

### **User manual**

CE

# PUFFER CONTROL LSP-PC1





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### Description



The LSP-PC1 controller is designed to control a simple heating system consisting of a heat source (e.g. a fire place), a hot water storage tank and a pump.

By comparing the boiler and tank temperatures, the device controls the pump and assures the user that the system is operating safely and efficiently.

### **Functions**

- Temperature measuring with Pt1000 sensors
- Visual alarm
- Displaying measured temperatures
- Sound signal alarm
- Wall-mountable housing
- Manual control
- Algorithm to prevent pump stalling





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### Controller description





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You can easily change the settings, but it is recommended to seek professional advice. Our controllers are equipped with potentiometers and a button. It has two inputs for temperature sensors. Both sensors are Pt1000 type, one measures the temperature in the fire place and the other in the water tank (puffer). There is an output on the controller that drives the circulation pump. On this output the input supply voltage appears, which can be 150V - 240V AC. The maximum current drawn by the pump is 5A.

#### Display

When the potentiometers are operated, the display automatically switches to the potentiometer set value display. By default, the displayed temperature alternates every 5 seconds between fire place temperature and tank temperature, which can be distinguished by a dot.



#### Potentiometers

The **Start Temp** potentiometer determines the starting temperature at which the regulator must start. The fire place temperature must be higher than the value set here for the pump to start, even if the temperature difference is greater than Temp Diff. Its value can be changed between 0 and 40 °C.

The **Temp Diff** potentiometer sets the temperature difference between the fire place and the water tank. When the temperature in the fire place becomes higher than the tank temperature at the set value, the controller switches the pump on. It can be set from 2 to 22 °C.

#### **Button**

The main function of the button is to start the pump. Pressing the button starts the pump and releasing the button stops the pump. It can be operated at any time, regardless of how the controller is working. It is used for testing the pump.

The other function is the alarm reset, disables the alarm sound.



### Alarms

#### Sensor alarms

If any of the sensor wires break or short out, the audible alarm will sound and the pump will run until the controller receives a readable value from the sensor again. The audible signal can be turned off by pressing the button on the bottom of the controller. After the beep stops, the pump will continue to run until the problem is resolved.

The display will indicate which sensor has a problem and what the fault is. These can be displayed in combination.

E		B
E	5	B
E	B	
-		

EO-- means that the puffer sensor is not connected or broken

ES-- means the puffer sensor is short-circuited

E--O means that the fire place sensor is not connected or broken

E --S means the fire place sensor is short-circuited

#### High temperature alarm

After the temperature exceeds 90°C, the Error LED will light up and the pump will start. It runs until the boiler temperature drops below 87°C.

If the temperature also exceeds 100°C, the pump will also run and the alarm will sound.



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### Functioning



#### Normal mode

Under normal working conditions, the controller measures the temperature in the fireplace (T1) and in the water tank (T2), if the temperature in the fireplace minus the temperature in the water tank is higher than the Temp Diff value, then it starts the pump and runs it until the fireplace temperature (T1) is lower than T1 + half of the preset value.

Example:

Temp Diff = 10 degrees difference between T1 and T2 T1 = reaches 60°C T2 = 50°C, the controller starts the pump and runs it until T1 cools down to 55°C (50 + (10/2)).

#### **Antifreezing funtion**

The controller starts the pump at 3°C, preventing any freezing. If the fire place temperature rises above 5°C, normal operation will resume.

#### **Pump protection function**

If the pump has not been on for 8 days, then the pump turns on for 3 minutes.



### Dimensions





### Connectors



Pt1000 sensor for Fire place

150-240V AC Power supply

The polarity of the Pt1000 sensors does not matter, they are interchangeable.

A 3-pole connector is available for connecting the pump. This means that a threeconductor pump can be connected using protective earth (GND), neutral (N) and phase (L).

The power supply is also connected as shown. The picture shows the phase (L) at the bottom, the neutral (N) above it and the protective earth (GND) above it.



### **Default settings**

High temperature alarm	90 °C in fire place
Automatic high temperature alarm shutdown	87 °C in fire place
Anti-freeze mode	Pump starts at 3 °C and stops above 5 °C
Start Temp Value	30°C
Temp Diff Value	6°C

### **Technical specifications**

Power supply	150 - 240V AC 50Hz
Consumption	1W
Ambient working temperature for controller	-20 °C to 60 °C
Dimensions (W x H x L)	147 x 96,5 x 38 mm
Weight	460g (with power cord and sensors)
Display	3-Digit 7 segment display
Maximum pump load	5A
Sensor type	Pt1000
Measuring range	-50 °C to 180 °C
Accuracy of temperature control	+/- 0.5 °C



### Attention!

Before starting work on the controller (cable connection, equipment installation, etc.), make sure the equipment is disconnected from the main power source. All connections must be made personally by a qualified electrician. Before switching on the controller, check the correct connection of the cables and inspect the insulation of the wires!

# The device may be damaged if struck by a lightning.

# Make sure the plug is disconnected from the power supply during storm.

We are committed to protecting the environment. The manufacture of electronic devices imposes an obligation to ensure the safe disposal of components and electronic devices used for environmental safety. Recycling waste helps protect the environment. The user is obliged to transfer used equipment to a collection point, where all electrical and electronic components will be recycled.









### **INSTALLATION INSTRUCTIONS**

PUFFER CONTROL

Remove the controller cover by removing the 4 screws on the back.

1



Insert the pre-wired temperature sensor (Internal sensor) into the water tank measuring port. If necessary, extend it up to 300 m.

3 Insert the connected sensor into the measuring port of the boiler (external sensor). If necessary, extend the sensor cable up to 300 m.

Connect the pump to the controller. Warning, the input supply voltage is displayed!
Do not connect the unit to mains voltage during installation.

5 Plug the device's power cord into an outlet. Check that the device is working, the Power ON LED should be lit.



6 Once you have assembled the configuration shown in the picture, follow the setup instructions on the next page.







**T2** 



## **SETUP INSTRUCTIONS**

Use a screwdriver to set the minimum 1 temperature at which the regulator should operate. You can do this using the potentiometer on the right. This is set by default to 30°C.

Set the temperature difference 2 between boiler and tank at which the pump should start, using the potentiometer on the left. By default, this value is 6°C.

Reinstall the back cover. 3

Test the pump by pressing the button 4 indicated.



R CONTROL







