Be2K-Plus USER Manual

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Name:_____Company:_____Tel/Fax:_____

I would like to report the following error: _____

_____

Customer Support BERNINI DESIGN SRL ITALY

e-mail: **bernini@bernini-design.com**   *mobile: ++40 721 241 361   or ++39 335 7077 148.*

Warranty

Bernini Design SRL (hereinafter "BD") warrants that Be2K-Plus shall be free from failure due to components or manufacturing over a period of 3 years from the BD delivery date. Upon any return by the customer BD shall, at its discretion, either repair or replace the product without charge. BD will then return the Be2K-Plus to the buyer, reset to the factory default settings at no extra charge.
The buyer shall furnish sufficient information on any alleged defects in the product, so as to enable BD to determine their cause and existence. If the Be2K-Plus is not defective, or the product is defective for reason other than that covered by this warranty, then the buyer will be charged accordingly.
Warranty cover will not apply if the Be2K-Plus has been used in contravention of the User Manual or other applicable operating instruction, particularly if such defects are caused by misuse, improper repair attempts or negligence in use or handling. This purchase is non-refundable.

$C\!\epsilon$

This equipment complies with the EMC protection requirements.

!! IMPORTANT WARNINGS !!

High voltages are present inside the Be2K-Plus. To avoid the risk of electric-shock, operating personnel must not remove the protective cover. Do not disconnect the Earth (safety ground) connection!
The Be2K-Plus can and will start the engine at anytime. Do not work on equipment, which is controlled by the Be2K-Plus without isolating it first. When servicing the engine, always disconnect the battery and battery charger. We recommend that warning signs be placed on equipment indicating the above.

Alphabetic Index

Be2K-Plus User's Manual - Contents

Quickstart guide ! How to..........

How to............	*See section..*		*How to............*	*See section..*
start the engine	***2.20, 2.30***		**cancel an alarm**	***13.00***
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cancel alarm	***13.00***		**use the display**	***4.00***
select a mode of operation	***2.0***		**read parameters**	***12.00***
display Voltage & Current	***3.01***		**ask for support**	***15.00***
For issues not included in the above list, we recommend that you consult the Alphabetical index (page 2)				

Please work with us

Our policy is to support our customers. We have endeavoured to make this user manual friendly and simple to use. If you have any proposals for improving the quality of the document, or to modify the equipment in order for it to respond better to yours or your customer requirements, please contact us at: support@bernini-design.com

Section: 1.0 Introduction

The Be2K-Plus integrates a 3-Phase Automatic Mains Failure module and a Generating Set controller. The Be2K-Plus provides visual indication by means of LEDs and Displays for Engine environment, Electrical parameters and Alarms. The Be2K-Plus is pre-programmed by your Panel or Genset manufacturer. Figure 1 illustrates the layout of the front panel.

Figure 1: Front Panel layout
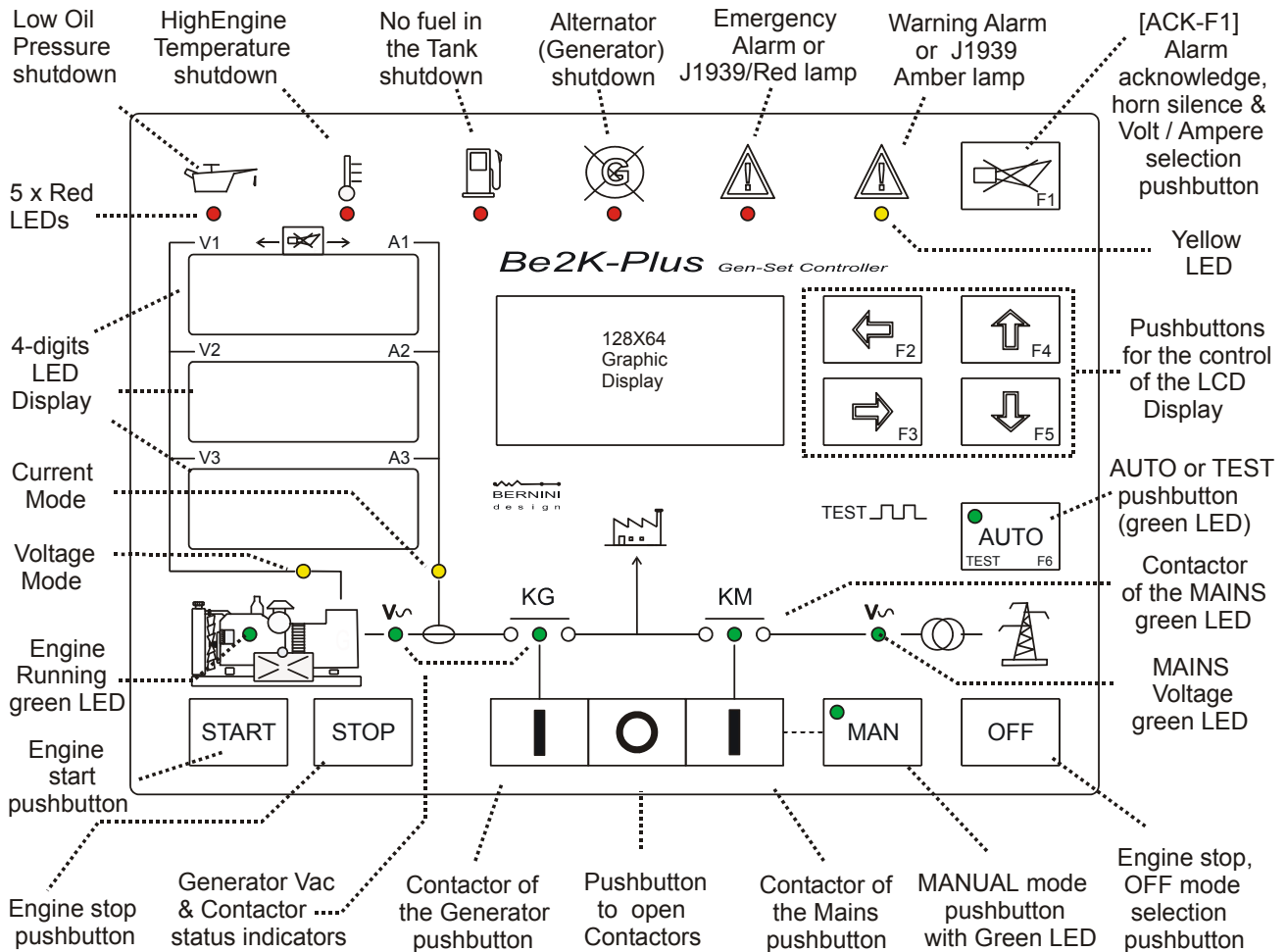
Section 2.0: Selecting an Operational Mode

The mode of operation is selected by pushbuttons and indicated by means of green LEDs:

NOTE: If the BE2K-PLUS was in TEST or AUTO prior to power down (battery supply), when you switch on the power supply, the Be2K-Plus enters the AUTO mode. In all other cases, the Be2K-Plus will enter the OFF mode.
The following sections describe the modes of operation.
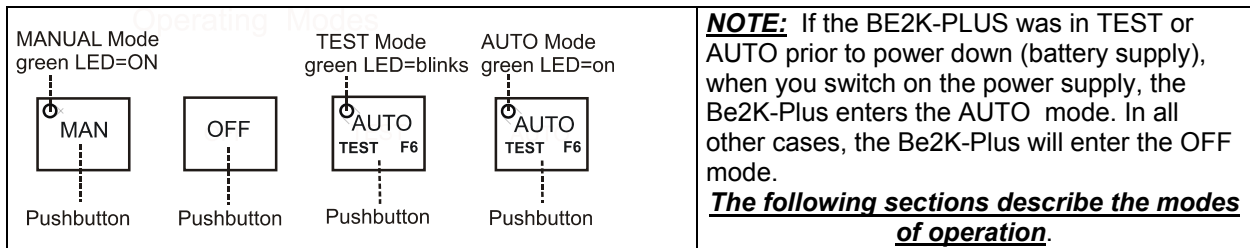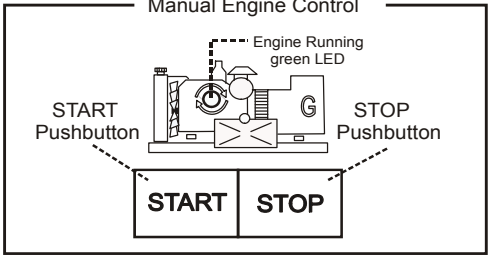
2.10   OFF mode

This mode clears the fault alarms (see section 13.00) and allows the parameters to be read (see section 12.0). The display indicates the MAIN MENU LIST (see section 4.00). The Display and LEDs are turned off after 30 seconds without a button press operation and a dot on the display will blink slowly. Press one of the pushbuttons on the front panel to return to the display.
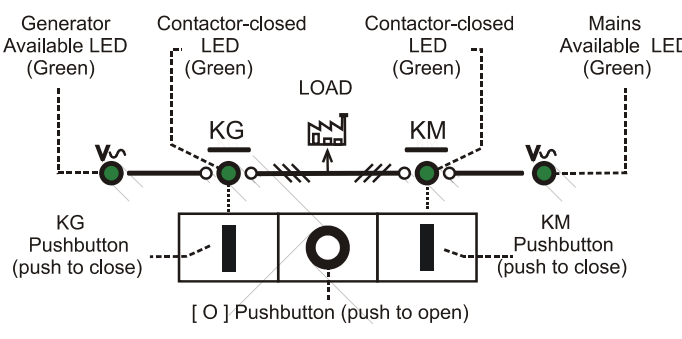
2.20 MANUAL mode

The MANUAL mode allows you to manually control the Engine and LOAD (see 2.21). Follow the instructions:

	In case of presence of alarms, consult section 13.00 first
Manual Engine Control Engine Running green LED START Pushbutton — STOP Pushbutton START | STOP	Push the [MAN] pushbutton to select the MANUAL mode. Push the [START] pushbutton until the engine starts; the display will automatically open a page with information about the start sequence: Preglow, Starting....... (see section 5.04) When the engine is running, the green LED 'ENGINE RUNNING' turns on. To stop the engine, push the [STOP] pushbutton until the [STOP] message appears on the display. If the engine has already stopped, it is possible to reset the STOP sequence by pressing the [STOP] pushbutton.

2.21 Manual Control of the LOAD   To control the contactors manually, follow the instructions:

	Instructions
Generator Available LED (Green) Contactor-closed LED (Green) LOAD Contactor-closed LED (Green) Mains Available LED (Green) KG KM KG Pushbutton (push to close) KM Pushbutton (push to close) [O] Pushbutton (push to open) [I] [O] [I]	Select the MANUAL mode, start the engine (see 2.20) and wait until the green LED 'Generator Presence' turns on. Push the [KG] pushbutton to close the contactor of the Generator. To transfer the Load to the Mains, wait for the green LED Mains Presence and push the [KM] pushbutton: the KG will open and KM will close after a 2-seconds delay. The displays (section 3.01 & 5.00) indicate all parameters. ***To switch off the LOAD, push the [O] pushbutton at anytime.***

!! WARNING !!

LINE VOLTAGE IS EXPOSED WITHIN THE BE2K-PLUS, THE LOAD OR ANCILLARY CIRCUITRY EVEN WHEN THE GREEN LEDs ARE TOTALLY OFF

2.30   AUTO mode

!! WARNING !!

The Be2K-Plus can start the engine at anytime without warning. Do not work on equipment, which is under the live control of the Be2K-Plus. When servicing the engine, disconnect the battery, the battery charger and all sources of Voltage and Current. We recommend that warning signs be placed on equipment indicating the above.

If alarms are already displayed, consult section 13.00 first

Push the [AUTO] pushbutton until the green LED illuminates. The engine will start in the case of a pre-existing Mains failure. After the warm-up time and if the Voltage and Frequency are within the correct settings, the contactor of the GENERATOR will close to supply your LOAD. The displays (section 3.01 & 5.00) indicate all parameters. If the Mains restores, the KG will open. The KM will then close following the pre-programmed changeover timing. The Engine will stop after an idling cooling down time. If the engine shuts down, the KM can close independently of the Mains status depending on the setting of Be2k-Plus, otherwise the KM will close only if the parameters of the Mains are within the programmed settings. In AUTO mode, the Be2K-Plus will periodically test the engine if the parameters PERIODIC TEST are correctly programmed (section 7.01). During the PERIODIC TEST, the green LED of the AUTO mode will continue to blink. In AUTO mode, the Be2K-Plus can start and stop the engine if a remote control is activated. You can stop the engine at anytime by selecting the MAN mode.

**(*)SEE NOTE**
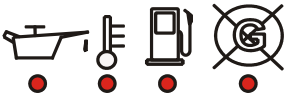
2.40 TEST mode

Push and hold the [AUTO] pushbutton until the green LED starts to blink. The Be2K-Plus will start the engine and transfer the LOAD to the generator only in the case of Mains Failure (if not otherwise programmed by your Panel supplier). To exit the TEST, push the [AUTO] pushbutton shortly or select another mode of operation.
**(*)NOTE:**   If you push the [STOP] pushbutton when the Be2K-Plus is in AUTO or TEST, the 'PANEL EMERGENCY' alarm will energize (see section 13.02).

Section: 3.00 LEDs indicators

The table explains the function of the LEDs (solid state lamps) on the front panel (see section 1, Figure 1). To test the LEDs, push the [OFF] pushbutton to enter the OFF MODE. Push and hold the [←] and [→] pushbuttons simultaneously or push the external TEST LAMP pushbutton (if provided by your panel manufacturer).

LED(s)	Note	LED(s)	Note
Indicators of Voltages and Contactor status. See section 2.21. (Vac, KM, KG....)	4 Leds (Green color). See section 2.21 for the description.	Manual Mode 🟢 MAN	Green LED: it turns on indicating the MANUAL mode
	4 Led indicators (red) for: -Oil pressure shutdown -Temperature shutdown -No Fuel shutdown -Generator shutdown	Auto Mode 🟢 AUTO **TEST F6**	Green LED: it turns on indicating the AUTO Mode. It will blink in TEST Mode.
 RED YELLOW	_**Red Led indicator:**_ it turns on in event of a shutdown. _**Yellow Led indicator:**_ it turns on in case of a warning. The Graphic display will indicate all details of the alarm(s).	Engine Running (see Fig.1)	Green LED on the drawing of the engine: it turns on when the engine is running.
		Current Mode & Voltage Mode (see section1, Fig.1)	2 yellow LEDs indicate the display mode (Voltage or Current). Push [ACK-F1] to toggle the display indication.

Section 3.01   LED DISPLAY description

The red LEDs Display consists of 3 groups of 4 digits. The display on the **TOP** indicates the electrical parameters of Phase L1, the display on the **MIDDLE** the Phase L2 and the display on the **BOTTOM**, the Phase L3. Two yellow LEDs indicate the mode of the display (Voltage Mode or Current Mode). Push the **[ACK-F1]** button to toggle the display mode; the other yellow LED will illuminate. See figure 1 in section 1.00. The display indicates the parameters of the Generator only.

Section 4.00 Main Menu List

Push the [OFF] to select the OFF mode and push **[←]**; the following Main Menu will appear:

MAIN MENU LIST	Section	Use **[↑]** or **[↓]** to select a Menu and **[→]** to enter the Menu
MEASUREMENTS & EVENTS	5.00	Accesses various Measurements and Events
CLOCK SETTINGS	6.00	Allows you to set the Clock
TEST & RENTAL	7.00	Miscellaneous functions and Automatic Test
MAINTENANCE TIMERS	8.00	Shows the status of the Maintenance timers
READ PARAMETERS	12.00	All parameters and settings can be read
COMMUNICATIONS	10.00	Used to broadcast alarms and information
DISPLAY & LANGUAGE	11.00	Display settings and language selection
PROGRAM PARAMETERS	9.00	Function reserved to the Panel Builder. Consult your supplierfor details
CLEAR MEMORY		
CLEAR EVENTS		
CLEAR ENERGY COUNTER		
CLEAR N° OF STARTS		
USER PASSWORD		
OEM PASSWORD		

The **MAIN MENU LIST** appears in the OFF mode (see 2.10). After 30 seconds without operating the **[↑][↓][←][→]** pushbuttons, the Display will shut down. To turn on the display push any of the button on the front panel.

Section 5.00: MEASUREMENTS & EVENTS

Use [F4 ↑] or [F5 ↓] to select this Menu from the **MAIN MENU LIST** (section 4.0) and push [→]. The submenu includes the indications of all parameters of the Engine and Generator.

Display Indication	See Section...	Note
GENERATING SET	5.01	Use [F4 ↑] or [F5↓] to select a sub-menu and [→] to enter the submenu. Push [←] to return back.
MAINS MONITORING	5.02	
POWER & ENERGY	5.03	
ENGINE & FUEL	5.04	
ALARM STATUS	5.05	
EVENT HISTORY	5.06	
CALIBRATION	Function reserved to the Panel Builder	
ABOUT BE2K-PLUS	Provides miscellaneous information about the controller: - Software Version and Release - Engine Manufacturer & Model	

Section 5.01 GENERATING SET

This Sub-menu indicates the following measurements:

Use **[↑]** or **[↓]** to select a page, use **[←]** to return			
L1-L2 (V) [XXX] L2-L3 (V) [XXX] L1-L3 (V) [XXX]	CURRENT 1 [XXXX] CURRENT 2 [XXXX] CURRENT 3 [XXXX]	L1-N (V) [XXX] L2-N (V) [XXX] L3-N (V) [XXX]	FREQUENCY [XX.X] SEQUENCE [CW/CCW] CONTACTOR [ON/OFF] EARTH FAULT [X.XX] SIMULATED [ON/OFF]

Section 5.02 MAINS MONITORING

This Sub-menu indicates the following measurements:

Use [↑] or [↓] to select a page, use [←] to return		
R - S (V) [XXX] S - T (V) [XXX] T - R (V) [XXX]	R - N (V) [XXX] S - N (V) [XXX] T - N (V) [XXX]	FREQUENCY [XX.X] SEQUENCE [CW/CCW] CONTACTOR [ON/OFF] SIMULATED [ON/OFF] TELECOM VDC [XX.X]

Section 5.03 POWER & ENERGY

This Sub-menu indicates the following measurements:

Use [↑] or [↓] to select a page, use [←] to return		
KVA 1 [XXXX] KVA 2 [XXXX] KVA 3 [XXXX]	KVAR 1 [XXXX] KVAR 2 [XXXX] KVAR 3 [XXXX]	KW 1 [XXXX] KW 2 [XXXX] KW 3 [XXXX]
PF 1 [X.XX] PF 2 [X.XX] PF 3 [X.XX]	TOTAL KW [XXXX] TOTAL KVA [XXXX] TOTAL KVAR [XXXX]	PF TOTAL [X.XX] ENERGY KWH [XXXXXXXX]

Section 5.04 ENGINE & FUEL

ENGINE STATUS PAGE push the [↓] to browse all the other pages related to the engine			
ENGINE STATUS **[MESSAGE 1]** **[MESSAGE 2]** **COUNTING [XXXX]** **DATE [XX.XX]** **TIME [XX:XX]** **HOUR RUN** **[XXXXXXXX]**	This page can indicate two messages that describe the status of the engine and the status of the active timer (COUNTING). Possible messages are:		
	RUNNING	**NOT RUNNING**	**RUNNING ON LOAD**
	REST	**PRELUBE**	**STARTING**	**CRANKING**
	STOPPING	**COOLING**	**WARM UP**
	IDLE SPEED	**PREGLOW**	**PERIODIC TEST**
	MAINS BREAKER DELAY	**MAINS FAILURE DELAY**	**REMOTE TEST**
	MAINS RESTORE DELAY	**TELECOM INHIBIT**	
	The engine run hours and Date / Time are also indicated		

push the [↓] to browse all the other pages related to the engine

Use [↑] or [↓] to select a page, use [←] to return		
SPEED RPM [XXXX] OIL PRESSURE [XX.X] COOLANT °C [XXX]	FUEL LEVEL [XX] TRANSFER PUMP [ON-OFF] V BATTERY [XX.X] ALTERNATOR V [XX.X] N° / STARTS [XXXXXX]	RENTAL H (!) [XXXXX] MAINTEN. 1 (!) [XXXXX] MAINTEN. 2 (!) [XXXXX] MAINTEN. 3 (!) [XXXXX]

(!) This indicates the remaining hours before expiry of the Maintenance Timers and Rental contract (see sections 7.01 & 8.0)

If your engine is equipped with an Electronic Control Unit, additional pages will appear as indicated below. The indication may change according to the model of engine (consult your supplier or the user manual of the engine for further details) :

Use **[↑]** or **[↓]** to select a page, use **[←]** to return			
OIL °C [XXX]	OIL °C [XXX] **SPN 175**	**WATER IN FUEL[ON/OFF]** **SPN 97**	**FUEL RATE [XXX]** **SPN 183**
AUXILIARY °C [XXX]	**OIL LEVEL [XX.X]** **SPN 98**	**FUEL °C [XXX]** **SPN 174**	**PEDAL % [XXXX]** **SPN 91**
	OIL PRESSURE [XX.X] **SPN 100**	**FUEL BAR [XXX]** **SPN 94**	**TURBO BAR [XX.X]** **SPN 102**

Use **[↑]** or **[↓]** to select a page, use **[←]** to return			
EXSAUST °C [XXXX] **SPN 173**	**COOLANT °C [XXX]** **SPN 110**	**CRANKCASE BAR** **[XXXX] SPN 101**	**DEMANDE TORQUE [XXXX]** **SPN 153**
BAROMETRIC P [XXXX] **SPN108**	**COOLANT % [XX.X]** **SPN 111**	**BOOST °C [XXXX]** **SPN 105**	**ACTUAL TORQUE [XXXX]** **SPN 513**
	COOLANT BAR [XXXX] **SPN 109**	**INTAKE BAR [XXXX]** **SPN 106**	**LOAD [XXXX]** **SPN 92**

Section 5.05 ALARM STATUS

This Sub-menu indicates the active alarms together with real time clock indication and general alarm information. A typical alarm screen is as follows (see section 13.00 for the list of the alarms):

Use **[↑]** or **[↓]** to browse the content of the pages	
ALARMS PAGE 1 OF 10 **OIL PRESSURE WARNING** **0,8 BAR** **DD:MM:YY HH:MM:SS**	This page opens automatically in the case of alarm(s). The Alarm status is also recorded in the Memory Events register. To return to the MEASUREMENTS pages, push the **[←]** pushbutton.

In case of alarms detected from an Electronically Controlled engine, the Be2K-Plus will provide additional information. Consult the user manual of the engine manufacturer for further details.

ALARMS PAGE 1 OF 10 **[DESCRIPTION OF ALARM]** **SPN XX FM1XX** **DD:MM:YY HH:MM:SS**	This page opens automatically in the case of alarm(s). The Alarm status is also recorded in the Memory Events register. To return to the MEASUREMENTS pages, push the **[←]** pushbutton.

Section 5.06 EVENT HISTORY

This submenu displays the last 200 events providing Date & Time information. The Events History captures: Warnings, Shutdowns, switching of the Contactors, Start & Stop sequences and changing of Operating Modes. The display can indicates 70 pages (3 alarms for each page)

Use **[↑]** or **[↓]** to browse the content of the pages	
EVENT HISTORY 1 / 70 **EMERGENCY** **DD:MM:YY HH:MM:SS**	Push **[↑]** or **[↓]** to browse the list of the events. To return to MEASUREMENTS, push the **[←]** pushbutton. (see section 13.0 for the list of the alarms)

Section 6.00: Clock Settings

Use **[↑]** or **[↓]** to select this Menu from the **MAIN MENU LIST** (section 4.0) and push **[→]** to enter the menu.

Display Indication	Section	Note
CLOCK DAY 1 **CLOCK MONTH** 1 **CLOCK YEAR** 2000 **CLOCK HOUR** 0 **CLOCK MINUTE** 0		Use [↑] or [↓] to select a function. Push [→] to enter the numerical field. Push [↑] or [↓] to set a value. Push [←] to return to the function. After setting the clock, push [↓] to select the [PUSH F3 TO SET CLOCK] function (see below) in order to start the clock.
DATE FORMAT DD:MM:YY		Select the function, push [→] and [↑] or [↓] to select the option MM:DD:YY (MONTH:DAY:YEAR) instead of DD:MM:YY (DAY:MONTH:YEAR).
PUSH F3 TO SET CLOCK		Select this functions and push [→] to start up the Be2k-Plus clock at the proper moment (use an external clock reference)

Section 7.00: Test & Rental Program

7.01: Periodic Test Settings

Use **[↑]** or **[↓]** to select this Menu from the MAIN MENU list (section 4.0) and push **[→]** to enter the menu.

Display Indication	Description		
TEST DAY 1 **TEST MONTH** 1 **TEST YEAR** 2008 **TEST HOUR** 0 **TEST MINUTE** 1	**Automatic test setting**. You can set the date of the Periodic Test. The engine will run for the [TEST DURATION] time. The Be2k-Plus will repeat the test every [REPEAT RATE] days. After a test, the **DATE** is automatically updated to inform you about the date of the next TEST attempt. In order to program correctly, make sure not to set the scheduled date at a time that has already occurred. **Instructions:** Use [↑] or [↓] to select a function. Push [→] to enter the numerical field. Push [↑] or [↓] to set a value. Push [←] to return to the function. After setting date and time, push [↓] to select the TEST DURATION.		
TEST DURATION OFF	Duration of the test (1-60 minutes, or OFF to disable the TEST).		
TEST REPEAT OFF	Repetition rate of the test (1-60 days, or OFF to disable the TEST). Push [←] to return to the function. The Be2k-Plus will start to count-up the time.		
RENTAL CONTRACT OFF	It indicates the hours of your Rental contract. The remaining time is indicated in the ENGINE & FUEL menu (see 5.04)		
EJP 5"	(Effacement des Jours de Pointe).	**TELECOM V LOW** OFF	
KG TEST CONTROL OFF		**TELECOM V HIGH** OFF	
RUN TIMEOUT OFF		**TELECOM °C LOW** OFF	
2XGEN. + MAINS OFF		**TELECOM °C HIGH** OFF	
LOW BATT. START OFF			
HIGH BATT. STOP OFF	These functions are reserved to the Panel Manufacturer.		
H AUX °C START OFF			
L AUX °C STOP OFF			
TELECOM BATT. OFF			
TELECOM °C OFF			

Section 8.0: Maintenance Timers

Use **[↑]** or **[↓]** to select this Menu from the MAIN MENU list (section 4.00) and push **[→]** to enter the menu. These functions are password protected.

Display Indication	Section	Note
MAINTENANCE 1 OFF **MAINTENANCE 2 OFF** **MAINTENANCE 3 OFF**		MAINTENANCE 1(2)(3) indicates the setting of the SCHEDULED Maintenance. The remaining time is indicated in the ENGINE PAGE (see section 5.04). ***Note:*** when a timer expires, the MAINTENANCE alarm triggers (see section 13.08). Consult your Genset supplier or the Engine user manual in order to carry out the scheduled MAINTENANCE.

Section 9.0: Programming & Password

The programming of the controller is reserved to the Panel or Genset Manufacturer. The programming instructions are indicated in the OEM user manual and are Password protected. Consult your supplier for further details. You are allowed to set a User password in order to restrict the access for the following functions:
- TEST & RENTAL PROGRAM
- MAINTENANCE TIMERS
- COMMUNICATIONS

User or Oem password selection:

Display Indication	Note
USER PASSWORD	Use **[↑]** or **[↓]** to select a function and push **[→]** to enter the function; the following screen will appear (see below)

User password programming:

Display Indication	Note
ENTER USER PASSWORD **CANCEL - - - - OK** **SELECT OK TO CONFIRM**	A) - Use [←] or [→] to select a digit of the password. B) - Push [↑] or [↓] to edit the digit (Number or Upper case letter). C) - Repeat steps A) and B) in order to edit the 4-digit password. D) - Select OK using the [→] button (the OK highlights when selected). E) - Push the [→] button to confirm the password. If the password is correct, the message [PASSWORD OK] will be displayed

User password available options:

Display Indication	Note

CHANGE USER PASSWORD
CLEAR USER PASSWORD
	Once you've entered the correct password, the Be2k-Plus presents the options to change or to clear the USER password.
	    A) - Push **[↑]** or **[↓]** to select the function
	    B) - Push **[→]** to enter the function
	    C) – Follow menu-driven instructions to complete the task

Section 10.0: COMMUNICATIONS

Use **[↑]** or **[↓]** to select this Menu from the MAIN MENU list (section 4.0) and push **[→]** to enter the menu.
Additional information is described in the BE-2KPLUS communication User Manual if provided by your supplier.

Display Indication	Section
RS485 NODE 1	These functions are reserved to the Panel Manufacturer.
MODEM SETTINGS	
TCP/IP SETTTINGS	

Section 11.0: Display & Language

Use **[↑]** or **[↓]** to select this Menu from the MAIN MENU list (section 4.00) and push **[→]** to enter the menu.

Display	Instructions
LANGUAGE	A) - Use [→] button to enter the selection of the language. Choose the language using the [↑] / [↓] pushbuttons B) - Push the [←] twice; the display will indicate the 3 options: - EXIT by pushing [←] - SAVE (the selection of the language) by pushing [ACK-F1] - RETURN BACK (to selection language) by pushing [→] Languages available are ENGLISH-ITALIAN-FRENCH-GREEK-SPANISH-RUSSIAN
CONTRAST 25%	You can optimize the text-readability of the display: - Push the [→] button to enter the selection, and [↑] or [↓] to choose 25%, 50% or 100% - Push [←] to return BACK.

Section 12.0: Read Parameters

To read the parameters, follow the instructions:

(1) – Push the [OFF] button to enter the OFF mode; push **[←]**

(2) – Select, from the MAIN MENU LIST (see section 4.0), the function [READ PARAMETERS]; push **[→]** The PARAMETERS MENU will appear on the screen of the display (see below).

(3) – Choose one Menu from the **PARAMETERS MENU** list by using the **[↑]** or **[↓]** buttons and push **[→]** to enter the Menu. Push **[↑]** or **[↓]** to browse the parameters. Push **[←]** to return. You have no access to the programming of the parameters (consult your panel manufacturer).

PARAMETERS MENU		PARAMETERS MENU
MAINS PARAMETERS GENERATOR PARAMETERS ENGINE PARAMETERS SPEED PARAMETERS FUEL SETTINGS MISCELLANEOUS AUXILIARY °C INPUT OIL °C INPUT		OIL PRESSURE INPUT COOLANT °C INPUT FUEL LEVEL INPUT CONFIGURABLE INPUTS CONFIGURABLE OUTPUTS CAN BUS SETTINGS

Section 13.0: Alarms, Warnings and Shutdowns

The Be2K-Plus features:

A) - A yellow LED that turns on in case of a warning, a red LED that turns on in case of a shut down and a pushbutton to silence the Horn (**[ACK-F1]**) as indicated below:

RED   YELLOW   PUSHBUTTON
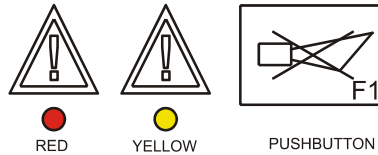
B) - Symbols with red LED, on the front panel, indicating the alarms of the engine (see figure 1, section 1.0)
C) - Display messages describing all alarms including Date, Time and Measurements (see examples in section 5.05).
D) - Event history capable of recording 200 alarms and events (see section 5.06)

Instructions in case of Alarms:

1) Look at the front fascia and take note of RED indicators and MESSAGES indicated on the display.
2) Some alarms shut down the engine after a programmable delay in order to cool down the engine. We recommend that you wait for the complete stop of the engine
3) Push the [ACK-F1] pushbutton in order to acknowledge the alarm. Push the [OFF] button
4) Consult the following sections for further information and if in doubt ask for support of your supplier
5) Remove the cause of the alarm
6) Restart the engine (see section 2.0)

!!! WARNING !!!   Always consult your supplier or the user manual of the engine. A short description of the alarm follows below. Recommendations for solving the problem are also indicated.

Displayed messages	Description	LED
**13.01 - Clock and Periodic Test Alarms**		
CLOCK ERROR	Real time clock failure or wrong programming **(Re-program the clock, see section 6.00)**	Yellow
AUTOMATIC TEST FAILED	Automatic Periodic Test Fault or wrong programming. **(Re-program the periodic test, section 7.01)**	
PARAMETER ERROR MEMORY ERROR	Error in a parameter or Failure of the memory In order to clear the alarm, follow the instructions: **(A) –** Disconnect the power supply for a minute (a switch is provided) **(B) –** Reconnect the power supply. If the message disappears you can continue using the controller without problem. If the error persists, consult your supplier. Assistance will be required.	
CAN BUS ERROR	Failure of the CAN-BUS communication **(!!!!)**	

(!!!!): CONSULT YOUR SUPPLIER IMMEDIATELY

13.02 - Emergency Alarms & Shutdowns		LED
FRONT PANEL EMERGENCY	This alarm takes place if you push the [STOP] button when the Be2k-Plus is in AUTO mode **(cancel the alarm, see 13.00)**	Red
ALARM 1 SHUTDOWN	ALARM 1 and 2 stops the engine ***NOTE (^)***	Red
ALARM 2 SHUTDOWN		
INPUT 1 WARNING **INPUT 1 SHUTDOWN**	Programmable Input 1 (2,3,4 or 5) can provide Warning (audible and optical) or it can stop the engine. ***NOTE (^)***	Red or Yellow
INPUT 2 WARNING **INPUT 2 SHUTDOWN**		
INPUT 3 WARNING **INPUT 3 SHUTDOWN**		
INPUT 4 WARNING **INPUT 4 SHUTDOWN**		
INPUT 5 WARNING **INPUT 5 SHUTDOWN**		
REMOTE LOCK	Indication of Remote Lock because a remote switch holds the system inoperative, ***NOTE (^)***	Red

NOTE (^) Remove the cause of the alarm, cancel the alarm and restart the engine

13.03 - Miscellaneous Engine Alarms			LED Indicator
PICK UP FAILURE	Pick Up Failure shutdown **(!!!!)**		Red
OVER SPEED SHUTDOWN [X- - X]	Over Speed shutdown	***NOTE (^)***	
UNDER SPEED SHUTDOWN [X- - X]	Under Speed shutdown		
HIGH BATTERY WARNING **LOW BATTERY WARNING**	High Battery Voltage warning:11,8/15V for 12V battery and 23,6/30V for 24V battery *(the battery requires maintenance)*		Yellow
FAIL TO START	Starting Failure shutdown ***NOTE (^)***		Red
FAIL TO STOP	Fail to stop shutdown **(!!!!)**		
ENGINE BELT BREAK	Engine Belt break shutdown or Charger Failure **(!!!!)**		

[X- - X] Note: the display records the value of the measurement in the moment the parameter triggers the alarm.

(!!!!): CONSULT YOUR SUPPLIER IMMEDIATELY

13.04 - Alternator and Contactors Alarms			LED Indicator
OVERLOAD SHUTDOWN	Overload alarm	*(These alarms trigger when the Load connected to the Generator causes the alternator to attempt to work outside it's limits. Cancel the alarm and restart. If the problem persists consult your supplier or an electrician)*	Ⓖ⊘
SHORT CIRCUIT [X- - X]	Short circuit alarm		
UNDER VOLTAGE [X- - X]	Under Voltage alarm		
OVER VOLTAGE [X- - X]	Over Voltage alarm		
PHASE UMBALANCE [X- - X]	Phase unbalance shutdown		
UNDER FREQUENCY [X- - X]	Under Frequency alarm		
OVER FREQUENCY [X- - X]	Over Frequency alarm		
OVER KVA SHUTDOWN [X- - X]	Over Apparent Power alarm		Ⓖ⊘
PHASE SEQUENCE ERROR	Phase Sequence alarm		
OVER CURRENT WARNING [X- - X]	Over Current alarm		Yellow
OVER CURRENT SHUTDOWN [X- - X]			Ⓖ⊘
ALTERNATOR FAIL	Alternator Failure alarm		
EARTH FAILURE	Earth Failure alarm		
REVERSE POWER [X- - X]	Reverse Power alarm		
KM FAILURE	The Mains or Generator contactor failed to operate **(!!!!)**		Yellow
KG FAILURE			

(!!!!): CONSULT YOUR SUPPLIER IMMEDIATELY

13.05 - Temperature Alarms			LED
TEMPERATURE SWITCH	High Engine Temperature	*(These alarms trigger in the case of High Temperature. Cancel the alarm and wait for a natural cooling of the affected condition. Identify and then rectify the cause of the over temperature. If the problem persists consult your supplier)*	🌡 Yellow Red
LOW COOLANT WARNING [X- -X] HIGH COOLANT WARNING [X- -X] COOLANT °C SHUTDOWN [X- -X]	Abnormal Temperature of the COOLANT of the engine.		
OIL °C WARNING [X- - X]	Abnormal OIL Temperature; Warning and / or Shutdown.		
OIL °C SHUTDOWN [X- - X]			
AUX °C WARNING [X- - X]	Abnormal Auxiliary Temperature (Room temperature for example); Warning and / or Shutdown.		
AUX °C SENDER SHUTDOWN [X- - X]			
COOLANT SENDER OPEN OIL °C SENDER OPEN AUX °C SENDER OPEN	Indicates a failure of the temperature sensor used for measurement of this Temperature **(!!!!)**.		Yellow

[X- - X] Note: the display records the value of the measurement in the moment the parameter triggers the alarm.

(!!!!): CONSULT YOUR SUPPLIER IMMEDIATELY

13.06 - Fuel Level Alarms			Led
LOW FUEL WARNING [X- - X]	Low Level Fuel warning	*(These alarms trigger in case of problems regarding Fuel. Verify the status of the tank and consult the user manual of the engine. Cancel the alarm and restart the engine. If the problem persists consult your supplier)*	Yellow
HIGH FUEL WARNING [X- - X]	High Level Fuel warning		
FUEL RESERVE SENDER FUEL RESERVE SWITCH	Fuel Reserve warning		
TANK EMPTY SENDER TANK EMPTY SWITCH	Be2k-Plus shuts down the engine if the level drops below the limit for the programmed time or if the Reserve Switch remains closed for more than the programmed time.		
PUMP TIMEOUT WARNING	This warning energizes if the PUMP to fill the tank remains activated for more than the programmed time.		Yellow
FUEL SENDER OPEN	Failure of the Fuel Sensor. **(!!!!)**		

[X- - X] Note: the display records the value of the measurement at the moment the parameter triggers the alarm.

13.07 - Oil Pressure Alarms			
LOW OIL BAR WARNING [X- - X]	Low Oil Pressure Warning	*(These alarms trigger in the case of lubrication problems. Cancel the alarm, Verify the cause of the fault and consult the user manual of the engine. If the problem persists consult your supplier)*	Yellow
LOW OIL BAR SHUTDOWN [X- - X]	Low Oil Pressure Shut down		
LOW OIL JF9 SHUTDOWN	Low Oil Pressure Shut down (Pressure Switch)		
PRESSURE SENDER OPEN	Failure of the Oil Pressure sensor or failure of the Transmitter of the Oil pressure **(!!!!)**		Yellow

(!!!!): CONSULT YOUR SUPPLIER IMMEDIATELY

13.08 - Service and Rental Contract alarms		LED
MAINTENANCE TIMER 1	*These alarms indicate that you are required to perform scheduled Maintenance on the engine (consult your Genset supplier or the Engine manufacturer's user manual). The MAINTENANCE 3 alarm shuts down the engine.*	Yellow
MAINTENANCE TIMER 2		
MAINTENANCE TIMER 3		Red
RENTAL WARNING	This informs you that the Rental contract is about to expire (<48h).	Yellow
RENTAL EXPIRED	Rental period termination. The engine shuts down.	Red
MAX RUN TIME	Timer 'RUN Timeout' expiry. This timer allows the generator to run in AUTO or TEST mode for a limited time. Ask your supplier for the setting. If this alarm takes place, verify the general status of the engine (Fuel level & Oil according to the Engine User Manual), cancel the alarm (section 13.0) and restart the engine.	Red

13.09 - Telecom alarms (Room ambient temperature e Battery voltage of the TELECOM equipment)		
TELECOM °C LOW	These alarms allow you to monitor the Room Temperature and voltage of the TELECOM equipment.	Yellow
TELECOM °C HIGH		
TELECOM V HIGH	Consult your supplier for further details	
TELECOM V LOW		

14.00 - Panel or Gen-set Builders Notes

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15.0 - SUPPORT

For help/advice regarding any problem in the use of the Be2k-Plus controller, email:

bernini@bernini-design.com

24h/24h service world wide: +40-721 241 361 or +39 335 7077148