



OPERATING MANUAL

PYRAMID EX

300-800kVA

Uninterruptible Power Systems

FOREWORD

We thank you for the trust you have in INFORM Uninterruptible Power Supply.

This equipment is fitted with the updated technologies. It is provided with power semiconductors (IGBT) with a digitally-commanded control achieved by micro-controller.

Our equipment comply with the standard EN 50091-2 referring to Uninterruptible Power Supply, and to the standard CEI 146-4 (specific standard for UPS).

SAFETY REQUIREMENTS

Using conditions:

Do read carefully these operation instructions before installing the UPS.

Whatever the repairs, they must be exclusively executed by authorized staff, trained accordingly.

For a better use of the UPS, it is recommended to maintain the ambient temperature and the humidity rate of the UPS premises below the values specified by the manufacturer.

This equipment meets the requirements of the Community's directives applied to this product. As a consequence it is labelled as follows:



This equipment is designed to a restricted distribution in compliance with the conditions defined by the standard EN 50091-2. As a consequence, restrictions to the installation or complementary steps may be needed to prevent possible electromagnetic interference.

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ABBREVIATIONS :

- UPS : Uninterruptible Power Supply,
- LCD : Liquid Crystal Display,
- SC : Static Contactor

1. DESCRIPTION AND FUNCTION OF THE UPS

The PYRAMID-EX static supply protects the connected load, and guarantees :

- the supply continuity,
- the voltage stability, and
- the frequency stability,
- whatever cutoffs or disturbances of the upstream mains.

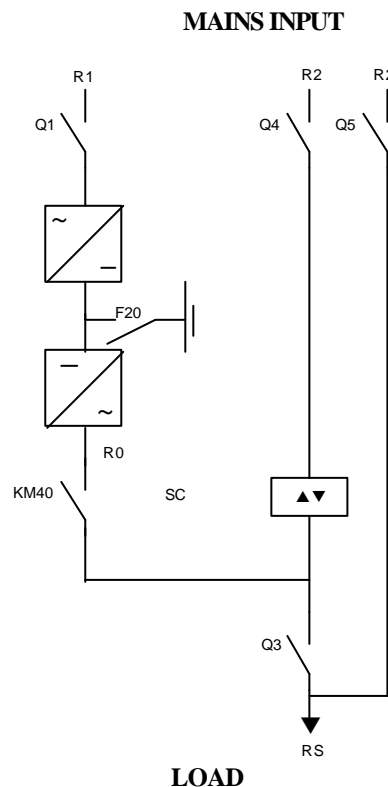
When the upstream mains is present, the UPS acts as a perfect stabilizer and as a generator in the event of a mains failure.

In such case, the required power is supplied by the battery, which is kept charged when the mains is present.

The UPS provides a three-phase sinusoidal energy. It is composed of :

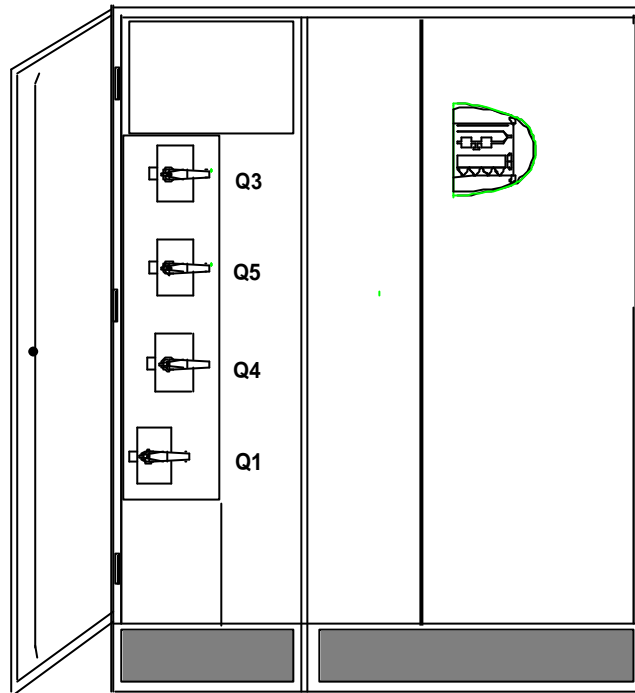
- 1 fully controlled three-phase rectifier,
- 1 three-phase P.W.M. (Pulse Width Modulation) inverter,
- 1 static by-pass to transfer the load automatically and without interruption to the mains in the event of an overload,
- 1 manual by-pass which allows a load transfer to the mains - without interruption - for reasons of maintenance,
- 1 accumulator battery,
- 1 control panel made up of a mimic panel, a 4-line display and a keyboard.

GENERAL PRINCIPLE



2. POSITION OF THE DIFFERENT SWITCHES

PYRAMID-EX UPS 250 to 400 kVA

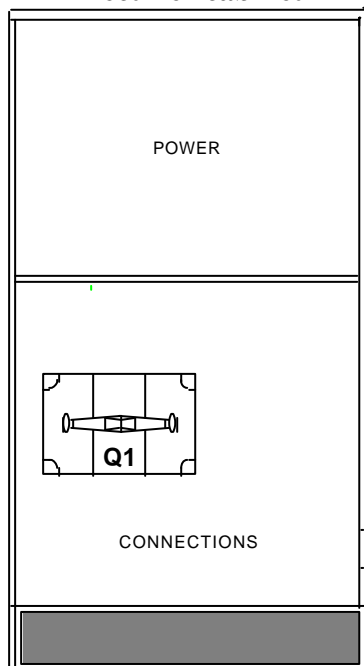


Designations of switches:

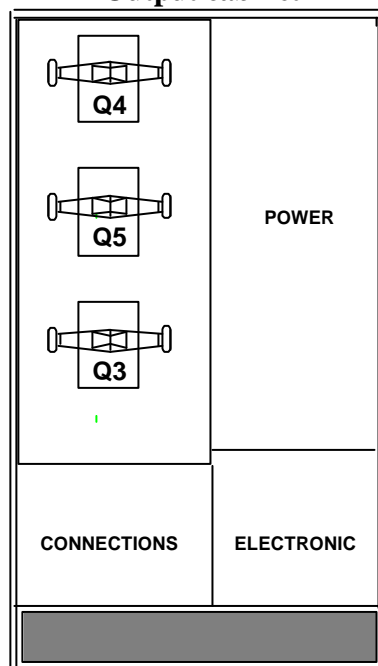
- Q1 RECTIFIER INPUT SWITCH
- Q3 OUTPUT SWITCH
- Q4 STATIC BY-PASS INPUT SWITCH
- Q5 MANUAL BY-PASS (BY-PASS)

PYRAMID-EX UPS 600 and 800 kVA

Rectifier cabinet



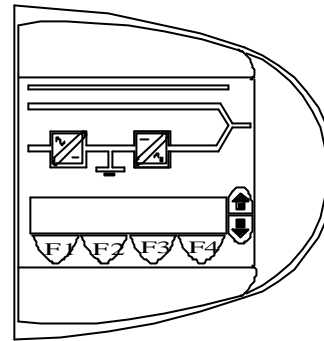
Output cabinet



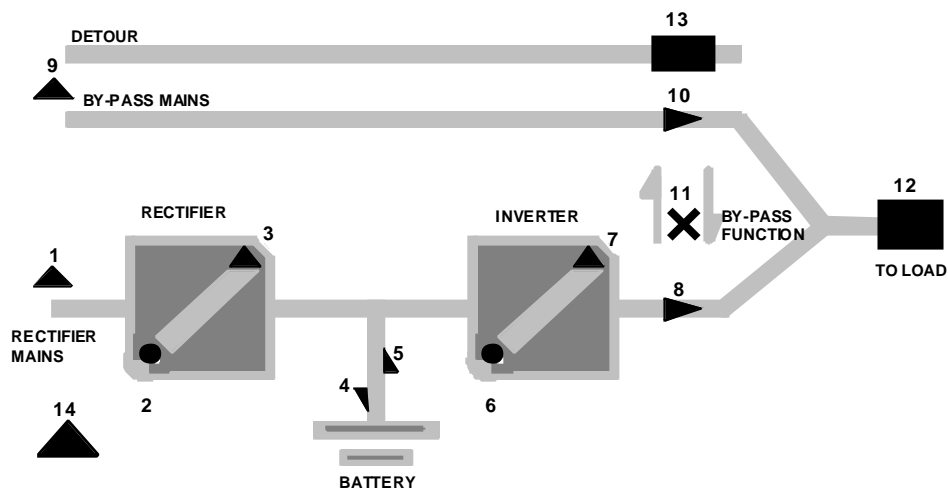
3. CONTROL PANEL

The control panel is composed of :

- 1 mimic panel
- 1 four-line LCD display
- 1 four-key keyboard



3.1. Mimic panel



When the system is operating properly, only the green LEDs 2, 4, 6 and 8 are on.

Detailed table of the mimic panel animation :

DESIGNATION OF THE DIFFERENT LEDES	Col *	LED OUT	LED ON	BLINKING LED
1 MAINS 1 ALARM	O	mains present	mains failure or Q1 open	
2 RECTIFIER STATE	G	rectifier off	rectifier on	internal communication problem
3 RECTIFIER ALARM	O	no fault	rectifier general alarm	internal communication problem
4 BATTERY CHARGING	G	floating battery (4) and (5) out	recharging battery	battery fault
5 BATTERY DISCHARGE	O	floating battery (4) and (5) out	discharging battery	battery fault
6 INVERTER STATE	G	inverter off	inverter on	internal communication problem
7 INVERTER ALARM	O	no fault	inverter general alarm	internal communication problem
8 LOAD ON INVERTER	G	KM40 contactor open	KM40 contactor closed and Q3 closed	KM40 contactor closed and Q3 open or internal communication problem
9 MAINS 2 ALARM	O	mains present	mains failure or Q4 open	
10 LOAD ON MAINS	O	SS does not conduct	SS conducts and Q3 closed	SS conducts current and Q3 open or internal communication problem
11 TRANSFER NOT POSS.	O	transfer possible	transfer not possible	by-pass fault and transfer not possible
12 IMMINENT STOP	R		Q3 and Q5 open	imminent stop
13 BY-PASS	O	Q5 open	Q5 closed and Q3 open	Q5 and Q3 closed
14 GENERAL ALARM	O	no alarm	general alarm	

* LEDs colours : O = orange; G = green; R = red.

3.2. Liquid crystal display

The screen of the PYRAMID-EX UPS is made up of four lines further divided into eight fields, as shown below :

FIELD 1			FIELD 2		
FIELD 3					
FIELD 4					
FIELD 5	FIELD 6	FIELD 7	FIELD 8	FIELD 7	FIELD 8

FIELD 1 : state of the output.

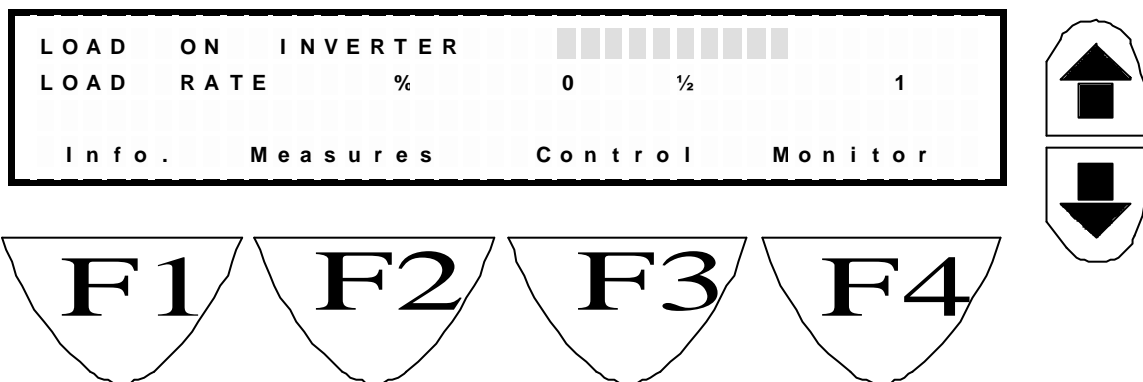
FIELD 2 : specific states of the system.

FIELDS 3 and 4 : display of the activated alarms.

FIELDS 5, 6, 7 and 8 : display of the accessible menus ; use the keys F1, F2, F3 and F4 on the keyboard.

3.3. Keyboard

The keyboard is composed of four function keys and two keys to scroll up and down.



The functions of the keys F1 to F4 depends on the operating mode of the PYRAMID-EX control panel. These keys can also be used to select menus or commands.

General principle of the keyboard functions

F1 : to validate the current operation.

F4 : to cancel an instruction or
to return to previous menu or
to reset an alarm.

↑ et ↓ : to scroll lists,
to scroll measurement screens and the event log,
to scroll the activated alarms,
to set the screen contrast,
to modify the settings of the clock and the battery test.

4. OPERATION

4.1. Safety instructions

Do scrupulously follow the using instructions described in this manual.

All handlings must be exclusively carried out by personnel trained accordingly.

Do respect the "switching-on" and "switching-off" procedures of the system so as to avoid abnormal stress for components.

Even when stopped, an inverter is still live :

- mains voltage to supply the rectifier,
- direct voltage generated by the battery and the operating rectifier.

Once the UPS has been switched off, wait about 5 minutes for the electrolytic capacitors to be discharged.

CAUTION : the ripple voltage of the capacitors may still cause heavy electric arc after the 5-minute discharge.

The detection of possible faults must be performed by a competent personnel, perfectly acquainted with the equipment.

4.2. Initial state of the UPS switches

For all handlings, refer to the principle diagram of the system's technical manual.

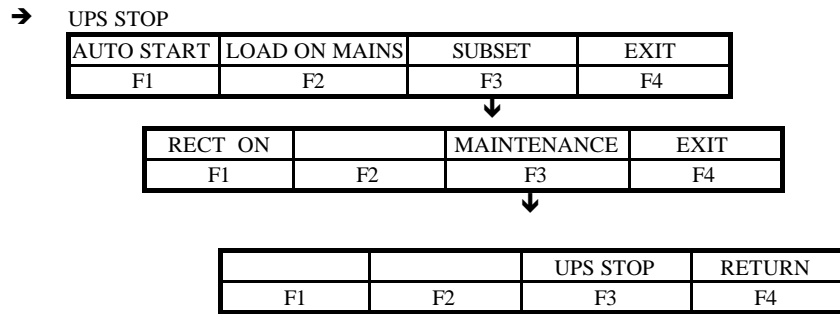
First of all, make sure that :

- the earth cable is properly connected,
- the connections of the input, battery and output cables are completed,
- the phase rotation is correct,
- the switches Q1, Q3, Q4, Q5 are open,
- the switch F20 or Q20 (in the board or in the battery cabinet) is open

4.3. Structure of the "CONTROL" menu

INFO	MEASURES	CONTROL	MONITOR
F1	F2	F3	F4

DIFFERENT MENUS ARE PROPOSED
ACCORDING TO THE STATE OF THE UPS



→ THE UPS IS OPERATING NORMALLY AND
THE LOAD IS ON INVERTER

STOP	LOAD ON MAINS	SUBSET	EXIT
F1	F2	F3	F4

↓

RECT OFF		MAINTENANCE	EXIT
F1	F2	F3	F4

↓
SYNCHRO MODE (See A)
DESYNCHRO MODE (See B)

→ THE INVERTER IS OPERATING AND
THE LOAD IS ON MAINS

LOAD ON INV		SUBSET	EXIT
F1	F2	F3	F4

↓

RECT OFF	INV OFF	MAINTENANCE	RETURN
F1	F2	F3	F4

↓
SYNCHRO. MODE (See A)
DESYNCHRO. MODE (See B)

→ THE INVERTER IS OPERATING AND THE
LOAD IS NOT SUPPLIED

LOAD ON INV	LOAD ON MAINS	SUBSET	EXIT
F1	F2	F3	F4

↓

RECT OFF	INV OFF	MAINTENANCE	RETURN
F1	F2	F3	F4

↓
MODE SYNCHRO. (See A)
MODE DESYNCHRO. (See B)

A → SYNCHRO MODE

DESYNCHRO		UPS STOP	RETURN
F1	F2	F3	F4

B → DESYNCHRO MODE

SYNCHRO		UPS STOP	RETURN
F1	F2	F3	F4

The control STOP entails :

- the load transfer to the by-pass mains (if the latter is available)
- the inverter and the rectifier stop (and the opening of the battery protection, if the option is provided).



The control `ES STOP` entails the switch off of the load.
Such these commands require a double validation.

4.4. Supply of the UPS

When applying voltage upstream from the UPS, the screen is on and that the sound signal goes on. You can reset possible alarms by pressing F4 several times.

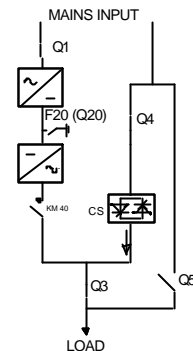
4.5. Switching on of the UPS

Perform the operations mentioned below :

- close switch Q1
- close switch Q4
- close switch Q3

Through the control panel select the command **LOAD ON MAINS**.

At this point the load is supplied by the mains.

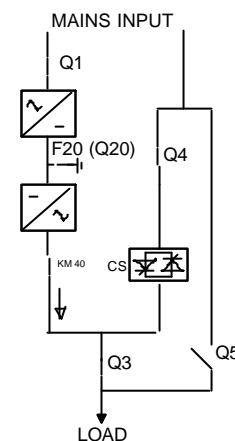


To start the UPS, perform the following operations:

- select the command "RECT. START"
- wait about 30 seconds for the load to be supplied (you can check it on the mimic panel)
- close switches F20 or Q20
- select the command "INV START".

The inverter is operative; just wait for the synchronization on the mains (led n°11 symbolized by an arrow is off).

Through the control panel, select the command "LOAD ON INVERTER". At this stage the load is supplied by the inverter.



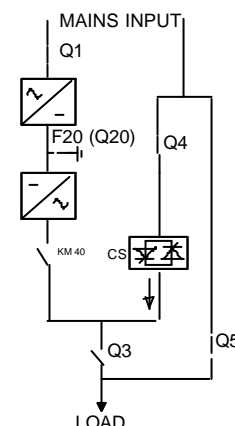
NOTE : In the above description, the start of the UPS is made chronologically and one subset after the other, however the automatic start is available. In this case do not forget to close the battery connection (F20 or Q20) when the start procedure is achieved.

4.6. Load transfer on the BY-PASS

To transfer the load on the BY-PASS, perform the following operations:

- select the command **LOAD ON MAINS**
- close switch Q5
- open switch Q3
- check the orange arrow is blinking (10) on the mimic panel and reset the sound alarm **BY-PASS FAULT** by pressing F4.

At this stage, the by-pass function as well as the inverter and rectifier subsets can be switched off without affecting the load.



4.7. Switching-off of the UPS

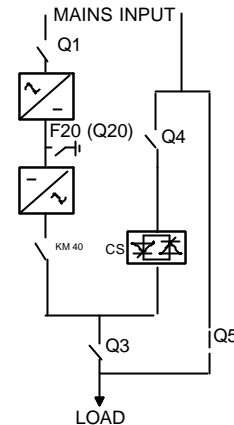
Make sure that the load is supplied by the BY-PASS. (Q5 need to be closed, Q3 open)

Through the control panel :

- select LOAD STOP
- select INVERTER STOP
- select RECTIFIER STOP

As far as the switches are concerned, perform the operations mentioned below :

- open F20 (or Q20)
- open Q1
- open Q4



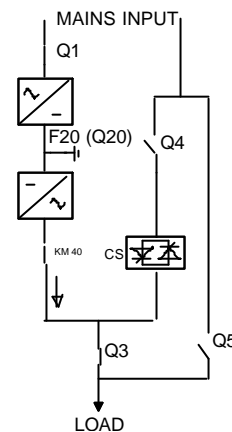
WARNING: when handlings inside the machine are necessary make sure that the electrolytic capacitors are completely discharged. The measure can be visualized on the control panel. The control panel is supplied upstream Q1.

4.8. Load transfer from BY-PASS to INVERTER

The UPS is supplied and operative.

Perform the following operations:

- select LOAD ON MAINS
- close Q3
- open Q5
- select LOAD ON INVERTER



4.9. Quick stop of the UPS

The STOP command allows a quick stop of the UPS.

A quick stop is only possible when the load is supplied by the inverter and when the transfer to mains is possible. If these conditions are fulfilled, by pressing the STOP command (twice to validate the command) will bring about :

- a transfer of the load to the mains
- the inverter switch off
- the rectifier switch off
- the opening of the battery circuit breaker (if the UPS is fitted with this option).

5. DISPLAY LEVEL - SCREEN

It corresponds to the permanently displayed message when the screen is idle. It indicates :

- the state of the load (field1),
- the UPS load rate (fields 2 and 3),
- the activated alarms (fields 3 and 4)*,
- the different menus corresponding to the four function keys (fields 5 to 8).

* When alarms are activated, the UPS load rate disappears.

5.1. Display of the load state

In field 1, one of the following four states will be displayed :

- LOAD NOT SUPPLIED,
- LOAD ON INVERTER,
- LOAD ON MAINS,
- LOAD ON BY-PASS.

5.2. Display of the load rate

It is represented by a bar-graph.

It is displayed when the load is supplied by the inverter and when no alarm is activated.

The display scale is non-linear :

- up to 40% : 1 block = 10%,
- from 40% to 100% : 1 block = 5%,
- from 100% to 108%, 2 blinking blocks to signal an overload.

Over 108%, the overload alarm will be activated and the bar-graph disappears.

Example of a screen under normal operating conditions:

LOAD ON INVERTER	XXXXXXXXXX		
LOAD RATE %	0 1/2 1		
	0 10 20 30 40 50 60 70 80 90 100		
INFO.	MEASURES	CONTROL	MONITOR
F1	F2	F3	F4

Example of a screen under overload operating conditions:

LOAD ON INVERTER		RATE = 125%	
UPS OVERLOAD			
INFO.	MEASURES	CONTROL	MONITOR
F1	F2	F3	F4

5.3. Display of the back-up time

The BACK-UP function is displayed when the inverter is operating on battery back-up. A minute counter is incremented as long as the back-up mode is active.

Example of a screen in back up mode:

LOAD ON INVERTER	BACK UP	XXX mn	
INVERTER ON BATTERY			
INFO.	MEASURES	CONTROL	MONITOR
F1	F2	F3	F4

The operating conditions in back-up mode are as follows :

- Stopped rectifier AND Operating inverter AND Battery connection closed
- Negative battery current AND Operating inverter

5.4. Display of the battery test

When the battery test is activated, the message "BATT. TEST ACTIVATED" appears in field 2.

6. INFORMATION MENU

6.1. Display of the different states

The different states are displayed on the 4 lines of the screen. Each one is numbered and followed by YES or NO .

To scroll up or down, use 'arrow up' and 'arrow down'.

The arrows indicate the beginning or the end of the list. If "↑" does not appear, the top of the list is displayed ; if "↓" disappears, the last state is displayed on line 4.

1 LOAD ON INVERTER	YES		
2 LOAD ON MAINS	NO		
3 LOAD NOT SUPPLIED	NO		
4 LOAD ON BY-PASS	NO	RETURN	↓
F1	F2	F3	F4

6.2. Display of the different alarms

If no alarm is activated, the message "NO ACTIVE ALARM" appears.

If not, the activated alarms are followed by "YES".

6.3. Display of the event log

Example of the event log screen:

001	LOAD ON INVERTER	N	15 : 05 : 26	01/10
002	COMMAND LOAD ON INVERTER	O	15 : 05 : 26	01/10
003	INVERTER ON	O	15 : 05 : 25	01/10
004	COMMAND INVERTER ON	O	15 : 05 : 25	01/10
F1	F2	F3	F4	

log number	Designation of the information or the command	State : Y active N inactive except comm.	hours minutes seconds	day month (no year)
------------	---	---	-----------------------------	---------------------------

7. ALARM MANAGEMENT

7.1. General principle

The alarm management includes three phases : an alarm is activated, it is reset and the user returns to the display level indicating the alarms that are still activated.

7.2. Display of an alarm

In the event of an alarm, the current screen is replaced by following screen and a sound signal (buzzer) :

LOAD ON INVERTER IMMINENT STOP			RESET
F1	F2	F3	F4

FIELD 1 : state of the load,
 FIELD 3 : designation of the alarm to be reset,
 FIELD 8 : reset command.

As long as a displayed alarm is not reset (either in local mode or by using a PC remote control or Building Management System), the screen will remain unchanged, except if a new alarm with a higher priority appears. In such a case, the latter replaces the previous alarm in FIELD 3.

The priority sequence of the different alarms depends on the customer information list (the first alarm being the one with the highest priority).

The priority sequence by default is given in § 7.5.b.

7.3. How to reset an alarm

To reset an alarm, use function key F4.

It stops the sound signal and you return to the "display" level. In the event of several consecutive alarms, they are successively displayed each time an alarm is reset.

7.4. Return to the "display" level

The "display" level appears when all alarms are eventually reset.

The still activated alarms appear in FIELD 3 and 4. If there are more than 2 active alarms, it is possible to scroll up or down. The arrow keys appear in FIELD 2 and FIELD 8.

LOAD ON INVERTER				
IMMINENT STOP				
BATTERY DISCHARGED				
INFO.	MEASURES	CONTROL	MONITOR	↓
F1	F2	F3	F4	

7.5. List of the different states and alarms

The lists below are accessible in the INFORMATION menu. Some designations are a combination of logic functions and basic information.

a. STATES

Num	Designation	Description
1	LOAD ON INVERTER	KM 40 and Q3 closed
2	LOAD ON MAINS	SC conducts and Q3 closed
3	LOAD NOT SUPPLIED	Q3 open or KM open and SC does not conduct
4	LOAD ON BY-PASS	Q5 closed and Q3 open
5	EMERGENCY MAINS ABSENCE	Q4 open or by-pass mains fault
6	INVERTER ON	elementary information
7	INVERTER / MAINS SYNCHRONIZED	elementary information
8	RECTIFIER ON	elementary information
9	RECTIFIER MAINS ABSENCE	Q1 open or rectifier mains absence
10	CHARGING BATTERY	the battery is recharging
11	OPERATING ON GENERATOR SET	external information
12	EMERGENCY STOP	external information activated

b. ALARMS

Num	Designation	Description
1	IMMINENT STOP	informs of the risk for the load no longer to be supplied
2	BATTERY DISCHARGED	elementary information
3	INVERTER ON BATTERY	the inverter is operating on the battery autonomy
4	BATTERY ALARM	several causes may be found : end of slow discharge, battery test not OK, battery connection open
5	TRANSFER BLOCKED	following to 4 successive transfers in less than 60 seconds; it is possible to choose the source : either inverter or mains
6	TRANSFER IMPOSSIBLE	the load can not be transferred from one source to the other (mains or inverter)
7	RETURN TO INVERTER IMPOSSIBLE	following to an automatic transfer on the mains, the transfer to inverter is not enabled due to a load overload or an inverter fault
8	BATTERY ROOM ALARM	information concerning the battery room
9	BY-PASS FAULT	Q5 and Q3 are simultaneously closed
10	BY-PASS GENERAL ALARM	activated if any fault or alarm is present on the by-pass
11	INVERTER GENERAL ALARM	activated for all inverter alarms
12	UPS OVERLOAD	when load is on inverter if the load rate is > 108% when load is on mains if the load rate is > 103%
13	RECTIFIER GENERAL ALARM	activated for all rectifier faults
14	BATTERY EARTH LEAKAGE	option, detection of current leakage to earth
15	MONITORING GENERAL ALARM	synthesis of the module monitoring alarms

NOTE : these lists do not include the message "UPS GENERAL ALARM". Nevertheless, it is available for :

- programming of the output relays,
- mimic panel signallings (LED 14),
- JBUS interface.

8. EVENT LOG MENU

8.1. General principle

Every alarm is stored in the event log, as well as every state or command change. The logging is based on the FIFO principle. When the log is filled up, the last recorded information overwrites the oldest one. **The log has a capacity of 300 records**. Each one includes the name, the state, the date and the time corresponding to the stored event.

8.2. Use

To enhance the user-friendliness of the display, the events appear 4 by 4 on separate lines.
 This layout suppresses the menu line ; therefore the help screen below appears before the events are displayed.

KEY FUNCTIONS TO SCROLL				↑
NEXT	PREVIOUS	TOP	RETURN	↓
F1	F2	F3	F4	

Function of the keys F1 to F4 :

F1 : display of the 4 next lines,

F2 : display of the 4 previous lines,

F3 : return to the first line of the log (Event n° 1),

"↑" : previous line, scrolling,

"↓" : next line, scrolling.

A specific line indicates the last line of the log :

***** END "

9. MEASURES MENU

The measures are displayed on 3 different screens.

SCREEN 1 : OUTPUT MEASURES

SCREEN 2 : MAINS MEASURES or INVERTER MEASURES

SCREEN 3 : RECTIFIER and BATTERY MEASURES

Use the keys "↑" and "↓" to move from one screen to another.

Examples :

SCREEN 1

MEASURES OUTPUT SUPPLIED BY INVERTER				↑
U12 = 400V	V1 = 231V	I1 = 150A	S = 104kVA	
U23 = 400V	V2 = 231V	I2 = 150A	F = 50.0Hz	
U31 = 400V	V3 = 231V	I3 = 150A	EXIT	↓
F1	F2	F3	F4	

SCREEN 2

MEASURES MAINS			↑
U12 = 400V	F = 48.9Hz		
U23 = 402V			
U31 = 398V		EXIT	↓
F1	F2	F3	F4

SCREEN 3

MEASURES RECTIFIER		MEASURES BATTERY	↑
U12 = 398V	Ir = 5A	Vdc = 450V	
U23 = 402V		Ibt = - 56A	
U31 = 400V		EXIT	↓
F1	F2	F3	F4

NOTES :

When "LOAD ON MAINS" is selected, the phase-to-phase voltages are not displayed on SCREEN 1. SCREEN 2 displays the inverter measures.

When "LOAD STOP" is selected : SCREEN 2 displays the mains measures, or the inverter measures in the event of a mains absence.

10. STRUCTURE OF THE MONITOR MENU

1 HELP

(F1) USE
 (F1) ON BY-PASS
 (F2) TRANSFER BACK TO INVERTER
(F2) REPAIR
(F3) MAINTENANCE

2 BATTERY

(F1) MANUAL TEST
 (F1) CONFIRM
 (F4) CANCEL
(F2) AUTOMATIC TEST PROGRAMMING
 (F1) NEXT
 (F2) CONFIRM
 (F3) SUPPRESS
 (F4) RETURN

3 CONFIG.

(F1) CLOCK
 (F3) NEXT FIELD
 (F4) CONFIRMS THE OPERATION
 ↑ SCROLL THE PREVIOUS FIELD
 ↓ SCROLL THE NEXT FIELD
(F2) ACCESS CODE
 (F3) NEXT CHARACTER
 (F4) VALIDATE THE OPERATION
 ↑ NEXT LETTER
 ↓ PREVIOUS LETTER

(F3).CONT.
 (F1) BUZZER
 (F1) +
 (F2) -
 (F3) LED TEST

 (F2) SUPERVISOR
 (F1) CONNECTION
 (F1) SPEED
 (F2) PARITY
 ↑/↓ SLAVE N°
 (F2) SLAVE OR MASTER
(F3) LANGUAGE
 (F1) FRANCAIS
 (F2) ENGLISH
 (F3) DEUTSCH
 (F4) CONT.
 (F1) ITALIANO
 (F2) ESPANOL

11. HELP MENU

11.1. Aid for the customer

The aid for the customer is a guide designed to explain the successive steps to perform some of the maintenance to prevent all risks of mishandlings.

The different operations are:

- the transfer on by-pass
- the transfer back to inverter

Note:

- at every moment the operations can be cancelled by pressing F4
- the transfer on by-pass is only available if the "load on mains" command is possible.

Example of display for the transfer to by-pass :

TRANSFER ON BY-PASS			
REQUEST	TO	INVERTER	
CONFIRM			CANCEL
F1	F2	F3	F4

If the transfer on by-pass is impossible :

TRANSFER ON BY-PASS			
TRANSFER	IMPOSSIBLE		
			EXIT
F1	F2	F3	F4

11.2. Repair aid

This "repair aid" is only displayed if there is an active alarm. It allows to display the specific alarms of each general alarm when these are activated.

List of the different specific and general alarms :

SUBSET	CODE	DESCRIPTION
RECTIFIER	ROT	phase rotation fault
	FUS	rectifier fuse fault
	TMP	transformer temperature fault, or rectifier bridges temperature fault
	CAP	VDC detector fault
	FH5	harmonic filter H5 fault
	ELC	20V supply fault or electronic fault or EEPROM. fault
INVERTER	FUS	bridge 1 fuse fault bridge 2 fuse fault *
	DRV	bridge 1 and 2 * drivers 1 to 3 fault
	TMP	bridge 1 temperature fault bridge 2 * temperature fault transfo temperature fault temperature prealarm fault
	SYN	inverter synchro. fault
	EQU	balance fault
	ELC	20V supply fault or electronic fault or EEPROM. fault
	BY-PASS	KM
CS		SC supply fault or SC thyristors fault
TMP		SC temperature fault or SC temperature prealarm fault
VRS		VRS voltage detector fault
VEN		ventilation fault
ELC		20V supply fault or electronic fault or EEPROM. fault
BATTERY		CBO
	TBA	battery test fault
	SDT	temperature probe fault
	FDL	end of slow discharge
MONITORING	ORG	subset bus fault : no communication with rectifier or inverter or with by-pass.
	DHM	DHM bus fault : no communication with JBUS or remote control or remote signalling.
	ALM	monitoring supply fault-
	ELC	20V supply fault or electronic fault or EEPROM. fault

* For UPS over 400kVA.

Screen of the repair aid :

GA RECT	GA INV	GA BYP	A-BATT	ALM-MON	↑
	FUS	DRV	DKM	ORG	
FUS		SYN			
TMP		TMP	SDT	ELC	↓
F1		F2	F3		F4

On the first line, only the activated general alarms are displayed.

For each subset, the alarms code appear in 2 columns, that is to say 6 codes for each subset.

Only the active alarm codes are displayed. To quit this menu, just press any key (F1 to F4).

11.3. Maintenance aid

It allows to display all elementary information in only one screen. The data coding is based on the different subsets and information types (States, Alarms, Faults). An hexadecimal coding makes them easy-to-read.

Screen of the hexadecimal codes.

SUBSET	RECT	INV	BYP	MON
STATES	1B8F	5A07	3FB1	DB03
ALARMS	0015	0008	01D2	0001
FAULTS	00B1	004F	0005	0009
F1	F2	F3		F4

To quit this menu, press any key from F1 to F4.

In the event of a UPS fault, you can indicate those codes to the SERVICE DEPARTMENT in order to diagnose the problem you are facing.

12. BATTERY MENU

12.1. Conditions to start the battery test

The battery test can only be activated if the following conditions are fulfilled :

- rectifier operating
- load on inverter and load rate > 10%
- no overload on inverter
- by-pass unlocked
- battery connection closed
- battery neither on charge, nor on discharge.

12.2. Starting the manual test

The battery test being fulfilled, the manual test can be activated through the UPS control panel. Before starting the battery test, the date of the last test as well as the date of the next one are displayed:

RESULTS OF THE LAST BATTERY TEST			
BATTERY TEST OK	18 : 00 : 08	05/01	
NEXT BATTERY TEST	02 WEEK SATUR 18/00		
VALIDATE	CANCEL		
F1	F2	F3	F4

12.3. Programming the automatic test

The battery test can be made automatic on the control panel according to a settable periodicity.

Battery test programming screen :

PROGRAMMING NEXT BATTERY TEST				↑
DATE	HOUR	MINUTE	N° WEEKS	
SUNDAY	18	00	4	
NEXT	VALIDATE	CANCEL	RETURN	↓
F1	F2	F3	F4	

If the number of weeks is equal to 0, the automatic test is disabled.

Description of the different function keys :

- F1 Next : to move to the next field (the current data entry field is blinking),
- F2 Validate : to validate the settings,
- F3 Cancel : to cancel the programmed battery test. All values are reset,
- "↑" and "↓" to increment or decrement the data entry field,
- F4 Return : to return to the "Control" menu without saving the settings.

12.4. Recording the test sequence

After each test, a message indicating the date, the time and the end of the test is stored in the event log. The displayed message is: "Battery test OK on 15.07.96 at 23.15". If the test failed, the message displayed is: "Battery test impossible".

The event log includes following information :

- date of the test execution,
- battery test OK,
- impossible to run battery test,
- battery test failed.
- battery test interrupted, (rectifier stopped while test in process)

Moreover, the UPS issues the BATTERY ALARM information.

13. CONFIGURATION MENU

13.1. Clock configuration

The UPS is fitted with a clock which make it possible to know the date, the time of any test at any time. The clock configuration is only possible from the control panel.

Configuration screen :

DAY	DATE	MONTH	YEAR	↑
MONDAY	1	5	96	
HOUR	MINUTE			
12	30	NEXT	EXIT	↓
F1	F2	F3	F4	

The current data entry field is blinking.

Different functions are available :

F3 : NEXT to move to another field,

"↑" : to increment the current value,

"↓" : to decrement the current value.

The keys F1 and F2 have no function.

NOTE: if a battery test was programmed, the date is automatically recalculated if the clock has been reset, either manually or through GTC.

13.2. Access code configuration

This code allows to inhibit the access to the 'CONTROL' and 'MONITOR' levels of the UPS.

It can only be configured on the local control panel and be made up of 6 characters, from "A" to "Z".

Configuration screen :

ENTER ACCESS CODE		(6 CHARACT. MAXIMUM)		↑
A				
NEXT	VALIDATE	SUPPRESS	EXIT	↓
F1	F2	F3	F4	

Functions :

F1 NEXT : to add a character,

F2 VALIDATE : to validate the entered code,

F3 SUPPRESS : to suppress the current code,

F4 EXIT : to cancel the current entry. The old code remains in the memory.

↑and↓: to modify a letter.

13.3. Buzzer configuration

It is possible to modify the buzzer frequency by successively pressing F1 "+" (to increase the frequency) and F2 "-" (to reduce the frequency).

13.4. LEDs test

This function is available in the buzzer configuration menu (F3). It makes it possible to test all the leds of the mimic panel (they are blinking) and to display the software versions of all the UPS subsets.

SCREEN

LED TEST	SOFTWARE	VERSIONS	DISPLAY
Monitoring	Rectifier	Inverter	By-pass
E500015A	E500025A	E500035A	E500045A
+	-	LED TEST	RETURN
F1	F2	F3	F4

13.5. Choosing a language

Seven different languages are available in the basic software version :
FRENCH, ENGLISH, GERMAN, ITALIAN, SPANISH, DUTCH, SLOVAK.

14. CONTRAST SETTING

To set the contrast of the liquid crystal display, use the keys "▲" and "▼" - 'DISPLAY' level - if no alarm is activated.

NOTA: the contrast can be adjusted if more than two alarms are active.

15. OVERLOAD MONITORING

Principle:

The control principle of the module overload can be compared to a tank, filling up more or less rapidly. The tank fills up with units : when it is empty, it contains 0 unit ; when it is filled up, it contains 3600 units. The filling rapidity depends on the overload rate. Nevertheless, when the module is no more overloaded or if it is off, the tank empties of 1 unit per second (at worst it needs one hour to empty completely, hence the initial value 3600).

This period corresponds to the cooling of the UPS after an overload.

Signalling and automatic actions:

The alarm "UPS overload" is activated if :

- the UPS load rate exceeds 108% with "Load on Inverter",
- the UPS load rate exceeds 103% with "Load on Mains".

The alarm disappears when the UPS load rate is again lower than 100%.

As the load is supplied by the inverter, the following automatic actions happen, according to the fill-up level of the overload "tank".

- ❖ at level ≥ 0 and ≤ 1800 :
 - if the by-pass mains is present : UPS OVERLOAD alarm is active
 - if the by-pass mains is absent : IMMINENT STOP alarm is active
- ❖ at level ≥ 1800 and ≤ 3600 :
 - if the by-pass mains is present : load automatic transfer
 - if the by-pass mains is absent : IMMINENT STOP alarm
- ❖ at level = 3600 :
 - if the by-pass mains is absent : inverter stop (the load is no longer supplied)
 - if the by-pass mains is present, but not synchronized, the load is transferred with cut- off (UPS specific configuration under customer's request).

Note: if the load is supplied by the by-pass mains following to an automatic transfer, and if the UPS OVERLOAD alarm is active, no transfer back to the inverter can be performed as long as the overload remains present.

TYPICAL OVERLOAD OF THE MODULES AT 25°C.

MODULE OVERLOAD	Load transfer to mains possible	Load transfer to mains not possible
110%	30 minutes	60 minutes
125%	5 minutes	10 minutes
150%	30 seconds	1 minute

Note : when the load is on mains, a prolonged overload of the static contactor entails its warming up and after a while the load is stopped.

16. EMERGENCY STOP

The UPS can be fitted with an EMERGENCY STOP (closing of loop on PCB NW630 'Alarms transfer of common cabinet - connector XJ5 terminals 3-4).

The emergency stop induces :

- the load stop
- the rectifier and inverter shutdown while the battery remains connected.

The battery connection can be made open on request, through the addition of a Mx coil, directly controlled by the emergency stop.

For any further information, do refer to the manual entitled GENERAL RECOMMENDATION FOR PYRAMID-EX UNINTERRUPTIBLE POWER SUPPLIES

17. EMERGENCY SET

An information (closing of loop on PCB NW630 'Alarms transfer' of common cabinet - connector XJ5 -terminals 1-2) called EMERGENCY SET allows the UPS to operate as an emergency set.

Four conditions are settable by the Service Department :

- a.- output voltage of rectifiers adjusted to the off-load voltage of the batteries,
- b.- desynchronization of the operating inverters,
- c.- conditions 'a' and 'b'
- d.- no action on the UPS when the emergency set is operating.

Without any specific customer's request, the 'd' condition is set on the UPS ex works.

18. FLOATING CORRECTION IN ACCORDANCE WITH THE TEMPERATURE

To optimize the lifetime of the batteries, the floating voltage can be adjusted to three levels of temperature :

- temperature level T1 < 22°C
- temperature level T2 between 22°C and 28°C
- temperature level T3 > 28°C.

Floating values are adapted according to the data provided by the battery manufacturer.

NOTA :

Ex-works, in the absence of connections, the floating is set in accordance with the temperature level T2. If thermostats happen to be faulty, or if loops 7-8 and 5-6 are closed simultaneously, the floating voltage is adjusted to temperature level T2.

The UPS issues the SENSOR TEMPERATURE FAULT information.