

# DARDA®

Digitalized product

## Operation manual



Digital pure sine wave inverter



Before installing the product, read this manual thoroughly to install and use safely.  
Test reports for each model are included (4p~5p).

### DARDA® Operation manual procedure

#### Operation manual procedure

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**Product features**

- Product Configuration : It is a cutting-edge device configured with original technologies of circuit-operation and connection parts with various patents and licences.
- High stability with 95% maximum efficiency (DC 24V) and 85% of max output efficiency.
- Highly competitive Prices : parallel output operation by original technology.
- Main feature : Smart auto protect controlled by software, High efficiency power by an parallel output circuit, Auto input (DC)/output (AC) control circuits, Auto surge output control by output(AC) sensor

**Product basic**

1. It is a **pure sine wave** digital power inverter. You can use this inverter for various appliances within the input range of DC 12V, 24V, 48V and the output range of 220V to 240V /AC 100V to 127V.
2. Before installation, refer to instructions in the page of 6 to 13.
3. Make sure the battery connection is stable and secured. Improper connection or installation can harms users and deteriorate performance of the product.  
 ※ Extending the warranty period to two years to ensure a high-quality pure sine wave inverter benefit of consumers.
4. If you don't read the warnings or connect the product improperly, it will damage the product. Especially if you provide household electricity to the outlet of this inverter, it could damage the circuit to the level of useless.

**Battery current & charging system**

- Quality charging system can keep your battery's life span.
- Improper battery charging or lousy charging devices will run down your battery faster.
- Battery should be charged before it drained to below **10.5V to 11V (DC 12 V), 20.5V to 21.5V(DC 24V), 42V to 43V (DC 48V)**. Then the battery life can be prolonged.

**DARDA® DC12V : 400W~7KW Specifications AC220V(AC200V~AC240V)**

NO.	PARAMETER	KEY140	KEY160	KEY180	KEY1001	KEY1015	KEY1020S	KEY1030S	KEYD1050	KEYD1070	LIMIT	
1	DC input voltage	12V									00.5V~18.0V	
2	DC input voltage standard	13.4V									±5%	
3	Output voltage no load	AC225V									220V±5%	
4	Output power continuous	400W	600W	800W	1000W	1500W	2000W	3000W	5000W	7000W	±5%	
5	Surge rating	800W	1200W	1500W	2000W	3000W	4000W	6000W	10KW	14000W	±10%	
6	Efficiency et rated power	86%									±3%	
7	THD[max]	240W 0.8%	360W 1.1%			1000W 1.1%			2500W 1.1%		MAX 2.0%	
8	No load current	no fan	0.67A	0.62A	0.63A	0.66A	0.80A	1.00A	1.00A	1.60A	1.80A	±0.1A
		on fan	0.74A	0.80A	0.82A	0.84A	1.15A	1.55A	1.67A	2.80A	3.64A	
9	Low battery shut down	10.2V									±0.5V	
10	Low battery return on power	11.2V									±0.5V	
11	High battery shut down	17.2V									±1.0V	
12	High battery return on power	15.2V									±0.5V	
13	Frequency selection(50hz/60hz)	60hz			60hz (50hz/60hz select switch)						±0.8hz	
14	Regulation	Max ±5%							5500V/222Vvac		7500V/222Vvac	
15	Over temperature protection	-25℃~-72℃ (75℃±5℃)							-25℃~-74℃ (78℃±5℃)			
16	Over temperature power on	58℃									60℃±5℃	
17	Output wave form	Pure sine wave (D.S.P)										
18	Cooling fan [auto fan]	Fan on temperature 43℃ (±5℃)							Fan on temperature 40℃ (±5℃)		±5℃	
19	Insulation transformer tester Withstand voltage	2KV~2.5KV									±0.5KV	
20	input sensor	-	-	-	-	-	100A	100A	100A	100A	PL cable type	
	input fuse	40A(1EA)	30A(2EA)	40A(2EA)	40A(2EA)	40A(2EA)	40A(6EA)	40A(9EA)	40A(16EA)	40A(18EA)	Car fuse type	
	output sensor	-	-	-	20A(Sensor)	20A(Sensor)	20A(Sensor)	20A(Sensor)	20A(Sensor)	50A(Sensor)	Terminal type	
	output circuit breaker	2.5A(Fuse)	3.5A(Fuse)	4A(Fuse)	5A(Fuse)	10A(Fuse)	13AHDCP-P9H	18AHDCP-P9H	25AHDCP-PRI	35AHDCP-PRI	SS-001	
	AC outlet/terminal	1P Socket*2ea(15A)				2P Outlet 16A				2P Outlet 16A(1P-20A(EU/US))		Output socket terminal
21	Dimensions(mm)(DxHxW)	165x71x224	165x71x224	165x71x250	202x71x290	195x89x365	225x89x420	225x89x488	225x154x480	225x154x540	±3mm	
	Weight[kg]	1.5Kg	1.5Kg	1.7Kg	2.9Kg	4.4Kg	5.5Kg	5.6Kg	11.3Kg	14.5Kg	±200g	

Product in use : Precision test equipment, Precision medical equipment, Precise audio-video equipment, Solar lamp, Mercury/Halogen HQI lamp, Non-linear loads(Motor, coil,etc.), Other electrical or electronic equipment, and **equipment while could experience malfunction due to similar step form waves**

※ Specification of the product may change without notification for the improvement of performance. ※

**DARDA® DC24V : 400W~9KW Specifications AC220V(AC200V~AC240V)**

NO.	PARAMETER	KEY240	KEY260	KEY280	KEY1002	KEY2015	KEY2020S	KEY2030S	KEYD2050	KEYD2070	KEYD2090	LIMIT		
1	DC input voltage	24V										DC20V~30V		
2	DC input voltage standard	26.4V										±5%		
3	Output voltage no load	AC225V										220V±5%		
4	Output power continuous	400W	600W	800W	1000W	1500W	2000W	3000W	5500W	7000W	9000W	±5%		
5	Surge rating	800W	1200W	1500W	2000W	3000W	4000W	6000W	11KW	14KW	18000W	±10%		
6	Efficiency et rated power	89%										±3%		
7	THD(max)	240W 0.8%	360W 1.1%			1000W 1.1%			2500W 1.1%		3500W 1.1%	MAX 2.0%		
8	No load current	no fan		0.38A	0.38A	0.44A	0.41A	0.40A	0.52A	0.79A	0.8A	1.0A	±0.1A	
		on fan		0.49A	0.49A	0.55A	0.45A	0.66A	0.87A	0.85A	1.58A	2.28A	2.28A	
9	Low battery shut down	20.0V										±0.5V		
10	Low battery return on power	22.4V										±0.5V		
11	High battery shut down	31.7V										±1.0V		
12	High battery return on power	30.0V										±0.5V		
13	Frequency selection(50hz/60hz)	60hz					60hz (50hz/60hz select switch)					±0.8hz		
14	Regulation	Max ±5%										5500W/222Vac	6500W/222Vac	8500W/222Vac
15	Over temperature protection	-25℃~+72℃ (75℃±5℃)										-25℃~+74℃ (78℃±5℃)		
16	Over temperature power on	58℃										60℃±5℃		
17	Output wave form	Pure sine wave (D,S,P)												
18	Cooling fan [auto fan]	Fan on temperature 43℃ (±5℃)					Fan on temperature 40℃ (±5℃)					±5℃		
19	Insulation transformer tester Withstand voltage	2KV~2.5KV										±0.5KV		
20	input sensor	-	-	-	-	-	100A	100A	100A	100A	100A	PL cable type		
	input fuse	25A(1EA)	30A(1EA)	40A(1EA)	30A(2EA)	40A(2EA)	40A(3EA)	40A(5EA)	40A(6EA)	40A(8EA)	40A(10EA)	Car fuse type		
	output sensor	-	-	-	20A(Sensor)	20A(Sensor)	20A(Sensor)	20A(Sensor)	20A(Sensor)	50A(Sensor)	50A(Sensor)	Terminal type		
	output circuit breaker	2.5A(Fuse)	3A(Fuse)	4A(Fuse)	5A(Fuse)	10A(Fuse)	13AHDCP-PSI	18AHDCP-PSI	25AHDCP-PSI	35AHDCP-PSI	42AHDCP-PSI	SS-001		
	AC outlet/terminal	1P Socket*2eat(15A)					2P Outlet 16A					3P-30A Terminal	3P/5P Terminal	Output socket terminal
21	Dimensions(mm)(DxHxW)	165x71x224	165x71x224	165x71x250	202x71x290	195x89x365	225x89x420	225x89x488	225x154x450	225x154x540	225x154x620	±3mm		
	Weight(kg)	1.5Kg	1.5Kg	1.7Kg	2.9Kg	4.4Kg	5.5Kg	5.6Kg	11.3Kg	14.5Kg	16Kg	±200g		

Product in use : Precision test equipment, Precision medical equipment, Precise audio-video equipment, Solar lamp, Mercury/Halogen HQI lamp, Non-linear loads(Motor, coil,etc.), Other electrical or electronic equipment, and equipment while could experience malfunction due to similar step form waves

\* Specification of the product may change without notification for the improvement of performance.

**DARDA® DC12V Input(Battery) / Equipment(Output power) Connection**

• Input connection diagram



• Output connection diagram

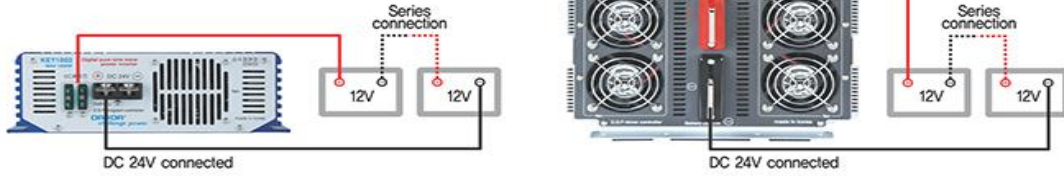


**Caution**  
Avoid installing this inverter in a sealed area, or an area with poor ventilation/excessive heat

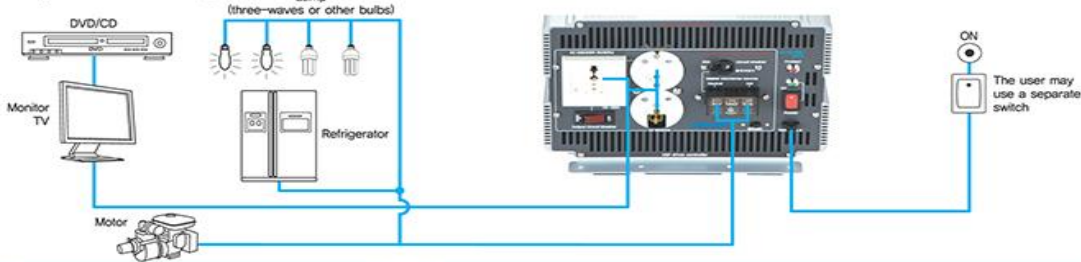
**Warning**  
This product contains battery connections and sparks can easily occur. To prevent fire or other accidents, do not install this inverter in a small or partitioned area with flammable materials. Wet or moist environments are fatal to this inverter. Special care shall be taken, keep inverter out of direct sunlight.

**DARDA® DC24V Input(Battery) / Equipment(Output power) Connection**

• Input connection diagram



• Output connection diagram

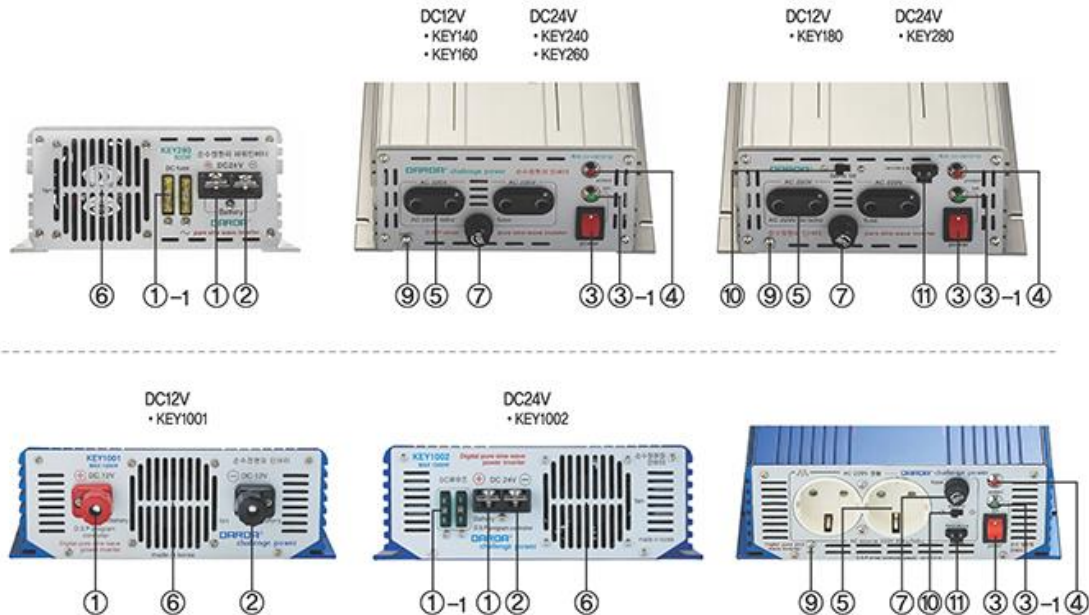


Avoid installing this inverter in a sealed area, or an area with poor ventilation/excessive heat

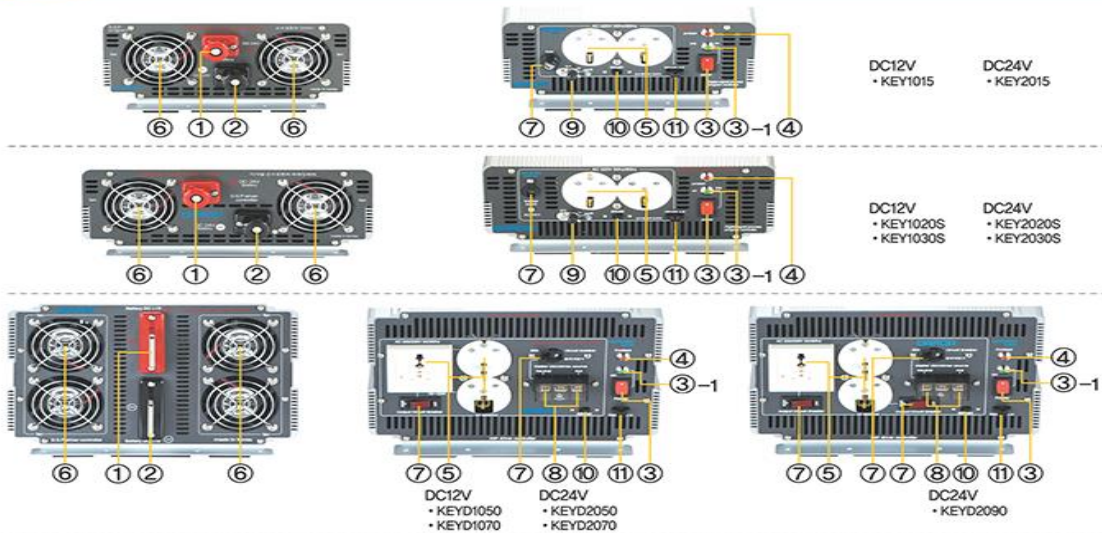


This product contains battery connections and sparks can easily occur. To prevent fire or other accidents, do not install this inverter in a small or partitioned area with flammable materials. Wet or moist environments are fatal to this inverter. Special care shall be taken, keep inverter out of direct sunlight.

**DARDA® Function code**



This product, a state-of-the-art pure sine wave inverter, has the same digital electric quality as the KEPCO electric waveform. It is a patented product developed with Korea's unique source technologies designed to be highly competitive in quality, technology and price.



This product, a state-of-the-art pure sine wave inverter, has the same digital electric quality as the KEPCO electric waveform. It is a patented product developed with Korea's unique source technologies designed to be highly competitive in quality, technology and price.

Use the function description

1. DC input power ⊕ red terminal 12V/24V/48V

12V/24V/48V DC input power ⊕ terminal. Connect the included red cable to the terminal. Refer to the connection diagrams in the attached paper and according to order, connect the cables. Check ⊕ red polarity and secure connection. This terminal should be clamped tightly to work without failure because this terminal generate high current and overheat.

※Even slight loosening between bolts and nuts in the terminal and the cable will generate heat and make a play, which leads to failure of the product or dramatically drains battery life.

1-1. Input power fuse

An internal input fuse is located at ⊕ red wiring. It is for the safety reasons. Be careful when changing shorted fuses.

※1KW or less model are attached to the fuse panel.

※As for the single layer model, open the upper cover you can change inside fuse.

※As for the double layer model, loosen the screw from both panels and lift the upper panel lightly, and you can change a fuse.

※When you need to change fuses, consult an expert.

2. DC input power ⊖ black terminal 12V/24V/48V

12V/24V/48V DC input power ⊖ connection terminal. Connect the included black cable to the terminal. Refer to the connection diagrams in the attached paper and according to order, connect the cables. Check ⊕ red polarity and secure connection. This terminal should be clamped securely to work without failure because this connection terminal generate high current and overheat

※Even slightly loosening between bolts and nuts in the terminal and the cable will generate heat and make a play, which leads to failure of the product or dramatically drains battery life.

※Tighten the screws securely.

### 3. Power switch

In the control circuit, DC input and AC output switches start simultaneously. The Power Switch turns the product on/off. Switch off when not in use.

※This switch is the only power switch on the inverter.

#### 3-1. Power LED

This LED always light up when the power switch is on or this inverter is in operation.

### 4. Warning LED

Overheating or exceeding maximum capacity will shut down the product to protect and operation will be restored when the state is stabled and normalized. Before the shutdown, buzz noise will warn you. When you hear the sound, turn off the power switch, and then 3 or 4 minute later, turn on the switch back. If the product works properly, it is in normal condition. If the product sounds alarm, sent the product to our company's warranty service center to check.

※Functions of warning lamp (red LED)

A. Low battery	C. Over temperature protection	E. Surge protection
B. High battery	D. Over load LED	F. Output short light

As for the warning LED operation to stop each function, refer to cautions on the page 14.

### 5. 220V 60hz/50hz power outlet

It is 220V AC power outlet. It can be connected to devices needed 16A to 20A (according to models), and 4500W or less. [Universal socket](#) is only available for over-5KW model.

※Universal socket: both American flat pin (ac 110v) and European 2 rounds can be used. Korean one can be used, but unearthed.

※Capacity (current) on the product greater than the indicated one will deform the outlet.

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### 6. Automatic fan operation

When the internal temperature increases (40 to 48°C), ventilation automatically starts until cooling down to under 40°C. The direction of ventilation could be different according to model.

※Over-3kw models have the fan on the inside.

### 7. Output protection switch (circuit breaker switch)

- Dramatic change and overload on output power outlet or terminal make the circuit breaker cause shutdown. When you turn the switch on under normal condition of input power, the output is turned off again. Check if it is overpower or failure.

- 1.5KW or less model are attached to the fuse holder Panel. The fuse is disconnected when the output (overload) or abnormal voltage higher. If the disconnection continues, or product failure conditions, it may be an excessive load of used equipment connected. Check.

※More than 5kw model only. The main power breaker circuit breakers and outlets.

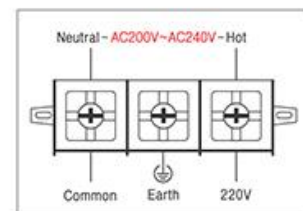
### 8. Output power terminal (only available for over-5kw models)

Over-5kw models have this output power terminal. The outlet use around 4kw output. Devices using over 4kw such as a welder or a motor compressor should not use this terminal (3pin). Consult an expert for wiring.

※For the connection to this terminal (3pin), refer to the figure on the left.

※Neutral and common terminals share the same line on AC in the circuit.

※Caution : Don't connect to the earth terminal.



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### 9. Ground terminal

The whole case is grounded. This can be used to ground other devices or equipment.

※3p terminal earth is the same with the ground terminal. You can use either of them.

※This is the ground terminal screw to 1KW.

### 10. Output frequency (60Hz ↔50Hz) select switch

※To change frequency, tune the switch to the frequency you want and turn it off. Wait until the power lamp light is completely out.

Turn on the power. The product will work at the desired frequency.

※Adjust 60Hz/50Hz switch (domestic products is setting to 60 Hz as default value)

※KEY140, KEY240, KEY160, KEY260 – The four models will switch is set to 60HZ. (50HZ order)

### 11. Auxiliary power switch outlet (remote power switch connector)

If you want to turn the power switch on/off more than 1m to 2m away from the product, or if you have difficulty in using the switch in the spot where the product was installed, use the included wiring to connect another power switch. The auxiliary power switch can be used only when the power of the product is turned off.

※KEY140, KEY240, KEY160, KEY260 – There are four models of this switch.

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### Check below items before repair report

Problems	Possible causes and check points	Solution
1. Low output voltage : red LED lit	The device connected to the inverter uses exceeding capacity of the output and causes overload. (Check if it is overload)	<ul style="list-style-type: none"> <li>• Stop the device connected to the inverter.</li> <li>• To check the capacity of the inverter and use less than the capacity</li> </ul>
2. No output voltage even when connected to small power devices	<ul style="list-style-type: none"> <li>To check charging status</li> <li>To check battery life span</li> <li>To check the cable</li> </ul>	<ul style="list-style-type: none"> <li>• To check battery charging</li> <li>• To check the cable gauge</li> </ul>
3. Red LED lit and overload buzzer	<ul style="list-style-type: none"> <li>To check the device connected to the inverter output.</li> <li>To check consumption power of the device.</li> </ul>	<ul style="list-style-type: none"> <li>• To check the quality of the device connected to the inverter.</li> <li>• Motors or freezers should be operated within 50% of the maximum power marked on this inverter</li> </ul>
4. Input fuse open and circuit breaker shut down and sensor shutdown	<ul style="list-style-type: none"> <li>To check wiring</li> <li>To check the device connected to the inverter</li> </ul>	<ul style="list-style-type: none"> <li>• To check polarity of input wire.</li> <li>• To check the power input of the device connected to the inverter</li> </ul>
5. High output voltage dramatically increases output	To check if the battery is 12V or 24V	<ul style="list-style-type: none"> <li>• Use DVM to check battery voltage.</li> </ul>

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**General problem**

Noise from audio systems: general audio system or related equipment can generate noise signals when the inverter is in operation. It is caused by current at the device interference with the one through the inverter.

TV interference : operation of the power inverter can interfere with television reception on some channels.

- Audio equipment, TV, RF transmitter, should be installed 1.5m away from the inverter.
- Check your system is grounded well at the inverter ground terminal.

**Cautions**

- The power level of electric appliances consumed big-watt on the short periods of time like freezer, air-conditioner, electric motor and drill should be between 40 and 50% of maximum power output of inverters to operate properly. check the power requirement of the device and the inverter.
- Especially, the rated capacity of motor should not be consider that of the inverter alike. It will cause failure due to the limited surge capacity of the product
- Use high-quality three-wavelength lamp due to its frequent failure without clear reason.
- Heating appliances like coffee makers, electric heaters, rice cookers can be used at the 80% of maximum capacity of this inverter and at the 70% constant use is possible. These product generate a lot of heat, you should pay attention. If ventilation is insufficient, it will shut down.
- Audio and video devices should be used within the rated power (watt). Exceeding the rated power will temporarily stop the inverter. Safety use is between 80% of indicated power.

 **Warranty** 

- This product is compensated according to the Compensation Criteria for Consumers' Damages.
- This product is manufactured based on a strict quality control and inspection process. Any trouble arising from the normal use be repaired free of charge during the warranty period in our A/S center, agencies and distributors, or other service centers.
- **The warranty period is extended to two years in normal year.**
- In the following cases, even within the warranty period, the service fee may be charged:
  - any breakdown which occurs due to remodeling or mishandling failure;
  - any breakdown which occurs due to fire or flood damage;
  - when there is no warranty
- The retention period of repair parts for this product is five (5) years.

Product Name	Digital Pure sine wave inverter	Warranty Period	Dealer	Firm Name
Model Name		2 Year		Address
Serial No.				
Date of purchase	Year      Month      Day			
Customer	Address		Celluler phone & phone	
	Name			
	Phone			

**P&K PNKHTECH CO., LTD**

www.pnkhitech.co.kr    E-mail : pnk@pnkhitech.co.kr

38, Namdongseo-ro 53beon-gil, (gojan-dong) Namdong-gu, Incheon city, Korea A-301, 302 TEL : 82-32-830-7666(ft)    TEL : 82-32-822-2339	Warranty repair center director TEL : 82-32-830-7641-2
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