

Industrial Online UPS 10-300KVA

# CNI310 & CNI330

Series



**CONSNANT**

Constant Electric Power

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



# CNI310 & CNI330 Series

## Industrial Online UPS

10-100KVA (3Ph in & 1Ph out) / 10-300KVA (3Ph in & 3Ph out)



Industrial Processes



Oil Industry



Gas Industry



Petrochemical Industry



Mining Industry



Power Station

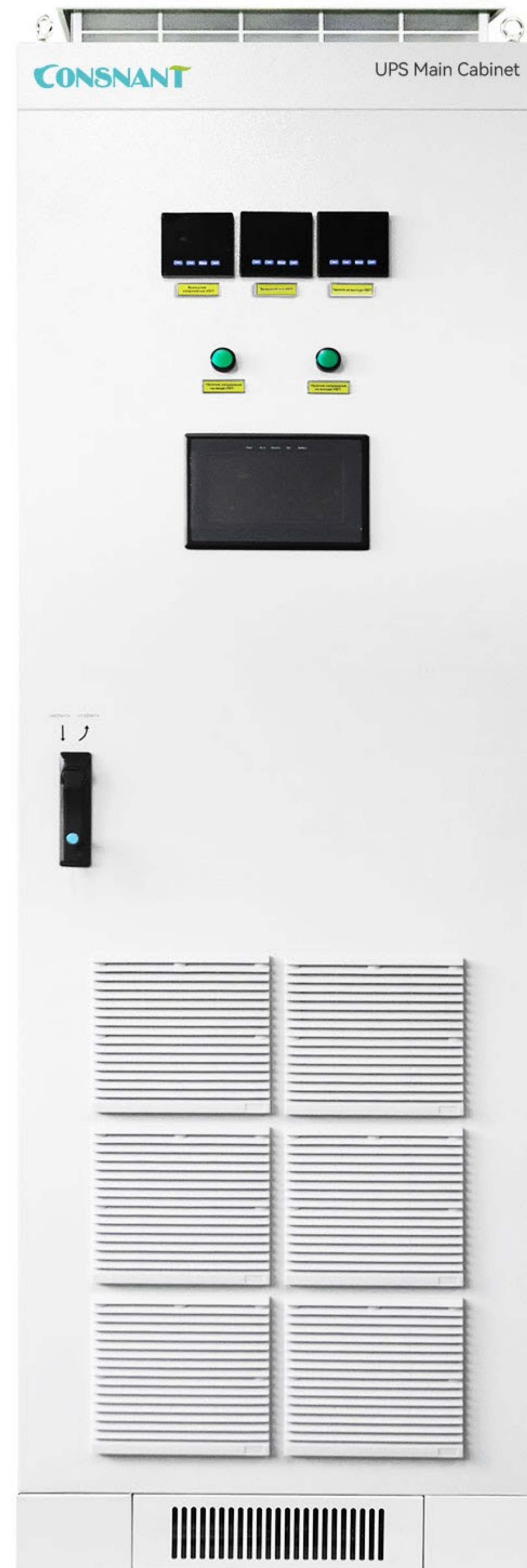
### Product Snapshot:

Capacity: 10-300KVA

Nominal Voltage: 380/400/415VAC

Nominal Frequency: 50/60Hz

Output Power Factor: 0.8



UPS Main Cabinet



Bypass Cabinet

CNI310/CNI330 series products ensure the continuous availability of uninterrupted power supply requirements in oil & gas, petrochemical, power generation, transportation and other heavy industries. The state-of-the-art, double-conversion topology, flexible and compact high-reliability industrial grade design, suitable for use in harsh environments.

### Typical Applications:

For all industrial applications

- Oil & Gas, Petrochemical (offshore, onshore, pipelines)
- Energy and Power (generation, transmission, distribution)
- Transportation (rail, airports, shipping, highways, tunnels)
- Water (desalination, treatment)
- All industrial production processes
- Instrumentation & Process control (chemicals, mining, steel, paper, emergency lighting)

## Key Features:

- Adopt full digital control technology.
- Intelligent detection and monitoring function.
- Digital control and static switch zero switching.
- Input/Output full isolation.
- Bypass isolation transformer and voltage stabilizer available.
- Multifunctional protections against overvoltage, low voltage, overcurrent, short circuit, and so on.
- Large touch screen LCD display with multi-language (English, Chinese, Russian, French...)
- Ultralong 256 event records, user-friendly analysis and management of the situation of power supply.
- Static bypass has a strong anti-overload capacity.

## Control System

Adopt microprocessor bus control technology and ensure the real-time control of rectifier, inverter, static switch, as well as coordination of each power part, characterized by increased control of aging, higher reliability, and improved efficiency of the entire UPS system.

## Static Switch:

Not sync automatically switch:

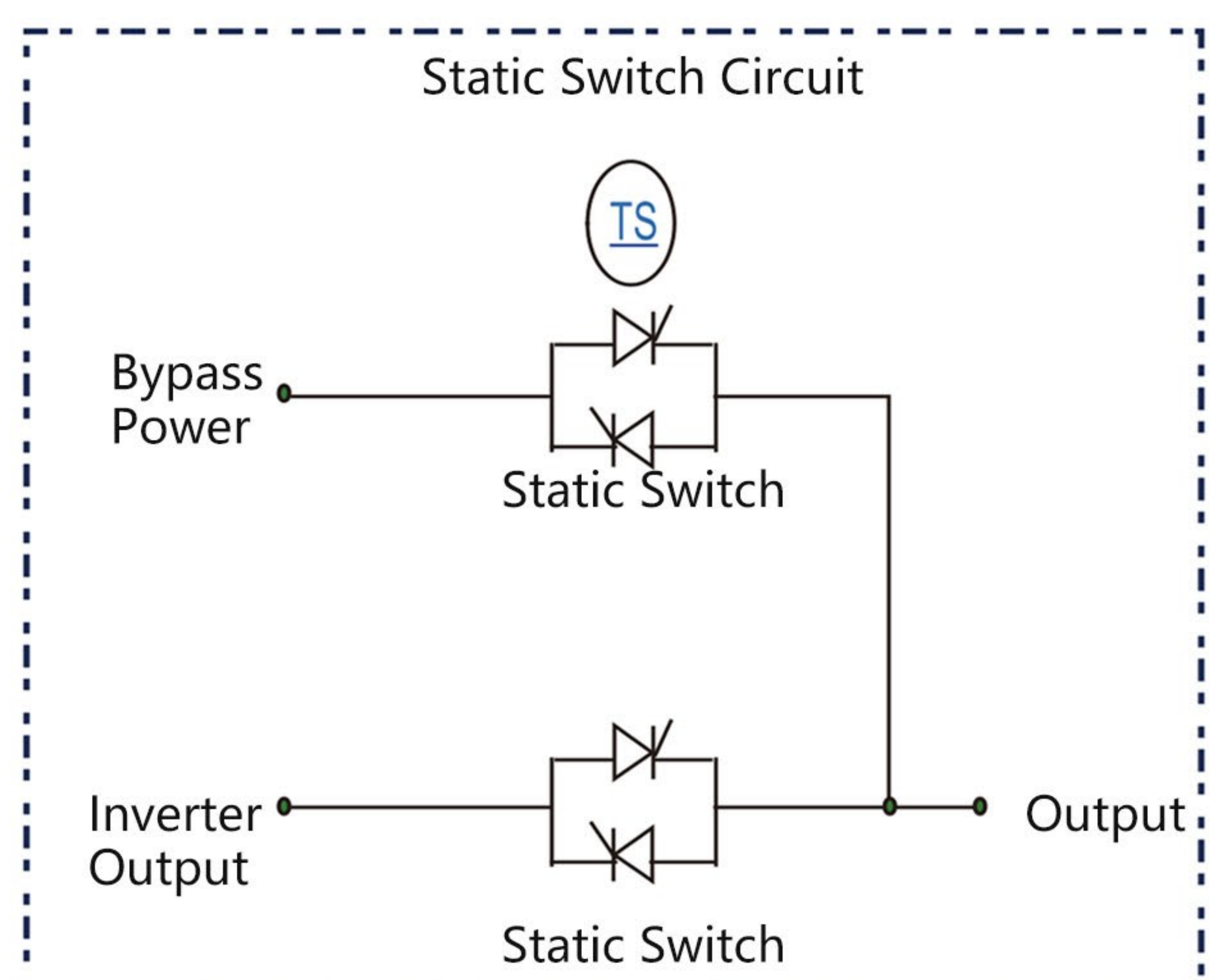
- When the bypass of UPS and inverter are not synchronized, the system can automatically implement not sync switch, which can ensure no power cutoff if the mains surge pulse width is  $<5\text{ms}$ .
- When the bypass exceeds the limit, UPS detects the bypass every 20ms, as long as the phase angle difference of bypass and inverter comes back to the normal range, not synchronized bypass switching can be realized.

## Inverter

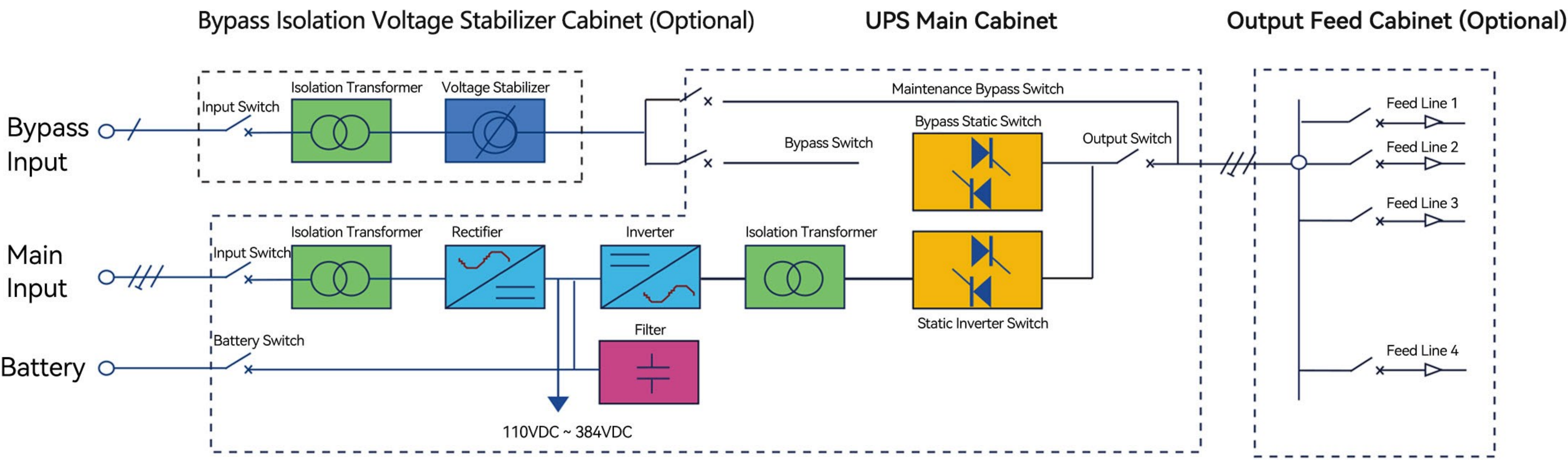
The SPWM (Sinusoidal Pulse Width Modulation) is a full bridge composed of six IGBT high-power transistors. Its function is to transform the DC voltage into standard sinusoidal AC voltage into AC 220V voltage required by the load through the special ( $\Delta/Y$ ) zero-phase-shift zigzag isolation transformer. In addition, the transformer can eliminate third harmonics reflected from non-linear loads such as computers. The control features the adoption of "slow-down gate voltage" protection technology, which greatly reduces the disturbance shutdown of the inverter (mutual conversion between the inverter and the static switch), improves the overload capacity of the entire UPS system, and the short-circuit resistance and anti-overload capacity are superior to the general UPS, especially the short-circuit resistance is unmatched by the general UPS.

## Rectifier

A fully controlled bridge rectifier composed of 6 pulses or 12 pulses (6 or 12 SGR). Its function is to rectify the input AC 380V to DC 405V or so. Its control features "slope" start, that is, the rectifier output voltage rises from 0V to 405V within 10 seconds without affecting the grid.

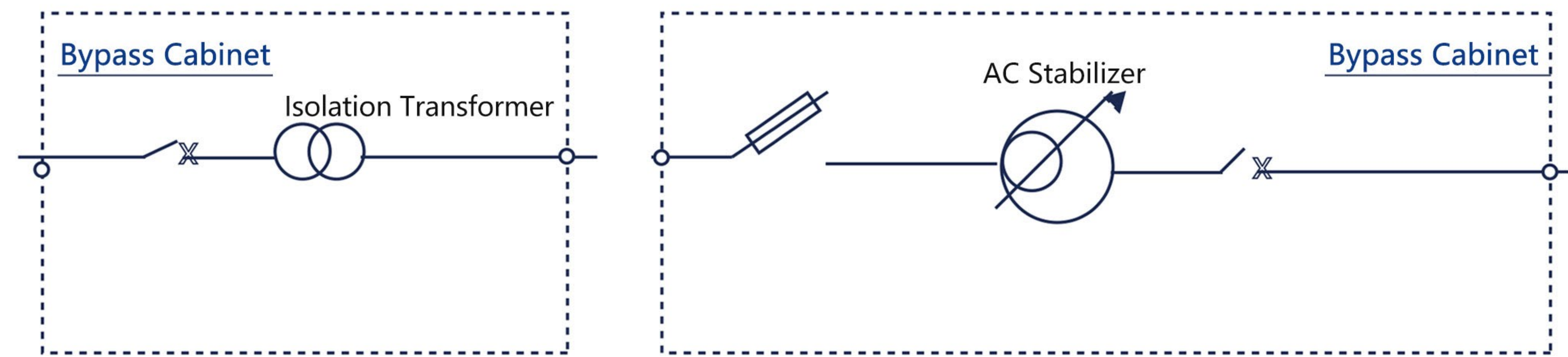


Principle Diagram



Optional Bypass Cabinet:

Isolation transformer and bypass voltage regulator



UPS Model List:

| Model  | Capacity     | Nominal Voltage     | Battery Voltage      | Power Factor | W x D x H (mm)      | Weight (KG)          |
|--------|--------------|---------------------|----------------------|--------------|---------------------|----------------------|
| CNI310 | 10KVA/8KW    | 380 / 400 / 415 VAC | 110 / 220 / 384 VDC  | 0.8          | 600x800x1900 (2050) | 327                  |
|        | 15KVA/12KW   |                     |                      |              |                     | 372                  |
|        | 20KVA/16KW   |                     |                      |              |                     | 418                  |
|        | 30KVA/24KW   |                     |                      |              |                     | 516                  |
|        | 40KVA/32KW   |                     |                      |              |                     | 620                  |
|        | 60KVA/48KW   |                     | 220 / 384 VDC        |              | 800x800x1900 (2050) | 720                  |
|        | 80KVA/64KW   |                     |                      |              |                     | 920                  |
|        | 100KVA/80KW  |                     |                      |              |                     | 1200x800x1900 (2050) |
| CNI330 | 10KVA/8KW    | 380 / 400 / 415 VAC | 110 / 220 / 384 VDC  | 0.8          | 600x800x1900 (2050) | 300                  |
|        | 15KVA/12KW   |                     |                      |              |                     | 410                  |
|        | 20KVA/16KW   |                     |                      |              |                     | 445                  |
|        | 30KVA/24KW   |                     |                      |              |                     | 536                  |
|        | 40KVA/32KW   |                     |                      |              |                     | 650                  |
|        | 60KVA/48KW   |                     | 220 / 384 VDC        |              | 800x800x1900 (2050) | 758                  |
|        | 80KVA/64KW   |                     |                      |              |                     | 952                  |
|        | 100KVA/80KW  |                     |                      |              | 1500x800x1900(2050) | 1100                 |
|        | 120KVA/96KW  |                     |                      |              |                     | 1200                 |
|        | 160KVA/128KW |                     |                      |              | 384 VDC             | 1600x800x1900 (2050) |
|        | 200KVA/160KW |                     | 1902                 |              |                     |                      |
|        | 300KVA/240KW |                     | 2000x850x1900 (2050) |              |                     | 2500                 |

( PF=0.9 can be for option )

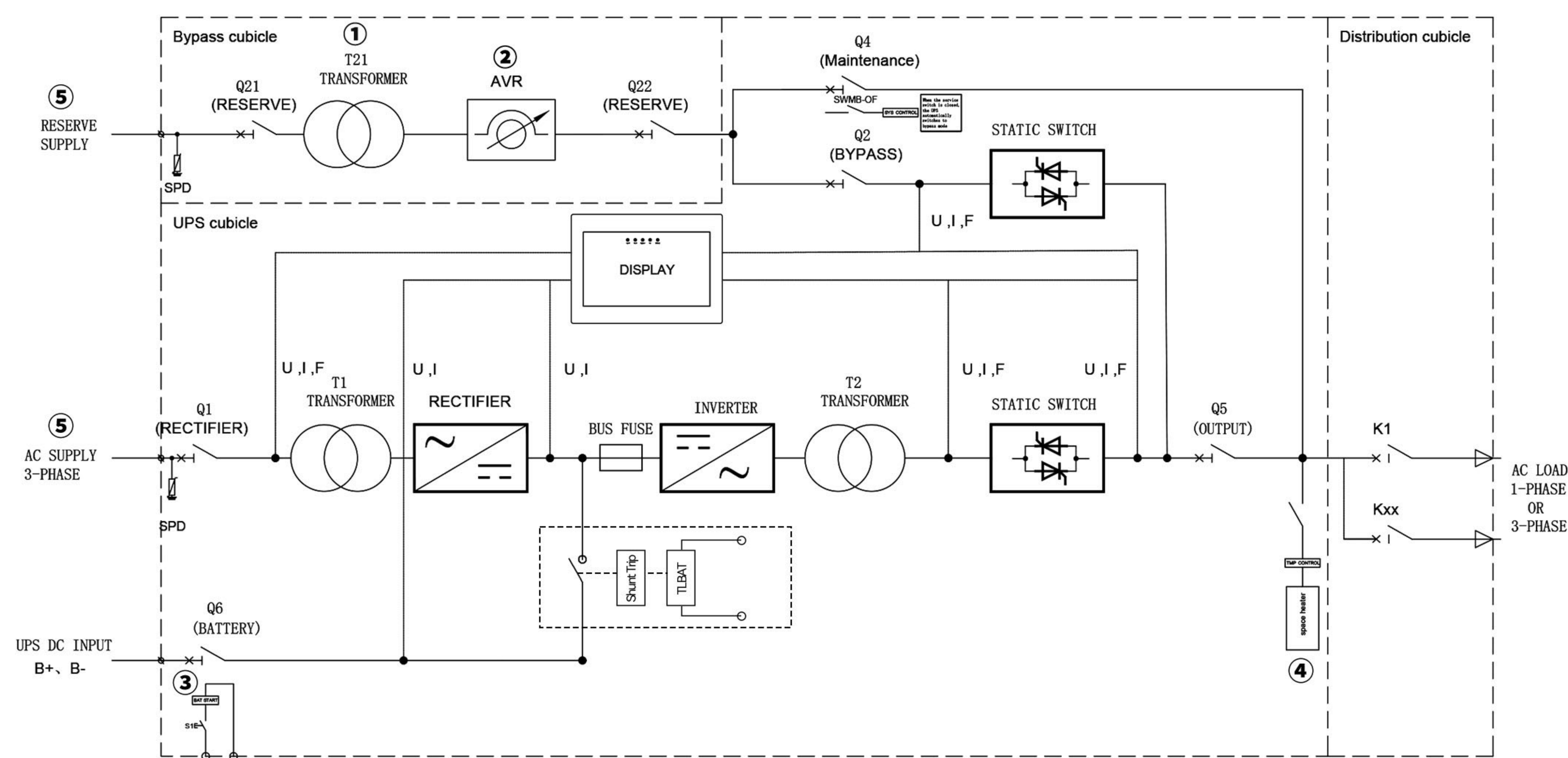
## CNI310 Series Technical Specifications

| CNI310 10-100KVA                             |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|----|-----|
| Rating (kVA)* @ P.F. 0.8 vs DC Rated Voltage |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |
| Nominal Power (kW)                           | 8                                                                                                                                                                                                                                                                                     | 12 | 16 | 24 | 32 | 40 | 48 | 64 | 80  |
| 110Vdc                                       | 10                                                                                                                                                                                                                                                                                    | 15 | 20 | 30 | -  | -  | -  | -  | -   |
| 220Vdc                                       | 10                                                                                                                                                                                                                                                                                    | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
| 384Vdc                                       | 10                                                                                                                                                                                                                                                                                    | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 |
| Input                                        |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |
| Input Voltage                                | 380/400/415 Vac 3Phase±20%, 50/60Hz±10%                                                                                                                                                                                                                                               |    |    |    |    |    |    |    |     |
| Power Factor                                 | Up to 0.95, if increase harmonic filter can reach to 0.99                                                                                                                                                                                                                             |    |    |    |    |    |    |    |     |
| Input THDi                                   | <10% @ rated load, if increase harmonic filter can <5%                                                                                                                                                                                                                                |    |    |    |    |    |    |    |     |
| Bypass Input Voltage                         | 220/230/240 Vac 1Phase±25%, 50/60Hz±15%                                                                                                                                                                                                                                               |    |    |    |    |    |    |    |     |
| Battery                                      |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |
| DC Voltage                                   | 110/220/384VDC (Optional)                                                                                                                                                                                                                                                             |    |    |    |    |    |    |    |     |
| Battery Type                                 | Lead-acid,Ni-cd or Li-Ion                                                                                                                                                                                                                                                             |    |    |    |    |    |    |    |     |
| Output                                       |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |
| Nominal Voltage                              | 220/230/240 Vac single phase                                                                                                                                                                                                                                                          |    |    |    |    |    |    |    |     |
| Frequency                                    | 50/60Hz (Adaptive),±0.05% Hz synchronization, ±2Hz asynchronous                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |
| Voltage Regulation                           | ±1% static; ±5% dynamic; 80% load change, <10 ms recovery                                                                                                                                                                                                                             |    |    |    |    |    |    |    |     |
| Overload Capacity                            | 125% for 10 min; 150% for 1 min; 200% for 100ms                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |
| Harmonic Distortion THDv                     | <2% linear load; <5% non-linear load                                                                                                                                                                                                                                                  |    |    |    |    |    |    |    |     |
| System                                       |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |
| Cooling                                      | Forced ventilation and redundant fans                                                                                                                                                                                                                                                 |    |    |    |    |    |    |    |     |
| Color                                        | RAL 7035 (standard), other optional                                                                                                                                                                                                                                                   |    |    |    |    |    |    |    |     |
| Protection Degree                            | IP42(standard), other optional                                                                                                                                                                                                                                                        |    |    |    |    |    |    |    |     |
| Environmental                                |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |
| Operating Temperature                        | -10°C to 40°C (up to 55°C with de-rating) / Storage: -20°C to 70°C                                                                                                                                                                                                                    |    |    |    |    |    |    |    |     |
| Altitude                                     | <1000m (For places higher than 1000 meters, the output will be -1% of the nominal value for every 100 meters higher)                                                                                                                                                                  |    |    |    |    |    |    |    |     |
| Audible Noise at 1 Meter (dBA)               | 65 to 75 (Depending on rating and options)                                                                                                                                                                                                                                            |    |    |    |    |    |    |    |     |
| User Interface                               |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |
| Front Panel                                  | Graphic display, minic LED panel, Running indicator, EPO optional                                                                                                                                                                                                                     |    |    |    |    |    |    |    |     |
| Connectivity                                 | Includes alarm relay card and RS485 interface                                                                                                                                                                                                                                         |    |    |    |    |    |    |    |     |
| Standards                                    | Quality assurance, environment, health and safety: ISO 9001:2008, ISO 14001:2004, BS OHSAS 18001:2007; Safety: IEC EN 62040-1; EMC: IEC EN 62040-2; Environmental aspects: IEC EN 62040-4; Test and performance: IEC EN 62040-3 VFI-SS-111; Protection degree: IEC 60529; Marking: CE |    |    |    |    |    |    |    |     |

## CNI330 Series Technical Specifications

| CNI330 10-300KVA                             |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |     |     |     |     |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|
| Rating (kVA)* @ P.F. 0.8 vs DC Rated Voltage |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |     |     |     |     |
| Nominal Power (kW)                           | 8                                                                                                                                                                                                                                                                                     | 12 | 16 | 24 | 32 | 40 | 48 | 64 | 80  | 96  | 128 | 160 | 240 |
| 110Vdc                                       | 10                                                                                                                                                                                                                                                                                    | 15 | 20 | 30 | -  | -  | -  | -  | -   | -   | -   | -   | -   |
| 220Vdc                                       | 10                                                                                                                                                                                                                                                                                    | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 | 120 | -   | -   | -   |
| 384Vdc                                       | 10                                                                                                                                                                                                                                                                                    | 15 | 20 | 30 | 40 | 50 | 60 | 80 | 100 | 120 | 160 | 200 | 300 |
| Input                                        |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |     |     |     |     |
| Input Voltage                                | 380/400/415 Vac 3Phase±20%, 50/60Hz±10%                                                                                                                                                                                                                                               |    |    |    |    |    |    |    |     |     |     |     |     |
| Power Factor                                 | Up to 0.95, if increase harmonic filter can reach to 0.99                                                                                                                                                                                                                             |    |    |    |    |    |    |    |     |     |     |     |     |
| Input THDi                                   | <10% @ rated load, if increase harmonic filter can <5%                                                                                                                                                                                                                                |    |    |    |    |    |    |    |     |     |     |     |     |
| Bypass Input Voltage                         | 380/400/415 Vac 3Phase±25%, 50/60Hz±15%                                                                                                                                                                                                                                               |    |    |    |    |    |    |    |     |     |     |     |     |
| Battery                                      |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |     |     |     |     |
| DC Voltage                                   | 110/220/384VDC (Optional)                                                                                                                                                                                                                                                             |    |    |    |    |    |    |    |     |     |     |     |     |
| Battery Type                                 | Lead-acid,Ni-cd or Li-Ion                                                                                                                                                                                                                                                             |    |    |    |    |    |    |    |     |     |     |     |     |
| Output                                       |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |     |     |     |     |
| Nominal Voltage                              | 380/400/415 Vac 3-phase                                                                                                                                                                                                                                                               |    |    |    |    |    |    |    |     |     |     |     |     |
| Frequency                                    | 50/60Hz (Adaptive), ±0.05% Hz synchronization, ±2Hz asynchronous                                                                                                                                                                                                                      |    |    |    |    |    |    |    |     |     |     |     |     |
| Voltage Regulation                           | ±1% static; ±5% dynamic; 8% load change, <10 ms recovery                                                                                                                                                                                                                              |    |    |    |    |    |    |    |     |     |     |     |     |
| Overload Capacity                            | 125% for 10 min; 150% for 1 min; 200% for 100ms                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |     |     |     |     |
| Harmonic Distortion THDv                     | <2% linear load; <5% non-linear load                                                                                                                                                                                                                                                  |    |    |    |    |    |    |    |     |     |     |     |     |
| System                                       |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |     |     |     |     |
| Cooling                                      | Forced ventilation and redundant fans                                                                                                                                                                                                                                                 |    |    |    |    |    |    |    |     |     |     |     |     |
| Color                                        | RAL 7035 (standard), other optional                                                                                                                                                                                                                                                   |    |    |    |    |    |    |    |     |     |     |     |     |
| Protection Degree                            | IP42 (standard), other optional                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |     |     |     |     |
| Environmental                                |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |     |     |     |     |
| Operating Temperature                        | -10°C to 40°C (up to 55°C with de-rating) / Storage: -20°C to 70°C                                                                                                                                                                                                                    |    |    |    |    |    |    |    |     |     |     |     |     |
| Altitude                                     | <1000m (For places higher than 1000 meters, the output will be -1% of the nominal value for every 100 meters higher)                                                                                                                                                                  |    |    |    |    |    |    |    |     |     |     |     |     |
| Audible Noise at 1 Meter (dBA)               | 65 to 75 (Depending on rating and options)                                                                                                                                                                                                                                            |    |    |    |    |    |    |    |     |     |     |     |     |
| User Interface                               |                                                                                                                                                                                                                                                                                       |    |    |    |    |    |    |    |     |     |     |     |     |
| Front Panel                                  | Graphic display, minic LED panel, Running indicator, EPO optional                                                                                                                                                                                                                     |    |    |    |    |    |    |    |     |     |     |     |     |
| Connectivity                                 | Includes alarm relay card and RS485 interface                                                                                                                                                                                                                                         |    |    |    |    |    |    |    |     |     |     |     |     |
| Standards                                    | Quality assurance, environment, health and safety: ISO 9001:2008, ISO 14001:2004, BS OHSAS 18001:2007; Safety: IEC EN 62040-1; EMC: IEC EN 62040-2; Environmental aspects: IEC EN 62040-4; Test and performance: IEC EN 62040-3 VFI-SS-111; Protection degree: IEC 60529; Marking: CE |    |    |    |    |    |    |    |     |     |     |     |     |

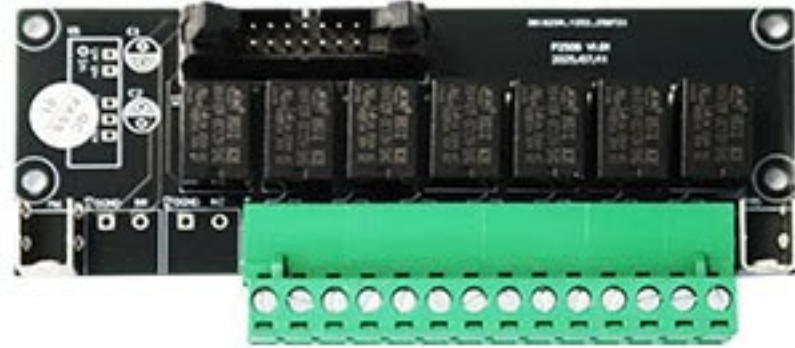
Main Electrical Options:



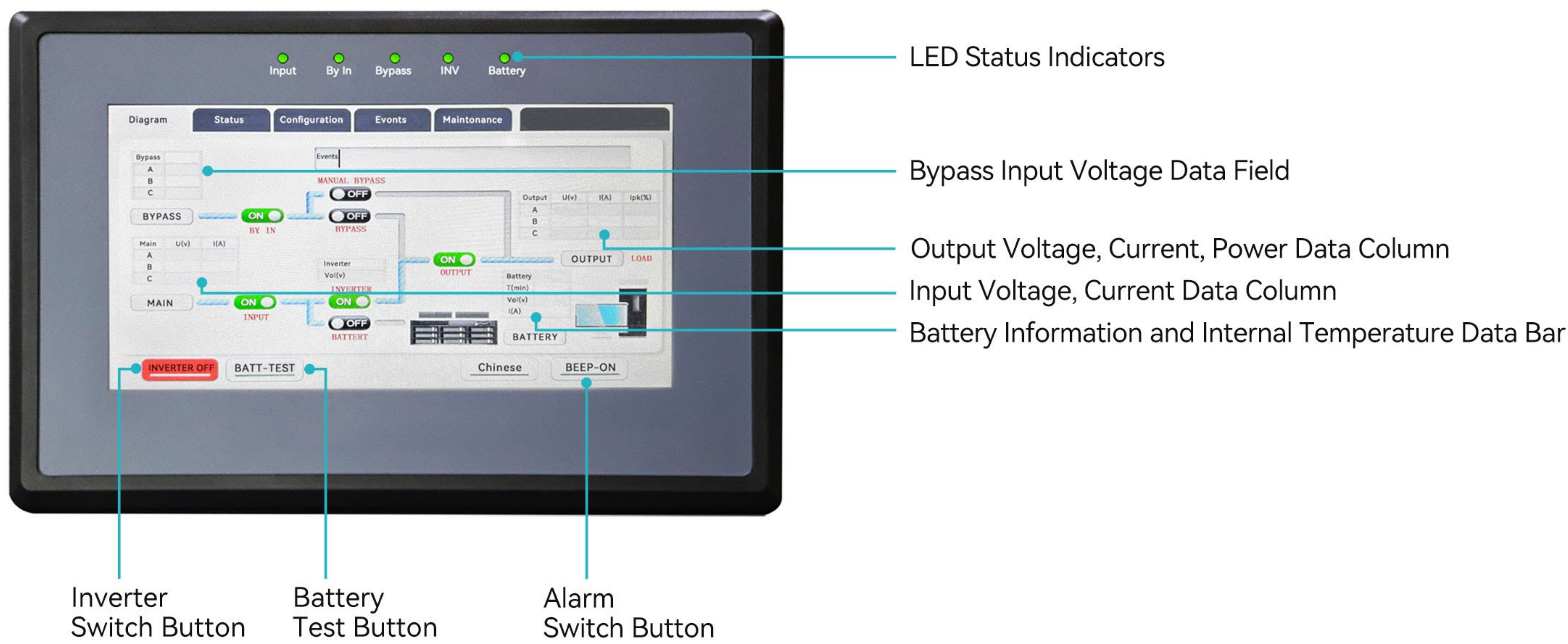
| No. | Option Item                | Item Name                    | Function Description                                                                                                                                                                                   |
|-----|----------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | T21                        | Bypass Isolation Transformer | Realize the isolation between the ups output and the power grid, insulation class H.                                                                                                                   |
| ②   | AVR                        | Bypass Stabilizer            | Electronic/electromechanical automatic voltage regulator to ensure the UPS reserve circuit voltage stability                                                                                           |
| ③   | Bat Start                  | Battery Black Start          | In case of mains power failure, the inverter can be started through the battery start button.                                                                                                          |
| ④   | Space Heater               | Internal Space Heater        | Space heater to prevent condensation of internal components                                                                                                                                            |
| ⑤   | Special Input Voltage      | Special Input Voltage        | Optional three-phase input voltage: 208/220/230/380/400/415/440/460/480/525/660/690V. Note: this option will affect the overall system size and technical information                                  |
| ⑥   | Parallel                   | Parallel Function            | Supports up to 6 ups for reliable parallel operation and shared battery pack mode                                                                                                                      |
| ⑦   | Input Harmonic Filter      | Input Harmonic Filter        | Input harmonic filter, input power factor up to 0.99                                                                                                                                                   |
| ⑧   | SNMP Card                  | SNMP Card                    | Web page remote monitoring, multiple UPS systems can be centralized monitoring                                                                                                                         |
| ⑨   | Protocols                  | Protocols                    | Modbus TCP, Profinet , IEC61850                                                                                                                                                                        |
| ⑩   | Analogue Meters            | Analogue Meters              | Meter size is 72x72. Standard : output voltage meter, output current meter, output frequency meter. Optional : input voltage meter, input current meter, battery voltage meter, battery current meter. |
| ⑪   | Special Enclosure Painting | Special Enclosure Painting   | Standard color RAL 7035, other color can be customized.                                                                                                                                                |
| ⑫   | Dry Contact                | Dry Contact Signal           | 14 programmable output dry contact signals, 2 input dry contact signals. Each dry contact function is compatible with 32 configurable alarm information.                                               |

(The options listed above are non-exhaustive. If other special requirements, please consult us.)

Option Item

| NO. | ITEM NAME                    | REFERENCE PHOTO                                                                       |
|-----|------------------------------|---------------------------------------------------------------------------------------|
| ①   | Bypass Isolation Transformer |    |
| ②   | Bypass Stabilizer            |    |
| ④   | Internal Space Heater        |  |
| ⑦   | Input Harmonic Filter        |  |
| ⑧   | SNMP Card                    |  |
| ⑩   | Analogue Meters              |  |
| ⑫   | Dry Contact Signal           |  |

7 inch LCD Touch Screen Introduction



Benefits:

The button **INVERTER ON** or the button **INVERTER OFF** can easily turn on or off the inverter though the screen. This operation can be easily and fastly to realize the switch between inverter mode and bypass mode.



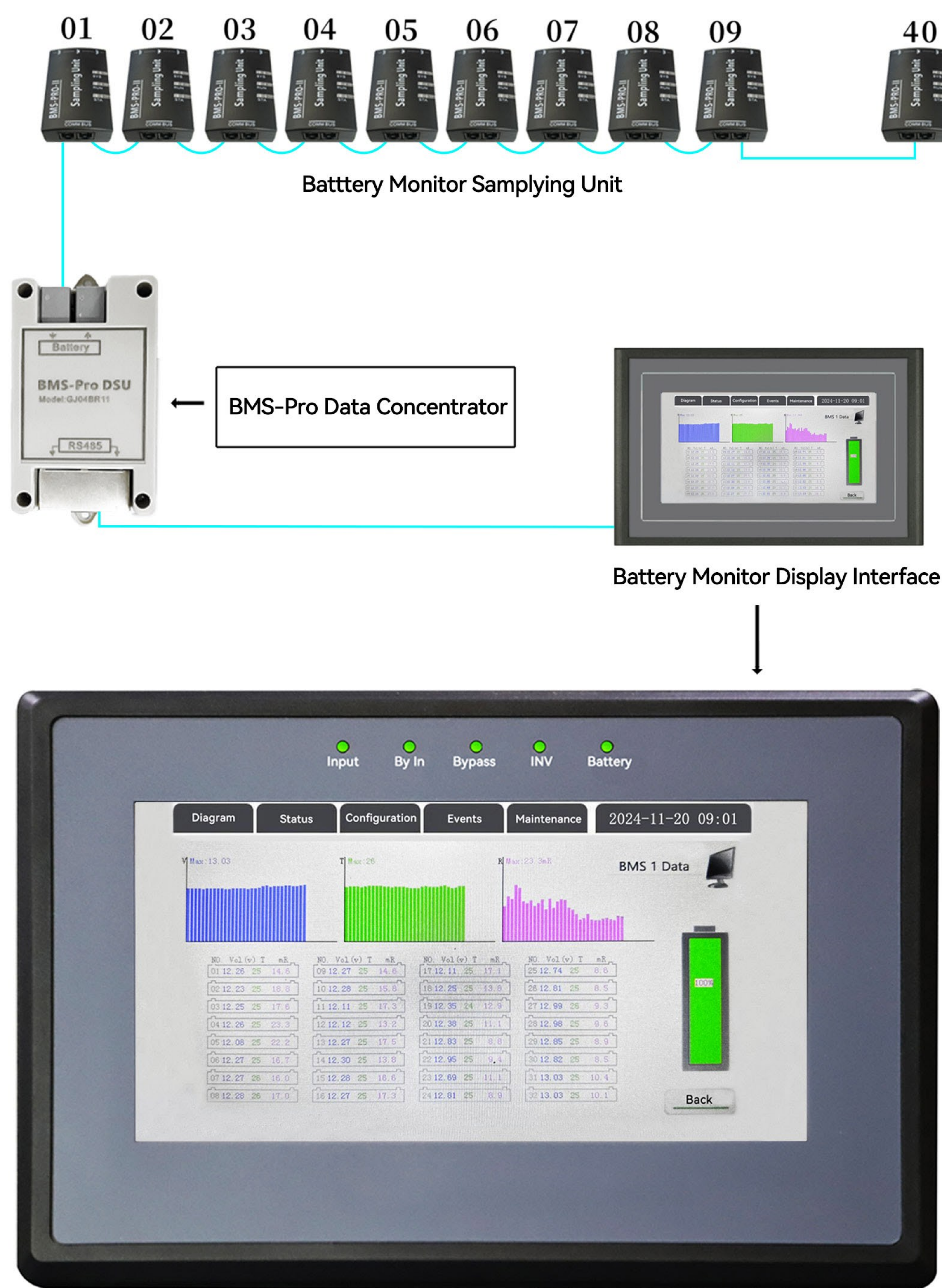
Benefits:

The button **BATT-TEST** can be one-click operation to perform battery testing, to check the battery status and current capacity.

Click the battery test button, the device will try to discharge the battery to run, the test time is 30s, when the battery is abnormal, the battery indicator will change to flashing state.

At the same time, the current status record bar prompts: battery or battery switch is abnormal.

# Battery Monitor



## Benefits:

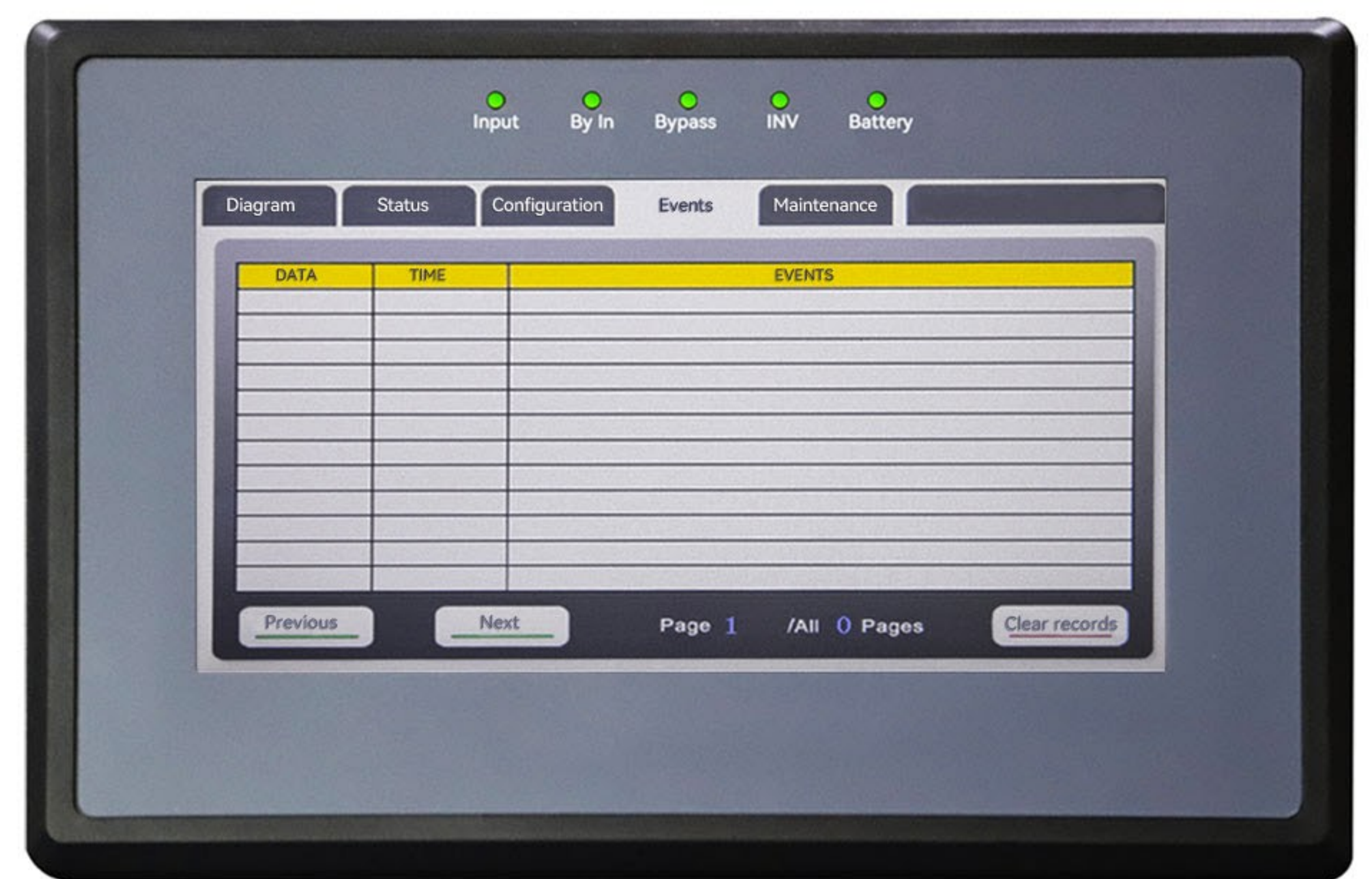
The battery monitor can detect single battery voltage, temperature, internal resistance and display parameters on the 7-inch UPS's LCD. The Maximum monitored battery cell number can reach to 40pcs.

## Battery Charge Temperature Compensation Function

With battery monitor or temperature and humidity sensor, UPS can collect batteries's information, by adjusting the charging voltage to implement battery charge temperature compensation.



"Status" interface can displays the real-time operating status of the system, load, bypass, rectifier, inverter, alarm. It can provide more than 100 kinds of alarm, so that the fault can be found quickly.



"Events" interface can provide 256 history records. It can provide rich diagnostic data for the maintenance.

## Structure Design Advantage:

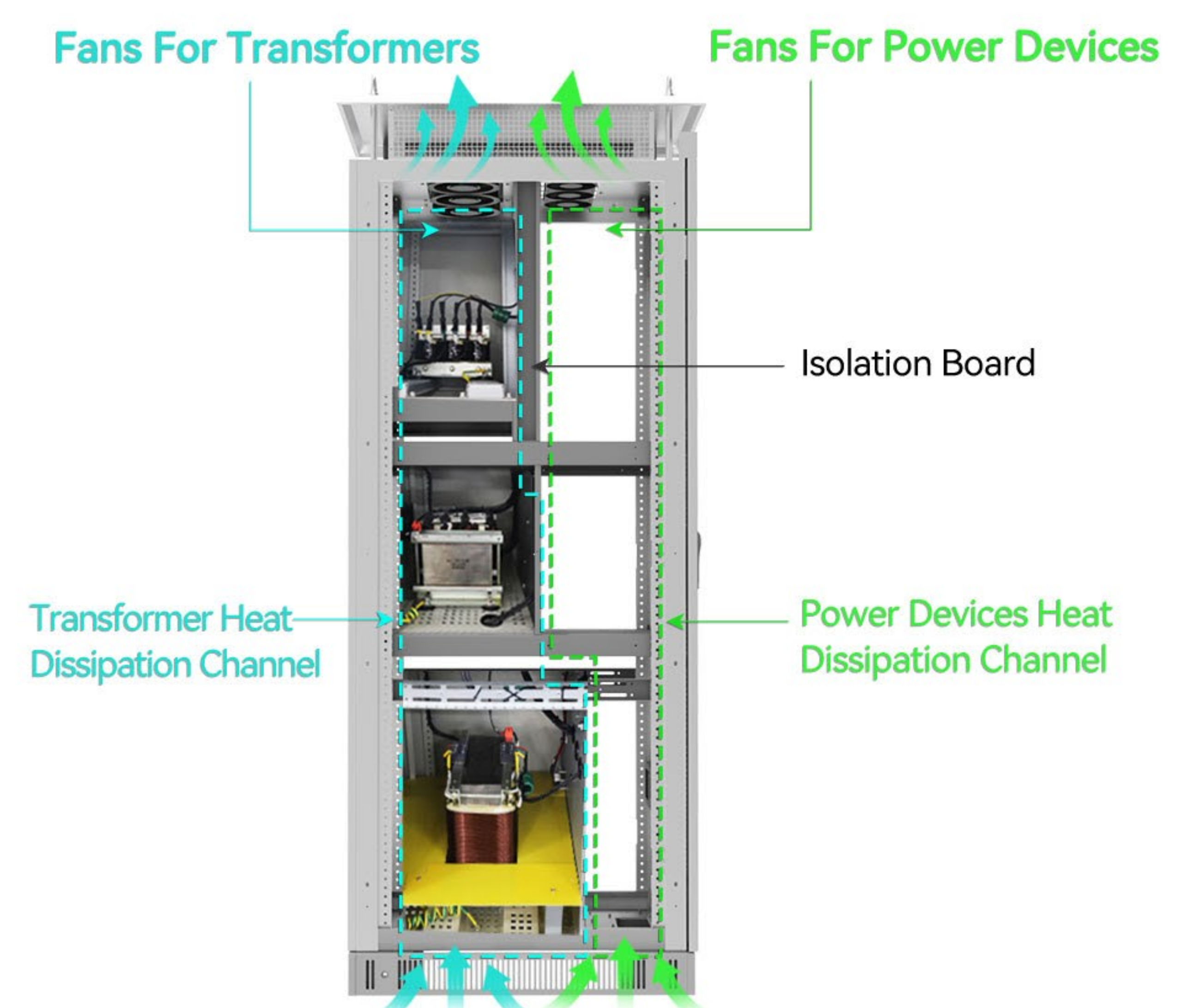
### 1) 10-80KVA STRUCTURE



### 2) 100-300KVA STRUCTURE

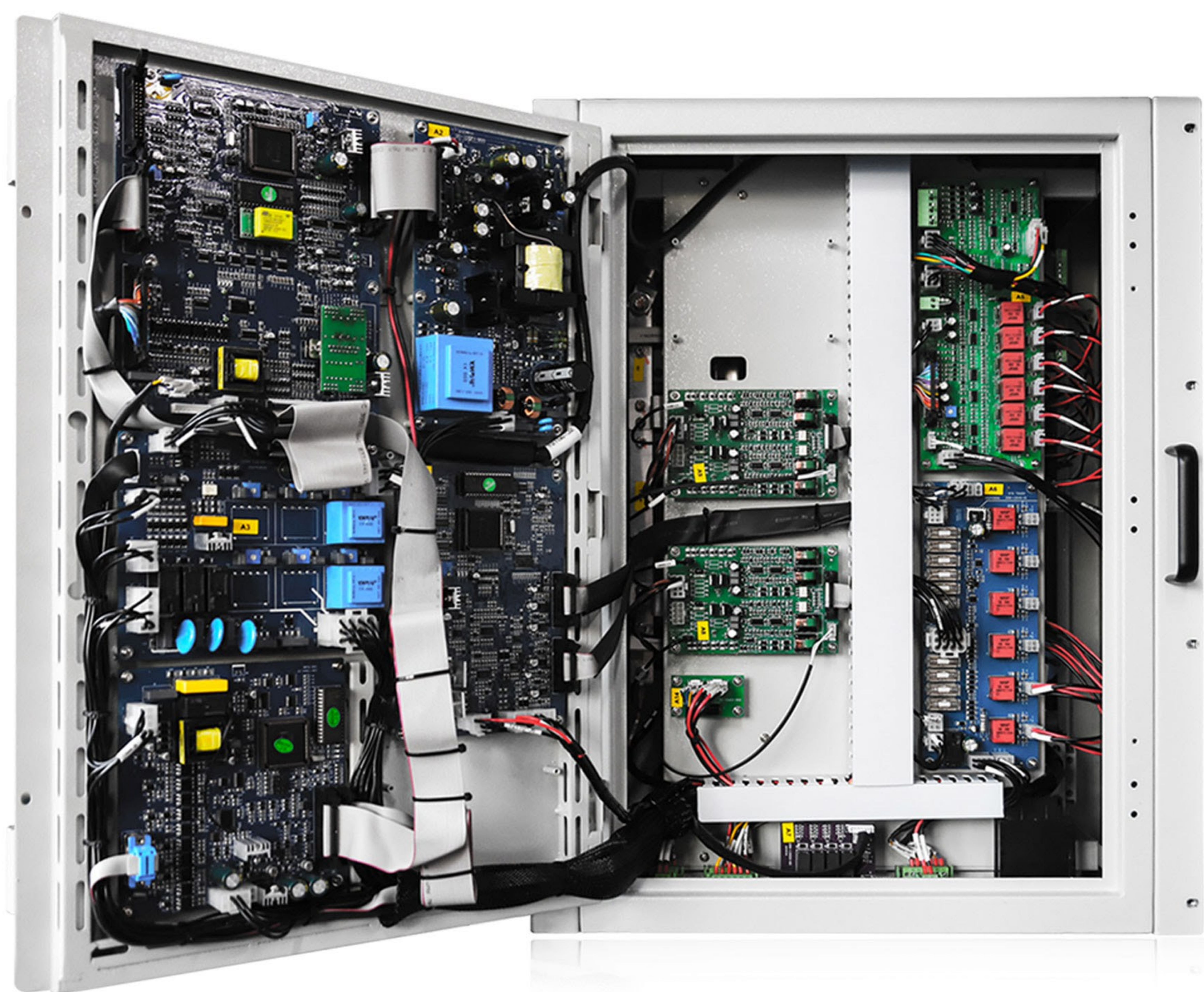


### 3) HEAT DISSIPATION STRUCTURE



- Front maintenance and top-cooling design, can be installed against a wall, save space.
- Better heat dissipation effect: transformer heat dissipation channel and power device heat dissipation channel are isolated.
- Fan redundancy design and fan faulty intelligent alarm, more safety.
- 10-80KVA adpot modular design is easy installing, disassembling, quick fault diagnosis and easy replacement.

## Power Module Structure



Power Module CNIR310/330

### Consist of the power module

|     |                                  |
|-----|----------------------------------|
| A1  | System control (SYS)             |
| A2  | Auxiliary power supply (SPS)     |
| A3  | Signal interface board (SENSING) |
| A4  | Inverter control board (INV)     |
| A5  | IGBT drive-1                     |
| A6  | IGBT drive-2                     |
| A7  | Rectifier control board (REC1)   |
| A8  | Rectifier control board (REC2)   |
| A9  | Static switch driver board (STS) |
| A10 | Adapter board                    |
| A11 | Dry contact board (DRY)          |

# IP20/IP30 Electricity Special Industrial UPS (10-100KVA)

Compatible with DC Power System

## Power Module (CNDR)



## Main UPS Structure:

- |                                                                              |                          |
|------------------------------------------------------------------------------|--------------------------|
| Input Isolation Transformer ⑩<br>(it is behind the power distribution panel) | Output Voltmeter ①       |
| Battery Switch ⑪                                                             | Output Ammeter ②         |
| Input Switch ⑫                                                               | Output Frequency Meter ③ |
| Bypass Switch ⑬                                                              | Input Indicator ④        |
| Output Switch ⑭                                                              | Output Indicator ⑤       |
| Maintenance Switch ⑮                                                         | Power Module ⑥           |
| SPD ⑯                                                                        | Cooling Fan ⑦            |
| Input / Output Terminal Block ⑰                                              | Output Transformer ⑧     |
|                                                                              | Shunt Reactor ⑨          |



10KVA

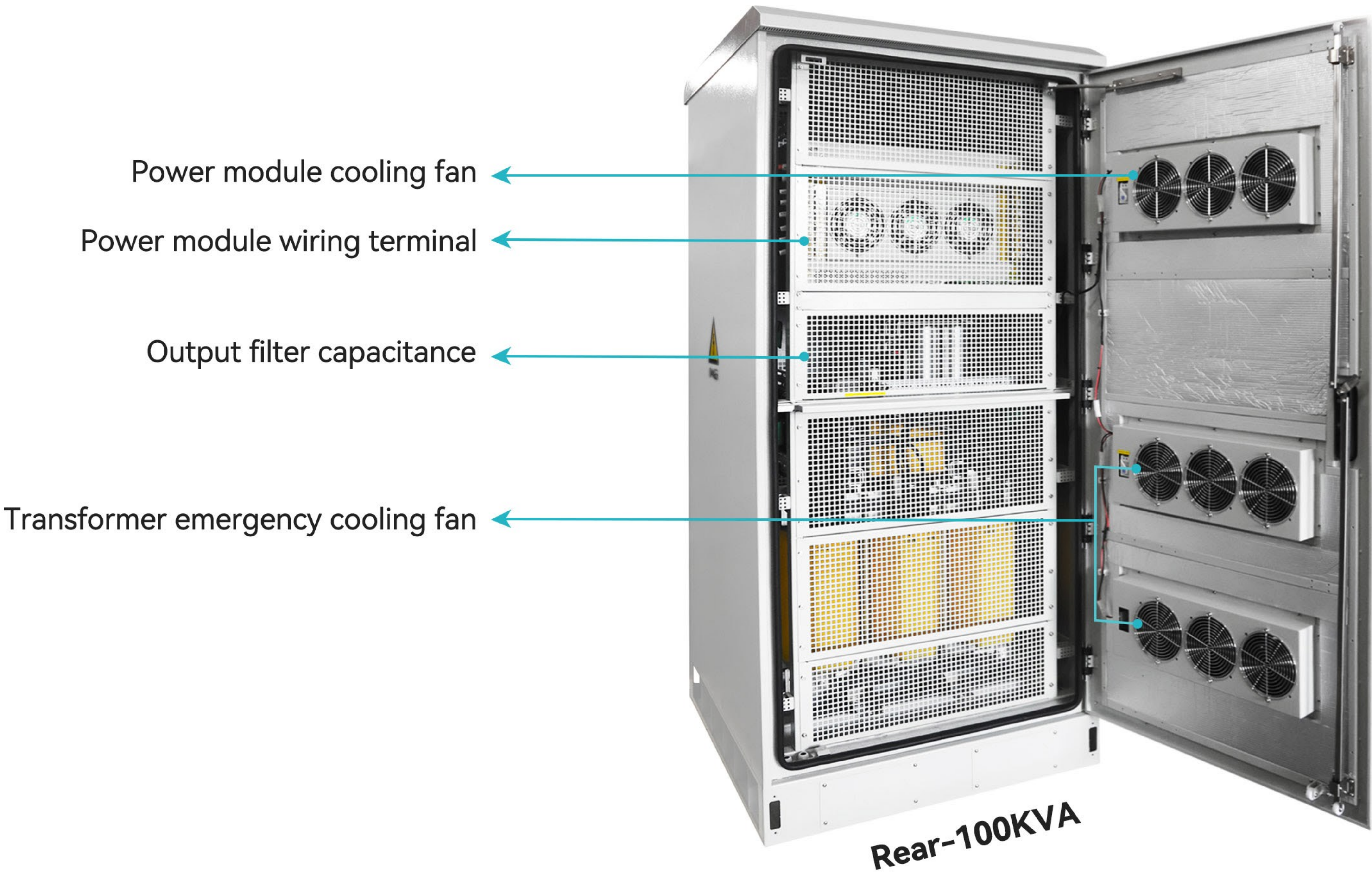
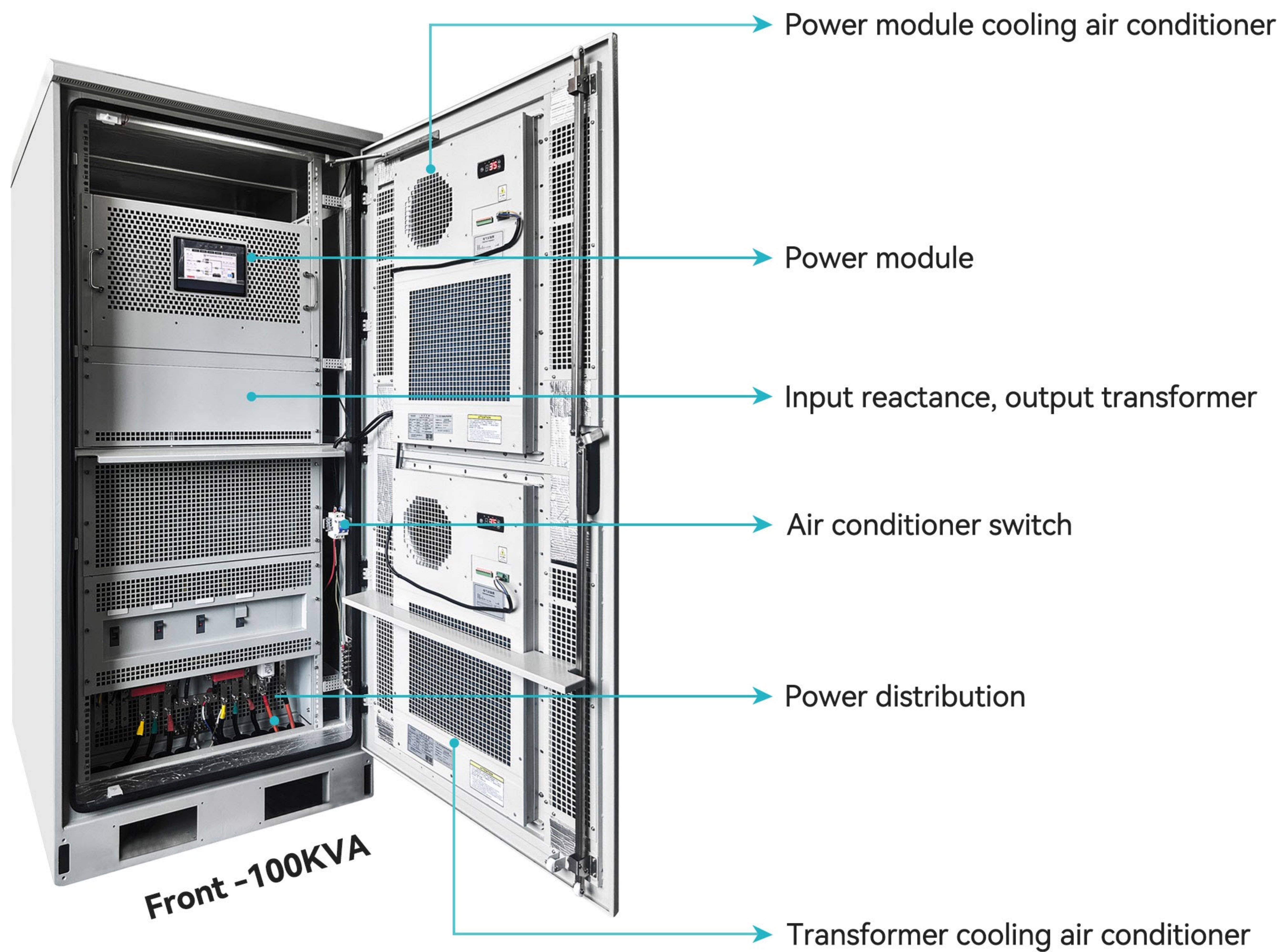


100KVA

## Bypass Cabinet Structure

- |                           |                                |
|---------------------------|--------------------------------|
| ① Feeder Voltmeter        | ⑨ Bypass Output Switch         |
| ② Feeder Ammeter          | ⑩ Feeder Loop                  |
| ③ Feeder Frequency Meter  | ⑪ Feeder Loop                  |
| ④ Bypass Input Voltmeter  | ⑫ Feeder Loop                  |
| ⑤ Bypass Output Voltmeter | ⑬ Bypass Voltage Regulator     |
| ⑥ Input Indicator Light   | ⑭ Feeder Master Switch         |
| ⑦ Output Indicator Light  | ⑮ Bypass Isolation Transformer |
| ⑧ Bypass Input Switch     |                                |

IP55/IP56 Outdoor Industrial UPS (10-100KVA)



# Application



# Application





**SHENZHEN CONSANT TECHNOLOGY CO., LTD.**

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