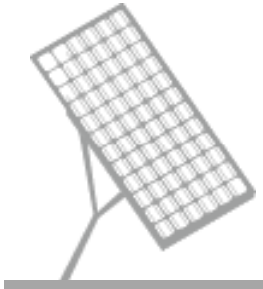


COTEK

Product line : SB Inverter
NPI Presentation

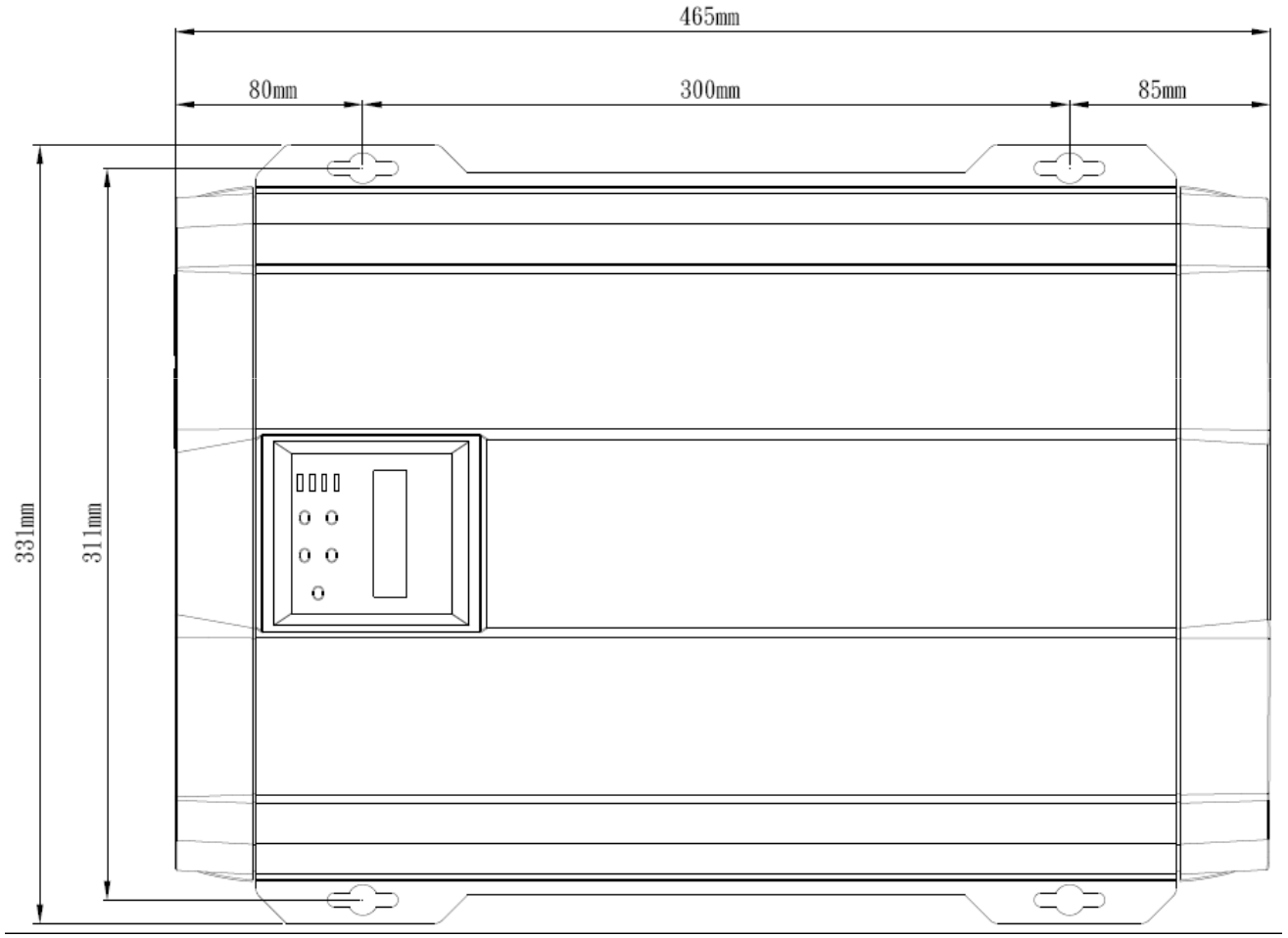
Product

Pure Sine Wave Inverter/Charger COMBI

NEW!!

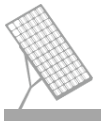
- Available models:
  - SB2000, 12VDC to 110/220VAC
  - SB2000, 24VDC to 110/220VAC

SB – inverter dimension



User benefits

Feature	User Benefit
COMBI Inverter	Provide Power Management capability (Inverter + Battery Charger combination)
Self Diagnosis Function	Easy to identify failure symptoms
Detachable Remote Control	Easy to set up the function parameter with user-friendly display
Provide Additional 5A Max. ESB Charger	Keep ESB (Engine Start Battery) in good condition
Power Sharing Function	Provide flexibility to allocate the AC input power between load & charger.
Generator Function	Inverter AC output can parallel with the utility AC to generate up to maximum 4KW
Support function	AC output can reach up to maximum 8KW (Inverter AC 2KW + Utility AC 6KW) for 230V system
Dry contact for system alarm	Recognize abnormal symptoms easier
Temperature compensated charging	Extend batteries' life and reduce life cycle cost



Transfer Switch And AC connector

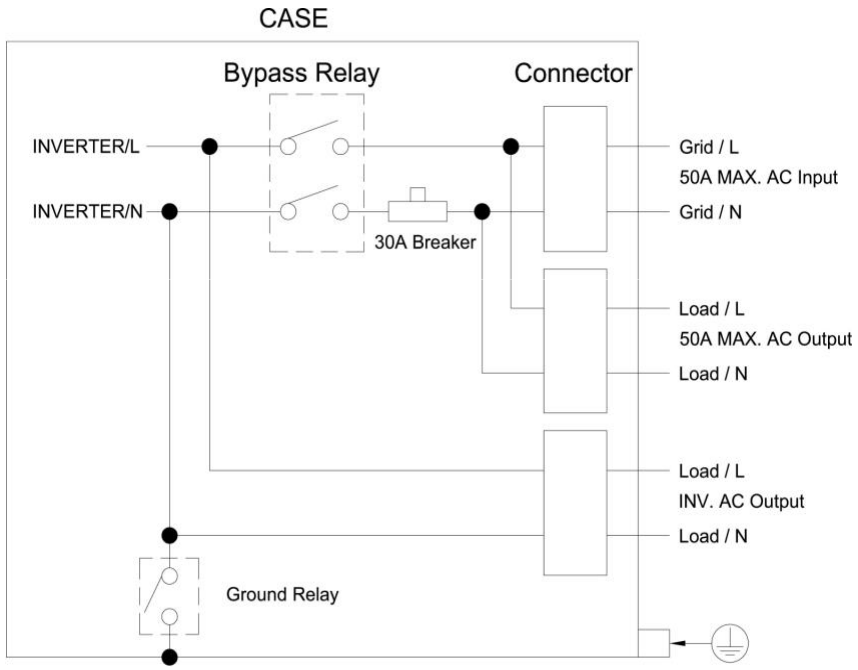
AC Input / Output contact

- INV. AC output :

  The “INV. AC output” output switches between the AC-input and the output of the inverter. The AC input has the highest priority. In principle, AC-power is always available on this output. However during a switchover the loads connected to this output are not supplied with AC power for a very short period of time (short break). It is the ideal output for loads that need AC-power permanently like personal computers, interior lighting and the refrigerator.

- AC output :

  This output is always internally connected to the AC-input. It is therefore only available when an external AC-source like shore power, a generator or an outlet is present. Larger loads like a hot water boiler, electric cooking appliance or washing machine should be connected to this output .



AC input / output contact

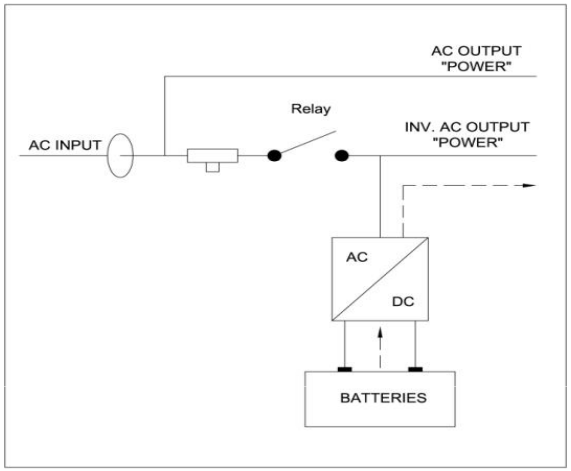
Operation Modes-1

Basic operation

- Inverter mode :

  When there is no external “AC input” power available, the inverter provides AC power on the “INV. AC output” output from the batteries and there is no AC power available on the “AC output”.

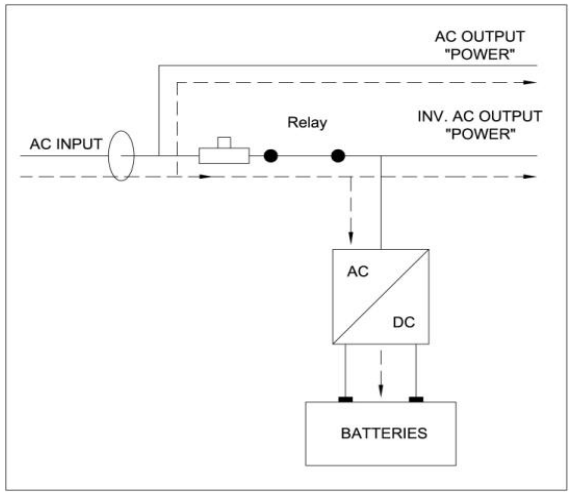
Inverter mode



- Charger mode :

  When external AC power comes available, the transfer relay switches on. Both outputs as well as the battery charger are supplied by the external AC power. The batteries are recharged now.

Charger mode



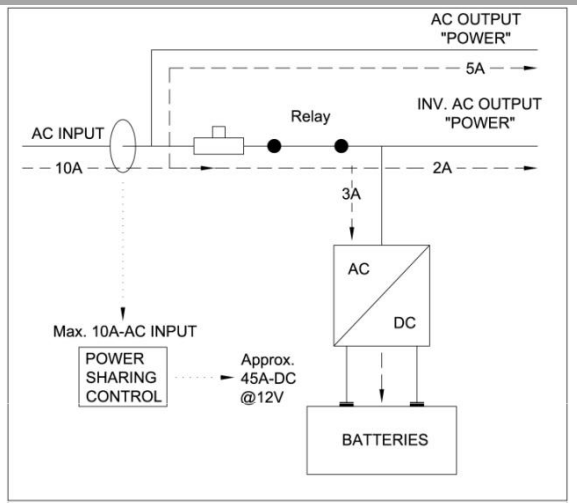
Operation Modes-2

Power sharing function

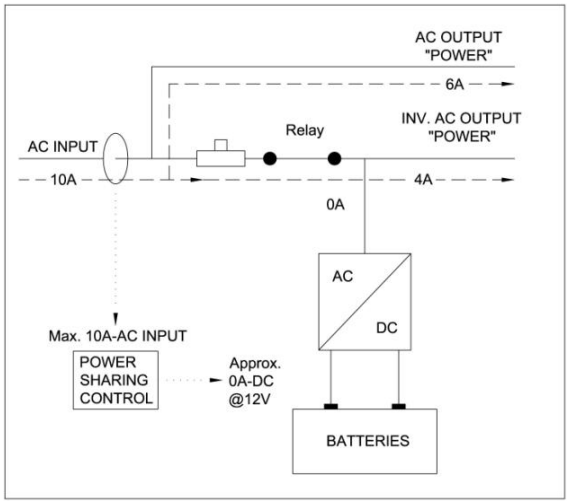
If the available power at the AC-input is limited, and the load connected to the AC output increases, the external AC circuit breaker may trip if nothing is done. To avoid this, the Combi unit can automatically reduce the battery charger output, and thus the AC power consumption. This Power sharing feature constantly senses the incoming AC current which is used to supply both the battery charger and the appliances connected to the AC outputs.

When the total connected AC load reaches the level of the Power Sharing setting (10A), there will be no power left over to charge the battery. This means that the charge current of the Combi unit will be reduced to 0A.

Power sharing 1



Power sharing 2



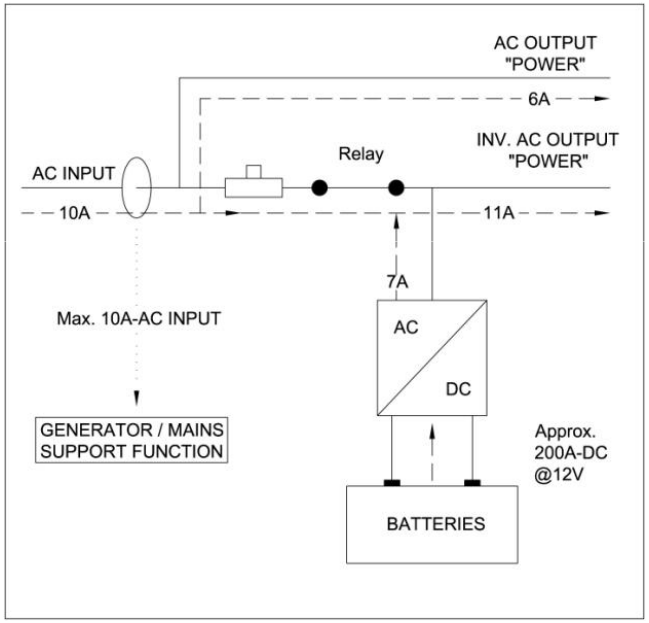
Operation Modes-3

Generator function

If the demand for AC power still increases, the external AC circuit breaker may still trip if nothing is done. This problem can be solved by the Generator function. If the total demand for energy exceeds the maximum external power supply, energy can be added to the “AC outputs” and “INV.AC Output” by means of the inverter. This appliance can be automatically connected in parallel with the external power supply.

When the AC load has dropped below the setting of the Power sharing function again, the battery charger of the Combi unit will commence to recharge the batteries.

For safety unit the transfer relay is immediately switched off when incoming AC power fails in operation so that there will never be a high voltage on the shore cable inlet when it is not connected.



Generator Function

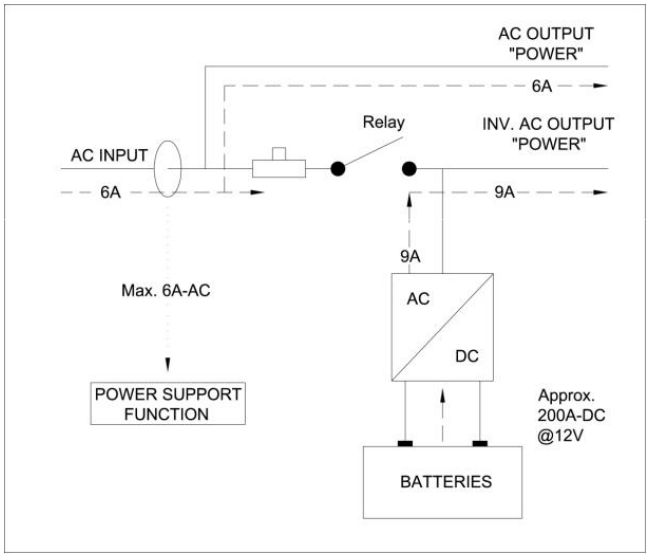
Operation Modes-4

Support function

When the Generator function is enabled, the inverter will operate in parallel with the external AC power source. Under no circumstance AC power from the inverter can be fed back into the AC grid. This may mean that in some situations the use of the Generator / Support function is not allowed.

To supply more energy than the external AC sourced can deliver. This can be achieved by using the "support function".

When the support function is enabled, the transfer relay will open. When opened, the external power source will deliver 6Amps to supply the load connected to the “AC output” output only, while the inverter will deliver 9Amps for the load connected to the “INV. AC output”.



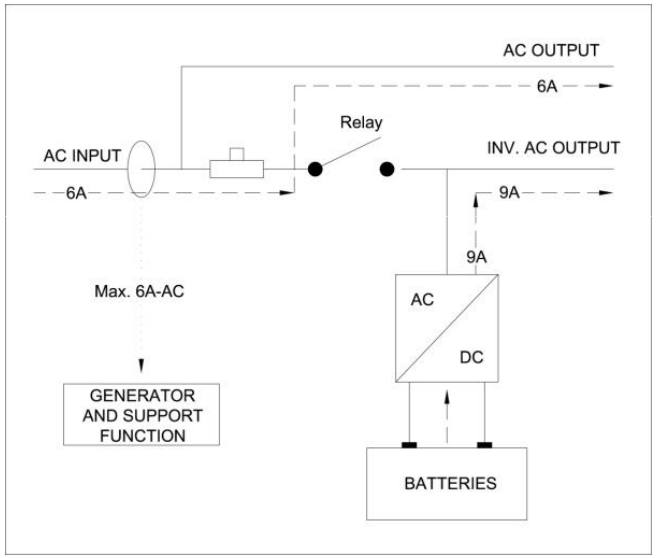
Support Function

Operation Modes-5

Support and Generator function

If user will support function and generator function both simultaneously enable. The Combi unit inverter will operate in parallel with the external AC power source, and when not enough to supply the total load connected to the “AC output” and “INV. AC output”. The transfer relay will open.

The AC input is still limited to 6 Amps. If the demand for AC powerstill increases, the external AC circuit breaker may still trip. The inverter will automatically to compensated by energy which is stored in the batteries. But when AC power still increases. This is not enough to the total load (7 + 9A = 16A) connected to the AC outputs. The transfer relay will open.



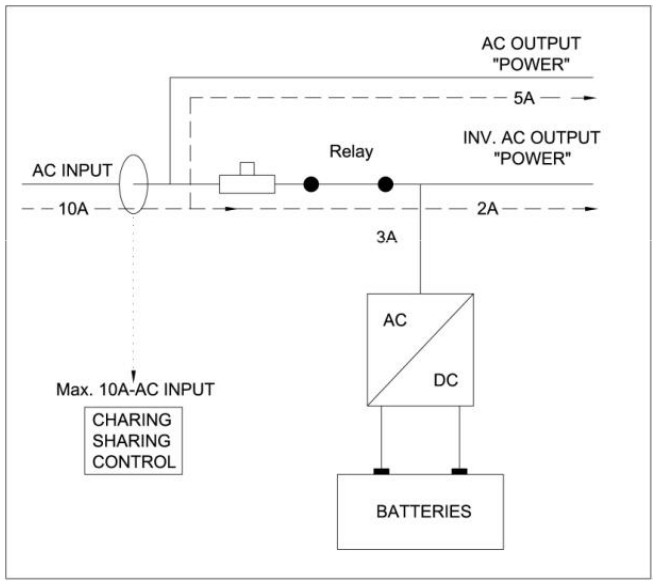
Support and Generator Function

Operation Modes-6

Charger sharing

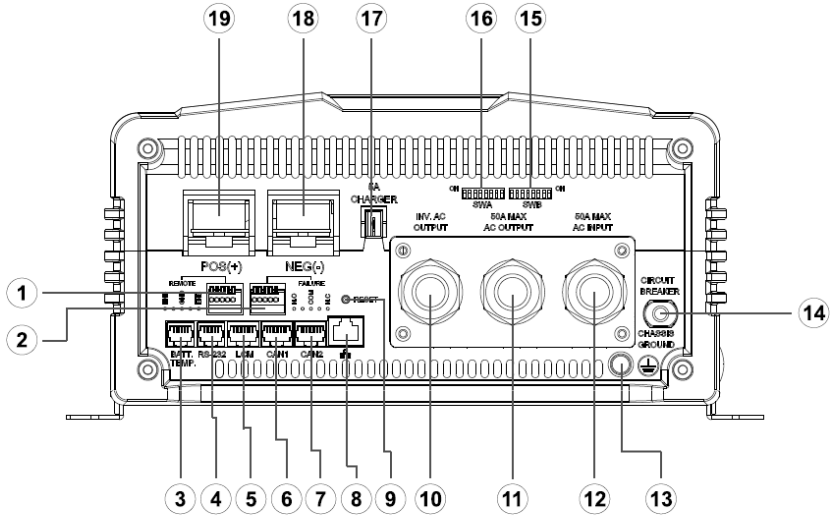
The Combi unit used “CHR.mode” startup. When external AC power comes available, the transfer relay switches ON. The Combi unit is constantly senses the AC power current witch is used to supply both the battery charger and the load Connected to the AC output.

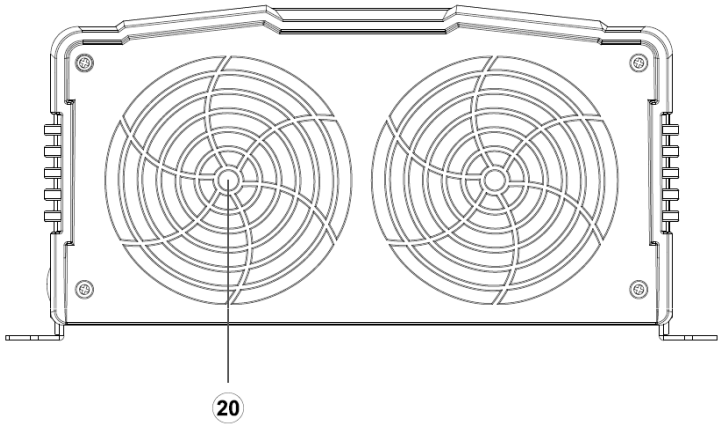
The AC input is still limited to 10Amps. Supply the total load (5 + 2A =7A) connected to the AC outputs. That only 10 – 7A = 3Amps is left over or sharing, if the AC outputs load increases more 10 Amps. The transfer relay will open. When opened, the AC power will deliver 5 Amps to supply the load connected to the “AC output” only. But the inverter not to supply 2Amps load connected to the “INV. AC output”.



Charger sharing

SB-2000 Front/Rear cap

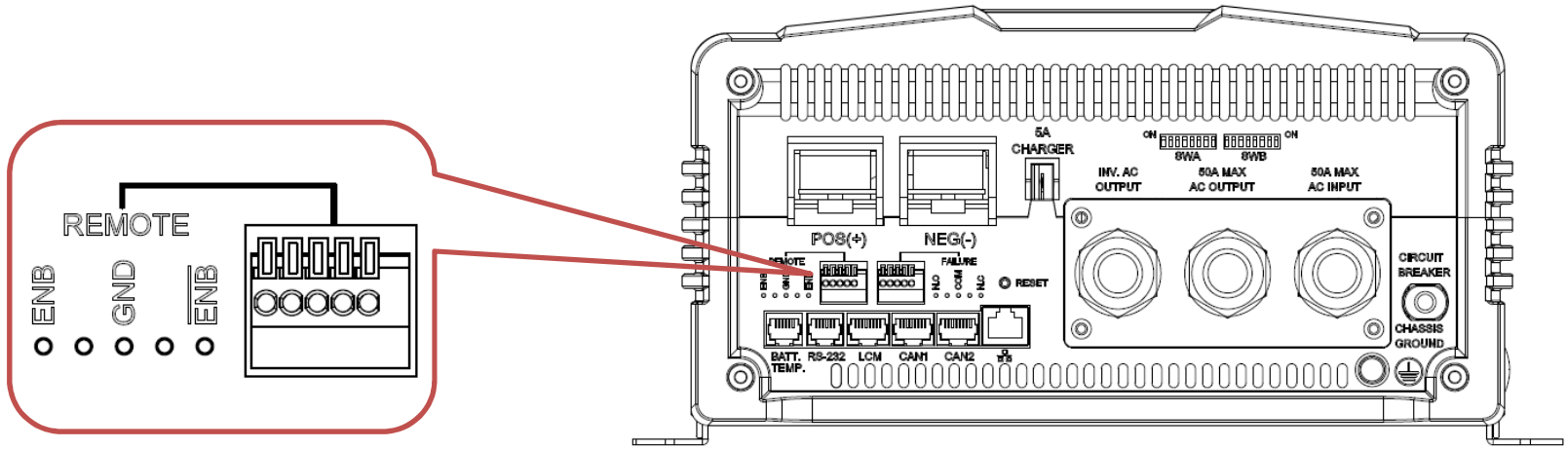




Front panel			
1	Remote control green terminal	11	Grid AC output (Hard-Wire Installation)
2	Dry Contact Green Terminal (for “FAULT” indication)	12	Grid AC input (Hard-Wire Installation)
3	BAT. TEMP. Port (for battery temperature sensor)	13	Chassis Ground
4	RS-232 Port (monitoring and control through PC)	14	AC Input Breaker
5	LCM Port (Connection for LCD remote control panel)	15	SWB (DIP Switch for function parameter adjustment)
6	CAN1 (Reserved)	16	SWA (DIP Switch for function parameter adjustment)
7	CAN2 (Reserved)	17	5A Charger (for a second small battery)
8	Ethernet Port	18	DC input –
9	Reset (to reset Ethernet connection)	19	DC input +
10	Inverter AC output (Hard-Wire Installation)	20	FAN

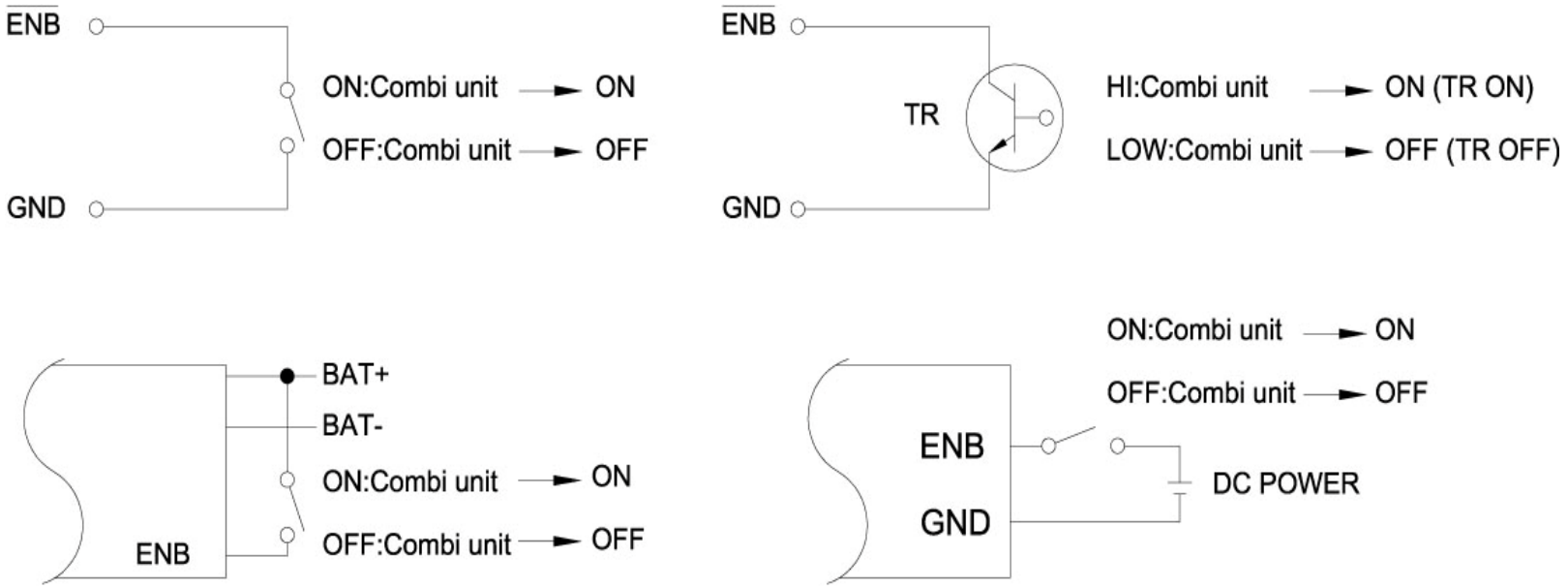
Remote control Terminal PIN Assignment

PIN #	PIN assignment
1	ENB
2	
3	GND
4	
5	$\overline{\text{ENB}}$



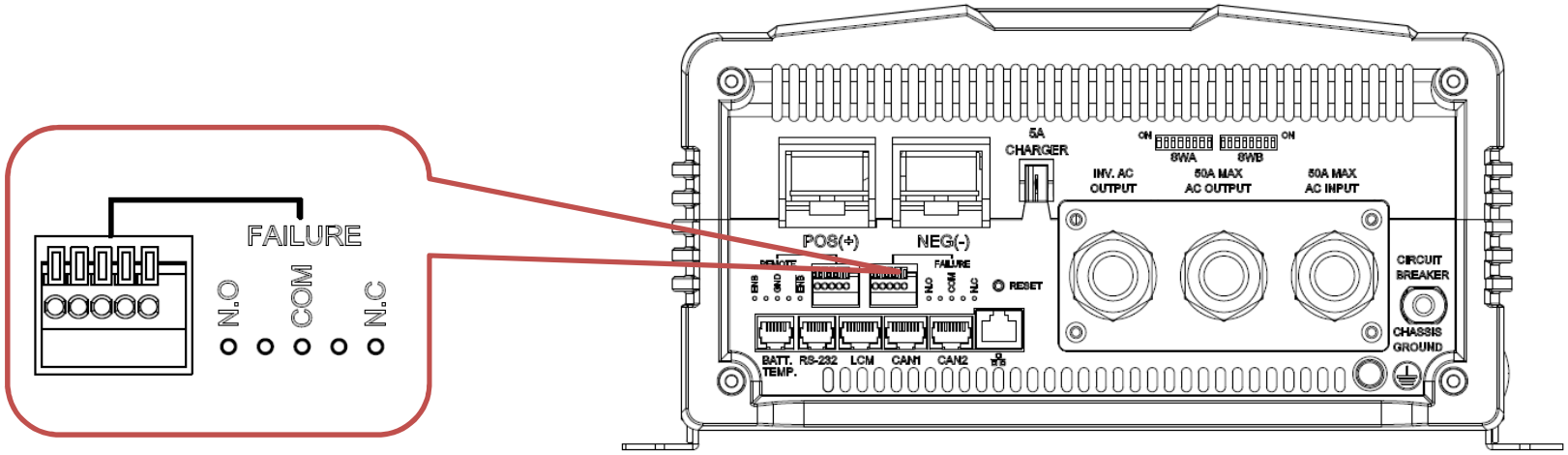
How to use Remote control terminal?

- Before installing the functions of the Combi unit, ensure the Combi unit to turn off.
- Use 20 ~ 24 #AWG wire to connect the remote control terminals.
- At one time, only one remote function should used to control the Combi unit.
- The maximum voltage value is 60VDC in the ENB.
- Remote control ON / OFF Combi unit setup status :



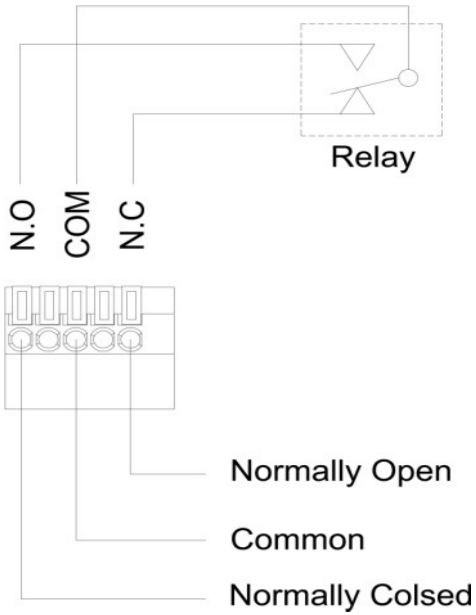
Dry Contact Terminal

PIN #	PIN assignment
1	N.O
2	
3	COM
4	
5	N.C



How to use Dry Contact terminal?

- Dry contact terminals may be connected to a Form C relay for “FAULT” indication. When “FAULT” occurs are provided with two sets of alarm contacts.
- Fault conditions include Input under/over voltage, Output Short Circuit, Over Temperature, Over-load and, Fan Failure.

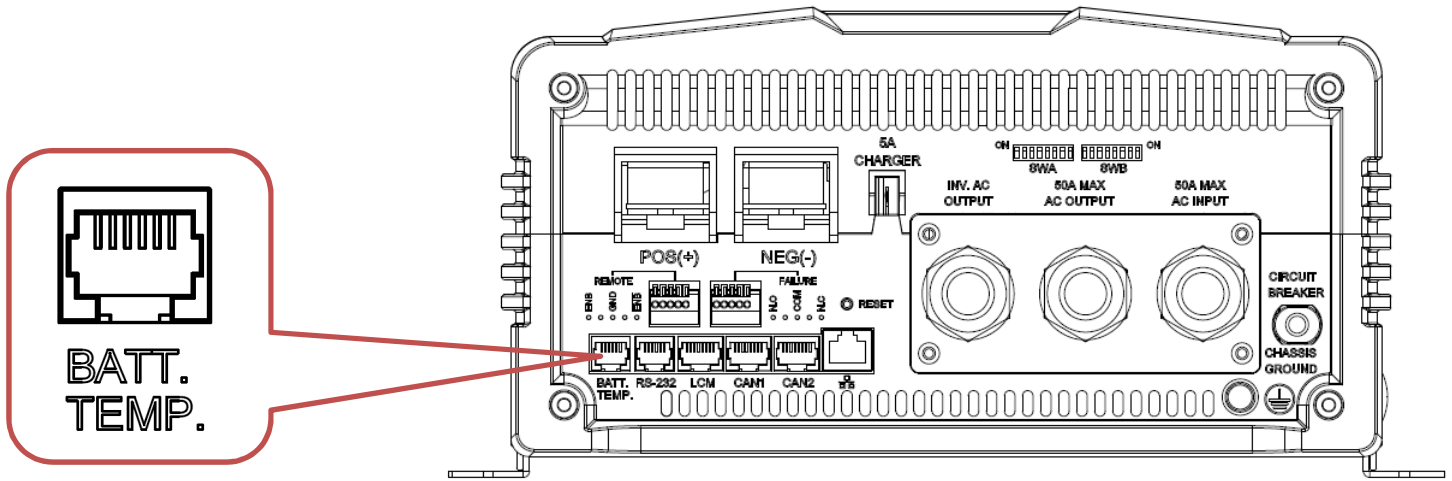


Specifications of the Relay

Maximum Voltage	Load	Contact Rating		Number of Operations	Operating/Storage Temperature
		N.O.	N.C.		
250 VAC	Resistive	1 A	---	100,000	-30℃~75℃
250 VAC	Resistive	---	1 A	---	
24 VDC	Resistive	1 A	---	---	
24 VDC	Resistive	---	1 A	---	

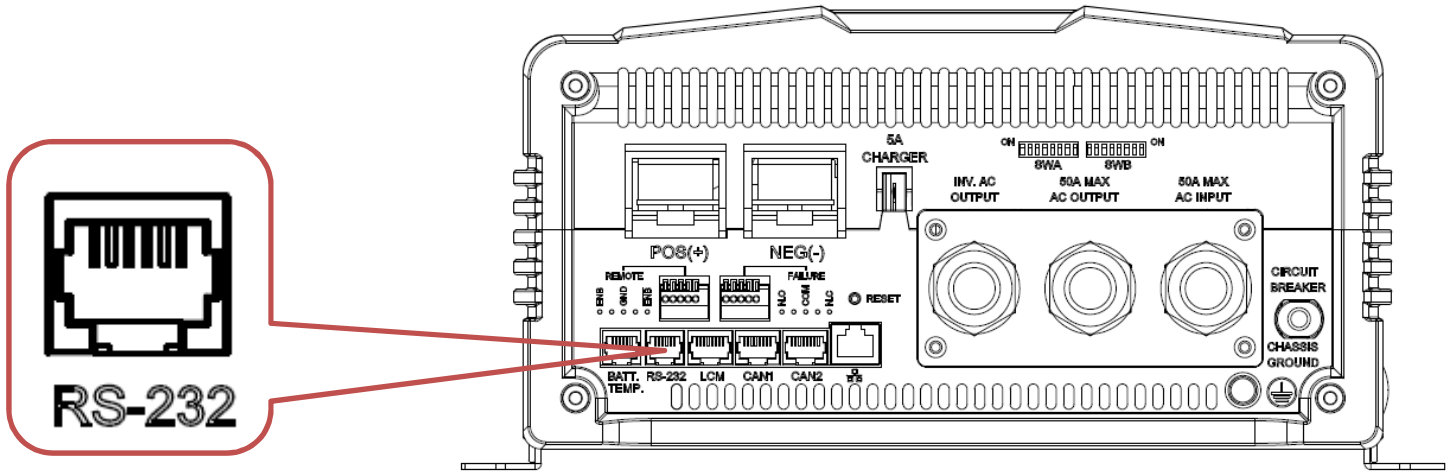
BAT. Temp. Port PIN Assignment

PIN #	PIN assignment
1	Reserved
2	GND
3	Batteries temperature sensor
4	GND
5	+5V
6	Reserved



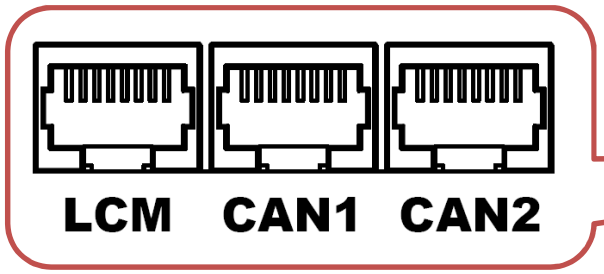
RS-232 Port PIN Assignment

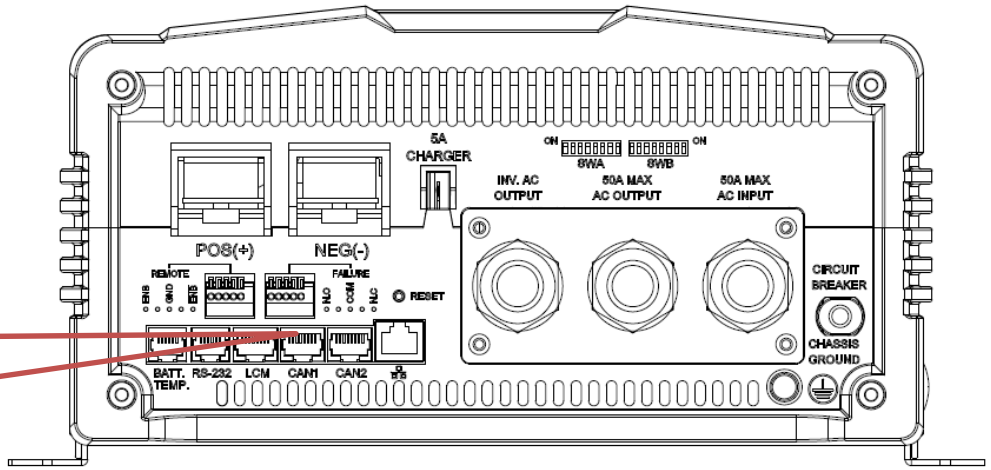
PIN #	PIN assignment
1	Reserved
2	GND
3	RXD
4	TXD
5	Reserved
6	Reserved



LCM/CAN1/CAN2 PIN Assignment

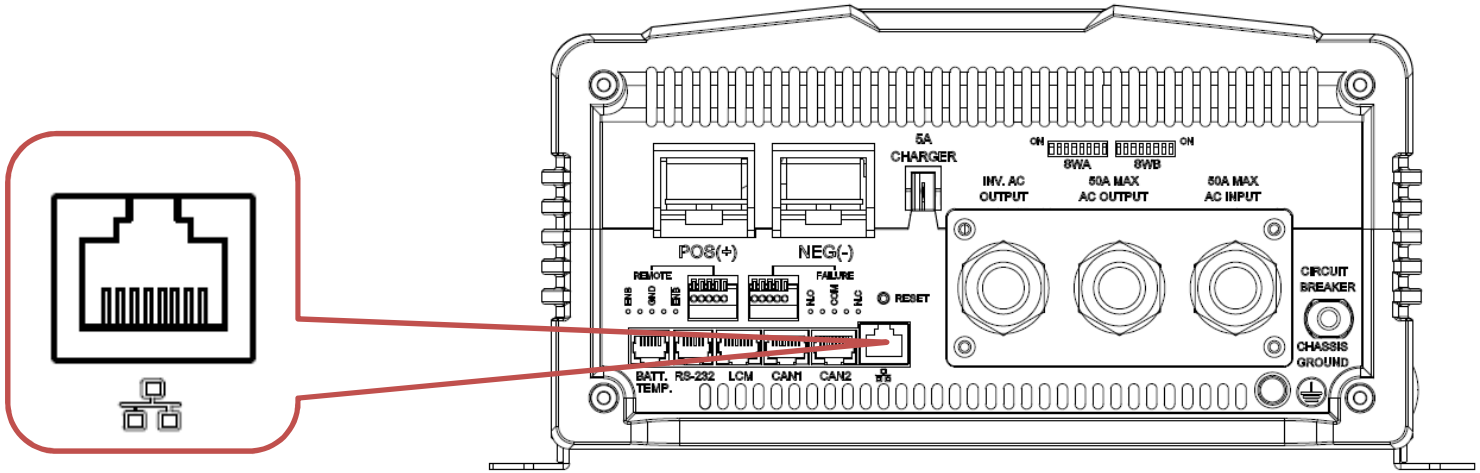
PIN #	LCM	CAN 1	CAN 2
1	CANH	CAN_H	CAN_H
2	CANL	CAN_L	CAN_L
3	PON	Reserved	Reserved
4	VCC-	Reserved	Reserved
5	VCC+	Reserved	Reserved
6	DIS	Reserved	Reserved
7	5VS-	RND	RND
8	5VS+	Reserved	Reserved



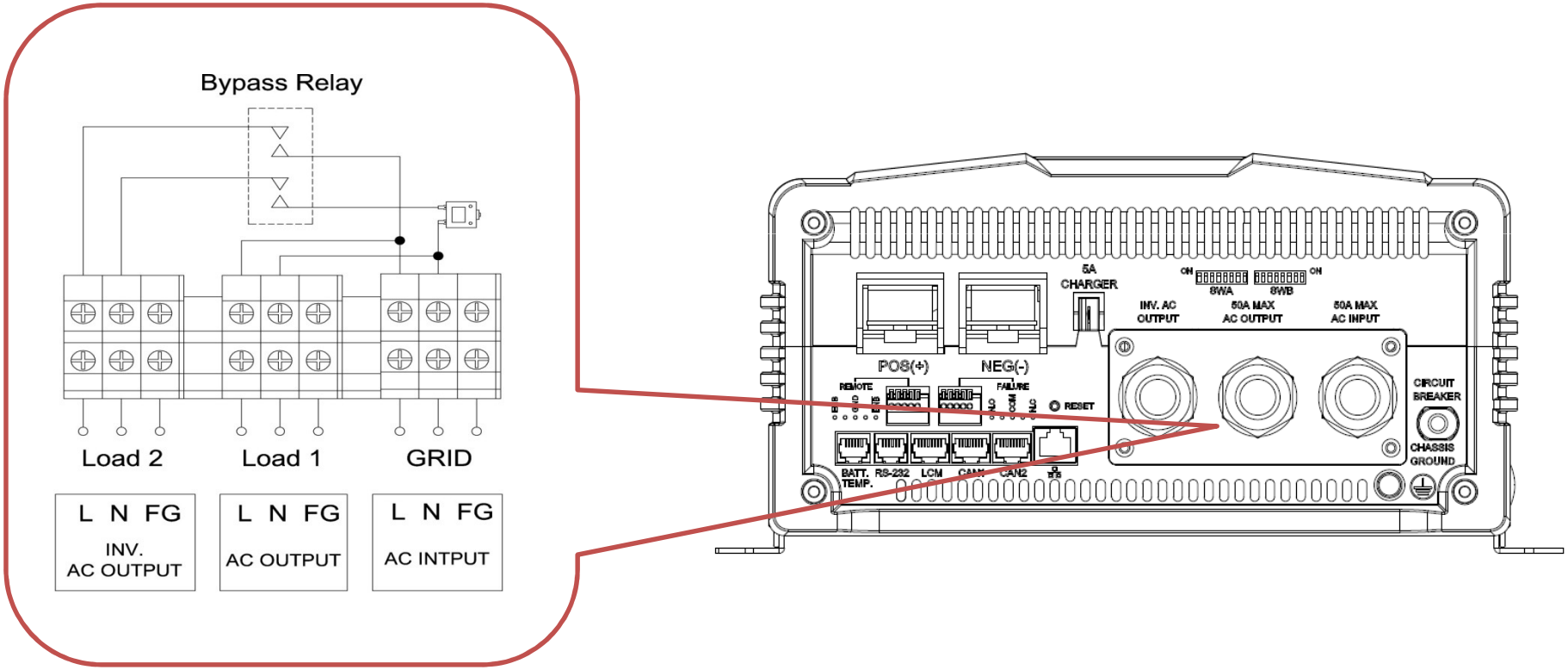


Ethernet PIN Assignment

PIN #	Ethernet
1	TX+
2	TX-
3	RX+
4	Reserved
5	Reserved
6	RX-
7	Reserved
8	Reserved



AC input and AC output terminal



SWA & SWB DIP switch Set-up

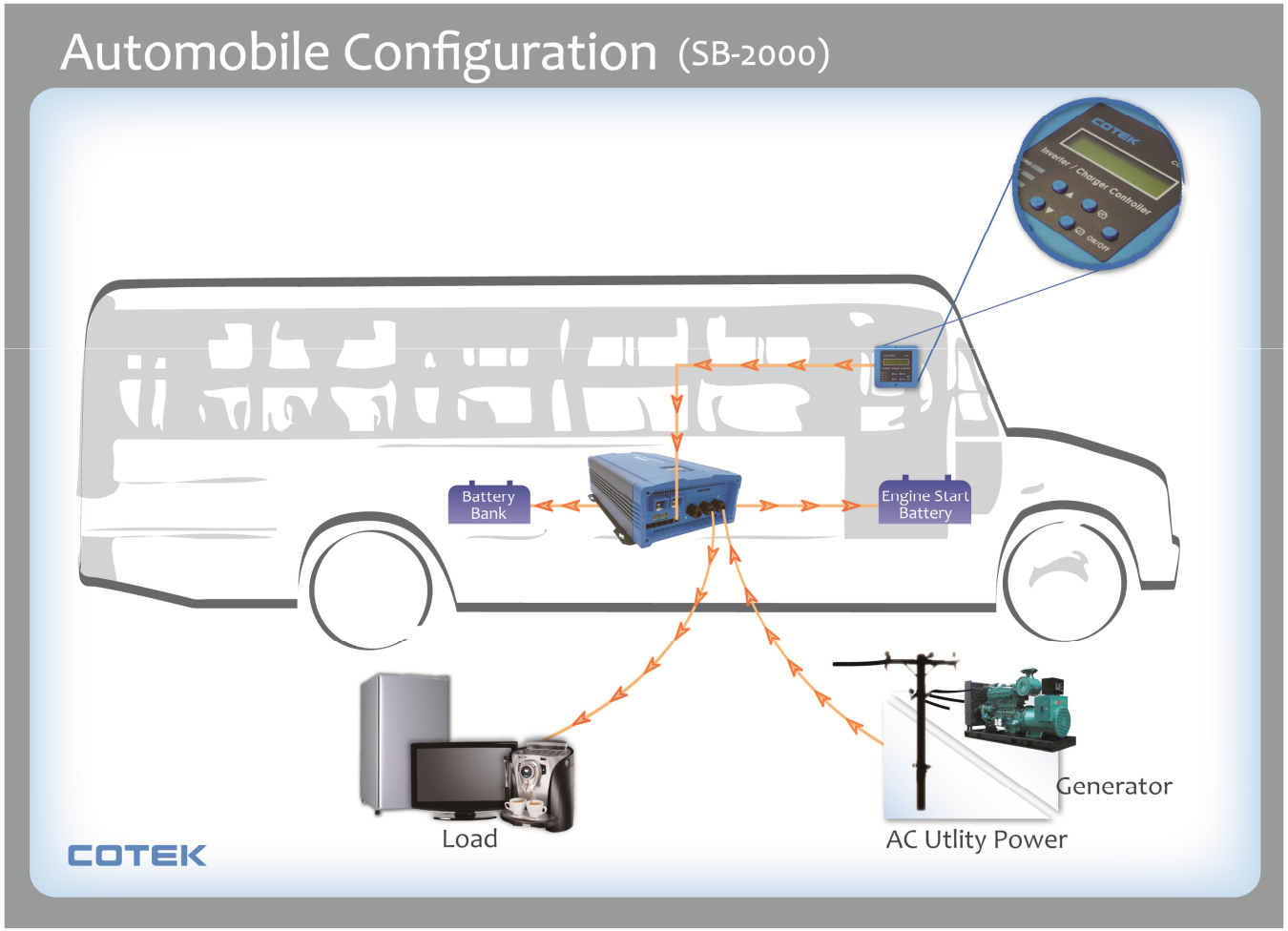
SWA

A1	A2	A3	Setting	A4	Setting	A5	A6	Setting	A7	Setting	A8	Setting
0	0	0	Disable	0	50Hz	0	0	100V	0	OFF	0	ON
1	0	0	Pow40W	1	60Hz			200V	1	ON	1	ON
0	1	0	Pow80W			1	0	110V				
1	1	0	Pow100W					220V				
0	0	1	Pow120W			0	1	115V				
1	0	1	Pow160W					230V				
0	1	1	Pow180W			1	1	120V				
1	1	1	Pow220W					240V				
Power Saving				Frequency		Output Voltage			Ground Relay		Reset	

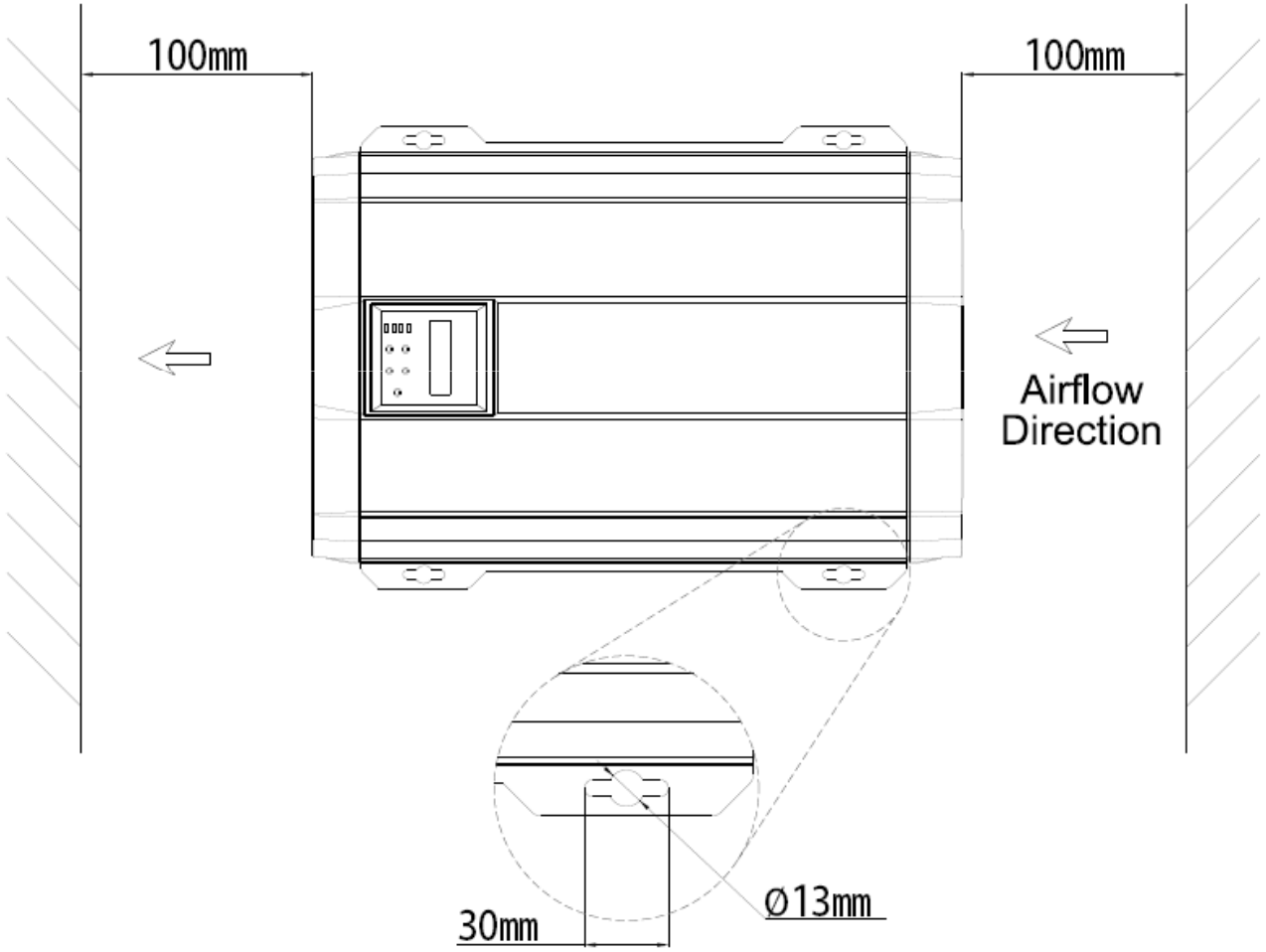
SWB

1	Setting	B2	Setting	B3	B4	Setting		B5	Setting	B6	B7	Setting	B8	Setting
0	Disable	0	Disable	0	0	6A	10A	0	Disable	0	0	Gel	0	COMBI Mode
1	Enable	1	Enable	1	0	10A	15A	1	Enable	0	1	Flooded		
				0	1	16A	25A			1	0	AGM1	1	CHR Mode
				1	1	25A	30A			1	1	AGM2		
Support		Generator						0	@110VAC	Battery Type Selection			Power "ON" Mode Selection	
						@230VAC	@110VAC							
				Sharing Current Limit				Power Sharing						

Application



Ventilation and installation notice



Accessories

- Standard
  - user manual
  - Ring terminal(2pcs)

- Optional
  - Remote control (CR-8, CR-10)
  - Ethernet module
  - STS module

Engineering spec

You can

Double click here!

SB-2000

SB-2000 specification

COTEK

www.cotek.com.tw