

Heater Controls /
Air Heaters /
PLANAR



Introduction

This manual is part of documentation for PLANAR air heaters and provides information on safe maintenance of the product.

If you have any problems, we strongly recommend that you contact authorized service centers, addresses and telephone numbers of which you can find out from the company, the seller or on the website www.autoterm.com.



Before using, the heater please read these instructions and the Operation Manual of the Heater.

Warranty

The manufacturer is not liable for defects and damages that result from non-compliance with the instructions on installation and maintenance of the heater, as well as the instructions contained in this manual.

- The Controller shall be used only for heater control.
- Do NOT connect or disconnect the connector of the Controller during the heater operation.
- After turning off the heater, reconnection should be made at least after 5-10 seconds.
- For safe operation of the heater, after two consecutive failed start-ups customer service should be contacted to identify and repair the malfunction.

The warranty period and conditions of the warranty service are listed on the warranty card.

Safety

Risk of explosion in places where large quantities of flammable vapours and gases or large amounts of dust can be generated or accumulated (e.g., gas stations, oil depots, warehouses, fuel, coal, wood or grain storage facilities).

- Do NOT start or use the heater

Risk of poisoning or choking by exhaust gases indoors.

- Do NOT start or use the heater

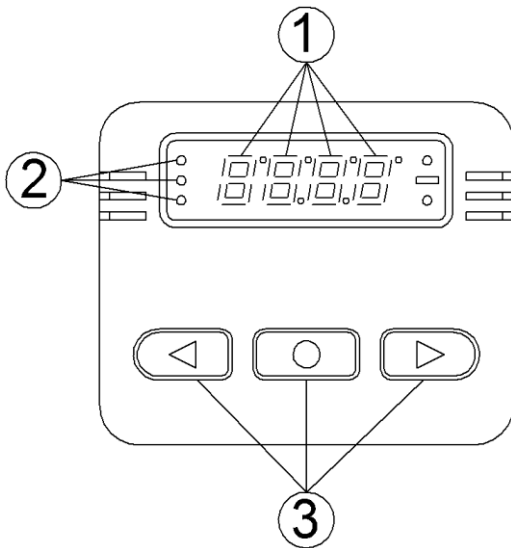
Fire hazard due to the presence of flammable materials and fluids in the exhaust gas stream.

- Do not allow the presence of combustible materials in the exhaust stream

Risk of injury due to the use of a defective unit

- Do not use a faulty heater
- Contact a service centre

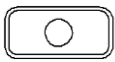
Controller PU-16



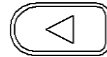
1 - 4-digit LED indicator (indication of temperature, power or a fault code).

2 - LEDs (indication of operation mode)

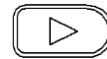
3 - control buttons



- heater start-up;
- heater shutdown;
- activation of the selected mode;
- confirmation of the selected menu item.



- selection of operation mode;
- selection of sensor;
- decreasing the desired setting of temperature or heat output.



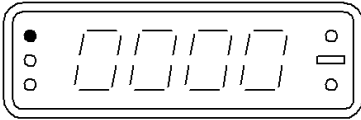
- ventilation mode ON/OFF;
- increasing the desired setting of temperature or heat output.

Application

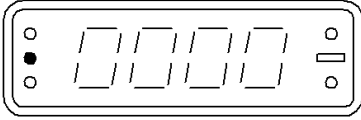
The functions of the Controller :

- Manual Start-up (for unlimited time) and Shutdown of the heater.
- Selection of Heat Control/Temperature Control operation mode.
- Activation of Ventilation mode.
- Indication of preset values for temperature or power.
- Indication of 1 of the 3 Temperature Sensors (installed in the heating unit, or in the Controller, or remote, if installed in the driver's cab/compartment).
- Fault code indication in case of heater malfunction.

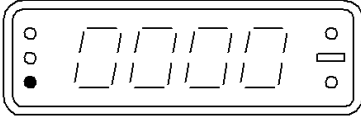
Status Indication



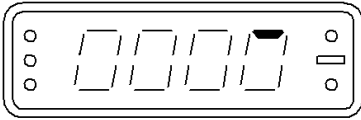
Operation of the heater in the Heat Control Mode



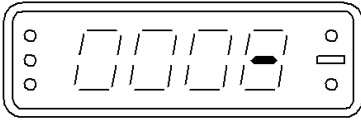
Indication of Ventilation mode



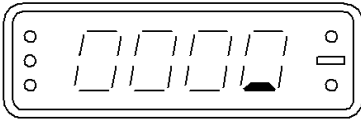
Operation of the heater in the Temperature Control Mode



Cab sensor



Sensor in the Controller



Sensor in the heating unit

Operation mode LED:

- | | |
|--------------------|--------------------------------|
| steady | – the heater is working; |
| blinks slowly | – the heater is not working; |
| blinks every 1 sec | – malfunction detected; |
| blinks fast | – the heater is shutting down; |

Operation Modes

- | | |
|-----------------------|---|
| «Heat Control» | <ul style="list-style-type: none">• designed to heat an interior space as quickly as possible;• has 8 steps of the operation mode;• the heater is constantly working at the set heat level.. |
| «Temperature Control» | <ul style="list-style-type: none">• designed to heat an interior space to a preset temperature;• decreases heating output when the difference between the preset and actual temperatures is reduced. |
| «Ventilation» | <ul style="list-style-type: none">• designed to maintain a preset temperature in a space;• stops heating of the space after reaching the preset temperature, then begins air ventilation;• controls the space temperature; when the temperature is lowered below the preset level, the heater starts running in heating mode. |

Features of Operation Modes

- Ventilation mode is compatible with the Temperature Control and incompatible with the Heat Control mode. In Heat Control mode the heater will not stop its heating operation regardless of the middle LED display.
- After each shutdown of the heater the activation of the Ventilation mode is reset.
- When the Heat Control mode is selected, the heater constantly operates at the preset level of heating power. When a comfortable temperature is reached, we recommend to reduce the heat level or to ventilate the room.
- When the Temperature Control mode is selected, the heater constantly operates to maintain the preset temperature, while its heating power is changed ranging from max. to min., depending on the ambient temperature. The higher the temperature, the less heat the heater generates.
- Changing the parameters of the heater (sensor selection, activation-deactivation of the ventilation mode) is only possible before starting the heater, and it is impossible during its operation

After reaching the preset temperature:

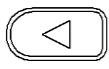
- If the Ventilation mode is not activated, the heater switches to "min." setting. Further operation of the heater depends on the ambient temperature in the room:

- 1) If the temperature continues to rise, the heater will continue to work at the "min" power level. The heater can be switched off manually.
- 2) If the temperature starts to drop, the heater will gradually increase generation of heating power, trying to maintain the preset temperature in the room. The heater can be switched off manually.

- When the Ventilation mode is activated, upon reaching a predetermined temperature the heater switches to "Ventilation". In Ventilation mode combustion is terminated, and air ventilation in the room begins. When the room temperature falls to 5°C below the preset value, the heater starts up again. The heater can be switched off manually.

Operating Controller

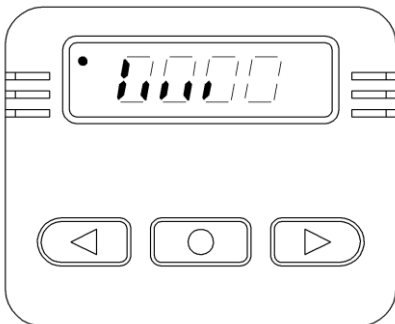
When the heater is connected to the vehicle electrical system, the display shows the software version of the Controller. Negative temperature is displayed with a minus sign.

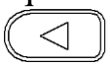

 - navigating the main menu.

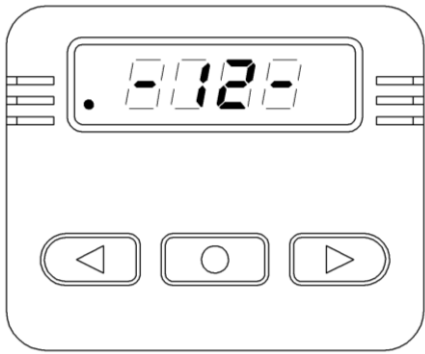
 - activation/deactivation of the Ventilation mode (the middle LED lights up).



 - mode selection confirmation and start-up of the heater.

After the heater is started, the required value for heating power or temperature should be entered, depending on the selected mode.

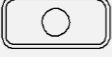



If the Heat Control mode is selected, then the required value of heating power is set by pressing the buttons  (decrease) or  (increase). An 8-step scale is displayed for choosing the required level of heating power.



If the Temperature Control mode is selected (regardless of activation of the Ventilation mode), then the required value of temperature is set by pressing the buttons  (decrease) or  (increase) (in the range from 1 to 30°C in the zone of the selected sensor).



There is no need to confirm the setpoint for heat or temperature. Depressing  switches off the heater.

To switch off the heater, press the button . This terminates fuel supply and the combustion chamber is purged for 3-5 minutes. The LED indicating the operating mode will flash rapidly until the end of the purge.



The heater power shall NOT be disconnected until the end of the purging cycle



To save energy, a light indicator turns off in 20 seconds after the last press of any button. To resume display press any button.



In case of open-circuit failure of the cabin temperature sensor (during operation), the heater will go to medium-power level.

Troubleshooting

Faults that occur during heater operation, are coded and automatically indicated on the Controller display. The fault code and the operating mode LED will blink slowly



ATTENTION
Maintenance and repairs should be carried out by trained qualified personnel only!

You can eliminate the following faults yourself (see Table 1).

With all other faults, or if you cannot self-troubleshoot the problem, please contact a service center.

Table 1

Fault Code	Description	Comments. Solution
1	Overheating of the heat exchanger	Check the intake and output of the heating unit for unobstructed entry and exit of heated air.
2	Overheating in the area of the control unit. Flame indicator overheating	Check the intake and output of the heating unit for unobstructed entry and exit of heated air. Check the combustion air supply system and the gas exhaust hose. Repeat the start-up to cool down the heater.
12	Disabling, overvoltage	Check the battery, voltage regulator and the supply wiring. Voltage between the power connector contacts 1 and 2 should be no higher than 30V. (for 12V products - no more than 16V).
13	Start-up attempts exhausted	Check for the quantity and supply of fuel. Check the combustion air supply system and the gas exhaust hose.
15	Disabling, undervoltage	Check the battery, voltage regulator and the supply wiring. Voltage between the power connector contacts 1 and 2 should be not lower than 20V (for 12V products - not lower than 10V).
16	Exceeded time for ventilation	Check the air supply system for combustion and the gas exhaust hose.
20	No connection between	Check connecting cables, connectors.
30	Controller and the control unit	Check connecting cables, connectors.
29	Exceeded permissible number of flameouts	Check for the quantity and supply of fuel. Check the combustion air supply system and the gas exhaust hose.
31*	Overheating in the area of the temperature sensor at the hot air outlet	Check the intake and output of the heating unit for unobstructed entry and exit of heated air.

Fault Code	Description	Comments. Solution
33*	Heater is locked **	To unlock the heater you need to contact the service center.
35*	Flameout in the combustion chamber due to undervoltage	Check for the battery and wiring. (Undervoltage may occur due to a prolonged use of the electric starter).
78	Detected flameout during operation.	<i>Shown for user's information.</i> Check for the tightening of clamps on the fuel line, fuel line leaks, and tightness of the fitting on the fuel pump.

* - only for the air heaters PLANAR-8DM

** **Attention!** If, during the start-up and operation of the heater the error message "Overheating" is repeated 3 times in a row, the heater will be locked. Locking is made upon actual overheating, regardless of the input from the sensors that produced errors. In case of locking, the controller display will show code 33. To unlock the heater you need to contact a service center.

Alarm System Remote

The operation of the heater can be controlled by a remote control of a security alarm system, provided that it has a free channel.

Heater control can be carried out in two ways: with short-time closures of relay contacts (closure time of 0.5 to 3 seconds) and with a long-time closure (longer than 3 seconds). With short closures, the first pulse switches the heater ON, the second OFF. A prolonged closure of relay contacts forms a Start-up command from the Remote, while the opening of contacts sends a Shutdown command.

After starting, the heater will operate at "max" in the Heat Control mode. The time of heater's operation – 2 hours. The operation of the heater can be interrupted from the alarm's Remote or from the Controller.

The type of the Remote and the relay does not matter, as long as the relay consumption current does not exceed the load capacity of the Remote's channel.

If the heater was started with the Controller, then, during its operation, the Start-up command from the alarm Remote is ignored and operation parameters cannot be changed

GSM Modem

The operation of the heater can be controlled from a smart phone using a modem and a special application.

A special connection is provided for the remote control of the heater by means of a GSM modem, designed for use in harsh environments (cold, vibration, etc.). Both the modem and the phone must have a SIM card installed.

Heater control is performed using a software application installed on the mobile phone (see. Instructions to the modem).

Operating parameters can be changed by means of SMS commands. Changes are possible at any time.

For detailed instructions on working with the modem, please see the "User Guide for TeplostarSMS" (included with the modem).