Flow Switch	Factory-connected
T5	D3		Low Pressure Switch E9	Factory-connected
T5	D2		High Pressure Switch E10	Factory-connected
T13	DL1		Compressor Overload Switch E11	Factory-connected
T-HMI	HMI	12-13-14-15	12-HMI R485A//13-HMI GND//14-HMI R485B//15-HMI+24V	Connection during installation

5.2.2 Hot Water and Solar Energy Setting:



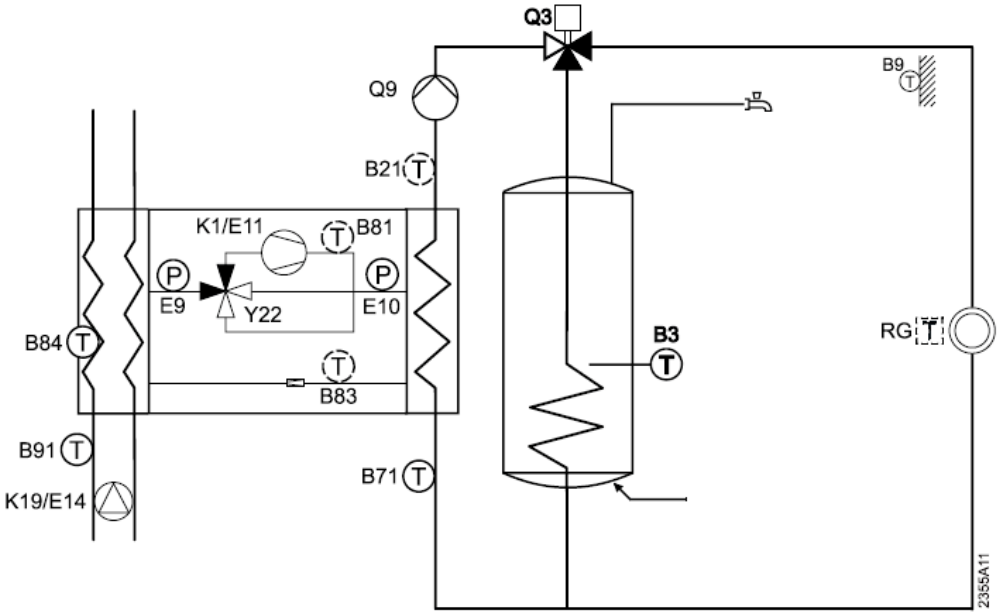
Connection Point	Socket	Terminals	Remark	Connection Status
T3	X4	1-2	Collector Sensor B6	Connection during installation
T2	B1		Hot Gas Sensor B81	Factory-connected
T3	X3	3-4	Boiler Sensor B3	Connection during installation
			Outer Air Sensor B9	Connection during installation
T2	B2		Hot Water Stream Sensor B21	Factory-connected
T2	B3		Hot Water Return Sensor B71	Factory-connected
T3	B5		Air Inlet Temperature Sensor B91	Factory-connected
T2	B4		Air Outlet Temperature Sensor B92	Factory-connected
T11	Q4		Four-way Valve Relay Outlet Y22	Factory-connected
T12	Q7	7	Boiler Resistance K6	Connection during installation
T12	Q6	8	Extra Heater Element	Connection during installation (Optional)
T12	Q9	9	Solar Energy Circulation Pump Q5	Connection during installation
T12	Q8		Compressor Crank Heater K40	Factory-connected
T11	Q2		Compressor Relay Outlet K1	Factory-connected
T11	Q3		Fan Relay Outlet K19	Factory-connected
T10	Q1	11	Condenser Pump Q9	Connection during installation
T5	D1		Flow Switch Normally Open	Factory-connected
T5	D3		Low Pressure Switch E9	Factory-connected
T5	D2		High Pressure Switch E10	Factory-connected
T13	DL1		Compressor Overload Switch E10	Factory-connected
T-HMI	HMI	12-13-14-15	12-HMI R485A//13-HMI GND//14-HMI R485B//15-HMI+24V	Connection during installation

5.2.3 Heating and Cooling Setting:



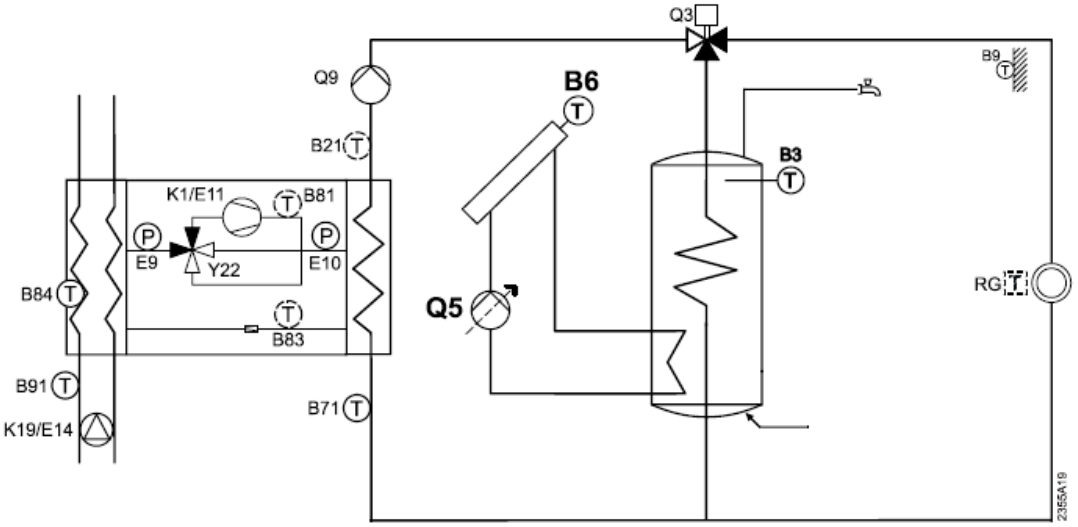
Connection Point	Socket	Terminals	Remark	Connection Status
T11	Q2		Compressor Return Sensor	Factory-connected
T2	B1		Hot Gas Sensor B81	Factory-connected
			Outer Air Sensor B9	Connection during installation
T2	B2		Hot Water Stream Sensor B21	Factory-connected
T2	B3		Hot Water Return Sensor B71	Factory-connected
T3	B5		Air Inlet Temperature Sensor B91	Factory-connected
T2	B4		Air Outlet Temperature Sensor B84	Factory-connected
T11	Q4		Four-Way Valve Relay Outlet Y22	Factory-connected
T12	Q8		Compressor Crank Heater	Factory-connected
T11	Q2		Compressor Relay Outlet K1	Factory-connected
T11	Q3		Fan Relay Outlet K19	Factory-connected
T12	Q6	8	Extra Resistance Relay Outlet	Connection during installation (Optional)
T10	Q1	11	Condenser Pump Q9	Connection during installation (contactor should be used more than 2 amperes stream or three phase pumps)
T5	D1		Water Flow Switch	Factory-connected
T5	D3		Low Pressure Switch E9	Factory-connected
T5	D2		High Pressure Switch E10	Factory-connected
T5	D4	5-16	Heating Thermostat	Connection during installation (Optional)
T5	D5	6-16	Cooling Thermostat	Connection during installation (Optional)
T13	DL1		Compressor Overload Switch E11	Factory-connected
T-HMI	HMI	12-13-14-15	12-HMI R485A//13-HMI GND//14-HMI R485B//15-HMI+24V	Connection during installation

5.2.4 Heating-Cooling-Hot Water Tank Setting:



Connection Point	Socket	Terminals	Remark	Connection Status
T11	Q2		Compressor Return Sensor	Factory-connected
T3	X3	3-4	Boiler Sensor B3	Connection during installation
T2	B1		Hot Gas Sensor B81	Factory-connected
			Outer Air Sensor B9	Connection during installation
T2	B2		Hot Water Stream Sensor B21	Factory-connected
T2	B3		Hot Water Return Sensor B71	Factory-connected
T3	B5		Air Inlet Temperature Sensor B91	Factory-connected
T2	B4		Air Outlet Temperature Sensor B84	Factory-connected
T11	Q4		Four-Way Valve Relay Outlet Y22	Factory-connected
T12	Q6	8	Extra Resistance Relay Outlet	Connection during installation (Optional)
T12	Q7	7	Boiler Resistance	Connection during installation (Optional)
T12	Q8		Compressor Crank Heater	Factory-connected
T11	Q2		Compressor Relay Outlet K1	Factory-connected
T12	Q5	10	3 Way Valve Q3	Connection during installation
T11	Q3		Fan Relay Outlet K19	Factory-connected
T10	Q1	11	Condenser Pump Q9	Connection during installation (contactor should be used more than 2 amperes stream or three phase pumps)
T5	D1		Water Flow Switch	Factory-connected
T5	D3		Low Pressure Switch E9	Factory-connected
T5	D2		High Pressure Switch E10	Factory-connected
T5	D4	5-16	Heating Thermostat	Connection during installation (Optional)
T5	D5	6-16	Cooling Thermostat	Connection during installation (Optional)
T13	DL1		Compressor Overload Switch E11	Factory-connected
T-HMI	HMI	12-13-14-15	12-HMI R485A//13-HMI GND//14-HMI R485B//15-HMI+24V	Connection during installation

5.2.5 Heating-Cooling-Hot Water and Solar Energy Setting:



Connection Point	Socket	Terminals	Remark	Connection Status
T3	X4	1-2	Collector Sensor B6	Connection during installation
T2	B1		Hot Gas Sensor B81	Factory-connected
T3	X3	3-4	Boiler Sensor B3	Connection during installation
			Outer Air Sensor B9	Connection during installation
T2	B2		Hot Water Stream Sensor B21	Factory-connected
T2	B3		Hot Water Return Sensor B71	Factory-connected
T3	B5		Air Inlet Temperature Sensor B91	Factory-connected
T2	B4		Air Outlet Temperature Sensor B92	Factory-connected
T11	Q4		Four-way Valve Relay Outlet Y22	Factory-connected
T12	Q7	7	Boiler Resistance K6	Connection during installation
T12	Q6	8	Extra Heater Element	Connection during installation (Optional)
T12	Q9	9	Solar Energy Circulation Pump Q5	Connection during installation
T12	Q5	10	3 Way Valve Q3	Connection during installation
T12	Q8		Compressor Crank Heater K40	Factory-connected
T11	Q2		Compressor Relay Outlet K1	Factory-connected
T11	Q3		Fan Relay Outlet K19	Factory-connected
T10	Q1	11	Condenser Pump Q9	Connection during installation
T5	D1		Flow Switch Normally Open	Factory-connected
T5	D3		Low Pressure Switch E9	Factory-connected
T5	D2		High Pressure Switch E10	Factory-connected
T5	D4	5-16	Heating Thermostat	Connection during installation (Optional)
T5	D5	6-16	Cooling Thermostat	Connection during installation (Optional)
T13	DL1		Compressor Overload Switch E10	Factory-connected
T-HMI	HMI	12-13-14-15	12-HMI R485A//13-HMI GND//14-HMI R485B//15-HMI+24V	Connection during installation

6. ECOCYCLE CONTROL PANEL

1.Buttons and Functions:

Info: Pressing this button from any screen gives you access to all current values of the heat pump.

Alarms: When pressing the alarm button (the red LED flashes if an alarm is active), the alarm management menu is displayed.

Escape: Returns to the previous level in the menu tree. Pressing this button during modification invalidates the change being made and returns the user to the previous menu. This function is very important if a setting is inadvertently modified.

And if this button is held down, the HMI settings and the Controller List are accessed.

OK / Roll: The scroll wheel has six functions:

1. In a menu, it is used to move up and down the list of possible options.

2. It can change the value of a setting when it has been selected.

3. It is used to access a submenu.

4. Activate the modification of a setting.

5. Validate the modification of a setting.

6. If logging in with one user level, press and hold key **ROLL** to activate the log in/off page.

If not, press and hold key **ROLL** to redict to the password entering page.

Notes:

	⚠ **CAUTION** **National safety regulations** Failure to comply with national safety regulations may result in personal injury and property damage. • Observe national provisions and comply with the appropriate safety regulations.

	The device is considered an electronics device for disposal in terms of European Directive 2012/19/EU and may not be disposed of as domestic garbage. • Dispose of the device through channels provided for this purpose. • Comply with all local and currently applicable laws and regulations.

2.Main Menu:

When the heat pump user interface is first opened, the main menu welcomes you. From this menu you can easily access all modes and setting menus.

You can move up and down with the Roll button and enter the desired menu by pressing on it.

3.Heating Mode Menu:

You can access the settings for this mode by selecting heating mode from the main menu.

1	Heating Mod	Off
2	Heating Setpoint	28.0°C
3	Differantial	2.0 °C
4	Setting Mod	Constant
	Setpoint at -10C	28.0°C
	Setpoint at -5C	28.0°C
	Setpoint at 0C	28.0°C
	Setpoint at +5	28.0°C
	Setpoint at +10	28.0°C
5	Smart Grid dT Heating	0.0°C
6	Heating Time Program	
7	Night Mode	Off
	Night Mode Start	*
	Night Mode End	*

1) **Heating Mode:**
   - Open: The heat pump is switched on.
   - Off: The heat pump turns off.
   - Auto: The heat pump operates according to the time program.

2) **Heating Setpoint:** It is the setting value of the heat pump water outlet temperature.

3) **Differantial:** The heat pump starts to reduce speed when the water outlet temperature reaches the setpoint value. If there is no need for heat, the water outlet temperature continues to rise. When half of the differential value + set value, the heat pump shuts off. When the set value - half of the differential value, the heat pump starts to work again.

   For example:
   Set value : 50°C
   Differential: 6°C
   Heat pump off : 50 +(6/2) = 53.1°C
   Heat pump restart: 50 -(6/2) = 46.9°C

4) **Setting Mode:**
   - **Constant:** The heat pump operates constant according to the setpoint value entered in the on position.
   - **Curve:** If you put the heat pump in curve mode, you need to enter the outlet water temperature according to the different outdoor temperatures under setting mode. Thus, the heat pump automatically creates a curve according to the entered setpoint values and operates.

5) **Smart Grid dT Heating:** If you have a solar panel and an inverter panel, your Ecocycle heat pump can be integrated into your solar panel. In this case, the solar panel inverter sends information to the heat pump in case of free energy. If you activate this setting, your heat pump will heat for free with the heating setpoint + smartgrid (°C). For example, let the setpoint be 50°C. If you enter this setting as 5°C, the heat pump will heat the water 5°C more in case of free energy. The new water temperature will be 55°C.

6) **Heating Time Program:**

If you want to run your Ecocycle heat pump in Automatic mode, you can set your time program from this menu. You can determine how many degrees it will operate on different days, at which hours.

7) **Night Mode:** You can make the heat pump run quieter at night by setting the night mode. For this, enter the start and end times of the night and turn it on.

3.Cooling Mode Menu:

1) **Cooling Mode:** You can set the cooling mode on or off.
2) **Cooling Setpoint:** Water outlet temperature setting value when the heat pump cooling mode is on.
3) **Smart Grid dT Cooling:** As in heating mode, if you have solar panels and an inverter, your heat pump will provide extra cooling up to the set value in case of free energy.

4.DHW Mode Menu:

1	DHW Mod	Off
2	DHW Setpoint	40.0 °C
3	DHW Differantial	5.00 °C
4	DHW Recharge	Off
5	Legionella Function	Off
6	Legionella Setpoint	70.0 °C
7	Legionella Time	240.0 min
8	Legionella Interval	5.00 Days
9	Smart Grid dT DHW	0.000 °C

1) **DHW Mode:** You can switch the hot water mode of your Ecocycle heat pump on or off.

2) **DHW Setpoint:** You can set the temperature of the hot water tank here.

3) **DHW Differantial:** The set differential value indicates when the heat pump will be activated. For example, if the DHW setpoint is 40°C and the differential value is 5°C. If the hot water tank is 40-5=35°C, the heat pump will restart.

4) **DHW Recharge:** If you have an urgent need for hot water, you can activate the re-charge option. Your heat pump will then start heating your hot water tank directly.

5) **Legionella Function:** You can activate this function to prevent legionella bacteria in your hot water tank. Requires additional heater.

6) **Legionella Setpoint:** It is the desired setpoint. In order to reach the setpoint, the heat pump heats up to the maximum temperature. As there will be a need for more temperature, it activates the additional heater and reaches the desired setpoint.

7) **Legionella Time:** The legionella function is active for the set time.

8) **Legionella Interval:** You can set how often you want the Legionella function to be activated.

9) **Smart Grid dT DHW:** If your solar panel has free energy, the heat pump will heat your hot water tank above the setpoint.

5.Solar Menu:

1	Solar On Dif.	8.00 °C
2	Solar Off Dif.	4.00 °C
3	Max DHW Temp.	70.0 °C

1) **Solar On Dif.:** Indicates when the collector circulation pump will be activated. For example, let your hot water tank be 45°C, if you set the differential value to 8°C, when the collector is 45+8 = 53°C, the collector pump is activated and heats your hot water tank.

2) **Solar Off Dif.:** The collector indicates when the circulation pump will turn off. For example, let your hot water tank be 45°C, if you set the differential value as 4°C, when the collector is 45+4 =49°C, the collector pump is deactivated and does not heat your hot water tank.

3) **Max DHW Temp.:** You can heat your hot water tank with the help of the collector up to the set value. You cannot heat with the collector above this value.

6.Functions: (only for services)

1	Cooling Circuit	Off
2	DHW Circuit	Off
3	Solar Circuit	Off
4	DHCP	On
5	IP Adress	192.168.1.2
6	BACnetIP	Passive
7	Master	Off
8	Activate	Off
9	Vacuum Operation	On

1) **Cooling Circuit:** You can switch the Cooling function on or off. After changing the setting, the setting must be activated. The heat pump will restart.

2) **DHW Circuit:** You can switch the DHW function on or off. After changing the setting, the setting must be activated. The heat pump will restart.

3) **Solar Circuit:** You can switch the Solar function on or off. After changing the setting, the setting must be activated. The heat pump will restart.

4) **DHCP:** If DHCP mode is on your heat pump can connect to the cloud system, if it is off it cannot.

5) **IP Adress:** When DHCP is on, you can see the IP address that the device receives automatically. When DHCP is off, you can change the IP address of the device.

6) **BACnetIP:** You can operate your Ecocycle heat pump integrated into your smart home automation via Bacnet interface. Passive mode means off.

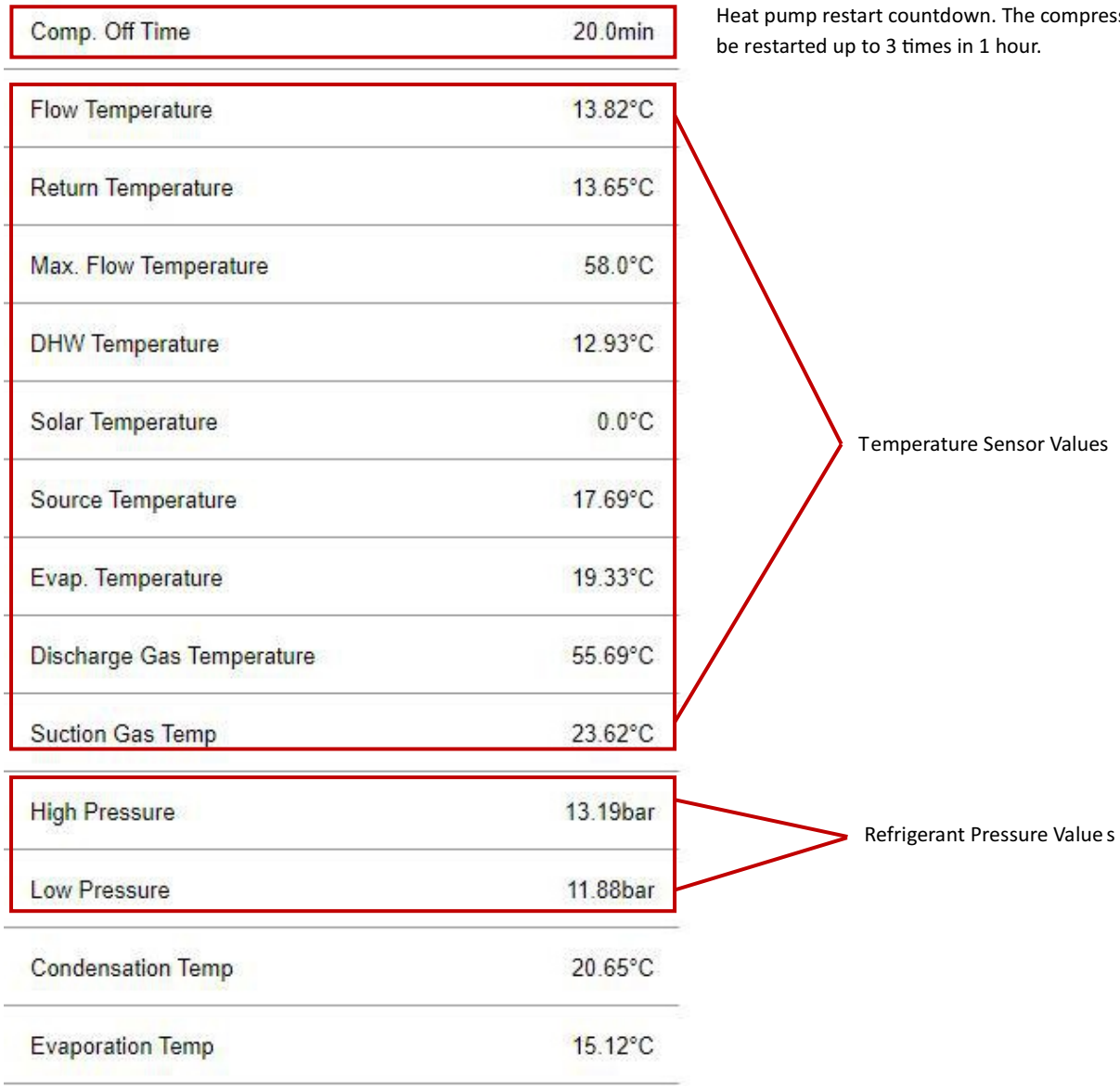
7) **Master:** If you want to operate more than one Ecocycle heat pump in cascade, the Master must be switched on to select the master device. In off state it will remain as slave. After changing the setting, the setting must be activated. The heat pump must be restarted. Cascade connection is explained in detail in chapter 12.

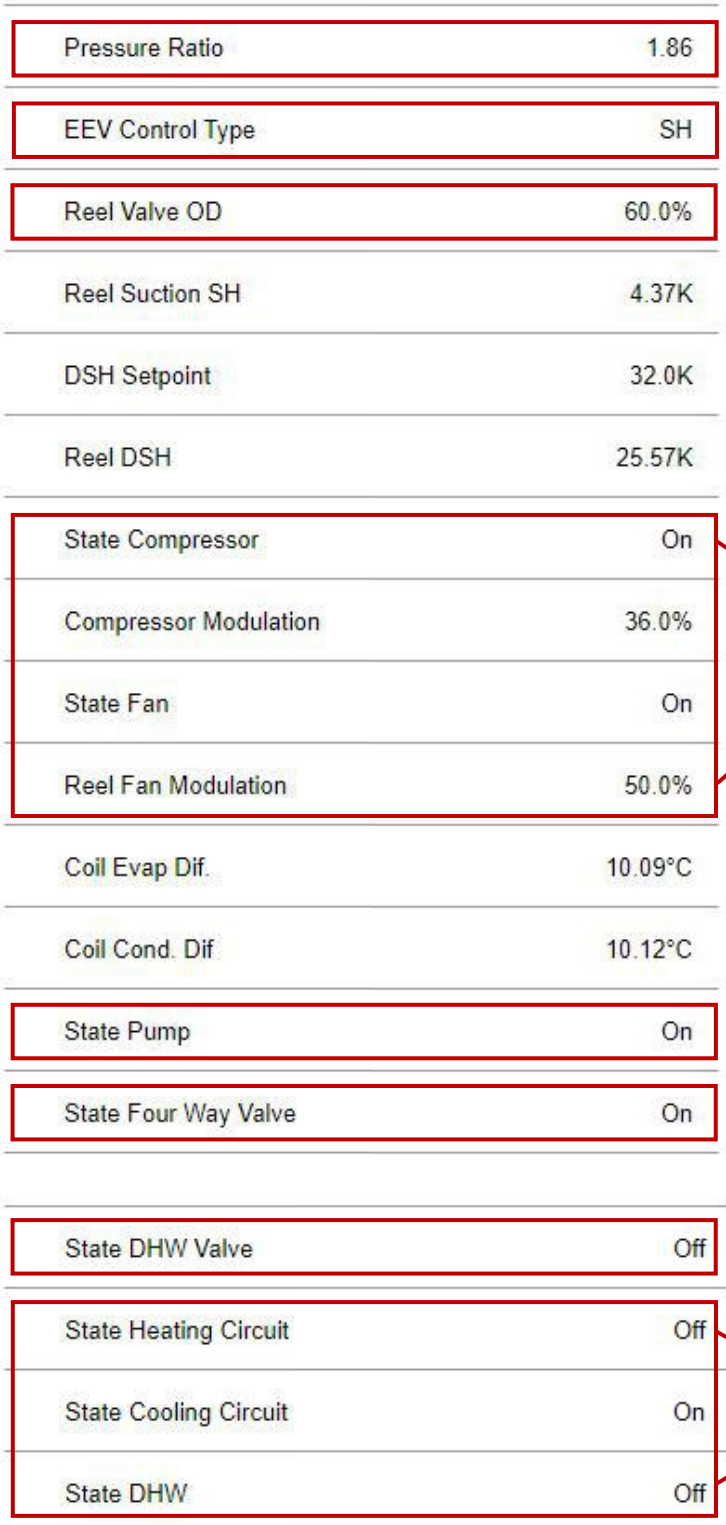
8) **Activate:** To memorize the all settings, you need to turn the activate button on. The heat pump will restart.

9) **Vacuum Operation:** To completely vacuum the remaining gas inside the heat pump during service intervention, the vacuum mode must be activated. EEV will be switched on at 100%. When the process is finished, it must be turned off again, otherwise your heat pump will not work properly.

7.Info Menu:

From the Info menu, you can access all the data of your Ecocycle heat pump.





Compressor Pressure Ratio = High Pressure / Low Pressure

Electronic expansion valve control method: SH, Protect SH and DSH.

Electronic expansion valve opening percentage

Compressor and Fan informations

Circulation Pump status

4-way valve status. If cooling mode or defrost is active, it is open, otherwise it is closed.

If there is a 3-way valve, it turns on when you switch to hot water mode.

Status of modes

IP DHW	65.0 °C
DHW Heater	Off
Extra Heater	Off
Solar Pump	Off
Crank Heater	Off
Freeze Protection	Off
Defrost State	Off
Forced Defrost Time	120.0min
Defrost Setpoint	20.0°C
Defrost Differantial	-2.11°C
State Compressor	13
Compressor Speed Feedback	41Hz
Compressor Driver Temp.	47°C
Compressor Power Consumption	0kW
Comp.Driver Error 1	0
Comp.Driver Error 2	0
Last Driver Error 1	32768.0
Last Driver Error 2	0.0

DHW memorized value

Hot Water Tank heating element

If there is an extra heater, it shows its status.

Solar energy (collector) circulation pump

Compressor crank heater for oil.

Freeze protection mode; water circulation continues even if the heat pump is switched off at low temperatures.

Defrost status informations

Compressor status, speed information, inverter driver temperature, power consumption and error information if available.

8.Parameters:

This menu contains and changes some settings of the heat pump. The Parameters menu is not accessible to the end user. Access to this menu is only available for service and factory. A user password is required to enter.

9.Language:

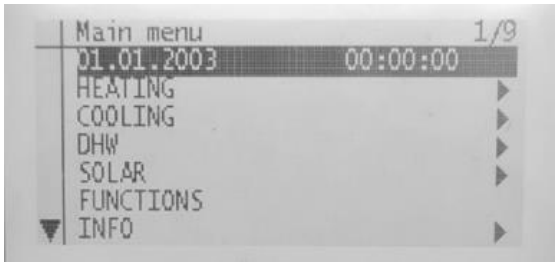
LANGUAGE	English

You can choose from the available languages to control your heat pump.

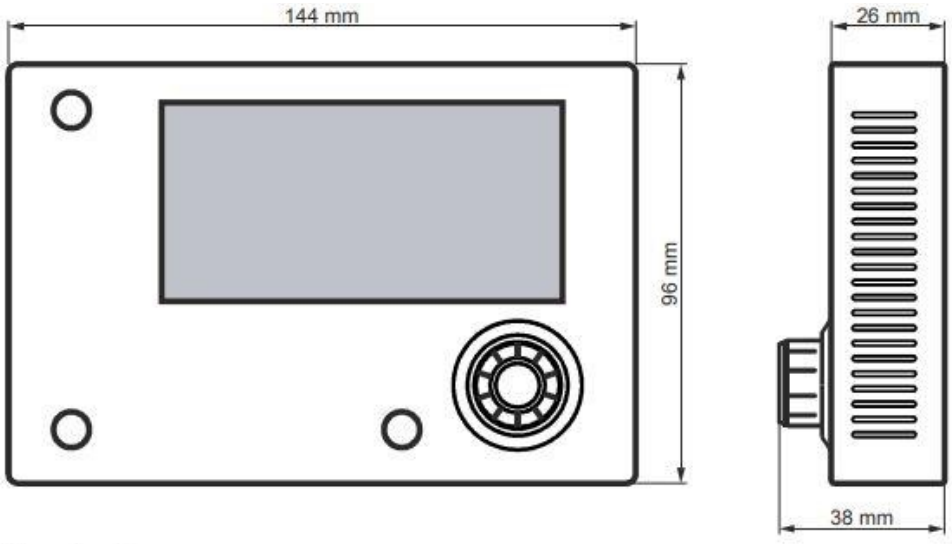
- Turkish
- English
- Deutsch
- Netherlands

10.Date and Time:

You can edit the date and time information by using the Roll button at the top of the main menu. You can press the OK button and roll to edit.



11.Dimensions:

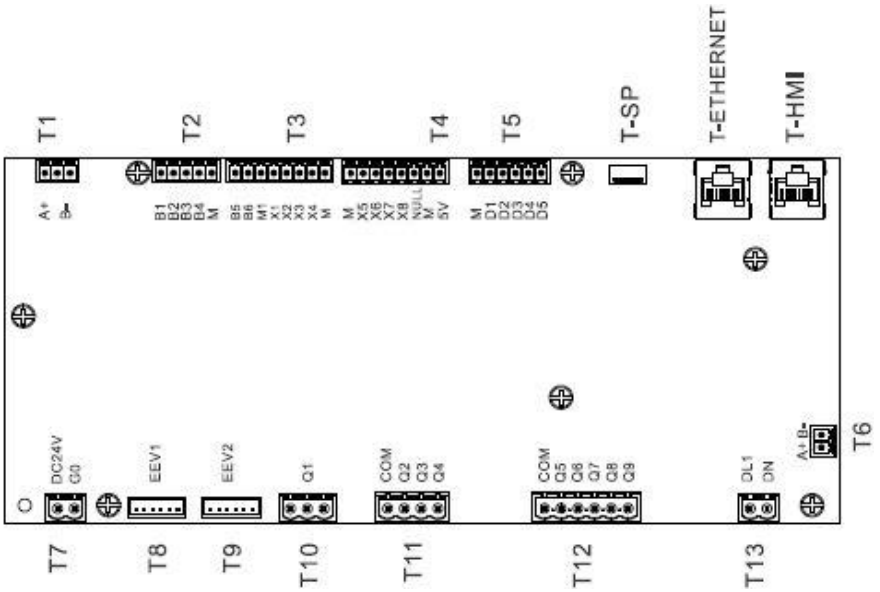


Dimensions in mm

12. Cascade Connection:

You can follow the steps below to connect more than one Ecocycle heat pump in cascade. Maximum 1 Master + 10 Slave heat pumps can be connected to the cascade connection. Thanks to the cascade connection, you can manage all devices from a single device and learn about possible error situations.

Cable Connection:

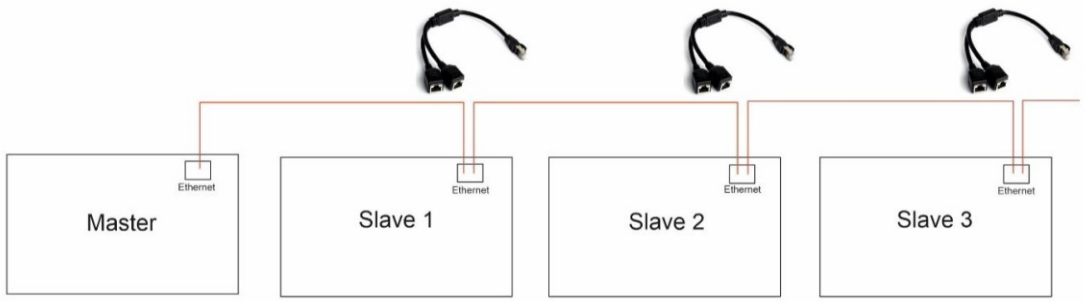


Heat Pump Control Board

RJ45 Coupler Adapter

LAN (RJ45) cable and RJ45 multiplier adapter are needed for cable connection between Master and Slave heat pumps. You can follow the steps below for cable connection.

i. Connect the LAN cable to the "Ethernet" output of the Master heat pump control card and connect to the Ethernet output of the 1st Slave device.
ii. If there will be more than one slave heat pump, RJ45 multiplier adapter is needed.
iii. Then, in order to connect to the 2nd slave heat pump, a connection must be made from the Ethernet output of the 1st slave device to the Ethernet output of the 2nd slave device. This step should be repeated for more slave heat pumps.
iv. A sample connection diagram is shown below.



Connection Settings:

After the cable connection between the heat pumps, the settings of the Master and Slave devices must be entered. The following steps can be followed for this.

Cooling Circuit	Off
DHW Circuit	Off
Solar Circuit	Off
DHCP	On
IP Adress	192.168.1.2
BACnetIP	Passive
Master	On
Number Of Device	0
Activate	Off
Vacuum Operation	On

i. To determine the master device, you need to enter the "functions" section from the HMI screen of the heat pump you have selected. This menu is only accessible by the service or manufacturer.

ii. Once in the functions menu, DHCP must be turned off if cloud connection is not desired. If cloud connection is desired, it should be turned on.

iii. The "Master" command must be turned on on the device where the master is determined and the activation process (Activate) must be done. The heat pump will be restarted.

iv. After the heat pump is restarted, enter the functions menu again and enter the "Number of Devices" that will work as slave. And the activation process should be done again. The heat pump will restart. This is the master device settings.

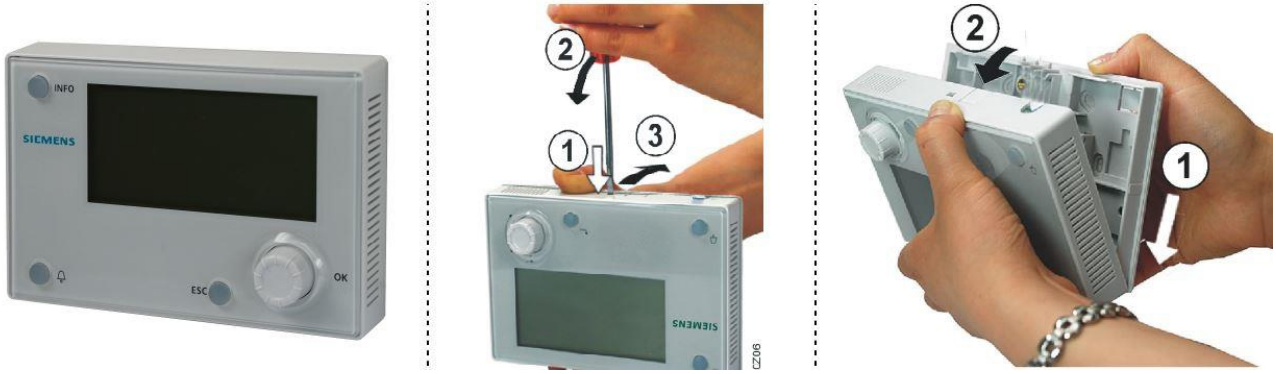
v. Then, by logging into the functions menu from the HMI screen of the slave devices, DHCP should be turned off and the setting should be activated. The heat pump will restart.

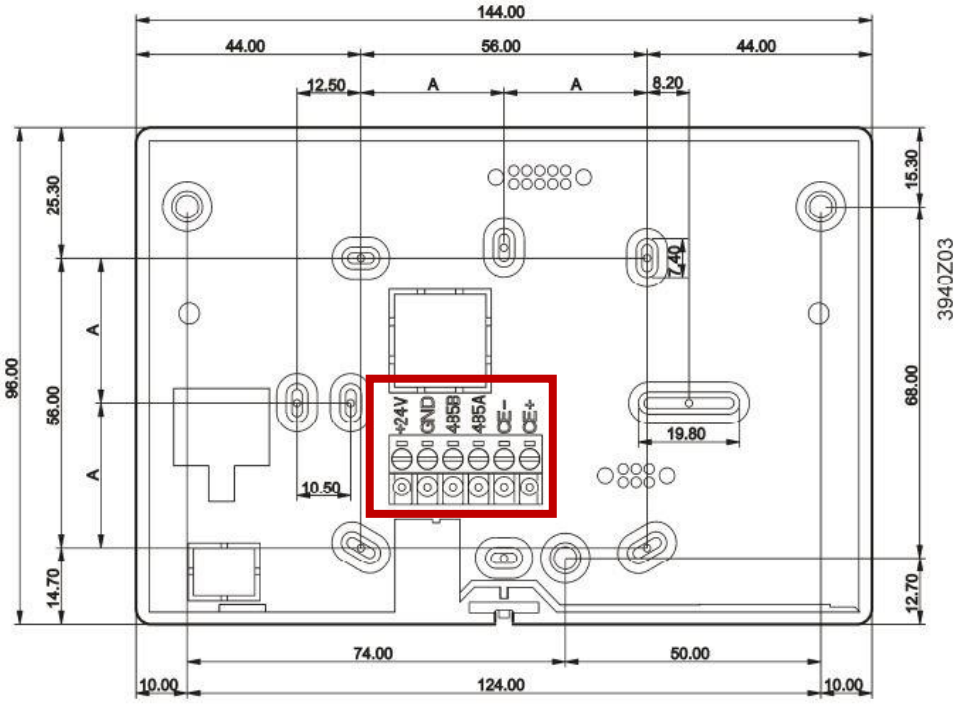
vi. When the heat pump restarts, the IP address of the heat pump should be set manually from the "IP Address" section by entering the functions menu again. 1. It should be set as 192.168.1.101 for the slave device. After the IP settings are made, the activation process should be done again.

2. 192.168.1.102 for slave device // 3. 192.168.1.103 for slave device
4. 192.168.1.104 for slave device // 5. 192.168.1.105 for slave device
6. 192.168.1.106 for slave device // 7. 192.168.1.107 for slave device
8. 192.168.1.108 for slave device // 9. 192.168.1.109 for slave device
10. 192.168.1.110 for slave device

vii. In non-slave heat pumps, the "Master" setting must be off. These are the slave device settings. You can control all heat pumps from the Master device.

13. Mounting Instructions:





Ecocycle heat pump and HMI connection:

First remove the back cover of the control unit as shown in the first picture.

Then, the cables coming from the heat pump should be connected to the part marked in red in the second picture on the removed back cover as in the table on the side.

Heat Pump Terminals	HMI Terminals
12	R485A
13	GND
14	485B
15	+24V

7. SERVICING

7.1. Repairs

	**Warning for danger!** Repairs to the heat pump may only be carried out by qualified personnel.
	**Warning for danger!** Make sure that the heat pump is disconnected from the power supply before opening the housing. Additionally, take measures to prevent the power from being switched on prematurely.

When the heat pump is disconnected from the mains, the unit can be safely operated.

7.2. Troubleshooting

A malfunction of your heat pump system may have several causes. We can't always see some of these by monitoring the system from distance, but most of the time we can see the consequences.
Below are instructions for a first general check and more directed instructions for specific error messages.

7.2.1. First check in case of an error

In order to be able to assist you in a number of cases, we have prepared a checklist for malfunctions. As you follow this, we can detect the problem faster and more accurately. A problem is often noticed when the temperature of the living space and / or the hot water boiler drops. Make sure the room thermostat is turned on. To turn it on, refer to the thermostat manual.

Item	Action
1.	Check the pressure of both expansion vessels is sufficient. This often is between 1.5 and 2 bars (depends on the installation calculations). If necessary, fill in with the filling hose. When the system has been running for some time and needs to be refilled regularly, there may be a leak.
2.	If the room is not on the right temperature, check the temperature setpoint first. The heat pump will only turn when it receives a signal.
3.	Verify that no error messages are displayed. The following section lists these reports. Follow the instructions for the appropriate notification and contact your installer if necessary.

7.2.2. Error messages and solutions

The alarm icon will flash red. You can view what the error is by pressing this key. The following table includes the error codes, error reasons and the way to eliminate the errors.

When an error is observed, read the error code and error reason written on the information screen. Do not attempt to eliminate the errors you are not allowed to interfere in as the end user (when there are expressions like call the technical team / inform the official / call an official / inform our company / contact our company / call the call centre). Otherwise, our company will not be responsible for the accidents, damages or injures that may occur.

Error	Possible Cause	Solution
Compressor Overload	High current problem at start-up or operation.	Restart the heat pump If the error occurs again, check the inverter board.
	Damaged compressor inverter board.	Replace damaged inverter board.
DSH Error	Expansion valve may be faulty.	Check the expansion valve.
	The discharge or suction temperature sensor may be faulty.	Check both sensors. Replace it if it is faulty.
Compressor Hot Gas Temperature	The filter drier in the system may be obstructed	Call the authorized service to ask for replacement of the filter drier.
	The quantity/quality of the refrigerant in the system may be wrong.	Call the authorized service to ask for help.
Flow Switch Error	There may be insufficient water flow. Or no water flow.	Check the water flow. Circulation pump may be broken, clogged pipes, clogged filters or other flow restrictions.
	The flow switch may be broken.	Call the authorized service to ask for help.

Error	Possible Cause	Solution
Driver Communication Error	No communication between the inverter drive board and the main control board.	Check the board-to-board connection cables.
		Call the authorized service to ask for help
High pressure	If the device gives this error, there can be no flow.	Circulation pump may be broken, clogged pipes, clogged filters or other flow restrictions.
	Too high quantity of refrigerant inside the system.	Call the authorized service to ask for help.
	High pressure switch may be broken.	Call the authorized service to ask for replacement.
Low pressure	If the device gives this error, there can be no flow.	Circulation pump may be broken, clogged pipes, clogged filters or other flow restrictions.
	Too low quantity of refrigerant inside the system.	Call the authorized service to ask for help.
Evap. Temperature Sensor Error	Sensor may be displaced or damaged.	Check connections on the control card.
	Sensor or wire may be broken.	Call the authorized service to ask for replacement of the sensor.
Discharge Gas Temperature Error	Sensor may be displaced or damaged.	Check connections on the control card.
	Sensor or wire may be broken.	Call the authorized service to ask for replacement of the sensor.
Suction Gas Temperature Error	Sensor may be displaced or damaged.	Check connections on the control card.
	Sensor or wire may be broken.	Call the authorized service to ask for replacement of the sensor.
Return Temperature Sensor Error	Sensor may be displaced or damaged.	Check connections on the control card.
	Sensor or wire may be broken.	Call the authorized service to ask for replacement of the sensor.

Error	Possible Cause	Solution
Flow Temperature Sensor Error	Sensor may be displaced or damaged.	Check connections on the control card.
	Sensor or wire may be broken.	Call the authorized service to ask for replacement of the sensor.
Source Temperature Sensor Error	Sensor may be displaced or damaged.	Check connections on the control card.
	Sensor or wire may be broken.	Call the authorized service to ask for replacement of the sensor.

7.2 3. Vacuum Operation

If the heat pump needs to be vacuumed, the "Vacuum Operation" mode in the functions menu should be turned on. When the vacuum process is finished, it must be turned off again. Otherwise, the device will cause malfunction.

Warning!

WARNING!
When the device does not operate;

- Do not unplug the power supply cable from the device, even if it will not be sed for a long time.

Please:

- Regularly check the electric cable connection and grounding cable leading to the power supply.
- If the system is going to operate for a long time in extremely cold areas (below 0°C), the water in the tank must be discharged to prevent damages and frosts in the tank.
- If you are going to operate the device after a long time, including the first operation, there may be some rusty water. Discharge the water until it gets normal.
- It the output water is adequate, a lower temperature is suggested to make energy saving, to prevent calcification and to reduce the heat loss.
- Shut down the power source before shutting down the system for a long period of time; Discharge all the water in the water tank and in the pipeline, and turn o ffall valves.
- Check if pipes and valves are damaged; have them repaired to prevent leakages, if damaged.
- Check if there is a foreign body blocking the air inlet-outlet
- You must keep the controller surface clean by wiping it with a soft, damp cloth. NEVER use detergents.
- There is an anode bar indicator on the boiler. When the bar turns red from green, the bar must be replaced. The calcification inside must be cleaned by removing the cleaning lid once in 2-3 years. This process can be carried out by the user himself.
- In case of an icing on the exterior unit during the heating process or the during the process of providing hot water, the process of defrosting will be automatically initiated to protect the heating capacity, while the ice defrosted will float over the base plate of the exterior unit.
- Be attentive to the fact that no snow falls on the exterior unit, or the unit does not get frozen.
- Antifreeze must be used in the circuit of water circulating in the heat pump.

!! Defrosting: Defrosting process is carried out automatically. The time of completion for this process is 5-10 minutes. The heat pump stops operating during this period.

Call the service in the following cases.

- In case of an abnormal smell of burnt, or an excessive noise, stop the device and turn o ffthe switch. Do not try to repair the device on your own in such cases.
- In case of a switch, fuse or power switch malfunction,
- If the main power supply cable is too hot or damaged, call the service.

7.3 Maintenance

7.3.1 Small regular maintenance

For proper operation of the system, regular maintenance is required. The items listed below can be used as a user by yourself. In case of doubt, contact your installer.

Item	Action
1.	Regularly check the pressure of the Delivery system. This is usually between 1.5 and 2 bar. Fill in the system if necessary. Do not forget to vent the system after filling. If you do not know the desired pressure for your resource or how to replenish, contact your installer.
2.	Regularly check the pressure of the source system. This is usually between 1.5 and 2 bar. Fill in the system if necessary. Do not forget to vent the system after filling. If you do not know the desired pressure for your resource or how to replenish, contact your installer.
3.	In an open source system, check the groundwater filter regularly and clean if necessary.
4.	Keep in mind that the supply filters on the heat pump can also be hidden. Clean it if necessary. Do not forget to close all taps.

7.3.2 Annual Maintenance

Warning for danger!

Maintenance of the heat pump may only be carried out by qualified personnel.

VISUAL INSPECTION

Item	Action
1.	Disconnect the heat pump from the mains and take measures to prevent accidental premature switching on.
2.	Check the pipework for leaks.
3.	Check in the heat pump whether all components are properly seated.
4.	Check the electrical connections and wiring in the heat pump.
5.	Check the heat pump internally for leaks. Pay particular attention to leaks of the coolant.
6.	Check the pressure in the source system and delivery system.
7.	Check the glycol content of the liquid in the source.
8.	Check that the expansion vessels are still functioning properly.
9.	Inspect the filters in the pipes and clean them if necessary.

After this checklist, the heat pump can be switched on. Further points can be considered. See next page.

Item	Action
10.	Check the settings in the heat pump software for deviations.
11.	Check that all the heat pump functions work properly.

When the heat pump has been in operation for some time, some data are interesting to note and build a history of the heat pump:

Item	Action
12.	Measure the current over each phase and record it. Increased power consumption is often an indication of wear.
13.	Note the number of operating hours of the heat pump.
14.	Note the difference in temperature between source and delivery system.
15.	Record the amount of start / stops since the previous inspection.
16.	Read recent malfunctions and see if they may be affected.

Now start the measuring, you can find an example of the maintenance sheet on the next page, but also on our website.

Add a copy of the maintenance in the documentation.

7.4 Spare parts

The ECOCYCLE heat pump is a carefully designed and highly robust device. The risk of malfunction is small, but it may prevent a component from failing. The most common components can be delivered by ECOCYCLE in the short term.

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HEATPUMPS

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