



Press and Porcelain Furnace
VACUUM PORCELAIN FURNACE

AT-300 P

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Dear Customer

We thank you for your selectivity and trust in purchasing domestically produced products, and we are pleased that after continuous efforts, we have been able to manufacture AT-300P device and put it at your disposal.

This product has been designed by our technical and engineering team of experienced and committed people in the fields of mechanical, electronics and computer engineering, and by utilizing updated technology and building upon 25 years of experience in manufacturing dental equipment, this product has reached production of export index quality.

In designing the product, three principles of accuracy, reliability and safety performance and also user friendly have been considered, so in order to correctly and completely utilize product features, we ask you to read the instruction manual carefully and if you have any questions or you need more information, contact the after-sales unit.

The instruction manual is a comprehensive reference for the efficient and safe use of the product. Following the instructions of this manual has a great role in reducing consumable costs, avoiding risks and ultimately increasing product life. The instruction manual should always be kept near the product and the user should periodically read it.

Please impart us with your constructive guidance, so that we can benefit from your comments, recommendations, and gain knowledge about your needs.

We hope that you will find using AT 300P to be an enjoyable and successful experience,

Polaris Engineering and Manufacturing

The logo for the Polaris AT-300 P. It features the word "POLARIS" in a white, sans-serif font inside a white-bordered black rectangle. To the right of this rectangle, the text "AT-300 P" is written in a white, sans-serif font on a solid black background. The background of the entire page is a deep blue with faint, light blue line art depicting a mechanical or industrial structure.

POLARIS AT-300 P

A white-bordered rectangular box containing the text "Introduction to initial start-up". The text is in a white, sans-serif font. The box is centered horizontally and positioned in the middle of the page.

**Introduction to initial
start-up**

(1-1) Unboxing

The packaging of your furnace has been prepared with the proper design for physical protection and according to the corresponding standards. This packaging is waterproof and is resistant to mechanical pressures in the given standards range. In order to unbox the furnace and its accessories, first put the box properly on a surface according to the written signs and then open the top door and remove the soft protections and remove the furnace carefully and put it a proper place.

Note: For convenience and safety purposes in future transportations, keep the box and the accessories in a safe place.

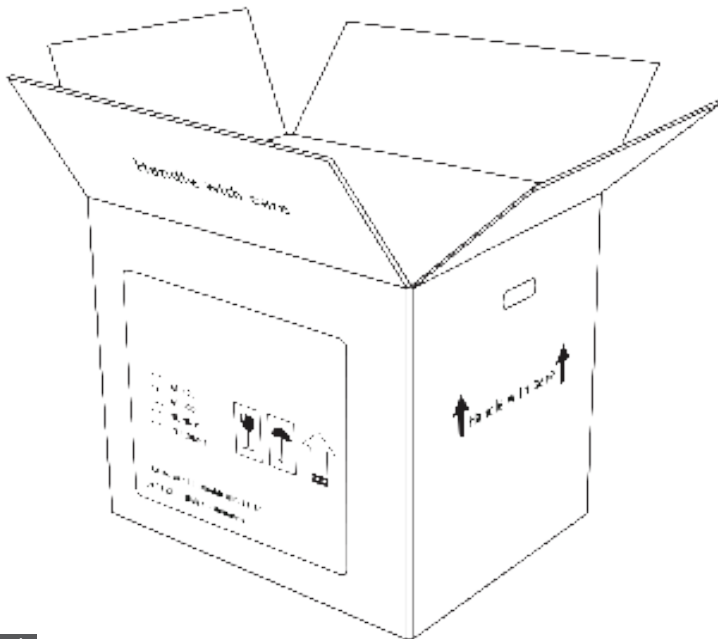


Fig-1 Device box

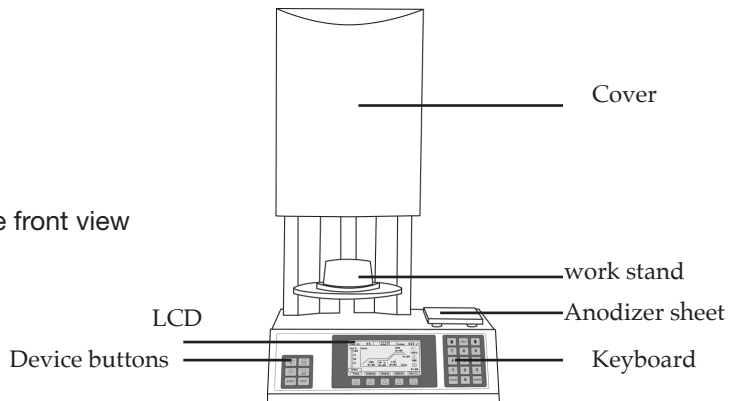
(1-2) Device contents

Parts	Amount	Parts	Amount
AT 300P furnace	1	Foliaceous pellets	4 (2 small & 2 Big)
Main electricity cable	1	Ceramic pellets	1
Work stand	3	Pin	10
Instruction manual	1	Air compressor hose	4 meters
Cylinder 100 cast and back door and front door set	1	Vacuum pump	1
Cylinder 200 cast and back door and front door set	1	Pump stand	4
Plunger	1	Vacuum pump hose	1

Table 1 Furnace box contents list

(1-3) Device parts

Fig-2 Device front view



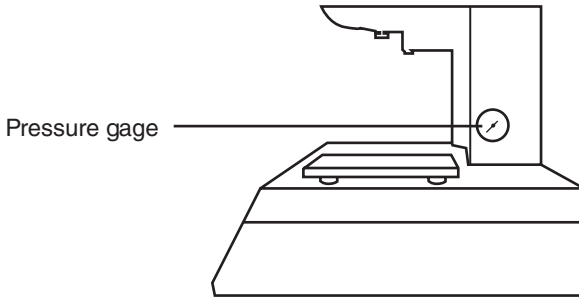


Fig-3 Device side view

(1-4) Device connections

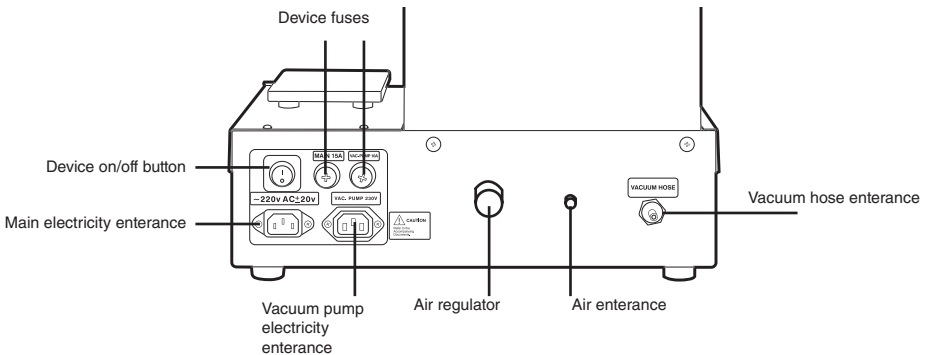


Fig-4 Device connections

Device fuses

There are two fuses behind the furnace related to the device main electricity and the value of each of them is written on the trunk. You can change the fuses according to the information available on the device if necessary (Fig 5).



Fig-5 Device fuses

(1-5) Device technical specification

Max Temp	1200 °C (2200 °F)
Power supply	240-210V AC 60/50 Hz
Maximum power	1800 W
Device height	675 mm
Device width	390 mm
Device depth	370 mm
Net weight	26 Kg
Vacuum pump	Compatible with 240-210V AC 60/50Hz metropolitan electricity 200 W power With the capability of the Vacuum creation of 985- mBars

Table 2 AT 300P furnace technical specification**Another furnace technical information**

- ✔ Equipped with the latest press technology, usable for all commercially available press ingots with vacuum environment
- ✔ With 200 defined programs in order to cure porcelain and also degassing different commercially available current alloys and able to define 100 new programs
- ✔ With the ability to define several firing programs (including crystal firing)
- ✔ With Stand by the automatic program in case of idleness
- ✔ With a pre-vacuum program for less thermal shock to ceramic
- ✔ With Fast Cooling program for time-saving
- ✔ With secondary programs such as NIGHT-IDLE-DRY-CALIBRATION for device initial setting, time-saving and prolonging product lifetime

- ✔ Equipped with precise thermal sensor (Radium Platinum Thermocouple)
- ✔ Equipped with an advanced processor in order to automatically control the programs
- ✔ Equipped with digital and analog LCD display with the ability to display process information
- ✔ Equipped with spiral muffle with quartz coating in order to create and distribute constant heat
- ✔ Equipped with a vacuum pump without oil with low noise
- ✔ Equipped with automatic vacuum and thermal calibration system
- ✔ Equipped with Acoustic signs system in start time and finishing time

(1-6) Practical notes

The device is designed and built based on engineering principles and all safety principles have been considered. If use substandard, this device will cause irreparable damages. Also, incorrect use of the device can lead to device malfunction and failure.

Incorrect usage

Working with tools, devices, and likes of these cases which are known to have destructive effects on health is not recommended at all. Also, manipulated devices may not be used by the user.

Correct usage

Using this device is only authorized for those who have read this instruction manual carefully and have understood the usage of this device's principles from this instruction manual. Improper methods and methods contrary to this manual may lead to usage deficiency of this device or/and damaging it. So product provider or its manufacturer is not liable for improper usage of this device. The risk of using the device in this way lays on the user.

Furnace installation and start-up

- 1 Get the device out of its box carefully.
- 2 To do so, take out all the protective material (Plastofoms) around it, take out the steam cleaner, and put it on a flat and standard laboratory table such that the space within 25 cm radius of the device is empty. Make sure that the surface and legs of the table are not made of metal.



Keep the device in a warm and dry place.



There is a danger of electrocution, if the surface or legs of table are made of metal and they are in contact with the ground. Thus, put your furnace on a wooden or fiberglass table.

- 3 When the temperature is less than 15 °C (59 °F) (for example, after transportation), before usage, let the temperature of the device and the environment reach equilibrium.
- 4 Make sure that the surface under the device is prone to heat. Sometimes surfaces sensitive to heating and surface coatings might lose their color because of constant heating.
- 5 Device earth connection should be connected to metropolitan electricity earth (earth wire can be connected to the nearest metal radiator or metal water pipe when the earth well is not available).
- 6 Keep the device away from direct sunlight.
- 7 Inflammable objects and materials should not be placed near the device.
- 8 When the device is working, do not place anything on the device firing container.
- 9 Install the device in a way that turning the device on/off should not be a problem.

(1-7) Safety notes







Problem	Device safety labels	Corrective actions
 CAUTION	Read the instruction manual before usage.	This label means that the lift surface can harm objects on its path. The device must be connected to proper voltage and earth connection.
	AC 220 Voltage	This label means that the device should be used with AC 220 Voltage with a ±10% error.
	Earth	This means the earth connection of the device is connected.
	Hot surface	The Surface temp is between 25 to 450 °C.
	Mobile surface	The elevator surface can damage the objects in its path.
	Dangerous electrical voltage	---

Table 3 Safety labels

(1-8) Environmental conditions

The device is designed for indoor usage.

Environment temp: 15 to 40 °C (59 to 104 °F)

Acceptable moisture: 80% in 31 °C

The voltage should not exceed ±10% of the defined voltage.

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Device application

(2-1) Device panel description

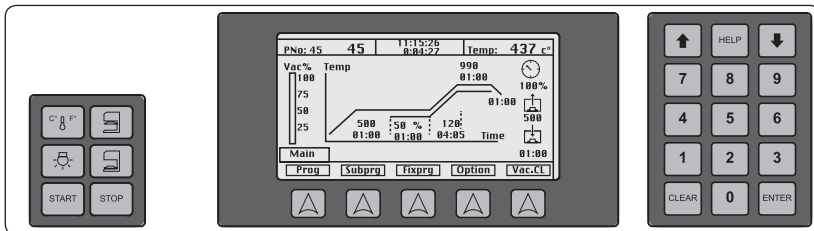


Fig-6 Device control panel



Lift control

The above buttons are for controlling the lift, up button is for lifting up and down button for lowering the device.



The temperature change from °F to °C or °C to °F

The above button is for changing the measuring scale from °F to °C or °C to °F



Lamp button

The above button is on the above of the upper sheet is used to turn the device on and off.



Enter Button

The above button is for registering in all programs and settings of the sintering furnace.



Clear button

The above button is for removing in all programs and settings of the sintering furnace.



Up and Down buttons

The up and down buttons are for moving between the displayed options on the LCD.



Help buttons

The Help button is designed for instructions of each part. To use this button, you should enter the desired part and then press the Help button. By doing this, you receive a brief description of that part.

(2-2) Porcelain firing programs (setting, changing and executing firing program)

IDLE		17:35:13	Temp: 124 c°
PN0: 0		0:00:00	
Vac%	10-Vita VmkMaster	20-Shofu	
100	11-Vita Vm7	21-Ceramax	
75	12-Vita Vm9	22-Ceramco 3	
50	13-Vita Vm13		
25	14-Vita Vmk95		
	15-Noritake1		
	16-Noritake2		
	17-Ivoclar Inline		
	18-Ivoclar Clasic		
	19-Go initial		
Fixprg			
			Back

Fig-7

Default firing programs:

This furnace has 300 memories. For your convenience and easy access to powders and alloys firing tables from different brands, Programs 100 to 238 have been recorded as constant and by default. Programs 0-99 and 239-289 are empty and you can program and make your changes. Default firing programs are referred to programs which are presented to the users as pre-prepared packages **Fig-7**

These packages include the following 13 parts which include programs 100 to 238:

- 10 Vita powder VMk Master
- 11 Vita Powder VM13
- 12 Vita Powder VM 9
- 13 Vita Powder VM 13
- 14 Vita Powder VMk 95
- 15 Noritake Powder(1st package)
- 16 Noritake Powder (2nd Package)
- 17 Ivoclar Inline
- 18 Ivoclar classic
- 19 GC initial Powder
- 20 Shofu Powder
- 21 Ceramax Powder
- 22 Ceramco powder

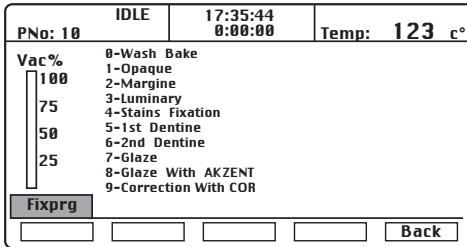


Fig-8

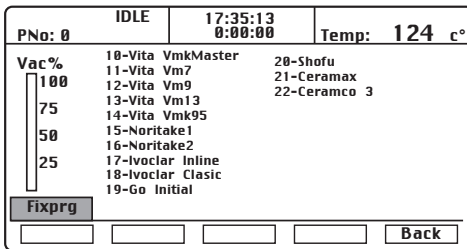


Fig-9

By selecting each of the mentioned parts in the next page, you will see all the firing stages related to that powder and you only need to enter that firing number and press Enter.

For example, for VMK Master vita powder, first enter 10 **Fig-8** and then, enter number 5 which is related to that powder and you will see 105 in this situation which is related to VMK Master vita powder **Fig-9**.

Firing program setting:

For firing program setting, you can arbitrarily select from programs 0-99. To achieve this, you must perform the following stages,

Attention: Before programming each of the furnace programs, the dear user should carefully read the catalog, manual and thermal table and use the recommended program for furnace programming according to used porcelain or/and alloy.

It is obvious that material developer companies' recommended programs might need to be changed to achieve the desired quality.

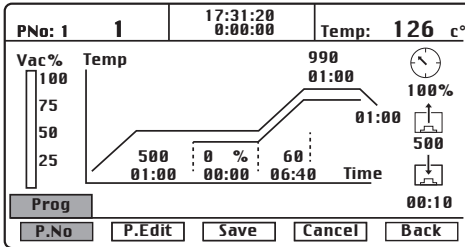


Fig-10

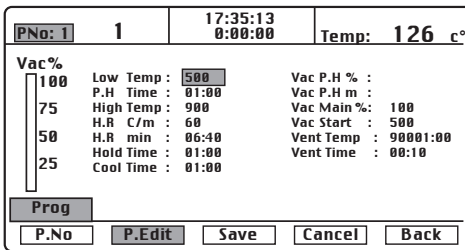


Fig-11

- Press the Prog key (Fig 9) and then press P.No key Fig-10. Now Select the desired programs using the number keys.
- Press Enter to enter the desired program so that you should be able to apply the necessary changes Fig-10.
- Press Prog. edit to enter program setting part Fig-11.

Introducing program parameters

Low Temp Drying temperature (Low Temp)

Drying temperature (Low Temp) means the powder initial temperature value for initial drying time.

Entry range:

Temp: 200-800 °C

Time: 0-99:59 Min

Validate the setting information by pressing the Enter button or by selecting the previous value by pressing the up and down buttons.

P.H Time **Drying time:**

Drying time or Pre-Heat Time means the time value which powder remains in Drying temp or Low Temp. The furnace door will close now.

Entry range:

Time: 0-100:00 Min

Validate the setting information by pressing the Enter button or by selecting the previous value by pressing the up and down buttons.

DOOR POSITIONS TIME:

Position Time 1	:	00:12
Position Time 2	:	00:12
Position Time 3	:	00:12
Position Time 4	:	00:12
Position Time 5	:	00:12
	:
Total Pos. Time	:	01:00
Pre Heat Time Set	:	01:00

D.Pos

Back

Fig-12

Setting door elevation:

This part of the program is for improving the quality of firing. In this part and in the drying time, you can set the furnace door position in a way that the best performance is achieved.

The furnace door will close in five steps. The timing of these steps is equal to each other by default. For example, if program drying time is 1 minute, each step will last for 12 seconds. If the user wants to make a change in this arrangement, he or she should press the P.H TIME button and enter the door position setting (Fig 7-6). In this stage, you can change the timing of each of these steps. It should be mentioned that the fifth step will be arranged according to the remaining time.

High Temp Powder firing temperature (High Temp):

High Temp is the maximum adjustable temperature in each thermal cycle.

Data entry range:

Max Temp: 1200 °C

Validate the setting information by pressing the Enter button or by selecting the previous value by pressing the up and down buttons.

H.R C/m
H.R min

Temperature elevation rate (Heat Rate Min and Heat rate c/m):

These parameters are the temperature elevation rates from Low Temp to High Temp and work with two functional units. The first type is based on temperature and its unit is Temp/Min and the second type is based on time and the distance travel time.

Data entry range:

Temp/Min: 20-120 °C

Time value: The given value is set in a way that the calculated Heat Rate will be between 20 and 120.

Validate the setting information by pressing the Enter button or by selecting the previous value by pressing the up and down buttons.

Hold Time Firing temperature hold time (Hold Time):

This parameter is the amount of time in which the furnace will be kept in High Temp.

Data entry range:

Time value: 0:10 – 99:59 Min

Validate the setting information by pressing the Enter button or by selecting the previous value by pressing the up and down buttons.

- Cool Time** **Furnace cooling temperature (Cool Time):**
It means the amount of time which it takes for the door to open after finishing the steps and the prepared work will be delivered.
Data entry range:
Time value: 0 – 99:59 Min
Validate the setting information by pressing the Enter button or by selecting the previous value by pressing the up and down buttons.
- Vac P.H %** **Time and value of Pre-vacuum (Vac P.H %**
Vac P.H m) **and Vac P.H m)**
Pre-vacuum is an operation which is performed before performing the main vacuum. This operation which is created in new generation furnaces gives you the ability to use vacuum in constant temperature and an initial value.
Data entry range:
Vacuum value: 0-100%
Time value: 0 – 99:59 Min
Validate the setting information by pressing the Enter button or by selecting the previous value by pressing the up and down buttons.
- Vac Main** **Main vacuum value (Vac Main):**
The level of vacuum which is necessary for complete firing. This amount of vacuum will be completely applied when the furnace door is closed and between Low Temp and High Temp.
Note: It is recommended that the vacuum level is set on the maximum possible amount,
Data entry range:
Vacuum value: 0-100%
Validate the setting information by pressing the Enter button or by selecting the previous value by pressing the up and down buttons.

Vac Start **Main vacuum start time (Vac Start):**

It is the temperature in which the device starts to vacuum.

Data entry range:

Low Temp \leq Vac Start $<$ High Temp

Validate the setting information by pressing the Enter button or by selecting the previous value by pressing the up and down buttons.

Vent Temp **Vacuum finish time and temperature (Vent Time and Vent Temp)**
Vent Time

Vent temp is the temperature in which the vacuum finishes.

Vent Time is the vacuum finishing time based on time in the hold time stage, in a way that the furnace has reached the High Temp and the maintenance time has started. Now, you can control vacuum finishing in Hold Time. The vacuum level can be maintained during the entire maintenance time or be kept at a lower level. It should be mentioned that setting on the parameter is enough.

So, you can control your vacuum start and vacuum evacuation based on consumable material's thermal cycle, needs and experience in the entire thermal cycle stages.

Data entry range:

Evacuation temp: Vac Start \leq High Temp

Evacuation time: Vent Time \leq Hold Time

Validate the setting information by pressing the Enter button or by selecting the previous value by pressing the up and down buttons.

After finishing the furnace programs setting, you should press the Save button to save the configured program.

Program altering

In any time before starting the program or/and during the program, the user can change program parameters arbitrarily. Before the start of the program, all of the mentioned parameters can be changed and during the program, the parameters that have not been performed can be changed. It should be mentioned that the applied changes during the program will only be saved during performing the program and these changes will be removed after performing the program.

(2-3) Side programs

(2-3-1) IDLE program

It is recommended that the furnace not to be turned off in short idle intervals and the IDLE program should be used instead. This function will result in a longer life of furnace muffle and faster operation. In order to program and executing the IDLE program, you should follow these instructions:

Press Sub Prg and enter side programs.

In this part, in case of the need for performing the program after finishing each firing program, press Idle Mode and enter automatic execution settings.

If you need automatic execution, place Idle Mode in YES mode and otherwise place it in NO mode.

If Idle Mode is in automatic mode, this program can be executed manually and from the Sub Prg path and then the IDLE program.

To configure IDLE temp, go to the IDLE section and then press Prg Edit button. In this section, you only can configure the temperature and vacuum level.



In performing automatic IDLE program, the device temp on the last performed program's initial temp will remain constant.

(2-3-2) Night program

Night program is a constant program which keeps the furnace temp on 200 °C with a vacuum. This ability is beneficial in idleness times with long periods where it prevents the moisture from getting inside the muffle and will result in prolonging the device lifetime. Program execution stages are the following:

- Put the furnace in on mode.
- Press Sub Prg button and enter side programs section.
- Press Night button and enter Night program.
- Press the Start button to perform the program automatically.



The Night program is constant and it is unchangeable.

(2-3-3) Dry program

AT300P furnace muffle is built from the best insulator and has been designed and built with low weight. Its material is resistant to air moisture absorption. If you observe vacuum leakage or dissolving after start-up and first use, perform the Dry program. Leakage or dissolving vacuum as a result of moisture evaporation on the door of inside the muffle insulators occurs in 1000°F or more and results in decreasing vacuum level inside the muffle container. The DRY program is a constant and unchangeable thermal cycle and its nine parameters' numerical values are programmed and no prosthesis is used inside the muffle.

(2-4) Press operation

(2-4-1) Air regulator setting

Before configuring the parameters, the necessary air pressure value will be configured by the regulator in the back of the furnace and the minute hand in the right side of the press furnace.

- Very important note: If you intend to use the press furnace for porcelain firing, you must connect air pressure (Put the pressure gauge on 0 value by the regulator)

(2-4-2) Press programs 290-299 definition

In order to configure programs 290-299 parameters for performing the automatic press operation, you should follow these instructions.

Press the PROG button.

Select PROG NO.

PNo: 290	290	9:13:11 0:00:11	Temp: 443 c°
Low Temp :	500	1st P(Bar) :	3
PH Time :	01:00	1st Time :	03:00
High Temp :	900	Vac Main %:	100
H.R C/m :	60	2nd P(Bar) :	3
H.R min :	06:40	2nd Time :	05:00
Hold Time :	01:00	Pellet No :	1
Cool Time :	01:00		
<input type="button" value="Prog"/>			
<input type="button" value="P.No"/> <input type="button" value="P.Edit"/> <input type="button" value="Save"/> <input type="button" value="Cancel"/> <input type="button" value="Back"/>			

Fig-13

Enter the desired program number from the keyboard.

Press ENTER.

Press PRG EDIT button.

Configurable parameters for this group of programs include the following. **Fig-13**

1st P (Bar): The first stage for creating pneumatic jack pressure on ingot pellets.

1st time: Pneumatic jack initial pressure time.

2nd P (Bar): The second pneumatic jack pressure on ingot pellets.

2nd time: pneumatic jack secondary pressure time.

Pellet No: Number of ingot pellets.

After configuring the mentioned parameters, press save.

In this stage, all of the parameters are configured and you can press the start button.

After the press furnace reaches the low temp, the press furnace doors come down and after placing the cylinder on the work stand, press the up button, so that the press and firing operation is performed automatically.

Now place the prepared cylinder on the work stand specially made for press furnace. Before placing the cylinder on the press furnace work stand, make sure that there are two foliaceous slots are in the work stand.

Place the desired ingot pellet inside the cylinder. Then, place the Plunger on the ingot in a way that the marking direction faces up (Do these steps carefully and with high speed).

Press the UP button to start the automatic press and firing operation.

(2-4-3) Air regulator setting

- 1 Be sure to place the device on a completely flat surface.
- 2 Before press operation, always vacuum caliber the furnace (By pressing the VAC.CL on the right side of the device, enter the device calibration page and follow the instruction from section 3-5).
- 3 Place the waxen model built by the technician with an angle between 45 and 60 degrees on the main place at the end of the cylinder.
- 4 The minimum distance of waxen model from the cylinder walls must be 10 mm.
- 5 If you want to build over press bridge (press ingots on zirconium bridge built from VITA YZ block), acknowledge that only a three-unit bridge can work.
- 6 Press wax is different from PFM wax. Because of the high cost, it is recommended to use imported waxes.
- 7 The time between the cylinder exit from the pre-warmed furnace and transportation to press furnace must be very short.
- 8 For injecting in 100 g, the air pressure must be placed on 3 bars.
- 9 For injecting in 200 g, the air pressure must be placed on 5 bars.
- 10 In press operation, sandblast or aluminum sand should not be done. always use Glass beads sand.
- 11 Select ingots considering the waxen pattern weight.
- 12 Always stop work on 1 mm distance from the crown with low speed.
- 13 For one unit work, sprue thickness is 1mm.
- 14 The amount of plaster combined with water is very important (according to the plaster manufacturer).

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POLARIS AT 300 P

Side settings

(3-1) configuring the device clock

By pressing the Options button, you can enter the device settings section.

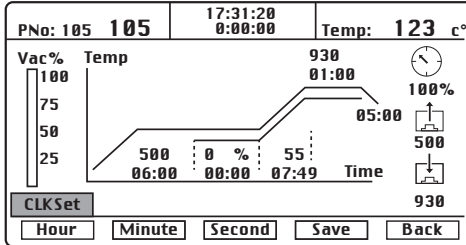


Fig-14

By pressing the Options button, you can enter the device settings section.

After entering the device settings section, you can enter the device clock software settings by pressing the CLK Set button **Fig-14**. In this section, you can change the clock settings by following these steps:

To set the clock, press the Hour button and adjust the clock using the up and down arrows.

To adjust the minute, press the Minute button and adjust the clock using the up and down arrows.

To adjust the second, press the Second button and adjust the clock using the up and down arrows. Then, press the Save button so that the entire steps will be saved in the device memory.

(3-2) Device calibration

The device calibration section is displayed with the abbreviation of Calib and its purpose is to set the furnace heat, which is the only available user calibrated section by the operator (U.Cal) **Fig-15**.

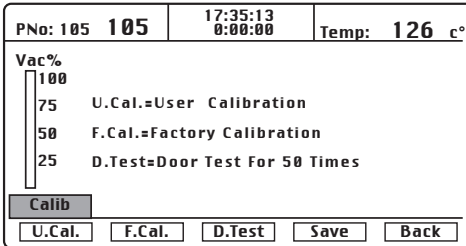


Fig-15

By pressing the U.Cal. Button, enter the device calibrated section and you can change the 960 number by the numbers on the right side of the keyboard. For example, considering the experience and specification from the previous firing according to transparency and color, for example, the user concludes that the device firing with specified deviation and less than perfect situation, the furnace temp is 15 units lower than expected. In this situation, technician should enter 946 and press the save button.

Note: This device does not need silver wire and accessories for temp calibration (Calibration Kit) and temp calibration is actually done in the factory. This method is for a better quality of firing.

(3-3) Device manual language

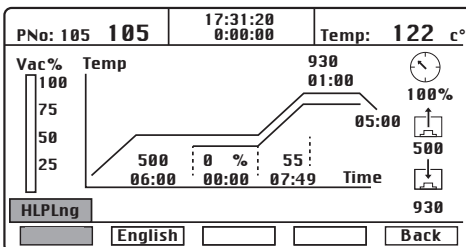


Fig-16

To change the device “Help” language, you can choose a language between Germany and English by pressing the HplLng button **Fig-16**.

(3-4) Device information

PNo: 105	105	17:35:13 0:00:00	Temp: 120 c°
Vac%	100	System User Hours : 06:19	
	75	Muffle On Hours : 00:25	
	50	Program Cycle : 6	
	25	Program Time : 00:03	
		Serial Number : 33.7.91	
		Software Version : 1391/06/29	
Option			
<input type="button" value="CLKSet"/>	<input type="button" value="Calib"/>	<input type="button" value="HLPLng"/>	<input type="button" value="Info"/> <input type="button" value="Back"/>

Fig-17

In “setting” and “Info” section, you can see the following information about your device **Fig-17**:

- Device operation hours
- Device muffle operation hours
- Number of executed programs
- Program execution time
- Device serial
- Software version

(3-5) Device vacuum calibration

Vacuum automatic settings or automatic vacuum calibration is one of the new capabilities of the furnace which can be used by following the next steps.

PNo: IDLE	IDLE	17:35:13 0:00:00	Temp: 27 c°
Vac%	100	Vacuum Calibration	
	75	Max Vacuum A2d : 568	
	50	No Vacuum A2d : 189	
	25	Raw Vacuum A2d : 189	
Vac.Cl			
<input type="button" value="Vac.Cl"/>	<input type="button" value="V.Test"/>	<input type="text"/>	<input type="text"/> <input type="button" value="Back"/>

After entering the vacuum calibration section or VAC CL, you will face two menus, V.Test and Vac.Cl **Fig-18**.

You can test the device vacuum value by pressing the V. Test button and in case of deviation, calibrate it. To test the vacuum, first, you should press the V.Test button and follow the number in front of the Raw Vacuum, This number must be stabilized with little deviation from the Max Vacuum number. Any deviation means the incorrect device vacuum calibration and it can be performed by the following method.

By pressing the Vac. Cl button, The calibration operation will start automatically and you should wait for this operation to finish for 1 minute. During calibration operation, never disconnect the pump from the furnace or for any reason this operation is stopped, repeat the path in order to reach complete and correct calibration.

(3-6) Fast Cooling

When we start the program, if the furnace temperature exceeds the LowTemp, the Fast Cooling message will appear on the furnace, which conveys a recommendation for furnace fast cooling. In case of choosing the “Yes” option (pressing the Enter button), the vacuum pump starts working and the air inside the container exit and the fast cooling operation is done faster than usual. In case of choosing the “No” option (pressing the Clear button), the furnace cools ordinarily.



POLARIS AT-300 P

Service and maintenance

(4-1) Troubleshooting

Problem	Possible reasons	Corrective actions
Vacuum Fail	The vacuum value does not reach the given value	<ul style="list-style-type: none"> ✔ The lower door and O-ring must be carefully and correctly inspected and cleaned. ✔ Vacuum connections to the furnace must be tested ✔ The pump alone with a direct connection to electricity must be tested
Door Fail	The door kicks on the top or on the bottom and does not stop	<ul style="list-style-type: none"> ✔ In the place where the door does not stop with kicking, there has been a problem with the microswitch. Test the microswitch alone and after checking their intactness, all of the microswitch connection to the main board and the place where the microswitch is placed must be checked to be higher than the original designated place and not to be lower. ✔ In case of a malfunctioning microswitch, replace it with a new one. ✔ In the case when the door does not move or/if it is noisy or there is a barrier in elevator's path, the barrier must be removed and if the elevator system including the motor and mechanical parts have a problem, the device must be serviced.
Muffle Fail	The device temp does not elevate	<ul style="list-style-type: none"> ✔ Device element must be replaced. ✔ Device connective equipment to the thermal system must be replaced with devices such as SSR and connective cables.
Thermocouple Fail	The device temp is not correct	<ul style="list-style-type: none"> ✔ Device element must be replaced.

Service and maintenance

Problem	Possible reasons	Corrective actions
Enter 0<P.No<299	The program does not change	✔ The selected number must be between 0 to 299.
Enter 200<T<1200 Enter 392<T<2192	The device does not accept the given temp	✔ The selected temp must be between 200 and 1200 °C ✔ The selected temp must be between 392 and 2192 °F
Enter 0:10 < t < 99:59	The user's given time is not accepted	✔ The selected time must be between 10 seconds and 99 minutes & 59 seconds.
Enter LowT<T<1200 Enter LowT<T<2192	The vacuum start temp is not accepted	✔ The firing temp must be between the initial temp and 1200°C ✔ The firing temp must be between the initial temp and 2192°C
Enter Due to HR	The given time is not accepted	✔ In the given time, the temp must change between the initial temp and firing temp with the speed of fewer than 120 degrees per minute.
Enter 20<HR<120 Enter 68<HR<248	he elevation rate is not in the authorized range	✔ Temp elevation speed must be between 20 to 120 °C ✔ Temp elevation speed must be between 68 to 248 °F
Enter 30<Vac<100	The vacuum value is not in the authorized range	✔ The vacuum value must be between 30 and 100 percent
Enter LowT<T<Hi.T	The temp is not in the authorized range	✔ The vacuum initial temp must be between the initial temp and the firing temp
Enter LowT<T<Hi.T	The temp is not in the authorized range	✔ The vacuum end of work temp must be between the vacuum initial temp and the firing temp

Problem	Possible reasons	Corrective actions
Thermocouple Fail	The temp does not change	<ul style="list-style-type: none"> ✔ The device thermocouple has a problem ✔ Thermocouple connections have problems
Enter 200<T<800 Enter 392<T<1472	The temp is not in the authorized range	<ul style="list-style-type: none"> ✔ The initial temp must be between 200 and 800°C ✔ The initial temp must be between 392 and 1472°F
Thermometer Fail	The device temp is not correct	<ul style="list-style-type: none"> ✔ The device A/D has a problem. Contact the after sales unit.
Valve Fail	The vacuum cannot be calibrated	<ul style="list-style-type: none"> ✔ The electrical valves do not work because of pollution

(4-2) Cases that prolong the device lifetime

- It is recommended that the furnace not to be turned off in short idle intervals
- It is recommended that after turning on the furnace in the morning (cold mode) or after device idleness for a long time, use NIGHT mode. The purpose of this action is to prevent the moisture from entering from the surface of the muffle and it leads to a prolonged lifetime. To execute this, first press NIGHT button and then press START.
- In humid conditions, it is recommended that you use Dry program every two months so that the system completely dries.
- If you did not use the device for several days, always completely dry the device thermal system (elements, thermocouples, and fibers).
- It is preferable that when turning off the furnace, the temperature inside the device must be at least 100 degrees. Also, close the furnace door so that the moisture does not enter the muffle.

Calling the aftersales services Unit of Polaris Co.

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