

# DUOTRONPRO

- Zirconia Sintering Furnace SF-700

## Operating Instructions



Make sure you carefully read this product manual  
before using product

Product Warranty is included at the back of this manual

!

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# 1. Introduction

Thank you for purchasing SF-700 Furnace. SF-700 Furnace is subject to stringent quality control procedures and patiently follows standard procedure. As the results of our quality system, SF-700 Furnace has better performance.

Also, SF-700 has sturdily and gracefully designed and programmed as user friendly.

This Operators Manual will explain the installation and operation of the oven as well as help you get the most out of your new SF-700 Furnace. Please read carefully the instructions in this manual for the best user experience.

## ⦿Attention

Please ensure that all safety information has been read by the operator before using the oven.

- The Safety information is divided into two sections: Warning and Caution as described below:

### **Warning**

Violations of instructions may cause increased risk of serious injury or death.

### **Caution**

Violations of instructions may cause increased chance of material waste or injuries.

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## Warning

1. Do not disassemble, repair or modify any part of the machine without prior approval from an authorized technician. It could be out of warranty and could cause damage, electric shock or fire.
2. Ensure the oven is properly grounded to prohibit error or electrical hazard.
3. Do not cut or modify the power cord. Do not stretch or bend the power cord that may cause electrical hazard.
4. Keep flammable materials away from the oven at all time.
5. Keep liquid away from the oven and avoid using the oven in damp environment to prevent electrical hazard.
6. Ensure that the power plug is firmly plugged into the proper section. Unstable contact may cause an electric spark and a fire.
7. Always wear heavy thermal insulated gloves when handling units with door open to avoid burns.
8. Always ensure that the oven is completely stopped before working with the oven and only operate the door when the machine is not in a cycle.
9. Do not touch or handling the power plug. It may cause an electric shock or a fire.
10. Carefully use tongs without touching wires when takeout Casting Ring from inside of Furnace.
11. Do not place flammable materials or body inside of Furnace. It may cause a burn or a fire.

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## Caution

- 1 Keep away from Furnace during operation. While running, furnace generates high temperature.
  2. Please handle the oven carefully to avoid damage. The furnace contain fragile parts.
  3. Do not use in places with a lot of vibration.
  4. Please read the manual and understand the instructions before using the oven.
  5. Do not leave Furnace with a door open.
  6. Keep away from flammable spray or materials from Furnace.
  7. Do not install Furnace on place with gradient or rocking table
  8. Do not pull a plug out with a strong force.
  9. Keep temperature lower than 40 Celsius degree and sweep the dust out.
  10. If detecting any defect during the operation, stop using and inquire manufacturer.
  11. Use dry cloth and unplug power cords when cleaning Furnace. Do not use any detergent.
  12. While operating and right after, do not touch Furnace. Especially, do not touch the upper part of furnace. It may cause a burn or a fire.
  13. Keep away flammable materials from Furnace. It may cause a fire.
  14. If Furnace is not in use, turn off switch to power off.
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15. If Furnace is not in use for a long term, pull out power plug.

16. Using Tray only from the manufacturer. If dimension of the tray is different, it could damage or break the Muffle. <Dimension of tray = lower than Ø95 mm x 30 mm> ♣ It is not responsibility of manufacturer or seller, if muffle broke or damaged by using wrong size of tray.

17. If continuously use the Furnace at high temperature, glass materials might lay on the moving insulation and could contaminate materials. To remove contaminated materials, use only vacuum cleaner. Do not use air compressor for health and safety.

18. To remove the tray after sintering, wait till inside temperature of the furnace is lower than 100°C. Higher temperature could damage on the tray and skin.

19. Cleaning Mode: Regularly inspect inside of the furnace. If oxide films on the heating elements are damaged or zirconia materials are contaminated, use Cleaning Mode to clean and prevent contamination. <Caution. Too often use of Cleaning Mode (less than 1 month period) could damage on Muffle/heating elements. If use of Cleaning Mode is getting shorter, contact manufacturer of seller>

20. Changing insulation: Contact particulate from insulator with the eyes or skin may cause irritation. Long term and inhaling a large quantity of the particulate from insulator may cause respiratory disorders. Try protecting skin, eyes and respiratory organs with wearing safety glasses and mask.

<Compliance matters: wear long sleeves clothes, safety glasses, mask and using vacuum machine. After work, wash unprotected skin with fresh water.>

21. Cracks in insulator should occur by a high temperature or a rapidly changing temperature. However, cracks by thermal shock in insulator do not critically affect Firing result. (In case of cracks on Tray insulator may effect on temperature. In that case, need to change tray insulator through manufacturer or local distributor.)

## 2. Product Information

### (1) **Characteristics**

- ▶ Easy to operate and full set of features
- ▶ Easy-to-use display provides all available information and setting control
- ▶ Store 9 different schedules
- ▶ Maximum ramp rate 99°C/min
- ▶ Compact Size
- ▶ Sintering Zirconia and basic glazing function

### (2) **Display Feature**

- ▶ User defined programs
- ▶ Progress indicates with LED lights
- ▶ Display remaining time
- ▶ User can fine-tune temperature
- ▶ User can define On/Off for cooling fan

### 3. Technical Data

#### Temperature Sensor

**Sensor Type** Thermocouple R-type

**Sensor Range** 0~1760°C

#### Main Controller

**Voltage** DC 12V

**Display** LED Display

#### I/O Controller

**Voltage** DC 12V

**Output** 1 Ch. : DC Fan

#### General Information

**Voltage** AC 230V/110V, 50/60 Hz

**Fuse** 30A / AC250V

**Max. current** 8A

**Dimensions** 270 mm(W) x 300 mm(D) x 565 mm(H)

**Chamber size** Ø45 mm x 30 mm (h)

**Max. temp.** 1600°C

**Max. ramp up rate** 99°C/min

**Environment temp** +2°C ~ +35°C

**Working humidity** Less than 80%

**Working altitude** Lower than 3800m

**Weight** About 26kg



## 4. Install

### (1) Connect AC power

This furnace requires AC230V/AC110V and maximum current is 8A. This furnace should be connected directly to over 15A breaker in a panel board. (Do not use extension cords and connecting to other equipment. Insufficient capacity may cause a short circuit and fire.)

### (2) Parts List

After open a box, ensure there are all parts. Also, check any visual damage. If you find any damages or defects, contact seller.

- Super Fast Sintering Furnace .....1 pc
- Instruction.....1 pc
- Tray .....2 pc

### (3) Installation

Avoid sunlight or moist when installing the product. Also, install on a level place. Dust could damage on heating elements, thus, install in clean environment.

Place a furnace at least 30 cm apart from the wall and 1.5 m away from the ceiling. If too close to wall or ceiling, may cause a fire and damage on product.

Do not place flammable materials on the top of product. Before use, install a ventilation system above the product to remove harmful gas during sintering.

## 5. Appearance and Name

### List of parts

1. Furnace housing
2. Air Ventilation opening
3. Control Panel
4. Control Housing
5. Sintering chamber
6. Oven Door Plate



## 6. Front Panel Information

### Display



<Information in this picture is only example>

#### 1) Time and Mode display

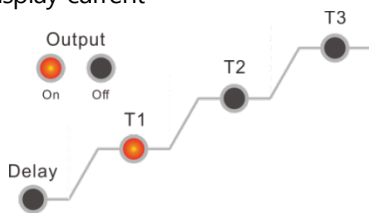


- ① Displaying the time required for selected schedule
- ② Changing schedule: Changing schedule with pressing PRG. button

#### 2) Current Temperature Display.



#### 3) Display current progress.



- ① Output on : Fan on, Output off : Fan off.
- ② T1, T2, T3 : Blinking light at current progress.

# 7.Run and Temperature Setting (Fast Schedule)

## 1. Select Schedule (Example: Schedule 5)

Press  button

Remaining time  
Min. Sec. Schedule


5 0 5 Blink

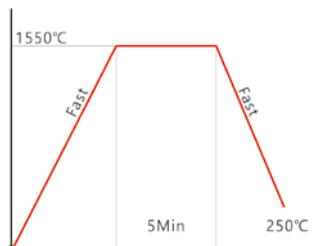
  


Use up/down arrow button to select schedule (1~9)

Press  button

 LED light will blink and reday to start.

Press  button will change Blinking LED light to solid light and start schedule




## 2. Temperature Setting (2 stage sintering)

- ① Ex ) Setting Pre-drying time. After pre-dry for the time (at 450 °C , factory set temperature), start sintering schedule.

i. Setting Pre-Drying time: Press  button,

Remaining time  
Min. Sec. Schedule

0 0 5 Delay  LED light will on.

 Settin Pre-dry time (Factory set temp. is 450°C)



Use up/down and left/right arrow button to input the number.


※ . Time will be displayed as (hh.mm). Input "00.00" will skip this step.

- ② Ex) T1 : 1550°C, Ramp up : FAST, Stay : 5min

i) Setting T1 temp.: Press  button,

Remaining time  
Min. Sec. Schedule

0 0 5 T1  LED light will on

 First set temp. number °C light on, then blink



Use up/down and left/right arrow button to input the number.

- ii) Setting ramp up rate for T1: Press  button,  T1 LED light will on


 Display ramp up rate °C/min, then blinking.



Use up/down and left/right arrow button to input the number.

※ Click triple times  button will set Fast sintering mode.

- iii) Setting time to stay at T1: Press  button,  T1 LED light will on.

 Display holding min at T1 (Hold/min), then blinking



Use up/down and left/right arrow button to input the number.

③ Ex ) T2 : 0°C, Ramp up : 0°C/min, Stay : 0min

(If max. temperature needs to be changed, set T2 temp. as 0°C or equal to max. temp.)

- i) Setting T2 temp.: Press  button,  T2 LED light will on


 Displaying T2 temp. °C, then blinking.



Use up/down and left/right arrow button to input the number.

※ Input "0" will skip T2

- ii) Setting T2 ramp up rate: Press  button,  T2 LED light will on

 Displaying ramp up rate °C/min, then blinking.



Use up/down and left/right arrow button to input the number.

※ Input "0" will skip this step

iii) Setting staying time at T2: Press  button,  T2 LED light will on



Displaying staying time Hold/min, then blinking



Use up/down and left/right arrow button to input the number.

(input "0" will skip this step)

④ Ex ) Factory pre-set as T3 : 0°C, Ramp up : 0°C/min, Stay : 0min

⑤ Ex ) T4 : Cool Down Temp. (Factory set temp. of T4 is 250°C)

Only needs to set cooling down rate.


i) Setting cool down rate till T4 250°C: Press  button,  T3 LED light will on






Display cool down rate °C/min, then blinking



Use up/down and left/right arrow button to input the number.

※ Click triple times  button will set fast cooling mode. (Lift will down in 2 stages and cooling will take 4 min.)

⑥ Setting cooling fan on/off (Do not change cooling fan settings without having discussion with manufacturer)

i) Setting cooling fan start temp.: Press  button,   LED light will on



Display temp. °C, then blinking.



Use up/down and left/right arrow button to input the number..

ii) Setting cooling fan off temp.: Press **PRG.** button,



LED light will on



Display temp. °C, then blinking.



Use up/down and left/right arrow button to input the number.

Press **PRG.** button,



return to very first step






Press **Ok** button,



LED light will blink and ready to start.


# 7.Run and Temperature Setting(3 Stages)

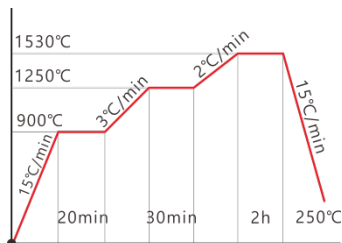
## 1. Run (Example: Schedule 8)

Press  button,   blink  

Use up/down arrow button to input schedule number(1~9)

Press  button  LED light will blink and ready to start.

Press  button, LED light will on and start schedule..



## 2. Set temperature (3 stage)

- ① Ex ) Setting Pre-drying time. After pre-dry for the time (at 450 °C , factory set temperature), start sintering schedule.

ii. Setting Pre-drying time: Press  button,    LED light will on




 °C/min Hold/min Set Pre-Drying time



Use up/down and left/right arrow button to input the number

※ . Time will be displayed as (hh.mm). Input "00.00" will skip this step

- ② Ex ) T1 : 900°C, Ramp up rate : 15°C/min, Stay : 20min

i) Setting T1 temp.: Press  button,    LED light will on





Displaying T1 temp. °C, then blinking



Use up/down and left/right arrow button to input the number

ii) Setting T1 ramp up rate: Press



button,



T1



LED light will on



Displaying ramp up rate °C/min, then blinking



Use up/down and left/right arrow button to input the number

iii) Setting staying time at T1: Press



button,



T1



LED light will on.



Displaying staying time Hold/min, then blinking



Use up/down and left/right arrow button to input the number

③ Ex ) T2 : 1250°C, Ramp up rate : 3°C/min, Stay : 30min

i) Setting T2 temp.: Press



button,



T2



LED light will on



Displaying T2 temp. °C, then blinking



Use up/down and left/right arrow button to input the number

※ Input "o" will skip this step

ii) Setting T2 ramp up rate: Press



button,



T2



LED light will on




Display ramp up rate °C/min, then blinking



Use up/down and left/right arrow button to input the number

※ Input "o" will skip this step

iii) Setting staying time at T2: Press  button,  T2 LED light will on

 °C  
°C/min Hold/min Display staying time Hold/min, then blinking



Use up/down and left/right arrow button to input the number

Input "o" will skip this step

④ Ex ) T3 : 1530°C, Ramp up rate : 2°C/min, Stay : 120min

i) Setting T3 temp.: Press  button,  T3 LED light will on


 °C  
°C/min Hold/min Display T3 temp. °C, then blinking



Use up/down and left/right arrow button to input the number

Input "o" will skip this step

ii) Setting T3 ramp up rate: Press  button,  T3 LED light will on


 °C  
°C/min Hold/min Display ramp up rate °C/min, then blinking



Use up/down and left/right arrow button to input the number

Input "o" will skip this step

iii) Setting staying time at T1: Press  button,  T3 LED light will on

 °C  
°C/min Hold/min Display staying time Hold/min, then blinking



Use up/down and left/right arrow button to input the number

Input "o" will skip this step

- ⑤ Ex ) T4 : Cool down temp (Factory set cool down temp. is 250°C)

Only need to set cooling down rate.

- i) Setting cooling down rate till T4 250°C: Press  button,  T3 LED light will on

 Display cool down rate °C/min, then blinking



Use up/down and left/right arrow button to input the number

- ⑥ Setting cooling fan on/off (Do not change cooling fan settings without having discussion with manufacturer)

- i) Setting cooling fan start temp.: Press  button,   LED light will on

 Display temp. °C, then blinking.



Use up/down and left/right arrow button to input the number.

- ii) Setting cooling fan off temp.: Press  button,   LED light will on

 Display temp. °C, then blinking.



Use up/down and left/right arrow button to input the number.

Press  button,  return to very first step

Press  button,  LED light will blink and ready to start.


# 7.Run and Temperature Setting(Glazing)

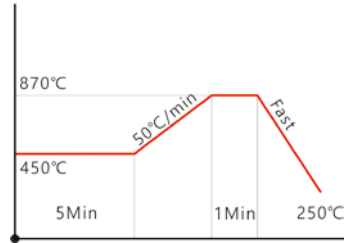
## 1. Start to change schedule (ex: Schedule 9)

Press  button   blink,  

use up/down arrow button to input schedule (1~9)

Press  button  LED light will blink and ready to start.





Press  button, LED light will on and start the schedule.



## 2. Setting temperature (2 stage)

### ① Ex ) Setting Pre-Drying time (Factory set temp. is 450°C).

Start schedule after holding pre-drying time..

i) Setting Pre-Drying time: Press  button,    LED light will on.

 °C Display pre-drying time



Use up/down and left/right arrow button to input the number.

※ . Time will be displayed as (hh.mm). Input "00.00" will skip this step

### ② Ex ) T1 : 1550°C, Ramp up rate : FAST, Stay : 5min

i) Setting T1 temp.: Press  button,    LED light will on.

 °C Display T1 temp. °C, then blinking



Use up/down and left/right arrow button to input the number.

- ii) Setting T1 ramp up rate: Press  button,   LED light will on



Display ramp up rate °C/min, then blinking



Use up/down and left/right arrow button to input the number.

- iii) Setting staying time at T1: Press  button,   LED light will on.



Display staying time Hold/min, then blinking



Use up/down and left/right arrow button to input the number.

③ Ex ) T2 : 0°C, Ramp up : 0°C/min, Stay : 0min

(If max. temperature needs to be changed, set T2 temp. as 0°C or equal to max. temp.)

- i) Setting T2 temp.: Press  button,   LED light will on



Display T2 temp. °C, then blinking



Use up/down and left/right arrow button to input the number

Input "0" will skip this step

- ii) Setting T2 ramp up rate: Press  button,   LED light will on



Display ramp up rate °C/min, then blinking



Use up/down and left/right arrow button to input the number

Input "0" will skip this step

iii) Setting staying time at T2: Press **PRG.** button, **T2** LED light will on



Display staying time Hold/min, then blinking



Use up/down and left/right arrow button to input the number

Input "0" will skip this step

④ Ex ) T3 : 0°C, Ramp up rate : 0°C/min, Stay : 0min

⑤ Ex ) T4 : Cooling down temp. (Factory set cooling down temp. is 250°C)

Only need to set cooling down rate.

i) Setting cooling down rate till T4 250°C: Press **PRG.** button, **T3** LED light on



Display cool down rate °C/min, then blinking



Use up/down and left/right arrow button to input the number

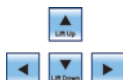
Click triple times button will set Fast mode (Cooling in 2 stage for 4 min.)

⑥ Setting cooling fan on/off (Do not change cooling fan settings without having discussion with manufacturer)

i) Setting cooling fan start temp.: Press **PRG.** button, **Output** LED light will on



Display temp. °C, then blinking.





Use up/down and left/right arrow button to input the number.

ii) Setting cooling fan off temp.: Press  button,   LED light will on

 Display temp. °C, then blinking.



Use up/down and left/right arrow button to input the number.

Press  button,  return to very first step

Press  button,  LED light will blink and ready to start.

## 8. User Instruction

1. Drying materials (About 30 min.)



2. Main Power S/W On.



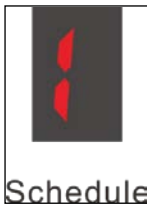
3. Lift Down



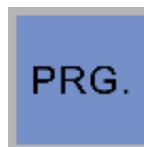
4. Place restoration on the Tray.



5. Select schedule.



6. Confirm selected schedule







7. Ready to sinter -> start sintering.



8. Finish sintering



9. Remove Tray



<Caution>

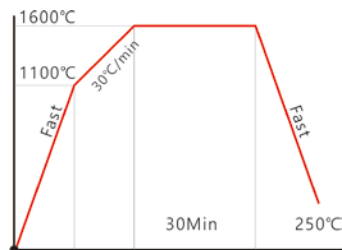
- ① Do not place hot tray in front of the furnace. May cause controller damage.
- ② Place hot tray sides of the furnace.
- ③ Open the door when temperature is lower than 100 °C. May cause burn skins and fire.

## 9. Pre-set 10 Sintering Schedules

Schedule : 0 (Cleaning Mode)

Max. temp. : 1600°C

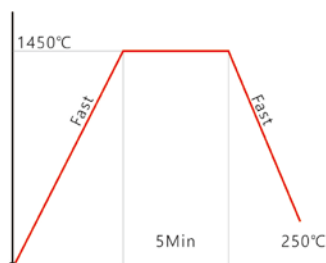
Total hours : about 1hr



Schedule : 1

Max. temp. : 1450°C

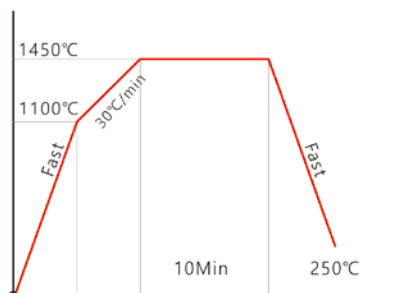
Total hours : about 17min



Schedule : 2

Max. temp. : 1450°C

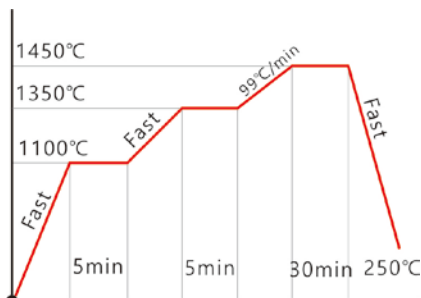
Total hours : about 35min



Schedule : 3

Max. temp. : 1450°C

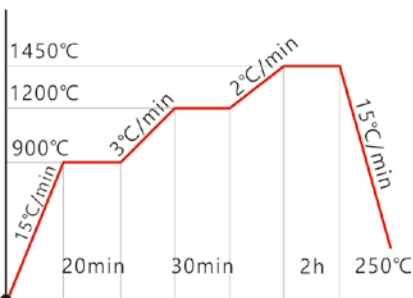
Total hours : about 1hr



Schedule : 4

Max. temp. : 1450°C

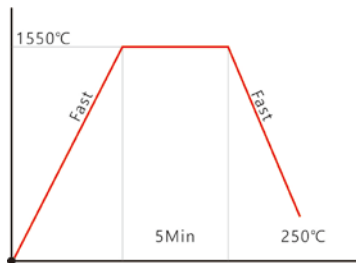
Total : 8hr 55min



Schedule : 5

Max. temp. : 1550°C

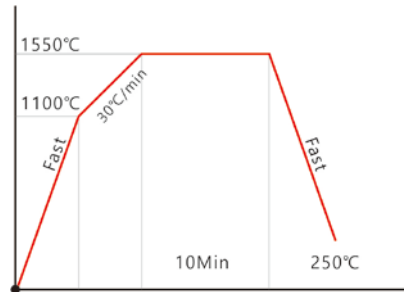
Total hours : about 19min



Schedule : 6

Max. temp. : 1550°C

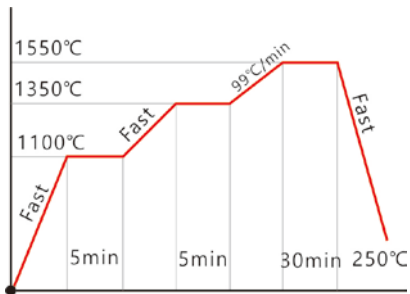
Total : about 38min



Schedule : 7

Max. temp. : 1550°C

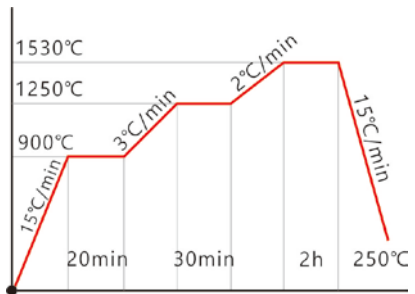
Total hours : about 1hr



Schedule : 8

Max. temp. : 1530°C

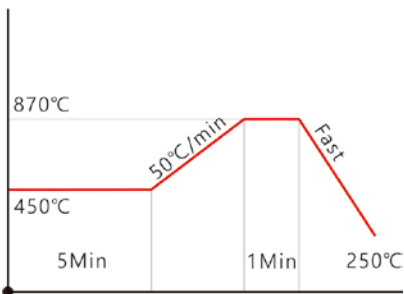
Total hours : 9hr 32min



Schedule : 9 ( Glazing )

Max. temp. : 870°C

Total hours : about 18min



## 10. Trouble Shooting

### (1) Possible error messages and trouble shooting

Error	Error description	Trouble shooting
Err01	Disconnected the sensor	Replace the sensor
Err02	Board or control IC is damaged	Inspection control PCB
Err03	Heating elements damaged	Replace heating elements
Err04	Short sensor	Inspection control PCB sensor part
Err05	When starting temperature is higher than T1 temperature	Restart the furnace till cool down lower than T1 temperature

# 11. Warranty

No.	Condition	Within warranty period	After warranty period
1	Within 10 days of purchase, require major repair by defect even though used in normal condition	Exchange or refund	
2	After 1 month of purchase, require major repair by defect even though used in normal condition	Exchange	
3	Manufacturer could not repair for a month from customer request to be fix	Exchange	Exchange + Charge for depreciation in price
4	Same problem occur 3 times	Free Repair	Repair + fee
5	Same problem occur 4 times	Exchange	Repair + fee
6	Within 6 month after repairing with charging fee, same problem occur	Repair without fee or refund repair fee	
7	5 times repaired by troubles in several parts, but detecting trouble again	Exchange	Repair + fee
8	Cannot be repaired although have the spare parts. (Within spare parts holding period)	Exchange	Exchange + Charge for depreciation in price
9	Cannot be repaired by out of parts (Within spare parts holding period)	Exchange	Exchange + Charge for depreciation in price
10	Incident due to operator error	Repair + fee	Repair + fee
11	Lost parts or products by manufacturer	Exchange	Exchange + Charge for depreciation in price
12	Damage in delivery	Exchange(Claim for damages to carrier)	
13	Lost or damaging parts during delivery from customer to manufacturer	Cost for Customer	
14	Damage during the install by manufacturer	Exchange	Free repair
15	Any other quality issue	Additional progress	

♣ It is not manufacturer's responsibility that any loss of business while product is not working.

# MEMO

# WARRANTY CARD

To protect benefit of customers and official dears, **Addins** inc. assure product quality as follow

Warranty is void under these circumstances

- Modification not approved by authorized support technician
- Incident due to operator error
- Sales performed by unauthorized persons
- Oven not operated as outlined in the manual
- Damage caused by external sources such as power outage, fire, act of God, etc.
- Without a warranty

Fill out this warranty card and send to e-mail ([addins@korea.com](mailto:addins@korea.com)) or fax to 031-848-2072. Without submitting this warranty card, warranty may not be covered.

Customer	Name	
	Phone	
	Address	
Seller	Company	
	Phone	
	Address	
Install date		
Serial No.		Warranty period
Product Name		



## Warranty Info

### 1. Warranty Length

Warranty is good for 1 year after purchase for malfunctions due to manufacturer defects

### 2. Warranty Exclusions

Warranty is void under these circumstances

- Modification not approved by authorized support technician
- Incident due to operator error
- Sales performed by unauthorized persons
- Oven not operated as outlined in the manual
- Damage caused by external sources such as power outage, fire, act of God, etc.
- Without a warranty

### 3. Miscellaneous

Sales must be invoiced to be eligible for warranty

### 4. Caution at use

- Avoid places of sudden and/or drastic temperature changes
- Do not use flammable material for cleaning
- Do not install near high voltage usage or voltage fluctuations
- Avoid heavy shock to the machine
- Do not place oven in direct sunlight or in place with heavy dusts
- Store in dry places
- Do not use in area with vibrations

\* For upgrade product, function can be changed without notice.<Updated 01. 02. 2018>

# DUOTRONPRO

[www.addinco.com](http://www.addinco.com)



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