30 YEARS ELTERM®

Advanced electric in-line heater
Boatswain LED/LED PRO
in central heating system.

Polish manufacturer

version 1.1

Independent heat source in CH installation
e.g. while waiting for heat pump assembly

PV Ready
Countdown meter

PV Ready
Maximum power lock

PV Ready
Normally open contact 0V

PV Ready
separating contact

PV Ready
PID on/off

2. Device description.

Bosman LED heater is a device that, thanks to the built-in heating element and control panel, can act as a basic and additional / peak heat source in a water central heating system. It is most often used in combination with heat pumps, which are not adapted for efficient operation at very low temperatures, but also in a set with a fireplace, solid-fuel boiler or gas boiler. The device can also provide protection against freezing water in the installation of occasionally used buildings. Thanks to the use of electricity for the preheating process, it works perfectly in systems powered by photovoltaics, increasing the level of self-consumption and shortening the return on investment.

Comply with the directive
- LVD - low tension-electric security
- RoHS - restriction of the use of certain hazardous substances
- EMC - electromagnetic compatibility
- WEEE - waste equipment, GIOŚ Register No: E0001767W
- ErP - energy efficiency of heat sources

Watch Dog
supervising system processor

PID
Proportional - Integral Differentiating Regulator

BM
non-volatile program memory

SC
protection against excessive frequency of switching on the heater

OSC
quadruple overheating protection

PAS
pump protection system ANTY STOP

Included in the price Boatswain LED

PV Ready Countdown meter
- counter for the work of the heater
- stop heating
- the ability to adjust the power consumption
- signaling stop of the heater

PV Ready Maximum power lock
Adjusting the power of the heater to the power of the PV system (function available on the heater panel).

PV Ready Normally open contact 0V
Ability to work the heater with:
- any voltage-free room regulator 0V
- automation of another heat source or inverter

PV Ready separating contact
Disconnects the second heat source when the electric heater comes on. Turns on the second source when the heater is turned off

PV Ready PID on/off
balanced load of heater phases (heater operation with or without PID)

VARIANT

DHW package
code 100003

Priority DHW on/off

Solenoid valve three-way valve + actuator

temperature sensor DHW to storage tank

Solo heating device for installation CH

equipment required in the central heating system.

- Expansion vessel
- electronic valve
- air vent
- manometer
- safety valve

basic automation in Boatswain LED

included


EPP insulation


control automation


mounting profile


electric heater

model	maximum power	code	power supply 230/400 V
Boatswain LED 3	3 kW	234003	1 kW/1fuse 2 kW/1 fuse 2 kW/2 fuse 3 kW/1 fuse 3 kW/3 fuse
Boatswain LED 6	6 kW	234006	2 kW/1fuse 4 kW/1 fuse 4 kW/2 fuse 6 kW/1 fuse 6 kW/3 fuse
Boatswain LED 8	8 kW	234008	2,7 kW/1fuse 5,4 kW/1 fuse 5,4 kW/2 fuse 8 kW/3 fuse

2.1. Boatswain LED PRO

Boatswain LED PRO have all the same function as a Boatswain LED. In addition due to the use of heating body 4 spigots 5/4" , may perform low loss header function. Hydraulic low loss header function used to separate the boiler circuit from the heating circuit. They are used in medium to large heating systems consisting of one or more boilers and in particular, several heating circuits(E.g. underfloor heating circuit + radiator heating circuit + D.H.W heating circuit). This type of circuit uses low loss header eliminates necessity to balance pump flows – low loss header produce independent operation of the individual circuits and does not interfere with the operation of the pumps (the pumps do not interfere with each other). Additionally function is desludging and venting system. Low loss header protects boiler from low temperatures of backwater (low temperature corrosion).

PV ready x6

Boatswain LED PRO automation - all functions of the Boatswain LED

All functions of Boatswain LED necessary to work with the heat pump

230 V

Control output 230V

PV Ready
Normally open contact 0V

PV Ready
Heater operation counter

PV Ready
PID on/off

PV Ready
Heater operation counter

Solid-fuel boiler:
The Boatswain controls the C.H. pump for 2 heat sources

PV Ready
Heater operation counter

Fireplace with water mantle:
The Boatswain controls the C.H. pump for 2 heat sources

Included:

EPP insulation

Automation control

Mounting profile

Electric heater

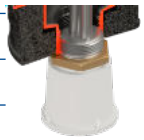
Air vent

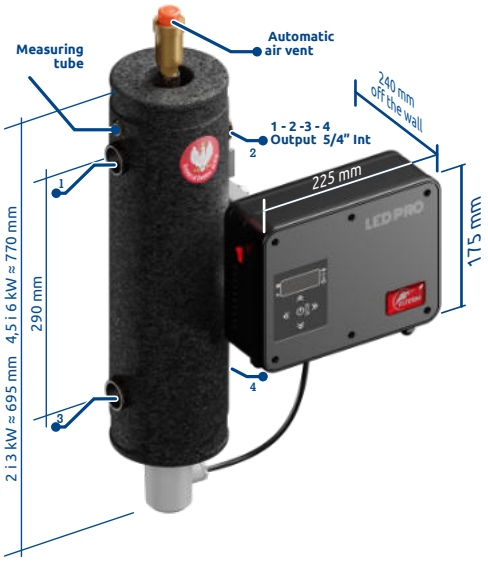
	Maximum power	code
Boatswain LED 3 PRO	3 kW	**254003**
Boatswain LED 6 PRO	6 kW	**254006**
Boatswain LED 8 PRO	8 kW	**254008**

Equal phase load

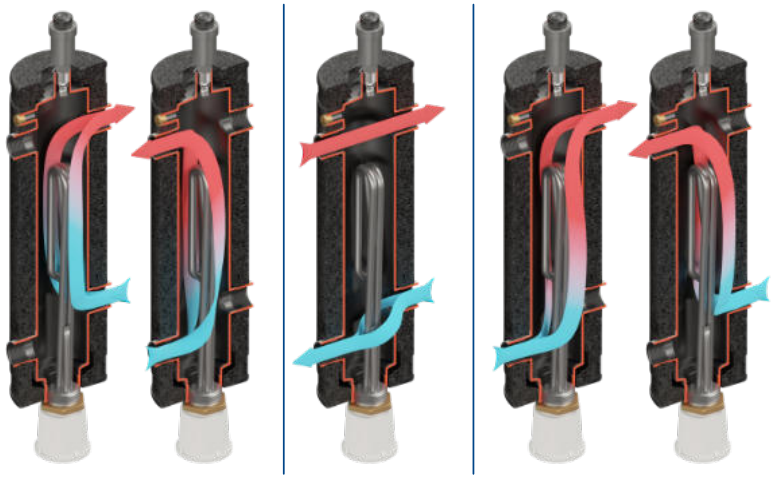
PV installation

Maximum power	Heating set
3 kW	1 + 1 + 1 kW
6 kW	2 + 2 + 2 kW
8 kW	2,7 + 2,7 + 2,7 kW

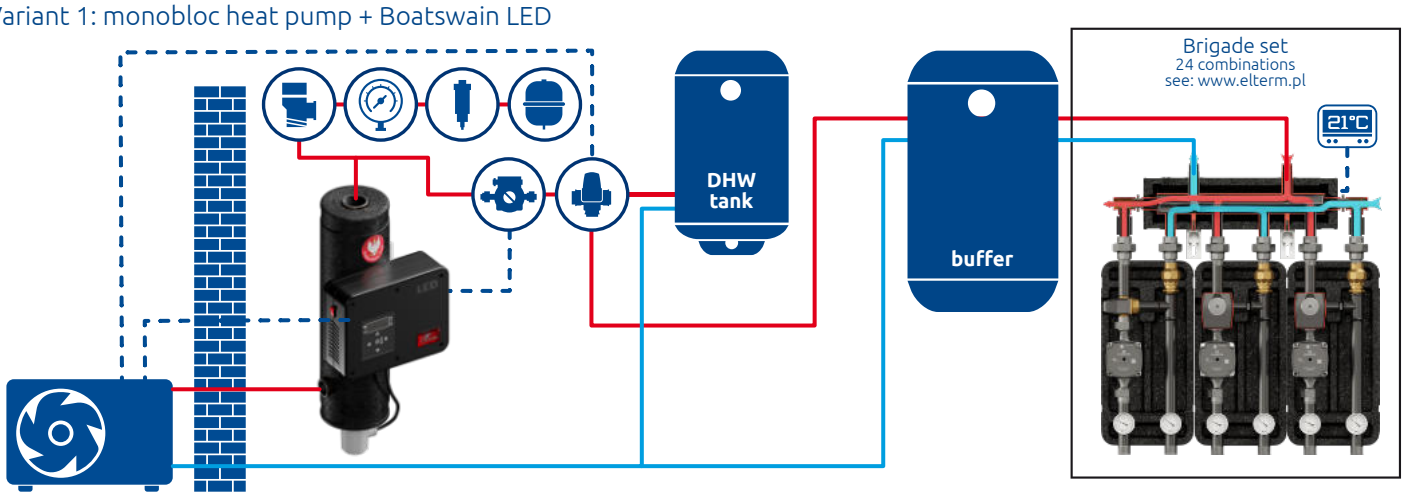




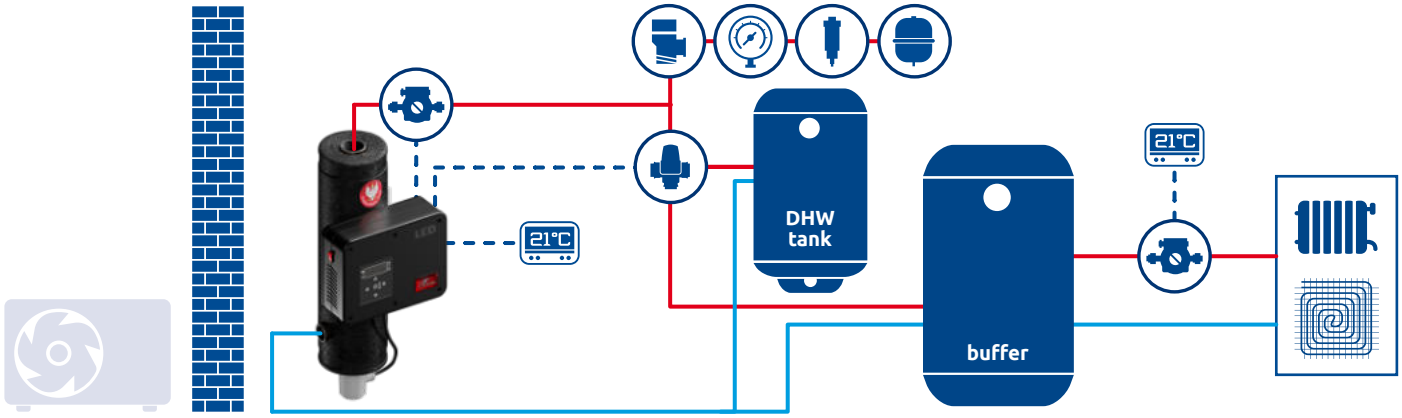
Universal connection - 5 variants



Variant 1: monobloc heat pump + Boatswain LED

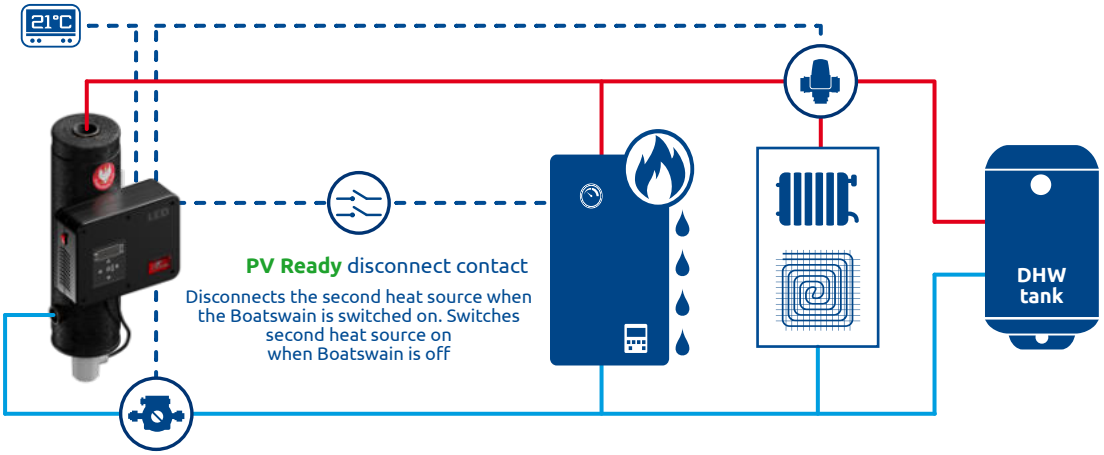


Variant 2: as a stand-alone unit pending the installation of a heat pump or other heat source



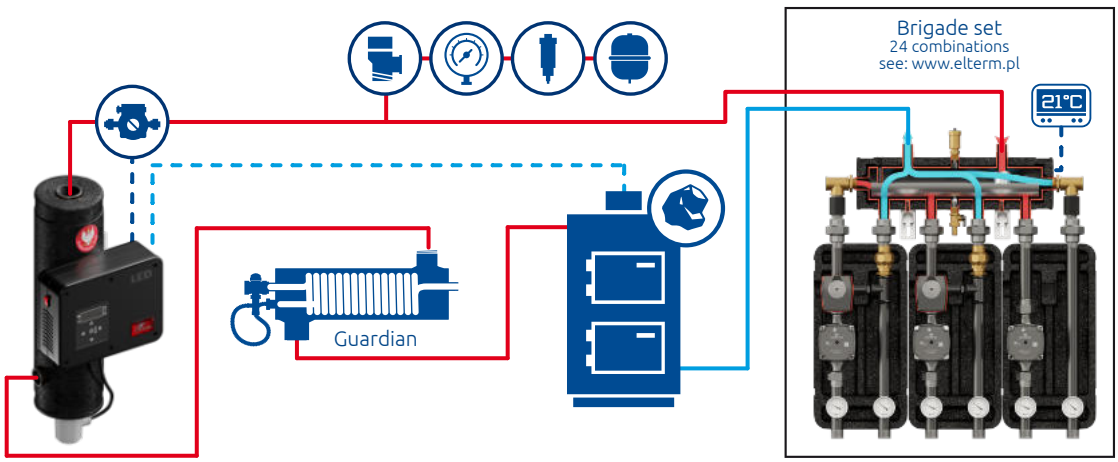
Variant 3: gas boiler + Boatswain LED

A+
A
low investment cost



Variant 4: solid fuel boiler + Boatswain LED

A+
A
low investment cost

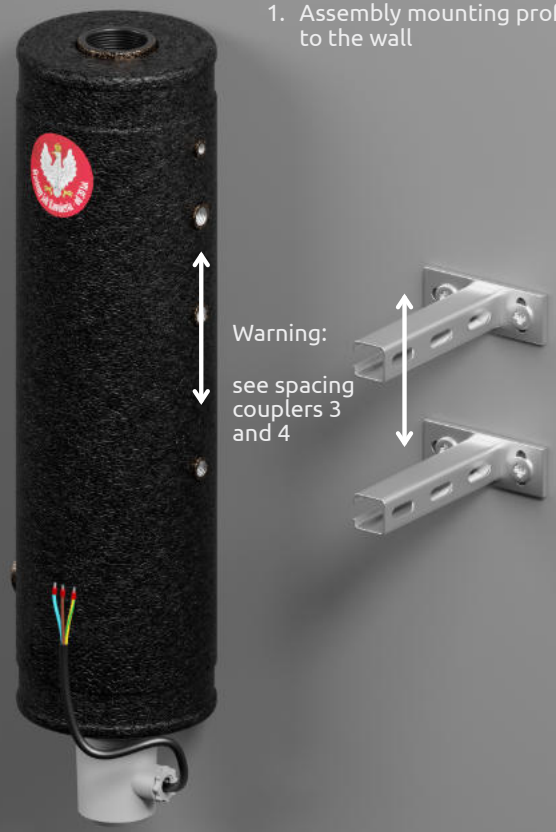


3. Assembly Boatswain LED
components of the device

1. measurement pocket
2. sleeve for mounting the temperature limiter
3. Sleeve for securing the mounting profiles
4. Sleeve for securing the mounting profiles
5. control automation
6. basis for automation
7. screw M8(4 pieces)
8. wall plugs(4 pieces)
9. mounting profiles
10. heating body with heater
11. heating element

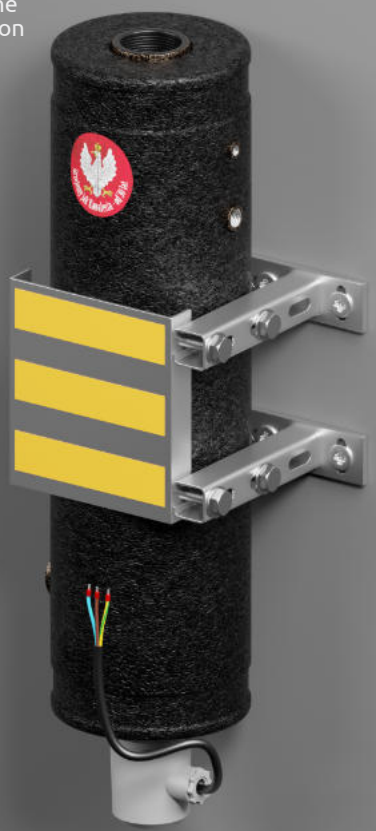
3.1. Installation sequence for Boatswain LED

1. Assembly mounting profile to the wall



2. Assembly Boatswain body to the mounting profile

3. Assembly of the base automation Boatswain



4. Assembly of automation Boatswain to base (double-sided tape)

5. Screw the thermal switch into the socket located in the heating body
6. Open the electronics box Boatswain LED.
7. Screw the cable with the thermal switch under the STB connector on the controller Boatswain LED *- point 4 figure 1.2*
8. Connect the power cord from the heaters to the strip point 5 figure 1.2
9. Boatswain LED as peak heat source in a system with a heat pump

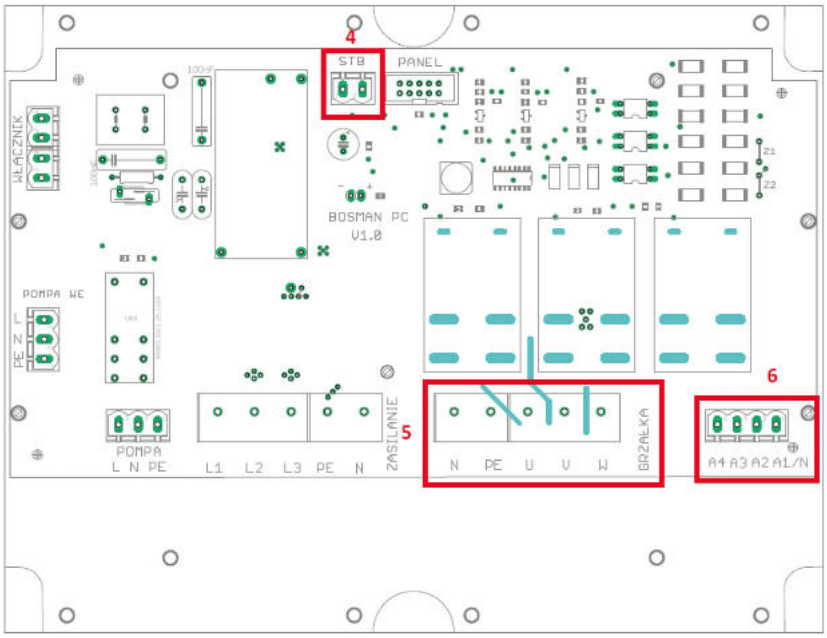


Figure 1.2. pattern of control board

3.2. Control output to heaters point 6 figure 1.2 Control independent of the energy limit set on the Boatswain LED control panel - heating priority allows individual heaters to switch on in the following configurations

- One heater - connect the N wire under PIN A1 and the 230V power cord under PIN A2
- Two heaters - under PIN A1 connect the N wire, and under PIN A2 and A3 connect the two 230V supply wires
- Three heaters - under PIN A1 connect the N wire, and under PIN A2, A3 and A4 connect the three 230V supply wires

A prerequisite is that the main control panel is operational

4. Hydraulic Assembly

1. The Boatswain LED is a wall-mounted unit that should be mounted vertically on the wall - the heater mounted on the underside.
2. The Boatswain LED should be mounted in such a way that it can be accessed from all sides at a later date. Mounting the device too close to other surfaces (e.g. wall, ceiling, built-in), may reduce the safety of its exploitation and cause difficulties in operation. The minimum distance from any surface is 30cm
3. When assembling the heater, install shut-off valves at the boiler inlet and outlet, in such a way that it can be removed if necessary.
4. Mounting to the wall is carried out using the mounting profiles supplied with the unit
5. The device should be connected to the system using a suitable pipe joint size - 6/4", according to the direction of water flow (see corresponding arrows). The connection should be made in accordance with PN-91/B-02413 (open central heating systems) or PN-91/B-02414 (closed).
6. The heating system should be flushed before starting up the unit and the closed system should be filled with water or antifreeze (recommended pressure - 1.5 bar).
7. When fitting the Boatswain LED to a previously used installation, it should be flushed, especially if the heat source was a solid fuel boiler. Failure to do so can significantly affect the efficiency of the device. The system should be equipped with a central heating safety group. (safety valve, expansion vessel, manometer, air vent).

5. Electronics Boatswain LED

5.1. Application.

The device is used to control the coil heater and the circulating pump for central heating and DHW. In addition, the Boatswain LED electronics has a microprocessor-based LED control board which makes it possible to set: the power of the heater, the pump operation time after the coils have stopped, the PID function, the maximum heater operation temperature and the heater hysteresis. It also has: an energy consumption counter in kWh and an adjustable energy consumption counter - stop heating. It is also equipped with thermal STB protection against excessive temperature rise.

The Boatswain LED electronics control the activation of the heaters and central heating pump according to the present settings. The device checks the status of the control inputs and compares them with the set parameters. If the inputs for which operation is activated are short-circuited and the set temperature is not reached, the heaters and pump will switch on. When the input signal fails or the set temperature is reached, the heaters are switched off and the pump operates at the present time.

5.2. Switching the controller ON and OFF.

The controller is switched on by setting the power switch to position "1"..

ATTENTION

After switching off the power supply with the power switch (1), there is still voltage on the terminals of the power strip! It is imperative to disconnect the power supply on the cable before installation.

6. Electric assembly

1. The connection to the electrical system must be made in accordance with the valid regulations of the country in which the boiler is installed and must only be carried out by a qualified electrician (evidence of this is included in the guarantee).
2. The Boatswain LED heater is adapted for 3-phase AC supply (400V 3N~50Hz). and in 1-phase version (230V1N~50Hz).
3. The heater shall be connected to the fixed electrical installation by means of a device enabling the power supply to be disconnected at all poles where the distance between the contacts is not less than 3 mm.
4. A residual current circuit breaker is required. Refer to the following technical data table for the appropriate cross-section of the supply lines and the required installation protection technical data table.

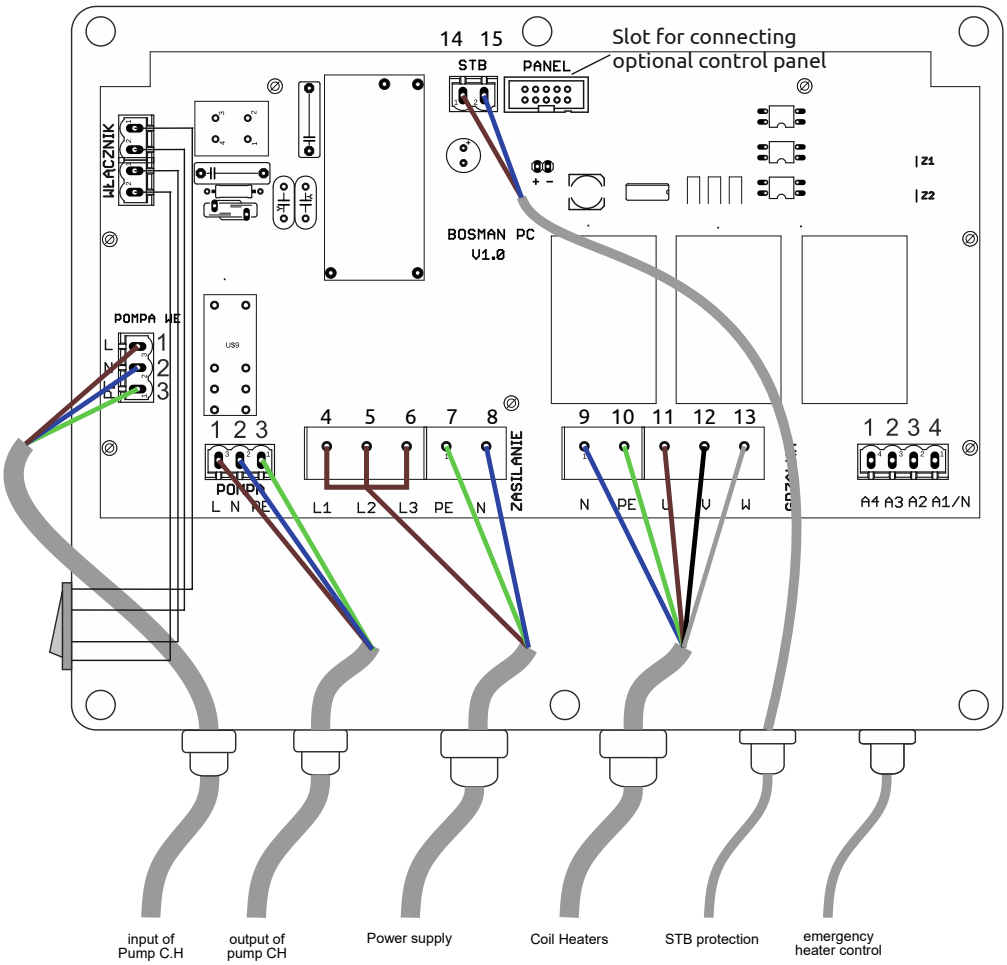
security selection	3 kW	3 kW	6 kW	6 kW	8kW	8 kW
	1 fuse	3 fuse	1 fuse	3 fuse	1 fuse	3 fuse
Fuses (A)	1 x 16	3 x 6	1 x 32	3 x 10	1 x 40	3 x 16
power cord (mm²)	3 x 4	5 x 2.5	3 x 4	5 x 2.5	3 x 10	5 x 2,5

6.1 Single-phase electrical connection.

Single-phase connection: when connecting the heater to a single-phase installation, it is necessary to connect (bridge) all supply lines - L1L2L3; a busbar can be used (busbar not included) - see picture no. 2.

6.2 Three-phase electrical connection.

Connect the power supply, PE and N wires of the superheater to the terminal strip (marked L1L2L3 PE N) located in the electronics box of the Boatswain HP- see picture No. 3. After the appliance has been correctly connected to the electrical installation, switch the switch (left side of the electronics box) to the on - I position. The switch on the electronics panel will illuminate, indicating that the boiler is ready for operation.



DESCRIPTION OF CONNECTIONS
I - PUMP INPUT and OUTPUT:
1 - phase wire
2 - neutral wire
3 - protective wire

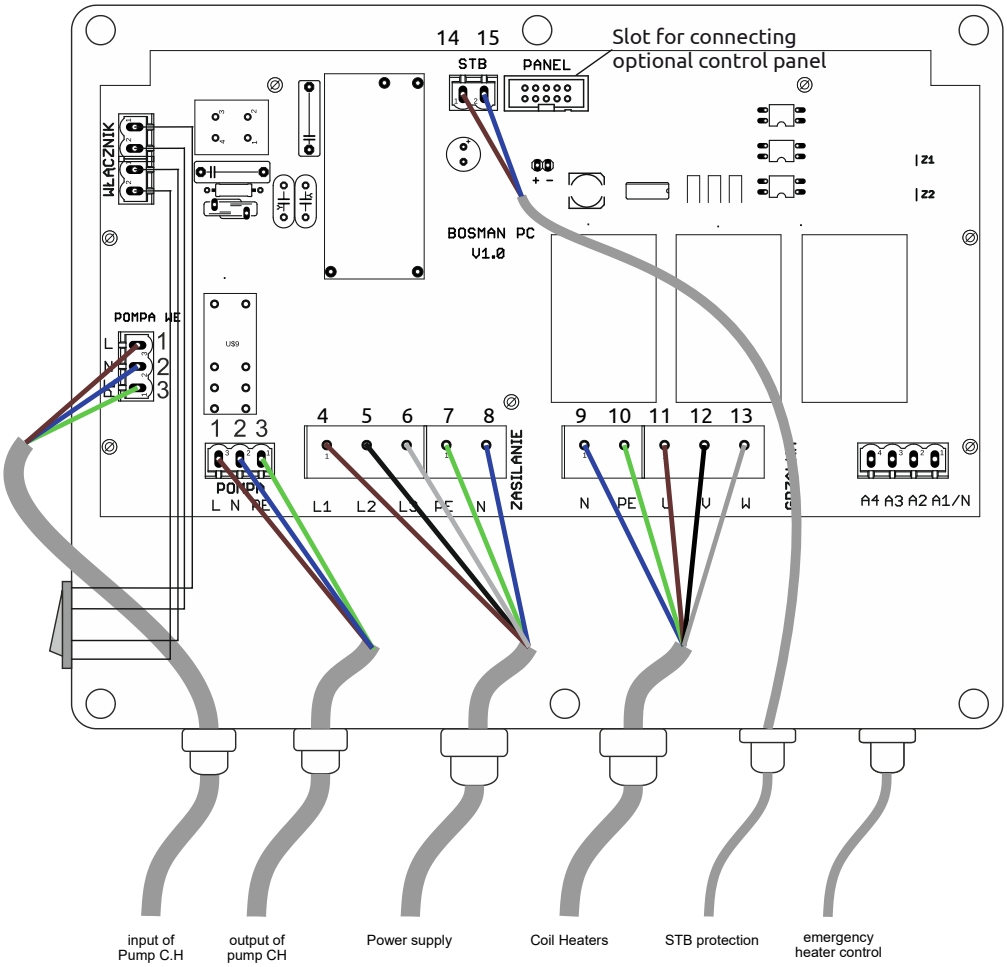
II - POWER SUPPLY:
4 - L1 wire
5 - L2 wire
6 - L3 wire
bridge
7 - protective wire
8 - neutral wire

III - HEATER COIL:
9 - neutral wire
10 - protective wire
11, 12,13 - phase wire

IV - STB PROTECTION:
14,15 - protection joints

V - CONTROL OF HEATERS:
See section 3.2.

Figure 2
single-phase electrical connection



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9 - neutral wire
10 - protective wire
11, 12,13 - phase wire

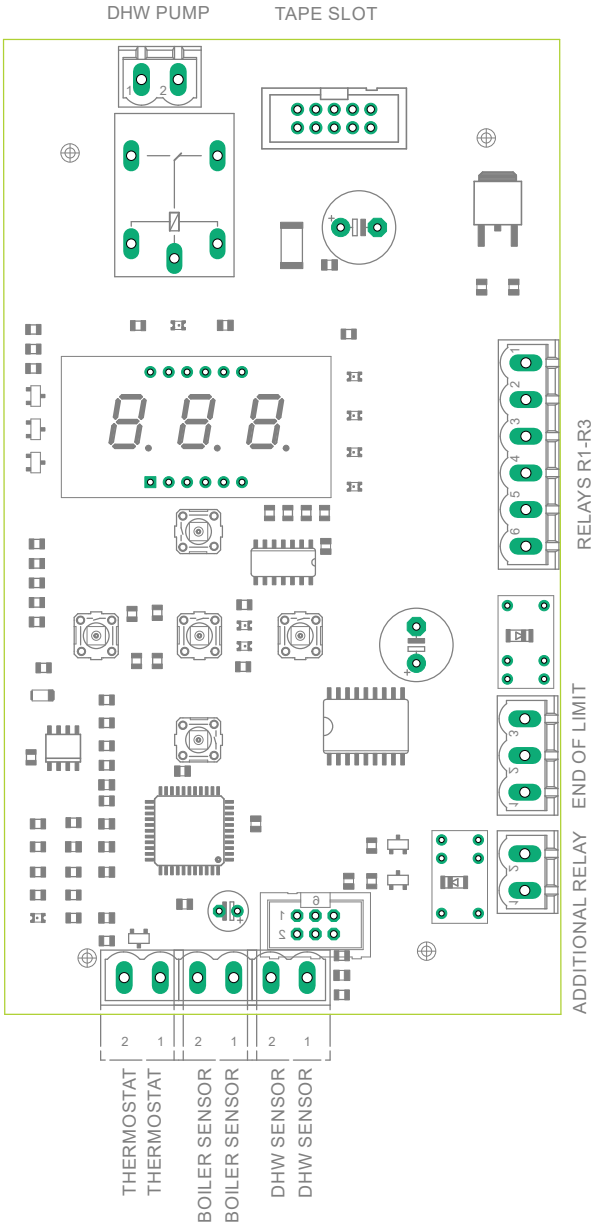
IV - STB PROTECTION:
14,15 - protection joints

V - CONTROL OF HEATERS:
See section 3.2.

Figure 3
three-phase electrical connection

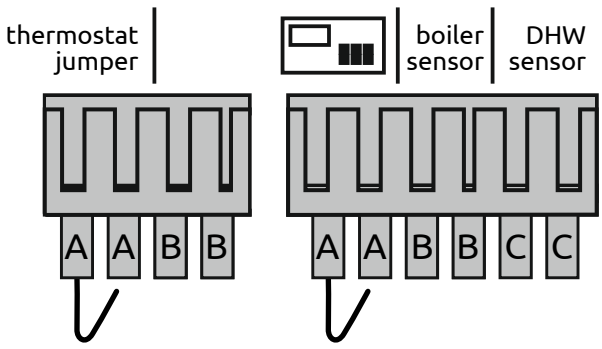
7. launch of Boatswain LED

7.1. Diagram of the microprocessor control panel:



7.2. Start-up of heating coils Boatswain LED:

The Boatswain LED in not equipped with a room thermoregulator, therefore a wire is connected under terminals A. The device will only start the heaters when the circuit is closed (jumper).



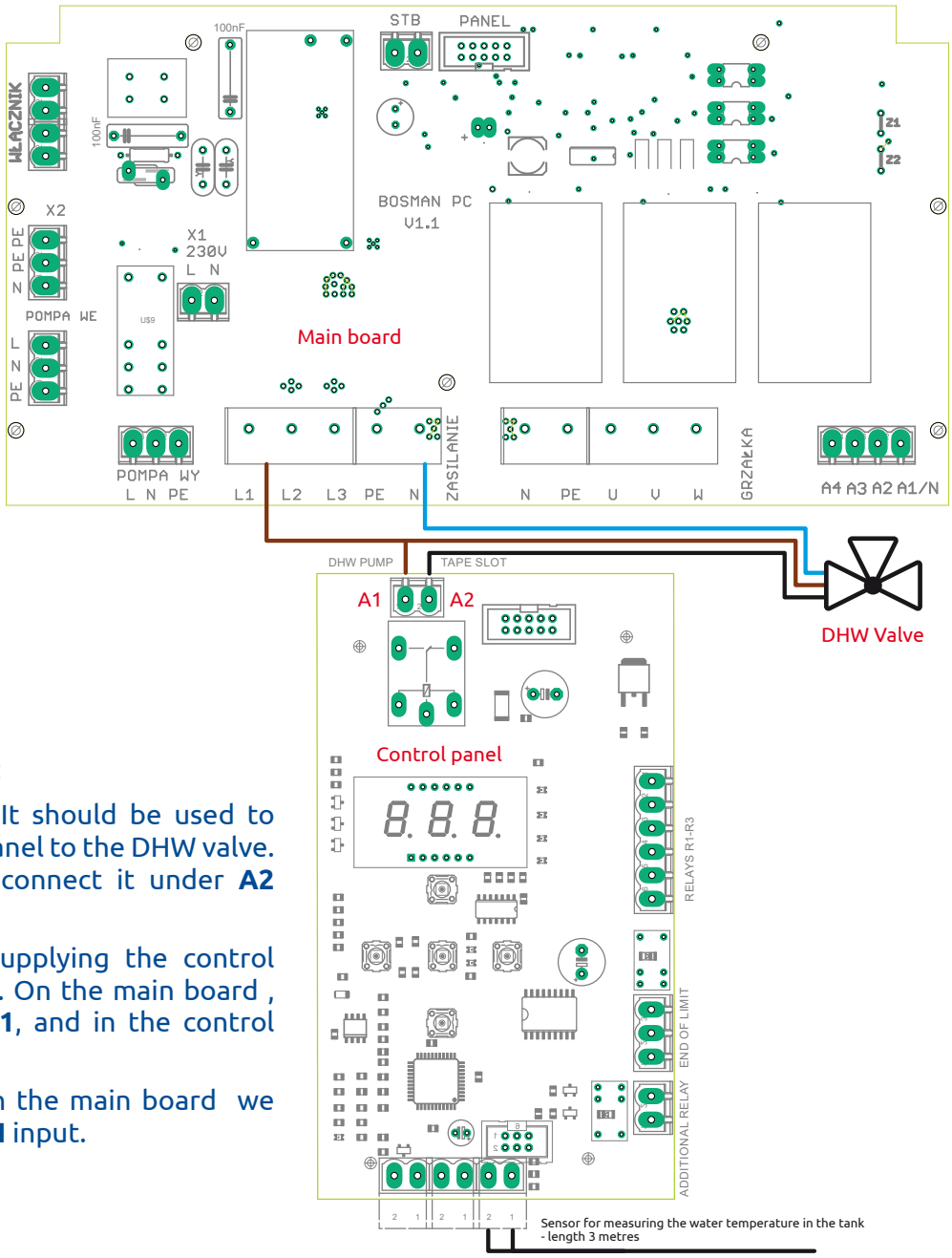
Terminal A - for the connection of a potential-free room thermoregulator

Terminal B - for connection of measuring sensor (no. 1) to the boiler body - central heating function.

Terminal C - for connection of measuring sensor (No. 2) to the DHW cylinder. - DHW heating function (in DHW pack)

7.3. Connection of DHW package

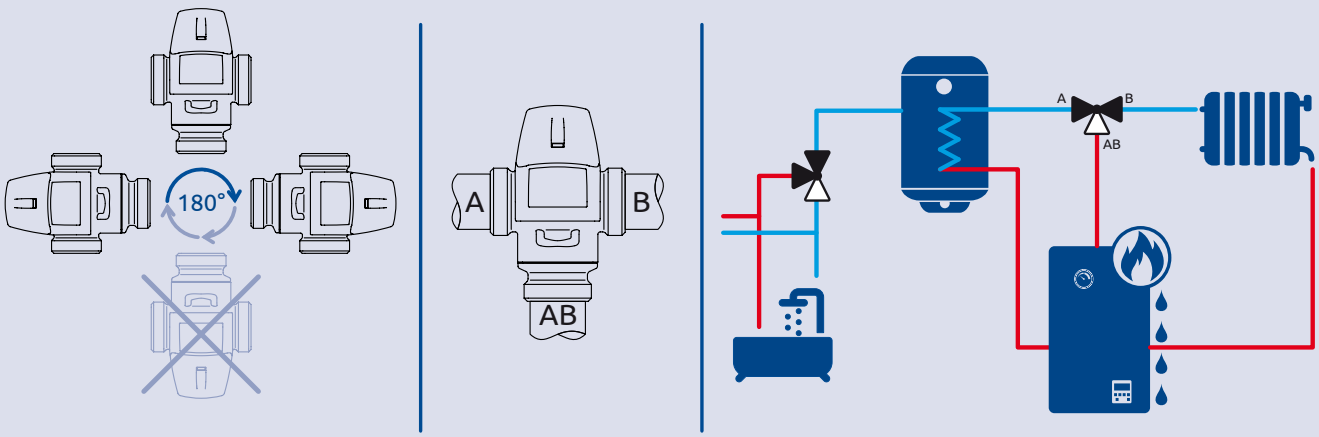
Connection diagram for the DHW valve to the main board and control panel:



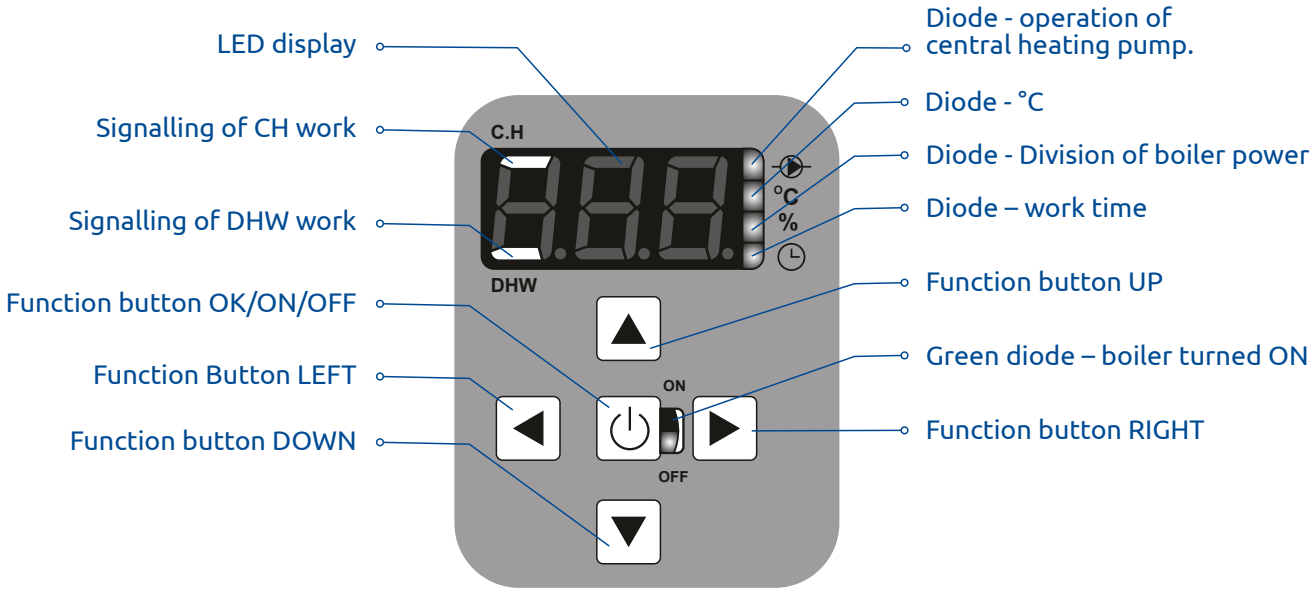
description of the figure:

1. Black wire - control. It should be used to connect the control panel to the DHW valve. In control panel we connect it under **A2** input
2. Brown phase wire, supplying the control panel and DHW valve. On the main board , connect it to input **L1**, and in the control panel to input **A1**.
3. Blue wire - neutral. In the main board we connect it under the **N** input.

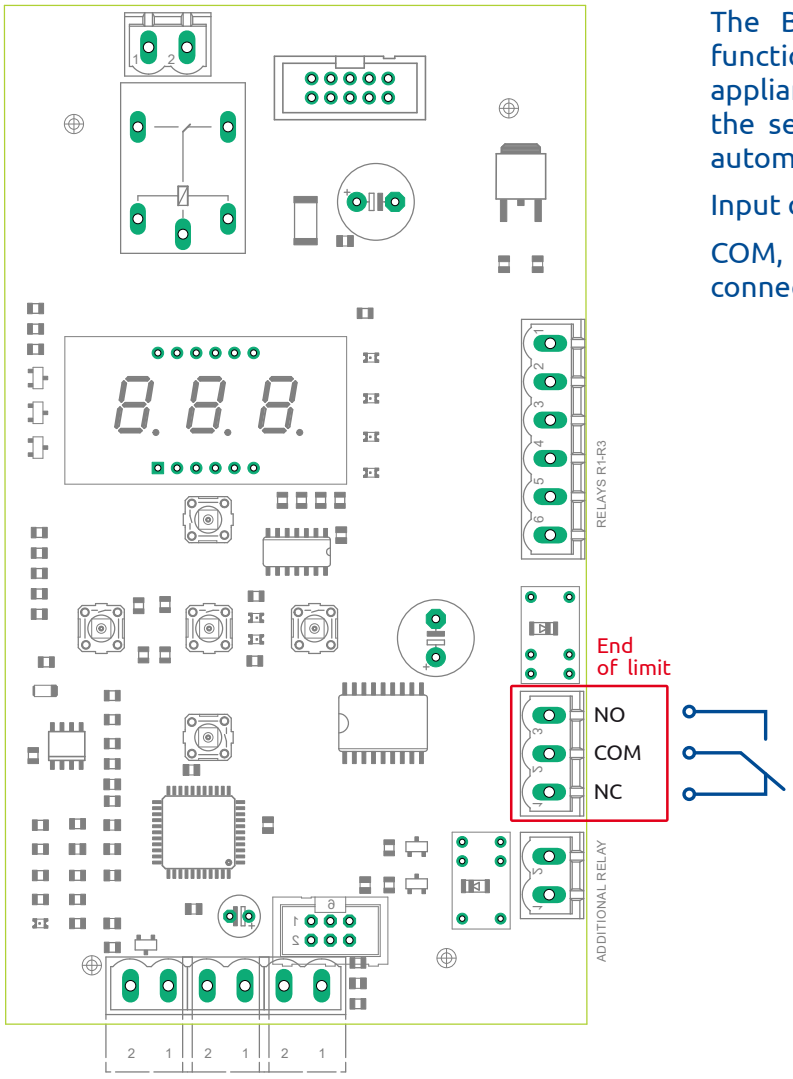
Three-way valve - assembly position



7.4. LED display, indicator diodes and control panel



8. Function “End of limit”



The Boatswain LED has an 'end of limit' function. It allows you to control a second appliance, e.g. a gas furnace. After the end of the set energy limit in kWh, this device will automatically be switched on.

Input description

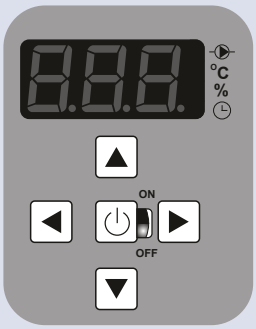
COM, NO, NC non-voltage outputs e.g. boiler connection.

9. The control

Programming can only take place when the heater is correctly connected (section: electrical assembly).

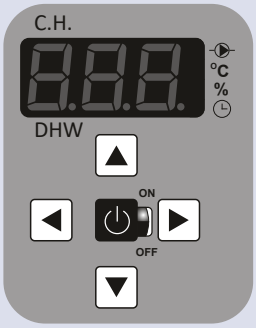
1. Red diode ON - Boatswain LED OFF, in standby 1
   - recommended state in the off-season.

1



2. After 5 seconds of pressing ⏻ the green diode lights up.

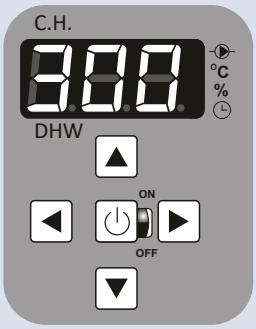
2



3. The LED display shows the number 300 starting the countdown - this function cannot be skipped. Only the central heating pump is switched ON at this stage, it is not possible to turned ON the heaters. The time of 300 seconds should be appropriate for venting the device, pump and central heating system properly, but if this is not the case - the whole procedure should be repeated by switching the heater off and on again.

   300 seconds is the time to vent the hydraulic system at all points. The device does not vent the system itself

3



4. **DHW package.** (connected). The LED display shows the number 50 - this is the current DHW temperature. (visible lower dash on the display).
   - ▲ rise temperature
   - ▼ reduce temperature
   - ⏻ approval of selection
   - ▶ move to central heating temperature setting

4

5. **The LED display shows a number which is the current central heating temperature. (visible top line on the display)**
   - ▲ rise temperature
   - ▼ reduce temperature
   - ⏻ approval of selection
   - ▶ move to function P01

5

P01 **Device power - manual split**
- ⏻ the display shows the current boiler power in %
- ▲ Increase power (67%, 100%)
- ▼ Decrease power (67%, 33%)
- ⏻ Approval of settings (recommended – 100%)
- ▶ Move to function P02

P01

P02 **Central heating pump operation.**
- ⏻ the display shows the current running time of the pump
- ▲ extending working time
- ▼ reduction of working time
- ⏻ approval of settings  ((recommended - 10), indication of continuous pump operation, independent of the operation of the heaters in the boiler
- ▶ move to function P03

P02

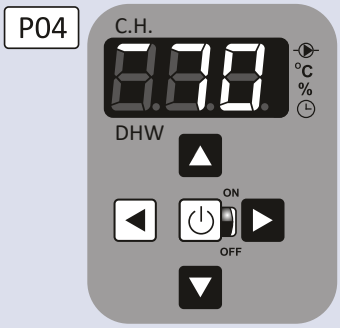
P03 **Function PID - proportional-integral-differential regulator**
- ⏻ display shows the current setting of PID
- ▲ increase in the ratio
- ▼ decrease in the ratio
- ⏻ approval of settings (recommended 3)
- ▶ move to function P04

Attention: if the device takes a very long time to reach the set temperature - set the parameter to 4 or 5, if the temperature is reached too quickly - select 1 or 2.

P03

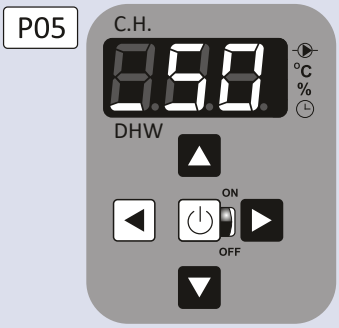
P04 **Maximum operating temperature Boatswain LED - central heating.**

- ⏻ display shows the currently set temperature
- ▲ increase temperature to 70°C
- ▼ decrease temperature
- ⏻ approval of settings (recommended - 70°C)
- ▶ move to function P05



P05 **Maximum operating temperature of Boatswain LED - DHW**
(for connected DHW pack)

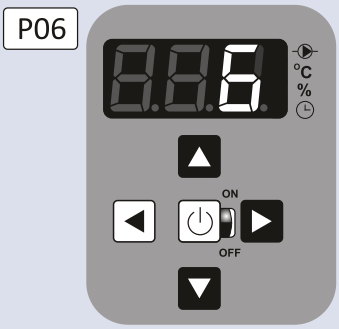
- ⏻ display shows the currently set temperature
- ▲ increase temperature to 65°C
- ▼ decrease temperature to 5°C
- ⏻ approval of settings (recommended - 50°C)
- ▶ move to function P06



P06 **Boatswain LED operation hysteresis**

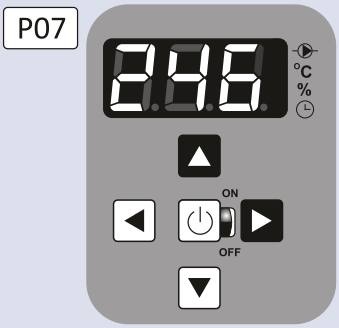
- ⏻ display shows the currently set hysteresis.
- ▲ increase
- ▼ decrease
- ⏻ Approval of settings (recommended - 6°C)
- ▶ Move to function P07

Attention: range 1-2-3°C available for boiler temperature settings up to 40°C; range 4-5-6°C available for higher temperature settings.



P07 **Energy consumed in kWh**
(from the start of measurement for a maximum of 24 hours)

- ⏻ display shows consumed kW
- ▲ counter reset, consumption indicator starts from zero with 1 second update
- ▶ move to function P08

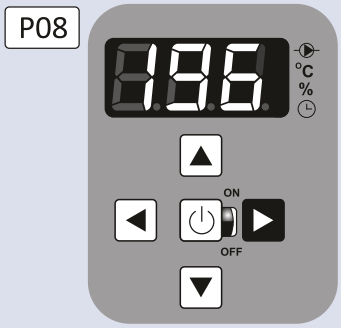


P08 **STOP heating - adjustable energy consumption counter**
display shows 0 kWh

▲ increasing the operating limit by 10kWh

⏻ acceptance of selection
Once the preset kWh has been consumed, the counter stops at 1kW and is indicated by a flashing diode on the display. In order for the heater to continue operating regardless of the kWh consumed, the parameter must be manually reduced to value of 0 kWh thus deactivating the STOP heating function

▶ move to function P09

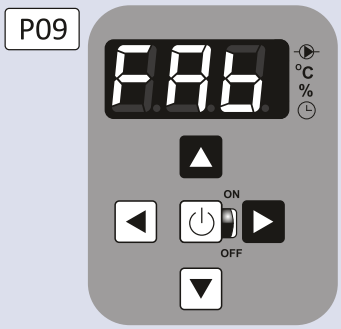


P09 **Factory settings of Boatswain LED**

⏻ the display shows the currently selected parameter

▲ restore factory settings:
1 - power 100%,
2 - pump operating time 10min,
3 - PID 3,
4 - central heating temperature 70°C,
5 - hysteresis 6°C,
6 - DHW temperature 50°C (for connected domestic hot water package)

▶ move to function P10



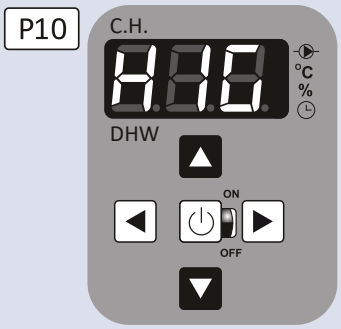
Attention: activating function P09 automatically activates venting the boiler. After 5 minutes the boiler will start to operate according to factory settings

P10 **Hygienization (for connected DHW package)**

the display shows HIG

▲ launch

▼ finish



Attention: during hygienization in the DHW circuit temperature is automatically maintained 70 C - the lower segment of the display flashes. (The value is only displayed when a dual function valve is connected).

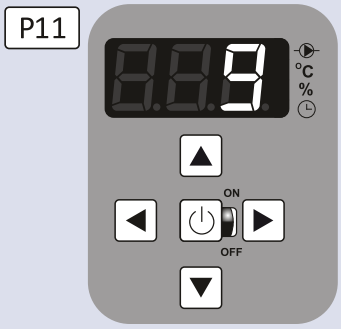
P11 **Maximum power (kW)**

the display shows the currently set boiler power

▲ increase

▼ decrease

⏻ additional of settigns



Elterm's boilers are equipped with an Anti-Stop function. The automatics switches the pump on for 1 minute every 14 days preventing the pump impeller from seizing up. The Anti-Stop function operates independently of the on/off status. During the off heating season, it is recommended to leave the boiler in the off mode (visible red diode) - energy consumption in this mode is only 0.5W!

Do not remove the cover of the Boatswain LED control panel while it is under power. If the heater is switched on without water, wait until it has cooled down, fill it with water and switch on again. Do not pour cold water over hot heaters! Before the next heating season, vent the central heating system and especially the central heating pump.

9. Guarantee

Heater Boatswain LED (Power in KW)	
serial number	
Production date	
Sale date	Dealer's stamp and signature

Stamp of the hydraulic service assembling the heater	Stamp of the electrical firm installing the heater	I declare that I have read and understood with the conditions of guarantee and assembly. I accept.

Without the above stamps and signatures, the guarantee is invalid

Guarantee conditions:

1. The guarantee for the functional performance of the device is provided for a period of 24 months.
2. The guarantee expires if any modifications are made to the product without the manufacturer's approval, or if the assembly or operation of the product does not comply with the operating instructions and guarantee conditions.
3. Repairs under guarantee are carried out by the manufacturer or its authorised facilities.
4. A guarantee filled in incompletely is invalid.
5. If the service technician discovers that the device is not working due to the user's fault (e.g. poorly made electrical installation, airlock central heating system, etc.) or the guarantee is invalid, the cost of repair and travel expenses will be borne by the applicant.
6. Failure by the user to comply with the service technician's recommendations, as stated in the guarantee repair protocol, will result in the suspension of the guarantee until the recommendations are complied with.
7. When starting up the device, the user is obliged to read and follow the instructions.

Stamp of the service technician, short description of the fault and recommendations for the user:

CE Declaration of Conformity No. 1/2022

Elterm M.M.Kaszuba Sp.J., ul. Przemysłowa 5 , 86-200 Chełmno

We declare with full responsibility that the products: Boatswain LED/ Boatswain LED PRO

- ~ 230V, 50Hz, max power 3kW
- ~ 230V, 50Hz, max power 6kW
- ~ 230V, 50Hz, max power 8kW
- 3N~400V, 50Hz, max power 3kW
- 3N~400V, 50Hz, max power 6kW
- 3N~400V, 50Hz, max power 8kW

manufactured at Elterm, are compliant with the regulations of the following WE directives:

Directive/Regulation number	Title:
2014/35/UE as amended	Low Voltage Directive (LVD)
2014/30/UE as amended	Electromagnetic compatibility (EMC) directive
2011/65/UE as amended	Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)
2012/19/UE as amended	Waste Electrical and Electronic Equipment (WEEE) Directive, GIOŚ register number E0001767
2009/125/UE	General principles for setting ecodesign requirements for energy-related products (Annex 13)

Chełmno, 1 May 2022

Maciej Kaszuba

Electrical device - do not dispose of in municipal waste containers. Return the used device to the manufacturer or bring it to an electro-technical waste collection point.

Elterm electric boilers 30 years of experience

more than 500,000 satisfied customers throughout Europe

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