

RICH ELECTRIC

CombiPlus®

Quick Reference Guide



Pure Sine Wave

DC / AC Inverter

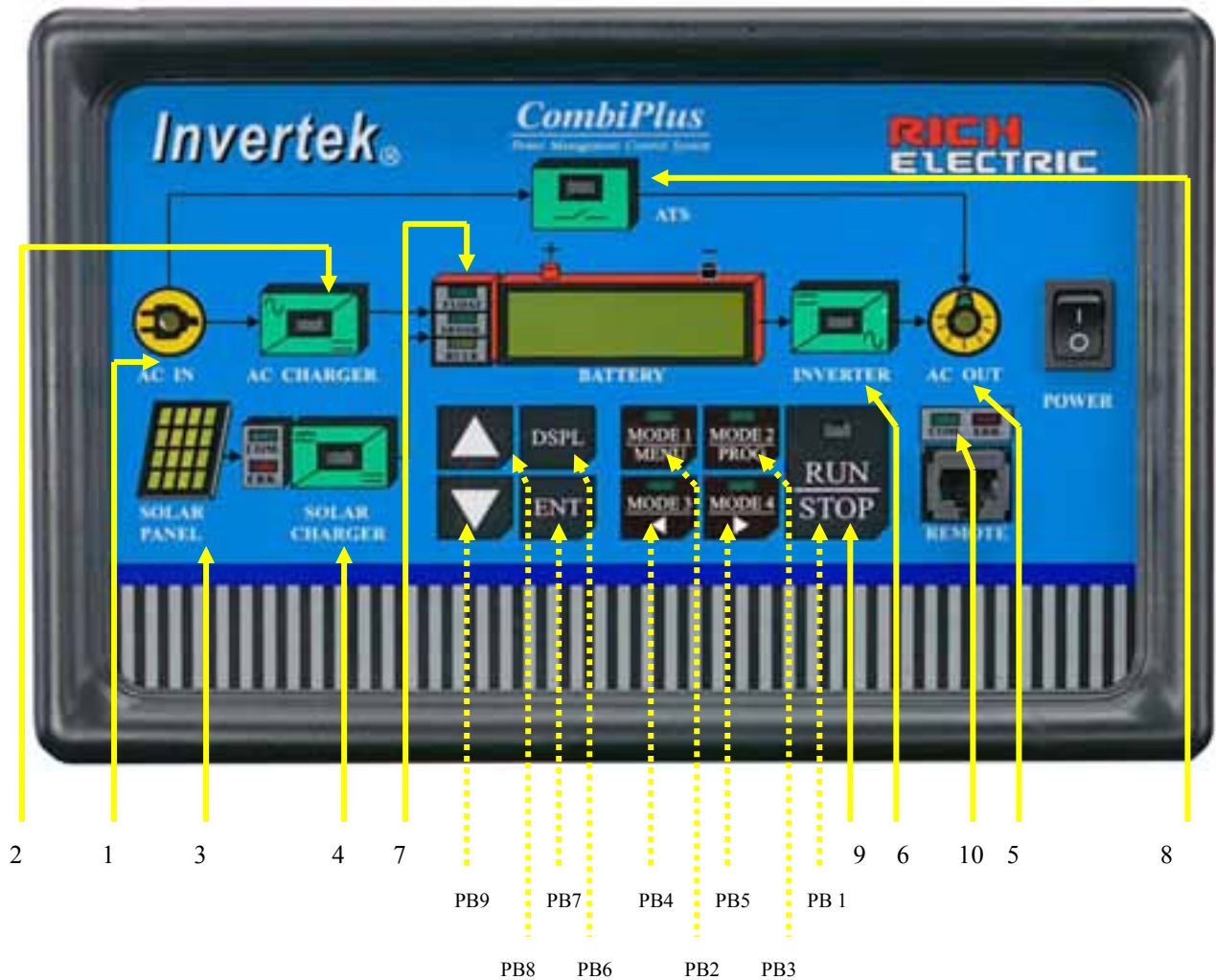
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This Guide is only a reference for
Basic Operating Instructions and Display Navigation.
For full instructions and programming please refer to the User Manual.

Front Panel: Display

Front Panel Display



The **POWER** “rocker” switch is the Master ON / OFF Switch. This switch in the “OFF” position will terminate all functions of the Combi. This switch in the “ON” position will by default resume functions previously running when the POWER switch was turned off.

The **RUN/STOP** button changes the Combi between Standby and Operation Mode.





NOTE: The AC Output is turned OFF when the inverter is Switched OFF at the Master Power Switch or in Standby mode. The AC Bypass (ATS) is also disabled.

LED Indicators

LED	Name	LED ON	LED OFF
1	AC IN	<ol style="list-style-type: none"> 1. Input voltage normal, and position > "transfer Voltage Level" (150VAC~240VAC) 2. Input voltage frequency range in between(45~65Hz) 3. Flashing: Input voltage or frequency is outside settings. 	No input power
2	AC CHARGER	Green: AC Battery charger is working.	-----
3	SOLAR PANEL	Solar module is delivering energy.	<ol style="list-style-type: none"> 1. Solar module not connected 2. Day or Night / (cloudy day)
4	SOLAR CHARGER	Solar module is charging the batteries	No external solar charger is connected.
5	AC OUT	There is voltage at the "AC OUT" terminal.	-----
6	INVERTER	<p>Green: Inverter is working.</p> <p>Green Flashing: Inverter is in Support mode. (Mains AC power plus the Inverter power is being used).</p>	-----
7	BATTERY	FLOAT or ABSOR. Or BULK charge state of battery.	-----
8	ATS	<p>Green : ATS switch is active AC IN voltage is being sent directly to AC OUT terminal</p> <p>Flashing: AC input is not stable.</p>	-----
9	RUN/STOP	Green: CombiPlus® turn on.	-----
		Red: CombiPlus® turn off / standby.	
		NOTE: Green Blink : Auto-Restart is in use	
10	COM./ERR.	Remote control port in communication/in error	

Front Panel: Button Operations

Push Buttons

Push buttons	Name	Description	
PB1	RUN/STOP	CombiPlus® RUN/STOP key	
PB2		AC Power as Priority Support Function Key to return to Main Menu “Operation”	Before changing from one mode to another, it has to stop running and be in STOP mode.
PB3		AC Generator Support with Dynamic Power Shifting Function Key to return to Main Menu “Programming”	
PB4		Renewable Energy with Power Support Function Key to move Cursor to the left digit at Parameter Edit.	
PB5		Renewable Energy with AC Charger Backup Support Function Key to move Cursor to the right digit at Parameter Edit	

PB6	DSPL	Multi-display select key	
PB7	ENTER	Data write-in key	
PB8	UP (△)	△ Increment key	Press △ and ▽ keys at the same time to enable the cursor to move to the left digit from the current digit.
PB9	DOWN (▽)	▽Decrement key	

Four Control Modes Applications:

MODE 1: AC Power as has Priority to Support the AC Load.

MODE 2: AC Generator has Priority to Support the AC Load with Dynamic Power Shifting.

MODE 3: Renewable Energy has Priority to Charge the batteries.

The Combi Inverter has Priority to Support the AC load with AC Power Support.

MODE 4: Renewable Energy has Priority to Charge the batteries with AC Charger Support.


The Combi Inverter has Priority to Support the AC load with AC Power Support.


Note:


1. When pressing RUN/STOP key, you must hold the key for at least 2 seconds (initial setting) to activate the RUN or STOP function. This is to avoid any accidental pressing of the RUN/STOP key. This time can be adjusted, See RUN/STOP Key Hold Time (O2-07) menu. Refer to page 10.
2. When changing between any of the four modes you must STOP the CombiPlus® and then press the desired mode key. When pressing MODE 1, MODE 2, MODE 3 or MODE 4 key, You must hold the key for at least 5 seconds (initial setting) to activate the mode change. This is to avoid any accidental pressing on the mode keys. This time can be adjusted, See second MODE Key Hold Time (O2-06) menu. Refer page 10.
3. The beep sound when pressing keys can be enabled or disabled, See Key Pressed Beep Select (O2-01) menu. Refer page 9.
4. When the front panel is not in use it will go to sleep after a set period of time. (O1-02), Once any key is pressed, the front panel display will illuminate and the LCD monitor will resume display. This time can be adjusted, See LCD Display Time Set (02-09) menu. Refer to page 11.

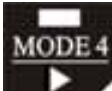
Note: When the front panel goes to sleep, the LCD Display and LED Indicators are not active but RUN/STOP indicator remains active.

5. Press \triangle key to increase the setting value and ∇ key to decrease the setting value. Press \triangle and ∇ keys at the same time to enable the cursor to move to the left digit from the current digit. For example, if the current digit stays in decimal, press \triangle and ∇ at the same time for the digit to move to centesimal.

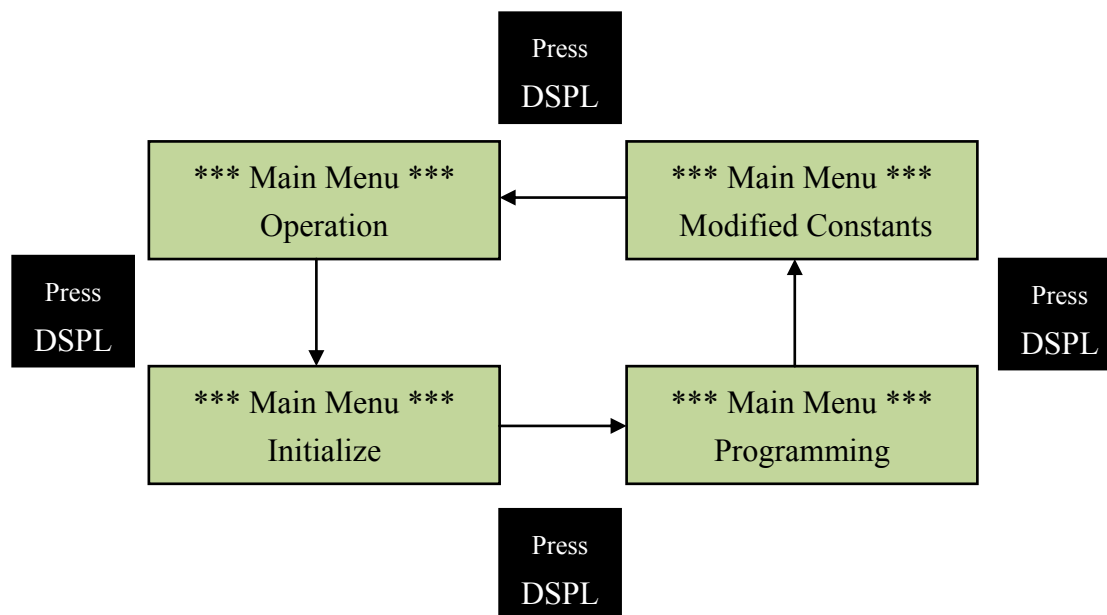
6. Press  key for 1 second to return to Main Menu “Operation” immediately.

7. Press  key for 1 second to return to Main Menu “Programming” immediately.

8. Press  key to move cursor to the left (one digit)

9. Press  key to move cursor to the right (one digit)

Main Menu



Note: After the set time period (01-02: Key Idle Detect Time) the system will exit any menu screens and return to the standby display (01-01: Power ON LCD Monitor Select).

Main Menu

There are four options in the Main Menu of the “CombiPlus®” and they are “**Operation**”, “**Initialize**”, “**Programming**” and “**Modified Constants**”.

Function	Content
Operation	“CombiPlus®” can monitor AC IN voltage and current, AC OUT voltage and current, battery voltage, battery current and ripple voltage in charging and discharging battery and other extension modules status. This is U (Monitor Group) constants.
Initialize	Operation Condition Setting Group A (Initialize) Group: Multi-language setting, constants initialization setting and constants modification allowed/prohibited setting.
Programming	Constant groups to program (modify) all the constants: B (General) Group, C (INVERTER) Group, D (AC CHARGER) Group, E (Aux-relay) Group F (Solar charger) Group and O (Operator) Group
Modified Constants	Operating the read-out and modification of the constants group setting which are different from initial setting. Users can program and modify constants

Note: On any Menu screen, pressing “DSPL” key will return you to the previous Menu.

Main Menu: Programming

“Operator”

Monitor Select.....

O1-01: Power ON LCD Monitor Select

Main Menu>Programming>ENT>Operator>ENT>Monitor Select>ENT>

- After power of the CombiPlus® is on, the monitor selections will be showed on LCD Display, U1-05 Battery Voltage is the initial display shown.
- All the constants in U1 Group can be programmed (U1-01~U-26).

O1-02: Key Idle Detect Time

Main Menu>Programming>ENT>Operator>ENT> Monitor Select >ENT>

- Use constant O1-02 to set the idle time when the keyboard is not operated and once any key is pressed, the display will return to the LCD monitor selection value set in constant O1-01.
- Initial Setting=180 sec, setting range: 10~600 sec.

Key Selections.....

O2 Group (Key Selections)

O2-01: Key Pressed Beep Select

Main Menu>Programming>ENT>Operator>ENT>Key Selections>ENT>

Setting	Function
O2-01=0	When keys are pressed, beep sound will not be heard.
O2-01=1 (Initial setting)	When keys are pressed, beep sound will be heard.

O2-02: Elapsed Time Reset

Main Menu>Programming>ENT>Operator>ENT>Key Selections>ENT>

- Use constant O2-02 to reset elapsed time.

O2-03: Elapsed Time Select

Main Menu>Programming>ENT>Operator>ENT>Key Selections>ENT>

Setting	Function
O2-03=0 (Initial setting)	The elapsed time started to be counted after power is on.
O2-03=1	The elapsed time started to be counted after RUN.

O2-04: CombiPlus® Model

Main Menu>Programming>ENT>Operator>ENT>Key Selections>ENT>

- This is the model number to be displayed.

O2-06: MODE Key Hold Time

Main Menu>Programming>ENT>Operator>ENT>Key Selections>ENT>

- Use constant O2-06 to set the time it takes to press MODE key to transfer from one of four modes to another mode. (This has to be done in STOP mode)
- Initial setting=5 sec, setting range: 2~10 sec.

O2-07: RUN/STOP Key Hold Time

Main Menu>Programming>ENT>Operator>ENT>Key Selections>ENT>

- Use constant O2-07 to set the time it takes to press RUN/STOP key to activate its function.
- Initial setting=2 sec, setting range: 2~10 sec.

O2-08: Power ON Auto Run Select

Main Menu>Programming>ENT>Operator>ENT>Key Selections>ENT>

- Use constant O2-08 to select to auto run manually or automatically.

Setting	Function
O2-08=0	Auto Run is active when pressing Run/STOP key
O2-08=1 (Initial setting)	Auto Run is active when the power is on.

O2-09: LCD Display Idle Time Set

Main Menu>Programming>ENT>Operator>ENT>Key Selections>ENT>

- When O2-09=0, Display Idle Function is disabled.
- Use constant O2-09 to set the idle time when the keypad is not operated and all the LCD Display and LED Indicators of the CombiPlus® entering the idle mode which only RUN/STOP indicator is active.
- Once any key on the panel is pressed, it will return to the display before Idle status.
- Initial setting=10 min, setting range: 0~60 min.

Main Menu: Operation

“Monitor”

U1-01: AC IN Voltage

Main Menu>Operation>ENT>Monitor>ENT>

- Use U1-01 to monitor the current voltage value of AC IN power in unit of 0.1V.

U1-02: AC IN Current

Main Menu>Operation>ENT>Monitor>ENT>

- Use U1-02 to monitor the current value of AC IN power in unit of 0.1A.

U1-03: AC OUT Voltage

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-03 to monitor AC OUT voltage value in unit of 0.1V.

U1-04: AC OUT Current

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-04 to monitor AC OUT current value in unit of 0.1A .

U1-05: Battery Voltage

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-05 to monitor the battery voltage in unit of 0.1V.

U1-06: Battery Ripple Voltage

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-06 to monitor the battery ripple voltage in unit of 0.1V.

U1-07: Battery Current

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-07 to monitor battery current value in unit of 0.1A.

U1-08: Control Mode

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-08 to monitor the current control mode (MODE 1, MODE 2, MODE 3 or MODE 4)

U1-09: Operation Status

Main Menu>Operation>ENT>Monitor>ENT>

- There are 12 digits to account for each operation status. Please see NOTE 1 in Chapter 5 of the User Manual.

U1-10: Aux-Relay Status

Main Menu>Operation>ENT>Monitor>ENT>

Use constant U1-10 to monitor the ON/OFF status of 3 sets of Aux-Relay (RY1, RY2, RY3). Please see NOTE 2 in Chapter 5 of the User Manual.

U1-11: Elapsed Time

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-11 to monitor the elapsed time after power ON (O2-03=0) or after RUN (O2-03=1) in unit of 1 hour.

U1-12: Battery Temperature Sensor

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-12 to monitor the temperature that has been detected by Battery Temperature Sensor (BTS-3) in unit of 1°C.

U1-13: CPU ID1

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-13 to check the software version 1.

U1-14: CPU ID2

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-14 to check the software version 2.

U1-15: Solar Charger Status

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-15 to monitor solar charger status after solar module is connected to the extension port (Port C).

U1-16: Solar Supply Current

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-16 to monitor the solar supply current value in unit of 0.1A.

U1-17: Solar Supply Power

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-17 to monitor the solar supply power value in unit of 1W.

U1-18: Solar Amp-Hours

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-18 to monitor solar Amp-Hours value in unit of 1AH.

U1-19: Solar Total Amp-Hours

Main Menu>Operation>ENT>Monitor>ENT>

- Use constant U1-19 to monitor solar total Amp-Hours value in unit of 1AH.

Main Menu: Operation

“Fault Trace”

U2 Group (Fault Trace)

U2-01: Current Fault

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-01 to monitor the current fault that results in “CombiPlus®” stopping operating.

U2-02: Last Fault

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-02 to monitor the last fault that has been recorded.

U2-03: AC IN Voltage

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-03 to monitor the AC input voltage value in unit of 0.1V when the current fault occurs.

U2-04: AC IN Current

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-04 to monitor the AC input current value in unit of 0.1A when the current fault occurs.

U2-05: AC OUT Voltage

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-05 to monitor the AC output voltage value in unit of 0.1V when the current fault occurs.

U2-06: AC OUT Current

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-06 to monitor the AC output current value in unit of 0.1A when the current fault occurs.

U2-07: Battery Voltage

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-07 to monitor the battery voltage value in unit of 0.1V when the current fault occurs.

U2-08: Battery Ripple Volt

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-08 to monitor the battery ripple voltage in unit of 0.1V when the current fault occurs.

U2-09: Battery Current

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-09 to monitor the battery current value in unit of 0.1A when the current fault occurs.

U2-10: Control Mode

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-10 to monitor what the control mode (MODE 1, MODE 2, MODE 3 or MODE 4) is when the current fault occurs.

U2-11: Operation Status

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-11 to monitor 12 digits which account for each operation status when the current fault occurs. Please see NOTE 1 in Chapter 5.

U2-12: Aux-Relay Status

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-12 to monitor the ON/OFF status of 3 sets of Aux-Relay (RY1, RY2, RY3) when the current fault occurs. Please see NOTE 2 in Chapter 5.
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U2-13: Elapsed Time

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-13 to monitor the elapsed time after power ON (O2-03=0) or after RUN (O2-03=1) in unit of 1 hour when the current fault occurs.

U2-14: Solar Charger Status

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-14 to monitor solar charger status when the current fault occurs. This constant is only visible when extension port is connected to solar module.

U2-15: Solar Charge Current

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-15 to monitor the solar charge current value in unit of 0.1A when the current fault occurs.

U2-16: Solar Supply Power

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-16 to monitor the solar supply power value in unit of 1W when the current fault occurs.

U2-17: Solar Amp-Hours

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-17 to monitor solar Amp-Hours value in unit of 1AH when the current fault occurs.

U2-18: Solar Total Amp-Hours

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-18 to monitor solar total Amp-Hours value in unit of 1AH when the current fault occurs.

U2-26: Battery Temperature Sensor

Main Menu>Operation>ENT>Fault Trace>ENT>

- Use constant U2-26 to monitor the current temperature that has been detected by Battery Temperature Sensor (BTS-3) in unit of 1°C when the current fault occurs.

Main Menu: Operation

“Fault History”

U3 Group (Fault History)

U3-01: Last Fault

Main Menu>Operation>ENT>Fault History>ENT>

- Use constant U3-01 to monitor the latest fault stored in the software.

U3-02: Fault Message 2

Main Menu>Operation>ENT>Fault History>ENT>

- Use constant U3-02 to monitor the most recent second fault stored in the software.

U3-03: Fault Message 3

Main Menu>Operation>ENT>Fault History>ENT>

- Use constant U3-03 to monitor the most recent third fault stored in the software.

U3-04: Fault Message 4

Main Menu>Operation>ENT>Fault History>ENT>

- Use constant U3-04 to monitor the most recent fourth fault stored in the software.

U3-05: Elapsed Time 1

Main Menu>Operation>ENT>Fault History>ENT>

- Use constant U3-05 to monitor the elapsed time before the latest fault occurs.

U3-06: Elapsed Time 2

Main Menu>Operation>ENT>Fault History>ENT>

- Use constant U3-06 to monitor the elapsed time before the most recent second fault occurs.

U3-07: Elapsed Time 3

Main Menu>Operation>ENT>Fault History>ENT>

- Use constant U3-07 to monitor the elapsed time before the most recent third fault occurs.

U3-08: Elapsed Time 4

Main Menu>Operation>ENT>Fault History>ENT>

- Use constant U3-08 to monitor the elapsed time before the most recent fourth fault occurs.

Trouble Shooting Table

- Proceed as follows for a quick detection of common faults.
- DC loads must be disconnected from the batteries and the AC loads must be disconnected from the INVERTER before the INVERTER and/or battery charger (AC CHARGER) is tested.
- Consult your Rich Electric dealer if the fault cannot be resolved.

Problem/Error message	Possible Cause	Solution
The “CombiPlus®” fails to operate when power on.	The battery voltage is too high or too low.	Ensure that the battery voltage is within the correct value range.
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> ‘Udc-UV’ Battery under volt </div> <p>‘ ’: blink</p>	The battery voltage is low.	Charge the battery or check the battery connections.
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> Udc-UV Battery under volt </div>	The “CombiPlus®” cuts out because the battery voltage is too low.	Charge the battery or check the battery connections.
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> ‘OL’ Inverter OverLoad </div> <p>‘ ’: blink</p>	The load on the inverter of “CombiPlus®” is higher than the normal load.	Reduce the load.
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> OL Inverter OverLoad </div>	The INVERTER of “CombiPlus®” cuts out due to excessive load. Or “CombiPlus®” has been Over Loaded and caused Internal Damage.	Reduce the load. If Overload warning does not reset after restart the “CombiPlus®” will need to be sent to service for repair.
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> ‘OH’ Heatsink Max Temp. </div> <p>‘ ’: blink</p>	The ambient temperature is too high, or the load is excessive.	Place the “CombiPlus®” in a cool and well-ventilated room, or reduce the load.

<div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>OH Heatsink Max Temp.</p> </div>	<p>The ambient temperature is too high, or the load is excessive.</p>	<p>Place the “CombiPlus®” in a cool and well-ventilated room, or reduce the load.</p>
<div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>‘Udc-ripple’ Volt Ripple Exceeds</p> </div> <p>‘ ’: blink</p>	<p>Voltage ripple on the DC input exceeds 1.25Vrms</p>	<p>Check the battery cables and terminals. Check the battery capacity; increase it if necessary.</p>
<div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Udc-ripple Volt Ripple Exceeds</p> </div>	<p>The INVERTER of “CombiPlus®” cuts out as a result of excessive voltage ripple on the DC input</p>	<p>Install batteries with a higher capacity. Use shorter and/or thicker battery cables and reset the CombiPlus® (Power OFF and ON again).</p>
<div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>‘Udc-OV’ Battery over voltage.</p> </div> <p>‘ ’: blink</p>	<p>Battery charger is not in normal charging status to cause battery voltage too high.</p>	<p>“CombiPlus®” will need to be sent to service for repair.</p>
<div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Udc-OV Battery over voltage.</p> </div>	<p>Incorrect battery voltage connection (12V system but connected to 24V battery)</p>	<p>Recheck if the CombiPlus® and the battery voltage is matched.</p>
<div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>‘Idc-OC’ Over current.</p> </div> <p>‘ ’: blink</p>	<p>The actual charge current is 1.5 times larger than the set current value (D1-08) when AC CHARGER is operating.</p>	<p>Stop the Charge mode of the “CombiPlus®”.</p>
<div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Idc-OC Over current.</p> </div>		<p>“CombiPlus®” will need to be sent to service for repair.</p>

<div style="border: 1px solid black; padding: 5px; text-align: center;"> ‘Bat-NG’ Battery Fault </div> ‘ ’: blink		
<div style="border: 1px solid black; padding: 5px; text-align: center;"> Bat-NG Battery Fault </div>	The charging time of <u>AC CHARGER</u> has been over 10 hours and remains in Bulk Charge mode. (D1-09=1) shows the battery is at fault.	Replace the battery banks.
The charger is not functioning	The AC IN voltage or frequency is out of range.	Ensure that the AC IN voltage is within the range 220V system: 180VAC~260VAC 110V system: 90VAC~130VAC And that the frequency matches the setting.
	“CombiPlus®” internal circuit breaker has tripped.	Reset the internal circuit breaker.
The battery is not being charged fully.	Incorrect charging current.	Set the charging current at between $(0.1\sim 0.2)\times$ battery capacity.
	A defective battery connection.	Check the battery terminals.
	The absorption voltage has been set to an incorrect value.	Adjust the absorption voltage to the correct value.
	The float voltage has been set to an incorrect value.	Adjust the float voltage to the correct value.
The internal DC fuse is defective	“CombiPlus®” will need to be set to service for repair.	

The battery is overcharged.	The absorption voltage has been set to an incorrect value.	Adjust the absorption voltage to the correct value.
	The float voltage has been set to an incorrect value.	Adjust the float voltage to the correct value.
The battery is overcharged.	The battery is too small.	Reduce the charging current or use a battery with a higher capacity.
	A defective battery.	Replace the battery.
	The battery is too hot.	Connect a Battery Temperature Sensor (BTS-3)
Battery charge current drop to 0 A when the absorption voltage is reached.	Battery over temperature (> 50°C)	<ol style="list-style-type: none"> 1. Allow battery to cool Down. 2. Place battery in a cool Environment. 3. Check for shorted cells.
	Battery Temperature Sensor (BTS-3) is faulty	<ol style="list-style-type: none"> 1. Unplug Battery Temperature Sensor (BTS-3) from “CombiPlus®” and power off the “CombiPlus®” then wait 5 seconds and Power on again. 2. If the “CombiPlus®” AC CHARGE normally, the BTS-3 is faulty and needs to be replaced.

NOTES: