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## **Preface**

Dear Users:

Hello! Thank you for choosing this brand PCE device. In order to use this instrument safely and correctly, please read this manual thoroughly, especially the Safety Information.

After reading this manual, it is recommended to keep the manual at an easily accessible place, preferably close to the device, for future reference.

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consequential damage may occur, the PCE and its distributors shall not be responsible for any of the damages.

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**Features:**

- ✧ Dual equivalent channels with variable voltage output range: 0-30V
- ✧ Channel 3 with fixed output: 2.5V, 3.3V, 5.0V
- ✧ Superior load regulation and line regulation
- ✧ Serial/parallel output
- ✧ Programmable linear voltage/current
- ✧ Timer, delay, store/replay
- ✧ Waveform display of voltage, current and power
- ✧ Ultra-low output noise
- ✧ Tracking function for channel voltage setting and output switch.
- ✧ 4.3 inch high resolution TFT color LED display, support display of multiple parameters and status
- ✧ Standard interface: USB Device, LAN
- ✧ Easy-to-use multifunctional knob and keypad
- ✧ Keypad lock to avoid faulty operation

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# Chapter 1 Safety Information

## 1.1 Safety Terms and Symbols

The following terms may appear in this manual:

**Warning:** The conditions and behaviors may endanger life.

**Note:** The conditions and behaviors may cause damage to the product and other properties.

The following terms may appear on the product:

**Danger:** This operation may cause immediate damage to the operator.

**Warning:** This operation may cause potential damage to the operator.

**Note:** This operation may cause damage to the product and devices connected to the product.

The following symbols may appear on the product:



**Alternating Current**



**Ground Terminal for Testing**



**Ground Terminal for Chassis**



**On/Off Button**



**High Voltage**



**Caution**



**Protective Ground Terminal**



**CE marking**



**CSA International**



**N10149 Spectrum Management Agency of Australia**



**Environmental Protection Use Period (EPUP)**

**1SM1-A:** This instrument belongs to SM Group1 Class A according to CISPR Article 4

**ICES/NMB-001:** This instrument complies with ICES-001

## 1.2 Safety Guidance

### General



- Do not block off the air intake and vent
- Avoid crash and using the instrument improperly.
- Do not discharge static electricity on the instrument
- Non-specialized personnel is forbidden to use the instrument

### AC input



- AC input voltage: 110V/120V/220V/230V,50/60Hz
- Ensure ground protection to avoid shock hazard.

### Fuse



Model	110V/120V	220V/230V
PCE-PPS3303	T4A/250(20X5mm)	T2A/250(20X5mm)
PCE-PPS3305	T8A/250(20X5mm)	T5A/250(20X5mm)

## 1.3 Safety Overview

This instrument strictly complies with the GB4793 safety requirements for electrical equipment and EN61010-1 safety standard during design and manufacturing. It complies with the safety standards for insulated voltage standard CAT II 1000V and pollution level II.

**If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.**

Please read the following safety preventative measures:

To avoid electric shock and fire, please use the dedicated PCE power supply appointed to the local region or country for this product.

This product is grounded through the power supply ground wire. To avoid electric shock, grounding conductors must be connected to the ground. Please be sure that the product is properly grounded before connecting to the input or output of the product.

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To avoid personal injury and prevent damaging the product, only trained personnel can perform the maintenance program.

To avoid fire or electric shock, please notice rated operating range and product marks. Do not use the product outside the rated range.

Please check the accessories for any mechanical damage before usage.

Only use accessories that came with this product.

Please do not put metal objects into the input and output terminals of this product.

Do not operate the product if you suspect it is faulty, and please contact PCE authorized service personnel for inspection.

Please do not operate the product when the instrument box opens.

Please do not operate the product in humid conditions.

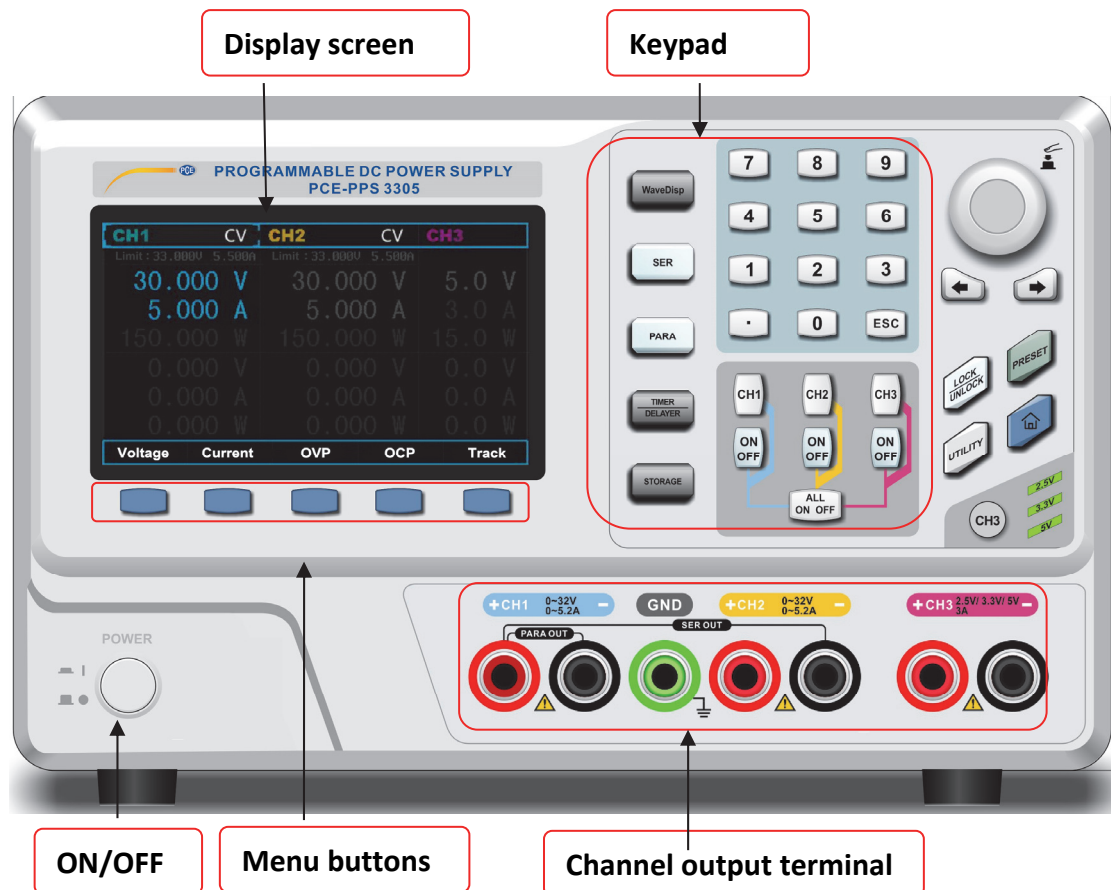
Please keep the product surface clean and dry.



# Chapter 2 Panel Introduction

## 2.1 Panel & Buttons

### Front panel



### Keypad



#### 1. Number:

Number 0~9, decimal point ".", "+/-"

Press decimal point "." to fast switch unit



#### 2. Functional knob

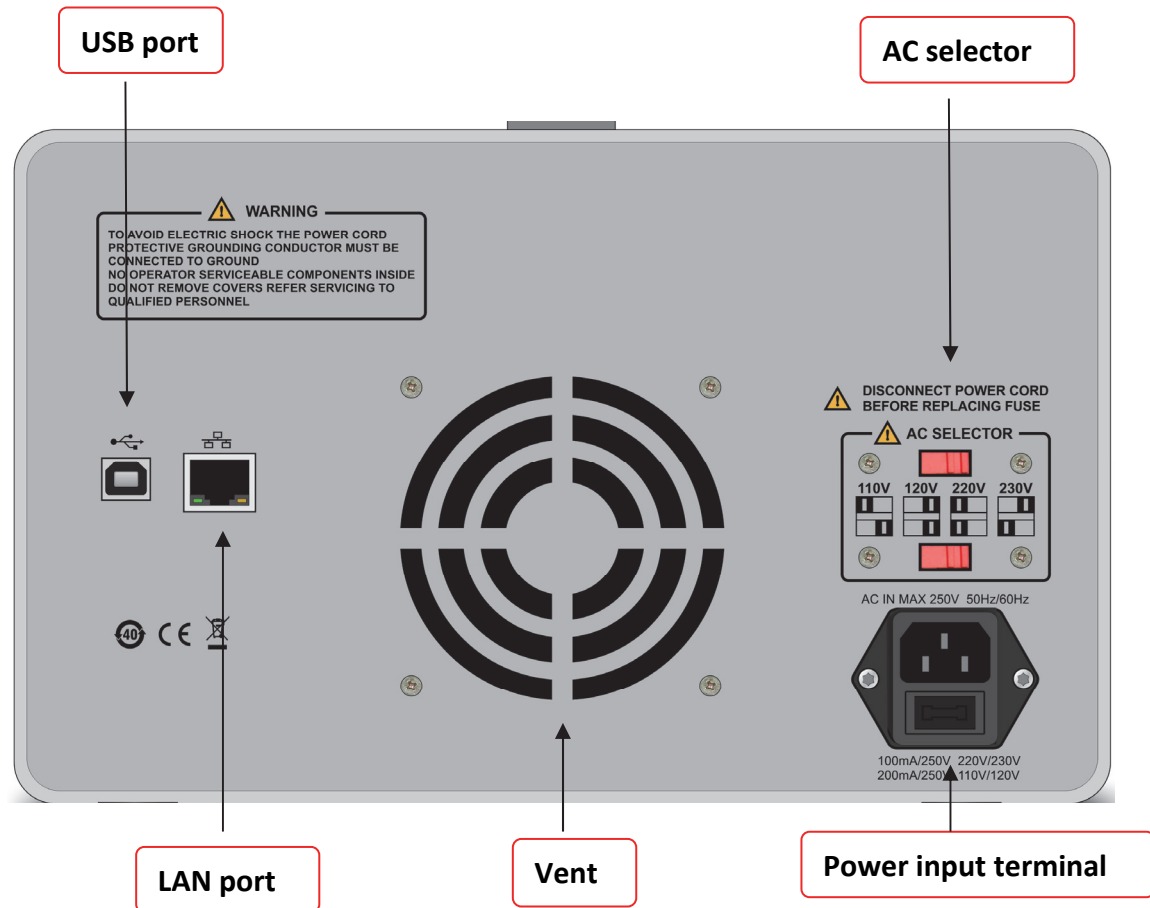
Rotate the functional knob to change number or direction, press this knob to select function or confirm parameter settings.



#### 3. Directional key

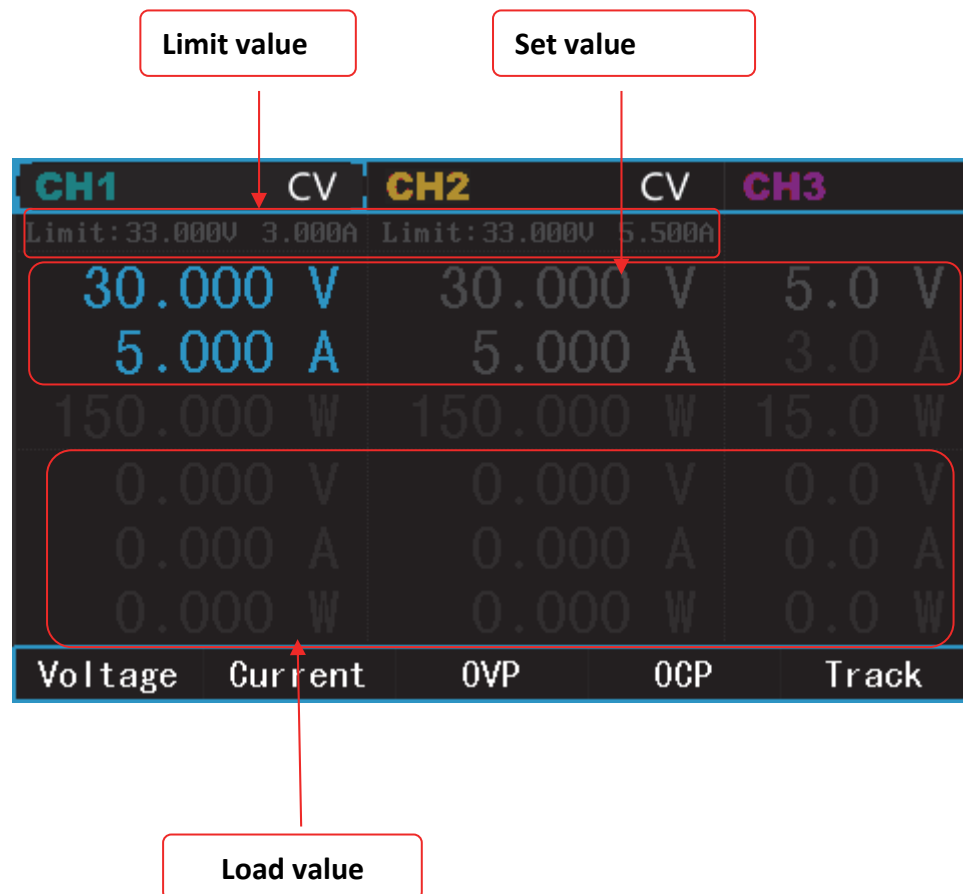
Press left arrow key to backspace and delete the previous digit.  
Move the position of the cursor

## Back panel



**Warning:** For better heat emission, please do not block off the vent.

## 2.2 Main interface



# Chapter 3 Functions

## 3.1 Set value

### Voltage setting:

**Method 1:** On main interface, press **CH1** → menu button **Voltage**, rotate the knob and directional key to change the number

**Method 2:** On main interface, on main interface, press **CH1** → menu button **Voltage**, press the number key pad to input number directly, press the knob to confirm the value. You can press **ESC** to delete the value, press **ESC** to exit the setting.

Current setting is similar to voltage setting method

**Note:** Channel 3 output voltage: 5V, 3.3V, 2.5V, press the menu button to select

directly, or press **CH3** to fast switch

### 3.2 Output method

Adaptive mode: Output voltage/current varies according to the change of the load. For example, set value: voltage: 10V, current: 2A, if the current  $\leq 2A$ , the instrument will enter into constant voltage operation automatically, the output voltage keeps 10V. If the current  $> 2A$ , the instrument will enter into constant current operation, the output current keeps 2A.

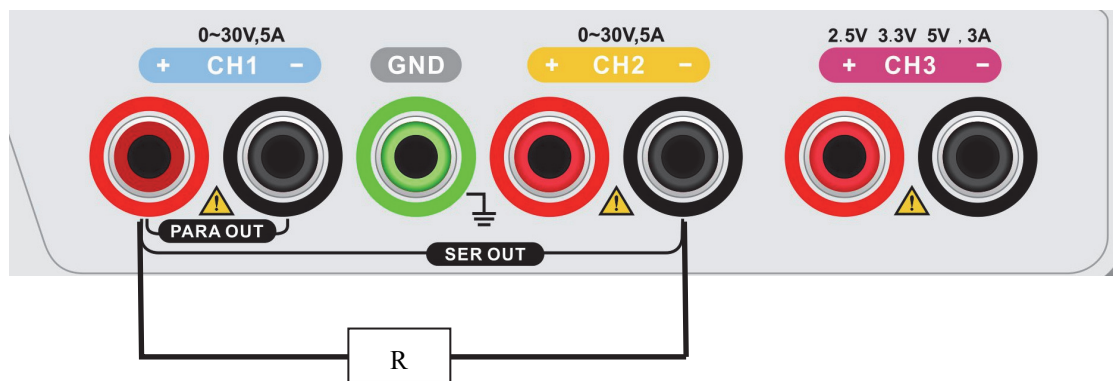
### 3.3 Series/parallel connection

#### Series connection

Series connection can provide higher output voltage which is the sum of that from Channel 1 and Channel 2.

Run as: Press **SER** button, there is LED indicator with  on the display screen.

**Wiring method:**

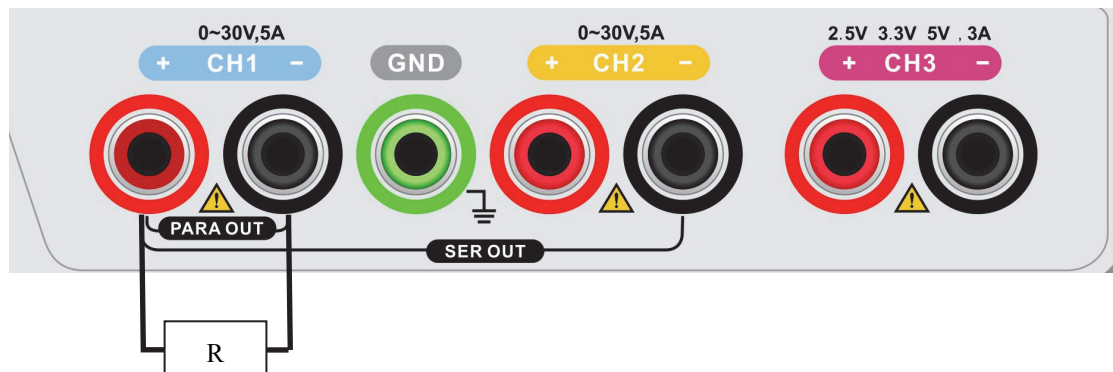


#### Parallel connection

Parallel connection can provide higher output current which is the sum of that from Channel 1 and Channel 2.

Run as: Press **PARA**, there is LED indicator with  on the display screen.


**Wiring method:**





**Caution:** Pay attention to the polarity.

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### 3.4 Tracking function

When you open the tracking function,  appears on the display. If you change the voltage or current of one channel, the other will change accordingly. This function is mainly used for operational amplifier or generating equivalent voltage.

Run as: On main interface, press the menu button ,  appears on the display screen.

**Note:** Tracking function is only available on programmable value not the practical output value.

### 3.5 Output tracking

After enabling tracking function, press  to turn on/off output tracking

ON: When you turn on/off the output of one channel, the other one will run accordingly.


OFF: When you turn on/off the output of one channel, the other one will not be influenced.

### 3.6 Timer and delayer

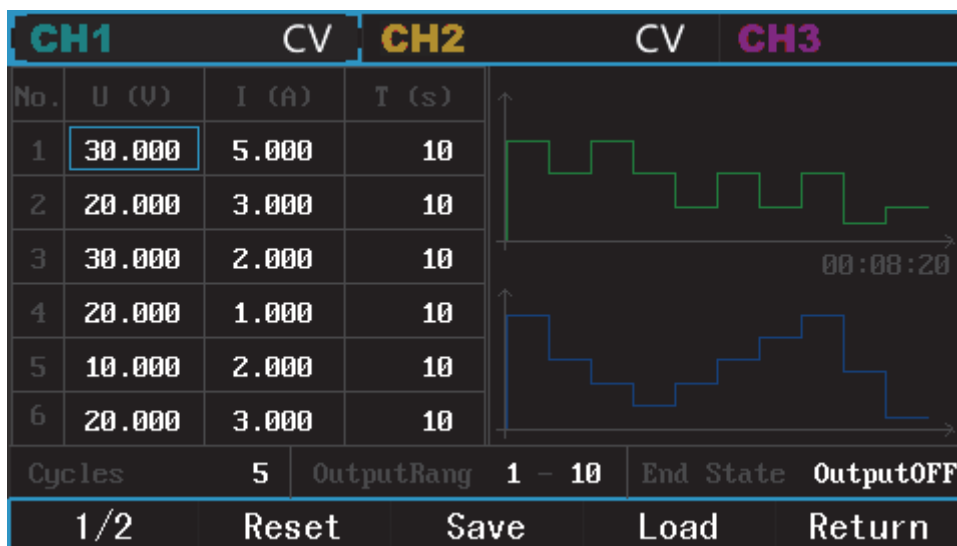
When you turn on the timer, the instrument will output the set value of voltage/current (maximum 10 groups). Users can set the group quantity, voltage, current and time. Output voltage and current are no longer restricted by the limit value when the timer is on.

When you turn on the delayer, the instrument will turn on/off the output (maximum 10 groups) according to the status and delay time set before. Users can set the group quantity, status and delay time of each group.

Users can save the edited parameters (Data format, timer:\*.tmr. Delayer:\*.dlr).  
Setup:

Press  to cycle switch Timer→Delayer→Exit

When you open the timer:



### Voltage:

Press the number keypad to input value, press the knob to confirm. You can press to delete the input value.

### Current:

After the voltage setting, rotate the knob or press to switch to current bar, number input method is similar to voltage.

Time setting is similar to voltage and current. After the setting of the first group, rotate the knob or press the directional key to the next group. There are 10 groups in total, 6 in the first page. You can switch to the rest 4 groups by pressing

.

**Note:** On Channel 3 setting, press the knob to cycle switch the fixed voltage.

### Output setting:

After the setting of voltage, current and time for each group, use the knob or the number keypad to input output times: 0~9999; Output range means output groups. Output status: output hold/output off. Output hold means when the timer is off, the instrument remains the last output status. Output off means output is 0.

### Menu buttons:

: flip over

: reset all data to 0

: Load all timer data saved in the instrument.

: return to main interface.

### Delayer interface:

CH1		CV		CH2		CV		CH3		
<div>ON</div> <div>OFF</div>										
No.	1	2	3	4	5	6	7	8	9	10
Output	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Delay(s)	0	0	0	0	0	0	0	0	0	0
Cycles:	1				Stop When: None					
OutputRange	1 - 10				End State: Output OFF					
01   10		Reset		Save		Load		Return		

**Output:** Press **01 | 10** or press the knob to fast switch ON/OFF.

**Delay:** Please refer to voltage setting.

**Output times:** Please refer to timer

**Stop when:** none, <voltage value, >voltage value, <current value, >current value, <power value or >power value.

**Output range:** groups quantity

**End state:** Output OFF/Output Hold, output hold means the output remains still even the delayer is off. Output off means output zero signal.

**Menu buttons:**

**01 | 10:** Fast switch the output status

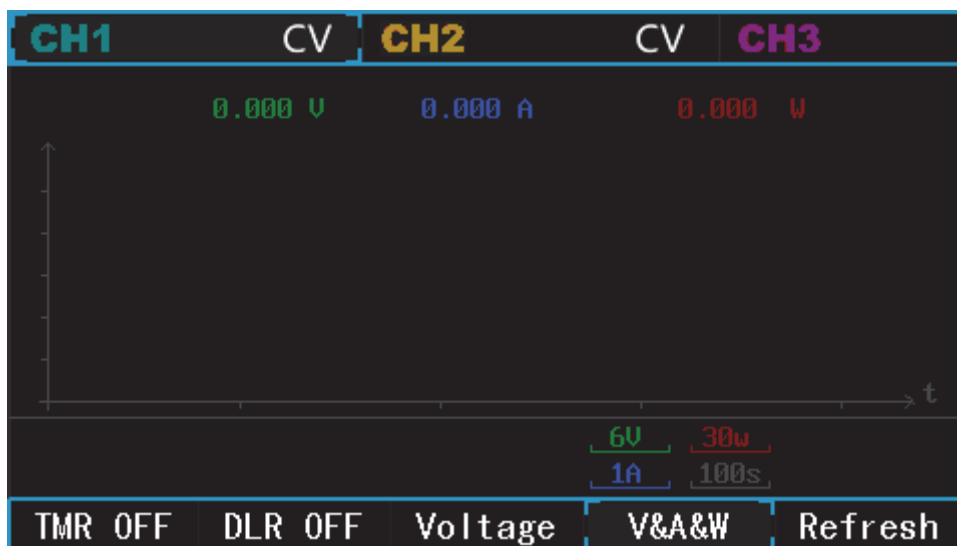
**Reset:** Reset all data to 0

**Load:** Load all delay data saved in the instrument.

**Return:** Return to main surface

### 3.7 Waveform display

After the setting of timer and delayer, press **WaveDisp** to enter into waveform display interface:



### Menu button:

**TMR OFF:** Timer ON/OFF

**DLR:** Delayer ON/OFF

**Voltage:** Select voltage as the waveform type in display

**V&A&W:** Voltage, current and power are displayed at the same time

**Refresh:** Delete the waveform display

## 3.8 Storage

Press **STORAGE** to enter into storage interface

CH1	CV	CH2	CV	CH3
Timer Data		Delayer Data		
Default.tmr		ch2.tmr		_.tmr3
2lcd.tmr		6.tmr		_.tmr3
_.tmr		4.tmr		10w.tmr3
5.tmr		6.tmr		ch3.tmr3
10.tmr		_.tmr		_.tmr3
Channel I	Type	Load		Rename



### Menu button:

**Channel**: Select channel, or press , ,  to select channel.

**Type**: Switch between timer and delayer data.

**Load**: Load the saved data on timer or delayer interface.

**Rename**: Rename the data. Press RENAME, rotate the knob, input the name and press confirm

## 3.9 Utility

Press **UTILITY** to enter into utility setting interface:

CH1 CV		CH2 CV		CH3
O-Track	: ON	IP Mode	:	Manual
Auto Lock	: Close	IP	:	192.168. 1.110
Mute	: OFF	SubnetMask	:	255.255.255. 0
OTP	: OFF	Gateway	:	192.168. 1. 1
Language	: English	MAC	:	30:00:DF:05:43:53
Default setting		Brightness	:	
Sys info				
O-Track	AutoLock	Mute	OTP	Sysinfo

### Menu button:

**O-track**: Output tracking. Refer to Section 3.6

**AutoLock**: 10mins/30mins/1hr

**Mute**: Buzzer ON/OFF

**OTP**: ON/OFF, to protect the instrument, the power supply will automatically shut off when the inner temperature is relatively high.

**Language**: Chinese/English

**Default setting**: Reset to default setting.

**Sysinfo**: Display system information: model, software version, firmware version,

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serial number, production date, boot times and working hours.

**Brightness**: Adjust brightness of the backlight

**IP mode**: Auto/Manual

**IP address**

IP address format: nnn.nnn.nnn.nnn. Range of the first nnn is 1 to 223, the other nnn is 0 to 255. It is suggested that you ask the network administrator for an available IP address. Select **IP address**, use the number keypad and directional key to input IP address. This setting will be saved in NVM. When you start up the instrument next time, the instrument will load the IP address automatically.

**Sub-net mask**

Sub-net mask format: nnn.nnn.nnn.nnn. Range of nnn is 0 to 255. It is suggested that you ask the network administrator for an available Sub-net mask. Select **Sub-net mask**, use the number keypad and directional key to input Sub-net mask.

This setting will be saved in NVM. When you start up the instrument next time, the instrument will load the Sub-net mask automatically.

**Gateway**

Gateway format: nnn.nnn.nnn.nnn. Range of nnn is 0 to 255. It is suggested that you ask the network administrator for an available gateway. Select **Gateway**, use the number keypad and directional key to input gateway. This setting will be saved in NVM. When you start up the instrument next time, the instrument will load the gateway automatically.

**MAC**

MAC starts from 0, increase by 1 each time, therefore, the physical address space increases linearly.

### 3.10 Keypad lock

To avoid faulty operation, press **Lock/Unlock** to lock the keypad, the button is lightening. Press this button again to unlock the keypad and the light is off.

### 3.11 Preset

Press "PRESET" to display the preset parameters:

[CH1 CV] CH2 CV CH3						
Preset	1	2	3	4	5	Current Status
Channel	CH1	CH2	CH3	CH1	CH2	CH3
Voltage	30.000V	30.000V	5.00V	30.000V	30.000V	5.00V
Current	5.000A	5.000A	-----	5.000A	5.000A	-----
OVP	35.200V	35.200V	-----	33.000V	33.000V	-----
OCF	5.720A	5.720A	-----	3.000A	5.500A	-----
Track	OFF	OFF	-----	OFF	OFF	-----
Preset	Cover				Apply	Return

You can preview preset status value and present status value. The present status value can be used to cover the preset value.

The present status value is the set value on the main interface.

Menu button:


**Preset**: Group selection, or you can use the knob to select.

**Cover**: Cover the preset status value with the present value

**Apply**: Apply the preset value to the present value.

**Return**: Return to the main interface.

### 3.12 Home page

Press  at any page to return to the home page:

CH1		CH2		CH3
CV		CV		
Limit: 33.000V 3.000A		Limit: 33.000V 5.500A		
30.000 V		30.000 V		5.0 V
5.000 A		5.000 A		3.0 A
150.000 W		150.000 W		15.0 W
0.000 V		0.000 V		0.0 V
0.000 A		0.000 A		0.0 A
0.000 W		0.000 W		0.0 W
Voltage	Current	OVP	OCP	Track

# Appendix A: Performance Index

Note: The following index recorded on 25 °C, 5 minutes after start up.

Model	PCE-PPS3303	PCE-PPS3305
Output voltage	0-30V	0-30V
Output current	0-3A	0-5A
<b>Load effect</b>		
Voltage	$\leq 0.01\% + 2\text{mV}$	$\leq 0.01\% + 2\text{mV}$
Current	$\leq 0.01\% + 250\mu\text{A}$	$\leq 0.01\% + 250\mu\text{A}$
<b>Power effect ion</b>		
Voltage	$\leq 0.01\% + 2\text{mV}$	$\leq 0.01\% + 2\text{mV}$
Current	$\leq 0.01\% + 250\mu\text{A}$	$\leq 0.01\% + 250\mu\text{A}$
<b>Programming resolution</b>		
Voltage	1mV	1mV
Current	1mA	1mA
<b>Load resolution</b>		
Voltage	1mV	1mV
Current	1mA	1mA
<b>Programming accuracy</b>		
Voltage	$\pm(0.05\% + 10\text{mV})$	$\pm(0.05\% + 10\text{mV})$
Current	$\pm(0.2\% + 10\text{mA})$	$\pm(0.2\% + 10\text{mA})$
<b>Reading accuracy</b>		
Voltage	$\pm(0.05\% + 5\text{mV})$	$\pm(0.05\% + 5\text{mV})$
Current	$\pm(0.15\% + 5\text{mA})$	$\pm(0.15\% + 5\text{mA})$
<b>Ripple (5Hz~1MHz)</b>		
Voltage	$\leq 1.0\text{mVrms}$	$\leq 1.0\text{mVrms}$
Current	$\leq 2\text{mA}_{\text{rms}}$	$\leq 2\text{mA}_{\text{rms}}$
<b>Output temperature coefficient per°C (output%+offset)</b>		
Voltage	0.01%+5mV	0.01%+5mV
Current	0.01%+2mA	0.01%+2mA
<b>Parallel connection</b>		

Line regulation	≤0.01%+2mV	≤0.01%+2mV
Load regulation	≤0.01%+2mV	≤0.01%+2mV
Series connection		
Line regulation	≤0.01%+3mV	≤0.01%+3mV
Load regulation	≤300mV	≤300mV
Tracking error	≤0.5%+100mV (master without load), when with load plus≤300mV load effect)	≤0.5%+100mV (master without load), when with load plus≤300mV load effect)
Channel 3 features		
Output voltage	2.5V/3.3V/5V±8%	2.5V/3.3V/5V±8%
Line regulation	≤0.01%+3mV	≤0.01%+3mV
Load regulation	≤0.01%+3mV	≤0.01%+3mV
Voltage SPC speed		
Increase	Full load<50ms; no load<30ms	Full load<50ms; no load<30ms
Decrease	Full load<45ms; no load<400ms	Full load<45ms; no load<400ms
General specifications		
Display		
Screen	4.3 inch TFT LCD	
Resolution	480×272	
Interface		
Type	Standard: USB Device, LAN	
Power supply		
Voltage	AC 100V/120V/220V/230V±10%	
Frequency	50Hz/60Hz	
Machinery specifications		
Dimension	395mm×380mm×265mm	
Net weight	9.6kg	
Gross weight	10.6kg	

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## Appendix B: Accessories

Model	PCE-PPS3300 series power supply
Standard configuration	Power cord
	USB cable
	User manual
	User disk

## Appendix C: Maintenance and Cleaning

### General maintenance

- Please don't store or place the instrument where LCD is exposed to direct sunlight for a long time.
- To avoid damage to the instrument or connecting line, please don't place it in mist, liquid or solvent.

### Cleaning

- Please clean the instrument frequently in the light of use.
- Cut off the power, and then clean with soft cloth that is wet but not dripping (wipe floating dust off the exterior of instrument with mild detergent or clear water, don't use chemical medicine or detergent containing benzene, methylbenzene, dimethyl benzene, acetone and other potent substances).
- Please prevent scratch of LCD protection screen when cleaning instrument with LCD.
- Please protect the instrument against any corrosive liquid to prevent damage.

**Warning:** please confirm that the instrument is completely dry before powering on again to prevent electrical short circuit and even personal injury due to moisture