Gutor PXC

10–80 kVA

Operation

10/2018

www.schneider-electric.com

Schneider Electric

Legal Information

Table of Contents

Important Safety Instructions — SAVE THESE INSTRUCTIONS

Read these instructions carefully and look at the equipment to become familiar with it before trying to install, operate, service or maintain it. The following safety messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a “Danger” or “Warning” safety message indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages with this symbol to avoid possible injury or death.

⚠DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this type of safety message.

Failure to follow these instructions can result in equipment damage.

Please Note

Electrical equipment should only be installed, operated, serviced, and maintained by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Electromagnetic Compatibility

NOTICE

RISK OF ELECTROMAGNETIC DISTURBANCE

This is a product Category C3 according to IEC 62040-2. This is a product for commercial and industrial applications in the second environment - installation restrictions or additional measures may be needed to prevent disturbances. The second environment includes all commercial, light industry, and industrial locations other than residential, commercial, and light industrial premises directly connected without intermediate transformer to a public low-voltage mains supply. The installation and cabling must follow the electromagnetic compatibility rules, e.g.:

- the segregation of cables,
- the use of shielded or special cables when relevant,
- the use of grounded metallic cable tray and supports.

Failure to follow these instructions can result in equipment damage.

Safety Precautions

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

All safety instructions in this document must be read, understood and followed.

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Read all instructions in the Installation Manual before installing or working on this UPS system.

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not install the UPS system until all construction work has been completed and the installation room has been cleaned.

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- The product must be installed according to the specifications and requirements as defined by Schneider Electric. It concerns in particular the external and internal protections (upstream breakers, battery breakers, cabling, etc.) and environmental requirements. No responsibility is assumed by Schneider Electric if these requirements are not respected.
- After the UPS system has been electrically wired, do not start up the system. Start-up must only be performed by Schneider Electric.

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The UPS system must be installed according to local and national regulations. Install the UPS according to:

- IEC 60364 (including 60364–4–41- protection against electric shock, 60364–4–42 - protection against thermal effect, and 60364–4–43 - protection against overcurrent), **or**
- NEC NFPA 70, **or**
- Canadian Electrical Code (C22.1, Part 1)

depending on which one of the standards apply in your local area.

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Install the UPS system in a temperature controlled indoor environment free of conductive contaminants and humidity.
- Install the UPS system on a non-flammable, level and solid surface (e.g. concrete) that can support the weight of the system.

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The UPS is not designed for and must therefore not be installed in the following unusual operating environments:

- Damaging fumes
- Explosive mixtures of dust or gases, corrosive gases, or conductive or radiant heat from other sources
- Moisture, abrasive dust, steam or in an excessively damp environment
- Fungus, insects, vermin
- Salt-laden air or contaminated cooling refrigerant
- Pollution degree higher than 2 according to IEC 60664-1
- Exposure to abnormal vibrations, shocks, and tilting
- Exposure to direct sunlight, heat sources, or strong electromagnetic fields

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not drill or cut holes for cables or conduits with the gland plates installed and do not drill or cut holes in close proximity to the UPS.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

HAZARD OF ARC FLASH

Do not make mechanical changes to the product (including removal of cabinet parts or drilling/cutting of holes) that are not described in the Installation Manual.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTICE

RISK OF OVERHEATING

Respect the space requirements around the UPS system and do not cover the product's ventilation openings when the UPS system is in operation.

Failure to follow these instructions can result in equipment damage.

NOTICE

RISK OF EQUIPMENT DAMAGE

Do not connect the UPS output to regenerative load systems including photovoltaic systems and speed drives.

Failure to follow these instructions can result in equipment damage.

Electrical Safety

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Electrical equipment must be installed, operated, serviced, and maintained only by qualified personnel.
- The UPS system must be installed in a room with restricted access (qualified personnel only).
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.
- Turn off all power supplying the UPS system before working on or inside the equipment.
- Before working on the UPS system, check for hazardous voltage between all terminals including the protective earth.
- The UPS contains an internal energy source. Hazardous voltage can be present even when disconnected from the utility/mains supply. Before installing or servicing the UPS system, ensure that the units are OFF and that utility/mains and batteries are disconnected. Wait five minutes before opening the UPS to allow the capacitors to discharge.
- A disconnection device (e.g. disconnection circuit breaker or switch) must be installed to enable isolation of the system from upstream power sources in accordance with local regulations. This disconnection device must be easily accessible and visible.
- The UPS must be properly earthed/grounded and due to a high leakage current, the earthing/grounding conductor must be connected first.

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

In systems where backfeed protection is not part of the standard design, an automatic isolation device (backfeed protection option or other device meeting the requirements of IEC/EN 62040–1 **or** UL1778 5th Edition – depending on which of the two standards apply to your local area) must be installed to prevent hazardous voltage or energy at the input terminals of the isolation device. The device must open within 15 seconds after the upstream power supply fails and must be rated according to the specifications.

Failure to follow these instructions will result in death or serious injury.

When the UPS input is connected through external isolators that, when opened, isolate the neutral or when the automatic backfeed isolation is provided external to

the equipment or is connected to an IT power distribution system, a label must be fitted at the UPS input terminals, and on all primary power isolators installed remote from the UPS area and on external access points between such isolators and the UPS, by the user, displaying the following text (or equivalent in a language which is acceptable in the country in which the UPS system is installed):

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Risk of Voltage Backfeed. Before working on this circuit: Isolate the UPS and check for hazardous voltage between all terminals including the protective earth.

Failure to follow these instructions will result in death or serious injury.

Battery Safety

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Battery circuit breakers must be installed according to the specifications and requirements as defined by Schneider Electric.
- Servicing of batteries must only be performed or supervised by qualified personnel knowledgeable of batteries and the required precautions. Keep unqualified personnel away from batteries.
- Disconnect charging source prior to connecting or disconnecting battery terminals.
- Do not dispose of batteries in a fire as they can explode.
- Do not open, alter, or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Batteries can present a risk of electric shock and high short-circuit current. The following precautions must be observed when working on batteries

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Wear protective glasses, gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Disconnect the charging source prior to connecting or disconnecting battery terminals.
- Determine if the battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electric shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

When replacing batteries, always replace with the same type and number of batteries or battery packs.

Failure to follow these instructions will result in death or serious injury.

NOTICE

RISK OF EQUIPMENT DAMAGE

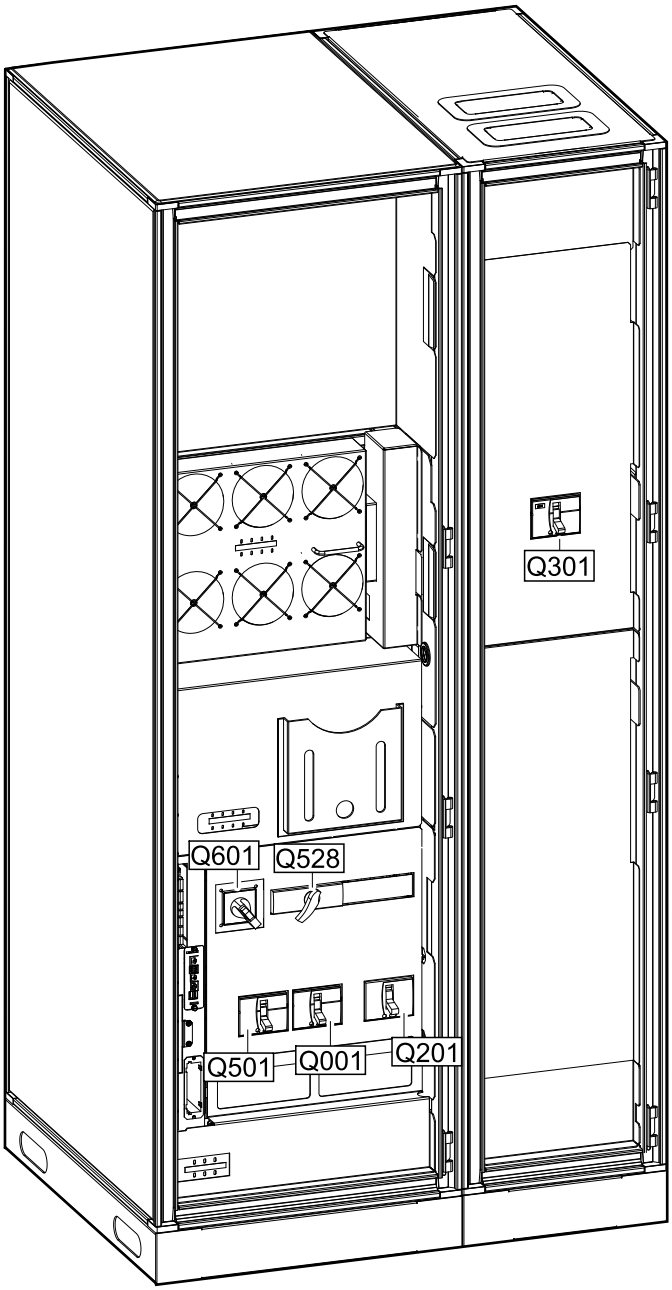
- Wait until the system is ready to be powered up before installing batteries in the system. The time duration from battery installation until the UPS system is powered up must not exceed 72 hours or 3 days.
- Batteries must not be stored more than six months due to the requirement of recharging. If the UPS system remains de-energized for a long period, Schneider Electric recommends that you energize the UPS system for a period of 24 hours at least once every month. This charges the batteries, thus avoiding irreversible damage.

Failure to follow these instructions can result in equipment damage.

Single System Overview

Breakers in the Single System

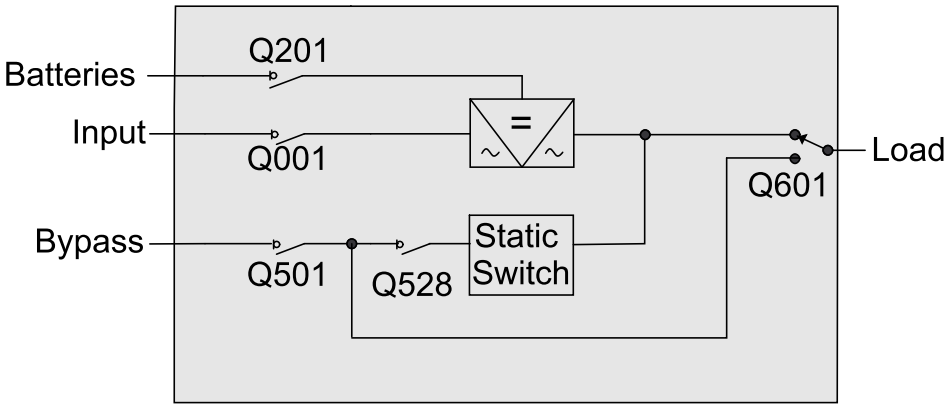
UPS and Optional AUX Cabinet



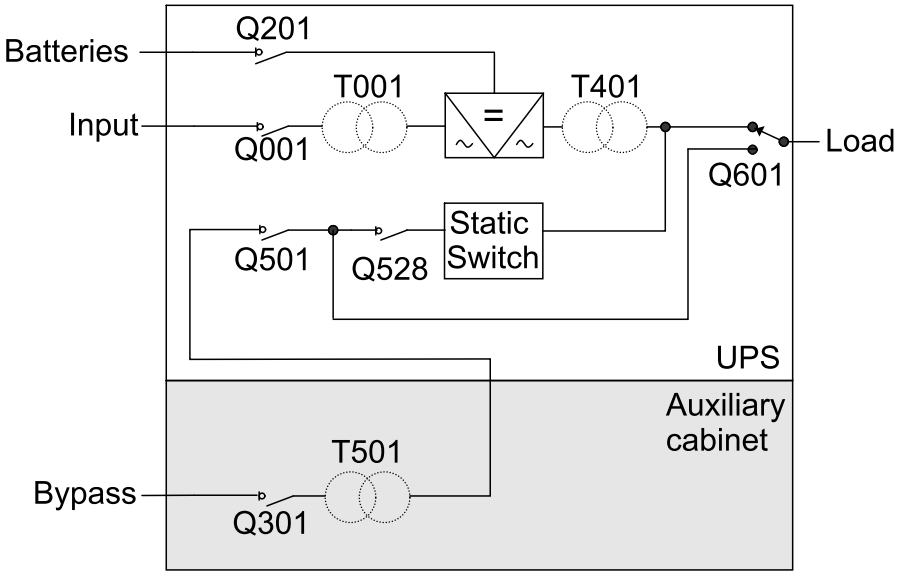
- Q501: Bypass mains
- Q001: Rectifier mains
- Q201: Battery
- Q601: Manual bypass
- Q528: Bypass input
- Q301: Bypass transformer (only present with bypass transformer installed in AUX cabinet.)

One Line Diagrams

Single UPS



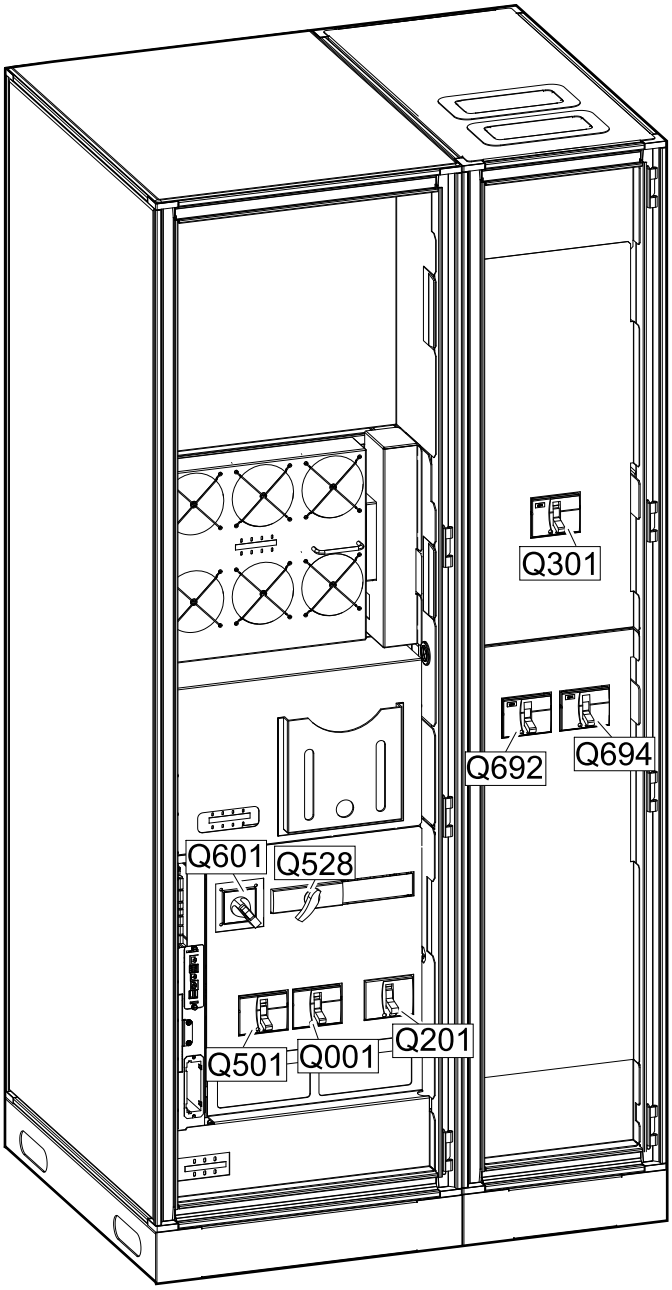
Single UPS with Optional Input Transformer, Output Transformer and Bypass Transformer



Parallel Redundant System Overview

Breakers in the Parallel Redundant System

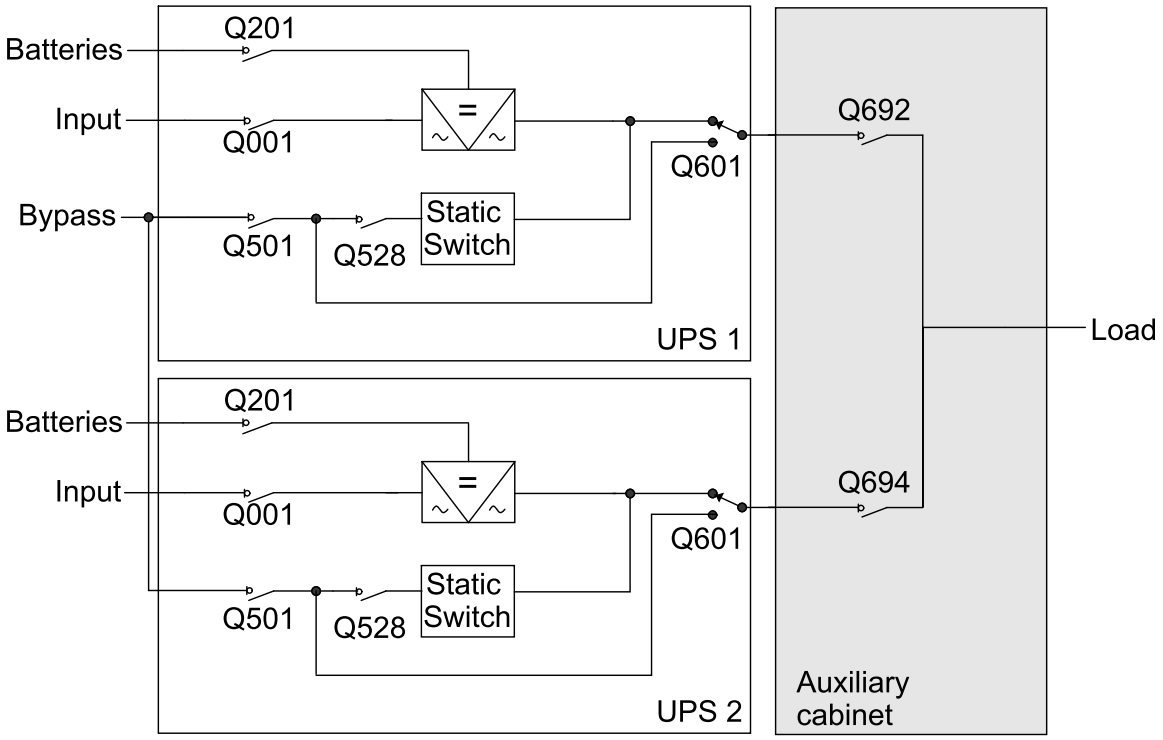
UPS and AUX Cabinet



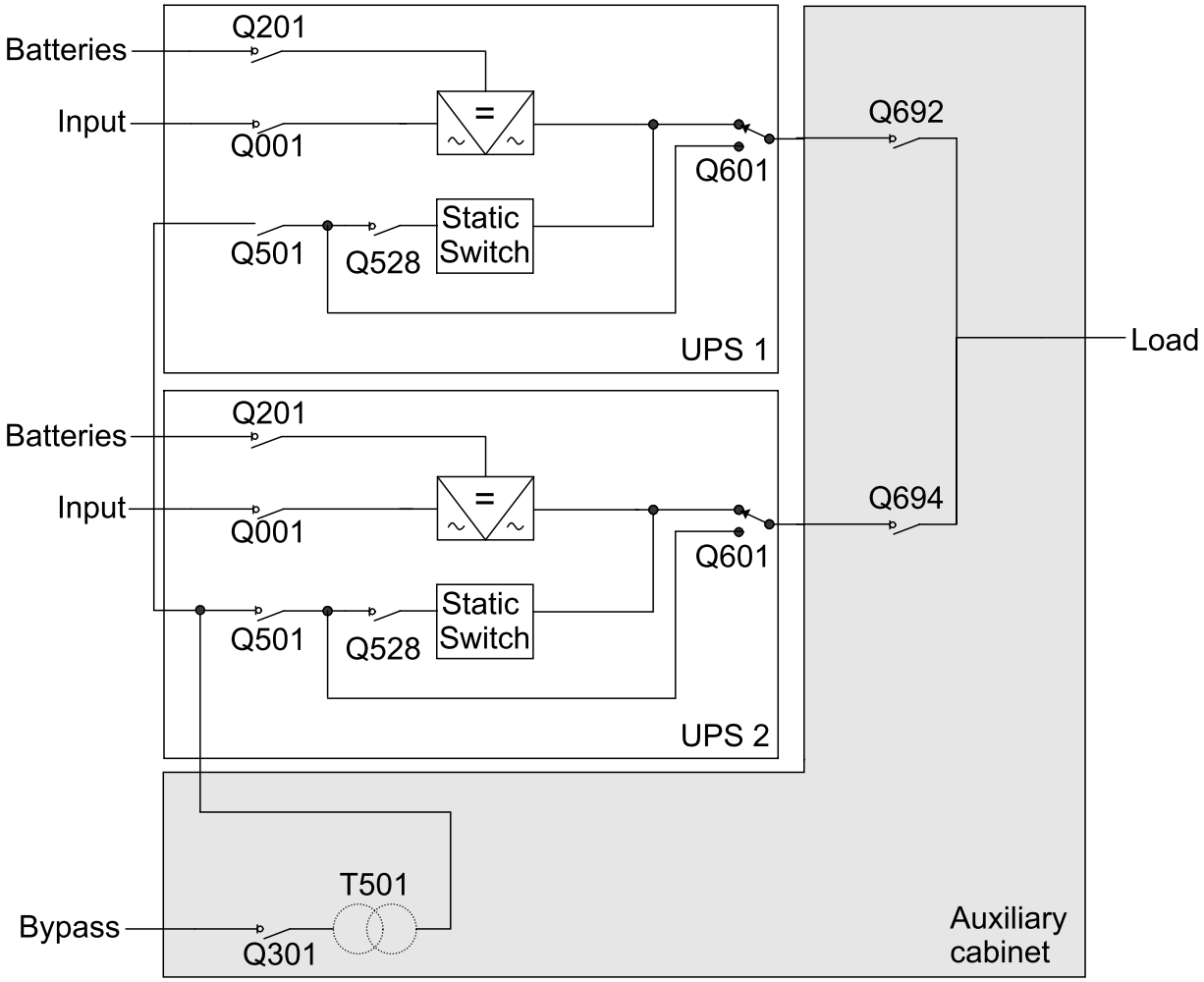
- Q501: Bypass mains
- Q001: Rectifier mains
- Q201: Battery
- Q601: Manual bypass
- Q528: Bypass input
- Q301: Bypass transformer (only present with bypass transformer installed in AUX cabinet.)
- Q692: Coupling switch for UPS 1
- Q694: Coupling switch for UPS 2

One Line Diagrams

Parallel Redundant System with Coupling Switches

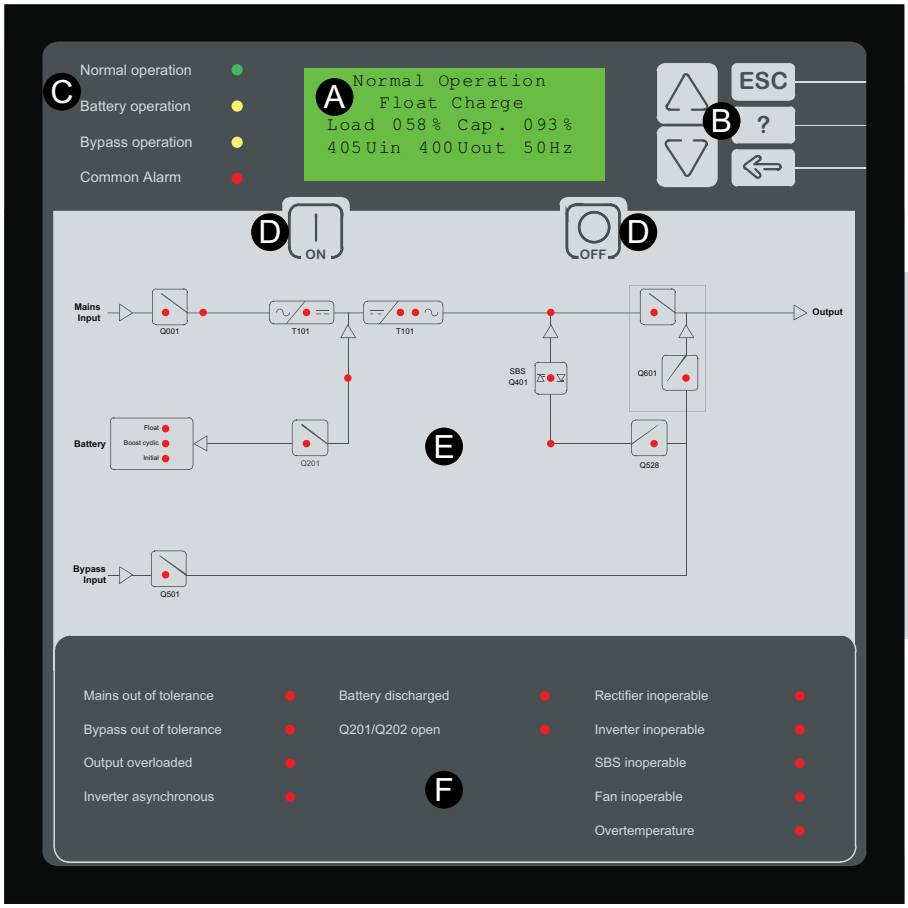


Parallel Redundant System with Bypass Transformer and Coupling Switches



User Interface

User Interface on the UPS Cabinet



A. Display
B. Display navigation keys
C. UPS status LEDs that show the current operation mode of the UPS
D. ON and OFF buttons
E. Mimic diagram that shows the power flow of the UPS
F. Alarm LEDs.

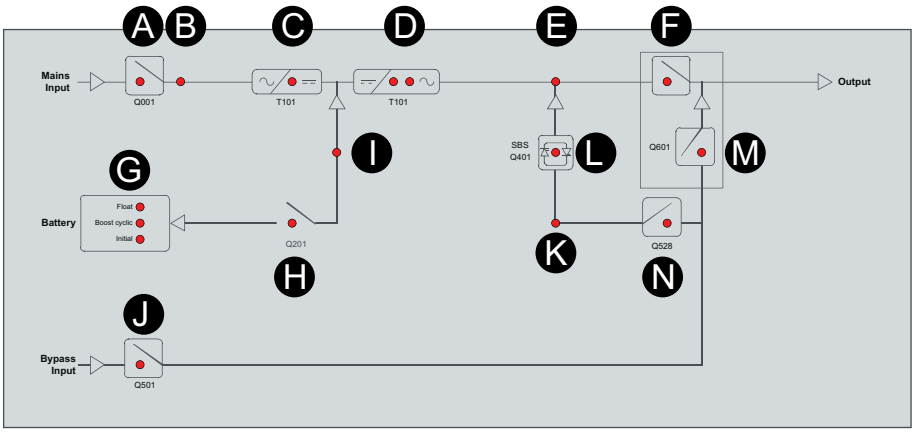
Display Navigation Keys

↵	Use the ENTER key to enter the main menu, submenus, and confirm/save settings.
ESC	Use the ESC key to return to a higher level menu.
△	Use the UP key to select a submenu or to change a setting upwards.
▽	Use the DOWN key to select a submenu or to change a setting downwards.
?	Use the HELP key to access help information about a menu point.

UPS Status LEDs

Normal operation LED	Green	The load is supplied by the input source.
Battery operation LED	Yellow	The load is supplied by the batteries.
Bypass operation LED	Yellow	The load is supplied by the bypass source.
Common Alarm LED	Red	An alarm exists in the UPS system.

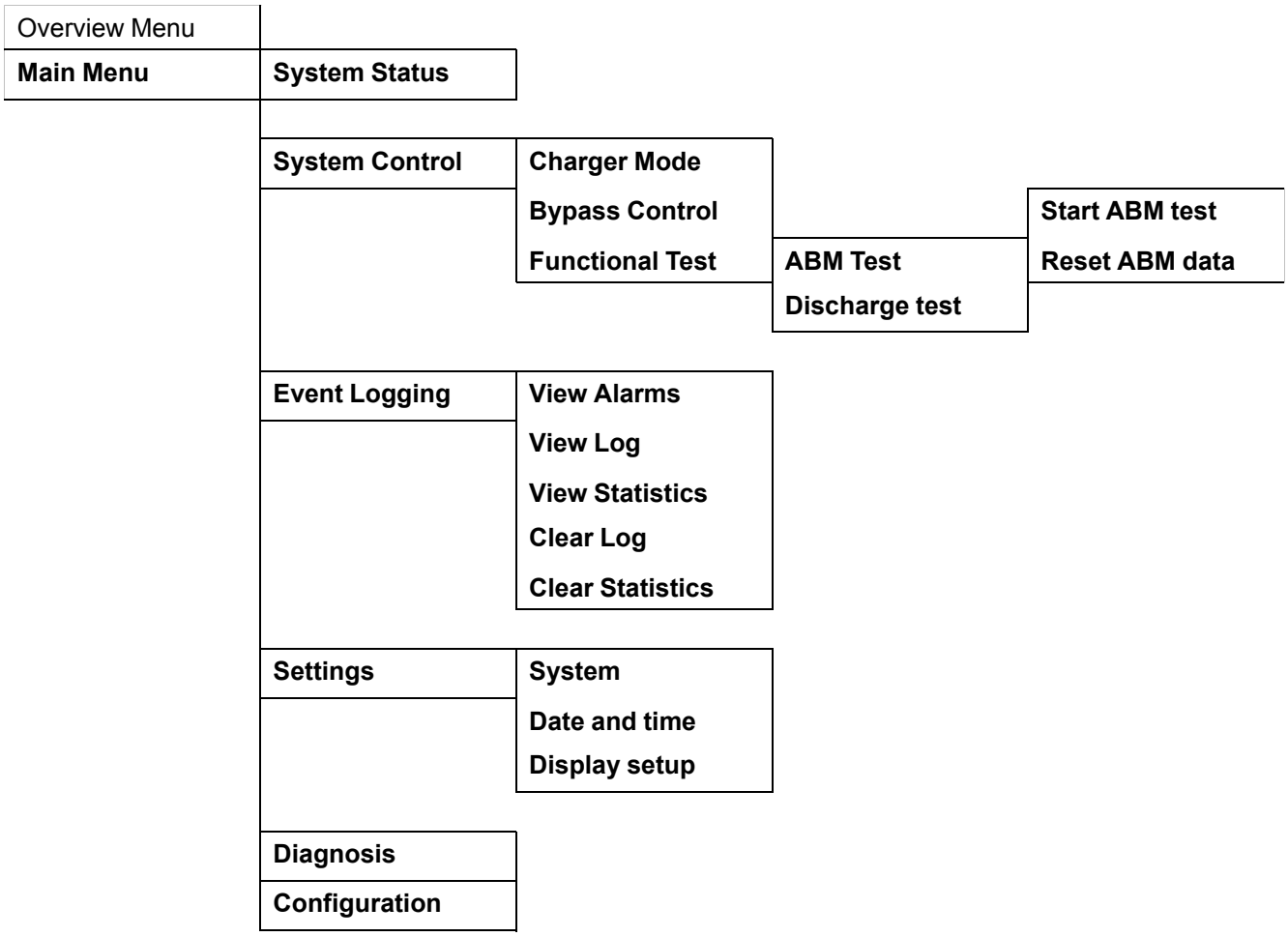
Mimic Diagram



Position	LED color	Description
A	Green	The rectifier mains breaker Q001 is closed (ON)
	Red	The rectifier mains breaker Q001 is open (OFF)
B	Green	The mains voltage is within range
	Red	The mains voltage is out of range
C	Green	The rectifier is ON
	Orange	At least one rectifier is inoperable
	Red	The rectifier is inoperable
D	Green	The inverter is ON
	Orange	At least one inverter is inoperable
	Red	The inverter is inoperable
E	Green	The output voltage is within range
	Red	The output voltage is out of range
F	Green	The unit output breaker is closed (ON)
	Red	The unit output breaker is open (OFF)
G	yellow	Float: The battery is charged in float charge mode
	yellow	Boost cyclic: The battery is charged in boost charge mode or at cyclic charge level mode
	yellow	Initial: The battery is charged in initial charge mode
H	Green	The battery breaker Q201 is closed (ON)
	Red	The battery breaker Q201 is open (OFF)
I	Green	The battery voltage is within range

Position	LED color	Description
	Red	The battery voltage is out of range
J	Green	The bypass mains breaker Q501 is closed (ON)
	Red	The bypass mains breaker Q501 is open (OFF)
K	Green	The bypass voltage is within range
	Red	The bypass voltage is out of range
L	Green	The static bypass switch is ON
	Orange	The static bypass switch is independently switched on
	Red	The static bypass switch is inoperable
M	Green	The manual bypass breaker Q601 is closed (ON)
	Red	The manual bypass breaker Q601 is open (OFF)
N	Green	The bypass input breaker Q528 is closed (ON)
	Red	The bypass input breaker Q528 is open (OFF)

Menu Tree



Display

In normal operation with no alarms present, the display will show the overview screen with the system operation mode, operation information, and measurements.

NOTE: If the advanced battery monitoring (ABM) function is not available, the overview screen will not show calculated runtime or capacity.

Overview Screen in Standby Operation

```
Standby
```

The UPS output is turned OFF.

Overview Screen in Normal Operation

```
Normal Operation
Float Charge
Load 058%  Cap. 093%
xxxUin  xxxUout  xxHz
```

The second line shows the battery charge mode: **Float Charge**, **Boost Charge**, **Initial Charge**, or **Cyclic Charge**.

Overview Screen in Battery Operation

```
Battery Operation
Runtime:  02h  42min
Load 058%  Cap. 093%
xxxUin  xxxUout  xxHz
```

The calculated remaining runtime for the load percentage and the battery charge is shown on the second line if advanced battery monitoring (ABM) is set up. If an ABM test or a discharge test is running this is indicated in the second line. See *Perform Advanced Battery Monitoring (ABM) Test, page 42* and *Perform Discharge Test, page 43*.

Overview Screen in Temporary Static Bypass Operation

```
Temporary Static
Bypass  Operation
Load 058%  Cap. 093%
xxxUin  xxxUout  xxHz
```

Overview Screen in Requested Static Bypass Operation

```
Requested Static
Bypass  Operation
Load 058%  Cap. 093%
xxxUin  xxxUout  xxHz
```

Overview Screen in ECO Mode

```
ECO mode
Float charge
Load 058%  Cap. 093%
xxxUin  xxxUout  xxHz
```

Overview Screen in Manual Bypass Operation

```
Manual Bypass
Normal  Operation
Load 058%  Cap. 093%
405Uin  xxxUout  xxHz
```

The second line indicates the state of the isolated system: **Standby**, **Normal Operation**, **Battery Operation**, **Static Bypass Operation**. Input voltage, output voltage, and output frequency are not shown in manual bypass operation.

Main Menu and Navigation

From the main menu it is possible to configure and monitor the system through the submenus: **System Status**, **System Control**, **Event Logging**, **Settings**, **Diagnosis**, and **Configuration**. Use the UP/ DOWN and the ENTER display navigation keys to navigate through the menus. Press the ESC key to return to a previous menu. Press the HELP key to access help information about a menu point.

View UPS Measurements

1. From the **Main Menu**, select **System Status** using the UP/DOWN keys and the ENTER key.
2. Use the UP/DOWN keys to browse through the different measurement screens.

```
Ø  Uin    Ubyp    Uout
1  405.2  402.5  400.5
2  404.3  400.4  400.1
3  406.0  401.4  399.7↓
```

- Input voltages: phase to phase
- Bypass voltages (only displayed if bypass input measurement is installed): phase to phase; phase to neutral if one phase bypass mains
- Output voltages: phase to phase; phase to neutral if one phase bypass mains

```
Ø  Iin    Ibyp    Iout↑
1  025.5  000.0  025.1
2  024.3  000.0  024.0
3  025.0  000.0  024.1↓
```

- Input current per phase
- Bypass current per phase (only displayed if bypass input measurement is installed)
- Output current per phase

```
Out  kW    kVA    PF  ↑
1  017.3  019.4  096C
2  020.3  020.3  1.00
3  016.7  018.7  0.81I↓
```

- Real power on output
- Apparent power on output
- Power factor (cos phi) on output. **C** indicates capacitive load and **I** indicates inductive load.

```
Fin   Fbyp  Fout  ↑
50.1  50.0  50.0
Load:     058.4kVA
          055.2kW ↓
```

- Input, bypass, and output frequencies
- Total output apparent power
- Total output active power

```
Bat Voltage: 400.2V↑
Bat Current:+005.3A
Bat Cap.:   098  %
Runtime: 01h 37min ↓
```

- Battery voltage
- Battery current (positive = charging, negative = discharging)
- Actual battery charge in % of installed capacity
- Calculated runtime for the actual load and battery charge

```
Temperature          ↑
Sensor 1:    028°C
Sensor 2:    024°C
Sensor 3:    036°C↓
```

```
Total system status  ↑
Load:        058.4kVA
             054.3kW
Load-%:      073.0 % ↓
```

In a redundant system configuration:

- Total actual output power
- Total apparent output power
- Total output power in percent of system rating

```
Total system status↑
UPS is master
UPS availability:
    1  of  2
```

In a redundant system configuration:

- This system is isolated, the master or slave
- Number of available systems

View System Configuration

1. From the **Main Menu**, select **System Status > Configuration** using the UP/DOWN keys and the ENTER key.
2. Use the UP/DOWN keys to browse through the system configuration screens. Here you can see information about the system configuration.

```
Type:     PXC 1040
SKU  :  123456789012
Conf.:  Redundant
UPS:     2  of  2↓
```

- System type
- SKU
- System configuration: **Single** or **Redundant**
- System number

```
Inp.     Byp.     Out.  ↑
3x400V  3x400V  1x230V
0058A  0058A  0174A
T001     T501     T401↓
```

- Nominal voltages on input, bypass, and output
- Nominal currents on input, bypass, and output
- Installed transformers in the system

```
Out. Freq.:   50Hz↑
Out. Power:  040kVA

                    ↓
```

- System output frequency
- Nominal system output power

```
Alarm Thresholds:  ↑
  Load:      075 kVA
  Runtime:  00h 20min
  Bat. Temp.:  075 °C
```

Configuration

Set the Date and Time

1. From the **Main Menu**, select **Settings > Date and time** using the UP/DOWN keys and the ENTER key. You can press the ESC key at any time to cancel the modification of the parameter values.

```
Date and Time:
Date:   21-Jul-2015
Time:   11:35:08
```

2. Press the ENTER key to start modifying the parameter values.

```
Date and Time:
Date:  ↕21-Jul-2015
Time:   11:35:08
        SET
```

3. Press the UP/DOWN keys to modify the parameter values and press the ENTER key to confirm modification and move to the next parameter value.

```
Date and Time:
Date:   22↕Jul-2015
Time:   11:35:08
        SET
```

4. When you have modified all the parameter values, the cursor will point to **SET** – press the ENTER key to confirm and save the modified date and time values.

```
Date and Time:
Date:   22↕Jul-2015
Time:   11:35:08
        ►SET
```

Set Up the Display

1. From the **Main Menu**, select **Settings > Display Setup** using the UP/DOWN keys and the ENTER key. You can press the ESC key at any time to cancel the modification of the parameter values.

```
Display Setup:
Language: English
Contrast: 1
Beeper Volume: 3
```

2. Press the UP/DOWN keys to select a parameter to modify and press the ENTER key.

```
Display Setup:
►Language: English
Contrast: 1
Beeper Volume: 3
```

3. Press the UP/DOWN keys to modify the parameter values and press the ENTER key to save the modification and move to the next parameter value.

```
Display Setup:
↕Language: English
Contrast: 2
Beeper Volume: 1
```

4. When you have modified all the parameter values, press the ESC key return to a higher menu level.

Reset the Display Language to English

1. From the overview menu, press the ESC key ten times (within 10 seconds). The display language will now reset to English.

Set Auto Start, Auto Boost, LCM Alerts, and ECO Mode

1. From the **Main Menu**, select **Settings > System** using the UP/DOWN keys and the ENTER key. You can press the ESC key at any time to cancel the modification of the parameter values.

2. Select **Auto Start**, **Auto Boost**, **LCM Alerts**, or **ECO Mode** using the UP/DOWN keys and the ENTER key.
3. Select **On** or **Off** using the UP/DOWN keys and the ENTER key to save the setting.

Set Battery Charge Mode

1. From the **Main Menu**, select **System Control > Charge mode** using the UP/DOWN keys and the ENTER key.

```
Charge mode:
      Float
Ubat: 440.3V  438  V
Ibat:+004.2A  007.2A
```

```
Charge mode:
      Cyclic
Ubat: 440.3V  438  V
Ibat:+004.2A  007.2A↓
```

   Cyclic charge mode has a second page that shows the configured period and charge time.

2. Press the ENTER key to start modifying the parameter values.
3. Press the UP/DOWN keys to modify the parameter values and press the ENTER key to confirm modification.

```
Charge mode:
↕      Float
Ubat: 440.3V  438  V
Ibat:+004.2A  007.2A
```

Operation

Operation Modes

The manual bypass switch (Q601) offers the possibility of setting the system volt-free when performing work inside the system, e.g. service and maintenance. There is no interruption to the load when the switch is switched over. Two positions are available:

- AUTO: In this position, the load is supplied by the UPS.
- BYPASS: In this position the load is supplied directly from the bypass mains.

Normal Operation

In normal operation, the manual bypass switch must be in the position AUTO.

During normal operation, the UPS supports the load with conditioned power.

While the UPS is in normal operation, the status LED Normal operation is green.

Battery Operation

In battery operation, the manual bypass switch must be in the position AUTO.

If the input source becomes unavailable or outside the specified limits, the UPS transfers to battery operation and supports the load with conditioned power from the DC source.

If the input source is recovered, the system is automatically transferred back to normal operation.

While the UPS system is in battery operation, the status LED Battery operation is yellow.

If the battery discharge limit is approached an alarm is activated. If the batteries are depleted, the system transfers to bypass operation if the bypass source is available and within tolerance. If the input source or the bypass source are still unavailable, the UPS system will turn off and stop supplying the load, but if **Auto Start** is configured for the UPS system, then the UPS will automatically restart and return to normal operation again as soon as the input source is recovered.

Temporary Static Bypass Operation

In temporary static bypass operation, the manual bypass switch must be in the position AUTO.

The UPS is in temporary static bypass following an event in the UPS system (inverter inoperable, no input source available, no battery runtime available). During temporary static bypass operation, the load is supplied by the bypass source. When the cause of the automatic transfer is no longer present, the system automatically transfers back to normal operation without interruption.

While the UPS system is in temporary static bypass operation, the status LED Bypass operation is yellow.

Requested Static Bypass Operation

In requested static bypass operation, the manual bypass switch must be in the position AUTO.

The UPS can be transferred to requested static bypass following a command from the display. During static bypass operation, the load is supplied from the bypass source. To avoid interruptions during the transfer, the voltage, frequency and phase relation of the UPS system must be synchronized to the bypass source.

The UPS will transfer to normal or battery operation if the bypass source becomes unavailable.

While the UPS system is in requested static bypass, the status LED Bypass operation is yellow.

ECO Mode

In ECO mode, the manual bypass switch must be in the position AUTO. The UPS can be transferred to ECO mode following a command from the display or when enabled the system will automatically switch to ECO mode after system has been running for one minute in normal operation and the bypass voltage quality is above the acceptable limits. ECO mode will transfer the system to static bypass operation. In this operation mode the total system efficiency is increased. During static bypass operation, the load is supplied from the bypass source. To avoid interruptions during the transfer, the voltage, frequency and phase relation of the UPS system must be synchronized to the bypass source. The UPS will transfer to normal or battery operation if the bypass source becomes unavailable or if the bypass voltage quality drops below the acceptable limits. While the UPS system is in requested static bypass, the status LED Bypass operation is yellow.

Manual Bypass Operation

For repair and maintenance work or work inside the system, the manual bypass switch must be set to BYPASS.

In manual bypass operation, the load is supplied with unconditioned power from the bypass input via the manual bypass switch. The batteries are not available as an alternate power source in manual bypass operation.

Charger Only

When the UPS is in charger mode, the UPS does not supply the connected load with power.

Standby

When the UPS is in standby mode, the UPS is OFF and does not supply the connected load with power, and the batteries are not charged.

OFF

When the UPS is in OFF mode, the UPS does not supply the connected load with power, and the batteries are not charged.

Operation Procedures

Turn on the UPS

1. Press the ON button on the display.

Turn off the UPS

1. Press the ON and the OFF buttons simultaneously on the display. The UPS will shut down with no voltage on the output.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

After this operation, power will still be present on the power connection terminals. Ensure that the protection covers are installed.

Failure to follow these instructions will result in death or serious injury.

Transfer from Normal Operation to ECO Mode

NOTE: This menu is only available if ECO Mode is enabled.

1. From the **Main Menu**, select **System Control > Bypass Control** using the UP/DOWN keys and the ENTER key.

```
Confirm action:
UPS into ECO Mode
 NO, Abort
►YES, UPS into ECO Mode
```

2. Select **YES, UPS into ECO Mode** to transfer to ECO Mode. The following message will appear on the display:

```
The load is supplied via the static bypass switch
```

3. After the transfer to ECO Mode is complete, press the ESC key.

   NOTE: For parallel UPS units, it is only necessary to perform the transfer into ECO Mode on one UPS – the other parallel UPSs will automatically transfer to ECO Mode.

Transfer from ECO Mode to Normal Operation

NOTE: This menu is only available if ECO Mode is enabled.

1. From the **Main Menu**, select **System Control > Bypass Control** using the UP/DOWN keys and the ENTER key.
2. Select **YES, UPS out of ECO Mode** to transfer to normal operation.

```
Confirm action:
UPS out of ECO Mode
 NO, Abort
►YES, UPS out of ECO Mode
```

NOTE: For parallel UPS units, it is only necessary to perform the transfer into normal operation on one UPS – the other parallel UPSs will automatically transfer to normal operation.

Transfer from Normal Operation to Static Bypass Operation

NOTE: This menu is only available if ECO Mode is disabled.

1. From the **Main Menu**, select **System Control > Bypass Control** using the UP/DOWN keys and the ENTER key.

```
Confirm action:
UPS into Bypass
 NO, Abort
►YES, UPS into Bypass
```

2. Select **YES, UPS into Bypass** to transfer to bypass operation.
3. After the transfer to static bypass is complete, press the ESC key.

NOTE: For parallel UPS units, it is only necessary to perform the transfer into static bypass operation on one UPS – the other parallel UPSs will automatically transfer to static bypass operation.

Transfer from Static Bypass Operation to Normal Operation

NOTE: This menu is only available if ECO Mode is disabled.

1. From the **Main Menu**, select **System Control > Bypass Control** using the UP/DOWN keys and the ENTER key.
2. Select **YES, UPS out of Byp** to transfer to normal operation.

```
Confirm action:
UPS out of Bypass
 NO, Abort
►YES, UPS out of Byp
```

NOTE: For parallel UPS units, it is only necessary to perform the transfer into normal operation on one UPS – the other parallel UPSs will automatically transfer to normal operation.

Transfer from Normal Operation to Manual Bypass Operation

1. From the **Main Menu**, select **System Control > Bypass Control** using the UP/DOWN keys and the ENTER key.
2.
   – **With ECO Mode enabled:** Select **YES, UPS into ECO Mode** to transfer to bypass operation.

   ```
   Confirm action:
   UPS into ECO Mode
    NO, Abort
   ►YES, UPS into ECO Mode
   ```

   – **With ECO Mode disabled:** Select **YES, UPS into Bypass** to transfer to bypass operation.

   ```
   Confirm action:
   UPS into Bypass
    NO, Abort
   ►YES, UPS into Bypass
   ```

3. If the UPS is able to turn on the static bypass switch, the following message appears **You may switch to manual bypass now!**. Perform the manual switch-over now to go to manual bypass operation.
4. When the UPS has transferred to manual bypass operation this message will appear on the display:

   ```
   The load is supplied via the manual bypass switch.
   ```

5. To isolate the UPS, turn switch Q528 to OFF position.

Transfer from Manual Bypass Operation to Normal Operation

1. Check that switch Q528 is closed.
2. From the **Main Menu**, select **System Control > Bypass Control** using the UP/DOWN keys and the ENTER key.
3.
   – **With ECO Mode enabled:** Select **YES, UPS into ECO Mode** to transfer to bypass operation.

   ```
   Confirm action:
   UPS into ECO Mode
    NO, Abort
   ▶YES, UPS into ECO Mode
   ```

   – **With ECO Mode disabled:** Select **YES, UPS into Bypass** to transfer to bypass operation.

   ```
   Confirm action:
   UPS into Bypass
    NO, Abort
   ▶YES, UPS into Bypass
   ```

   The following message will appear on the display:

   ```
   The load is supplied via the static bypass switch
   ```

4. If the UPS is able to turn on the static bypass switch, the following message appears **You may switch to auto now!**. Perform the manual switch-over now to go to static bypass operation.
5. From the **Main Menu**, select **System Control > Bypass Control** using the UP/DOWN keys and the ENTER key.
6.
   – **With ECO Mode enabled:** Select **YES, UPS out of ECO Mode** to transfer to normal operation.

   ```
   Confirm action:
   UPS out of ECO Mode
    NO, Abort
   ▶YES, UPS out of ECO Mode
   ```

   – **With ECO Mode disabled:** Select **YES, UPS out of Bypass** to transfer to normal operation.

   ```
   Confirm action:
   UPS out of Bypass
    NO, Abort
   ▶YES, UPS out of Bypass
   ```

   The UPS is now in normal operation.

Transfer from Normal Operation to Manual Bypass Operation – Parallel UPS System

1. On UPS1: From the **Main Menu**, select **System Control > Bypass Control** using the UP/DOWN keys and the ENTER key.
2.
   - **With ECO Mode enabled:** Select **YES, UPS into ECO Mode** to transfer to bypass operation. All UPS units in the parallel system will now transfer to static bypass operation.

     ```
     Confirm action:
     UPS into ECO Mode
      NO, Abort
     ►YES, UPS into ECO Mode
     ```

   - **With ECO Mode disabled:** Select **YES, UPS into Bypass** to transfer to bypass operation. All UPS units in the parallel system will now transfer to static bypass operation.

     ```
     Confirm action:
     UPS into Bypass
      NO, Abort
     ►YES, UPS into Bypass
     ```

3. If the UPS is able to turn on the static bypass switch, the following message appears **You may switch to manual bypass now!**.
4. Turn switch Q601 on UPS1 from position AUTO to position BYPASS.
5. Turn switch Q601 on UPS2 from position AUTO to position BYPASS.
6. To isolate the UPS, turn switch Q528 of UPS1 and UPS 2 to the OFF position.
7. The overview screen now shows:

   ```
      Manual Bypass
     Normal Operation
   Load xxx% Cap. 093%
   405Uin xxxUot xxHz
   ```

Transfer from Manual Bypass Operation to Normal Operation – Parallel UPS System

1. Check that switch Q528 on UPS1 and UPS2 is closed.
2. On one UPS: From the **Main Menu**, select **System Control > Bypass Control** using the UP/DOWN keys and the ENTER key.
3.
   – **With ECO Mode enabled:** Select **YES, UPS into ECO Mode** to transfer to bypass operation. All UPS units in the parallel system will now transfer to static bypass operation.

   ```
   Confirm action:
   UPS into ECO Mode
    NO, Abort
   ►YES, UPS into ECO Mode
   ```

   – **With ECO Mode disabled:** Select **YES, UPS into Bypass** to transfer to bypass operation. All UPS units in the parallel system will now transfer to static bypass operation.

   ```
   Confirm action:
   UPS into Bypass
    NO, Abort
   ►YES, UPS into Bypass
   ```

   The following message will appear on the display:

   ```
   The load is supplied via the static bypass switch
   ```

4. If the UPS is able to turn on the static bypass switch, the following message appears **You may switch to auto now!**.
5. Turn switch Q601 on UPS1 from position BYPASS to position AUTO.
6. Turn switch Q601 on UPS2 from position BYPASS to position AUTO.
7. The overview screen now shows:

   ```
      Requested Static
     Bypass Operation
   Load xxx% Cap. 093%
   405Uin xxxUot xxHz
   ```

8. On one UPS: From the **Main Menu**, select **System Control > Bypass Control** using the UP/DOWN keys and the ENTER key.

9.

– **With ECO Mode enabled:** Select **YES, UPS out of ECO Mode** to transfer to normal operation. All UPS units in the parallel system will now transfer to normal operation.

```
Confirm action:
UPS out of ECO Mode
 NO, Abort
►YES, UPS out of ECO Mode
```

– **With ECO Mode disabled:** Select **YES, UPS out of Bypass** to transfer to normal operation. All UPS units in the parallel system will now transfer to normal operation.

```
Confirm action:
UPS out of Bypass
 NO, Abort
►YES, UPS out of Bypass
```

The UPS is now in normal operation.

10. Press the ESC key twice to return to the overview menu. The overview screen now shows:

```
   Normal Operation
  Float Charge
Load xxx% Cap. 093%
405Uin xxxUot xxHz
```

Isolate One UPS in a Redundant UPS System

NOTE: Check that the other UPS in the redundant UPS system is working correctly with no pending alarms and can supply the load by itself.

1. Press the ON and the OFF buttons simultaneously on the display. The UPS will shut down with no voltage on the output.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

After this operation, power will still be present on the power connection terminals. Ensure that the protection covers are installed.

Failure to follow these instructions will result in death or serious injury.

2. Open coupling switch Q694 for UPS2 or Q692 for UPS1 (if present).

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

In a redundant system without coupling switches there will be voltage backfeed from the other UPS when only UPS is switched off for maintenance.

Failure to follow these instructions will result in death or serious injury.

3. Open switch Q501.
4. Open battery switch Q201 and/or Q211.
5. Open switch Q001.
6. Wait five minutes for the DC capacitors to discharge.
7. Measure for voltage on all terminals before working on the UPS.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Hazardous voltage is still present on the connecting terminals as input source, bypass source, and batteries are still connected.

Failure to follow these instructions will result in death or serious injury.

Return an Isolated UPS to a Redundant UPS System

NOTE: Check that the other UPS in the redundant UPS system is working correctly with no pending alarms and can supply the load by itself.

1. On the isolated UPS, check that:
   a. Switch Q001 is open.
   b. Switch Q501 is open.
   c. Coupling switch Q694 for UPS2 or Q692 for UPS1 is open (if present).
   d. Battery switch Q201 and/or Q211 is open.
   e. Switch Q601 is in position AUTO.
2. Close the rectifier mains input switch Q001.
3. Close the battery switch Q201 (Q211)[1].
4. Close the bypass mains input switch Q501. The display will turn on after 10 seconds.

   NOTE: If the system is programmed for **AUTOSTART** it will start automatically after 60s if the rectifier mains input switch Q001 is closed and the input voltage is within tolerance.
5. Press the ON button on the display.
6. Check that the UPS is functioning correctly and that there are no alarms pending.
7. Press the ON and the OFF buttons simultaneously on the display. The UPS will shut down with no voltage on the output.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

After this operation, power will still be present on the power connection terminals. Ensure that the protection covers are installed.

Failure to follow these instructions will result in death or serious injury.

8. Close coupling switch Q694 for UPS2 or Q692 for UPS1 (if present).
9. Press the ON button on the display.
   The load is supplied by both UPS units in redundant operation with load sharing.

1. The system can have one internal battery switch Q201, or one battery switch Q211, or both.

View the Event Log

1. From the **Main Menu**, select **Event Log > View Log** using the UP/DOWN keys and the ENTER key. Wait a few seconds while the event log is being prepared.
2. Use the UP/DOWN keys to browse through the log entries. All system events and alarms are stored in this event log.

Clear the Event Log

1. From the **Main Menu**, select **Event Log > Clear Log > YES, Clear Log** using the UP/DOWN keys and the ENTER key.

View the Alarms

1. From the **Main Menu**, select **Event Log > View Alarms** using the UP/DOWN keys and the ENTER key. Wait a few seconds while the alarm list is being prepared.
2. Use the UP/DOWN keys to browse through the alarms present on the UPS system.

Example

```
Present Alarms:    ↓
Bypass RMS not ok 123
Output RMS not ok 034
Inverter async. 456
```

View Diagnosis

1. From the **Main Menu**, select **System Status > Diagnosis** using the UP/DOWN keys and the ENTER key.
2. Use the UP/DOWN keys to browse through the diagnosis screens. Here you can see information about the digital inputs, internal measurements, and internal status.

```
Breaker status:

Q001   Q201   Q501
OFF    OFF    OFF↓
```

```
Q502   Q528↑
OFF   OFF
Q601   Q611
OFF    OFF
```

The state of the breakers and switches in the system.

- **ON** or **OFF** for a breaker or switch
- **AUTO** or **BYP.** for Q601

```
Inputs status:     ↑
ECB-EPO     :0
ECB-IN1     :1
ECB-IN2     :1↓
```

The current state of the digital inputs of the system.

- Three inputs on the external connection board (ECB)

```
Ø  Urec   Usbs   Uinv↑
1  401.3  400.9  405.2
2  401.6  399.5  401.3
3  403.6  401.2  406.1↓
```

- Rectifier input voltage per phase measured after the rectifier transformer
- Bypass voltage per phase measured after the bypass transformer
- Inverter output voltage per phase measured before the output transformer

```
U  dc-bus:  + 389.5V↑
            - 370.8V↓
```

DC-Bus positive and negative side voltages

```
Temperatures     ↑
T001:  123 °C
T401:  105 °C
T501:  042 °C↓
```

- Input transformer temperature (if installed)
- Output transformer temperature (if installed)
- Bypass transformer temperature (if installed)

```
HMI FW: 00.00.00   ↑
DSP FW: 00.00.00
IF  FW: 00.00.00
RB  FW: 00.00.00
```

- Display firmware revision (**HMI**)
- Main controller firmware revision (**DSP**)
- Interface board firmware revision (**IF**)
- Relay board firmware revision (**RB**)

View Statistics

1. From the **Main Menu**, select **Event Log > View Statistic** using the UP/DOWN keys and the ENTER key.
2. Use the UP/DOWN keys to browse through the statistics available on the UPS.

```
023 Transfers->Bat.
006 Transfers->Byp.
004836hr Inv. Time
024h 13min on Bat↓
```

- Number of transfers to battery operation
- Number of transfers to bypass operation
- Total time in inverter operation
- Total time in battery operation

```
Uin   max:   423.6V↑
Uin   min:   380.9V
Ubat  max:   405.3V
Ubat  min:   395.2V↓
```

- The highest and lowest measured input voltages on mains and battery

```
Iin   max:    056.3A↑
Iout  max:   055.4A
```

- The highest measured currents on mains input and UPS output

```
Last discharge test↑
Date:    21.07.2015
Runtime: 0312 min
Load:    040%-082%
```

- Data from the last discharge test

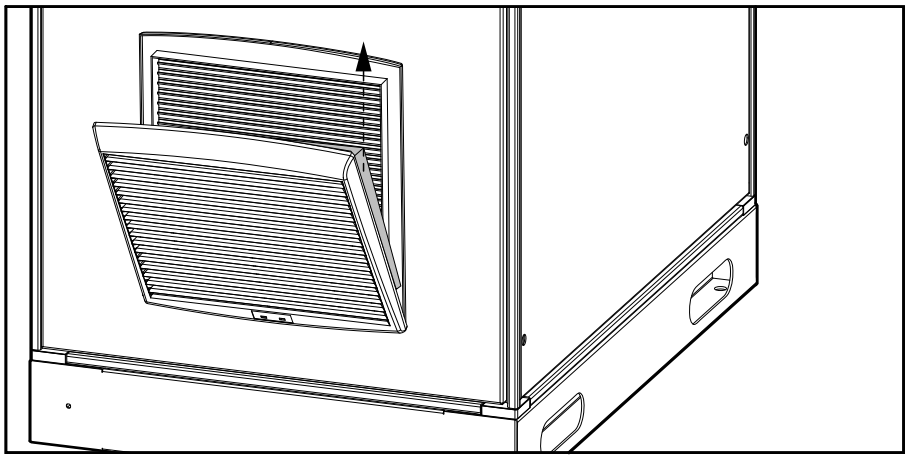
Clear Statistics

1. From the **Main Menu**, select **Event Log > Clear Statistic > YES, Clear Statistic** using the UP/DOWN keys and the ENTER key.

Maintenance

Replace the Filters

1. Pull the top of the air grid free of the cabinet.



2. Replace the air filter.
3. Push the air grid back into position.

Perform LED and Display Test

1. From the overview menu, press twice on the UP key (within two seconds).

All status, mimic diagram, and alarm LEDs will be activated. All segments on the display will be switched on. When the test is complete all LEDs will go back to normal function and the display returns to the overview menu.

Perform Advanced Battery Monitoring (ABM) Test

NOTE: Only available if advanced battery monitoring is set up.

This test detects weak or inoperable batteries, or determines the capacity and runtime estimation based on voltage and current (performed by Schneider Electric field service engineer during start-up of the UPS). The test initiates a capacity discharge of 10%. During this test the battery voltage is monitored. If the battery voltage drops below the battery weak level, the battery weak alarm is generated. If the voltage drops below the battery inoperable level, the battery inoperable alarm is generated. The test then stops immediately. Both alarms are stored and can only be reset by selecting **System Control > Functional Test > ABM Test > Reset ABM data**. The **ABM Test** can only be started if the battery is at least 50% charged.

1. From the **Main Menu**, select **System Control > Functional Test > ABM Test > Start ABM test** using the UP/DOWN keys and the ENTER key.

```
ABM test:
►Start ABM test
 Reset ABM data
```

2. Select **YES, Start test** in the next menu.

```
Confirm action:
Start ABM test
 NO, Abort
►YES, Start test
```

During the ABM test, the overview menu shows the following:

```
Battery Operation
ABM test
Load 058% Cap. 093%
405Uin 400Uout 50Hz
```

NOTE: If automatic testing is selected in the system settings, the test is executed (if possible) automatically. After the test the system returns to the former operation mode.

Perform Discharge Test

The discharge test initiates a complete discharge of the battery down to the low battery warning level or to the voltage which stops the test (defined in the system settings).

NOTE: If the ABM is not available, no values for **Runtime** or **Capacity** are displayed.

1. From the **Main Menu**, select **System Control > Functional Test > Discharge Test** using the UP/DOWN keys and the ENTER key.

```
Functional test:
►Discharge test
 ABM test
```

2. Select **YES, Start test** in the next menu.

```
Confirm action:
Start discharge test
 NO, Abort
►YES, Start test
```

During the discharge test, the overview menu shows the following:

```
Battery Operation
Discharge test
Load xxx% Cap. xxx%
xxxUin xxxUout xxHz
```

NOTE: After the test the system returns to the former operation mode. The data of the last discharge test are shown in the menu **View Statistic**.

Troubleshooting

Alarm Messages

The following table lists all pop-up messages that can appear on the display:

Number	Alarm Message	Pop-Up Message	Description	Corrective Action
2	-	**System configuration not OK**	System configuration not OK. Hardware inoperable or wrong configuration file loaded.	Check the configuration file
186	**Bat. temp. warning**	**Battery temperature has exceeded upper limit**	The battery temperature is above the configured warning level.	Check the air inlet
				Check the ambient temperature
				Check the charge current
				Check the health of the battery
266	-	**High output voltage**	The UPS output voltage (RMS) is above the configured voltage level.	-
269	**Overload**	**UPS overloaded**	The UPS output is overloaded (>105%).	Reduce the load
304	**High Battery voltage**	**Battery voltage too high**	The battery voltage is above the configured high battery voltage warning level. This warning is suppressed in battery operation.	-
306	**Battery discharged**	**Inverter shutdown due to low Battery**	The battery voltage is below the configured low battery voltage shutdown level.	Charge the battery
826	-	**Battery earth fault**	The UPS measures a battery earth fault.	Check the battery wiring
312	**Battery weak**	**Battery weak**	The advanced battery monitoring test has detected a weak battery.	Charge the battery
				Maintain the battery
313	**Battery inoperable**	**Battery inoperable**	The advanced battery monitoring test has detected an inoperable battery.	Maintain the battery
331	**Q201/Q202: open**	**Battery disconnected**	The battery switch Q201 / Q202 is open.	-
351	**ABUS term incorrect**	**ABUS termination incorrect**	The ABUS wiring is disconnected or the ABUS termination is incorrect.	-
371	**No parallel master**	**No Master present in the parallel system**	No master is present in the redundant system.	-
375	**Redundancy alarm**	**Loss of Parallel Redundancy**	At least one UPS is isolated or turned off. In this case the redundancy operation is not assured.	-
397	**PBUS1 com inoperable**	**Parallel bus communication on cable 1 inoperable**	The internal or external PBUS1 wiring (parallel bus) is disconnected or the PBUS1 termination is incorrect.	-
398	**PBUS2 com inoperable**	**Parallel bus communication on cable 2 inoperable**	The internal or external PBUS2 wiring (parallel bus) is disconnected or the PBUS2 termination is incorrect.	-
440	**EPO active**	**EPO activated**	The digital input "emergency power off (EPO)" is activated (contact open) or the EPO wiring is disconnected.	-
447	**Int inoperable state**	**Internal inoperable state detected**	An internal inoperable state was detected.	-
803	-	**Static Bypass Switch inoperable**	The communication to the SBS is not working or DC is detected during requested static bypass operation.	-
814	-	**Overtemperature in PM or Trafos**	The UPS measures a temperature above the threshold level in one of the power modules or in one of the power transformers.	Check the air inlet and the air filters
				Check the ambient temperature
				Check the output load

Number	Alarm Message	Pop-Up Message	Description	Corrective Action
825	-	**Fan inoperable**	One of the transformer-, SBS- or power module fans is inoperable.	Check the correct functionality of the fans
830	-	**Rectifier inoperable**	The PFC rectifier or the charger is inoperable.	-
831	-	**Inverter inoperable**	The inverter is inoperable.	-
HMI_1	-	**ABUS communication inoperable**	Communication via ABUS does not work.	Check the ABUS wiring
HMI_2	-	**ABUS supply missing**	The SELV4 supply of the HMI is missing.	Check the ABUS wiring
HMI_3	-	**No more space for configurations in HMI FLASH memory**	The HMI Flash memory does not offer enough free space to save the configuration change.	Unplug and reconnect HMI supply
HMI_4	-	**HMI SRAM is inoperable**	The external SRAM on the HMI was detected to be inoperable.	-
HMI_5	-	**HMI code memory checksum invalid**	The HMI firmware detected an invalid code memory CRC.	-

Log Event Descriptions

The following table lists all events that can appear on the display log and that can be assigned to LEDs and relays:

Number	Log Text for Alarm	Log Text When Alarm is Resolved	Alarm Text	Alarm Description	Corrective Action
11	**Standby**	**-**	**Standby**	The system is in standby.	-
15	**Battery operation**	**-**	**Battery operation**	The system is in battery operation.	-
16	**Normal operation**	**-**	**Normal operation**	The system is in normal operation.	-
17	**Requested Bypass**	**-**	**Requested Static bypass**	The system is in requested static bypass operation due to a user request.	-
18	**Temporary Bypass**	**-**	**Temporary Static bypass**	The system is in temporary static bypass operation due to a problem in the system.	Check the event log for the reason, why the system has switched to static bypass operation
40	**Charger OFF**	**-**	**Charger OFF**	The battery charger has been set to OFF state. The batteries are not charged in this state.	-
41	**Float charge**	**-**	**Float charge**	The battery charger has been set to **Float charge** state. The batteries are charged with the configured float charge voltage.	-
42	**Boost charge**	**-**	**Boost charge**	The battery charger has been set to **Boost charge** mode. The batteries are charged with the configured boost charge voltage.	-
43	**Initial charge**	**-**	**Initial charge**	The battery charger has been set to **Initial charge** mode. The batteries are charged with the configured initial charge voltage.	-

Number	Log Text for Alarm	Log Text When Alarm is Resolved	Alarm Text	Alarm Description	Corrective Action
44	**Cyclic charge**	**-**	**Cyclic charge**	The battery charger has been set to **Cyclic charge** mode. The batteries are charged with the configured cyclic charge voltage.	-
45	**Boost/Init blocked**	**Boost/Init allowed**	**Boost / Initial-Charge blocked**	The digital input to block boost resp. initial charge is activated.	-
102	**PFC inoperable**	**PFC OK**	**PFC inoperable**	The rectifier part of the power module is not working.	-
110	**Charger inoperable**	**Charger OK**	**Charger inoperable**	The charger part of the power module is not working.	-
132	**Inverter inoperable**	**Inverter OK**	**Inverter inoperable**	The inverter part of the power module is not working.	-
146	**Inverter async.**	**Inverter sync.**	**Inverter asynchronous**	The UPS is unable to synchronize to the bypass source.	Check the bypass source quality (voltage, frequency)
161	**Static Bypass ON**	**Static Bypass OFF**	**SBS ON**	The system is in static bypass operation. The bypass supplies the load (temporary or requested static bypass operation).	-
162	**SBS inoperable**	**SBS OK**	**SBS inoperable**	The static bypass switch is not energized, the communication wiring from the UPS controller to the static bypass switch controller is disconnected or the static bypass switch controller is inoperable.	Check if the static bypass switch controller board is energized Check the communication wiring between main controller and the static bypass switch controller Check the function of the static bypass switch controller board
163	**SBS Indep fired**	**SBS OK**	**SBS Independent fired**	The SBS is no longer controlled by the UPS controller and is locked in the fire state.	Check the communication wiring Check the function of the UPS controller This state can only be left when the SBS controller board is reset. This should be done by switching the manual bypass switch to 'Bypass'
164	**SBS DC detected**	**SBS DC OK**	**SBS DC detected**	DC content detected in requested static bypass operation.	-
166	**Q601: BYPASS**	**-**	**MBS: BYPASS**	The manual bypass switch is in position **BYPASS**.	-
167	**Q601: AUTO**	**-**	**MBS: AUTO**	The manual bypass switch is in position **AUTO**.	-
181	**PM temp. warning**	**PM temp. OK**	**PM Temperature warning**	The power module temperature is above 90 °C.	Check the air inlet of the UPS Check the fan module Check the ambient temperature

Number	Log Text for Alarm	Log Text When Alarm is Resolved	Alarm Text	Alarm Description	Corrective Action
					Reduce the load
182	**PM overtemperature**	**PM temp. OK**	**PM Overtemperature**	The power module temperature is above 100 °C (delay 60 seconds). The inverter is shut down immediately.	Check the air inlet of the UPS
					Check the fan module
					Check the ambient temperature
					Reduce the load
183	**T001 overtemperature**	**T001 temp. OK**	**T001 Overtemperature**	The rectifier mains transformer temperature is above the configured threshold level. After 10 minutes, the rectifier is shut down and the system changes to battery operation.	Check the air inlet of the UPS
					Check the fan module
					Check the ambient temperature
					Reduce the battery charging current
					Reduce the load
184	**T401 overtemperature**	**T401 temp. OK**	**T401 Overtemperature**	The output transformer temperature is above the configured threshold level. After 10 minutes, the system tries to change to static bypass operation within the next 2 minutes. If the change to static bypass operation is not possible due to bad bypass quality the inverter is shut down after these 2 minutes.	Check the air inlet of the UPS
					Check the fan module
					Check the ambient temperature
					Reduce the load
185	**T501 overtemperature**	**T501 temp. OK**	**T501 Overtemperature**	The bypass transformer temperature is above the threshold level.	Check the air inlet of the UPS
					Check the fan module
					Check the ambient temperature
					Reduce the load
186	**Bat. temp. warning**	**Battery temp. OK**	**Battery temperature warning**	The battery temperature is above the configured warning level.	Check the air inlet
					Check the ambient temperature
					Check the charge current
					Check the health of the battery
187	**Bat. temp. shutdown**	**Battery temp. OK**	**Battery temperature shutdown**	The battery temperature is above the configured shutdown level. The battery charger switches off.	Check the air inlet
					Check the ambient temperature
					Check the health of the battery
189	**Temp. 1 warning**	**Temp. 1 OK**	**Temperature 1 warning**	The sensor, connected to the external connection board, measures a temperature above the configured warning level.	-
190	**Temp. 2 warning**	**Temp. 2 OK**	**Temperature 2 warning**	The sensor, connected to the external connection board, measures a temperature above the configured warning level.	-

Number	Log Text for Alarm	Log Text When Alarm is Resolved	Alarm Text	Alarm Description	Corrective Action
191	**Temp. 3 warning**	**Temp. 3 OK**	**Temperature 3 warning**	The sensor, connected to the external connection board, measures a temperature above the configured warning level.	-
192	**T001 sensor inop.**	**T001 sensor OK**	**T001 temperature sensor inoperable**	The mains input transformer temperature sensor is not connected or shorted.	Check the wiring of the temperature sensor
193	**T401 sensor inop.**	**T401 sensor OK**	**T401 temperature sensor inoperable**	The output transformer temperature sensor is not connected or shorted.	Check the wiring of the temperature sensor
194	**T501 sensor inop.**	**T501 sensor OK**	**T501 Temperature sensor inoperable**	The bypass transformer temperature sensor is not connected or shorted.	Check the wiring of the temperature sensor
200	**PM fan inoperable**	**PM fans OK**	**PM fan inoperable**	One of the power module fans is inoperable.	Check the fans of the power modules
201	**SBS fan inoperable**	**SBS fan OK**	**SBS fan inoperable**	One of the static bypass switch fans is inoperable.	Check the static bypass switch fans
202	**Trafo fan inoperable**	**Trafo fans OK**	**Trafo fan inoperable**	One of the transformer fans is inoperable (rectifier transformer, output transformer or bypass transformer).	Check the transformer fans
220	**Mains RMS not OK**	**Mains RMS OK**	**Mains RMS not OK**	The rectifier mains voltage is out of the configured tolerance.	Check the quality of the mains input (voltage and frequency)
221	**Mains Inp RMS not OK**	**Mains Input RMS OK**	**Mains input RMS not OK**	The rectifier mains voltage on primary side of the input transformer is out of the configured tolerance.	Check the quality of the mains input (voltage and frequency)
222	**Mains FAST not OK**	**Mains FAST OK**	**Mains FAST not OK**	The rectifier mains voltage is out of tolerance.	-
223	**Mains freq. not OK**	**Mains frequency OK**	**Mains frequency not OK**	The rectifier mains frequency is out of the configured tolerance.	-
224	**Mains phase missing**	**Mains phases OK**	**Mains phase missing**	A rectifier mains input phase is missing.	Check the contacts of the input switch Check the control wiring of the input voltage measurement Check the correct wiring of the input transformer
225	**Mains In.Ph. missing**	**Mains Inp. phases OK**	**Mains input phase missing**	One phase of the rectifier mains voltage on the primary side of the input transformer is missing.	Check the contacts of the input switch Check the control wiring of the input voltage measurement
228	**Mains synch. missing**	**Mains synch. OK**	**Mains synch missing**	The mains PFC rectifier is unable to synchronize to the rectifier mains input.	Check the quality of the mains input (voltage and frequency)
229	**Mains neutral lost**	**Mains neutral OK**	**Mains neutral missing**	The rectifier mains neutral is missing.	Check the mains neutral wiring

Number	Log Text for Alarm	Log Text When Alarm is Resolved	Alarm Text	Alarm Description	Corrective Action
240	**Bypass RMS not OK**	**Bypass RMS OK**	**Bypass RMS not OK**	The bypass voltage is out of the configured tolerance. The UPS is not able to transfer to static bypass operation.	-
241	**Byp. Inp. RMS not OK**	**Bypass Input RMS OK**	**Bypass input RMS not OK**	The bypass mains voltage on the primary side of the bypass transformer is out of the configured tolerance.	-
242	**Bypass FAST not OK**	**Bypass FAST OK**	**Bypass FAST not OK**	The bypass voltage is out of the configured tolerance. The UPS is unable to transfer to static bypass operation.	-
243	**Bypass freq. not OK**	**Bypass frequency OK**	**Bypass frequency not OK**	The bypass frequency is out of the configured tolerance. The UPS is unable to transfer to static bypass operation.	-
244	**Bypass phase missing**	**Bypass phases OK**	**Bypass phase missing**	One phase of the bypass mains is missing.	-
245	**Byp. In. phase miss.**	**Byp. Inp. phases OK**	**Bypass input phase missing**	One phase of the bypass voltage on the primary side of the transformer is missing.	-
260	**Inv. Out. RMS not OK**	**Inv. Out. RMS OK**	**Inverter output RMS not OK**	The UPS output voltage is out of the configured tolerance.	-
261	**Output RMS not OK**	**Output RMS OK**	**Output RMS not OK**	The output voltage on the secondary side of the output transformer is out of the configured tolerance.	-
262	**Output FAST not OK**	**Output FAST OK**	**Output FAST not OK**	The UPS output voltage is out of the configured tolerance.	-
263	**Output freq. not OK**	**Output frequency OK**	**Output frequency not OK**	The UPS output frequency is out of the configured tolerance.	-
264	**Output phase missing**	**Output phases OK**	**Output phase missing**	One phase of the output voltage on the secondary side of the transformer is missing.	-
267	**High load warning**	**Load OK**	**High Load warning**	The load is above the configured load alarm level.	Reduce the load
268	**Current limitation**	**No limitation**	**Current limitation**	The inverter current limiter is active.	Reduce the load
269	**Overload**	**No overload**	**Output overloaded**	The UPS output is overloaded (>105%).	Reduce the load
301	**High Bat.V. shutdown**	**Battery voltage OK**	**High Battery shutdown**	The battery voltage is above the configured high battery voltage shutdown level. The charger is shut down.	-
304	**High Battery voltage**	**Battery voltage OK**	**High Battery warning**	The battery voltage is above the configured high battery voltage warning level. This warning is suppressed in battery operation.	-

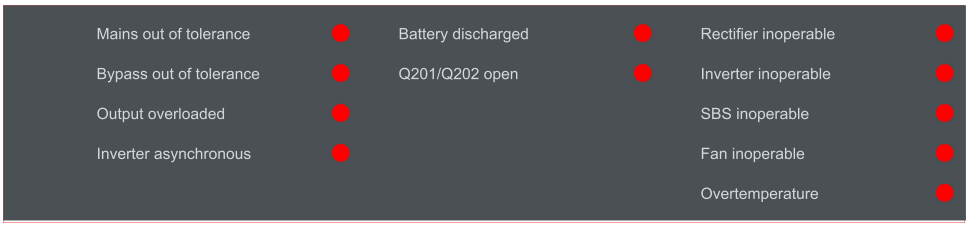
Number	Log Text for Alarm	Log Text When Alarm is Resolved	Alarm Text	Alarm Description	Corrective Action
305	**Low Battery voltage**	**Battery voltage OK**	**Battery discharged**	The battery voltage is below the configured low battery voltage warning level.	Charge the battery
306	**Battery discharged**	**Battery OK**	**Low Battery shutdown**	The battery voltage is below the configured low battery voltage shutdown level.	Charge the battery
307	**Bat. earth fault pos**	**No bat. earth fault**	**Battery earth fault positive**	The UPS measures a positive battery earth fault.	Check the battery wiring
308	**Bat. earth fault neg**	**No bat. earth fault**	**Battery earth fault negative**	The UPS measures a negative battery earth fault.	Check the battery wiring
309	**ABM test Start**	**-**	**ABM test started**	The advanced battery monitoring test has been started.	-
310	**ABM test End**	**-**	**ABM test done**	The advanced battery monitoring test has been completed.	-
311	**ABM test Stop**	**-**	**ABM test aborted**	The advanced battery monitoring test has been aborted.	-
312	**Battery weak**	**Battery OK**	**Battery weak**	The advanced battery monitoring test has detected a weak battery.	Charge the battery Maintain the battery
313	**Battery inoperable**	**Battery OK**	**Battery inoperable**	The advanced battery monitoring test has detected an inoperable battery.	Maintain the battery
314	**Low runtime warning**	**Runtime OK**	**Low runtime warning**	The battery runtime is less than 2 minutes above the configured warning level.	-
315	**Low runtime alarm**	**Runtime OK**	**Low runtime alarm**	The battery runtime is below the configured battery runtime level.	-
316	**Discharge test Start**	**-**	**Discharge test started**	The battery discharge test has been started.	-
317	**Discharge test End**	**-**	**Discharge test done**	The battery discharge test has been completed.	-
318	**Discharge test Stop**	**-**	**Discharge test aborted**	The battery discharge test has been aborted.	-
330	**Q001: open**	**Q001: closed**	**Q001 open**	The rectifier mains input switch Q001 is open.	-
331	**Q201/Q202: open**	**Q201/Q202: closed**	**Q201/Q202 open**	The battery switch Q201 / Q202 is open.	-
332	**Q501: open**	**Q501: closed**	**Q501 open**	The bypass mains input switch Q501 is open.	-
334	**Q611: open**	**Q611: closed**	**Q611 open**	The load output switch Q611 is open.	-
338	**K401: open**	**K401: closed**	**K401 open**	The bypass backfeed contactor K401 is open.	-
339	**Q528: open**	**Q528: closed**	**Q528 open**	The SBS input switch Q528 is open.	
351	**ABUS term incorrect**	**ABUS term OK**	**ABUS termination incorrect**	The ABUS wiring is disconnected or the ABUS termination is incorrect.	-

Number	Log Text for Alarm	Log Text When Alarm is Resolved	Alarm Text	Alarm Description	Corrective Action
371	**No parallel master**	**Par. master selected**	**No parallel Master**	No master is present in the redundant system.	-
374	**Parallel load alarm**	**Parallel load OK**	**Parallel load alarm**	The actual load is too high to guarantee the redundant operation. If one UPS switches OFF, the remaining systems would be overloaded.	-
375	**Redundancy alarm**	**Redundancy OK**	**Redundancy alarm**	At least one UPS is isolated or turned off. In this case the redundancy operation is not assured.	-
397	**PBUS1 com inoperable**	**PBUS1 OK**	**PBUS1 communication inoperable**	The internal or external PBUS1 wiring (parallel bus) is disconnected or the PBUS1 termination is incorrect.	-
398	**PBUS2 com inoperable**	**PBUS2 OK**	**PBUS2 communication inoperable**	The internal or external PBUS2 wiring (parallel bus) is disconnected or the PBUS2 termination is incorrect.	-
399	**PBUS1 term incorrect**	**PBUS1 term OK**	**PBUS 1 termination incorect**	The internal or external PBUS1 wiring (parallel bus) is disconnected or the PBUS1 termination is incorrect.	-
400	**PBUS2 term incorrect**	**PBUS2 term OK**	**PBUS 2 termination incorect**	The internal or external PBUS2 wiring (parallel bus) is disconnected or the PBUS2 termination is incorrect.	-
440	**EPO active**	**EPO cleared**	**Emergency Power Off (EPO)**	The digital input "emergency power off (EPO)" is activated (contact open) or the EPO wiring is disconnected.	-
447	**Int inoperable state**	**Int operation OK**	**Internal inoperable state**	An internal inoperable state was detected.	-
448	**Locked in Bypass**	**Bypass unlocked**	**SBS locked**	The system has been locked in static bypass operation after 8 unsuccessful tries to switch back to normal or battery operation.	-
663	**LCM Fan Module**	**-**	**LCM Alert 1**	The life cycle monitoring recommends to replace the fan modules.	-
668	**LCM Battery**	**-**	**LCM Alert 2**	The life cycle monitoring recommends to replace the battery.	-
673	**LCM Power Module**	**-**	**LCM Alert 3**	The life cycle monitoring recommends to replace the power modules.	-
678	**LCM Air Filter**	**-**	**LCM Alert 4**	The life cycle monitoring recommends to replace the air filters.	-

Number	Log Text for Alarm	Log Text When Alarm is Resolved	Alarm Text	Alarm Description	Corrective Action
683	**LCM 10 Year**	-	**LCM Alert 5**	The life cycle monitoring recommends to do the 10 year component replacement.	-
738	**BlockBst/Init**	-	**ECB-In1**	External connection board input 1 open / close	-
739	**ForceToBoost**	-	**ECB-In2**	External connection board input 2 open / close	-
800	-	-	**Common Alarm**	There is at least one pending alert in the system.	-
803	-	-	**SBS inoperable**	The communication to the SBS is not working or DC is detected during requested static bypass operation.	-
807	-	-	**Bypass out of tolerance**	The bypass voltage is out of the configured tolerance, a phase is missing, there is an invalid phase rotation or the frequency is out of the configured tolerance.	-
808	-	-	**Output out of tolerance**	The output voltage or the frequency is out of configured tolerance.	-
812	-	-	**Mains out of tolerance**	The mains input voltage is out of the configured tolerance, a phase is missing, there is an invalid phase rotation or the frequency is out of the configured tolerance.	-
814	-	-	**Overtemperature**	The UPS measures a temperature above the threshold level in one of the power modules or in one of the power transformers.	Check the air inlet and the air filters Check the ambient temperature Check the output load
823	-	-	**Battery out of tolerance**	The battery voltage is out of the configured tolerance or the battery runtime is too short.	-
825	-	-	**Fan inoperable**	One of the transformer-, SBS- or power module fans is inoperable.	Check the correct functionality of the fans
826	-	-	**Battery earth fault**	The UPS measures a battery earth fault.	Check the battery wiring
830	-	-	**Rectifier inoperable**	The PFC rectifier or the charger is inoperable.	-
831	-	-	**Inverter inoperable**	The inverter is inoperable.	-

System Specific Alarm Indication LEDs

Alarm LEDs on the Display Interface



Number	LED Text	Alarm Description	Corrective Action
812	**Mains out of tolerance**	The mains input voltage is out of the configured tolerance, a phase is missing, there is an invalid phase rotation or the frequency is out of the configured tolerance.	-
807	**Bypass out of tolerance**	The bypass voltage is out of the configured tolerance, a phase is missing, there is a phase rotation fault or the frequency is out of the configured tolerance.	-
269	**Output overloaded**	The UPS output is overloaded (>105%).	Reduce the load
146	**Inverter asynchronous**	The UPS is unable to synchronize to the bypass source.	Check the bypass source quality (voltage, frequency)
305	**Battery discharged**	The battery voltage is below the configured low battery voltage warning level.	Charge the battery
331	**Q201/Q202 open**	The battery switch Q201 / Q202 is open.	-
830	**Rectifier inoperable**	The PFC rectifier or the charger is inoperable.	-
831	**Inverter inoperable**	The inverter is inoperable.	-
803	**SBS inoperable**	The communication to the static bypass switch is not working or DC is detected during requested static bypass operation.	-
825	**Fan inoperable**	One of the transformer-, SBS- or power module fans is inoperable.	-
814	**Overtemperature**	The UPS measures a temperature above the threshold level in one of the power modules or in one of the power transformers.	Check the air inlet and the air filters
			Check the ambient temperature
			Check the output load

System Specific Digital Inputs

Digital Input	Alarm Number	Input Text	Alarm Text	Alarm Description	Corrective Action
ECB-EPO	440	Emergency Power Off	**EPO**	The digital input "emergency power off (EPO)" is activated (contact open) or the EPO wiring is disconnected.	-
ECB-In1	738	Blocking Boost/Initial Charge	**BlockBst/Init**	Block boost and inital charge	-
ECB-In2	739	Force to Boost Charge	**ForceToBoost**	Transfers the UPS into boost charge mode	-

System Specific Digital Outputs

Digital Output	Alarm Number	Output Text	Alarm Description	Corrective Action
ECB-ComAl	800	**Common Alarm**	There is at least one pending alert in the system.	-
ECB-Out01	15	**Battery operation**	The system is in battery operation.	-
ECB-Out02	161	**SBS ON**	The system is in static bypass operation. The bypass supplies the load (temporary or requested static bypass operation).	-

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As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

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