

EQUIPMENT CHARACTERISTICS

Utility water heat pump - PCWU 2.5kW uses heat contained in outdoor or ventilation air for high-efficiency hot utility water production. The temperature of outlet air from heat pump is 5-10°C lower. It may be used to cool rooms in summertime.



The PCWU 2,5kW heat pump is a complete device using RES, which offers the most extended package of possibilities for utility water heating:

- possibility of work as the only source for utility water heating beyond heating season
- all-year-round operation with ventilation air, flow exceeding 350 m³/h
- setting operation priorities for various heating devices in HUW boiler-room, so as to ensure possibly lowest costs of the system interaction
- time programmes
- circulation control
- intuitive and at the same time the most complex controller in the HUW heat pump market in Poland
- possibility to control and analyse operation statistics in EKONTROL.pL (a separate LAN module is needed)
- access to thoroughly metered thermodynamic system of the unit
- the system completeness - e.g. circulating pump, absorbing feet, all temperature sensors in the set
- complete connection accessories available in the offer (including: ducts, dampers, air guides and on-wall structures)

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1 The system safety and comfort

NOTE:

HEWALEX bears no responsibility in cases, when installation safety rules haven't been followed.
 All specified safety rules shall be strictly followed in order to avoid hazard for health or life of users and fitters!

operation **ADULT**



The unit may be operated by grown up persons only, without any mental and/or physical impairment, trained by fitter and knowing the unit Manual well.

fitting **FITTER**



The heat pump should be installed by qualified fitter possessing specialised knowledge and valid licence for electrical works up to 1kV. In case if the unit location must be changed, also use services of qualified fitters.

Secure the unit



Do not put your fingers inside the unit housing, if it is connected to power supply. There is a hazard of burning, electric shock or cutting your fingers. In particular, protect the unit against access of children.

COOLING-RELATED failures



Heat pump is filled with cooling medium allowing its correct operation. It is prohibited to allow people without required experience and qualifications cooling cycle opening. Any possible repairs should be also carried out by qualified personnel.

Flammable gases or corrosive environment



Do not install the unit near storage areas used for flammable gases or in environment, which may have corrosive impact on the equipment.

CHECKLIST



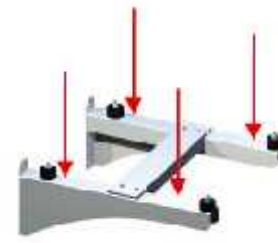
Fitting and first start-up should be carried out by a person commissioning the system according to the system start-up checklist, accompanied by the Investor. Suitable report should be made as well.

Maintenance



Evaporator should be cleaned at least 1 per year (before season) in order to ensure its efficient operation. Cut off power supply in case of cleaning or maintenance of the unit subassemblies.

Design



Make sure that the structure holding the unit is firmly fixed to the wall. The machine should be adequately levelled in order to ensure correct heat pump operation and proper condensate discharge.

Power supply



Power supply line should be provided according to the requirements specified in the Manual and laid so as to prevent its flooding with water. If it is planned that heat pump will not be used in winter season, it should be switched off only through the controller. Do not cut off power supply. Earthing is an obligatory element of power supply.

In case of emergency...



If user observes any alarming symptoms (e.g. noise or odour) indicating abnormal equipment operation, it is required to cut off power supply and consult authorised service centre.

Safety



During installation keep to industrial safety requirements according to current regulations concerning environmental protection, safety of work, and making of installations and safeguards.

The unit location



Install the heat pump in a heated room. If you do not use the unit in winter, cover air ducts in order to avoid excessive cooling of room.

THE CE CERTIFICATE

The heat pump is CE marked.

The CE mark confirms the product compliance with regulations applicable in the European Union. The compliance has been confirmed on the basis of obtained results of tests related to harmonised standards:

PN-EN 60335-1:2004/A1:2005/A2:2008,
PN-EN 60335-2-40:2004+A1:2006+A2:2009+A11:2005+A12:2005

The tests were performed by an accredited Research Laboratory in Poland.

2 Technical warranty terms and conditions

At the end of this Manual you will find Guarantee Certificate containing the following warranty terms and conditions. Correctly filled card is the basis for making a complaint regarding incorrectly working equipment.

A) It is prohibited to repair the unit without contact with HEWALEX service. In case of incorrect equipment operation, report failures by phone ((32) 214 17 10) or e-mail (serwis@hewalex.pl). Depending on failure type, service team will be sent to the site, or guidelines concerning repair of minor defects will be provided.

B) It is allowed to connect the heat pump to correctly working electrical system only. Installation requirements:

- power cable to the mains socket: 3x2.5mm² 300/500V, complying with the 227IEC53
- current protection: B16 or C16
- differential-current protection: 30mA
- correctly made earth installation (grounding resistance should not exceed 4 Ω).

All the above power supply parameters are standard and do not go beyond applicable norms.

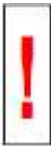
C) Water in the system must meet the requirements specified for potable water (O.J. (Poland) no. 203, item 1718). Important for own water intakes:

- pH ranges between 6.5 and 9.5
- conductivity under 2500 [µS/cm at 20°C]
- ammonia under 0.5 [mg/l]
- nitrates under 50 [mg/l]
- chlorides content under 250 [mg/l]
- copper under 2 [mg/l, permissible value provided that it does not cause any change in water colour due to its corrosive aggressiveness]
- sulphates under 250 [mg/l]
- hardness 60-500 [mg CaCO₃]

D) Water, air and wiring systems for the unit should be made according to the guidelines and connection diagram.

E) Select proper location for the unit installation. Any damage caused by improper selection of the equipment location will not be covered by the guarantee (that is caustic and polluted air drawn into the heat pump, unlevelled equipment, foundation tilting the unit, installing in an unheated room).

H) It is prohibited to switch off the unit during break in operation (e.g. in wintertime). Otherwise, user will be solely responsible for eliminating circulating pump protection against seizure and anti-freezing protection.



NOTE:

Guarantee is valid since equipment purchase date. Guarantee requires sending the checklist not later than 30 days after fitting date (however not later than 90 days from purchase date) to the following address: HEWALEX Sp. z o.o. Sp. komandytowa, ul. Słowackiego 33, 43-502 Czechowice-Dziedzice, Poland, with a note: GWARANCJA PCWU [PCWU GUARANTEE] 2.5kW, or after registering at hewalex.pl/gwarancja and filling the form.

3 Recycling and utilisation

All machine components are made of materials, which are not harmful for environment. To a large extent they are recyclable. Non-reusable materials can be utilised.

4 Environmental requirements

During maintenance and/or service works, one must satisfy important for environment requirements regarding recovery, reuse and utilisation of materials. In particular, keep to the following standards concerning cooling medium contained in freon cycle:

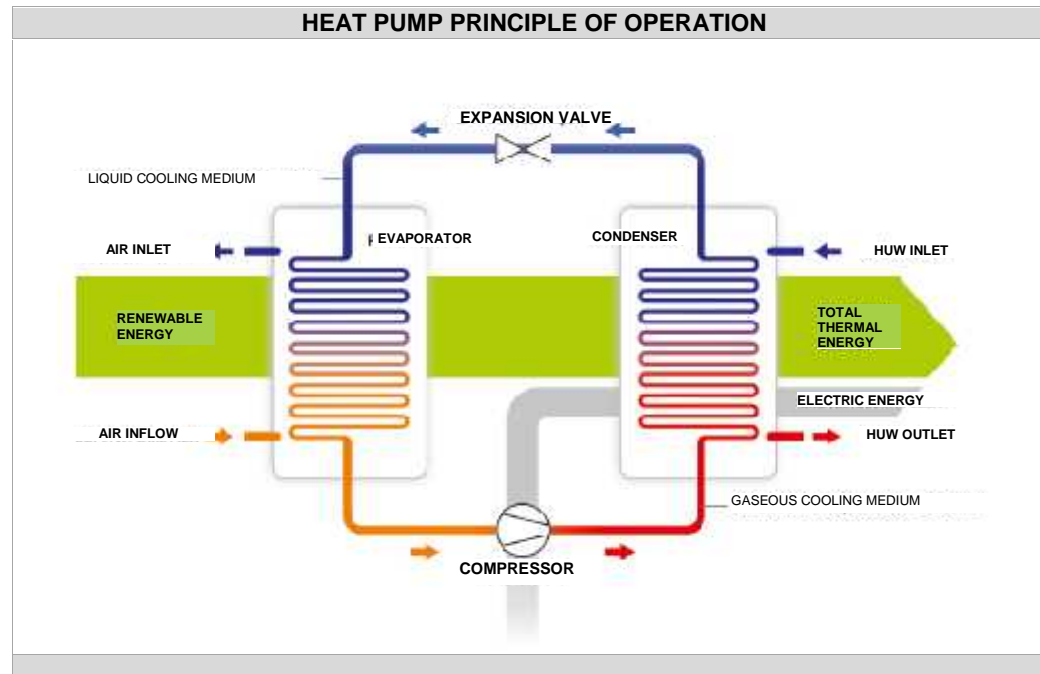
DIN 8960 Cooling medium, requirements

DIN EN 378 Cooling systems and heat pumps - requirements concerning safety and environment protection

The R410a cooling medium is safe, non-flammable, freon-free and not harmful for ozone layer.

1 Introduction

Heat pump is a device, which allows efficient absorbing of heat from our environment. Drawing heat from area of lower temperature with a compressor, it rises medium temperature. This allows using absorbed energy for heating purposes. Heat pumps belong to the category of renewable energy sources, because on average 70-80% of energy for heating is taken from environment.



Basic advantage of heat pump is that it is characterised by considerably lower electric energy consumption than thermal energy generated by it. Compared to electric heater of the same power, electric energy consumption is few times lower. Therefore, the main parameter characteristic for heat pump operation is the COP (coefficient of performance). Below you will find an explanation how heat pump works and how different factors affect its operation efficiency.

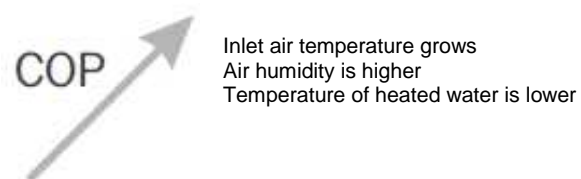
The COP coefficient is calculated according to the following formula:

$$\text{COP} = \frac{\text{equipment heating power}}{\text{absorbed power of the drive}}$$

The COP coefficient depends primarily on the temperature of air delivered to heat pump and utility water temperature required by us. The higher COP value, the better efficiency of our installation.

The COP coefficient drops with decreasing air temperature, and due to physical parameters of the medium in compressor system it becomes impossible to receive heat for certain low temperature of the source. The same problem applies to the temperature on heated water side. Raising required utility or heating water temperature will also lower the COP coefficient value. Therefore, in order to maximise efficiency of heat pump use we should make efforts to provide optimal conditions of its operation that is to ensure adequately warm air for its work, and to consider whether preset heating temperature of the heat pump is not unnecessarily too high.

From point of view of the system economy, if utility water temperature ranging from 45 to 50°C is comfortable for us, then heat pump should work up to the temperature of 50°C (its restart according to factory settings will take place as soon as temperature in the tank drops to 45°C). In other heating sources, where cost of heating does not depend on the temperature of heated water, a frequently applied solution involves vessel superheating and using a mixing valve - in case of heat pumps it is not an economically justified solution.

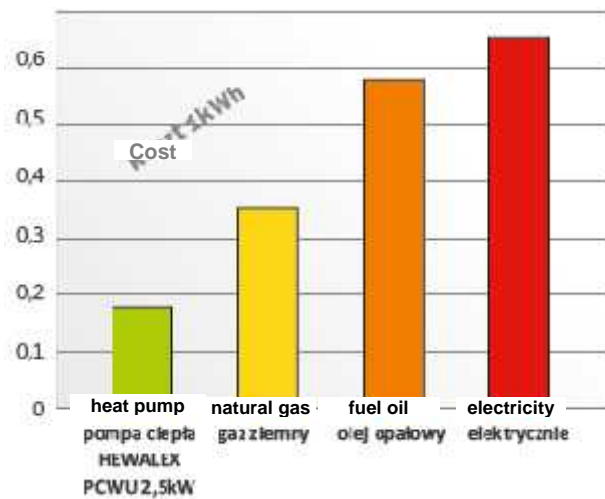


The essence of operation of such machine as heat pump is its work with heat transmitted during phase transitions. Therefore, using special cooling media, we are able to receive heat at low air temperature values and transfer it to warmer water without high energy expenditure. In some way, it is a system much like refrigerator - from its interior we carry heat out of cooling chamber. In case of heat pumps the process is reverse, however analogical as regards its principle - heat is drawn from environment and transferred inside utility water tank.

2 Savings

One of the main criteria for equipment purchase is to ensure savings during its operation. Especially, when we use electric heaters or oil-fired boiler for HUW heating in summertime, we have economic grounds for switching to air heat pump. In case of solid fuel fired boiler we speak less about economic profits compared to combusted fuel itself, because water heating costs are comparable - here, decisive issues are: automatics of the system operation and possible costs, which have to be incurred for chimney repair in case of boiler work at low parameters (flue gas condensation).

Below we show costs for 1kWh of heat in summertime for various automatic equipment:



1. For heat pump – average-season COP coefficient = 3.4; cost for 1kWh of electric energy 0.65 PLN

2. For natural gas assumed cost is 2.15 PLN/m³ (fixed charges not included), min. kWh content in 1 m³ of gas (according to standard) reaching 8.61 kWh/m³, actual efficiency of gas-fired boilers in summertime (low-load work), near 70%

3. For oil heating, cost for 1l of oil 4.10 PLN, actual efficiency of oil-fired boilers in summertime near 70%, kWh content in 1l of oil: 10 kWh/l

4. Cost of 1 kWh of electric energy, 0.65 PLN/kWh

In case of using heat pump for room cooling, return on investment will be even faster - cooling is a side-effect, and therefore it is completely free and reduces return on investment period to 2-3 years.

3 Heat pump design

Main parameters of the compressor in heat pump system:

- 1) Increases cooling medium pressure and temperature to allow efficient heat transfer in heat pump condenser
- 2) The compressor has considerable impact on the efficiency and productivity of the whole process, because this heat pump section consumes ca. 90% of electric energy.

Rotary compressor has been used in the PCWU 2.5kW heat pumps.

Condenser. Shell-and-tube heat exchanger has been used as a device, in which heat is transferred to utility water. Utility water flows through copper tube with extended heat exchange area. Cooling medium flows in jacket between housing and internal cylinder. During heat transfer it condenses from gaseous form to liquid and returns process heat previously drawn in the evaporator.

Due to the exchanger design, we can work directly with utility water, considering both hygiene and negligible exchanger susceptibility to scaling.

Medium state changes from liquid to gaseous inside the evaporator. During evaporation, the medium draws a lot of heat from air (this heat will be returned to utility water during condensation). Due to low specific heat of air, we have to force air flow through evaporator using the fan.

Remember that soiled evaporator (e.g. with greasy air, pollens or leaves) will draw heat from air in a considerably less efficient way.

Electronic, automatically controlled precision expansion valve. Expansion valve is expected to ensure that cooling medium in evaporator draws heat from air washing the evaporator. Heat transfer is generated through medium evaporation. Depending on medium temperature difference before and after the evaporator, expansion valve either opens (at the moment when high volume of heat may be drawn in evaporator - larger amount of the medium can be evaporated) or closes (if too much medium is being sent to the evaporator and all of it cannot be evaporated because of

insufficient amount of heat in air). Expansion valve opening or closing changes medium pressure before evaporator - and thus modifies medium evaporation temperature (lower pressure - the medium boils at lower temperatures, and for higher pressure - at higher temperatures).



Controller map

MENU

Login [default 0000]

Parameter settings

Heat pump operation parameters

Heat pump activation [YES/NO, factory setting YES]

HUW temperature for heat pump [10-60°C, factory setting 50°C]

Minimum ambient temperature (T1) [-5-10°C]

Parameters of accessory equipment

Heater E [shown in diagrams no. 3,4,5,6,7,8,9]

Heater activation [YES/NO, factory setting YES]

HUW temperature for heater - heat pump on [30-60°C, factory setting 45°C]

HUW temperature for heater - heat pump off [30-60°C, factory setting 55°C]

Heater stoppage during heat pump operation [YES/NO, factory setting YES]

Heater stoppage during gas-fired boiler operation [YES/NO, factory setting YES -

shown in diagrams no. 4,7,9]

Heater P [shown in diagrams no. 4,5,6,7,8,9]

Heater activation [YES/NO, factory setting YES]

HUW temperature for heater - heat pump on [30-60°C, factory setting 45°C]

HUW temperature for heater - heat pump off [30-60°C, factory setting 55°C]

Heater stoppage during heat pump operation [YES/NO, factory setting YES]

Heater stoppage during gas-fired boiler operation [YES/NO, factory setting YES -

shown in diagrams no. 4,7,9]

Circulating pump [shown in diagrams no. 2,3,4,6,7,8,9]

Minimum circulating pump activation temperature [20-60°C, factory setting 35°C]

Circulating pump operation mode [INTERMITTENT/CONTINUOUS, factory setting INTERM.]

Solid fuel fired boiler B [shown in diagrams no. 5,7,9]

Max. boiler pump deactivation temperature [10-85°C, factory setting 65°C]

Min. boiler pump activation temperature [30-60°C, factory setting 45°C]

Temperature difference for boiler pump activation [5-15°C, factory setting 8°C]

Solid fuel fired boiler heating priority [YES/NO, factory setting YES]

Gas-fired boiler D [shown in diagrams no. 6,7,8]

Max. boiler pump deactivation temperature [10-85°C, factory setting 65°C]

Boiler stoppage during heat pump operation [YES/NO, factory setting YES]

Time programmes

Heat pump

Heater E

Circulating pump [shown in diagrams no. 2,3,4,6,7,8,9]

Gas-fired boiler D [shown in diagrams no. 6,7,8]

Anti-Legionella [shown in diagrams no. 3-9]

Anti-Legionella function activation [YES/NO, factory setting YES]

Protection carried out by heater E [YES/NO, factory setting YES]

Protection carried out by heater P [YES/NO, factory setting YES]

Protection carried out by gas-fired boiler [YES/NO, factory setting YES, shown in diagrams no. 6,7,8]

Passwords

User

Controller settings

Date and time

Display

Backlight brightness [1-10, fab.10]

Inactivity time until backlight switching off [1-10min., factory setting 10min.]

Sounds

Sound of keys [YES/NO, factory setting YES]

Sound of alarms [YES/NO, factory setting YES]

Port RS485

Transmission rate [by default 115200]

Physical address [by default 255]

Logic address [by default 65535]

Language

Polish

English

German

Manual control

Measured indications

Info

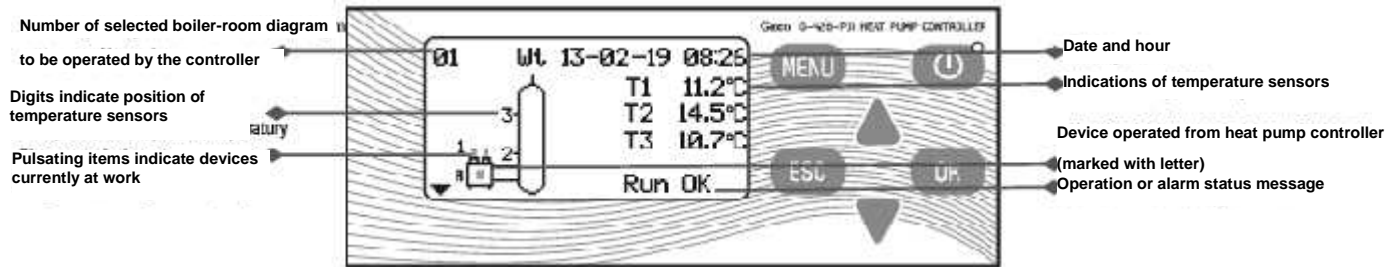
Software replacement [only for manufacturer]

Heat pump start-up

The following messages will be displayed for few seconds after switching on power supply of the machine. Please, do not touch keyboard then.



Main screen of the controller will appear then. It contains the following:



Start with studying basic pushbuttons to freely move through the controller.



Approval key. Press it to approve settings or enter required controller level.



Arrow up. You will move to higher items in the list, or return to the main screen from the screen showing internal diagram of heat pump.

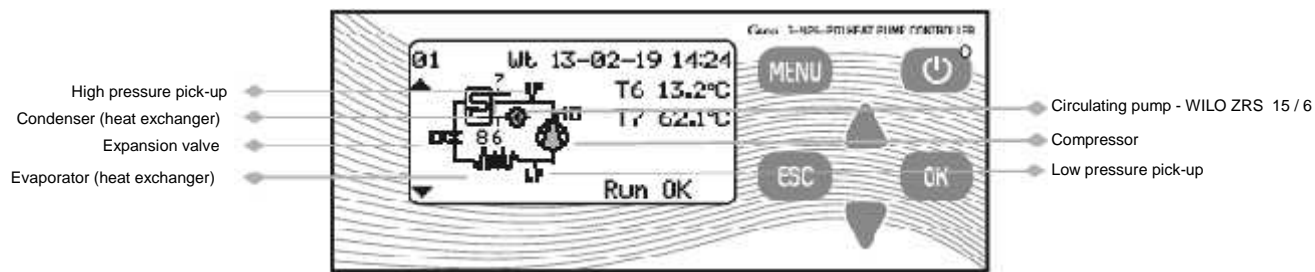


Return key. Press it to return to previous controller level without saving setting changes.

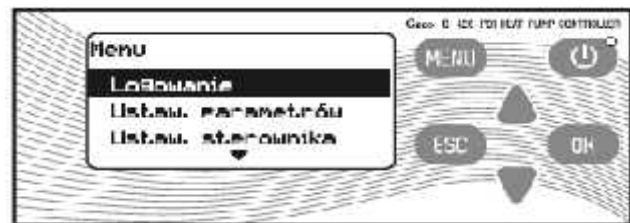


Arrow down. You will move to higher items in the list, or go from the main screen to the screen showing internal diagram of heat pump.

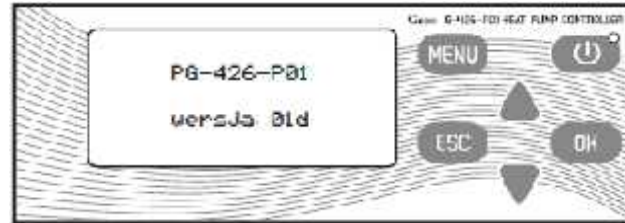
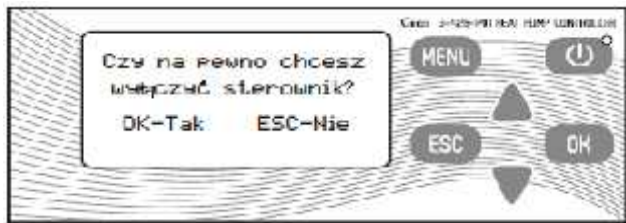
Press arrow down to move to internal diagram of heat pump. Press arrow up or wait few seconds to return to the main screen.



Press this button to enter individual settings menu. A list of settings or information to browse or change will appear. Press arrow down to see the whole list. Press arrow up to return to previous items.



The unit on/off pushbutton. Confirmation screen will appear after pressing this button (below, on the left side). Press OK to switch off the controller.



NOTE:

It is prohibited to cut off power if the unit is filled with water. This will deactivate tank protection and circulating pump safeguards.

Login is the first item in Menu (below, on the left side). Press OK. Access screen appears where password should be entered (photo below, to the right). By default, for the user it has been set to 0000 (press OK 4 times). After the next 5 minutes from return to the main screen the password will be saved and there is no need to enter it again throughout the controller. Fitter's password is provided in installation and service instructions in the controller map.



Operation parameters settings

After approval we may enter parameter settings (screen view below on the left side). Scrolling arrow down, we may also see second part of the list (below, to the right).



Heat pump parameters

3 items will appear when we enter heat pump parameters (OK pushbutton). Press OK, the value in grey field will start to pulsate. Then, set the required value using arrows and confirm with OK.



YES - heat pump will work until the required water temperature in the tank is reached. If the heat pump is set to YES, its operation may be stopped only by an alarm or settings of other equipment priorities.

NO - heat pump will not switch off



It is possible to change heated water setting within 10 to 60°C.



It is possible to preset min. ambient temperature to which heat pump is to keep working (measured temperature at air inflow to the heat pump).

Depending on second heat source used to heat up water, it is possible to choose min. ambient temperature (sample values):
 -5°C - electric (-5°C is the minimum temperature acceptable by the controller, however operation within 0 to -5°C results in faster wear and tear of the compressor)

- 0°C - fuel oil
- 4°C - liquid gas
- 8°C - natural gas

In case if solid fuel fired boiler is working, heat pump will not activate when the option of heating with solid fuel fired boiler is set.

Parameters of accessory equipment

The second item in the list of Parameter settings is: Parameters of accessory equipment. The following list will appear depending on the selected diagram run by the controller:



Diagram no. 2:



Diagram no. 3:



Diagram no. 4, 5a, 6a, 7a, 8a, 9a:



Diagram no. 5b, 9b:



Diagram no. 6b, 8b:

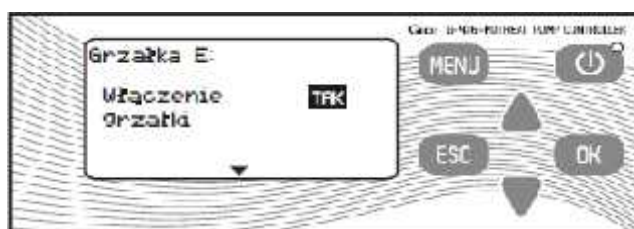


Diagram no. 7b:

Diagram no. 1 supports heat pump only, therefore no additional heating sources will appear. Symbols a or b on the above screens indicate more heating devices, which do not fit on a single screen. After moving arrow down we switch from screen a to screen b.

Parameters of heater E and heater P

The first parameter shown is activation/deactivation of connected electric heater (below, to the left). YES will start to pulsate after pressing OK. The setting can be changed to NO using an arrow. Press OK to approve, or ESC to cancel without saving (the parameter returns to initial value). When no value pulsates, it is possible to move using arrows to another parameter, which allows setting the temperature of heating with a heater while heat pump is on (below, to the right). The heater will be heating up the tank with heat pump to that value, provided that heat pump independent operation priority is not activated. It is important to ensure that this temperature setting is not higher than the temperature, to which heat pump keeps heating - otherwise heat pump will never be able to work, because heater will keep the required water parameter. The heater works at constant hysteresis of 2°C (drop of water temperature, which restarts heat pump). This solution is frequently called the PARTY mode - if more people than usually are to use utility water, it is worth activating simultaneous operation of heater or other heating source, so as to ensure the comfort of suitable hot water volume.

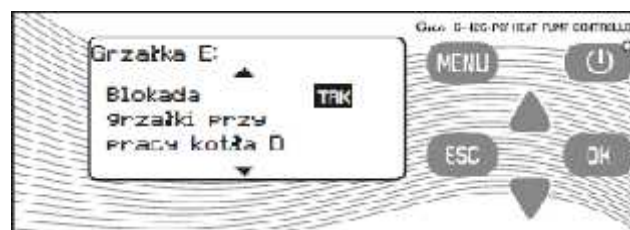


Another parameter in heater settings is the required HUW temp., while heat pump is off (below, to the left). If heat pump enters an alarm mode (conditions, which may disturb correct operation, or there is too low min. temperature of air supplied to the heat pump), or it is switched off manually from the controller level, then heater may keep heating up the tank to higher temperatures, because in this case heating costs do not depend on the temperature of water being heated up. If we have a system with a suspended or solid fuel fired boiler and we set heating priority to either of them - the heater will not switch on.

Another parameter is heater stoppage while heat pump operates. At the moment, when the value is set to YES, the heater will not activate if heat pump operates or is waiting for restart of work (that is drop of temperature in the tank, which will restart the heat pump).



The last parameter in heater settings is its stoppage while boiler D operates. If we have selected a diagram, which supports suspended (automatic) boiler, then automatic boiler will switch on as the first unit at the moment when heat pump cannot work (alarm states, low COP, or the pump is switched off manually from the controller).



Circulating pump parameters

Circulating pump operation depends on two preset parameters. The first is minimum circulating pump activation temperature depending on temperature at the tank top (temperature sensor T2). This value may be set between 20 and 60°C. Factory setting is 35°C.

The second parameter involves setting of circulating pump operation mode. We have the choice of continuous operation mode - circulating pump will work all the time according to time settings, or intermittent operation mode - in this case circulating pump will be working in the regime 5 min. operation/10 min. stop, according to time settings.

Parameters of solid fuel fired boiler B

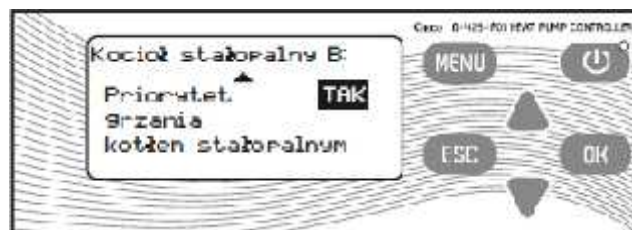
In case of solid fuel fired boiler it is possible to set max. temperature of boiler pump deactivation (below, to the left). Setting within 10-85°C is possible (factory setting: 65°C). This parameter allows protecting the tank against excessive pressure increase and too high water temperature in the tank.

The second parameter is minimum boiler pump start-up temperature depending on the T4 temperature at boiler outlet (setting within 30-60°C, factory setting: 45°C).



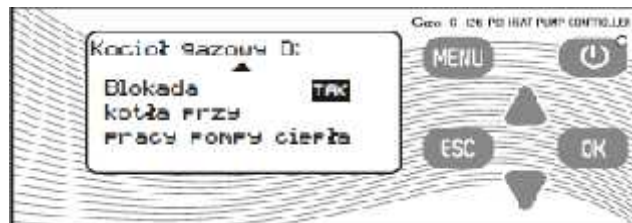
Another parameter is the temperature difference for boiler pump activation, set at factory to 8°C (possibility to change the setting within 5-15°C). This parameter refers to the difference between sensor T4 (boiler outlet), and sensor in the tank at the coil of solid fuel fired boiler T3 (except of diagram no. 8, where solid fuel fired boiler is connected to upper coil and controlled by sensor T2). The boiler pump will receive signal to activate, when both conditions are satisfied at the same time, that is temperature T4 is higher than preset value, and temperature difference between the boiler and the tank is higher than preset value.

The last item in this list is the priority of heating with solid fuel fired boiler (below, to the right). If YES value is set and conditions required for boiler pump activation are fulfilled, all other pieces of equipment operated by the controller (heat pump, heater, automatic boiler) will switch off, even is they are currently in operation. The priorities are connected with reaching possibly highest efficiency and economy of the HUW boiler-room system, depending on existing conditions.



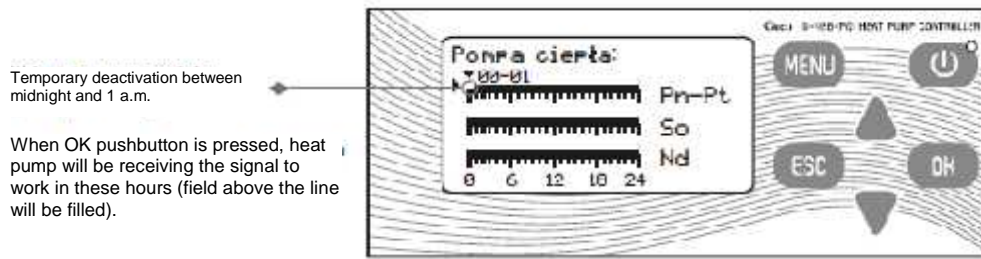
Operation parameters of automatic boiler D:

These settings concern gas-fired boiler or another automatically controlled boiler. Analogically to solid fuel fired boiler, the first parameter allows setting maximum temperature for boiler deactivation (applicable in the case, when heat pump is off or does not work due to an alarm). In case of parallel operation of heat pump and gas-fired boiler (boiler stoppage during heat pump operation set to NO) - automatic boiler will keep heating up only to HUW temperature required for the heat pump - heat pump hysteresis. For example, if heat pump activates for temp. 45°C and heats water to 50°C, then automatic boiler will be heating up water only to 45°C, provided that it drops to lower value before. It is also one of possibilities of the so-called PARTY mode – in case of higher demand for hot utility water, besides heat pump it will be also heated up e.g. by gas-fired boiler.



Time programmes

Time programmes for all heating devices are the same. After entering time programme, we see 3 lines indicating period from Monday through Friday, and separately Saturday and Sunday. We may define working hours for individual pieces of equipment in one-hour intervals. In order to change time programme, move using arrows to the desired time interval and press OK. **White field** indicates that the unit is to work in that time interval provided that temperature requirements for the unit operation are satisfied. **No white field** (field in background colour) above a given hour indicates that the unit will be off then.



Anti-Legionella

This item describes the method used to operate the Anti-Legionella function from the controller. More information about hazards generated by the Legionella bacteria and protection against them is available in chapter: Anti-Legionella. The Anti-Legionella function control is available only in diagrams 3-9.

This level allows defining, whether we wish to activate the Anti-Legionella function. It will start on midnight (Sunday/Monday) and keep running no longer than until 6 a.m. on Monday. The superheating function will end earlier, if temperature of water in the tank reaches 70°C.



NOTE:

Install mixing valve at the tank outlet so as to avoid burns, especially if water is used by small children.

Depending on the selected HUW boiler-room diagram, the superheating function may be carried out either by heater E, heater P and/or gas-fired boiler (below). Only if clients decide, which source they want to perform superheating, the Anti-Legionella function will work in practice.



Passwords:

Users may modify their passwords, so as to secure the controller settings e.g. from children.

Press OK, and then enter new password. Its reconfirmation will be necessary. Message acknowledging password change will be displayed at the end.

If user forgets correct password, it may be changed by installer/fitter or HEWALEX service. The user may have to cover service person or fitter's travel costs.



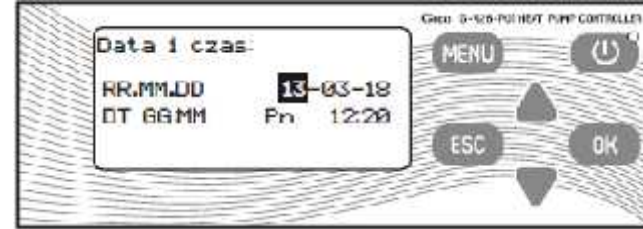
Controller settings

Overlap 'Controller settings' allows modifying basic parameters, including date and time, display unit parameters or sounds.



Date and time

Entering 'Date and time', we successively set pulsating parameters according to guidelines provided on the left side. Required value is selectable with arrows. Then, we proceed to the next item using the OK pushbutton.



Display unit

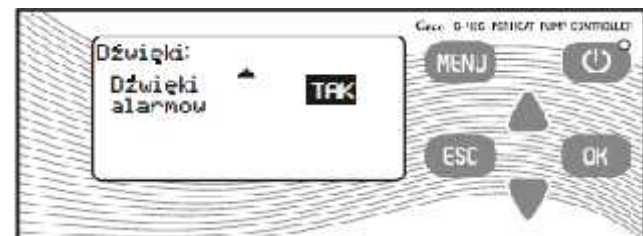
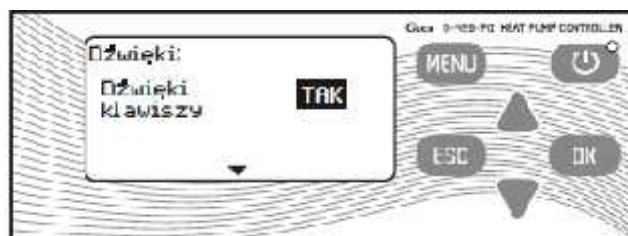
Display unit parameters allow changing screen backlight brightness (1-10, darkest / brightest).

The second parameter is setting of inactivity time until backlight dimming - the screen will get dimmed if user does not touch any keys for preset time.



Sounds

Sound parameters allow setting keyboard sound (if set to YES - we will hear characteristic sound when pressing controller operation pushbuttons). The sound of alarms indicates an acoustic signal when faulty equipment operation is detected.



RS485 port

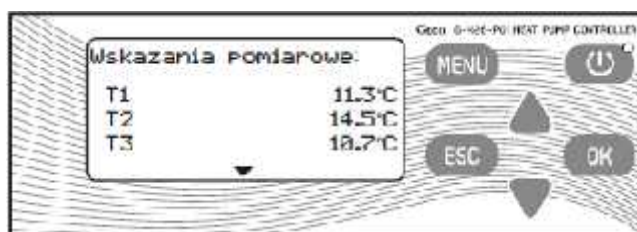
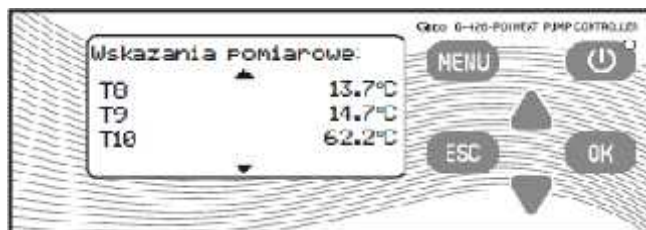
It is an interface used for data acquisition or controlling the unit through an external controller. Master device decides about the settings of transmission rate, and physical and logic address.

Language

It is possible to choose the language for communication with the controller from among those available in the database (Polish, English, German).

Measured indications

Measured indications are available from the main menu. Here, we have one list of all temperature readings in the system, and signals from safeguards and an external controller. During correct operation, the LP and HP contacts and an external control unit should be closed. Opening of the LP and HP contacts indicates equipment failure connected with cooling medium pressure, or pressure controls damage.



Info

Here you will find the id. number of software used by automatics, needed in case of possible update.

5 Anti-Legionella

The type of Legionella bacteria occurs in water environment. Their growth is supported by stagnant water in the tank at the temperature of 38-42°C. Illness, which they may develop, is called Legionellosis (type of pneumonia). Its symptoms include the following: high fever, loss of consciousness, cough, respiratory failure. Influenza-like symptoms, diarrhoea, vomiting, bronchitis, or fatigue and chronic respiratory disorder are also possible. Legionellosis is considered an infectious disease according to the Ministry of Health. In case of incorrect treatment it may cause death. In majority, the disease cases are observed in Mediterranean countries, however occasionally it appears in Poland as well.

An effective method to destroy Legionella bacteria is periodic tank superheating to water temperature reaching 70°C. At this temperature the bacteria completely perish. The equipment is provided with possibility to use anti-Legionella superheating every week between midnight (Sunday/Monday) and 6 a.m. on Monday. During that time the tank is superheated to the temperature of 70°C either by an electric heater, or e.g. gas-fired boiler, depending on the option chosen by user (described in detail in par. 'Operation parameters settings', 'Anti-Legionella').

If water remained in the tank unused for several days, perform an additional superheating (e.g. after return back home).

NOTE:

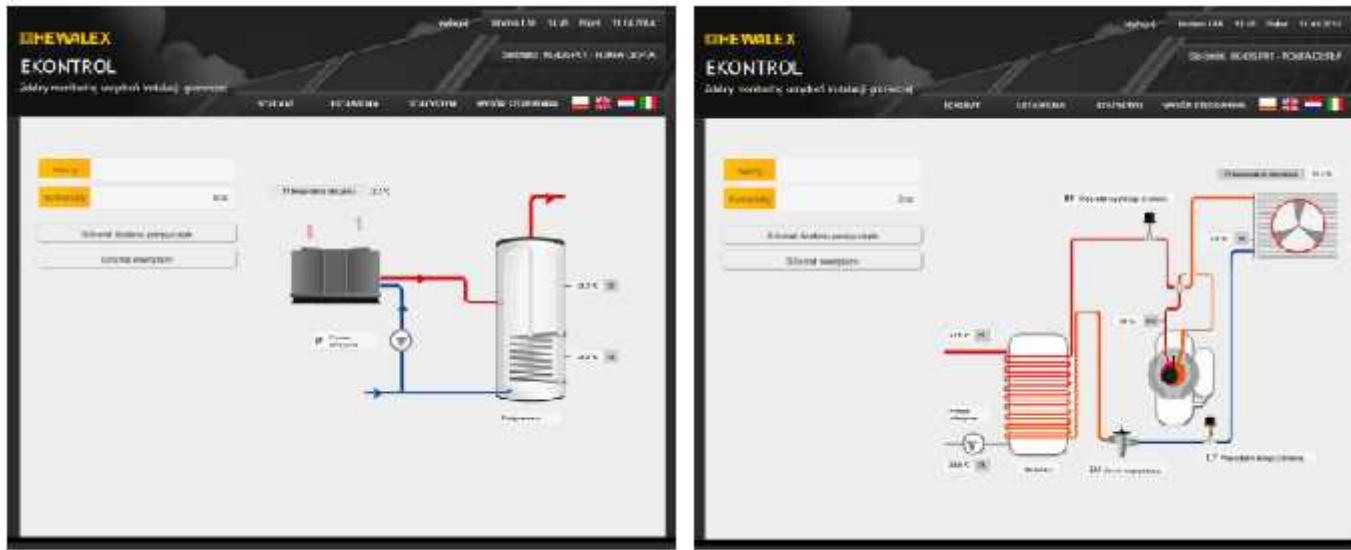
Install mixing valve at the tank outlet so as to avoid burns during the Legionella superheating, especially if water is used by small children.

According to: http://www.e-instalacje.pl/a/3244_bakterie-legionella-w-instalacjach [Joanna Ry ska, 06.12.2004]
Photos: <http://www.cruiselaawnews.com/tags/legionella/>

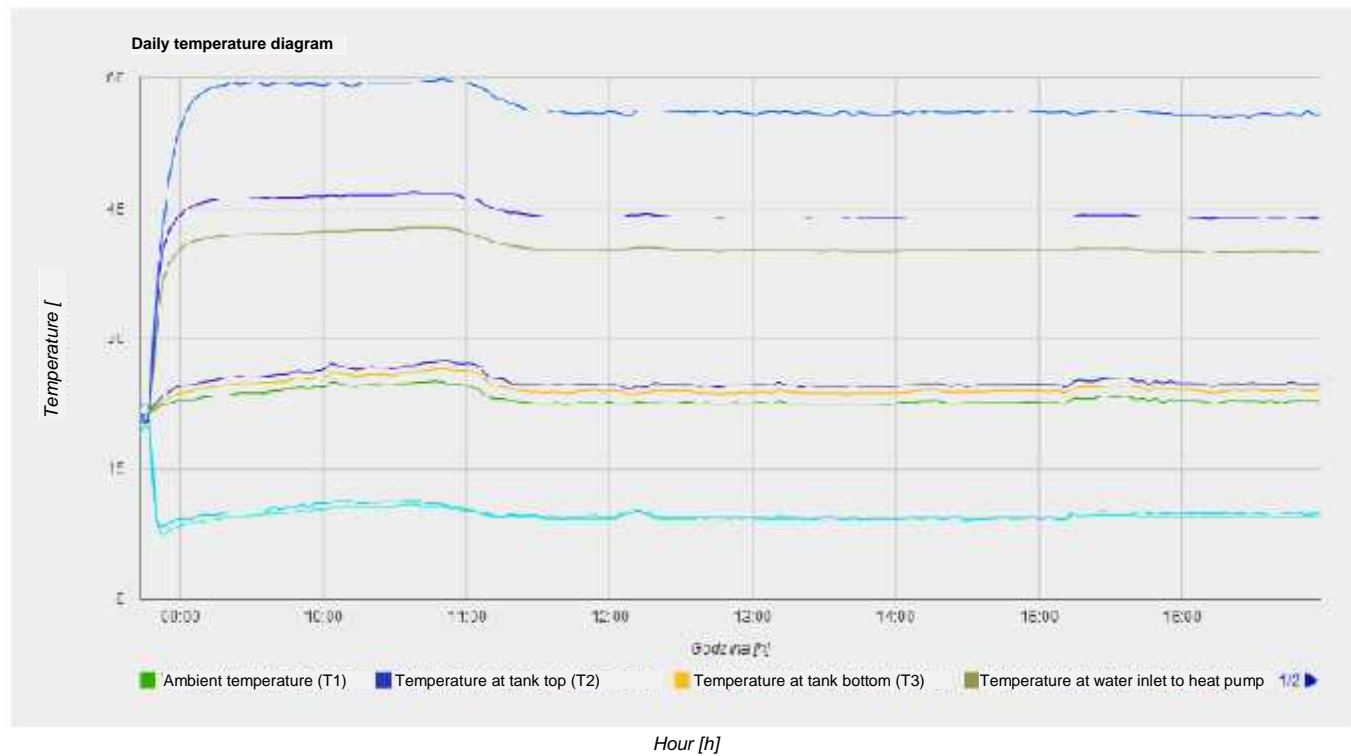


6 Equipment maintenance

Detailed procedures related to the equipment maintenance are specified in installation-service part of the manual, Maintenance chapter. User should remember about periodic checks of safety valve according to the valve manufacturer's requirements, and about cleaning of the filter of air drawn into the heat pump.



After purchasing LAN modem and registering at the EKONTROL.pl platform (current costs available at web site: www.hewalex.pl), user will be able to extend the controller operation to mobile version. After logging in to his/her profile, it is possible to change settings or viewing equipment operation statistics. Another important advantage of the unit remote control is round-the-clock observation by the system and prompt information concerning alarms in the installation. A network LAN modem is required for remote operation, which is available from HEWALEX. More information is available at hewalex.pl, or contact HEWALEX Heat Pumps Engineering Department.



Several issues involved in the heat pump operation have been distinguished on the basis previous questions from our clients:

1) Is it better if the pump works during second (cheaper) tariff of electricity charge, or during regular tariff in daytime, when outside air is warmer (provided that we take air for the pump from outside)?

There is no significant difference in operating costs, because in this case lower price of electric energy is also connected with lower temperature of supply air at night. In case of heat pump connected to exhaust air from ventilation, in fact it is possible to heat up the tank at lower cost overnight.

2) Is it possible to use colder exhaust air from the heat pump to cool a building?

Yes, however in case of larger distances it is necessary to use an additional fan to support air flow, tubes should be fitted to ventilation system requirements and, much the same as in air-conditioners, evaporator should undergo antibacterial cleaning at least once per year.

3) What is the condensate?

The condensate is condensed steam generated due to cooling of air flowing through the evaporator. It is a most desired effect, because considerable volume of heat is transferred to cooling medium during condensation. As a result of this, the COP coefficient value depends not only on ambient temperature, but on air humidity as well.

4) Is it possible to connect the PCWU 2.5kW heat pump to air conditioning station (that is work with ventilation air)?

Yes, however we should remember that the heat pump air demand reaches 350-500 m³/h. In case of work with ventilation air the heat pump may operate all-year-round at efficiency index near 4.

5) Is it possible to unplug the unit if for example we use boiler in wintertime?

Due to the heat pump safeguards, which must be connected to power network, it is not allowed to cut off power supply of the whole unit. In such case it is possible to switch off the heat pump from the controller level.

6) How many litres of water can be heated up within 1 hour?

A lot depends on the temperature of heated water and temperature of air drawn into the heat pump. Average volume of heated up water ranges from 40 to 80 litres per hour.

7) Can I use this equipment to heat building?

The heat pump power has been selected so as to match utility water heating needs. We should remember that the heat pump power drops at lower temperatures.

8) Which are minimum temperatures the PCWU 2.5kW heat pump may work at?

Minimum working temperature set at the controller is -5°C. However, its work under 0°C may result in faster wear and tear of the compressor. Minimum working temperature should be set depending on second water heating source.

Guarantee Certificate

Manufacture date (Quality Control stamp).....

Receipt or sales invoice should be enclosed with Guarantee Certificate. Warranty is null and void if the following is not filled.

WARRANTY TERMS:

1. HEWALEX grants a 3-year warranty for failure-free operation of the HEWALEX PCWU 2.5kW heat pump.
2. During warranty period the user is entitled to free of charge repairs of any damage occurring through the fault of manufacturer.
3. HEWALEX is discharged from any warranty liability for faulty unit operation, which may occur due to its use contrary to Operating Manual instructions, as well as carrying out any repairs and modifications by unauthorised persons, and due to any other damage occurring not through the fault of the manufacturer.
4. Any defects revealed during warranty period will be eliminated within 30 days from the date of reporting them by the user.
5. Warranty claims should be sent to Claims Department of Hewalex Sp. z o.o. Sp.K., ul. Słowackiego 33, 43-502, Czechowice-Dziedzice, Poland (tel.:+48(32) 214 17 10, GSM: + 48 723 232 232, INFOLINE: 0801 000 810, hewalex.pl).
6. Buyer is entitled to equipment replacement with a new one, or return of incurred costs in case of finding manufacturing defect, which is impossible to eliminate.
7. Warranty rights may be executed only on the basis of submitted Guarantee Certificate and completed checklist procedure. Not filled or partially filled checklist is void. One checklist sheet must be sent to HEWALEX according to the terms and conditions specified in the checklist. Failure to send installation checklist is the basis to reject service application.
8. Unjustified visits of service personnel may provide grounds for the manufacturer to charge user with applicable costs.
9. In particular, technical warranty terms and conditions are applicable:

A) It is prohibited to repair the unit without contact with HEWALEX service. In case of incorrect equipment operation, report failures by phone (32) 214 17 10) or e-mail (serwis@hewalex.pl). Depending on failure type, service team will be sent to the site, or guidelines concerning repair of minor defects will be provided.

B) It is allowed to connect the heat pump to correctly working electrical system only.

Installation requirements:

- power cable to the mains socket min. 3x2.5mm² 300/500V, complying with the 227IEC53
- current protection: B16 or C16
- differential-current protection: 30mA
- correctly made earth installation (grounding resistance should not exceed 4 Ω).

All the above power supply parameters are standard and do not go beyond applicable norms.

C) Water in the system must satisfy requirements specified for potable water (O.J. (Poland) no. 203, item 1718).

Important for own water intakes:

- pH ranges between 6.5 and 9.5
- conductivity under 2500 [μS/cm at 20 °C]
- ammonia under 0.5 [mg/l]
- nitrates under 50 [mg/l]
- chlorides content under 250 [mg/l]
- copper under 2 [mg/l, permissible value provided that it does not cause any change in water colour due to its corrosive aggressiveness]
- sulphates under 250 [mg/l]
- hardness 60-500 [mg CaCO₃]

D) Water, air and wiring systems for the unit should be made according to the guidelines and connection diagram.

E) Select proper location for the unit installation. Any damage caused by improper selection of the equipment location will not be covered by the guarantee (that is caustic and polluted air drawn into the heat pump, unlevelled equipment, foundation tilting the unit, installing in an unheated room).

H) It is prohibited to switch off the unit during break in operation (e.g. in wintertime). Otherwise, user will be solely responsible for eliminating circulating pump protection against seizure and anti-freezing protection.

HEWALEX

Spółka z ograniczon odpowiedzialno ci Sp. k. [Ltd, Limited Partnership]
ul. Słowackiego 33
43-502 Czechowice – Dziedzice, Poland
Tel.:+48(32) 214 17 10

INSTALLATION CHECKLIST for the PCWU 2.5kW heat pump

Installation checklist has been developed as a response to ensure improved quality of systems containing HEWALEX heat pumps. We care very much about satisfying clients using our products for a long time - however, besides the heat pump itself, this also requires a supporting system meeting highest quality standards.

We also believe that owing to this checklist, fitters installing our equipment will be able to demonstrate to their clients own work in a professional and reliable way.

Each item of the list must be completed. Please, mark your answer matching completed installation:

1	Is the system made according to the diagram provided in the Manual? If not, enclose drawn diagram. If YES, the diagram no. is: _____ If NO, enclose diagram drawing.			YES	NO
2	Does the control diagram selected in the controller comply with actual installation?			YES	NO
3	Are temperature sensors located according to the conditions specified at individual diagrams in the Manual?			YES	NO
4	Is current protection of either B16 or C16 type, and power cable to the mains socket - min. 3x2.5mm ² ?			YES	NO
5	Is the unit connected to correct earth installation? (see guarantee terms and conditions)			YES	NO
6	Is the system provided with differential-current protection not exceeding 30mA?			YES	NO
7	Does heat pump draw in caustic and corrosively aggressive air (e.g. from pool chlorination facilities, composting plant, sty or alike)?			YES	NO
8	Does water satisfy requirements specified for potable water? (see guarantee, according to O.J. (POLAND) no. 203, item 1718)			YES	NO
9	Is water filter installed at the inlet to heat pump?			YES	NO
10	If it is not planned to remove water from the unit in wintertime - is the equipment located in a room, where ambient temperature does not drop below 0°C?			YES	NO
11	Is the system provided with tested safety valve, max. 7 bar per HUW tank, and does water flow after depressing the valve handle?			YES	NO
12	Are suitable valves installed, which would, according to the Manual, allow possible cyclic exchanger washing?			YES	NO
13	Is the unit properly levelled and does condensate flow down to sewage system, and at the same time does not spill beyond heat pump housing? (It is acceptable to lower slightly the side, from which condensate flows down in order to ensure faster water discharge.)			YES	NO
14	Is the unit fixed in a stable way to the wall, or set on a flat ground so as to make its moving impossible?			YES	NO
15	Is the user informed that as a result of controller switching off, the function protecting against freezing and protection against circulating pump rotor seizure are lost? (Set activation to NO in the controller in heat pump parameters, if the pump is not to work and the system safeguards are to be active.)			YES	NO
16	Is the user informed that in case of polluted heat pump inlet air it may be necessary to clean evaporator once every year or more often?			YES	NO
17	Is the user trained in basic controller operation and informed that the equipment efficiency depends on air temperature and humidity, as well as temperature, to which water is heated up?			YES	NO
18	What is the diameter of air ducts? Specify the lengths of inlet and exhaust ducts, including number of elbows and extra components. Please, enclose proper drawing in case of more complex installations.				
	Diameter of air ducts (intake):	Air duct length:	Number of elbows, 90°:	Other resistance values for air (e.g. grates, filters):	
	Diameter of air ducts (exhaust):	Air duct length:	Number of elbows, 90°:	Other resistance values for air:	
19	Specify parameters of water pipeline between the pump and the tank. Specify water temp. (T6 and T7) after 10 min. of heat pump work (stabilised operation).	Pipeline making material:	Pipe size:	Pipe insulation:	
		Pipeline length (one way):	Temp. readout (T6) °C	Temp. readout (T7) °C	

INSTALLATION CHECKLIST for the PCWU 2.5kW heat pump

Investor's notes

Fitter's notes

Investor's name and surname:

Fitter's name and surname:

Address:

Company name:

Contact phone no.:

Company address:

E-mail address:

NIP [Taxpayer Identification No.]:

Model:

*If the unit is mounted by a physical person, the system with heat pump can be made by Investor only.

Purchase date:

Heat pump serial number:

Fitting date:

*Purchase date must be confirmed by a copy of proof of purchase. Equipment prices may be covered.

Personal data will be used only for warranty-related purposes for the purchased equipment, and will be handled by authorised persons employed at HEWALEX Sp. z o.o. [Ltd.] Sp. komandytowa [Limited Partnership], seated in Czechowice-Dziedzice, ul. Słowackiego 33, Poland. The whole personal information acquired is protected and used according to the terms specified in the following acts: of August 29, 1997, on personal data protection (O.J. (Poland) of 2002 No. 101, item 926 with amendments), of July 18, 2002 on provision of electronic services (O.J. (Poland) No. 144, item 1204 with amendments), and in Regulation issued by the Minister of Internal Affairs and Administration on April 29, 2004 on the documentation of personal data processing, and technical and organisational conditions, which should be met by computer equipment and systems used for personal data processing (O.J. (Poland) No. 100, item 1024). Your personal information is kept in adequately secured data base, not accessible for unauthorised persons.

I have read guarantee terms and conditions and checklist and I consent to my personal data processing only for warranty-related purposes:



HEWALEX Sp. z o.o. Sp. k.
tel: +48 714 17 10
infolinia: 0800 000 810

I assume responsibility for actual state of the installation according to the checklist, and consent to my personal data processing only for the purposes related to installed equipment warranty:

Investor's signature:

Fitter's signature:

The checklist should be prepared in 3 sheets when the Investor takes over the system. Its copies should be sent to:

1. Investor
2. Fitter
3. HEWALEX with a copy of equipment proof of purchase (the list to be sent by the installation Investor)

False information given in the checklist will result in immediate rejection of any complaint.

We also urge to sending photos of the installation.

NOTE:

Guarantee is valid since equipment purchase date. Guarantee requires sending the checklist not later than 30 days after fitting date (however not later than 90 days from purchase date) to the following address: HEWALEX Sp. z o.o. Sp. komandytowa, ul. Słowackiego 33, 43-502 Czechowice-Dziedzice, Poland, with a note: GWARANCJA PCWU [PCWU GUARANTEE] 2.5kW, or after registering at hewalex.pl/gwarancja and filling the form.