



善施者 · 知行合一



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CHINA FAMOUS BRAND

# RNE SERIES INTELLIGENT DIGITAL EMERGENCY POWER SUPPLY (EPS)

## USER'S MANUAL



# **RNE SERIES INTELLIGENT DIGITAL EMERGENCY POWER SUPPLY (EPS)**

## **USER'S MANUAL**

English version

- Please read carefully this manual for understanding all description so that installation, circuit wiring, operation and maintenance etc can be performed correctly.
- The specifications of the product are subject to change without notice.
- Keep this manual until the product is discarded.
- This manual should be kept by the actual end-user.

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A large, bold, black number '1' centered within a white square, which is itself centered within a larger, light gray rectangular background.

# PREFACE

Thank you for purchasing ceayea's FEPS-RNE (D,S) series intelligent digital Emergency Power Supply (EPS).

This product is widely employed for fire fighting facilities and some important first-grade loads in many areas, such as industry, commerce, civil and military application and medical care etc. Please read this manual carefully to understand all description for correct application. Incorrect usage may result in malfunction of the machine or fault or even decrease of service time. This manual should be kept by the actual end user. Please preserve it with the warranty card properly for future usage.

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# SAFETY NOTICE

Before installation, circuit wiring, operation and maintenance, be sure to be familiar with the content of this manual for correct usage of the equipment. During application it is necessary to well know the driving mechanism and all notices concerned with safety.

 HAZARD

Wrong operation may result in danger, such as personal injury or even death.

 CAUTION

Wrong operation may result in danger, such as moderate personal injury or slight wound or equipment accident etc.

## ABOUT APPLICATION

 HAZARD

This series EPS is designated to providing first-grade load such as fire fighting illumination and power (for motor). At the installation site there should be safety device in case of emergency. Otherwise there is danger of severe accident.

## ABOUT INSTALLATION

 HAZARD

Do not install the equipment at flammable, explosive, dusty or humid environment.

 CAUTION

Do not convey the equipment aslant otherwise there may be danger of personal injury or accident of equipment damage. Do not allow foreign body, such as paper, screw, wood

crumbs, dust, metal crumbs, screws or wire head to fall inside the EPS. Otherwise there is risk of fire; Do not install or operate the EPS when it is damaged or there is defective component. Otherwise there is risk of accident.

 HAZARD

- A protective circuit breaker should be placed at the front of EPS otherwise there may be malfunction of the equipment or even fire.
- There should be grounding connection otherwise there is risk of electroshock.
- Perform operation only after confirmation that the equipment has been switched off.
- Perform wiring only after installation of the main body, there is risk of electroshock or injury.

 CAUTION

- Make sure the input power phase number of city power for the EPS. The rated input voltage should be in compliance with the phase number and voltage of AC power.
- The single phase for EPS requires one-phase two-wire system, and three phases for EPS require three-phase four-wire system. Otherwise the equipment may be damaged.
- Never connect the output terminals (U, V, W) of the main control box to AC network. Otherwise the equipment may be damaged.
- There may be electric interference among EPS, electric motor and wirings. Pay attention to nearby sensors and equipment so that they do not arouse misoperation. Otherwise accident may occur.

## ABOUT MAINTENANCE CHECK AND REPLACEMENT OF COMPONENTS

 HAZARD

- Be sure to operate according to the steps after switching off. Maintenance check of the EPS can be performed only ten minutes later after the equipment is powered off. Otherwise there is risk of electroshock.
- Maintenance check and replacement of components can be performed only by designated professional personnel. Otherwise there is risk of electroshock or personal injury.

 CAUTION

- When the product is discarded, it should be disposed off as industrial discards. Otherwise there is risk of injury.
- Never try to reconstruct EPS, otherwise there is risk of injury.

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# OVERVIEW

## **EMERGENCY POWER SUPPLY (EPS)**

### **RNE SERIES INTELLIGENT DIGITAL EMERGENCY POWER SUPPLY (EPS)**

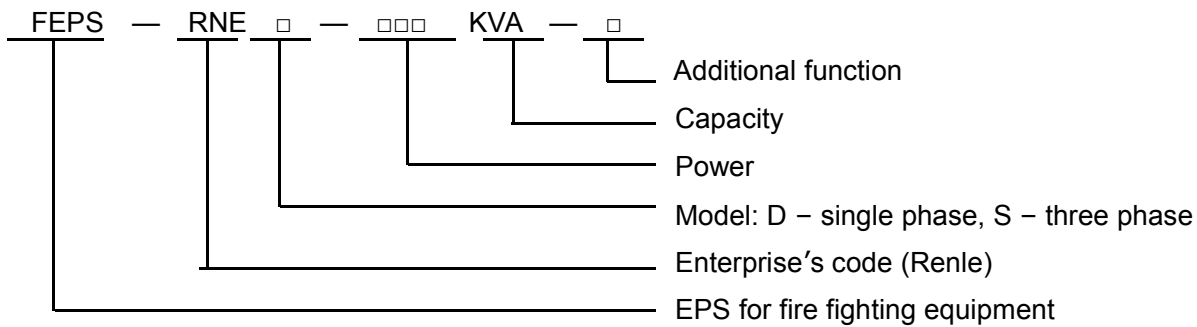
EPS is a kind of emergency power supply adopted for power network guarantee and fire fighting in the buildings in contemporary world. It follows the principle that when the power grid works normally, it supplies power to important loads through changeover control device. When the power grid is disconnected, the changeover control device immediately switches to inversion power supply for offering electricity. When the power grid resumes, the power is supplied by the power grid.

#### **PRODUCT APPLICATION**

- For emergency illumination in important places, such as hospital, government organ, supermarket, store, school, square, station and park, factory, gym, convention & exhibition center etc.
- Emergency power for power equipment of building fire fighting, lift, pump, ventilator and rolling door etc.
- Emergency application for commercial places, such as financial system, trading screen at securities exchange, monitoring system and financial organs etc.
- For important industries: Chemical, metallurgical, DCS of CNC, safety & protection system of ESD, peripheral equipment of CRT control and action control of PLC programming etc.



## MODEL DESCRIPTION



## PRDUCT FEATURES

- Static, with no noise, no exhausted smoke, no pollution, but energy saving and environmentally friendly.
- No necessity to maintain the battery, which can be used repeatedly 300 – 500 times.
- Simple handling with automatic transient switching function. Person on duty not required.
- Stable voltage, reliable running and simple maintenance.
- Reasonable design and easy construction.
- Long service life. More than 20 years for the main machine.
- Complete protection functions with strong loading capacity.
- Low no-load loss, high inversion efficiency.

## SUPERIORITIES OF THE PRODUCT

EPS system is a necessary power supply for identification lamp and lighting lamp in time fire or other emergency in buildings. EPS enjoys fast development with the raise of fire fighting level of buildings, especially the increase of high buildings. Renle's fire fighting equipment EPS has the following features:

- Complete protection: To protect your loading. During power failure EPS ensures normal work.
- High reliability: It adopts advanced DSP microprocessor for control and SPWM technology. With excellent performance.
- Simple operation and convenient maintenance.
- Control panel: LCD displays – main voltage, battery voltage, output voltage, output load current and fault display.
- Output short circuit protection, overload and overheating protection.
- Sound fault alarm and indication of fault type.
- Battery overdischarging protection.

- Chinese LCD display and alarming system.
- Connection to outer batteries allows longer power supplying time.

## **CONSTITUENT**

EPS mainly consists of battery pack, inversion module, charger, battery measurement device, test circuit, automatic switching device, isolation power supply, switch power, cooling system, distribution control system and PC software control system.



## NOTICE BEFORE APPLICATION

### PURCHASING INSPECTION

After receiving the equipment you order, please open the packing to inspect the following items at site. If you find problem in the product or the product is not in compliance with the order, please contact our agent or Renle's office nearby.

Check the nameplate of EPS to confirm the specifications of the product you order.

Model: FEPS-RNES-10-KVA	
Power: 10kW	Battery voltage: DC192V
Number of phase: 3-phase (3P-N+PE)	Emergency service time: 90 minutes
Input voltage: 180V - 260V (phase voltage)	Emergency start time: < 5S
Input frequency: 50Hz $\pm$ 2.5Hz	Battery recharge time: < 48 hours
Output voltage: Phase voltage 220V (1 $\pm$ 5%) (Emergency) Line voltage 380V (1 $\pm$ 5%) (Emergency)	Noise: < 60dB
Output frequency: (50 $\pm$ 0.5Hz) (Emergency)	
Overload capacity: $\leq$ 120%: normal work; > 120%: automatic shutdown 10 seconds later (during emergency)	

Inspect the outer appearance to see if there is damage resulted during transportation, for example, the pit on the surface of the enclosure of EPS, falling of component, whether there is leak in the batteries (the paper packing is soaked in liquid).

Check the accessories according to the packing list. The accessories include:

1. User's manual..... 1 copy
2. Certificate of quality..... 1 copy
3. Warranty card..... 1 copy
4. Main machine..... 1 set
5. Battery cabinet, provided according to requirements (See the note of the list for detailed quantity)
6. Battery wires, provided according to requirements (See the note of the list for detailed quantity)
7. Battery (See the note of the list for detailed quantity)



## CAUTION

After the equipment is delivered, please check and install it within one month. Otherwise the service life of the accumulators will be affected (the accumulators should be charged and discharged every 2 – 3 months).

## NOTICE FOR INSTALLATION

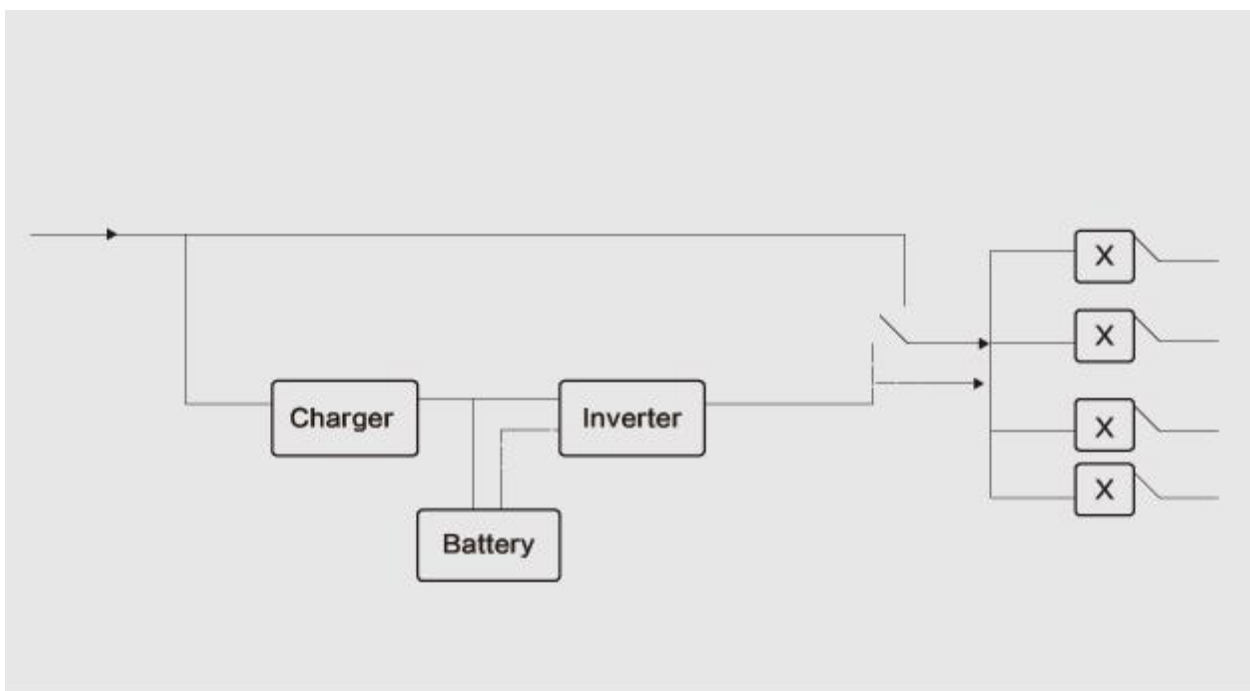
- The equipment should be installed at a clean, dry place without water drop or erosive/conductive dust (Protection degree II). The room where the EPS is installed should be locked in case of entry of unrelated personnel.
- Choose a reasonable place convenient for installation, commissioning and maintenance (in compliance with safety distance and maintenance channel for LV electric device).
- The machine body should be at least 10cm away from surrounding walls for free entry and exhaust of air.
- Make sure that mounting bracket or fixed pedestal of the equipment accord with the requirements of the installation diagram.
- The power wire must comply with rated voltage. Its diameter must comply with the design.
- The grounding cable should be reliable and connected to the specialized grounding device in the building (equipotential terminal). Installation of the equipment should be performed by professional technician or guided by installation engineer or technician sent by our company. There should be protective device or air switch of enough capacity in the fixed line. The air switch should have both electromagnetic and thermal tripping to ensure short circuit and overload protection.
- When the equipment weighs more than 100 – 4000 kgs, pay more attention to personal safety during installation to the place to avoid body harm by decline of the equipment during installation to the place.
- Make sure the position number, wire diameter and color during wiring.
- Fixing screws much be installed in the machine cabinet and the battery cabinet and the screws must be connected firmly to the grounding wire (PE).
- The suitable environment temperature is 25°C and the suitable altitude < 2000m.

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## INSTALLATION AND CONNECTION

### WORKING PRINCIPLE



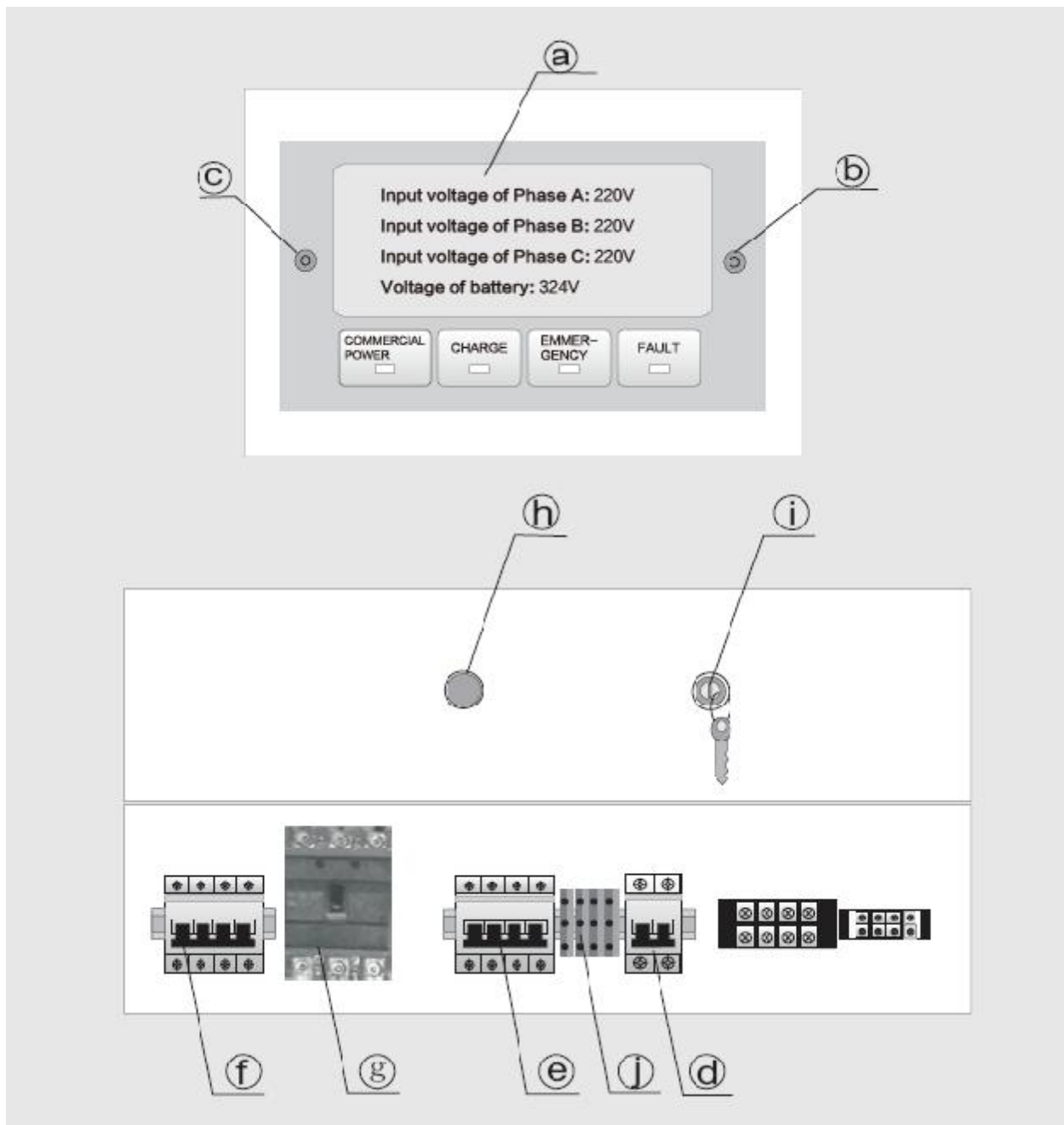
————— : Commercial power supply line

----- : When the commercial power supply stops or is too low, it is allowable to select forced emergency start.

- When the commercial power is normal, the output of EPS is supplied by the commercial power. And the charger charges the accumulators meanwhile.

- When the commercial power stops or is lower than 170V, the EPS works under the emergency condition.
- Alarm: Sound alarm works when fault occurs. Press MUTE key to cancel the sound alarm. Press the FLIP key to view the fault type. Unless the fault is removed, the fault type remains. The buzzer sounds again if new fault occurs. Press the MUTE key again to cancel the sound alarm.

## OUTER DIAGRAM AND DESCRIPTION





# MANUAL OPERATION

## POWERING STATUS OF THE MAIN POWER SUPPLY

Main menu 1	Function of main power supply	Main menu 3	Input voltage Ua: 220V
	Battery charging		Input voltage Ub: 220V
	Charging is normal		Input voltage Uc: 220V
			Voltage of battery Ud: 324V
Main menu 2	Output voltage Ua: 220V	Main menu 4	Output current Ia: 0A
	Output voltage Ub: 220V		Output current Ib: 0A
	Output voltage Uc: 220V		Output current Ic: 0A
	Voltage of battery Ud: 324V		Voltage of battery Ud: 324V

## POWERING STATUS OF EMERGENCY POWER

Main menu 1	Emergency powering	Main menu 3	Output voltage Ua: 220V
	Battery charging		Output voltage Ub: 220V
	Battery is discharging		Output voltage Uc: 220V
			Voltage of battery Ud: 324V
Main menu 2	Output voltage Ua: 220V	Main menu 4	Output current Ia: 0A
	Output voltage Ub: 220V		Output current Ib: 0A
	Output voltage Uc: 220V		Output current Ic: 0A
	Voltage of battery Ud: 324V		Voltage of battery Ud: 324V

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## COMMISSIONING DESCRIPTION

### COMMISSIONING STEP

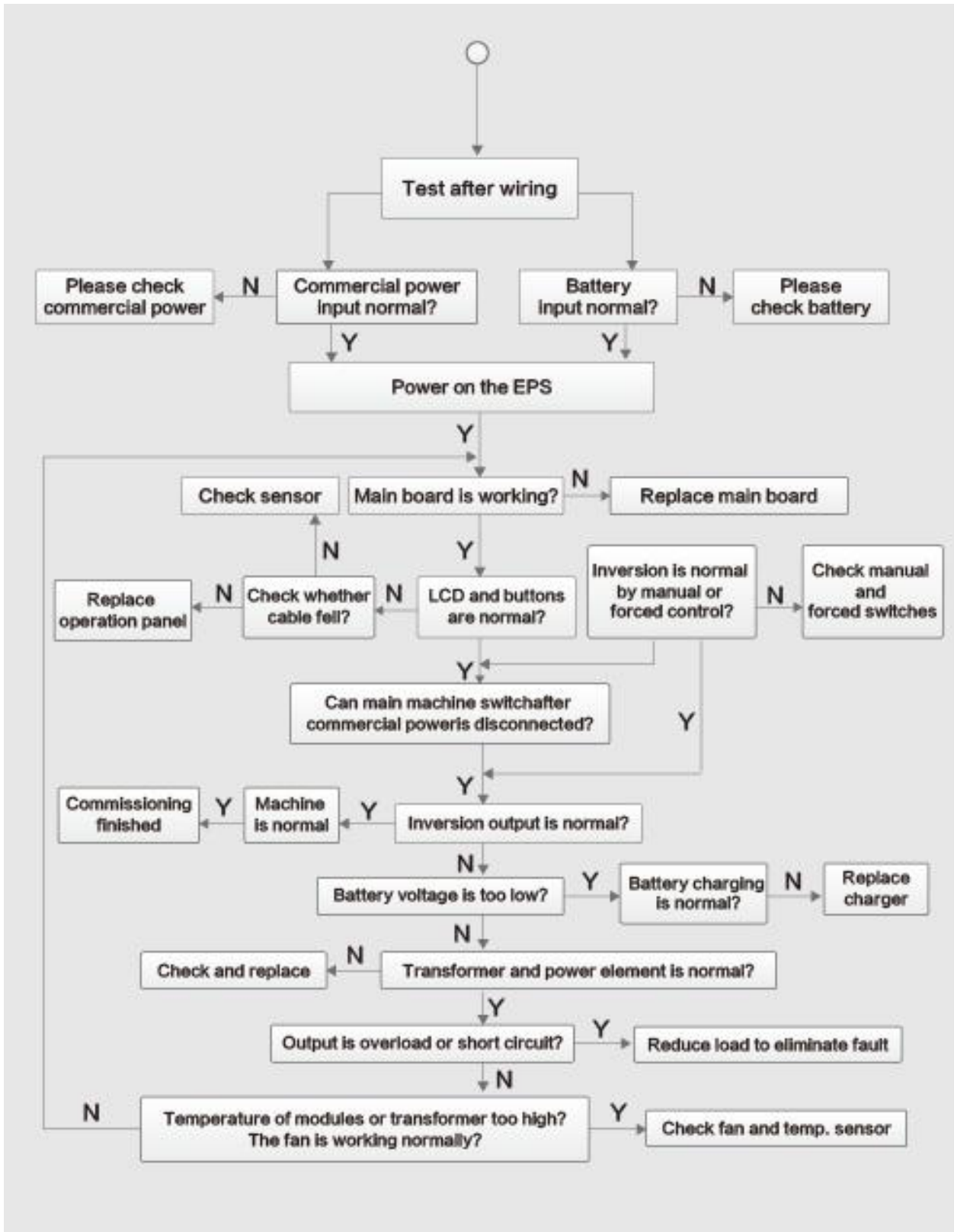
- Disconnect the output branch circuit breaker.
- Close the main power and battery input circuit breaker.
- Under main power supply condition, LCD can show main power voltage, battery voltage, output voltage and load current.
- Disconnect the commercial power to switch in emergency powering. LCD can show load current, output voltage and battery voltage.
- Press FLIP key to view LCD display.
- After the above shown tests, restore the main powering.
- The equipment can be put into application after all the above functions are normal.

### NOTES FOR APPLICATION

- Note 1: Forced emergency start mode is powered by the battery. EPS works under emergency condition. EPS offers no protection against over-discharging of battery.
- Note 2: If the battery is stored for more than 3 months without usage, charge it for over 20 hours to ensure enough electricity in the battery and extension of the service time of the battery.
- Note 3: If the main machine continues to work more than 3 months, discharge must be performed to ensure reliable work of the battery pack.



## COMMISSIONING FLOW CHART





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## MAINTENANCE

### ROUTINE MAINTENANCE

- Charge the battery pack continuously for 48 hours when the equipment is used for the first time.
- Keep the interior and outer side clean and tidy. There is no foreign matter, flammable, explosive or other dangerous article.
- Please use the Forced start button only in time of emergency. Deep discharging of the battery pack is not allowed even if during routine function check. Be sure to keep the EPS within 30% of nominal time value of emergency.
- Check whether load-carrying of each circuit surpasses rated max. output power of the EPS. If it exceeds the normal output power as a result of capacity amplification on the drawing, and this circumstance is not found in time, it may arouse power failure. Under such condition EPS can not perform inversion normally.
- Avoid overload of the EPS. Though the equipment can work normally with 120% overload, overload working for long time can influence the service life of the important components such as battery and power modules etc. Try to avoid overload work.
- Pay attention to dust prevention. Plentiful dust may reduce the insulation degree of EPS and may lead to malfunction of EPS during long-time work.
  - 1) Avoid creepage, arcing or short circuit in the PCB.
  - 2) Avoid increase of thermal resistance of heat dissipater and temperature rise of the modules.
- Method of cleaning: Brush away gently the dust with clean and dry brush. Blow away the dust with blower or compressed air.

### MAINTENANCE CHECK

Perform routine check and periodical check for long time and reliable running EPS. Pay attention to the following items:

- Routine check: Check the operation of EPS with eyes from its outside during powering on and running. If everything is normal, confirm whether the equipment is normal.
- Normally perform the following check:

- a. Running of EPS complies with standards and norms.
- b. Environment complies with standards and norms.
- c. Parameters shown in the keyboard screen are normal.
- d. No abnormal noise vibration or smell.
- e. No abnormal circumstance such as overheating or color change.

### PERIODICAL CHECK

During periodical check, turn off load equipment and switch off the commercial power, perform no-load inversion running of EPS. If the running is normal, switch to commercial power, close the load then turn off the commercial power: after the equipment runs under inversion for 30 min, close the load and switch to commercial power (Recommendation: periodically run the EPS every 2 – 3 months).

- Periodically (quarterly) check whether the connection terminals are loose. Make sure they are fastened.
- Periodically (quarterly) charge and discharge the battery pack for one time with continuous discharging for 30 min. to ensure the best operation state of the battery pack.
- Periodically (quarterly) switch off the commercial power during the automatic mode. Check whether inversion is normal and make sure the load is normal.
- 

Place of check	Check item	Method of check	Criteria for judgment
Environment	<ol style="list-style-type: none"> <li>1. Make sure the temperature, moisture, shake of the environment and whether there is dust, greasy gas dirt and water drop.</li> <li>2. Whether there is foreign matter or dangerous matter placed nearby.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check with eyes and instrument.</li> <li>2. Visual check.</li> </ol>	<ol style="list-style-type: none"> <li>1. In compliance with technical norms.</li> <li>2. No such thing placed.</li> </ol>
Voltage	Whether the main circuit and control circuit are normal	Measurement with avometer or other instrument	In compliance with technical norms.
Keyboard display	<ol style="list-style-type: none"> <li>1. Whether display is clear</li> <li>2. Whether some character is missing.</li> <li>3. Whether the key is sensitive</li> </ol>	<ol style="list-style-type: none"> <li>1 and 2 are checked with eyes.</li> <li>3. Check with hand.</li> </ol>	<ol style="list-style-type: none"> <li>1. Readable, with no unreadable codes.</li> <li>2. Keys are sensitive.</li> </ol>

Common	<ol style="list-style-type: none"> <li>1. Whether bolts are loose or falling.</li> <li>2. Whether there is deformation, crack or damage with the elements and insulators.</li> <li>3. Whether there is dirt and dust adhering to the items.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fasten.</li> <li>2 and 3 are checked with eyes.</li> </ol>	<p>1, 2 and 3 are normal. Note: Color change of the copper bar does not indicate problem of the features.</p>
Conductor Conducting wire	<ol style="list-style-type: none"> <li>1. Whether there is smell or crack of the insulator due to overheating.</li> <li>2. Whether the wire is broken.</li> </ol>	<ol style="list-style-type: none"> <li>1 and 2 are checked with eyes.</li> </ol>	<p>1 and 2 are normal.</p>
Terminal block	Whether there is damage.	Visual check	Normal
Transformer	Whether there is abnormal shock or smell.	Visual and audible check	Normal
Cooling system Cooling fan	<ol style="list-style-type: none"> <li>1. Whether there is abnormal noise or shock.</li> <li>2. Whether the bolts are loose.</li> <li>3. Whether there is overheating.</li> </ol>	<ol style="list-style-type: none"> <li>1. Visual and audible check. Turn the blade to see if it is agile when the fan is turned off).</li> <li>2. Fasten.</li> <li>3. Visual check.</li> </ol>	<ol style="list-style-type: none"> <li>1. Smooth revolution.</li> <li>2 and 3 are normal.</li> </ol>



## TROUBLESHOOTING

 **WARNING**

Do not try to repair EPS. Wrong repair may result in electroshock or fire. If there is fault in the equipment, only specified qualified personnel can repair it or contact Renle's Engineering Dept. Before contacting for repair, perform the following check to save time and expenditures.

Fault description	Troubleshooting
When EPS is connected to commercial power the bypass contactor does not perform pick-up: directly turns to inversion work.	Phase failure of commercial power. The forced revolution switch is turned to manual mode or forced mode.
Inversion is normal without commercial power, no output: test the secondary side of transformer and find there is voltage output.	Coils of the inversion contactor or line is bitten by mice, or the 12V relay in the conversion damages.
Commercial power and Inversion is normal but output circuit breaker has no output.	The breaker is broken. Test with avometer whether on-off of the monopole of the circuit is normal.
Commercial power and Inversion is normal and output circuit breaker has output: user's load has no voltage or other abnormal circumstance.	Firstly determine whether the load circuit is in good condition, whether end switch is normal, whether the connectors of the load are loose or falling.
The display is flashing.	The user firstly check whether the data line is loose, which may result in bad contact. Secondly frequent open and closure of the door of the equipment may press the line and damage it.

<p>When EPS starts inversion work, overcurrent protection is shown.</p>	<p>This phenomenon is caused by the too large start current of user's load. It is possible to reduce the power for retest. If the load is fire fighting pump, it means the rotor becomes rusted and can not revolve because the motor has been left unused for long time. This arouses large current protection. In such case make the rotor revolve then start EPS.</p>
<p>During inversion work EPS is abruptly stopped by protection, which is shown as short circuit protection.</p>	<p>This phenomenon occurs during inversion. It shows short circuit resulted from arcing, which is produced by bad contact in the line of load side of EPS. Maybe the diameter of the line is so small that the line generates heat. The heat leads to falling of protective sleeve. The falling then arouses short circuit. Other causes of the load also can generate short circuit. Turn off the output switch of EPS to perform machine-start test so as to determine whether the problem comes from the equipment itself: If short circuit occurs due to sudden problem in the cable at the input side of commercial power, the EPS can be switched to emergency output.</p>
<p>No-load inversion is normal for EPS. Loaded running results in low DC voltage.</p>	<p>This phenomenon shows during charging the output line is loose or the input/output circuit breaker of the charger is tripping, or the charger fails: During the work of battery the voltage is below the setting protection and the battery is not charged in time. The equipment tests the battery pack's voltage as floating voltage. When the equipment starts working the battery voltage drops to protective voltage value and the equipment stops inversion work.</p>



## SERVICE REGULATIONS

### AFTERSALES SERVICE COMMITMENT

Renle takes it as its tenet to “think all about the customers and ensure them with good service”. We realized the quality target of 98% satisfaction rate from the customers. Renle makes the following commitment to the customers:

- The warranty period is 18 months.
- After the warranty period terminates, Renle offers lifetime service – we offer preferential price when only charging the cost of components, including replacement of elements.
- Renle offers lifetime consultation free of charge to help customer solve problem without delay.
- Renle offers immediate site service. In China, after receiving service information, Renle’s personnel will arrive at site (in Shanghai or neighboring area) in 3 hours plus the time en route, and at site (in other regions of China) in 24 hours plus the time en route. For the distant or difficultly accessible region in 48 hours plus the time en route.

### AFTERSALES SERVICE HOTLINE

Tel: 021-59967500 Fax: 021-59968969 Hotline:400-9202-119

### TO THE CUSTOMER

- Please pay attention to Renle’s brand during purchasing.
- Please read carefully the manual before application and keep it carefully for further reference.
- Before installation be sure to read the part “SAFETY NOTICE” in this manual.
- For longtime storage, please do not open the packing and place the equipment in dry and well-ventilated place.
- After installation and commissioning is finished and signing of acceptance report, the customer is requested to keep the Certificate of Quality and Warranty Card”, fill in the Receipt of Warranty Card and mail it or fax it to: CEAYEA Electrical & Technology (shanghai)Co., Ltd, Add: No. 811 Pingcheng Road, Jiading District, Shanghai Post code: 201808
- If you have any comments or suggestions to our service, please contact us with:National-wide toll free service hotline: 400-9202-119

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## TECHNICAL INDEX

Technical index of FEPS-RNE series EPS		
Input	Voltage	Single phase 220VAC $\pm$ 20%, Three phase 380VAC $\pm$ 20%
	Frequency	50Hz $\pm$ 10%
Output	Voltage	In normal circumstance: the same as the commercial power In the time of emergency: 220VAC $\pm$ 3%
	Frequency	In normal circumstance: the same as the commercial power In the time of emergency: 220VAC $\pm$ 0.5%
	Waveform	Sine wave (THD $\leq$ 3%)
	Output branch	3 channel (extendable)
	Type of output branch	Continuous, incontinuous, fire fighting linkage
	Type of battery	Airtight without adding water
	Nominal battery voltage	DC48V, DC96V, DC192V, DC324V (customized)
	Charging time	<48h
Conversion time		<5s (customized, <0.25s, <2.5s, 0ms)
Emergency standby time		Customized
Overload capacity		120%, 60s; 150%, 0.5s
Protection function		Overvoltage, undervoltage, overcurrent, overload, short circuit protection
Working environment	Relative humidity	10-90%
	Environment temperature	-20 $^{\circ}$ C - 40 $^{\circ}$ C
Applicable load		Applicable to different kinds of lighting load



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## MAINTENANCE RECORD

Maintenance time	Maintenance description	Maintenance personnel