

EN



Operation manual

Control panel PU-27



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1 Introduction

This Operating Manual is part of the documentation for hydronic pre-heaters and air heaters (hereinafter referred as the product). The Manual contains information for the user on safe maintenance of the product.

This control panel is compatible with the following products:

pre-heaters:

- 14TC-10
- 14TC-mini
- BINAR-5S

air heaters:

- Planar 2D
- Planar 4D
- Planar 44D
- Planar 8D
- Planar 9D

For detailed information on product models supported, please visit www.autoterm-europe.com.

In case of any problems, we strongly recommend that you contact authorized service centers, the addresses and phone numbers of which you can obtain from the seller or on the www.autoterm-europe.com website.



Before operating the pre-heater, read this operating manual and the pre-heater (heater) operating manual.

2 Warranty and liability

The manufacturer will not be liable for defects and damage caused by failure to follow the product installation and maintenance instructions.

- The control panel can only be used to control products from the list of compatible products.
- Do not connect and disconnect the control panel connector while the product is operating.
- After the product is switched off, it should not be switched on again for at least 5–10 seconds.
- For safe product operation, after two unsuccessful attempts to start the product in a row, contact the service department for troubleshooting information.
- The warranty operating period of the control panel is 24 months from the date of sale, provided the operation, transportation and storage rules are followed by the consumer.
- The warranty storage period is 24 months from the product packing date.
- In the absence of a company stamp indicating the sale date, the warranty period is calculated from the date of manufacture.

This warranty does not cover defects appearing as a result of:

- force majeure circumstances, including lightning strike, fire, flood, impermissible voltage surges or traffic accidents;
- failure to follow the rules for installation, operation, storage, and transportation specified in the Operating Manual;
- use of the control panel for purposes other than intended.

3 Safety



Do not switch on and operate the product in locations where combustible vapors or gases or large amounts of dust can form and accumulate (for example, filling stations or petroleum, fuel, coal, timber or grain storage facilities). Explosion hazard.



Do not switch on and operate the product if combustible materials or fluids are present in the exhaust gas. Fire hazard.

Do not switch on and operate the product in enclosed or non-ventilated premises. Hazard of poisoning and asphyxiation by exhaust gases.

Do not use a faulty product. Injury hazard due to use of faulty device.

4 Purpose

The control panel is designed for:

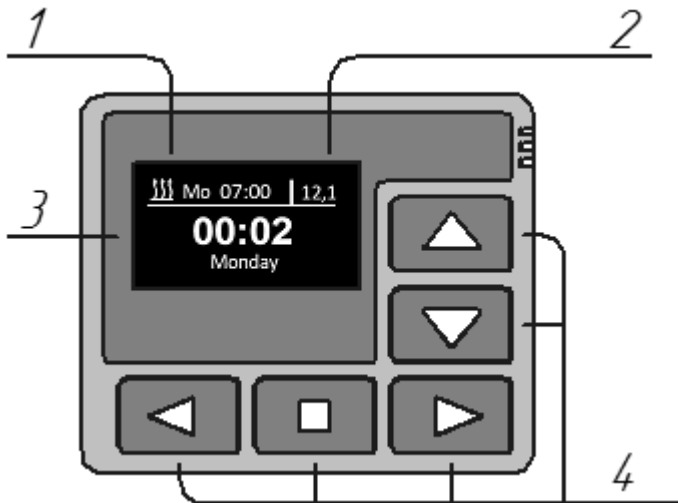
- manual start and shutoff of the product;
- manual start and shutoff of the pump (for the pre-heater);
- manual start and shutoff of ventilation (for the heater);
- fluid temperature display (for the pre-heater)
- power supply voltage display;
- current time and operating time display;
- activation of the product startup timer;
- economy mode activation (for the pre-heater);
- additional heater operation mode selection (for the pre-heater);
- display of malfunction code in case of product malfunctions;

display of control panel and control unit software version.



The control panel interface depends on the product it is connected to.

5 Control panel external view



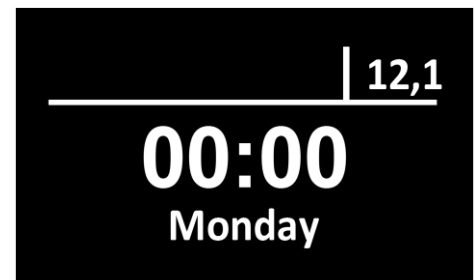
- 1 – activated startup timer.
- 2 - power supply voltage.
- 3 – LED indicator.
- 4 – control keys.

6 Starting control panel operation






After connecting the control panel to the product, the control panel software version and the process of establishing connection with the product will be displayed.

After the connection is established, the main screen (current time, day of week and power supply voltage) will be displayed.



Main screen















Action of keys in the main screen:

Keys	Action
 , 	Navigation between the main screen and temperature sensors screen.
 , 	Enter the main menu.
	Start product.

7 Main menu

Switch to the main menu from the main screen by clicking the  or  key.






Action of main menu keys:	
Keys	Action
 , 	Navigation through the main menu
	Activation of selected menu item
 , 	Exit from the main menu to the main screen

Menu icon	Description
	Startup timers menu.
	Product operating parameters setting menu. <i>(*this menu cannot be used for products without settings).</i>
	Control panel settings menu.
	Current time and day settings menu.
	Language settings menu.
	Software version display menu.
	Pre-heater operating time setting menu. <i>(*this menu cannot be used for air heaters).</i>



8 Timers settings menu

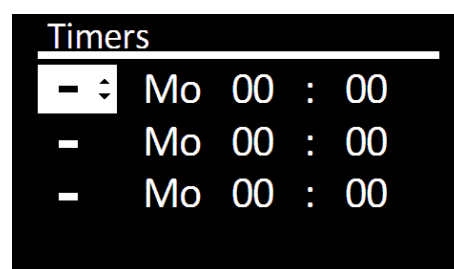



Action of the Timers menu keys:

Keys	Action
 , 	Navigation through the menu items
 , 	Change menu item value
	Exit from this menu to the main screen

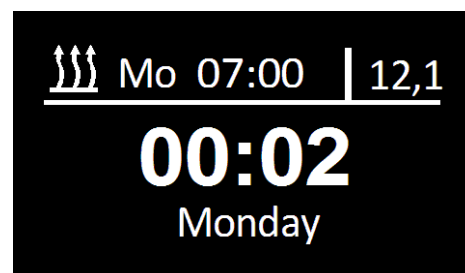
The control panel allows the startup timers to be programmed.
For startup timer setting, the following data must be indicated:

- startup time in 24-hour format;
- day of week (Monday - Sunday) or select daily startup (ED);
- activated timer:
 - activated - 
 - non-activated - 



Only a single timer can be activated. After editing of the timers is completed, press the  key to switch to the main screen.

When the timer is activated, the activated timer icon, day of week and startup time will appear in the upper left corner of the main screen.




In case of product power loss, timer settings are saved and timer activation is reset.








If the heater runs by timer it will work only for 2 hours. If you press any button on the control panel during these 2 hours the heater will switch to the unlimited work time.

9 Fast access to startup timers activation menu

For fast access to the timer activation menu from the control panel main screen, press and hold the  key.




This menu is only intended for timer activation.
Timers cannot be edited in this menu.






Action of timers activation menu keys:	
Keys	Action
 , 	Navigation between timers.
	Timer activation / deactivation.
 , 	Exit from this menu to the main screen

10 Hydronic pre-heaters settings menu



BINAR-5S heater settings menu:

Binar-5S
Twait preheater 89 
Warming up -
Twait warm up 85

Action of Settings menu keys:	
Keys	Action
 , 	Navigation through the menu items
	Exit from menu to the main screen
 , 	Change menu item value

“Settings” menu items:	
Twait preheater	Fluid temperature at which the pre-heater switches to standby mode (heater shuts off and pump continues to operate). When the fluid temperature drops, the pre-heater exits standby mode (the heater starts again). The default value for the switch to standby mode is +88 °C. The temperature for the switch to standby mode can be set in the +20 to +95 °C range.

“Settings” menu items:	
Warming up	<p>In the additional heater mode, the pre-heater operates with the engine and maintains the set fluid temperature.</p> <ul style="list-style-type: none"> - Additional heater mode is OFF. <p>A Additional heater automatic operation. If the pre-heater is off, after the vehicle engine starts, the pre-heater will start automatically. After the engine stops, the pre-heater will shut off automatically.</p> <p>If the pre-heater is on, after the vehicle engine starts it will switch to additional heater mode automatically.</p> <p>P Additional heater manual operation. If the pre-heater is off, after the vehicle engine starts, the pre-heater will not start automatically (manual start is required). If the pre-heater is on, after the vehicle engine starts it will switch to additional heater mode automatically.</p>
Twait warm up	<p>Additional heater temperature setting. The required temperature value can be set in the +75 to +95 °C range. The default temperature is +85 °C.</p>
Wait Mode pump	<p>Setting pump operation in standby mode. In the additional heater mode, after the heater switches to standby mode, the pre-heater shuts off and the pump continues to operate. Depending on this setting:</p> <ul style="list-style-type: none"> - The pump operates continuously (from the moment of start to the moment of pre-heater shutoff). ✓ The pump operates simultaneously with the pre-heater and does not operate in standby mode.
Vehicle	<p>Setting of interior heater activation (provided the relay harness is connected to the heater).</p> <ul style="list-style-type: none"> - The interior heater is not activated while the pre-heater is on. ✓ While the pre-heater is on, the interior heater starts automatically, depending on the fluid temperature.
Vehicle	<p>Setting of interior heater activation temperature. The required temperature value can be set in the +30 to + 60 °C range. The default temperature of relay activation is + 40 °C.</p>
Pump with engine	<p>Setting of pump activation when the engine starts. The pump, operating together with the heater, can be used for additional circulation of coolant during vehicle engine operation. The pump will activate automatically after the engine starts and will switch off after engine shutoff.</p> <ul style="list-style-type: none"> - The pump will not start. ✓ The pump will start when the engine starts.



“Settings” menu items:	
Pump type	Pump selection depending on configuration, pre-heater <ul style="list-style-type: none">- Bosch pump✓ ADVERS pump
Sign channel	Setting of pre-heater control with the alarm channel. <i>(provided the pre-heater is connected to the alarm system and a free channel is available).</i> <ul style="list-style-type: none">- Pre-heater control OFF✓ Control ON.
Fact settings	Reset pre-heater settings to default values.

11 Air heaters settings menu



PLANAR air heater settings menu:






Heater

By T heater

By T panel

By T air

Action of Settings menu keys:

Keys	Action
 , 	Navigation through the menu items
	Exit from this menu to the main screen
 , 	Change menu item value

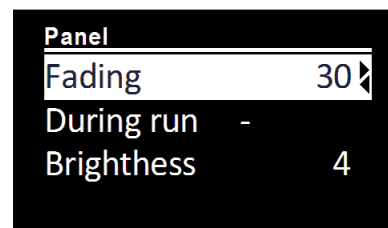
“Settings” menu items:

By T heater	In the “heater T based” mode, the “Set temperature” of the temperature sensor located in the heater is used for operation.
By T panel	In the “control panel T based” mode, the “Set temperature” of the temperature sensor located in the control panel is used for operation.
By T air	In the “exterior T based” mode, the “Set temperature” of the exterior temperature sensor is used for operation.
By power	In the “Power based” mode, the “Set power” is used for operation.
Power value	Heater power value in the 0 to 9 range, where 0 is minimum and 9 is maximum power.
T setpoint	The value at which the heater will switch to standby mode. The heater will switch from standby mode when the temperature of the sensor used to control heater operation drops 5 °C below the “Set temperature” value.
Ventilation	<p>Ventilation mode ON setting</p> <ul style="list-style-type: none"> - Ventilation mode OFF. When the heater switches to standby mode, the air pump will shut off. ✓ Ventilation mode ON. When the heater switches to standby mode, the air pump will continue to operate in ventilation mode.

12 Parameters settings



This menu is intended for setting control panel parameters.



Action of Parameters menu keys:	
Keys	Action
	Navigation through the menu items
	Change menu item value
	Exit from this menu to the main screen

Parameters menu items:	
Fading	Setting of indicator lighting time. By default, the control panel indicator lighting time is 30 seconds. The light duration can be set in the 10 to 120 sec. range with a 1 sec. step, or to set continuous lighting; in the latter case, the “-“ sign will appear on the display.
During run	Setting of indicator lighting during operation. <ul style="list-style-type: none"> - the indicator is dimmed while the pre-heater is on. ✓ the indicator is constantly lit while the pre-heater is on
Brightness	Setting of indicator light brightness. Indicator light brightness is set in the 0 to 4 range. The brightness default value is 4.
Short hit start	Setting of start by clicking key for pre-heater/heater start. <ul style="list-style-type: none"> - Click – pump/ventilation start. - Press and hold – pre-heater start. ✓ Click – pre-heater start. Press and hold – pump/ventilation start.
Time correction	Setting clock adjustment. The clock accuracy may vary slightly due to low temperatures. The required adjustment can be set in the -59 to +59 seconds per day range. The correction default time is 0.
Keys lighting	Keys lighting setting. <ul style="list-style-type: none"> ✓ - keys lighting ON. - keys lighting OFF.

13 Time settings menu








Current time is set and displayed in a 24-hour format. When the control panel power is shut off, the current time is set to zero and the day is reset to Monday.

Edit time

00 : 01 Mon

Action of Time menu keys:

Keys	Action
 , 	Navigation through the menu items
 , 	Change menu item value
	Save changes and exit from this menu to the main screen

14 Language settings menu






This menu is intended for interface language selection.

Language

Русский ✓

English

Action of Language menu keys:

Keys	Action
 , 	Navigation through the menu items
	Confirmation of language selection and exit from this menu to the main screen



15 Software version display menu

In this menu, the information on software versions is displayed.

- control panel software version;
- product control unit software version;
- Product serial number.

Press any key to exit.

Versions

5.0.0.0

CU: 6.1.0.9.1.

SN: 00138.0000160

16 Operating Time settings menu






This menu is intended for setting pre-heater operating time with a 5 minute step. The operating time setting range depends on the product the control panel is connected to.

Running time

00:40

Action of Operating Time menu keys:

Keys	Action
 	Value editing.
	Confirmation of set value and exit from this menu to the main screen

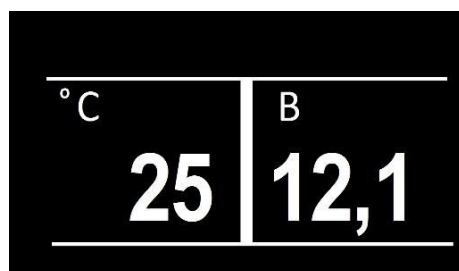
17 Hydronic pre-heater start



Start of pre-heater from the main screen or from the temperature sensors screen. The indicator will appear as follows. The pre-heater operating time count will be started.



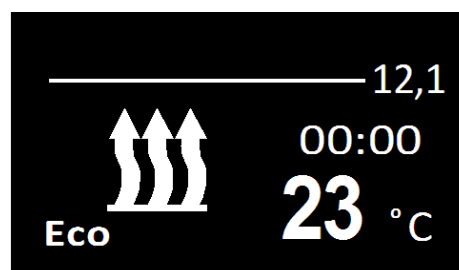
Full-screen display of current coolant temperature and power supply voltage.



When the pre-heater is operating, enter the pre-heater operating time editing menu.



Economy mode ON / OFF.
(for 14TC-mini and 14TC-10)



Pre-heater shutoff.



18 Air heater start



Start of heater from the main screen or from the temperature sensors screen. The indicator will appear as follows.



Press and hold more then 2 seconds for starting ventilation* (without heating).



Temperature sensors display.

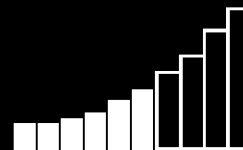


When the air-heater is operating, enter the air-heater operating time editing menu.

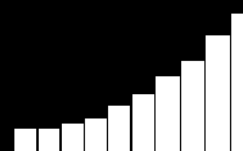


Heater shutoff.

Heating



Ventilation



Sensors



32

21

23

Heater

By T heater

By T panel

By T air



Shutting down

*only for PLANAR

19 Malfunctions



Malfunctions occurring during pre-heater operation are coded and automatically displayed on the control panel display. For malfunction reset, press any key. The malfunction codes depend on the product the control panel is connected to. See malfunction code descriptions in the product operating manual.

Error



Error

22



ATTENTION!

Maintenance and repair should only be performed by trained, qualified personnel!

Acceptance and packing certificate

PU-27 control panel, serial number _____

Is manufactured and accepted in accordance with the applicable technical documentation and found suitable for operation.

Packing performed

Surname

signature

Production date _____
Department

Stamp Here QC

Production

ADVERS LLC

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EN



Operation manual

Air heaters

PLANAR-2D-12/24



PLANAR-4DM2-12/24-P



PLANAR-44D-12/24-GP-P



PLANAR-8DM-12/24-P



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Dear Customer!

Thank you for choosing this heater! We have done everything possible to make this product meet your requirements, while its quality satisfies the best world standards.

Introduction

The PLANAR heaters are designed to be used:

- to keep the operator cabin warm;
- for heating of various confined spaces of vehicles and small ships;
- to maintain comfortable room temperatures for a long time.

The heater operates independently of the vehicle engine. The principle of operation is based on forcing heated air through the heat exchanger system of the heater.



Please read these instructions carefully to learn about all the functions of the heater.

Safety Instructions

Installation of the heater and its component parts must be carried out by specialized organizations approved by the manufacturer. Installation of the heater must be carried out only by specialists in accordance with the installation instructions.



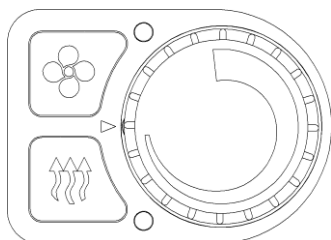
Health hazard



Danger of property damage

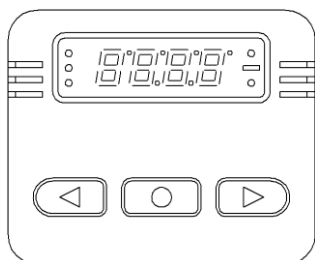
- The heater may only be used for the purposes specified in this manual.
- Due to the risk of poisoning by exhaust fumes when the heater is operating, the heater shall NOT be used in vehicles located in closed and poorly ventilated premises (garages, shops, etc.).
- When refuelling the car, the heater shall be switched off.
- The heater power shall not be disconnected until the end of the purge cycle.
- Any electrical connections or disconnections of the heater shall NOT be carried out while the power is ON.
- Do not step or put any items on the heater.
- Do not put any garments, pieces of fabric, etc., on the heater, nor place them in front of the intake or output of heated air.
- After turning off the heater, reconnection should be made at least after 5-10 seconds.
- For safe operation of the heater, the customer service should be contacted to identify and repair malfunction after two consecutive failed start-ups.

Heater Controls



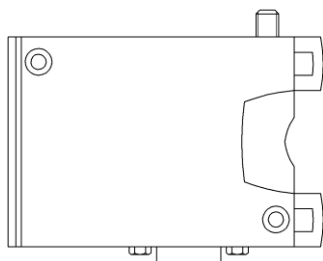
PU-5TM control panel

- Heater startup for unlimited duration
- Regulation of heater capacity
- Regulation of heated air temperature (if the cabin sensor is installed)
- LED indication of heater status



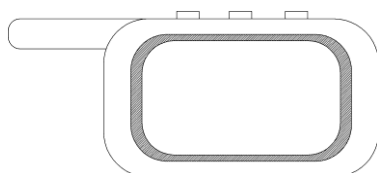
PU-22TM control panel

- Heater startup for unlimited duration
- Control by capacity/temperature
- Ventilation mode setting
- Operation according to one of temperature sensors
- Set temperature indication
- Actual temperature indication
- Malfunction code indication



GSM-modem

- Start-up and Shutdown of the heater.
- Setting of operation time.
- Power Control/Temperature Control.
- Setting of ventilation mode.
- Temperature indication.
- Indication of a selected temperature sensor



Remote Control

- Starting the heater for 2 hours.
- Heater operation at max. Power Control mode

*—optional part

Kit

The standard kit contains:

- control panel;
- fuel pump;
- fuel tank, fuel intake, tee pipe;
- wire harnesses;
- air intake;
- exhaust pipe;
- fasteners;
- muffler.

Optional (not in scope of supply): a cabin sensor and a GSM modem.

Responsibility



Failure to follow these instructions and the requirements contained therein results in the exclusion of any liability on the part of the manufacturer. The same applies to the repair specialist who does not have the necessary qualifications, or uses non-original parts without obtaining a permission of the manufacturer.

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-europe.com

Automatic Control Features

- 1) if for some reason the heater did not start, the start-up process will be automatically repeated. After two failed attempts the heater will be switched off;
- 2) if during the heater's operation burning is interrupted, the heater automatically re-starts. Restarts after consecutive flameouts are performed up to three times;
- 3) in case of overheating of the heater coil (for example, due to blocked intake or output of the heating unit), the heater is automatically switched off;
- 4) if the maximum temperature of the heated air is exceeded (for example, due to closed outlet of the heating unit), the heater is automatically switched off;
- 5) if voltage drops below 20V (10V) or increases to more than 30V (16V), the heater automatically switches off. The numbers in parentheses are for the heaters with the nominal voltage of 12V;
- 6) if the heater switches off due to an emergency situation, a malfunction code appears on the control panel. The malfunction code and the LED indicating the operation mode will be blinking.
- 7) in case one of the temperature sensors is faulty, the heater will not launch and a malfunction code will appear on the control panel.

Maintenance

It is recommended to send the heater for regular maintenance and testing to specialized service centers.

Many types of repairs and maintenance works on the heater require professional knowledge and special tools. Improper maintenance can result in damage to the heater.



We recommend to independently conduct the following services:

- If the heater is not in use, it is necessary to operate it once a month for 5-10 minutes, including the warm season, to ensure reliable operation of the heater.
- Regularly check the battery charge.
- Before the start of the heating season, check the fuel tank. If the tank stored fuel for a long time (for example from the past heating season), it is necessary to drain it! Rinse the tank with gasoline or kerosene and fill it with fresh diesel fuel. This procedure is designed to remove sediment formed in the fuel during prolonged storage. Failure to follow this procedure can lead to clogging or failure of the fuel pump and increased sooting in the combustion chamber.
- In case of a long parking or storing the vehicle, disconnect the heater from the power source (battery) to prevent it from discharging (current consumption of the heater out of service is $(30 \div 40)$ mA).
- Reliable operation of the heater depends on the grade of fuel used. Fuel grade is selected depending on ambient temperature.

Malfunctions

Actions in the event of a malfunction.

- check for the presence of fuel in the tank and the fuel line downstream of the fuel pump;
- check the 25A fuses;
- check for loose connections in connectors and fuse holders (possible oxidation of contacts);
- disconnect the power connector for 1-2 minutes and re-connect it again.

All other problems can be identified by the fault code, which is displayed on the Controller.

***Attention!** If, during 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 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.

We recommend not to wait for the lock of the heater, and immediately after the first overheating start troubleshooting causes of failure.

- Check intake and output of the heating unit for free passage of heated air.
- Check the Overheating Sensor on the heat exchanger and replace if necessary.

** - only for the heaters of the PLANAR-8D type.*

Technical Data and Specifications

Characteristics	Models			
	PLANAR-8DM-12-P		PLANAR-8DM-24-P	
Rated voltage, V	12		24	
Fuel	diesel fuel, depending on the ambient temperature			
Heating output, kW:	max	min	max	min
	6	3,2	7,5	3,2
Hot air flow, m³ /h:	max	min	max	min
	175	70	235	70
Fuel consumption, l/h:	max	min	max	min
	0,76	0,42	0,9	0,42
Power consumption, W:	max	min	max	min
	75	8	90	9
Start-up and Shutdown	manual			
Mass, kg, max	12			

Characteristics	Models			
	PLANAR-44D-12-GP-P		PLANAR-44D-24-GP-P	
Rated voltage, V	12		24	
Fuel	diesel fuel, depending on the ambient temperature			
Heating output, kW:	max	min	max	min
	4	1	4	1
Hot air flow, m ³ /h:	max	min	max	min
	120	70	120	70
Fuel consumption, l/h:	max	min	max	min
	0,514	0,12	0,514	0,12
Power consumption, W:	max	min	max	min
	57	10	56	10
Start-up and Shutdown	manual			
Mass, kg, max	10			

Technical Data and Specifications

Characteristics	Models			
	PLANAR-2D-12		PLANAR-2D-24	
Rated voltage, V	12		24	
Fuel	diesel fuel, depending on the ambient temperature			
Heating output, kW:	max	min	max	min
	2	0,8	2	0,8
Hot air flow, m ³ /h:	max	min	max	min
	75	34	75	34
Fuel consumption, l/h:	max	min	max	min
	0,24	0,1	0,24	0,1
Power consumption, W:	max	min	max	min
	29	10	29	10
Start-up and Shutdown	manual			
Mass, kg, max	10			

Characteristics	Models			
	PLANAR-4DM2-12-P		PLANAR-4DM2-12-P	
Rated voltage, V	12		24	
Fuel	diesel fuel, depending on the ambient temperature			
Heating output, kW:	max	min	max	min
	3	1	3	1
Hot air flow, m ³ /h:	max	min	max	min
	120	70	120	70
Fuel consumption, l/h:	max	min	max	min
	0,37	0,12	0,37	0,12
Power consumption, W:	max	min	max	min
	46,5	10	45	9
Start-up and Shutdown	manual			
Mass, kg, max	10			