



**LEON-A SERIES UNINTERRUPTABLE POWER SUPPLY
USER'S MANUAL**

1kVA - 1000kVA

Aralık 2022 / December 2022

IMPORTANT

This users manual contains setup, operation and maintenance information for LEON-A Series Uninterruptible Power Supplies.

Before starting setup and operation of the equipment, complete users manual should be read carefully.

Before operation, the Uninterruptible Power Supply should be prepared by an authorized technical personnel approved by Dealer. The warranty will be void, if this direction is not followed.

Please contact dealers customer service, if you see any problem about any process described in this users manual.

The manufacturer reserves the right to change the design of the equipment without notice.

HIGH LEAKAGE CURRENT

Because of the high leakage current, this equipment should be operated only after it is earthed.

ELECTROMAGNETIC COMPABILITY

This equipment is compatible to EMC directive 89/336/EEC and to conditions in released technical specifications. The compatibility remains only if related directions are followed and only if the equipment is used with accessories approved by the manufacturer.

IMPORTANT

In custom designs, there can be minor differences between this manual and the equipment.

CAUTION

1. There are no user servicable parts inside.
2. Even after the equipment is disconnected from batteries, input and output connections, a intervention to the interior of the equipment contains risk of electric shock.
3. Ventilation holes should be kept open and no objects should be inserted.
4. In the environment where the equipment will be operated, the temperature and humidity should be relevant.
5. Batteries should be kept away from high temperature, otherwise they can explode.
6. The equipment can not be operated in an environment having flammable and explosive devices.
7. Setup, maintenance and repair of the equipment should be performed only by trained, experienced and authorised technical personnel.
8. When working on live equipment a second person who is aware of all safety precautions and emergency actions should be present at all times.
9. It is the responsibility of each individual to be aware of national legislation, local legislation and site rules governing safety and working practices.
10. Use only good quality insulated tools and accessories, properly maintained and calibrated instruments, and suitable and adequate supports and lifting equipment.
11. Electrical energy can be supplied from the AC supply, internal / external batteries or the external alarm or auxiliary control terminals.

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1. GENERAL INTRODUCTION

1.1 SYSTEM DESCRIPTION

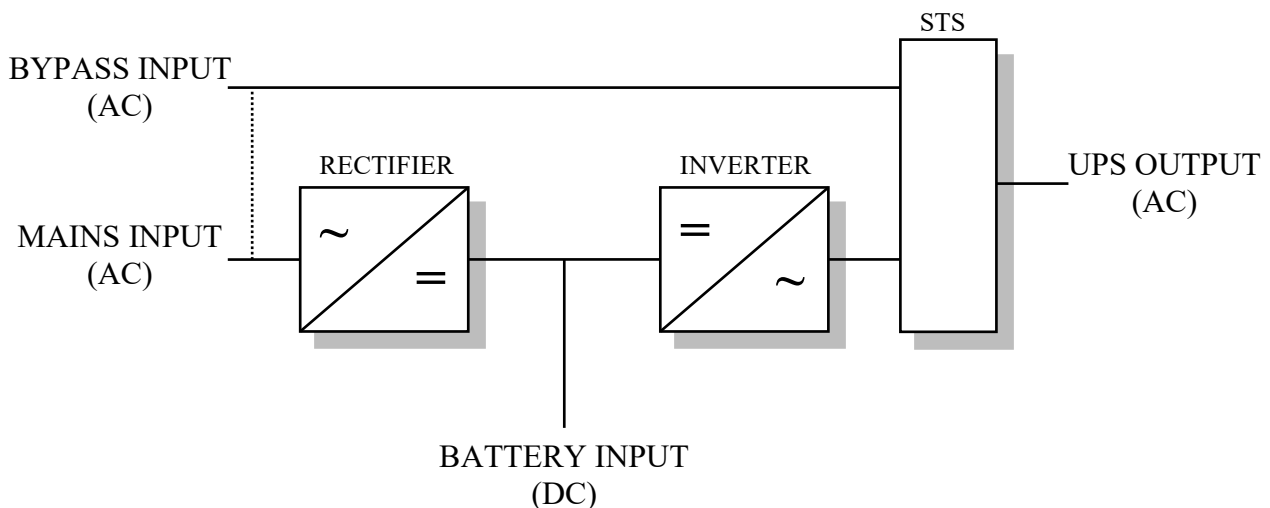
The LEON-A Series Uninterruptible Power Supply (UPS) system is designed to be connected between a critical load, such as a computer, medical systems, industrial systems and its three phase mains power supply. It provides increased power quality and uninterrupted for critical loads.

System is designed in modular structure. Every main block is controlled separately. There are 3 main blocks:

Rectifier : Converts 3 phase mains input ac voltage to regulated DC voltage and feeds the inverter and charges the batteries.

Inverter : Converts DC voltage to 3 phase AC voltage.

Static Transfer Switch (STS) : Connects bypass line voltage or inverter voltage to the output of the UPS.



1.2 BYPASS SUPPLY

System allows the user to have separate bypass input line. Therefore, mains input and bypass input can be disconnected and bypass line can be fed by separate source. Bypass line and mains inputs are connected, as factory default.

1.3 12 PULSE (RECTIFIER) DEVICES

To have reduced input current harmonics, especially at higher power ranges, LEON-A series UPSs are also manufactured with 12 pulse rectifier option. There are 2 completely separate rectifiers operating in parallel in such devices. Additional rectifier contains a phase shift transformer, sized for the half power of the UPS values.

1.4 TECHNICAL SPECIFICATIONS

1.4.1 SPECIFICATIONS for 15 – 20 – 30 - 40 kVA

INPUT DATA (MAINS)	Units	Power (kVA)			
		15	20	30	40
Line voltage	V	380 - 400 – 415 3P + N			
Permissible input voltage variation	%	+15% / -15			
Line frequency	Hz	50 – 60			
Permissible input freq. variation	%	± 10			
Input current @ 380V (normal operation)	A	25	32	49	65
Power factor (nominal)	-	0.8			
Current total harmonic distortion	%	< 30			
Current rating of neutral cable	-	1.4 times rated current			

INPUT DATA (BYPASS)	Units	Power (kVA)			
		15	20	30	40
Bypass voltage	V	380 - 400 – 415 3P + N			
Permissible bypass voltage variation	%	± 5			
Bypass frequency	Hz	50 - 60			
Permissible bypass freq. variation	%	± 5			

BATTERY & DC	Units	Power (kVA)			
		15	20	30	40
Limits for proper inverter operation	V	320 – 475			
Number of batteries in one arm	-	32			
Float charge voltage	V	432			
End of discharge voltage	V	320			
Rectifier output current rating	A	40	50	75	100
Battery charging current (maximum)	A	10	10	15	20
Ripple	%	< 1%			

INVERTER OUTPUT	Units	Power (kVA)			
		15	20	30	40
Voltage	V	380 – 400 – 415V 3P + N			
Current (pf = 0.8) nominal	A	22	30	45	60
Power factor	-	0.8 lagging			
Power at 0.8 power factor	kVA	15	20	30	40
Power at 1.0 power factor	kVA	12	16	24	32
Maximum non-linear load	-	3 : 1			
Voltage stability – steady state	%	± 1 %			
Voltage stability - transient	%	± 7 %			
Voltage phase shift	Degree	120			
Output voltage distortion (linear load)	%	< 3 %			
Output voltage distortion (non-linear load, 3:1 crest factor)	%	< 10 %			

ENVIROMENTAL	Units	Power (kVA)			
		15	20	30	40
Operating temperature	° C	0 / 40			
Relative humidity	%	< 90% at 23 ° C			
Altitude	M	< 1000 m			
Storage temperature	° C	-25 / 70			
Acoustic noise	dBA	52	54	56	56
Standart – EMC	-	EN 50091 - 2			
Standart - Safety	-	EN 50091 - 1			

1.4.2 SPECIFICATIONS for 60 – 80 - 100 kVA

INPUT DATA (MAINS)	Units	Power (kVA)		
		60	80	100
Line voltage	V	380 - 400 – 415 3P + N		
Permissible input voltage variation	%	+15% / -15		
Line frequency	Hz	50 – 60		
Permissible input freq. variation	%	± 10		
Input current @ 380V (normal operation)	A	99	131	164
Power factor (nominal)	-	0.8		
Current total harmonic distortion	%	< 30		
Current rating of neutral cable	-	1.4 times rated current		

INPUT DATA (BYPASS)	Units	Power (kVA)		
		60	80	100
Bypass voltage	V	380 - 400 – 415 3P + N		
Permissible bypass voltage variation	%	± 5		
Bypass frequency	Hz	50 - 60		
Permissible bypass freq. variation	%	± 5		

BATTERY & DC	Units	Power (kVA)		
		60	80	100
Limits for proper inverter operation	V	320 – 475		
Number of batteries in one arm	-	32		
Float charge voltage	V	432		
End of discharge voltage	V	320		
Rectifier output current rating	A	150	200	250
Battery charging current (maximum)	A	30	40	50
Ripple	%	< 1%		

INVERTER OUTPUT	Units	Power (kVA)		
		60	80	100
Voltage	V	380 – 400 – 415V 3P + N		
Current (@380V , pf = 0.8, nominal)	A	91	121	151
Power factor	-	0.8 lagging		
Power at 0.8 power factor	kVA	60	80	100
Power at 1.0 power factor	kVA	48	64	80
Maximum non-linear load	-	3 : 1		
Voltage stability – steady state	%	± 1 %		
Voltage stability - transient	%	± 7 %		
Voltage phase shift	Degress	120		
Output voltage distorsion (lineer load)	%	< 3 %		
Output voltage distortion (non-linear load, 3:1 crest factor)	%	< 10 %		

ENVIROMENTAL	Units	Power (kVA)		
		60	80	100
Operating temperature	° C	0 / 40		
Relative humidity	%	< 90% at 23 ° C		
Altitude	M	< 1000 m		
Storage temperature	° C	-25 / 70		
Acoustic noise	dBA	57	57	58
Standart – EMC	-	EN 50091 - 2		
Standart - Safety	-	EN 50091 - 1		

1.4.3 SPECIFICATIONS for 120 – 160 - 200 kVA

INPUT DATA (MAINS)	Units	Power (kVA)		
		120	160	200
Line voltage	V	380 - 400 – 415 3P + N		
Permissible input voltage variation	%	+15% / -15		
Line frequency	Hz	50 – 60		
Permissible input freq. variation	%	± 10		
Input current @ 380V (normal operation)	A	196	263	328
Power factor (nominal)	-	0.8		
Current total harmonic distortion	%	< 30		
Current rating of neutral cable	-	1.4 times rated current		

INPUT DATA (BYPASS)	Units	Power (kVA)		
		120	160	200
Bypass voltage	V	380 - 400 – 415 3P + N		
Permissible bypass voltage variation	%	± 5		
Bypass frequency	Hz	50 – 60		
Permissible bypass freq. variation	%	± 5		

BATTERY & DC	Units	Power (kVA)		
		120	160	200
Limits for proper inverter operation	V	320 – 475		
Number of batteries in one arm	-	32		
Float charge voltage	V	432		
End of discharge voltage	V	320		
Rectifier output current rating	A	300	400	500
Battery charging current (maximum)	A	60	80	100
Ripple	%	< 1%		

INVERTER OUTPUT	Units	Power (kVA)		
		120	160	200
Voltage	V	380 – 400 – 415V 3P + N		
Current (@380V , pf = 0.8, nominal)	A	182	242	303
Power factor	-	0.8 lagging		
Power at 0.8 power factor	kVA	120	160	200
Power at 1.0 power factor	kVA	96	128	160
Maximum non-linear load	-	3 : 1		
Voltage stability – steady state	%	± 1 %		
Voltage stability - transient	%	± 7 %		
Voltage phase shift	Degress	120		
Output voltage distorsion (linear load)	%	< 3 %		
Output voltage distortion (non-linear load, 3:1 crest factor)	%	< 10 %		

ENVIROMENTAL	Units	Power (kVA)		
		120	160	200
Operating temperature	° C	0 / 40		
Relative humidity	%	< 90% at 23 ° C		
Altitude	M	< 1000 m		
Storage temperature	° C	-25 / 70		
Acoustic noise	dBA	58	59	59
Standart – EMC	-	EN 50091 - 2		
Standart - Safety	-	EN 50091 - 1		

2. SETUP

2.1 OPENING PACKAGE

When the equipment is delivered to you, first to be examined is a possible damage during transport. Therefore, examine the equipment carefully. For a possible future use, save the packet and wooden pad of the rectifier after unpacking.

2.2 CHOOSING PROPER PLACE

1. For a proper ventilation, minimum distance between the rear of the rectifier and any nearby object should be minimum 20 cm.
2. Choose a place with proper temperature and humidity.
3. Do not choose any place which can cause dust and corrosion.
4. The place chosen should not have direct sunshine and shouldn't be near any heating source.
5. Operating the equipment in proper conditions will increase its lifetime.

2.3 ELECTRICAL CONNECTION

All electrical connections of the UPS exist on the back of the front door of the enclosure. All required connections to connection panel of UPS should be made by dealers service personnel or by the approval of dealers service personnel.

Before making the connections all power switches, isolators and circuit breakers must be in OFF position. Ground must be connected to the distribution panel.

CAUTION

Connect and control ground (PE) connection. Definitely, the equipment shouldn't be operated without ground connection.

3. DISPLAY PANEL

3.1 STRUCTURE OF LCD & LED DISPLAY PANEL

The display panel of LEON-A series UPS contains a 4x20 character LCD (Liquid Crystal Display), keypad and leds. Via LCD, measurements and status / alarm messages are displayed. Components of the display panel and their functions are given below.

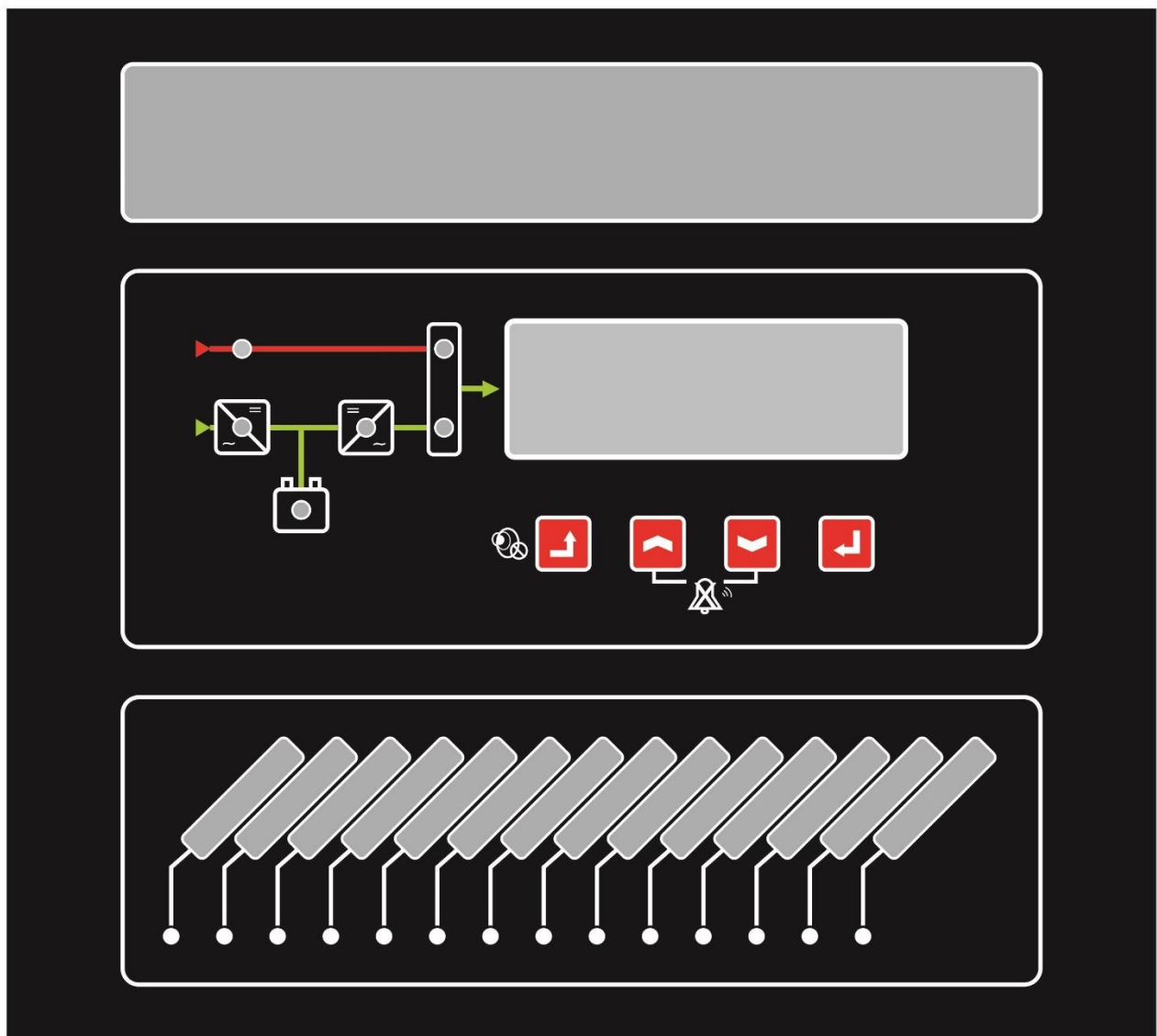


Figure 3-1 LEON-A series UPS LCD & Led Panel Panel

3.1.1 LCD DISPLAY & KEYPAD

A four key keypad and a 4x20 character keypad is provided. There are ESC, UP, DOWN and ENTER keys to navigate within the menu structure. All operational parameters can be modified via the LCD display and keypad.



ENTER : Pressing ENTER, when selecting options, displays the next window. The next window is determined by the option which has been selected in the present window. When selecting new parameters it saves the new parameters.

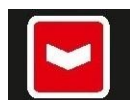


ESCAPE : Pressing the ESCAPE cancels the most recent actions; i.e. when selecting options it returns the previous window to the LCD; when setting parameters, it exits the window without saving the new settings.

Pushing this button for more than 10 seconds disables the current audible alarm. A disabled audible alarm is enabled only if all alarms are disappeared.



UP : This push-button moves a cursor up the LCD over the options offered on certain windows, and moves a rectangular cursor to the next digit on the right when changing parameter values in others.



DOWN : This push-button moves a cursor down the LCD over the options offered on certain windows, and changes the highlighted parameter values in others.

There is password protection to modify operation parameters. A key symbol on the most right character of the second LCD line is displayed, until correct password is entered (password disabled).

NOTE

To disable the audible alarm, push the ESCAPE button for more than 10 seconds.



3.1.1.1 ALARM LEDS

Some of the individual alarm and message states are displayed separately by led indicators.

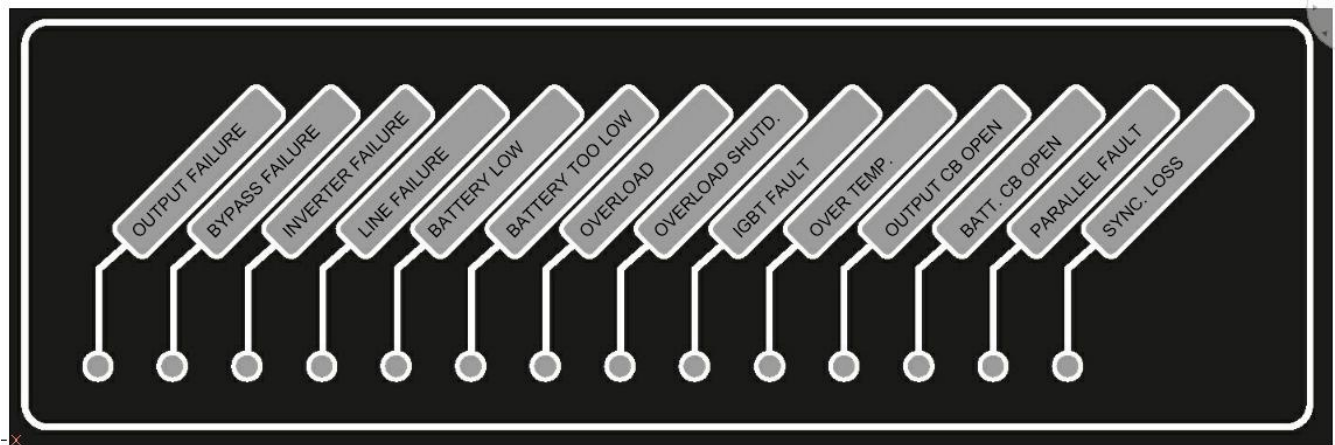


Figure 3-2 LEON-A Series UPS LCD & Led Panel - Alarm Leds

WARNING

The contents of the alarms shown are just examples. It may differ according to the device and the project.

3.1.1.2 FLOW LEDS

The power flow of the UPS and the operating status of the rectifier, inverter and Sts blocks are displayed on the flow indicator. The flow indicator helps to see the instant status of the UPS easily and at a glance.

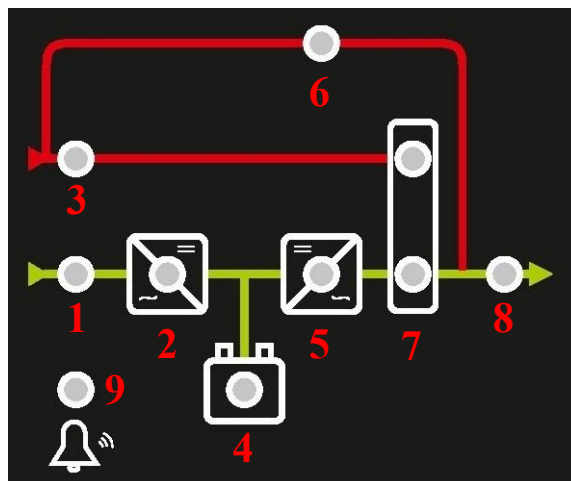


Figure 3-3 LEON-A Series UPS LCD & Led Panel - Flow Diagram

1	AC Input Led	
	Green - Continuous	3 Phase AC input is within tolerances.
	Red - Continuous	3 Phase AC Input is OK, but phase sequence is wrong
	No light	3 Phase AC Input is out of tolerances

2	Rectifier Led	
	Green - Continuous	Rectifier is ON, no alarm.
	Green - Blinking	Rectifier is OFF, no alarm, with automatic start
	Red - Continuous	Rectifier is OFF, because of an alarm
	Red - Blinking	Rectifier is OFF, alarm exists, with automatic start
	No light	Rectifier is OFF

3	Bypass Input Led	
	Green - Continuous	3 Phase Bypass Input is OK and is within tolerances
	Red - Continuous	3 Phase Bypass Input is OK, but phase sequence is wrong
	No light	3 Phase Bypass Input is out of tolerances

4	Battery Led	
	Green - Continuous	Battery voltage is OK, Battery CB is ON
	Green - Blinking	Battery voltage is OK, but Battery CB is OFF
	No light	Battery voltage is not OK.

5	Inverter Led	
	Green - Continuous	Inverter is ON, no alarm
	Green - Blinking	Inverter is OFF, no alarm, with automatic start
	Red - Continuous	Inverter is OFF, because of an alarm
	Red - Blinking	Inverter is OFF, because of an alarm, with automatic start
	No light	Inverter is OFF

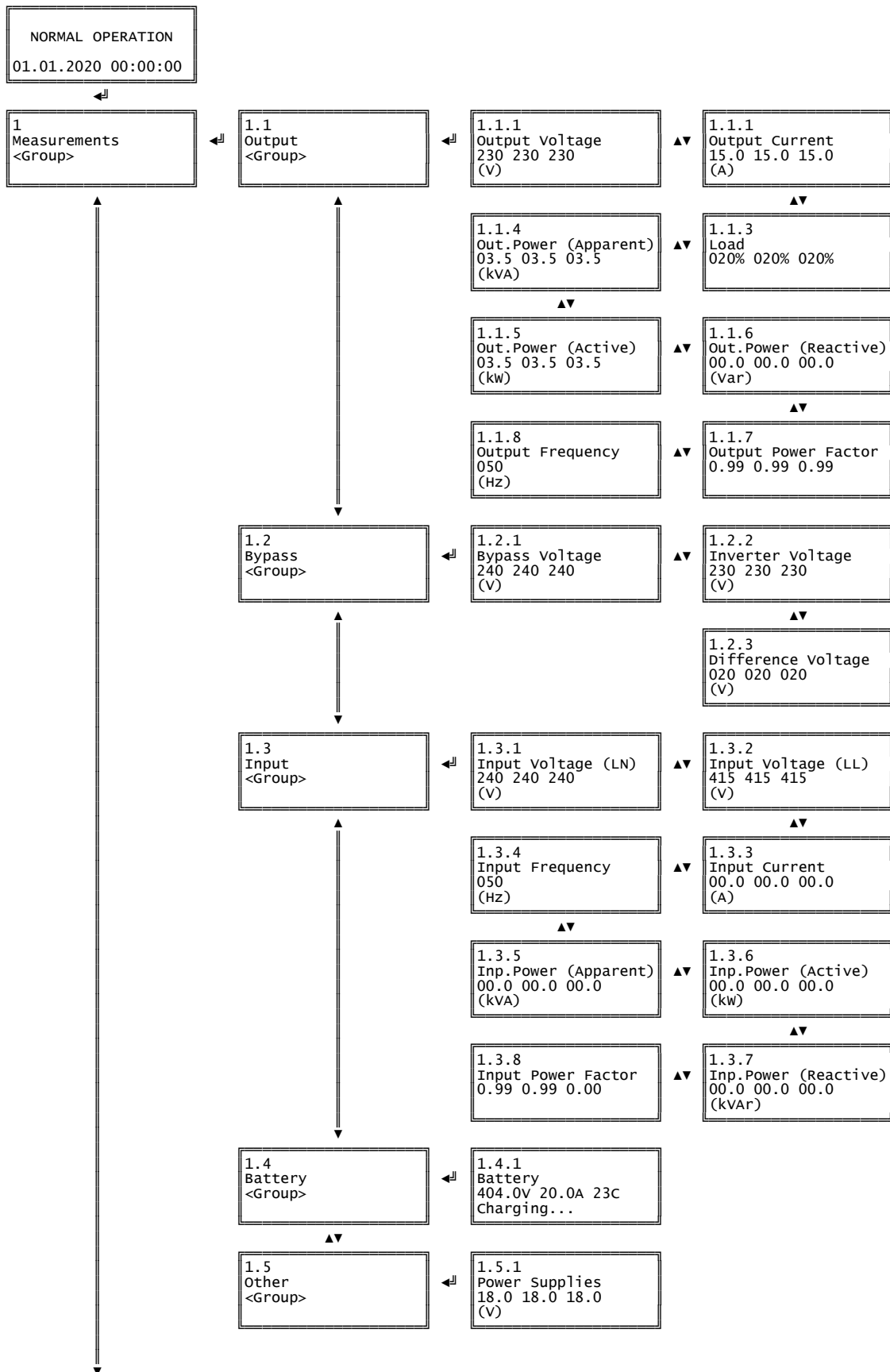
6	Maintenance Bypass Led	
	Green - Continuous	Maintenance Bypass is ON
	No light	Maintenance Bypass is OFF

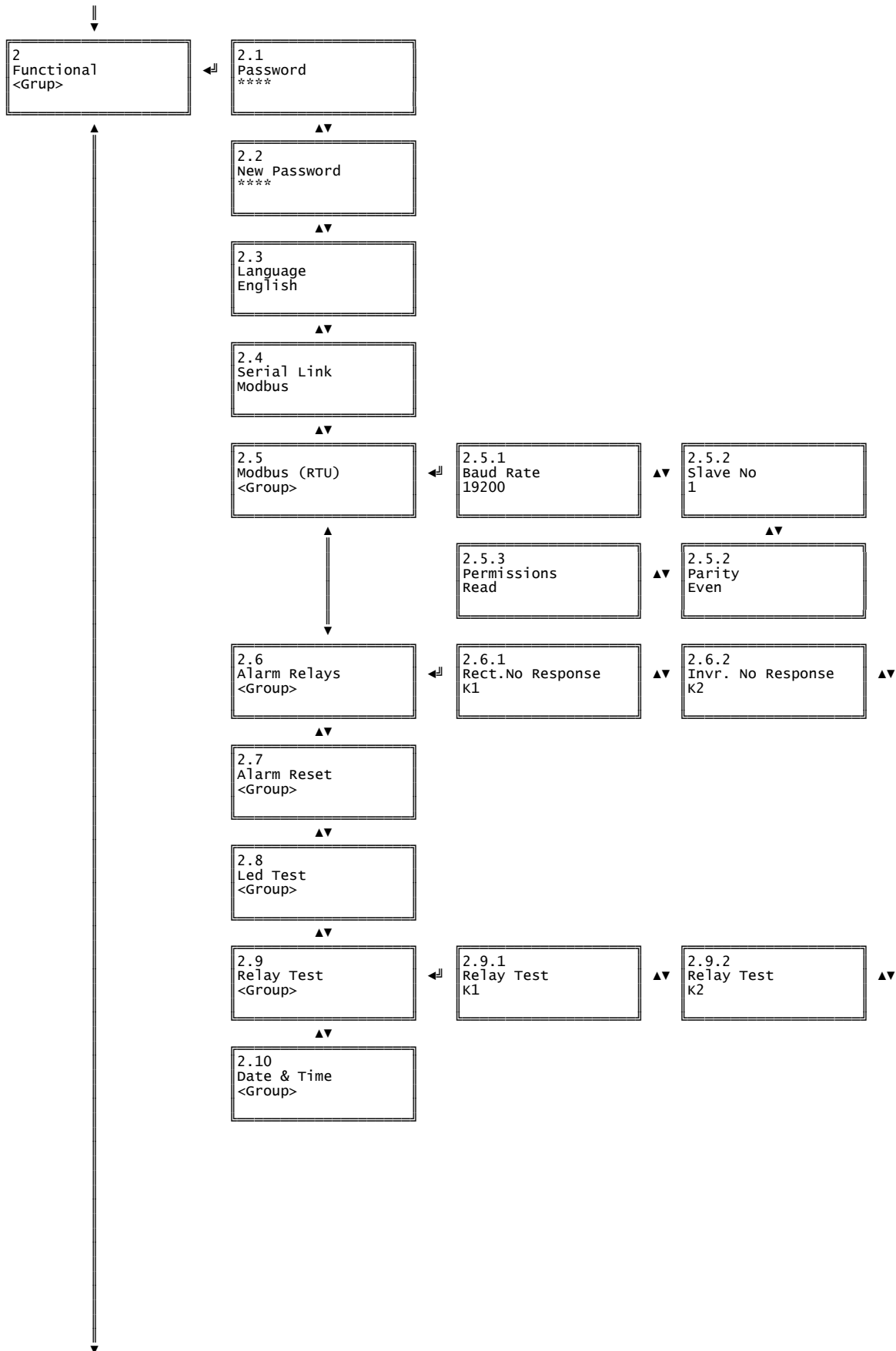
7	Sts Leds	
	Green - Continuous	The source of the corresponding led is switched to output.
	No light	No source is switched to output.

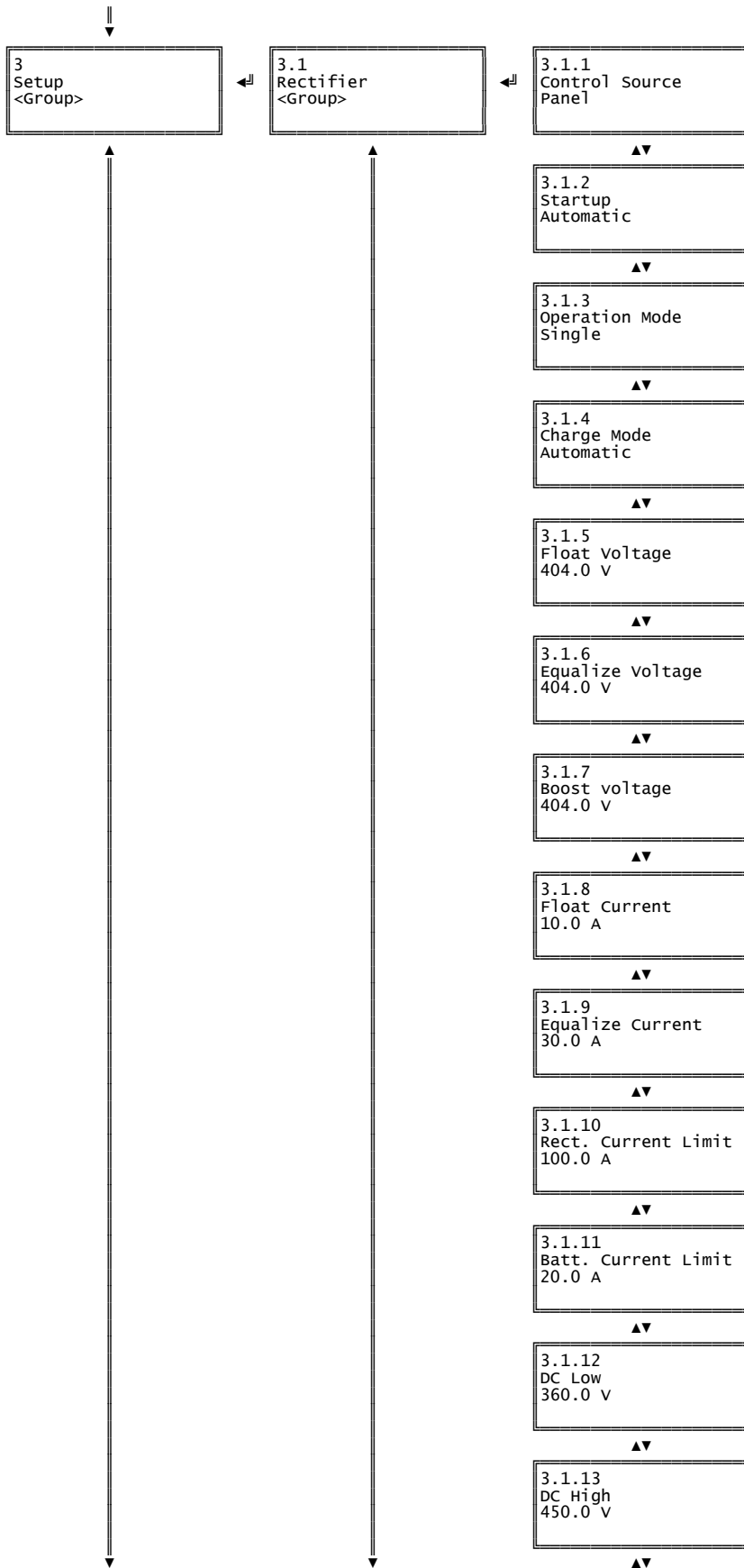
8	Output Led	
	Green - Continuous	Output is OK and output voltage is within tolerances
	No light	No output voltage is present

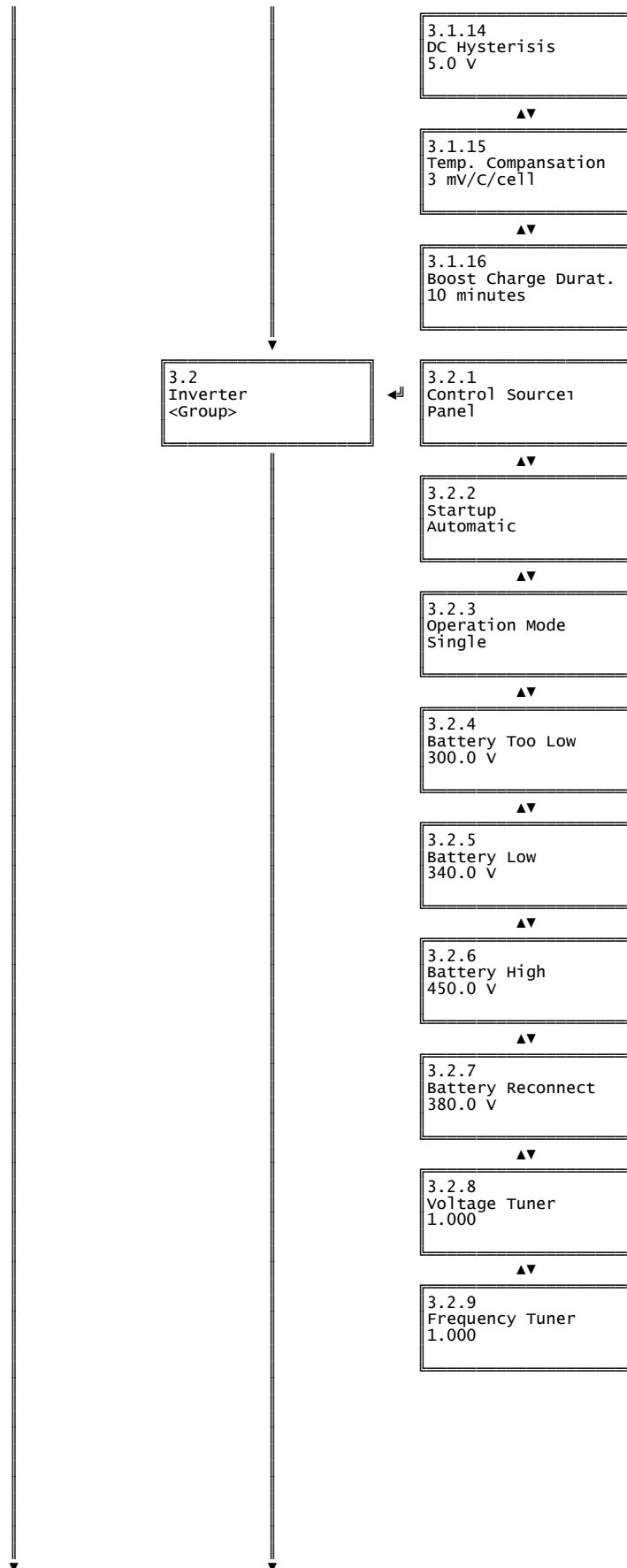
9	Common Alarm Led	
	Red - Continuous	Common Alarm is present
	No light	No common alarm is present

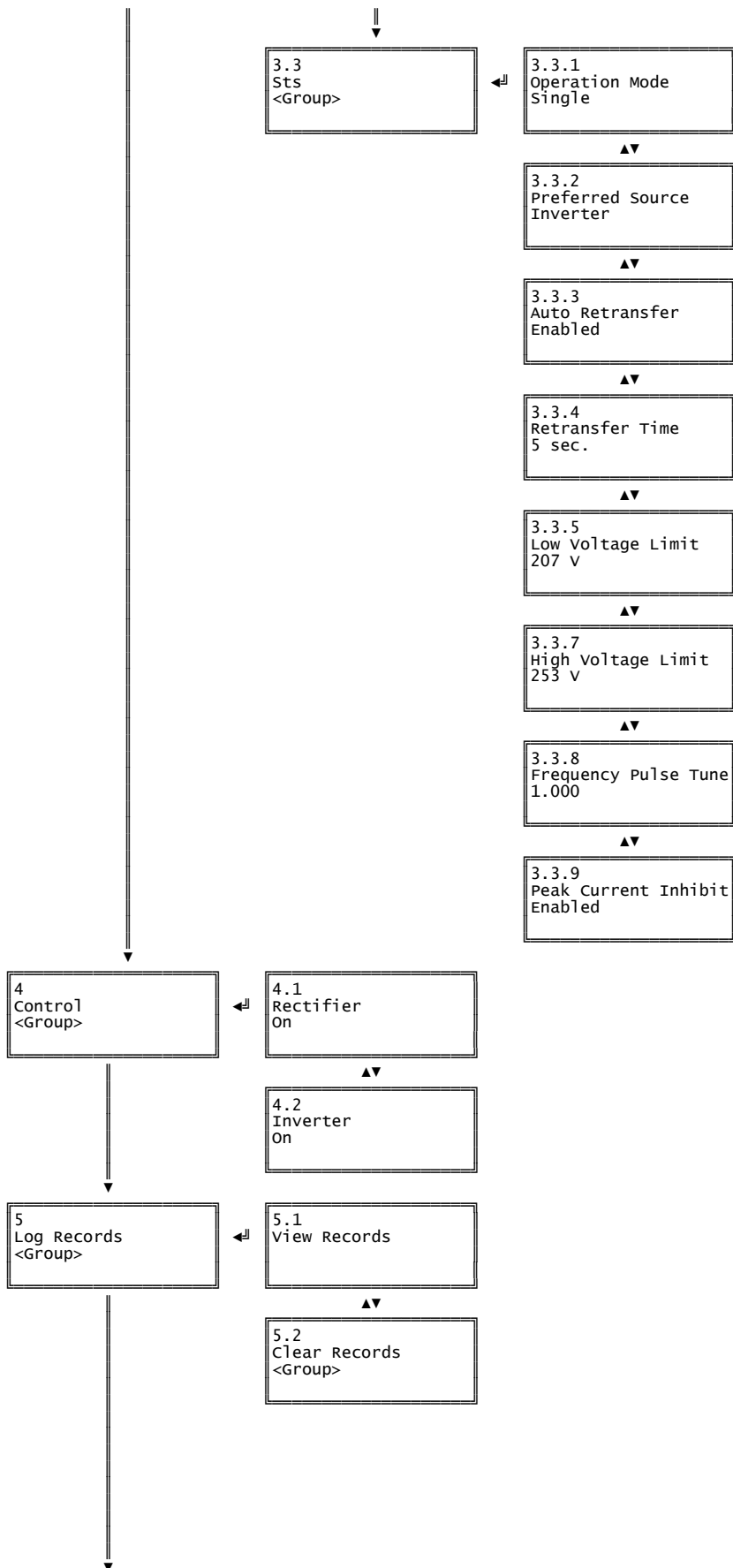
3.1.2 MEASUREMENT, CONTROL AND SETTING MENUS STRUCTURE

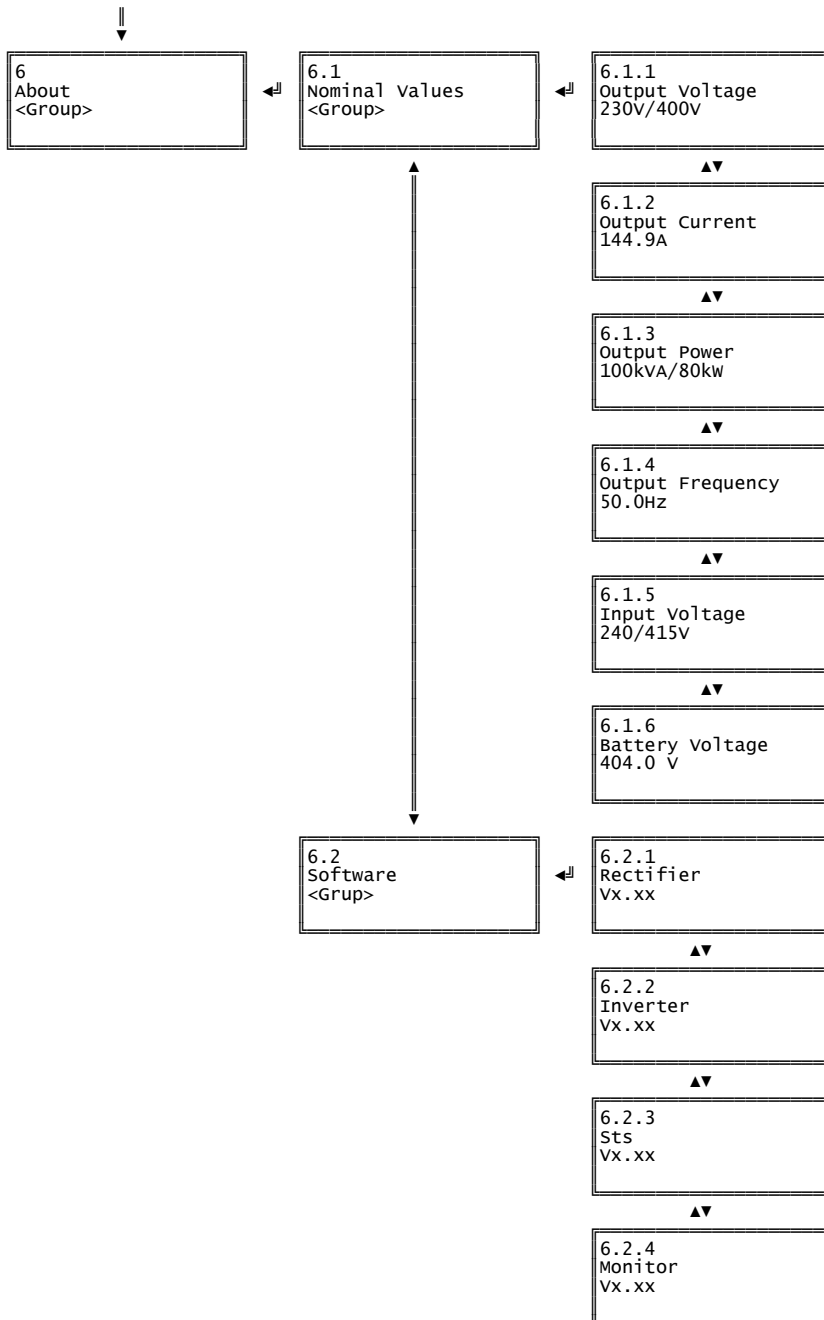








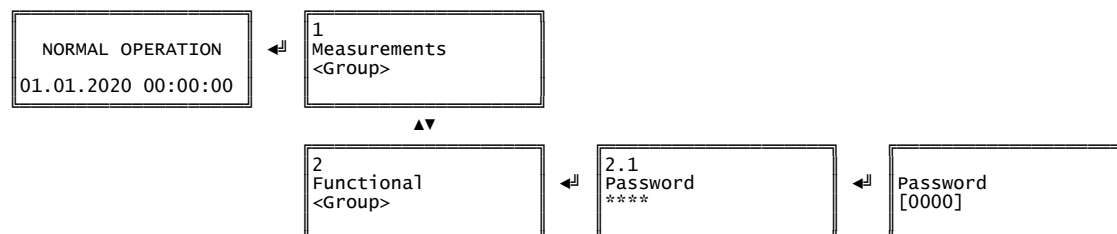




3.1.3 ENTERING USER PASSWORD

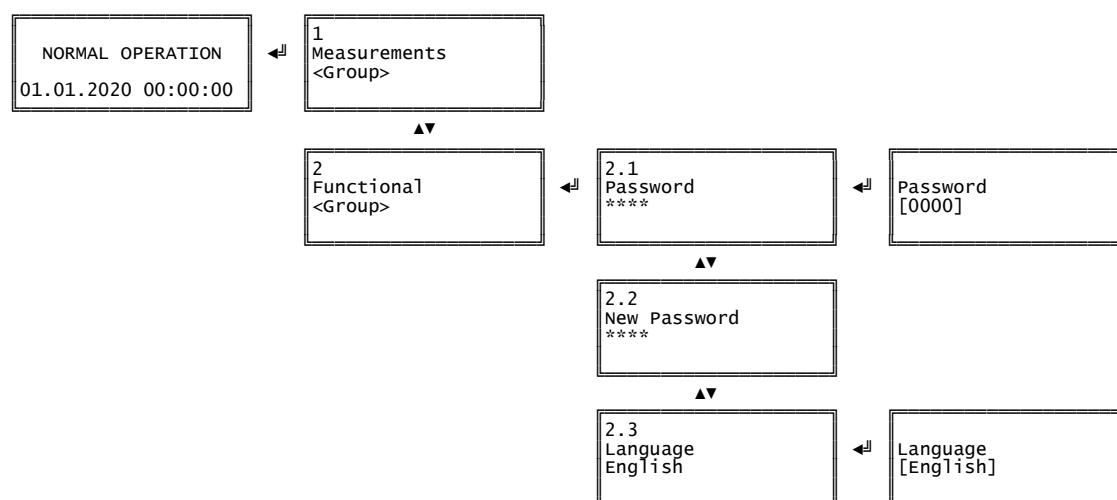
Parameters that can be adjusted by the user can be observed without entering a password. However, in order to change the parameter, the user password must be entered.

The user password can be entered by clicking the Main Screen / Functional / Password item.



3.1.4 CHANGING THE LCD PANEL LANGUAGE

The device front panel language can be changed from the Functional /Language item under the Main Menu.

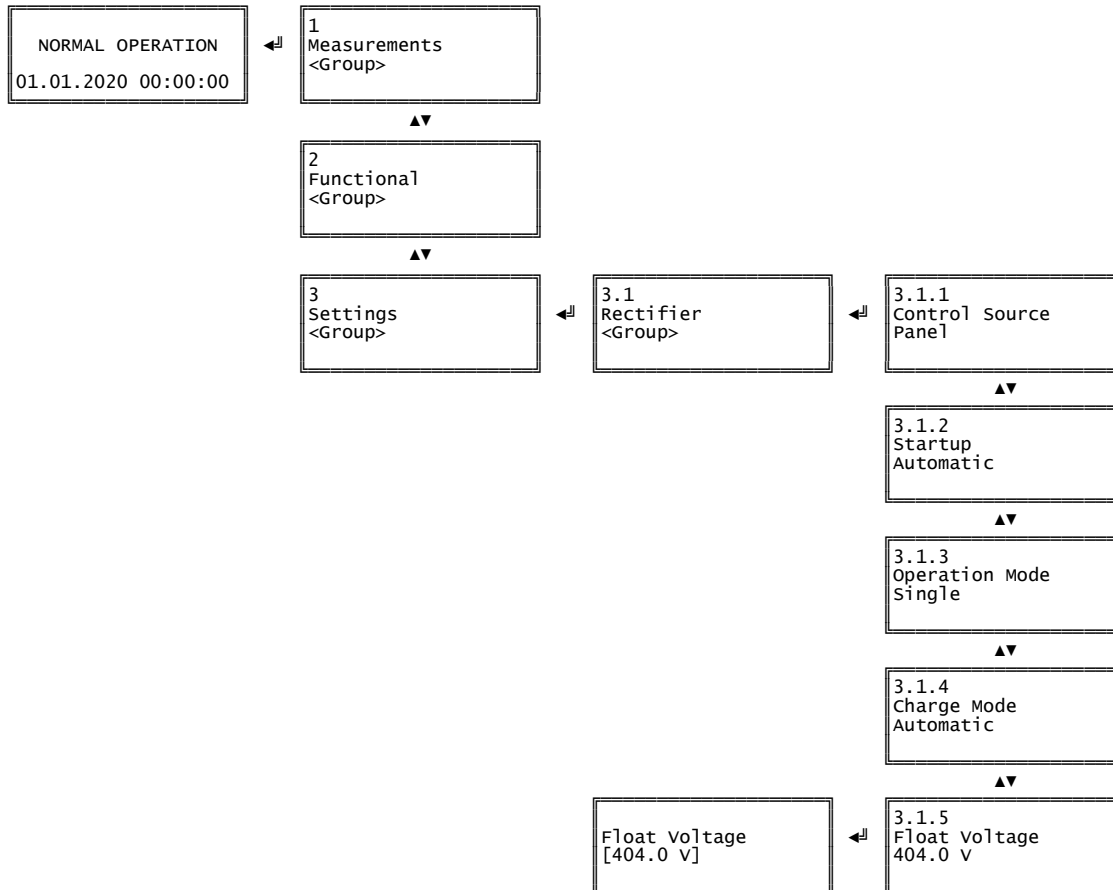


3.1.5 CHANGING THE DEVICE PARAMETERS

Device parameters can be adjusted separately for Rectifier, Inverter and Sts in the Settings menu.

The following example shows how to adjust the Rectifier Float Charge voltage.

Before this process, the user password must be entered as specified in Section 3.1.3.



3.2 TOUCH SCREEN DEVICES

The graphical display provides monitoring and control of the UPS in a color graphical environment.

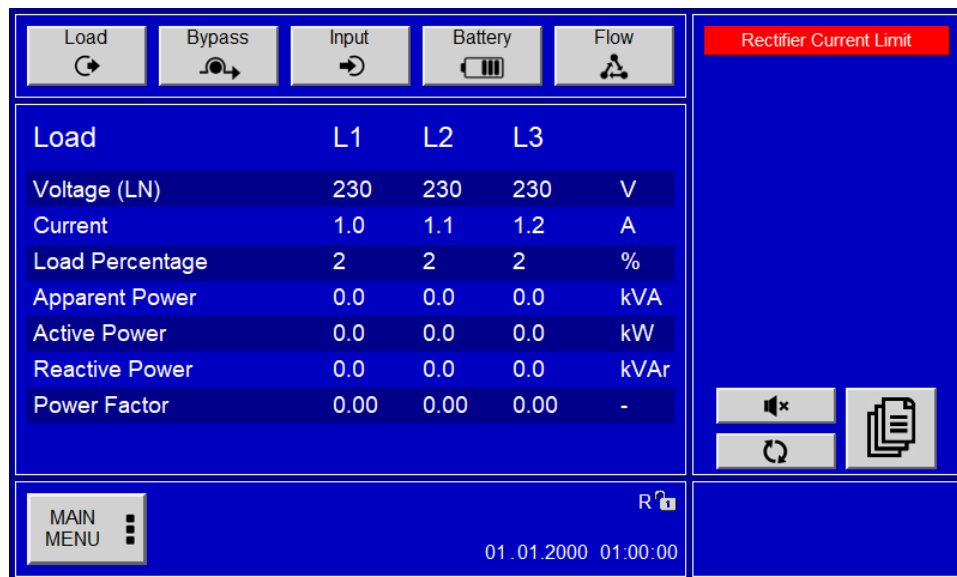


Figure 3-4 LEON-A Series UPS Display Panel Graphic Display

3.2.1 TOUCH SCREEN PANEL SECTIONS

3.2.1.1 MEASUREMENTS PAGES AND FLOW DIAGRAM

On the graphic screen, on the main screen, the measurements of different parts of the UPS can be displayed as a group, or the general status of the entire UPS can be displayed with a single flow diagram.

LOAD MEASUREMENTS



Figure 3-5 LEON-A Series UPS Touch Screen Panel - Load Measurements

BYPASS MEASUREMENTS



Figure 3-6 LEON-A Series UPS Touch Screen Panel - Bypass Measurements

AC INPUT MEASUREMENTS



Figure 3-7 LEON-A Series UPS Touch Screen Panel - AC Input Measurements

BATTERY MEASUREMENTS

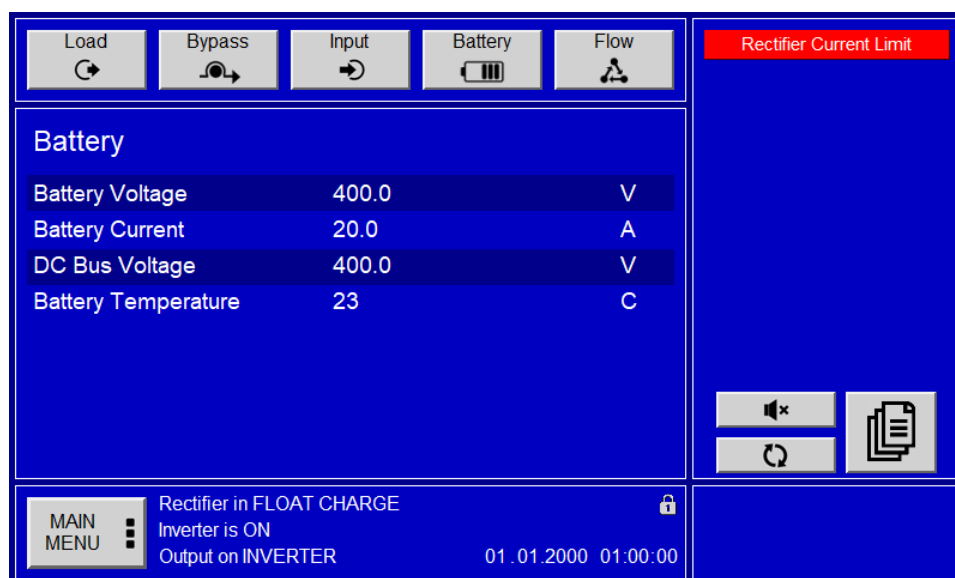


Figure 3-8 LEON-A Series UPS Touch Screen Panel - Battery Measurements

FLOW DIAGRAM

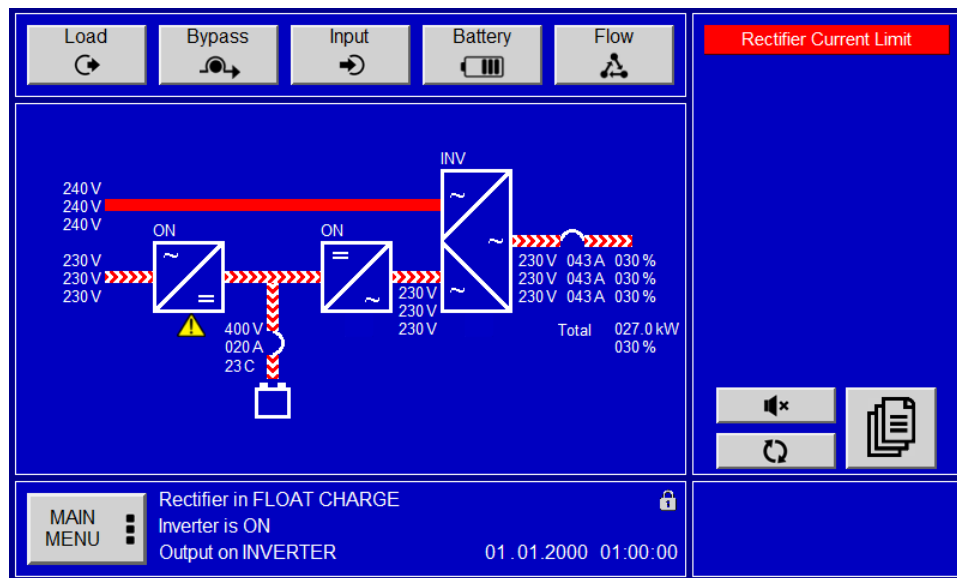


Figure 3-9 LEON-A Series UPS Touch Screen Panel - Flow Diagram

The Flow Diagram screen provides a simple summary of the current status of the UPS in a single view. Here, the rectifier, inverter and STS blocks, state-monitored switches and power flow direction can be monitored separately. On each block, there is information about where it is at that moment.



The “warning mark” icon indicates that there is an alarm concerning the block it is under. For example, since the "Rectifier Current Limiting" alarm concerns the rectifier, a warning sign is displayed under the rectifier block if this alarm is received.



The “question mark” icon appears next to the battery when the battery switch is OFF, because the battery and the UPS are disconnected, and indicates that the UPS is not aware of whether there is a battery at the other end of the switch.

3.2.1.2 ALARM SECTION

In the alarm window, available alarms are displayed. When there is no alarm, “No Alarm” text is displayed.

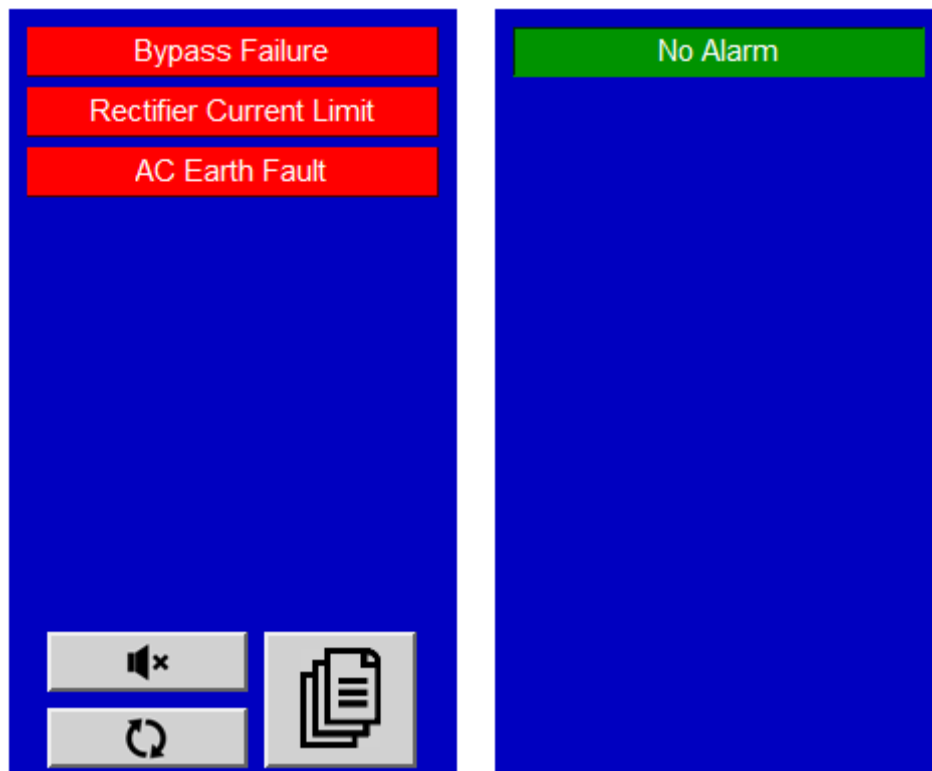


Figure 3-10 LEON-A Series UPS Touch Screen Panel - Alarm Section



The “Mute” button is used to silence the audible alarm. After pressing this button, if another new alarm is detected, the audible alarm will automatically reactivate. This button does not appear when there is no alarm.



The refresh button is used to refresh displayed alarms. This button does not appear when there is no alarm.



The alarm window button is used to display all available alarms in the same window when there are more than 10 alarms to be displayed in the alarm window. In this way, 30 different alarms can be displayed in the same window. This button does not appear when there is no alarm.

3.2.1.3 STATUS SECTION

In the status window, the current status of the rectifier, inverter and Sts, current time and date information, and the status of the user password are displayed. The button to switch to the main menu is also located in this section.

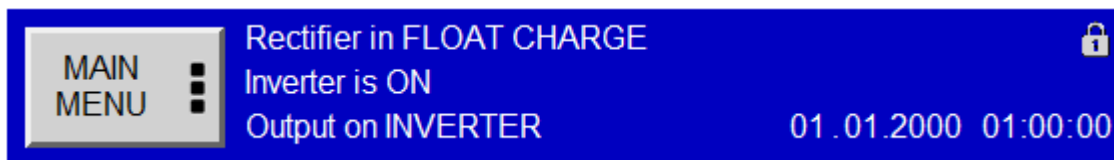


Figure 3-11 LEON-A Series UPS Touch Screen Panel - Status Section

The lock sign in the upper right corner of this section shows the current status of the user password.

3.2.2 MEASUREMENT, CONTROL AND SETUP MENU STRUCTURE

The main menu is accessed by pressing the MAIN MENU icon on the main screen.

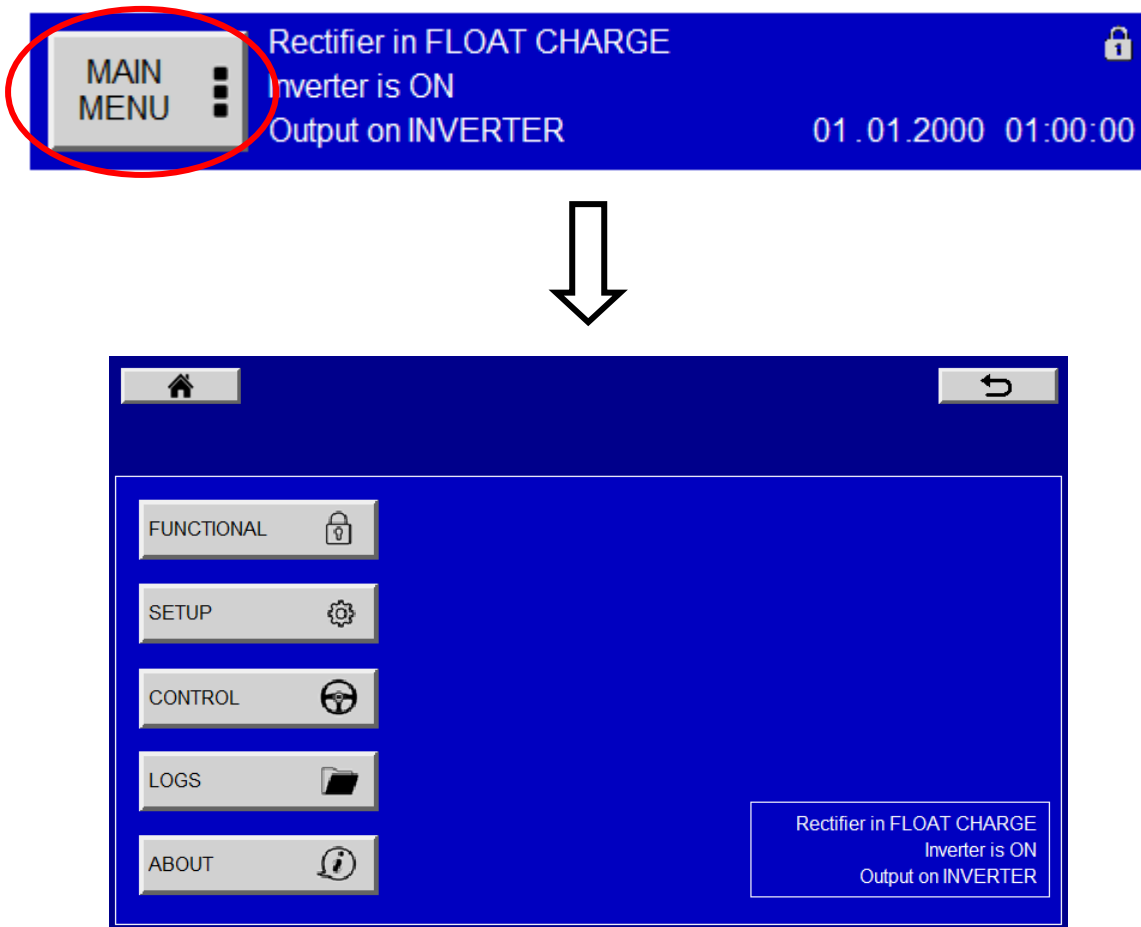


Figure 3-12 LEON-A Series UPS Touch Screen Panel - Main Menu Page



The “Home” sign returns to the main measurements screen.



The “Back” sign returns to the previous page.



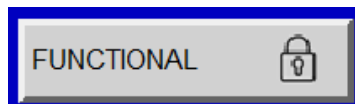
The “Next Page” sign provides the transition to the next page.



The “Previous Page” sign provides the transition to the previous page.



The “Save” sign allows the adjustments made to be saved.



Functional submenu is the environment where Password, Language, Communication and Date & Time functions of the device are set.

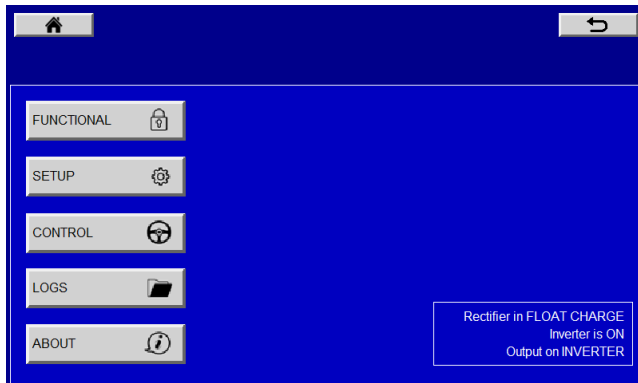
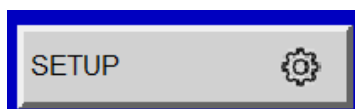


Figure 3-13 LEON-A Series UPS Touch Screen Panel - Functional Menu Page



Settings submenu is the environment where the operating values of the device such as voltage and current are set separately for rectifier, inverter and Sts.

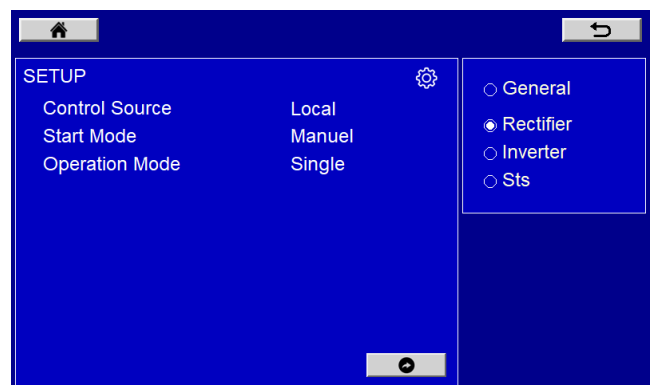
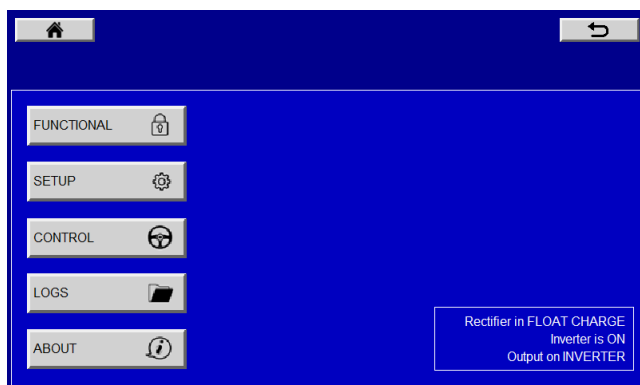
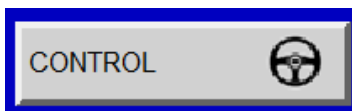


Figure 3-14 LEON-A Series UPS Touch Screen Panel - Setup Menu Page

On the right side, the parameters that can be adjusted by selecting the device on which the parameter will be changed are displayed. Rectifier, inverter and Sts have different parameters.



The Control Submenu provides controls for toggling the device's blocks on or off.

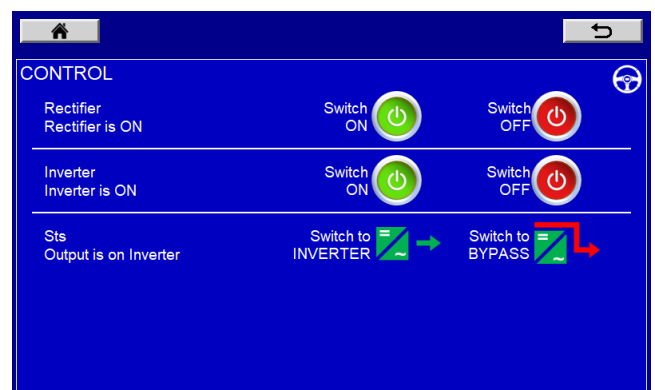
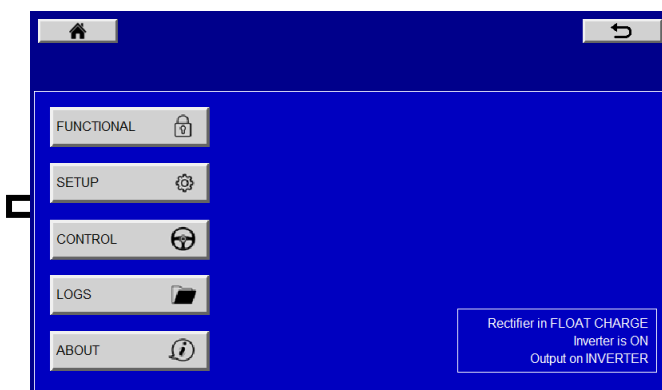


Figure 3-15 LEON-A Series UPS Touch Screen Panel - Control Menu Page

Access to the control submenu is password protected to prevent unauthorized use.



The Logs submenu provides access to the UPS's historical alarm logs. Alarm records are kept with date and time information.

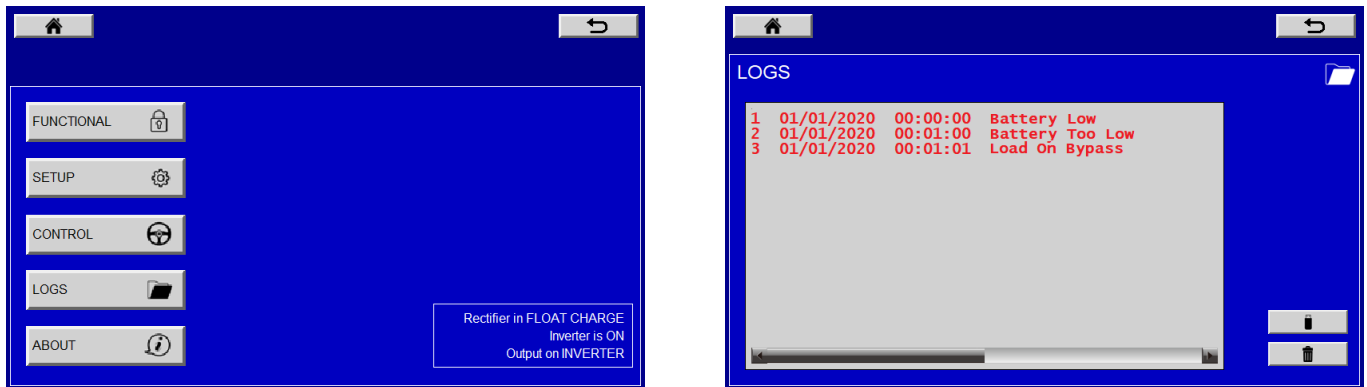


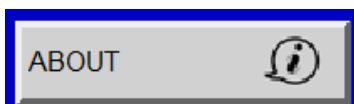
Figure 3-16 LEON-A Series UPS Touch Screen Panel - Logs Menü Page



The USB icon enables the existing alarm records to be transferred to the USB memory.



The “Trash” icon ensures that existing alarm records are deleted. It is password protected.



The “About” screen provides the display of the nominal values, software versions and the ethernet port MAC address of the device. There are no adjustable parameters in this field. It is for informational purposes only.

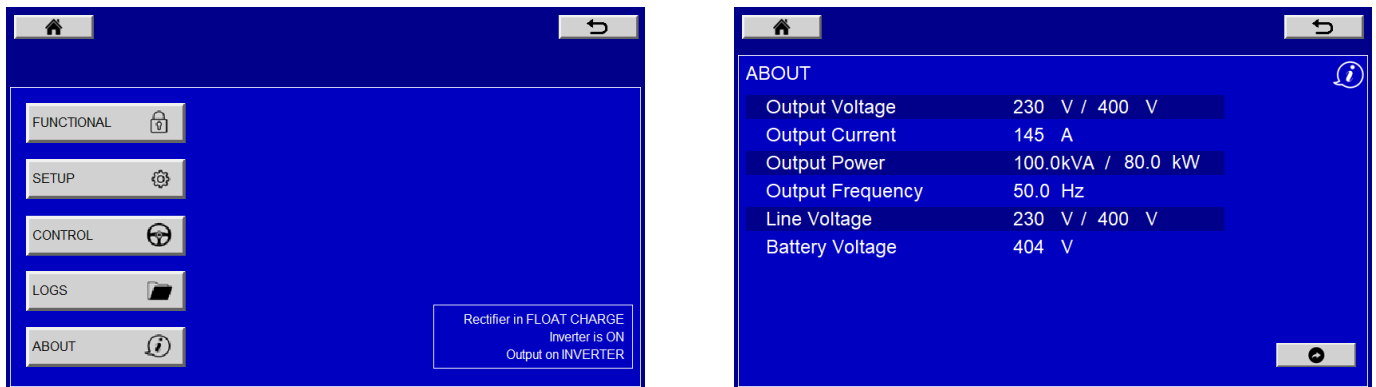
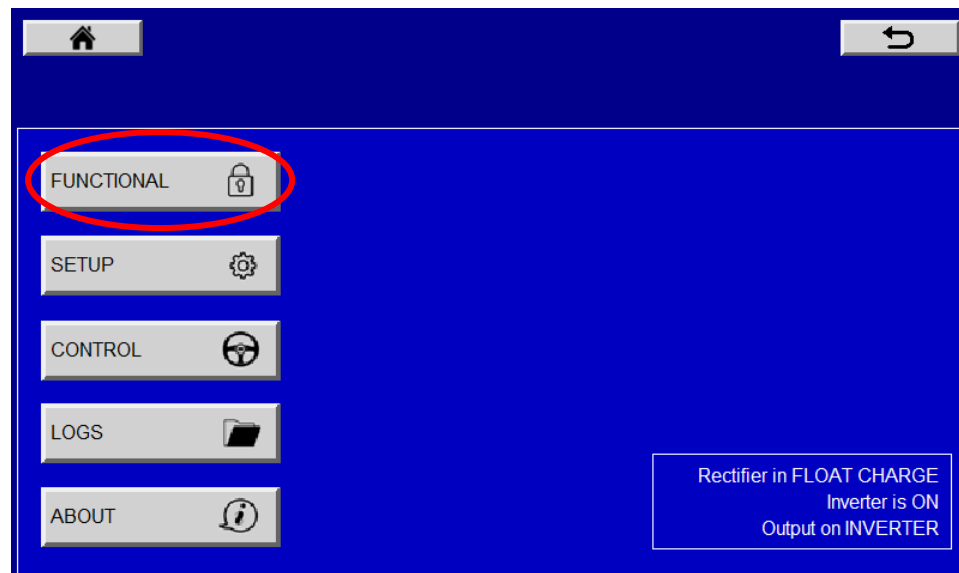
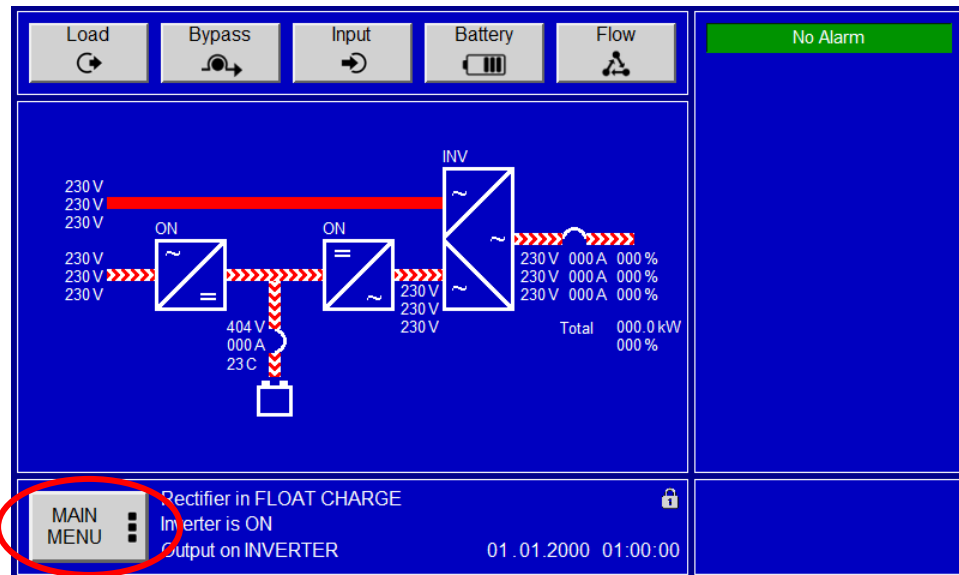


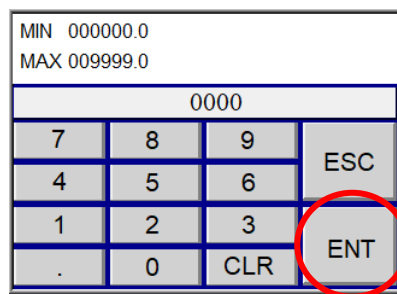
Figure 3-17 LEON-A Series UPS Touch Screen Panel - About Menu Page

3.2.3 ENTERING USER PASSWORD

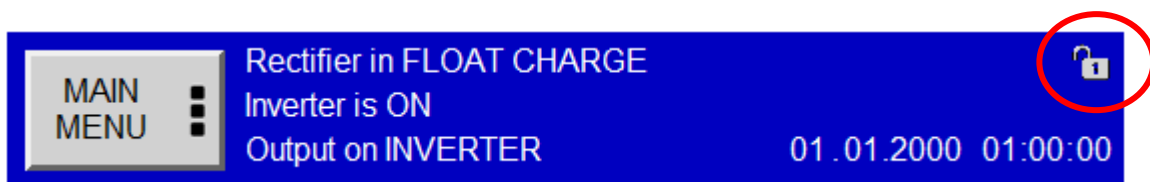
Parameters that can be adjusted by the user can be observed without entering a password. However, in order to change the parameter, the user password must be entered.

The user password can be entered by clicking the Main Screen / Functional / Password item.





If no user password is entered, the Lock sign appears as Locked in the upper right corner of the notification area on the Home Screen. If the user password has been entered, this mark will appear as Unlocked.



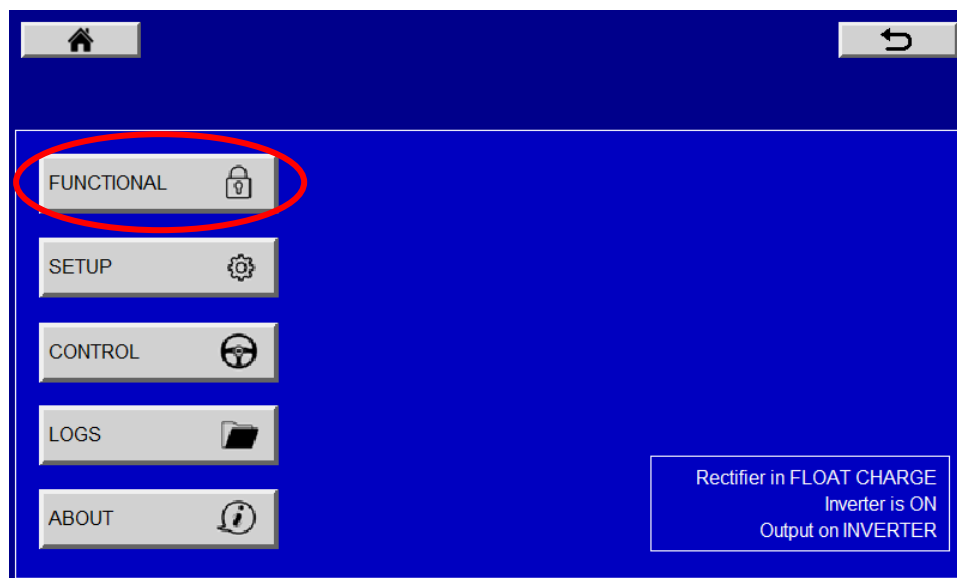
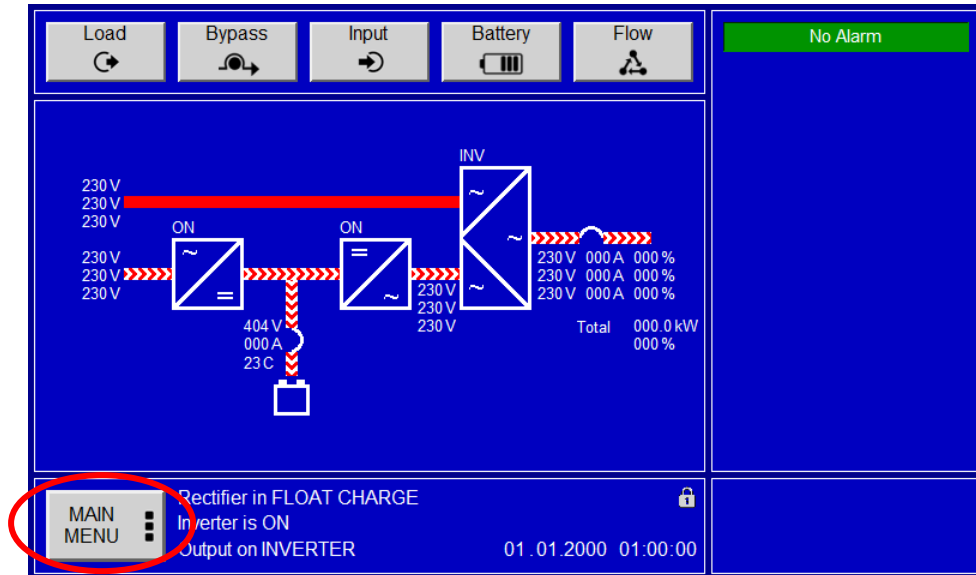
If no key is pressed for 5 minutes, the password protection is automatically reactivated.

NOTE

Default password is 0000.

3.2.4 CHANGING TOUCH SCREEN PANEL LANGUAGE

The device front panel language can be changed in the Functional submenu under the Main Menu. Before this process, the user password must be entered as specified in Section 3.2.3.



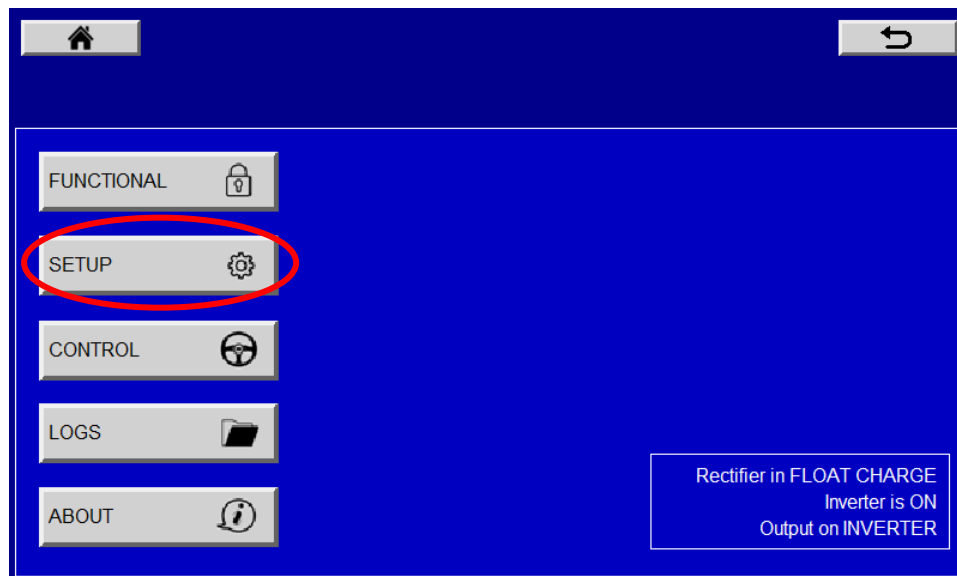
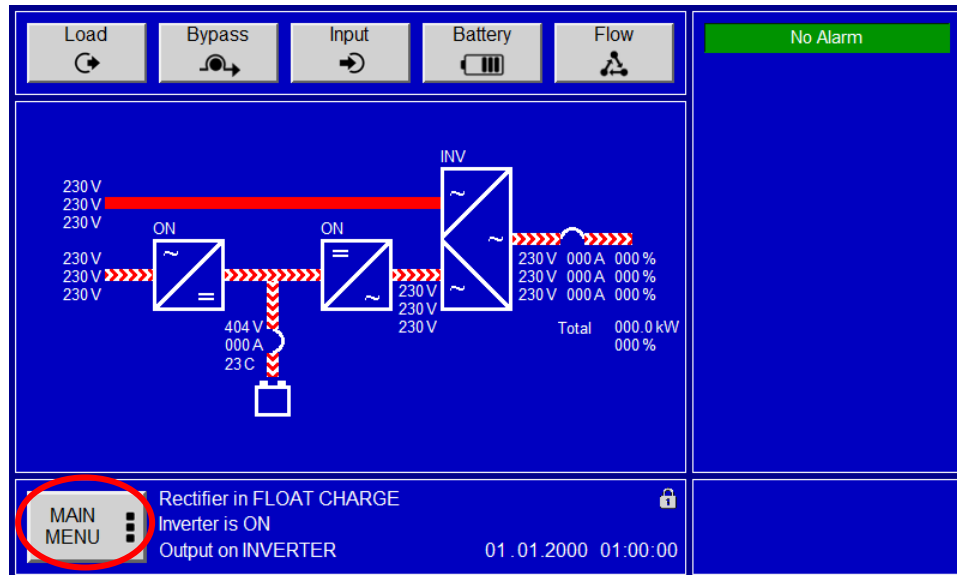


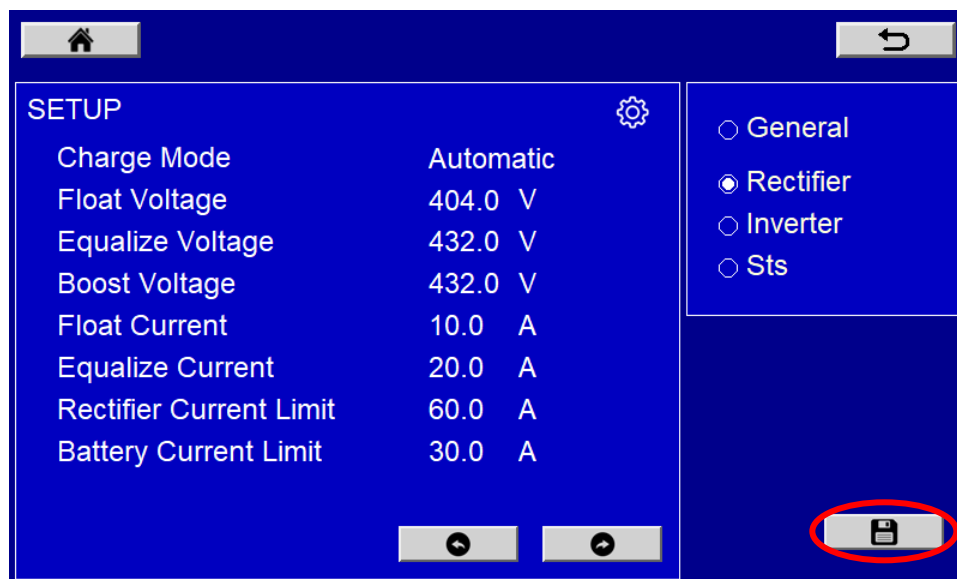
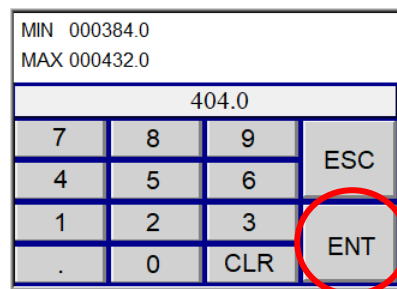
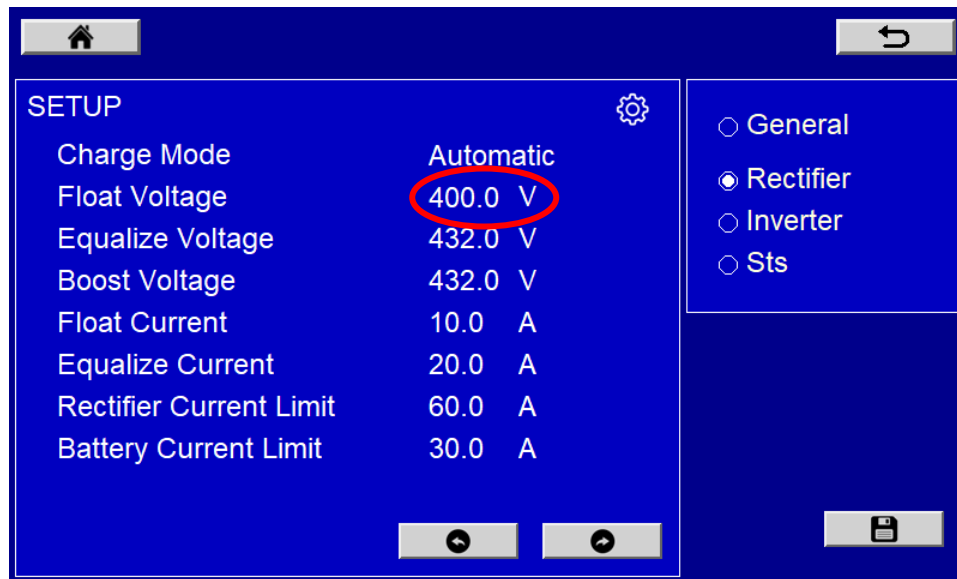
3.2.5 CHANGING THE DEVICE PARAMETERS

Device parameters can be adjusted separately for Rectifier, Inverter and Sts in the Settings menu.

The following example shows how to adjust the Rectifier Float Charge voltage.

Before this process, the user password must be entered as specified in Section 3.1.3.





3.2.6 MENU MAP

Main Menü

Functional

- Password
- New Password
- Language
- Serial Link
- Modbus RTU
 - Slave No
 - Baud Rate
 - Parity
 - Permissions
- Alarm Relays
- Relay Test
- Date & Time
- Modbus TCP

Setup

General

- Output Voltage
- Output Frequency
- Input Voltage
- Input Frequency
- Battery Cell Count
 - Cell Float Charge Voltage
 - Cell Equalize / Boost Charge Voltage
 - Cell Deep Charge (Cut Off) Voltage

Rectifier

- Control Source
- Startup
- Operation Mode
- Charge Mode
- Float Voltage
- Equalize Voltage
- Boost Voltage
- Float Current
- Equalize Current
- Rectifier Current Limit
- Battery Current Limit
- DC Low
- DC High
- Battery Too Low
- Battery Low
- Battery High
- DC Hysterisis
- Temperature Compansation
- Boost Duration
- Battery Test Voltage
- Battery Test Current

Inverter

- Control Source
- Startup
- Operation Mode
- DC Too Low
- DC Low
- DC High
- Voltage Tune
- Frequency Tune
- DC Reconnect

Sts

- Operation Mode
- Preferred Source
- Auto Retransfer
- Retransfer Time
- Low Voltage Limit
- High Voltage Limit
- Sync Voltage Limit
- Peak Current Inhibit
- Frequency Pulse Tune

Control

- Rectifier On / Off
- Inverter On / Off

Log Records

- View Logs
- Clear Logs

About

- Nominal
 - Output Voltage
 - Output Current
 - Output Power
 - Output Frequency
 - Input Voltage
 - Battery Voltage

Software

- Rectifier
- Inverter
- Sts
- Monitor

System

- Touch Screen IP Address
- Touch Screen MAC Address
- System Time

3.3 MONITOR, INFORMATION AND WARNING MESSAGES

Alarm and warning messages are displayed timely on the LCD display. Audible alarm is also provided at the mean time.

Possible alarm and warning messages are listed below.

Rectifier No Response

There is no communication between the rectifier and the monitor.
--

As long as the rectifier control processor is healthy, only the loss of communication does not prevent the system from continuing its normal operation.

Inverter No Response

Communication is not possible between the inverter and the monitor.

As long as the inverter control processor is healthy, only the loss of communication does not prevent the system from continuing its normal operation.
--

Sts No Response

Communication between sts and monitor is not possible.
--

As long as the sts control processor is healthy, only the loss of communication does not prevent the system from continuing its normal operation.

Rectifier Memory Error

Some parameters of the rectifier processor could not be loaded correctly from the memory at startup.
--

If the same alarm repeats after the UPS is turned off and then on again, the parameters need to be adjusted again, service support may be required.

Inverter Memory Error

Some parameters of the inverter processor could not be loaded correctly from memory at startup.

If the same alarm repeats after the UPS is turned off and then on again, the parameters need to be adjusted again, service support may be required.

Sts Memory Error

Some parameters of the sts processor could not be loaded correctly from memory at startup.
--

If the same alarm repeats after the UPS is turned off and then on again, the parameters need to be adjusted again, service support may be required.

Line Failure

The main 3 phase AC input network is outside the tolerances required for the operation of the rectifier. For this reason, the rectifier stops working until the mains recovers, if there are batteries in the system, the UPS continues to output until the batteries are used up.
--

Bypass Failure

The backup 3 phase AC bypass network is outside the tolerances that the UPS can accept. In case of an emergency, such as the batteries are dead or the inverter cannot output due to a malfunction, the UPS cannot use the bypass line as a backup and cannot transfer its output to the bypass.

Inverter Failure

The 3-phase AC voltage that the inverter should produce does not occur or it is outside the required limits. In these cases, the bypass line, if any, is used as a backup line in the usual situation, the UPS output is transferred to the bypass, but in this case, the output is unprotected against interruptions in the bypass line.

Output Failure

The output voltage of the UPS does not exist or it is outside the required limits. In these cases, the energy going to the load via the UPS's electronics is cut off.

Syncronisation Loss

There is a difference between the 3-phase AC voltage generated by the inverter and the 3-phase AC voltage coming from the bypass line, above the value that the UPS can accept, these sources are not synchronized with each other.

If this situation requires an interruption between the inverter and bypass, the UPS puts a gap of $\frac{1}{2}$ cycle time (10ms for 50Hz, 8.3ms for 60Hz) to this transition.

The UPS automatically tries to minimize the voltage difference between the voltage obtained from the inverter and the bypass source.

It is normal for this alarm to be received until the UPS synchronizes these sources after the UPS is turned on and the inverter occurs or the bypass voltage becomes available from nothing.

Battery Too Low

The battery voltage has dropped to the lowest level it should be. In this case, the inverter will shut itself down to protect the batteries and will stop generating 3-phase AC voltage. In this case, if the bypass source is available, the UPS will transfer its output to the bypass source.

Battery Too Low

The battery voltage has dropped to the lowest level it should be. In this case, the inverter will turn itself off to protect the batteries and will stop generating 3-phase AC voltage. In this case, if the bypass source is available, the UPS will transfer its output to the bypass source.

If this alarm has been received and the inverter has stopped running, the inverter will not start unless the battery voltage rises above the operating threshold again.

Battery Low

The battery voltage is below the required level and is approaching the lowest level. This alarm is the warning before the Battery Very Low alarm and after a while, depending on the battery capacity, the inverter will stop producing 3-phase AC voltage. For this reason, it is recommended that the loads be closed safely as soon as possible.

Battery High

The battery voltage is higher than it should be and therefore the inverter has stopped operating.

Rectifier Current Limit

The rectifier has reduced the output voltage it produces in order to limit the current drawn by the batteries to the set and allowable value. This situation is usually seen after using the batteries in long mains interruptions, when the mains comes back and the rectifier starts to charge the batteries again, and the batteries disappear by themselves after charging.

Overload

More power is drawn from the UPS output than the capacity of the UPS. If this situation continues, after a while, the UPS will stop outputting to protect itself. Loads need to be controlled and reduced quickly and below the limit of the UPS.

Overload Shutdown

More power was drawn from the UPS output than the UPS capacity, this situation continued for an allowable time, then the output of the UPS was cut off for self-protection. The UPS will not output again until this alarm is reset. Before resetting, loads must be controlled and lowered below the limit of the UPS.

Rectifier OverTemperature

The rectifier overheated for some reason and turned off to protect itself. The rectifier will wait until it cools down, then it will automatically start working again.

Inverter OverTemperature

The inverter overheated for some reason and shut down for self-protection. The inverter will wait until it cools down, then it will automatically start working again. In the moments when the inverter is not running, if the bypass source is available, the UPS will transfer its output to the bypass.

Sts OverTemperature

Sts overheated for some reason. However, this does not result in shutdown in order not to de-energize and protect the loads. For this reason, the reason for this situation should be investigated quickly, and if necessary, the loads should be controlled and reduced.

Battery CB Open

The battery switch (K5) is in the OFF position and for this reason, the UPS has been disconnected from the batteries. In any network interruption, the batteries that will back up the loads are not connected to the system because the switch is in the OFF position.

Output CB Open

The output switch (K4) is in the OFF position and therefore, the electronics of the UPS is disconnected from the loads. If the maintenance switch K3 is not ON, the loads are de-energized.

Bypass Maint Closed

Bypass maintenance switch (K3) is ON and therefore the output of the device is fed directly over the bypass line. In this case, the UPS never transfers its output to the inverter and continues to operate from the bypass line. Even if all switches of the UPS except K3 are turned OFF, the UPS will feed the loads through the mechanical maintenance switch.

Rectifier Fuse Failure

It is an optional alarm. It can only be seen on devices with this option.
A fast protection fuse located in the rectifier block is open circuit. Service is required.

Inverter Fuse Failure

It is an optional alarm. It can only be seen on devices with this option.
A fast protection fuse in the inverter block is open circuit. Service is required.

Sts Fuse Failure

It is an optional alarm. It can only be seen on devices with this option.
A fast protection fuse in the sts block is open circuit. Service is required.

Rectifier Fan Failure

It is an optional alarm. It can only be seen on devices with this option.
A malfunction has been detected in the fan or the fan fuse in the rectifier block.
Service is required.

Inverter Fan Failure

It is an optional alarm. It can only be seen on devices with this option.
A malfunction has been detected in the fan or the fan fuse in the inverter block.
Service is required.

Sts Fan Failure

It is an optional alarm. It can only be seen on devices with this option.
A fault has been detected in the fan or the fan fuse in the sts block.
Service is required.

Rectifier Hardware Block

It is an optional alarm. It can only be seen on devices with this option.
The rectifier is set to manual shutdown via the hardware shutdown input. This action is done for test and controlled commissioning purposes, usually via the hardware off switch on the interface board.

Inverter Hardware Block

It is an optional alarm. It can only be seen on devices with this option.
The inverter is in manual shutdown state via the hardware shutdown input. This action is done for test and controlled commissioning purposes, usually via the hardware off switch on the interface board.

Sts Hardware Block

It is an optional alarm. It can only be seen on devices with this option.
Sts has been set to manual shutdown via the hardware shutdown input. This action is done for test and controlled commissioning purposes, usually via the hardware off switch on the interface board.

Rectifier Parallel Fault

It is an optional alarm. It can only be seen on devices with this option.
In dual systems operating in parallel, it reports a problem in the CAN communication connection, which allows the rectifier blocks of the UPSs to work in parallel with each other. This may occur as a result of different parallel settings of the UPSs or an interconnection cable error, it is recommended to check the paralleling settings and the interconnection cable before calling the service.

Inverter Parallel Fault

It is an optional alarm. It can only be seen on devices with this option.
In binary systems operating in parallel, it reports a problem in the CAN communication connection, which allows the inverter blocks of the UPSs to work in parallel with each other. This may occur as a result of different parallel settings of the UPSs or an interconnection cable error, it is recommended to check the paralleling settings and the interconnection cable before calling the service.
The device set as master continues to work and feed the load, device set as slave cuts its output to avoid conflict.

Sts Parallel Fault

It is an optional alarm. It can only be seen on devices with this option.
In dual systems operating in parallel, it reports a problem in the CAN communication connection, which allows the Sts blocks of UPSs to work in parallel with each other. This may occur as a result of different

parallel settings of the UPSs or an interconnection cable error, it is recommended to check the paralleling settings and the interconnection cable before calling the service.

The device set as master continues to work and feed the load, device set as slave cuts its output to avoid conflict.

12 Pulse Failure

It is an optional alarm. It can only be seen on devices with this option.

In systems with 12-pulse rectifier, it reports a problem in the system operating the auxiliary bridge. In this case, the rectifier halves its capacity to protect itself.

Requires service.

Rectifier Probe Failure

It is an optional alarm. It can only be seen on devices with this option.

It reports a problem with the ambient temperature sensor used by the rectifier to measure the temperature of the batteries. The sensor may be faulty or disconnected. This will not prevent the system from operating normally, but the battery temperature compensation feature will be disabled.

Inverter Probe Failure

It is an optional alarm. It can only be seen on devices with this option.

The inverter reports a problem with the temperature sensor it uses to measure the coolant temperature.

The sensor may be faulty or disconnected. This does not prevent the normal operation of the system.

Sts Probe Failure

It is an optional alarm. It can only be seen on devices with this option.

Sts reports a problem with the temperature sensor it uses to measure the coolant temperature. The sensor may be faulty or disconnected. This does not prevent the normal operation of the system.

Emergency Stop

It is an optional alarm. It can only be seen on devices with this option.

The emergency stop input has been activated, therefore the rectifier, inverter and STS units of the UPS have stopped working and the UPS output has been cut off.

Door Open

It is an optional alarm. It can only be seen on devices with this option.

UPS cabinet door is open. This usually indicates that a staff member in the field is handling the device.

DC Earth Fault

It is an optional alarm. It can only be seen on devices with this option.

Indicates that there is an earth leakage in the DC system including the batteries, therefore the voltages between + and ground and - between ground and ground are unbalanced. Normal operation of the system will not be affected, but it is recommended to identify the cause of the leak.

AC Earth Fault

It is an optional alarm. It can only be seen on devices with this option.

Indicates that there is an earth leakage in the output AC system, the total phase currents and the neutral current are not equal to each other. Normal operation of the system will not be affected, but it is recommended to identify the cause of the leak.

Bypass Thyristor Fault

It is an optional alarm. It can only be seen on devices with this option.

It reports a malfunction in the semiconductor elements that enable the sts to transfer the bypass line to the output. As long as this fault persists, Sts cannot use the bypass line as a backup source and cannot transfer its output to the bypass line.

Service is required.

Inverter Thyristor Fault

It is an optional alarm. It can only be seen on devices with this option.

It reports a fault in the semiconductor elements that enable the sts to transfer the inverter line to the output. As long as this fault persists, Sts cannot use the inverter line as a backup source and cannot transfer its output to the inverter line. The loads cannot be fed by the batteries and if the UPS has transferred its output to the bypass line, the loads are unprotected against interruptions.

Service is required.

Inverter IGBT Fault

Indicates that there is a fault in the semiconductor elements that make up the block that enables the inverter to generate 3-phase AC voltage only in devices with this option, or that they have fallen into a fault state due to a current flowing from the output that is much higher than the capacity of these elements. As long as this fault persists, Sts cannot use the inverter line and cannot transfer its output to the inverter line. The loads cannot be fed by the batteries and if the UPS has transferred its output to the bypass line, the loads are unprotected against interruptions.

Service is required.

Bad Phase Sequence

Indicates that the phase order of the 3-phase input network is reversed. In this case, the rectifier cannot start. The problem can be solved by swapping any two phases of the 3-phase input network.

Load On Alternate Source

Indicates that the UPS output is supplied from the alternative source, not the preferred source that is set. If the inverter is set as the preferred source (on line operation), receiving this alarm indicates that the load is powered by the bypass source.

Retransfer Inhibit

It states that the back-transfer feature of the UPS is turned off manually, therefore, if the UPS output is transferred to an alternative source for any reason, it will not return to the inverter source without user intervention. If this alarm is active, for example, if the load is transferred to the bypass line, it will not be transferred back to the inverter without user intervention.

Power Supply Fault

Indicates that one of the power supplies feeding the electronic control system of the UPS is faulty and cannot produce the expected voltage. Most likely, it points to a faulty power supply.
Requires service, faulty power supply must be replaced.

Load On Battery

Indicates that the rectifier of the UPS is not working and that the UPS can feed the output loads via batteries. After a while, Battery Low and then Battery Very Low message will be received and the UPS will cut off its output because the batteries are exhausted. It is recommended that the loads be closed safely as soon as possible.

Battery Test Failed

It is an optional alarm. It can only be seen on devices with this option.
Indicates that the most recent battery test failed, the batteries are not feeding the load as expected. It is recommended to check the batteries.

4. OPERATION

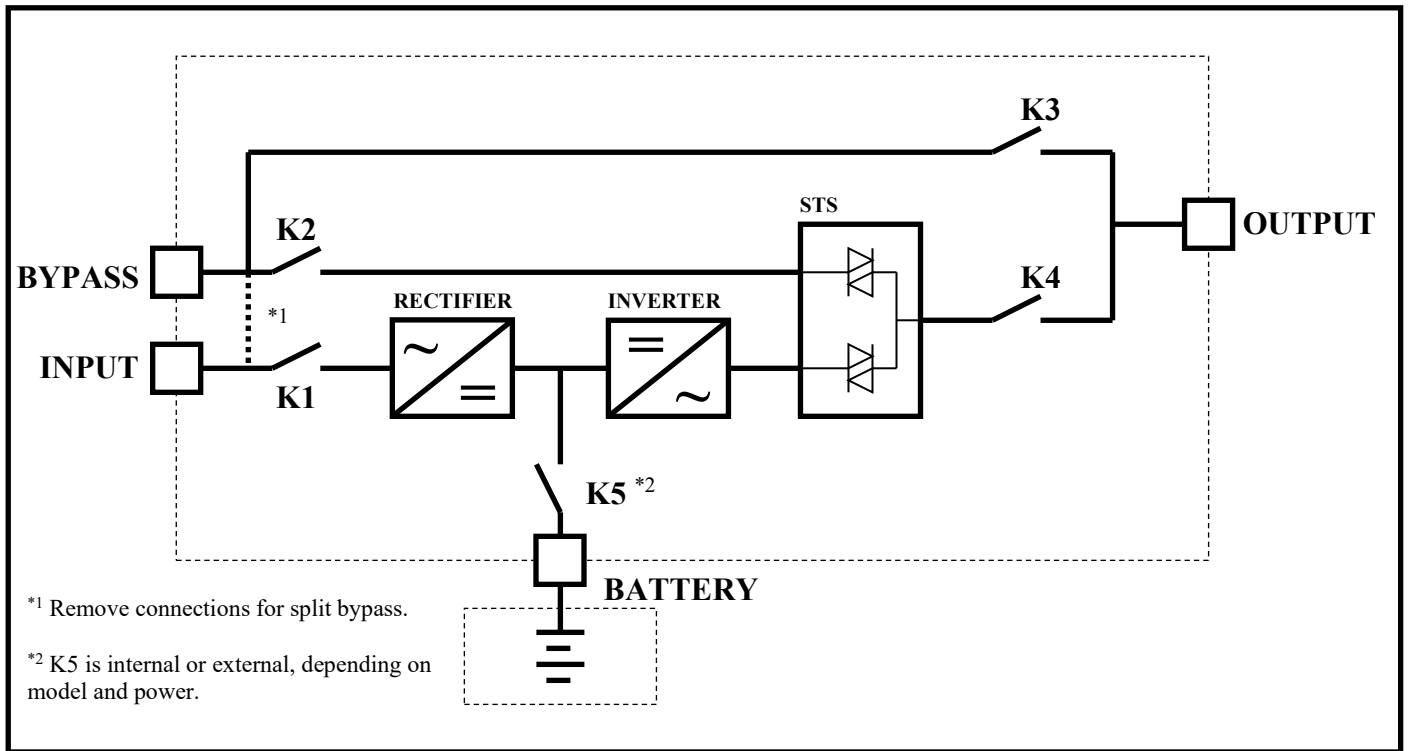


Figure 4-1 LEON-A Series UPS Circuit Breaker Konfiguration

4.1 STARTING THE DEVICE FROM COMPLETELY POWER-DOWN

This procedure is used to start and activate the UPS when the device loads are completely de-energized and unpowered.

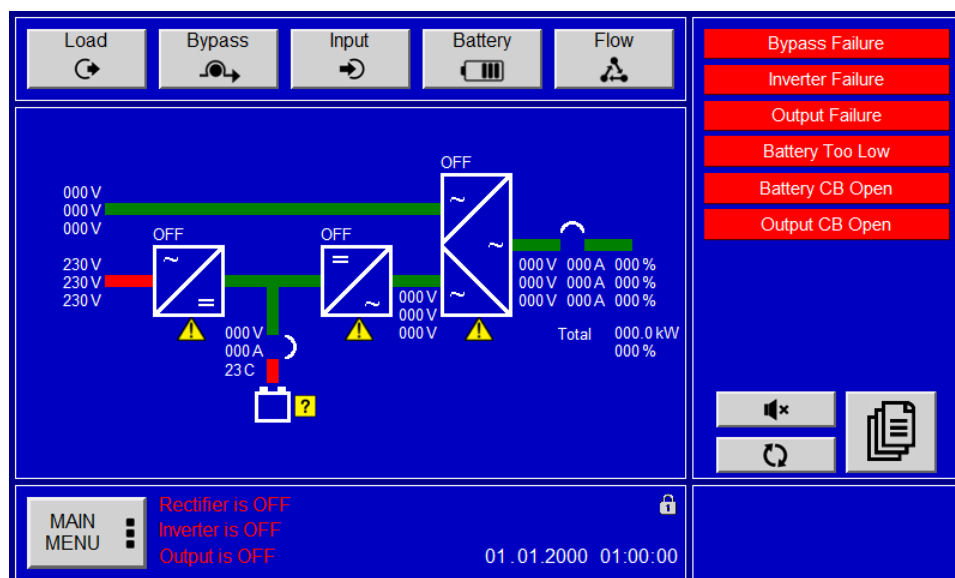
1. Set the K1 input circuit breaker to the ON (1) position. The device will be energized.

LCD & Led Panel Devices

The opening message will be seen on the LCD Display.

NORMAL OPERATION
01.01.2020 00:00:00

Touch Screen Panel Devices

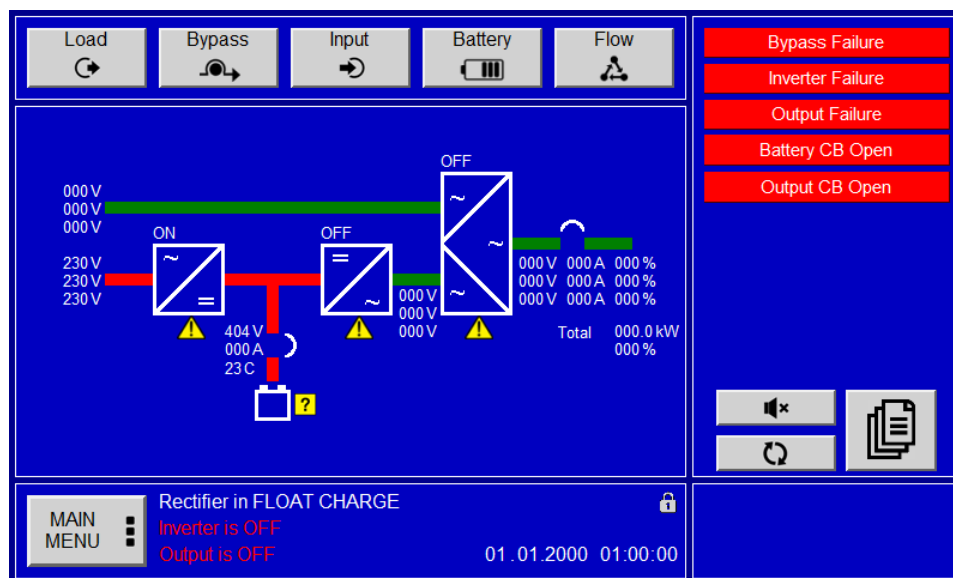


2. In a few seconds, the uninterruptible power supply's rectifier block will start to work and generate DC voltage.

LCD & Led Panel Devices

- The following messages will appear alternately on the bottom line.
- - Bypass Failure
- - Inverter Failure
- - Output Failure
- - Battery Too Low
- - Battery CB On
- - Output CB Open

Touch Screen Panel Devices



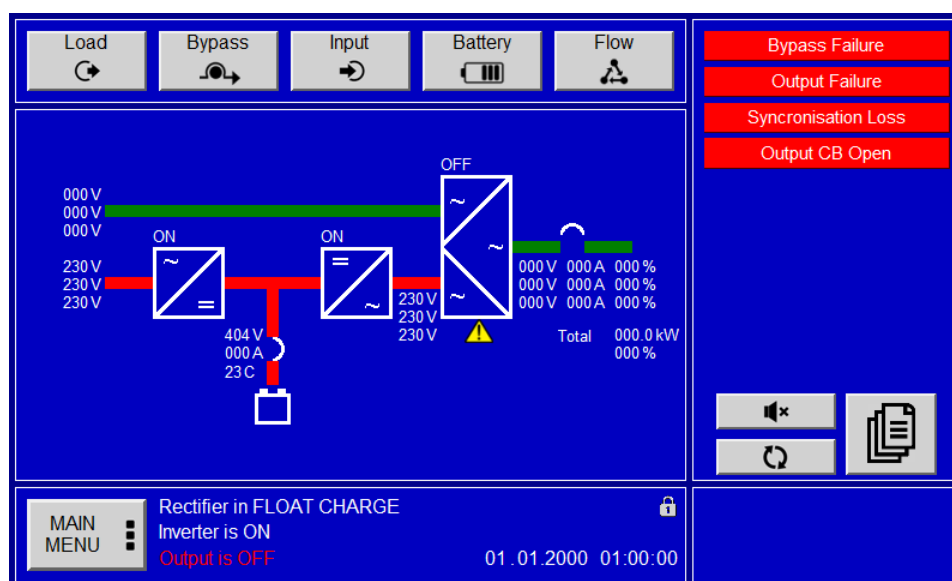
- You can now turn the K5 battery circuit breaker (internal or external circuit breaker) ON (1). After the DC bus voltage of the device is established, the inverter will start.

LCD & Led Panel Devices

The following messages will appear alternately on the bottom line.

- Bypass Failure
- Output Failure
- Synchronisation Loss
- Output CB Open

Touch Screen Panel Devices



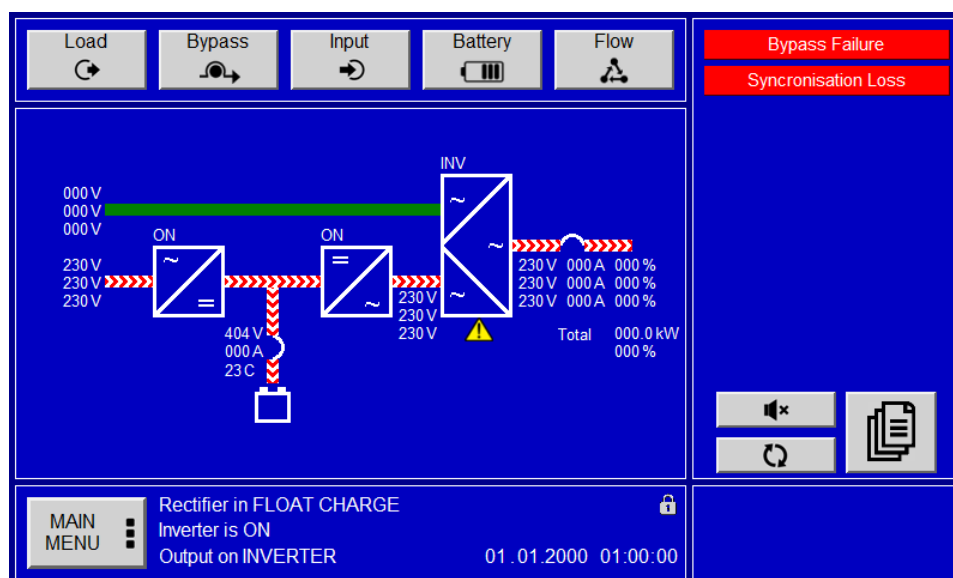
- In a few seconds, the device will output the inverter output to the loads. After this point, you can turn ON the K4 output breaker. When you do this, the UPS will start feeding the output output loads.

LCD & Led Panel Devices

The following messages will appear alternately on the bottom line.

- Bypass Failure
- Synchronisation Loss

Touch Screen Panel Devices



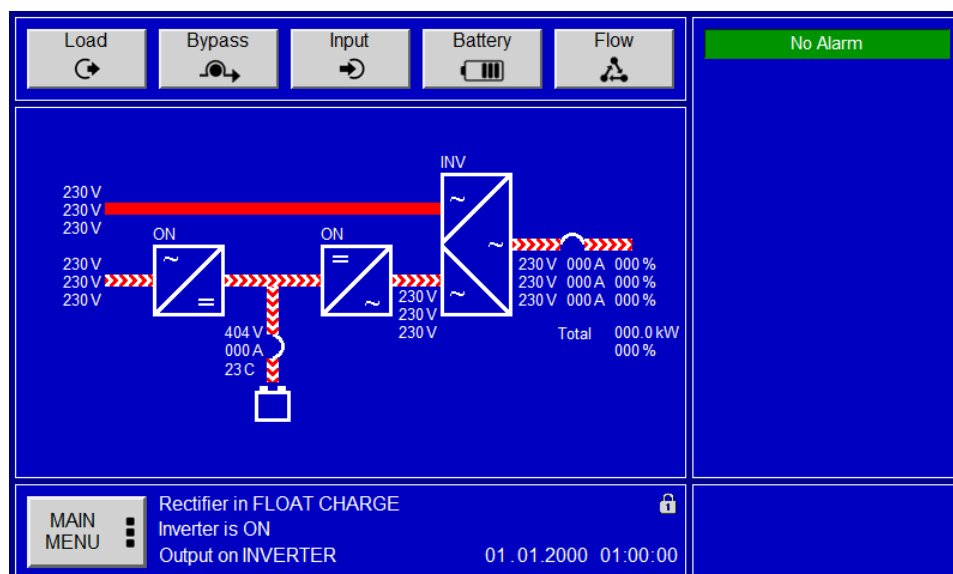
- Set the bypass input switch K2 to the ON position. After a while, the UPS output will be synchronized to the bypass line and all alarms will disappear and the system will switch to normal operation.

LCD & Led Panel Devices

The following message will appear on the screen.

NORMAL OPERATION
01.01.2020 00:00:00

Touch Screen Panel Devices

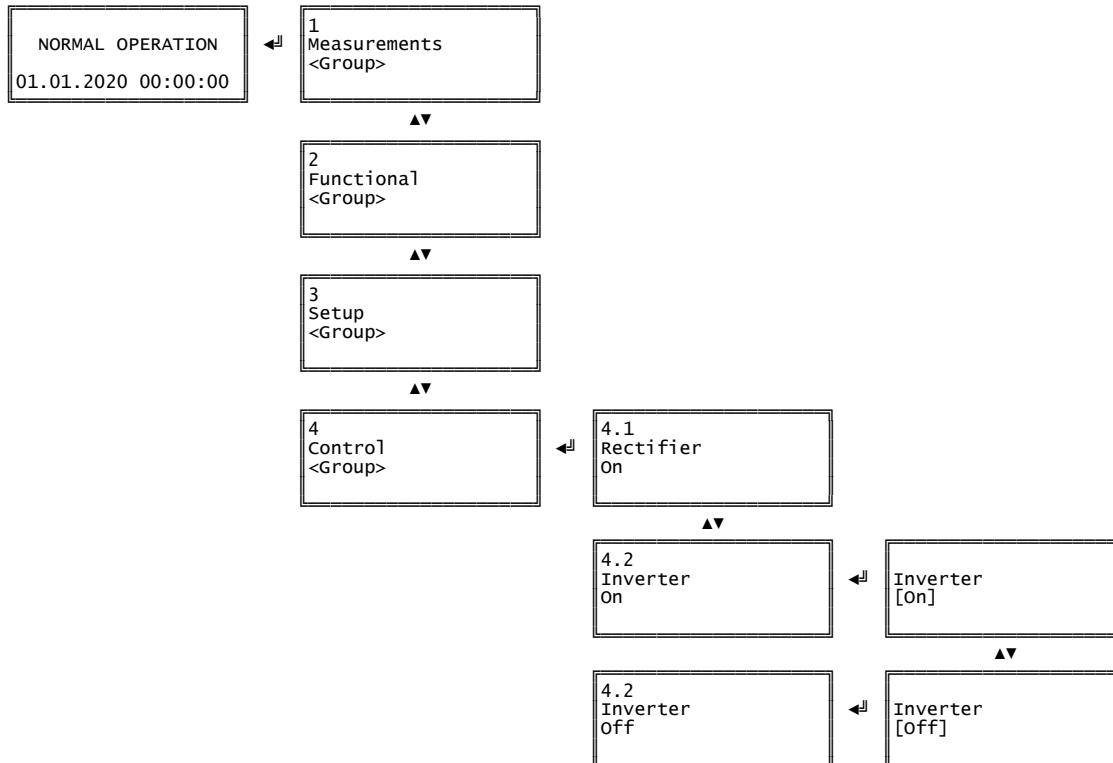


4.2 TURN OFF THE DEVICE BY TAKING MAINTENANCE BYPASS

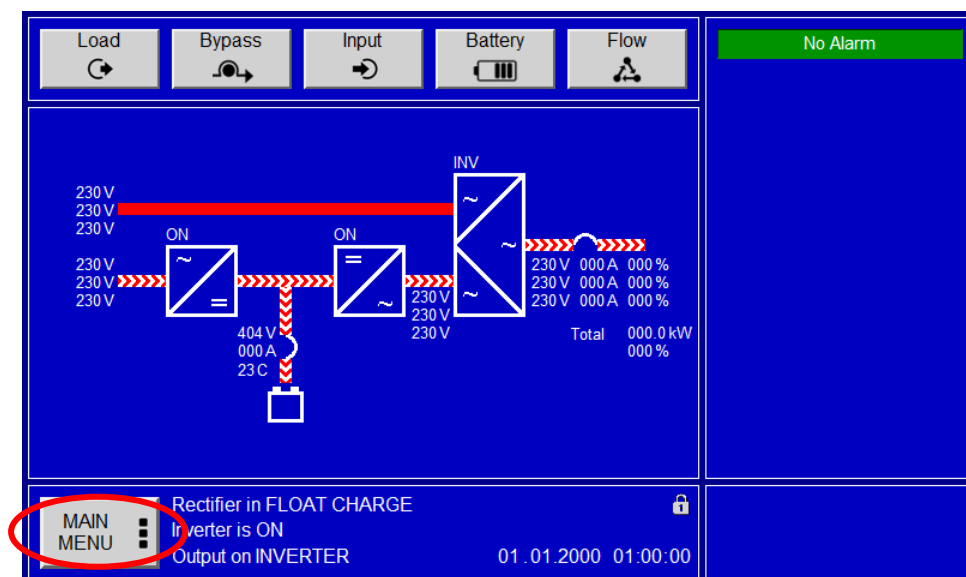
This procedure is used to transfer the supply of loads from the UPS to the maintenance bypass. This procedure is needed prior to servicing the UPS.

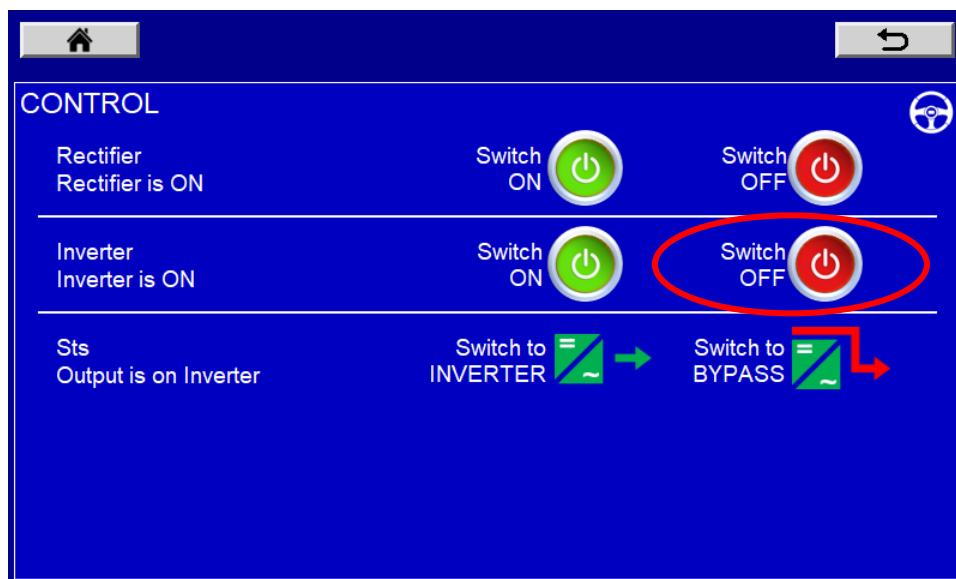
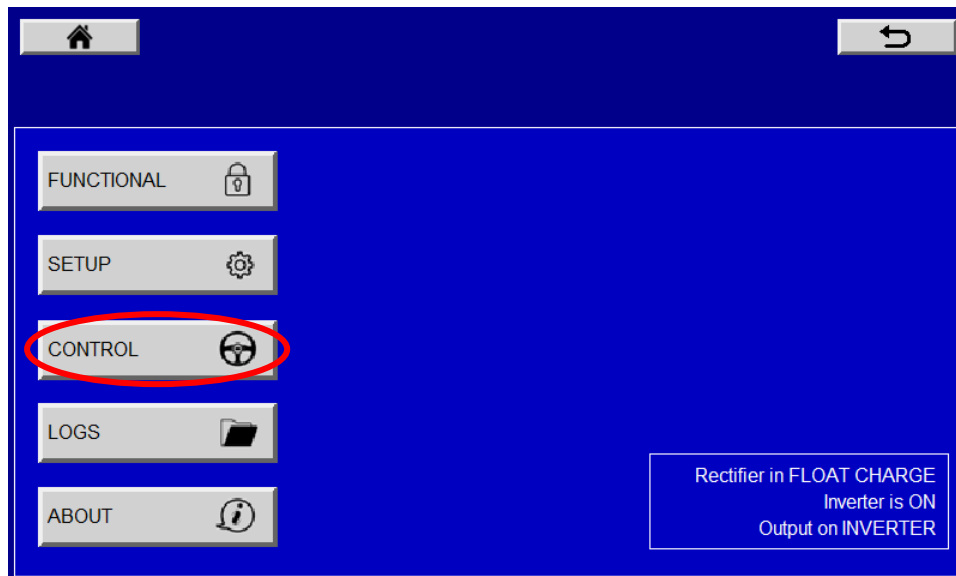
1. Stop the inverter of the device from the display panel. For this, follow these steps.

LCD & Led Panel Devices



Touch Screen Panel Devices





When you do this, the inverter block of the device will stop working and will switch to feeding the STS output via the bypass line.

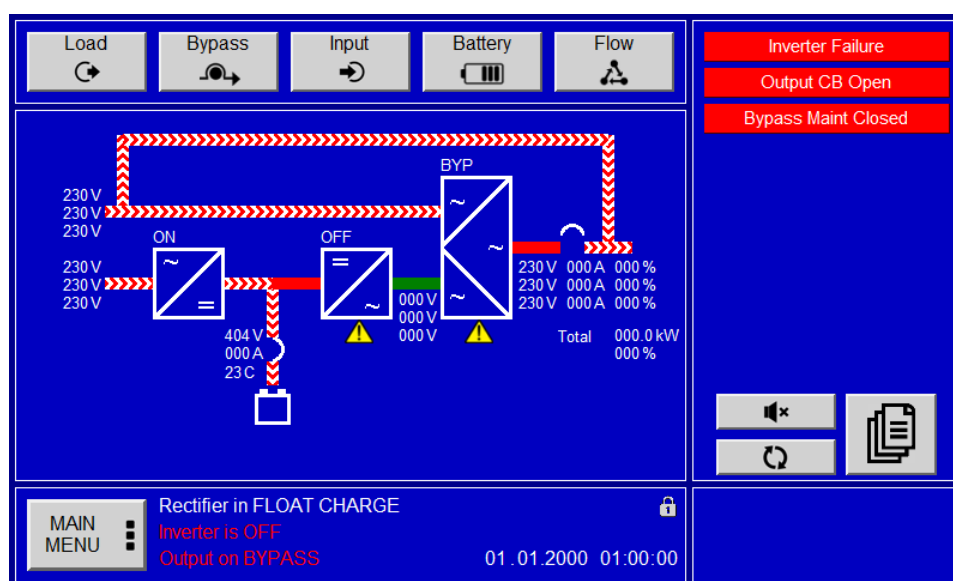
2. Turn the K3 maintenance bypass circuit breaker to ON (1). Turn K4 output circuit breaker to OFF (0) position.

LCD & Led Panel Devices

The following messages will appear alternately on the bottom line.

- Inverter Failure
- Output CB Open
- Bypass Maint Closed

Touch Screen Panel Devices



3. Turn K5 battery circuit breaker, K1 input circuit breaker and K2 bypass circuit breaker to OFF (0) position. After a while, the power of the instrument panel will be cut off.
4. Your load continues to be fed from the bypass network via the K3 maintenance bypass circuit breaker. Any interruption in the bypass network will be reflected on your load.

NOTE

The input phase sequence is important for the correct operation of the device. If the input phase sequence is not correct, bypass voltage error message will be displayed even if the bypass input voltage is within limits.

4.3 SWITCHING THE DEVICE FROM MAINTENANCE BYPASS TO NORMAL OPERATION

This procedure is used to restore normal operation to a UPS whose loads are fed through the maintenance bypass.

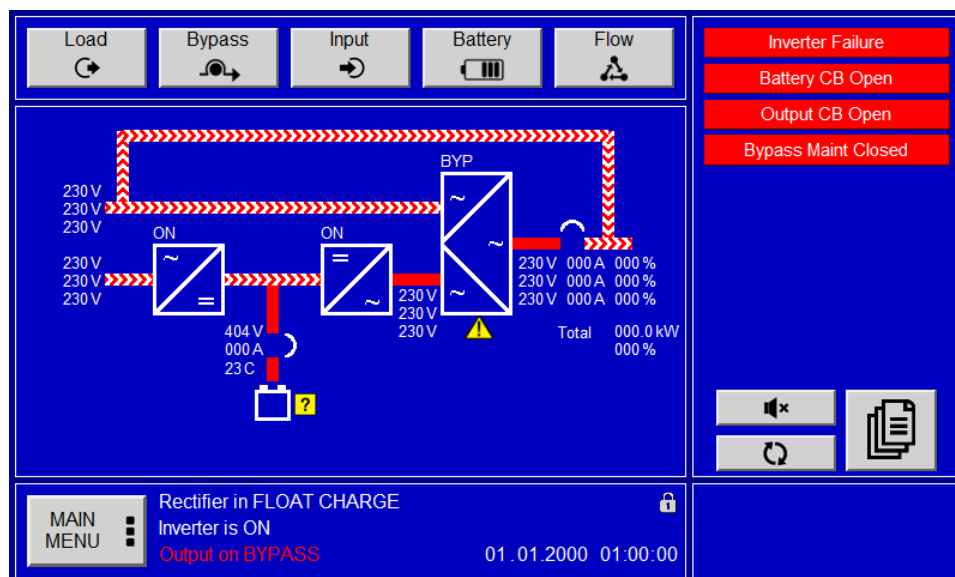
1. Turn the K1 input circuit breaker and K2 bypass circuit breaker to ON (1). The device will be energized and the opening message will be seen on the instrument panel.
After a while, the rectifier and then the inverter will start to work, and the STS will output over the bypass line. The fans will start spinning.

LCD & Led Panel Devices

The following messages will appear alternately on the bottom line.

- Inverter Failure
- Battery CB Open
- Output CB Open
- Bypass Maint Closed

Touch Screen Panel Devices

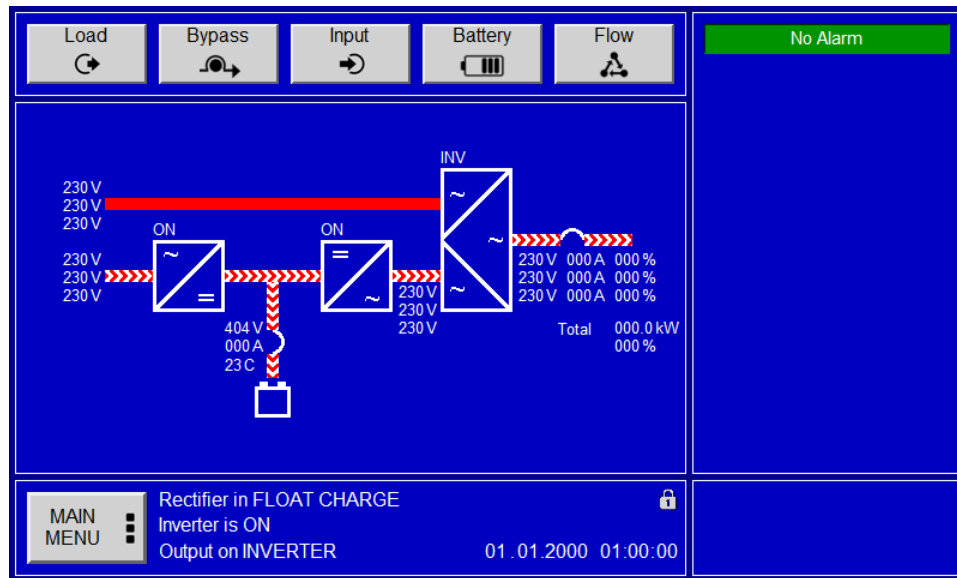


2. Turn the K4 output circuit breaker to ON (1). Set the K5 battery circuit breaker to the ON (1) position. Since the K3 maintenance bypass circuit breaker of the device is ON (1), although the inverter is in operation, STS will never switch its output to the supply via the inverter, that is, STS will never transfer the load to the inverter.
3. In this case, turn the K3 maintenance bypass circuit breaker to OFF (0) position. The device, which detects that the K3 maintenance bypass circuit breaker is turned OFF (0), will give the inverter output to your loads after a while. The device will switch to normal operating mode.

LCD & Led Panel Devices

NORMAL OPERATION
01.01.2020 00:00:00

Touch Screen Panel Devices



4.4 TURN OFF THE DEVICE TO COMPLETELY DISCONNECT SUPPLY TO THE LOAD

This procedure is used to completely de-energize the UPS and loads. All circuit breakers will be turned OFF (0) and the energy to the load will be cut off.

1. Turn K4 output circuit breaker to OFF (0) position. This process will cut off the energy to your load.
2. Turn the K5 battery circuit breaker to the OFF (0) position.
3. Turn K1 input circuit breaker and K2 bypass circuit breaker to OFF (0) position.
4. After a while, the power of the instrument panel will be cut off.

NOTE

After the UPS is completely turned off, the UPS output loads can be fed from the bypass line by turning the K3 maintenance bypass circuit breaker to the ON (1) position at any time.

5. SERVICE AND MAINTENANCE

CAUTION

There are no by the user servicable parts inside the equipment, therefore DO NOT OPEN THE COVER OF THE EQUIPMENT. Because of possible external battery connection and dry contact relay outputs, THERE MAY BE HIGH VOLTAGE INSIDE THE EQUIPMENT, EVEN WHEN THE RECTIFIER IS TURNED OFF. Do not permit unauthorized persons to intervene any failure, otherwise, the warranty will be void and moreover, significant injury may occur.

5.1 INTRODUCTION

This chapter contains the procedures necessary to effect general maintenance of the UPS module and battery. Certain procedures entail gaining internal access to the UPS, and should only be undertaken by a competent engineer who is familiar with the operation and layout of the equipment and understands the areas of potential hazard. If you have any doubts concerning safety or the method of carrying out any procedure then contact an approved service agent for assistance or advice. If the locally approved agent is not known to you, then you should contact the Customer Services & Support department of the dealer or manufacturer.

The manufacturer offers customer training, at a nominal fee, if required. Such training can range from a one-day operator course to in-depth training on maintenance and troubleshooting lasting several days, and can be carried out at the manufacturer's plant or at the customer premises.

5.2 SAFETY PRECAUTIONS

When working on the UPS remember that the equipment contains live voltages at ALL TIMES unless it is externally isolated from the mains supply, bypass supply and batteries. It is essential that the safety and precautionary notes contained throughout this manual are read and FULLY UNDERSTOOD before touching any UPS internal component part.

5.3 SCHEDULED MAINTENANCE

The UPS utilizes solid-state components which are not subject to wear, with the only moving parts being the cooling fans. Scheduled maintenance requirements, beyond ensuring that the environmental conditions remain suitably cool and clean, are therefore minimal. However, a well documented periodic program of inspection and preventive maintenance, as suggested below, will help to ensure optimum equipment performance and may serve to detect certain minor malfunctions prior to them developing into a major fault.

5.4 DAILY CHECKS

Carry out a daily walk-by inspection of the UPS, checking the following points:

1. Carry out a spot check of the operator control panel; ensuring that all mimic LED indications are normal, all metered parameters are normal and no warning or alarm messages are present on the display panel.

2. Check for obvious signs of overheating.
3. Listen for any noticeable change in audible noise.
4. Ensure that the ventilation grills around the UPS are unobstructed.
5. If possible, log the results of the inspection, noting any discrepancies from the norm.

5.5 WEEKLY CHECKS

Carry out the following checks from the mimic panel and log the results:

1. Measure and record the battery charge voltage.
2. Measure and record the battery charge current.
3. Measure and record the UPS output voltage on all three phases.
4. Measure and record the UPS output line currents. If these are significantly different from the values previously logged then, if possible, record the size, type and location of any additional load connected to the UPS supply since the previous inspection. This type of information could prove useful to the troubleshooting engineer should a problem occur.

If any of the above indications differ greatly from the previously logged values for no apparent reason then you should contact the Customer Service & Support Department of the dealer / manufacturer.

5.6 ANNUAL SERVICE

The equipment should be thoroughly cleaned and the following checks carried out annually. This entails working inside the equipment in regions containing hazardous voltages.

A manufacturer-trained engineer is fully aware of the hazards concerned and will carry out this procedure with the load connected to the maintenance bypass supply; however if the customer decides to carry out this service procedure himself it is imperative that the UPS be totally shut down and isolated from the input mains and bypass supplies and batteries using the procedure given below. We therefore strongly recommend that the annual service is carried out by trained personnel.

1. Carry out the weekly checks detailed above.
2. Shut down the UPS following the recommended operating procedure.
3. Isolate the UPS input mains supply externally (also the bypass supply if a split bypass system is in use) and isolate the battery.
4. Ensure that the UPS is totally powered down by checking for voltage at the rectifier input connections (U1, V1 & W1), the battery connection terminals, the output connections (U2, V2 & W2) and the bypass input connections (U3, V3 & W3).
5. Gain full access to the UPS interior by opening its internal hinged safety panel.
6. Carry out a thorough examination of the UPS power components and sub-assemblies, paying particular attention to the following:

Electrolytic capacitors - Check for signs of leakage, buckling etc.

Magnetic components - Check for signs of overheating, security of fixture and signs of delamination.

Cables and connections - Check cables for chaffing, fraying or signs of overheating. Check that all printed circuit board connectors are secure.

Printed circuit boards - check the cleanliness and integrity of the circuit boards and replace if any signs of deterioration are found.

7. Thoroughly clean inside the equipment enclosure using a vacuum cleaner and low pressure air to remove any foreign debris.
8. Reconnect the UPS input mains power. Start the UPS and transfer the load to the inverter following the appropriate operating procedure. If possible, check the battery autonomy time by opening the rectifier input power switch (K1) with the UPS on-load.

5.7 EXTENDED SERVICE

We recommend that ALL the input/output power cables and their connections are checked periodically. As this requires the UPS to be completely shut down such a check should be carried out on an 'opportunity' basis but at an interval not exceeding 2 years.

5.8 BATTERY MAINTENANCE

The batteries used with the UPS are generally sealed, valve-regulated type, and the only maintenance requirement is to ensure that the cells are kept clean and dry. Maintenance procedures appropriate to both valve-regulated and non-sealed batteries vary, and should be obtained from the battery manufacturer.

6. COMMUNICATION

6.1 ALARM & COMMUNICATION INTERFACE BOARD

Alarm & Communication Interface Board is provided together with the display panel and supports RS232 / RS485 communication and dry contact outputs. Receiving any alarm output via the dry contacts is possible, where any of the alarm contacts can be programmed to drop, when the programmed alarms occurs.

A view of the Alarm & Communication Interface Board is given below.

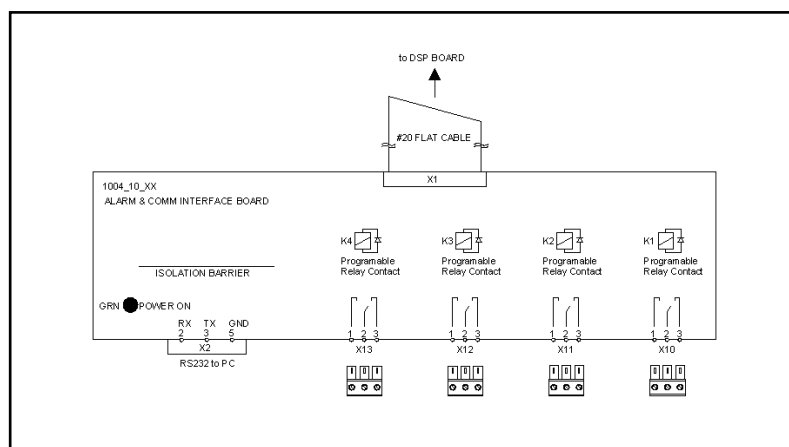


Figure 6.1 Alarm & Communication Interface Board

6.1.1 Dry Contact Outputs

4 programmable dry contact outputs are given to the use by the Alarm & communication Interface Board. Dry contact outputs can be programmed via the LCD panel or Modbus connection. Although the device model is deterministic, all alarm and warning messages can be dedicated to any of the dry contact outputs. Dry contact outputs are referred from K1 to K4 and remain energised, if the alarm conditions is not fulfilled. When the alarm condition is fulfilled, dry contact drops and switched to the deenergised status. Dry contact outputs are provided to the user directly from plugin sockets placed on the Alarm & Communication Interface Board.

NOTE

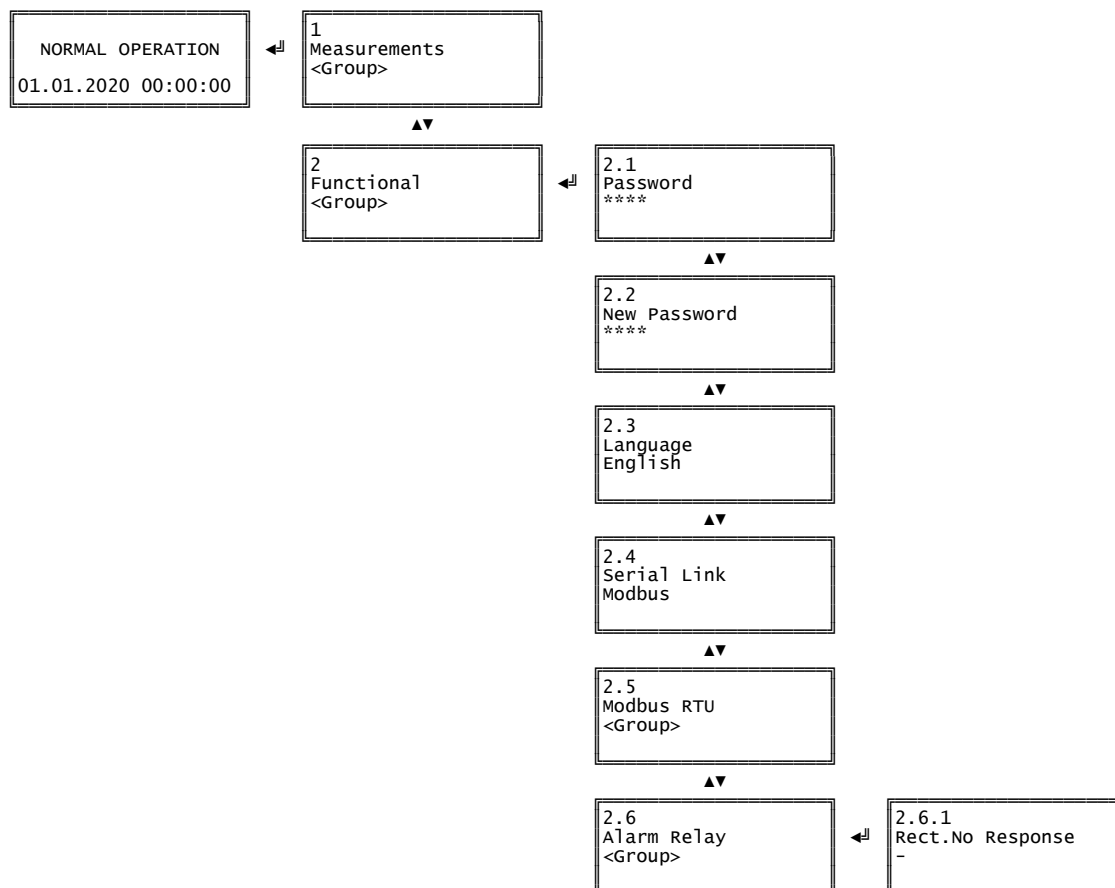
Maximum 24Vac or 24Vdc voltage should be applied to dry contacts. Dry contacts are for signaling purposes and can carry maximum 0.5A current.

6.1.2 Programming Dry Contact Outputs

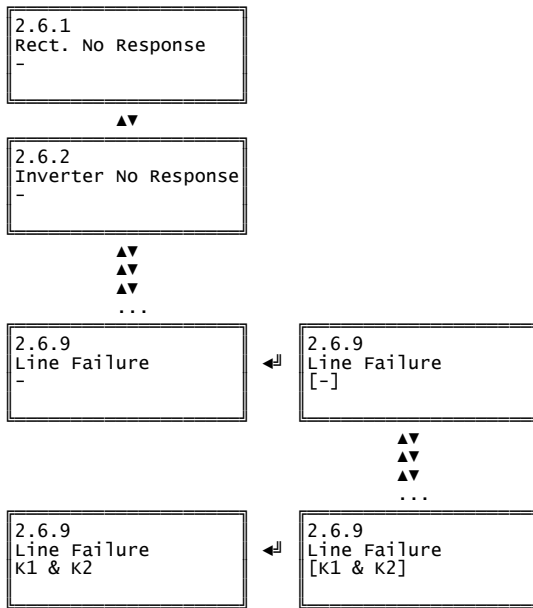
This procedure allows any of the dry contact outputs to be set to leave in the desired alarm state.

LCD & Led Panel Devices

- Follow these steps to access the relevant menu:

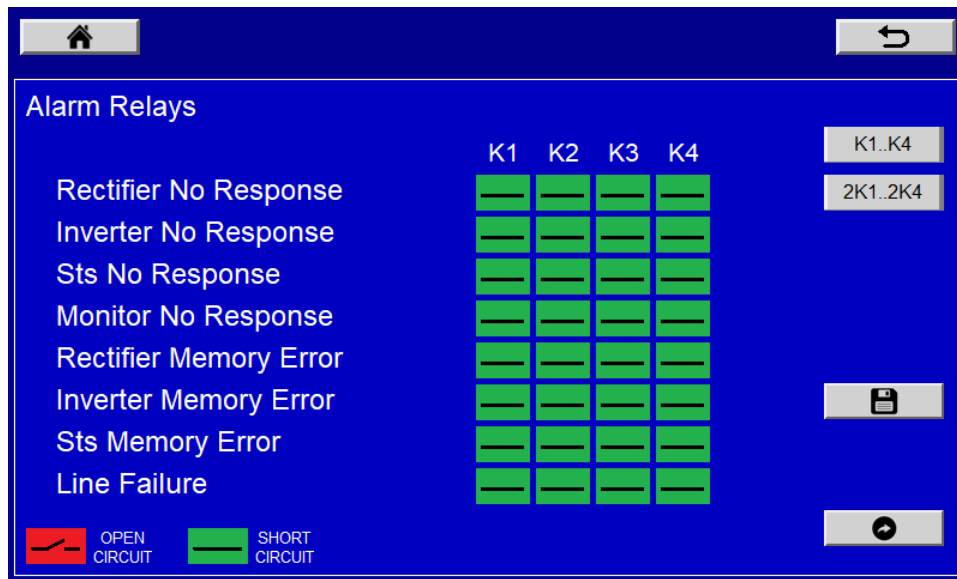


- Select the alarm you want to process with the up and down buttons. The list contains more than 40 alarm conditions in total. Press the enter key when the desired alarm state is reached. Select the desired relays from the list where the relay or relays will be deactivated in case of an alarm and press the enter key.



3. Your relay output is now programmed. Repeat the same process for other alarms, if any. Different or same relay outputs can be selected for different alarms.

Touch Screen Panel Devices



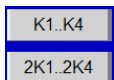
Indicates that when the relevant alarm occurs, the assigned relay will not be affected, and if there is no other alarm assigned to that relay and occurs, the relay will energize and its contacts will be short-circuited.



Indicates that when the relevant alarm occurs, the assigned relay will de-energize and its contacts will become open circuit.



It provides access to other alarms by going back and forth between the pages of other alarms.



In the alarm relay setting screen, it switches between the first 4 relay groups (K1..K4) and the second relay block (2K1..2K4).



Allows the settings to be saved.

NOTE

Alarm relays 2K1..2K4 are optional.

6.1.3 RS232 Communication

This option provides Modbus communication over RS232/RS485 connection, for Megatec and Modbus communication.

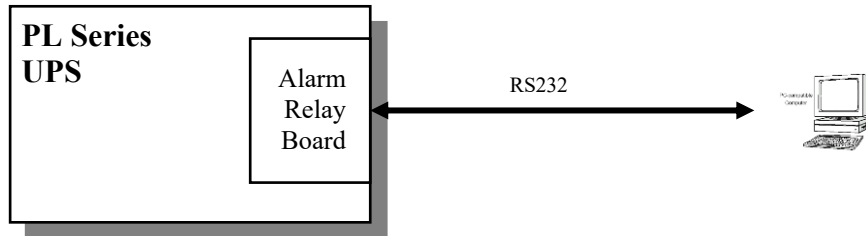
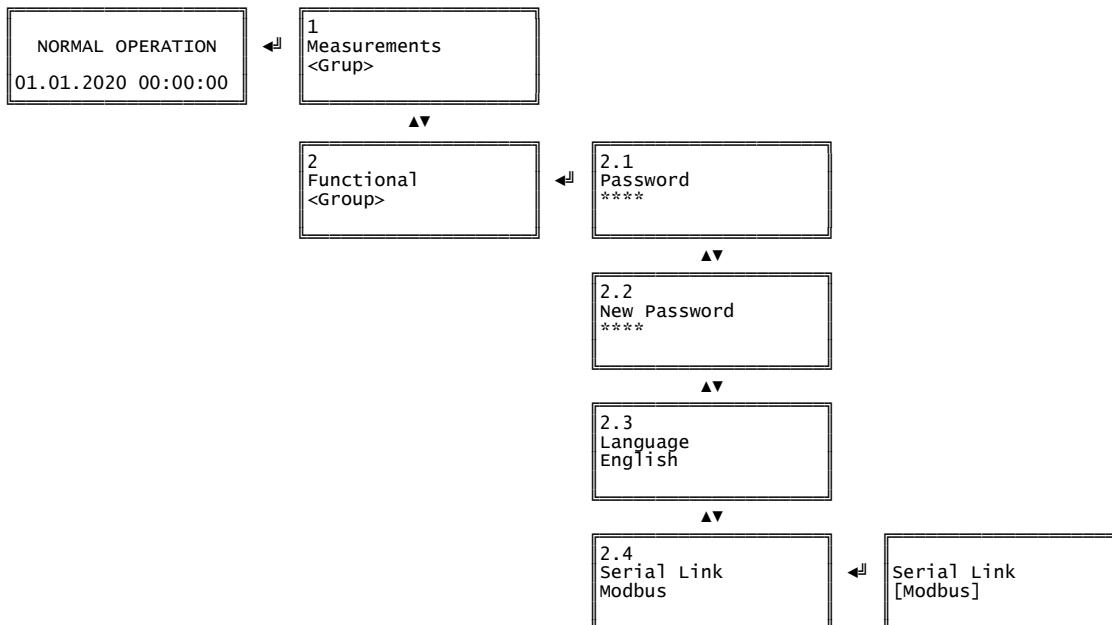


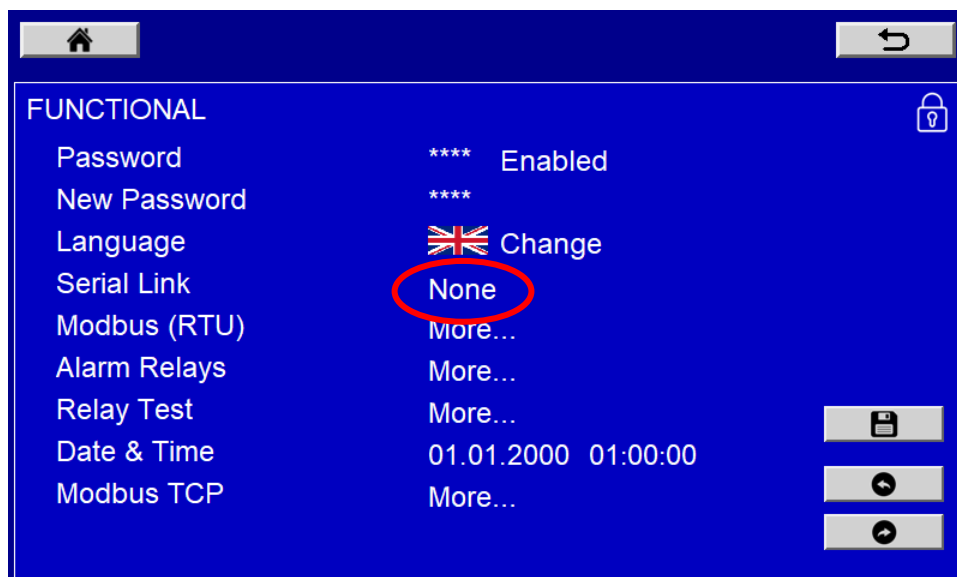
Figure 6.2 UPS / PC Connection

The protocol to which the serial port will serve can be chosen from the Serial Link menu. To do this, the following procedure should be applied.

LCD & Led Panel Devices



Touch Screen Panel Devices



For RS232 communication, 9 pin female DSUB connector on the Communication & Alarm Relay Board is used.

Pin connections of the necessary cable for UPS RS232 connection is given in the table below :

UPS side cable (DSUB9 Male)		PC side cable (DSUB9 Female)	
Pin No	Function	Pin No	Function
2	RX	2	RX
3	TX	3	TX
5	GND	5	GND

Depending on the request of the user, it is possible to provide RS485 output, by adding a RS232 / RS485 converter, on the manufacturing.

NOTE

RS232 / RS485 port is isolated from the rest of the UPS.

6.2 MODBUS ADRESS TABLE

Register (Hex)	Register (Dec)	Type	Register/Coil	Scale	Validity	Description
0x2000	8192	Register	UPSSStatus0			BIT00 : LoadOnBypass BIT01 : LoadOnInverter BIT02 : BIT03 : BIT04 : RectifierOnOff BIT05 : InverterOnOff BIT06 : StsOnOff BIT07 : BIT08 : RectifierFloatCharge BIT09 : RectifierEqualizeCharge BIT10 : RectifierBoostCharge BIT11 : RectifierBatteryTest BIT12 : BIT13 : BIT14 : BIT15 :
0x2001	8193	Register	UPSSStatus1			BIT00 : BIT01 : BIT02 : BIT03 : BIT04 : BIT05 : BIT06 : BIT07 : BIT08 : BIT09 : BIT10 : BIT11 : BIT12 : BIT13 : BIT14 : BIT15 :
0x2002	8194	Register	UPSSStatus2			BIT00 : BIT01 : BIT02 : BIT03 : BIT04 : BIT05 : BIT06 : BIT07 : BIT08 : BIT09 : BIT10 : BIT11 : BIT12 : BIT13 : BIT14 : BIT15 :
0x2003	8195	Register	UPSSStatus3			BIT00 : BIT01 : BIT02 : BIT03 : BIT04 : BIT05 : BIT06 : BIT07 : BIT08 : BIT09 : BIT10 : BIT11 :

						BIT12 : BIT13 : BIT14 : BIT15 :
0x2004	8196	Register	UPSFaultStatus0			BIT00 : RecNoResponse BIT01 : InvNoResponse BIT02 : StsNoResponse BIT03 : MonNoResponse BIT04 : RecMemoryError BIT05 : InvMemoryError BIT06 : StsMemoryError BIT07 : BIT08 : LineFailure BIT09 : BypassFailure BIT10 : InverterFailure BIT11 : OutputFailure BIT12 : DCTooLow BIT13 : DCLow BIT14 : DCHigh BIT15 : SynchronisationLoss
0x2005	8197	Register	UPSFaultStatus1			BIT00 : BatteryTooLow BIT01 : BatteryLow BIT02 : BatteryHigh BIT03 : RectifierCurrentLimit BIT04 : BatteryCurrentLimit BIT05 : Overload BIT06 : OverloadBlock BIT07 : RectifierOverTemp BIT08 : InverterOverTemp BIT09 : StsOverTemp BIT10 : LineCBOpen BIT11 : BypassCBOpen BIT12 : BatteryCBOpen BIT13 : OutputCBOpen BIT14 : BypassMaintCBClosed BIT15 : InverterMaintCBClosed
0x2006	8198	Register	UPSFaultStatus2			BIT00 : RectifierFuseFailure BIT01 : InverterFuseFailure BIT02 : StsFuseFailure BIT03 : BIT04 : RectifierFanFailure BIT05 : InverterFanFailure BIT06 : StsFanFailure BIT07 : BIT08 : RectifierHardwareBlock BIT09 : InverterHardwareBlock BIT10 : StsHardwareBlock BIT11 : BIT12 : RectifierParallelFault BIT13 : InverterParallelFault BIT14 : StsParallelFault BIT15 : 12 Pulse Failure
0x2007	8199	Register	UPSFaultStatus3			BIT00 : RectifierProbeFailure BIT01 : InverterProbeFailure BIT02 : StsProbeFailure BIT03 : RectifierTempPreAlarm BIT04 : InverterTempPreAlarm BIT05 : StsTempPreAlarm BIT06 : BIT07 : EmergencyStop BIT08 : DoorOpen BIT09 : DCEarthFault BIT10 : ACEarthFault BIT11 : BypassThyristorFault BIT12 : InverterThyristorFault

						BIT13 : RectifierThyristorFault BIT14 : InverterIGBTFault BIT15 : RectifierIGBTFault
0x2008	8200	Register	UPSFaultStatus4			BIT00 : BadPhaseSequence BIT01 : LoadOnAlternateSource BIT02 : RetransferInhibit BIT03 : PowerSupplyFault BIT04 : LoadOnBattery BIT05 : BatteryTestFailed BIT06 : BIT07 : BIT08 : BIT09 : BIT10 : BIT11 : BIT12 : BIT13 : BIT14 : BIT15 :
0x2009	8201	Register	UPSFaultStatus5			
0x200A	8202	Register	UPSFaultStatus6			
0x200B	8203	Register	UPSFaultStatus7			
0x200C	8204					
0x200D	8205					
0x200E	8206					
0x200F	8207					
0x2010	8208	Register	OutputVoltageL1			
0x2011	8209	Register	OutputVoltageL2			
0x2012	8210	Register	OutputVoltageL3			
0x2013	8211	Register	OutputCurrentL1			
0x2014	8212	Register	OutputCurrentL2			
0x2015	8213	Register	OutputCurrentL3			
0x2016	8214	Register	BypassVoltageL1			
0x2017	8215	Register	BypassVoltageL2			
0x2018	8216	Register	BypassVoltageL3			
0x2019	8217	Register	InverterVoltageL1			
0x201A	8218	Register	InverterVoltageL2			
0x201B	8219	Register	InverterVoltageL3			
0x201C	8220	Register	DiffVoltageL1			
0x201D	8221	Register	DiffVoltageL2			
0x201E	8222	Register	DiffVoltageL3			
0x201F	8223	Register				
0x2020	8224	Register	BatteryVoltage			
0x2021	8225	Register	BatteryCurrent			
0x2022	8226	Register	DCBusVoltage			
0x2023	8227	Register	InputFrequency			
0x2024	8228	Register	OutputFrequency			
0x2025	8229	Register	RectifierTemperature			
0x2026	8230	Register	InverterTemperature			
0x2027	8231	Register	StsTemperature			
0x2028	8232	Register	OutputLoadL1			
0x2029	8233	Register	OutputLoadL2			
0x202A	8234	Register	OutputLoadL3			
0x202B	8235					
0x202C	8236					
0x202D	8237					
0x202E	8238					
0x202F	8239					
0x2030	8240	Register	LineVoltageL1			
0x2031	8241	Register	LineVoltageL2			
0x2032	8242	Register	LineVoltageL3			
0x2033	8243	Register	LineCurrentL1			
0x2034	8244	Register	LineCurrentL2			

0x2035	8245	Register	LineCurrentL3			
0x2036	8246					
0x2037	8247					
0x2038	8248					
0x2039	8249					
0x203A	8250					
0x203B	8251					
0x203C	8252					
0x203D	8253					
0x203E	8254					
0x203F	8255					
0x2040	8256	Register	OutputPowerApparentL1			
0x2041	8257	Register	OutputPowerApparentL2			
0x2042	8258	Register	OutputPowerApparentL3			
0x2043	8259	Register	OutputPowerActiveL1			
0x2044	8260	Register	OutputPowerActiveL2			
0x2045	8261	Register	OutputPowerActiveL3			
0x2046	8262	Register	OutputPowerReactiveL1			
0x2047	8263	Register	OutputPowerReactiveL2			
0x2048	8264	Register	OutputPowerReactiveL3			
0x2049	8265	Register	OutputPowerFactorL1			
0x204A	8266	Register	OutputPowerFactorL2			
0x204B	8267	Register	OutputPowerFactorL3			
0x204C	8268					
0x204D	8269					
0x204E	8270					
0x204F	8271					
0x2050	8272	Register	InputPowerApparentL1			
0x2051	8273	Register	InputPowerApparentL2			
0x2052	8274	Register	InputPowerApparentL3			
0x2053	8275	Register	InputPowerActiveL1			
0x2054	8276	Register	InputPowerActiveL2			
0x2055	8277	Register	InputPowerActiveL3			
0x2056	8278	Register	InputPowerReactiveL1			
0x2057	8279	Register	InputPowerReactiveL2			
0x2058	8280	Register	InputPowerReactiveL3			
0x2059	8281	Register	InputPowerFactorL1			
0x205A	8282	Register	InputPowerFactorL2			
0x205B	8283	Register	InputPowerFactorL3			
0x205C	8284					
0x205D	8285					
0x205E	8286					
0x205F	8287					
0x2060	8288	Register	UPSNomOutputVoltage			
0x2061	8289	Register	UPSNomOutputCurrent			
0x2062	8290	Register	UPSNomOutputPower			
0x2063	8291	Register	UPSNomOutputFrequency			
0x2064	8292	Register	UPSNomLineVoltage			
0x2065	8293	Register	UPSNomBatteryVoltage			
0x2066	8294					
0x2067	8295					
0x2068	8296					
0x2069	8297					
0x206A	8298					
0x206B	8299					
0x206C	8300					
0x206D	8301					
0x206E	8302					
0x206F	8303					
0x2070	8304	Register	VersionRec			
0x2071	8305	Register	VersionSpecialRec			
0x2072	8306	Register	VersionInv			
0x2073	8307	Register	VersionSpecialInv			

0x2074	8308	Register	VersionSts			
0x2075	8309	Register	VersionSpecialSts			
0x2076	8310	Register	VersionMon			
0x2077	8311	Register	VersionSpecialMon			
0x2078	8312	Register	VersionHMI			
0x2079	8313	Register	VersionSpecialHMI			
0x207A	8314					
0x207B	8315					
0x207C	8316					
0x207D	8317					
0x207E	8318					
0x207F	8319					