Installation Manual

Soleaf

DASS Grid-connected Photovoltaic Inverter

(3-Phase Power Conditioning System)

DSP-33xxxK Series ver1.8

(주)다쓰테크

Contents

1. Caution for Safety

- Cautions for safety must be kept under any circumstances in order to prevent accident or dangers for safe and right use
- Read the installation manual very carefully before you install, operate or maintain the products.
- There are two types of caution in the manual- warning and attention as below.

⚠ Warning	It possibly causes SERIOUS INJURY or DEATH when violated.
⚠ Attention	It possibly causes minor injury or product damages when violated.

- Symbols in the manual indicate as follows.


Indicates that you must be careful for possible danger under certain conditions


Indicates that you must be careful for electric shock under certain conditions.

- Keep the manual in place that anyone can read it anytime.
- Read the manual carefully in order to understand DSP series
- The manual is subject to change without notice.
- Contact us anytime when you lose or damage the manual.
- The repair, check-up, part-changes for inverters must be performed by only certified engineer. The engineers must have the following qualifications.

1. The engineer must be trained and certified in performing electric power authorization, electric power removal, danger removal, wiring and electric instruments attachment and ground connection.
2. There must be proper safety equipments for engineers such as insulated glove, safety helmet, protective goggles, face protector, and safety clothes
3. Take emergency measures when needed.

⚠ Warning

- **Do not touch outside terminal any time when you install or operate product.**

  Main terminal with electric power on makes inner parts and inner circuits flow electric current. This current is very dangerous and it could cause severe injury or death when you touch the currents.

- **Do not operate when cover is open.**

  It could cause electric shock as high voltage terminal or electric charging is exposed outside

- **Do not operate switch when your hands are wet.**
  It could cause electric shock.

- **Do not open cover when power is on or in operation.**
  Stop operation or wait until the power is off when you need to open the cover.

- **Do not open cover even when power is off except for regular check-up.**
  Inverter is still charged even if power is off due to the long-time charging, which could cause electric shock.

- **Shut off the power and wait more than 10 minutes to confirm complete discharging to VOM from inverter when doing wiring work or regular check-up.**
  Inverter is still charged even if power is off, which could cause electric shock.

- **Do not use damaged wire.**
  Stop operation and contact us right away.

- **Do not put any heavy items on the wire.**
  It could damage insulated wire.

⚠ Attention

- **Keep away from inflammables.**

  If installed on or nearcombustible material, it could cause fire. When there is fire or smell, stop operation immediately and contact us right away.

- **Shut off output power (solar cell) and input power (AC power) immediately when inverter malfunctions.**
  Otherwise, it could lead to fire by subsequent accidents.

- **Do not touch inverter within 10 minutes even if power is off.**
  Inverter is very hot and it could cause burn on your body.

- **Do not input power even if you finish installation when inverter or parts are damaged.**
  It could cause electric shock.

- **Be careful not to get any screw, metals, water, oil, etc. inside inverter.**
  It could cause fire.

Directions

(1) transportation

- Please transport by proper means according to product weight.
- Please check external conditions.
- Do not pile up. Follow the loading regulation.
- Do not open the cover while transported.
- Do not drop or damage with shock.

(2) applications

- It automatically operates when auto-operation function is initially set.
- You can operate or stop with run/stop key on key pad
- Reset troubled items, and then it automatically operates after waiting time.
- Do not remodel at your convenience.
- Reset to the required value when initialized, otherwise it automatically reset to the predefined value.

(3) Trouble-shooting

- Install additional safety device such as emergency brake just in case that inverter is damaged and out of control.

(4)Maintenance and Repair

- Don’ t perform mega-test (for electric insulation and resistance) for inverter control circuit. It could cause malfunctions or damages.
- Refer chapter 6 for detailed explanations.

(5)Disposal

- Dispose as general industrial waste.

(6)Others

- The pictures occasionally drop the explanations for cover or breaker. However, you must strictly follow the guidelines in the manual for cover and breaker installation.

Directions for Installation

- Installation
  - Follow the instructions in the installation manual.
  - This product must be installed indoor. Be careful not to expose to external circumstances directly.
  - Keep away from place - wet, dusty, direct ray of light or high temperature.
  - Install in a spacious place. Please secure the space at least 20cm from the top and bottom for model DSP-3310K, and minimum 50 cm from ventilating opening in the back for model DSP-3320K~33250K.
  - Installation must be performed by technical experts.
  - Do not place any heavy items on the inverter.
  - Keep away from any inflammable materials.
  - Installation direction must be set followed by the guidelines in the manual.
  - Do not drop or damage inverters.
  - Do 3-class grounding construction(200V, grounding resistance under 100Ω) and special 3 class(400V, grounding resistance under 10Ω)
  - Don't place other home appliances. Any fault or noise of home appliances may happen.
  - Before install an inverter, turn off the power and be careful of connecting the electric wire.
  - Especially, after confirming the circuit breaker of solar cell (DC), install an inverter, and after completing the installation and turning on the power, run the appliance. If you install the inverter when the power of solar cell (DC) is "On", any serious damage may happen.

- Wiring
  - As this equipment is expensive, the expert should perform wiring work or inspection in person.
  - Wire with the wire more than allowable current applied by capacity.
  - After install the inverter body, perform wiring work.
  - If you connect wrong contacts, damage may happen on the inverter.
  - **Especially, in case the polarities (+/-) of DC power, damage may happen on the inverter or any accident may occur.**

- Adjustment while performing trial run
  - While performing trial run, follow the basic order of running

● Make sure of the present condition of displayed screen.

2. Outline of Products

2.1 Basic data

2.1.1 Contents you should know before using the appliance

Thank you for purchasing our products. To use the appliance right, it's important for you to understand the function of the inverter and how to use it through the manual. If you misuse the inverter, it is operated abnormally or its performance may be depreciated. Especially, as the inverter might be broken or damage might impair the body seriously, use the inverter after understanding the application or installation manual enough in using the inverter.

2.1.2 Confirmation of Products

After removing packing, check up the ratio nameplate on the front body. Also, make sure that the form and ratio power of the inverter correspond to ordered inverter.

(1) Form of the Inverter (Model Classifying Code)

DSP - 3 3 XXX K

Mark	Name
DSP	Das PCS

Mark	Name of Series
1	Single Phase
3	3 Phase

Mark	Output Power
2	220 V
3	380 V

Mark	Capacity
10K	10 kW
20K	20 kW
30K	30 kW
50K	50 kW
100K	100 kW
200k	200 kW
250K	250 kW

(2) Components - Installation manual, test result

2.1.3 Preparing devices or components for running

As the preparations for running may be changed according to the installed environment more or less, prepare necessary materials & members and tools for wiring.

2.1.4 Installation Environment

To prevent lifetime or performance of the inverter from being depreciated, install the appliance exactly, considering its installed position or direction, or peripheral space.

2.1.5 Wiring

Connect power and running signal (signal for control) to the block of terminal. If you don't connect them, the inverter or peripheral add-ons may be damaged, so be careful of wiring. Especially, watch out the polarity of input power (DC)

2.1.6 Characteristic of Products

(1) Conversion of High Efficient Power

The inverter performs the conversion of high efficient power with IGBT and high efficient characteristic more than 96% is presented in the rated power.

(2) Digital Controlling

It's easy to control the system through digital control of high performance. You can confirm the system through LCD. LCD screen presents the present condition of operation, input and output, any abnormality of the inverter and its operation is stopped if any error happens. It senses the power (DC) of solar cells to operate or stop the inverter automatically.

(3) Active Parallel Running (Only for the model of 200~250Kw)

As algorithm performing Master(Module1) and Slave(Module2) parallel running was applied to Photovoltaic Inverter model of 200~250kW according to the radiation to convert high efficient power, it converts high efficient power with active response in accordance with the radiation.

Master (Module1) is operated in the first running. Next, Slave (Module2) is operated if the power is generated more than 70% of rated capacity after the radiation increases.

If the radiation decreases to 30% of the inverter's rated capacity, Slave (Module2) is stopped.

(4) Non-transformer Typed Inverter

DSP series inverter is non-transformer type and is suitable for the decentralized power system designed to meet industrial and commercial generating need.

(5) Decentralized Power System and Economical Efficiency

In case of photovoltaic power generation, you can install the system to the places wherever the sun shines. As you can establish the decentralized power by the unit of a building, housing complex and photovoltaic generating plant, economic utility is possible.

(6) MPPT (Maximum Power Point Tracking)

As the uneven direct current occurs according to ambient temperature, humidity, climate, environment and radiation for the characteristic of solar cells, the inverter makes the solar cells tracks maximum power point through MPPT.

(7) Easy Parallel Operation

If the capacity of solar cells increases, you can add an inverter without any exclusive equipment and increase its capacity for bulky power generation.

(8) Convenience of Installation and Operation

It was designed more easily and safely to connect solar cells to the system current. Through frontal LCS screen, it was designed to display the present condition of converter and you can stop the operation manually.

(9) High Reliability and Over-noise

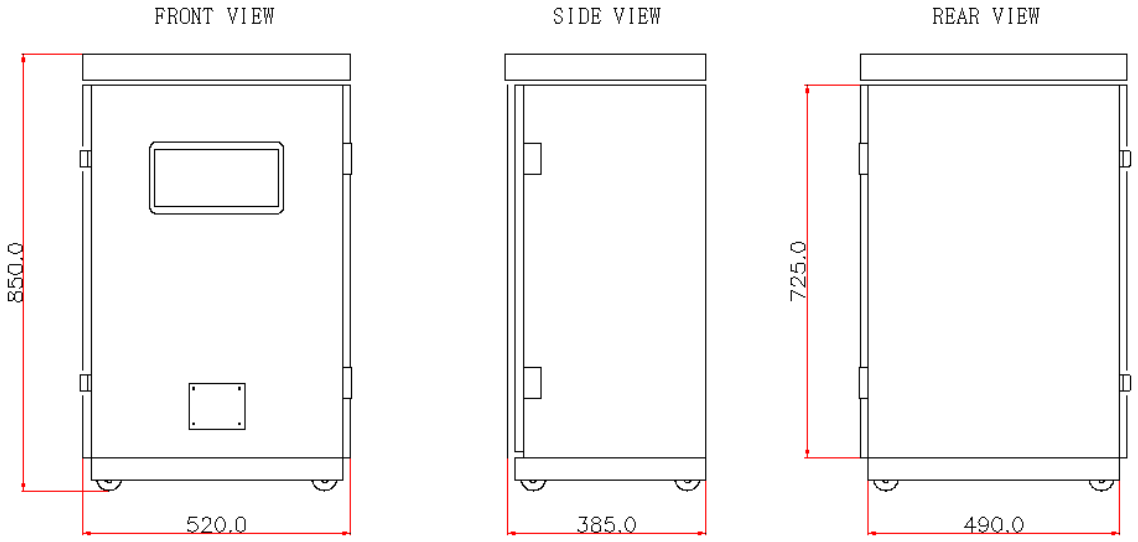
The components of the inverter were optimized and any defaults were deduced a lot. Also, we applied durable cooling fan of square shape and realized reliability and low noise.

(10) Monitoring System (Option)

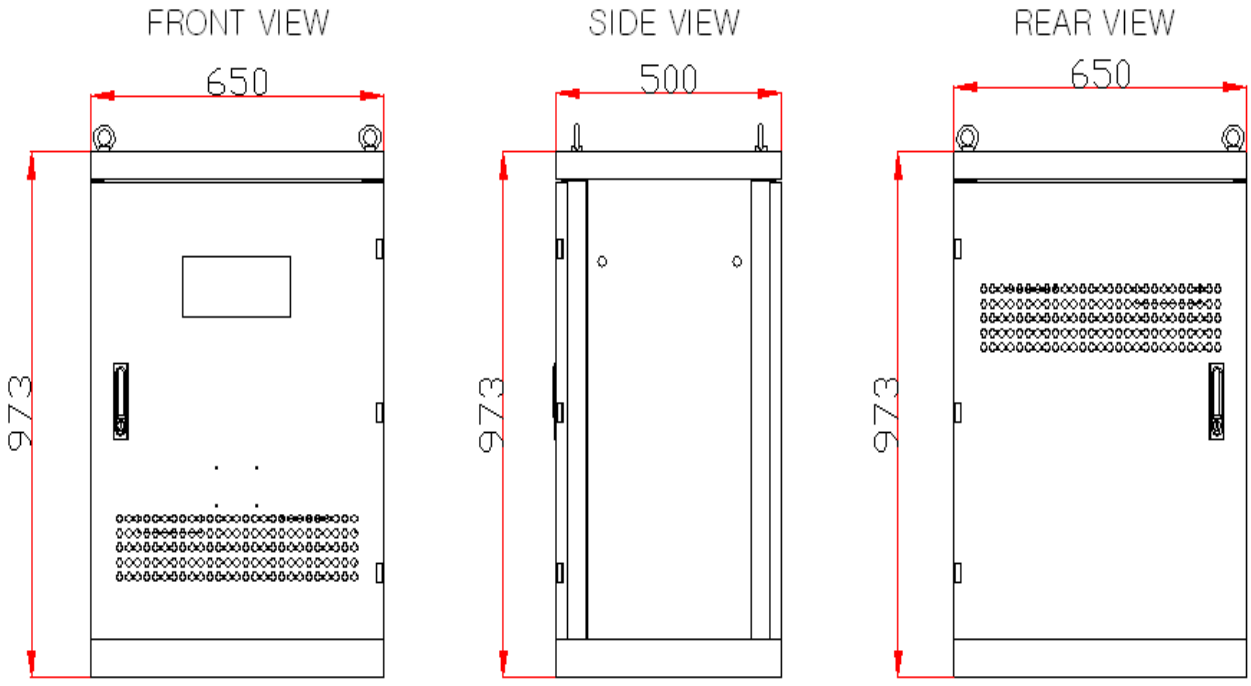
Making use of web communication module and a sensor box, we can monitor easily the present condition and statistics of inverter's power, radiation, temperature and peripheral environment, making use of PC.

2.2 External Dimensions

2.2.1 DSP-3310K



< Old model >



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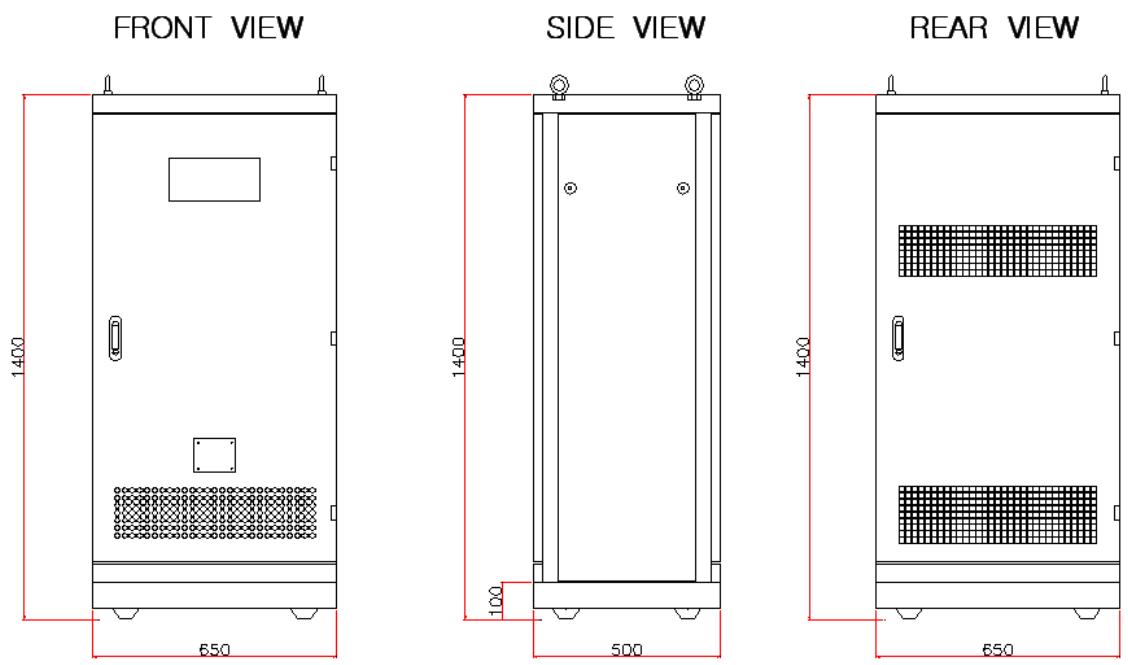
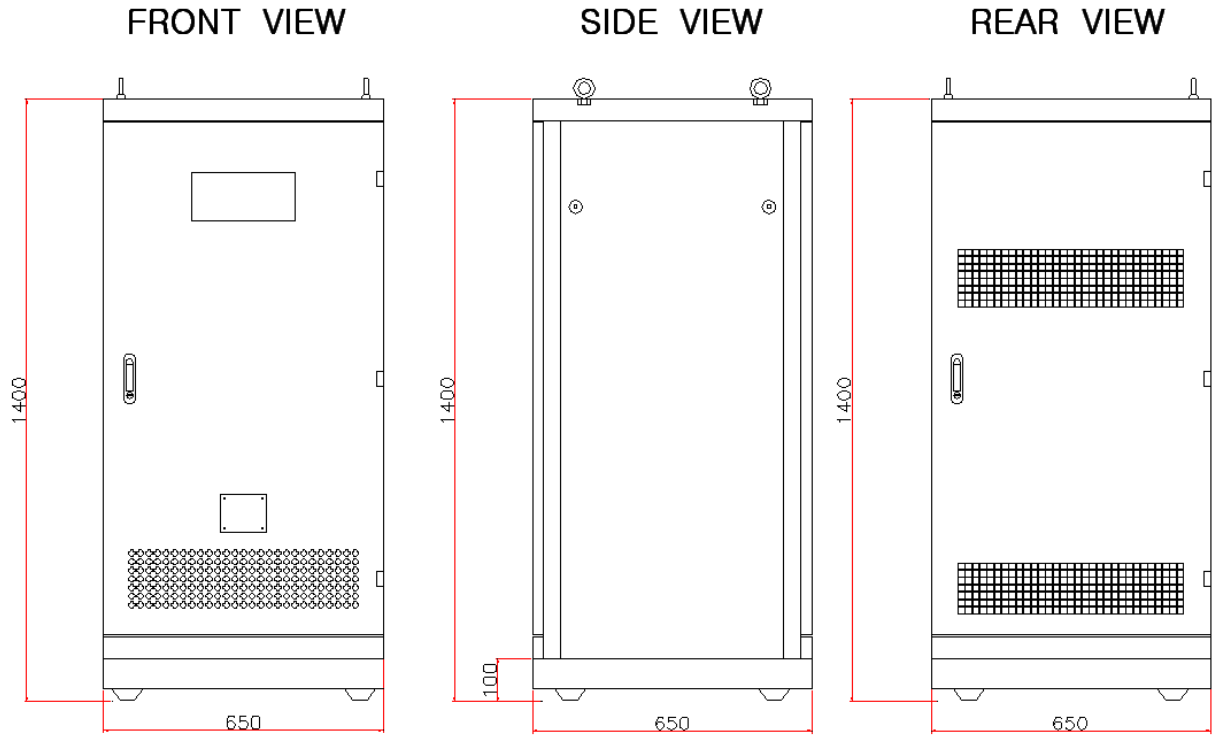
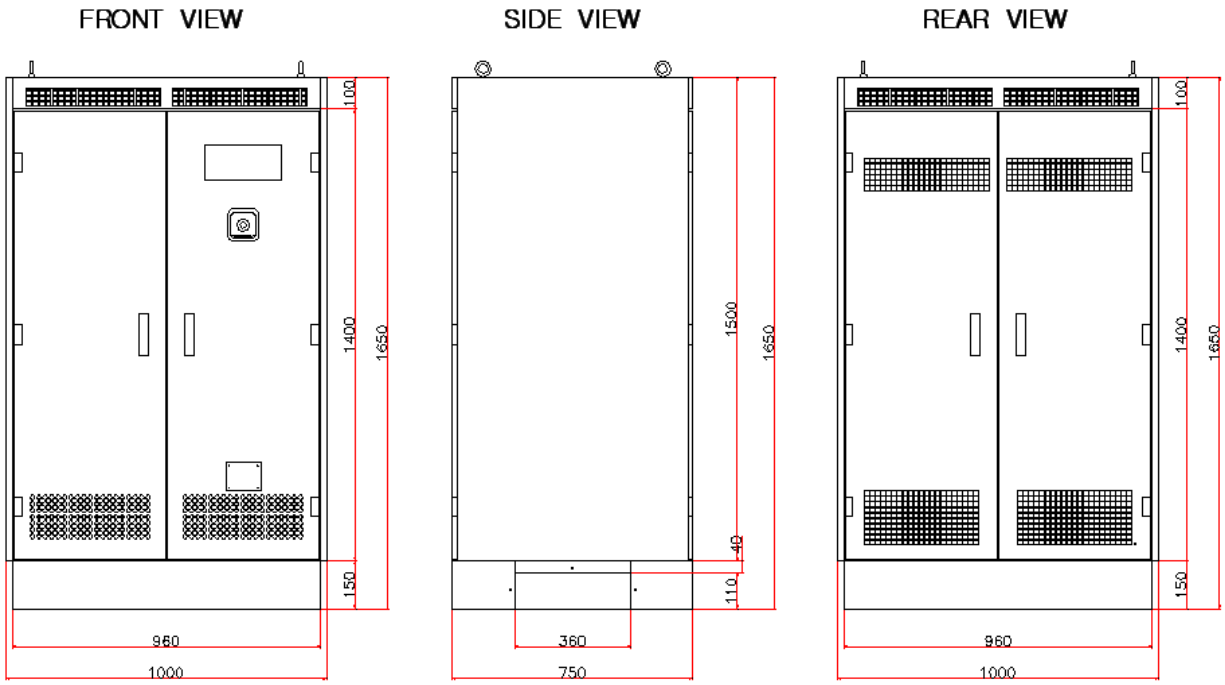
2.2.2 DSP-3320K~3330K



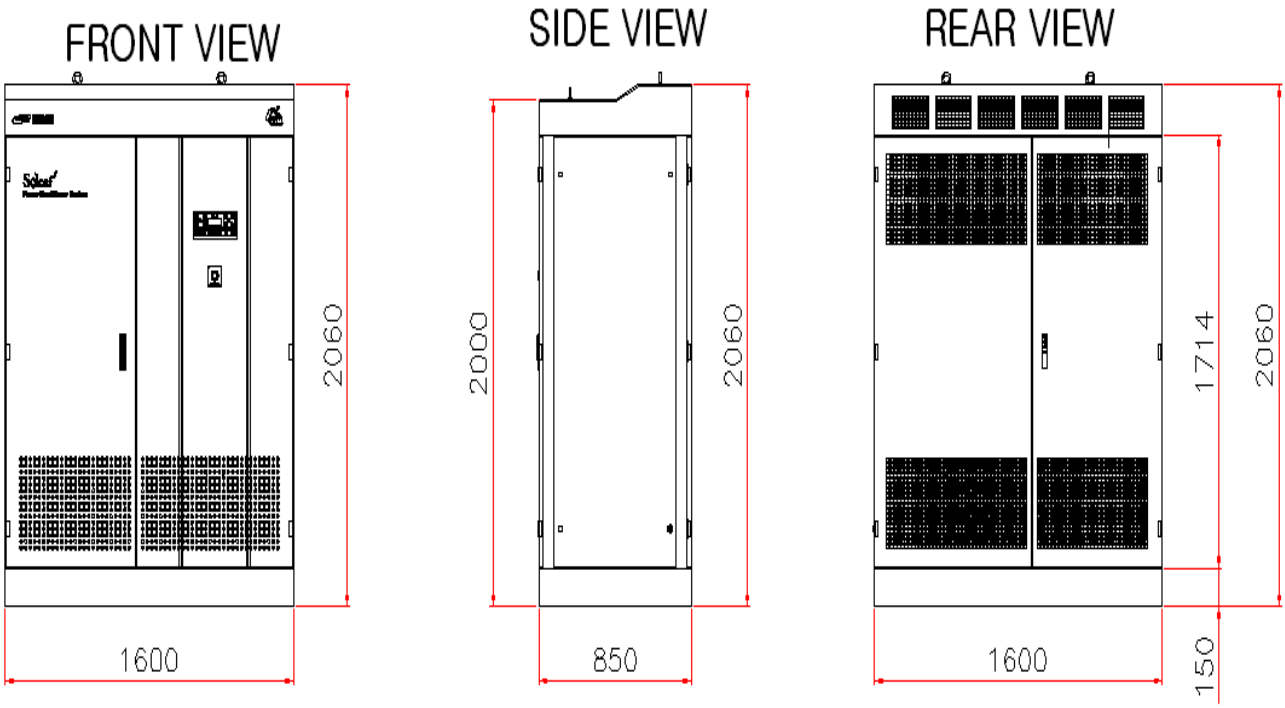
2.2.3 DSP-3350K



2.2.4 DSP-33100K

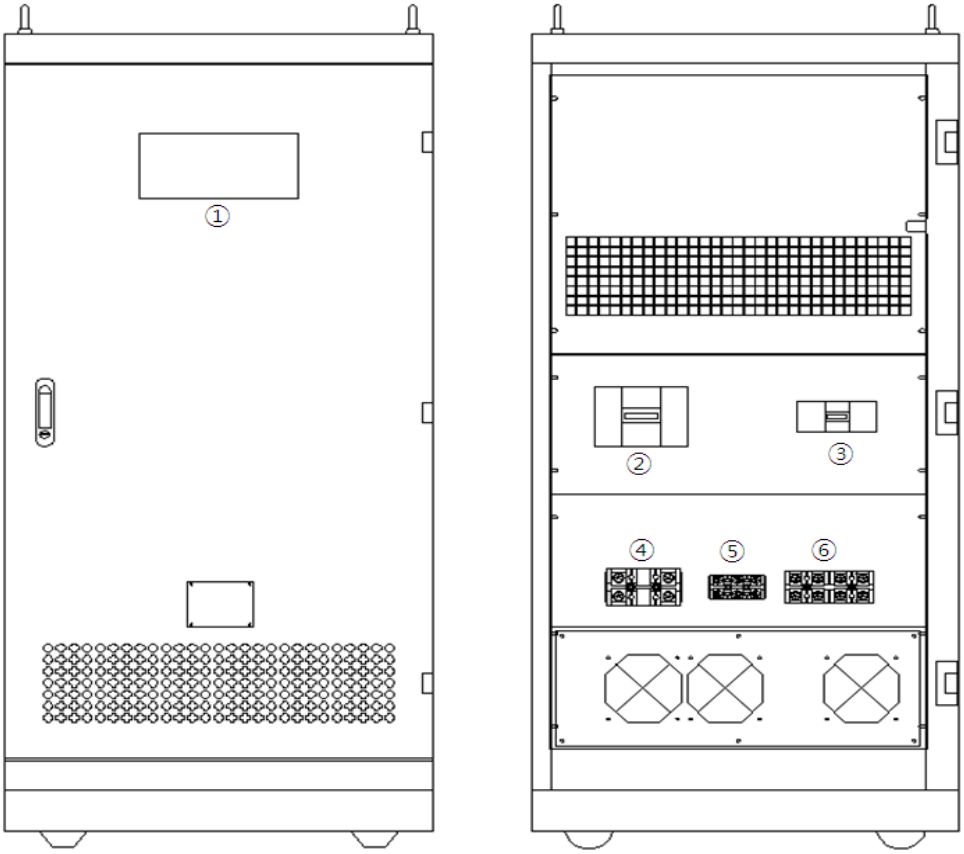


2.2.5 DSP-33200K ~ DSP-33250K



2.3 Names and Functions of Each Part

2.3.1 DSP-3310K ~ 3350K



External Internal

① Key pad

-Key pad presents the operating condition of the inverter on the LDC screen.

② DC INPUT MCCB

-This part prevents DC of input part of a converter from photovoltaic module contacting panel.

③ AC OUTPUT MCCB

-This device disconnects AC output part from grid system.

④ DC INPUT TERMINAL BLOCK

-This part is contacting parts connecting the inlet line to photovoltaic module contacting panel.

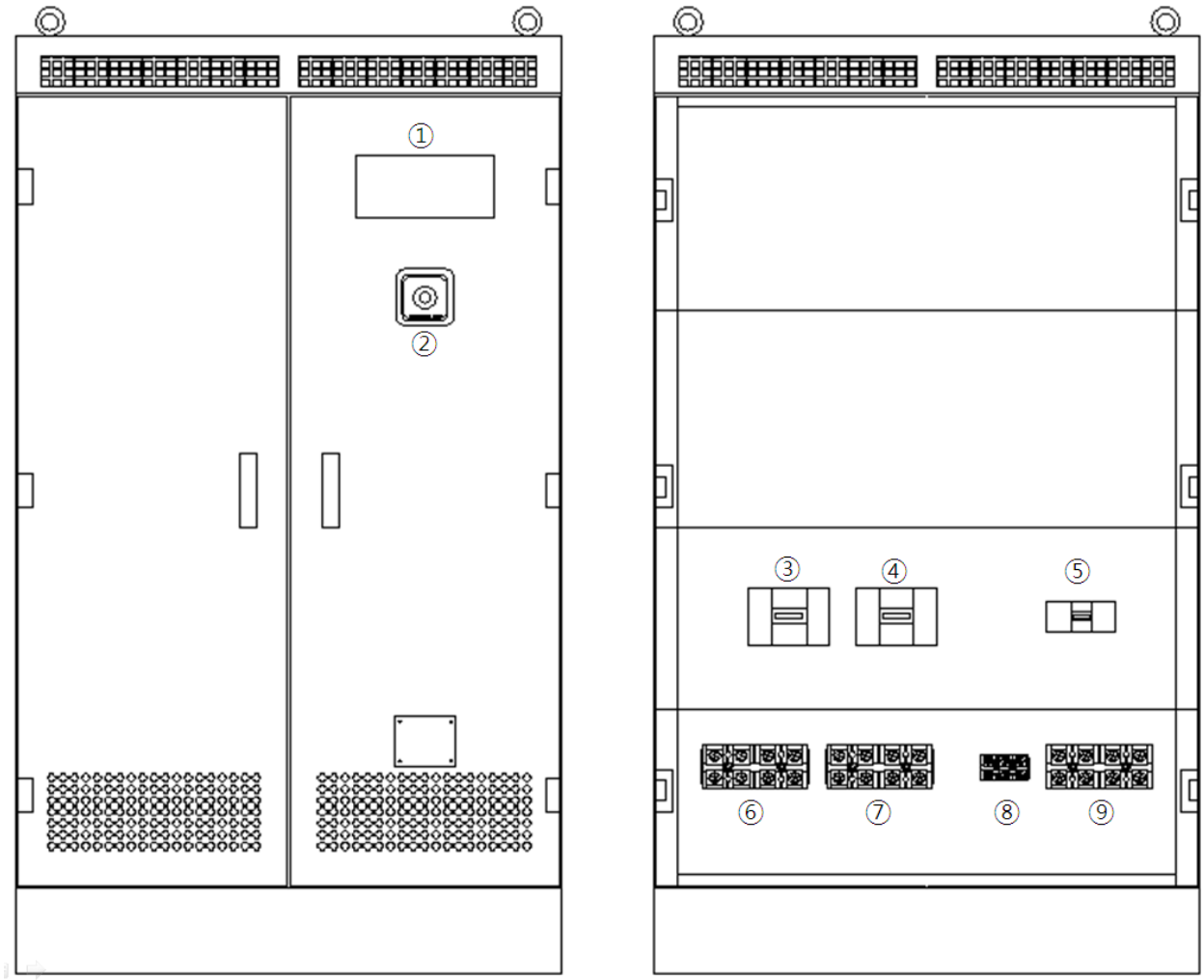
⑤ GROUND TERMINAL BLOCK

-This contact is connected to the earth wire.

⑥ AC INPUT TERMINAL BLOCK

-This terminal bock is connected to grid series line (380Vac).

2.3.2 DSP-33100K



External Internal

① Keypad

-Keypad displays synthetically running condition of the inverter on LCD screen.

② Emergency Switch

-Emergency Switch stops the inverter by compulsion in case of emergency situation. The inverter doesn't re-run if the switch is turned on.

※If emergency switch is pressed during transportation, It could not operate

properly. Check the emergency switch.

③ DC Input MCCB 1

-DC Input MCCB 1 disconnects DC input into Booster 1 of the inverter from solar light module contacting panel.

④ DC Input MCCB 2

-DC Input MCCB 1 disconnects DC input into Booster 2 of the inverter from solar light module contacting panel.

⑤ AC Output MCCB

-AC Output MCCB disconnects the inverter from grid line.

⑥ DC Input Positive(+) Terminal Block

-DC Input Positive (+) Terminal Block connects positive contact among the lines input from solar light module contacting panel.

⑦ DC Input Negative(-) Terminal Block

- DC Input Negative (-) Terminal Block connects negative contact among the lines input from solar light module contacting panel.

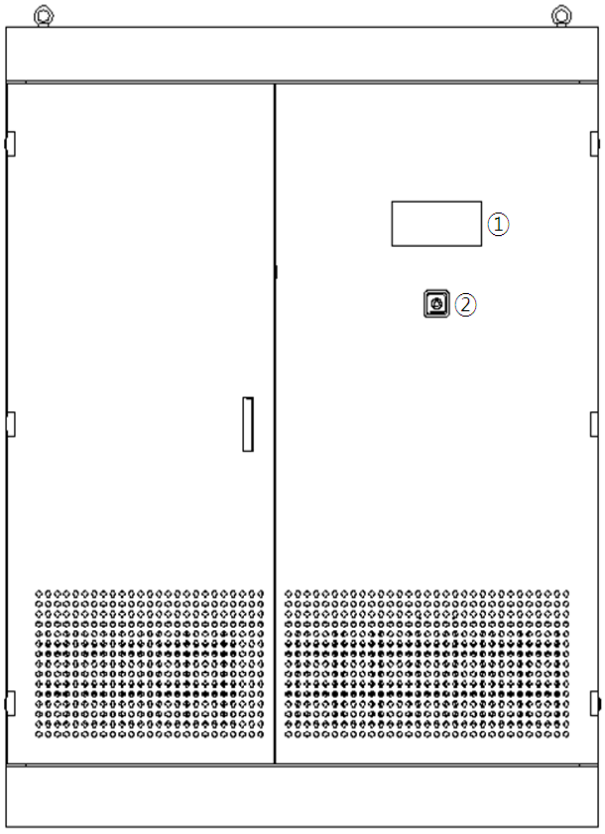
⑧ Ground Terminal Block

-Ground Terminal Block is connected to the earth wire.

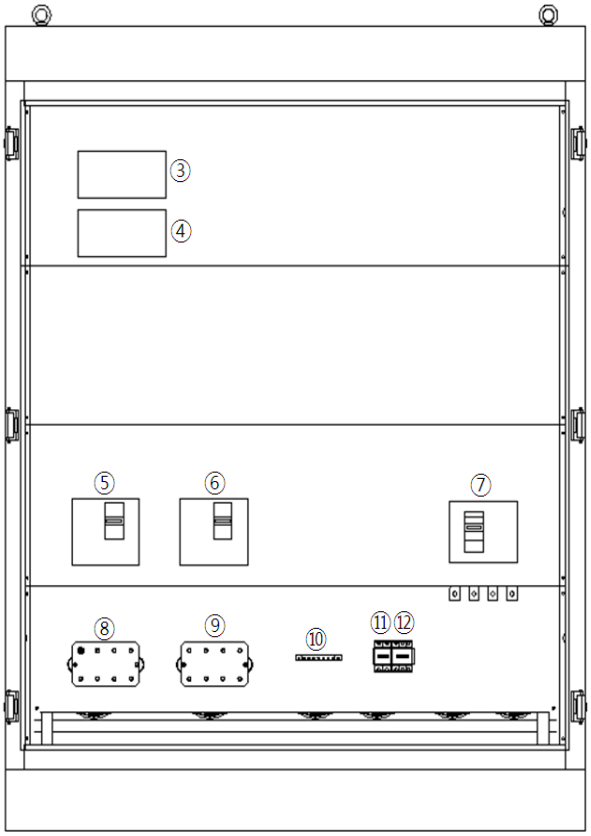
⑨ AC Output Terminal Block

-AC Output Terminal Block is connected to grid series line (380Vac).

2.3.3 DSP-33200K, DSP-33250K



External



Internal

① Integral Keypad

-Integral Keypad indicates synthetically running condition of Master and Slave Inverter on LCD screen.

② Emergency Switch

-In case emergency situation occurs, Emergency Switch stops the inverter by compulsion. The inverter doesn't re-run if the switch is turned on.

※If emergency switch is pressed during transportation, It could not operate properly. Check the emergency switch.

③ Master Keypad

-Master Keypad displays running condition of Master Inverter on LCD screen.

④ Slave Keypad

-Slave Keypad displays running condition of Slave Inverter on LCD screen

⑤ DC Input MCCB 1

-DC Input MCCB 1 disconnects DC input into Master Inverter from solar light module contacting panel.

⑥ DC Input MCCB 2

-DC Input MCCB 1 disconnects DC input into Slave Inverter from solar light module contacting panel.

⑦ AC Output MCCB

-AC Output MCCB disconnects the inverter from grid series line.

⑧ DC Input Positive(+) Terminal Block

-DC Input Positive (+) Terminal Block connects positive contact among the lines input from solar light module contacting panel.

⑨ DC Input Negative(-) Terminal Block

- DC Input Negative (-) Terminal Block connects negative contact among the lines input from solar light module contacting panel.

⑩ Ground Busbar

-Ground Busbar is connected to the earth wire.

⑪ Monitoring Keypad MCCB

-Monitoring Keypad MCCB disconnects the power of integral keypad (220V).

⑫ Control Power MCCB

-Control Power MCCB disconnects the controlling power(3Φ 380V) such as MC and cooling pan of the inverter.

3. Installation of Products

3.1 Place of Installation

⚠ Please, install the converter to the place satisfying next conditions.

1) As DSP-33 series is for outdoor product, don't install it to outdoor space.

2) As the lifetime of inverter is affected by ambient temperature, lower the temperature around the place where the converter is installed less than allowable temperature(-10 ~ 40℃).

3) Avoid hot and humid place (Relative humidity should be less than 90%. No dewfall).

4) Install this converter to the place no vibration exists.

5) As the inverter is a high temperature heating unit, install it to non-flammable material.

6) Install the converter to let its heat emitted without a hitch, securing peripheral space.

7) Avoid the places where oil mist, flammable gas, fabric mote, dust and moisture exist.

8) Install the bolts of specified size, fixing them with a determined torque.

9) Install the converter to the place no salt exists.

3.2 Connecting Contacts (terminal bars) and Their Installation

⚠ If you uncover the cover in front on the lower part of inverter, terminal blocks exist as below. As their composition is different from each other by their capacity, connect them exactly according to the manual.

⚠ For the earth of converter, apply single earth constructing method.

⚠ Caution in connecting the main circuit.

- In case of input power, connect positive (+) power source to the input contact (PV [+]) of the inverter, negative (-) power source to the input contact (PV [-]) and then supply power. The inverter might be damaged by false connection.

- For power input contacts and output contacts, use pressing contacts that insulating caps are attached. Chips of wire might result in default, failure or false operation.

- In case you change any wire due to improper matter, make sure if the power for the LC(Liquid Crystal) of the keypad on the main body is turned off or not, perform wiring

work, please. As the internal capacity of an inverter is charged with high voltage, it is dangerous.

●To prevent electric shock, perform No.3 earth work and special No.4 earth work with the inverter. Make sure that the resistance of earth should be less than 100 Ω.

●Connect the contacts of the inverter to the exclusive terminal blocks. Don't use a case or sash as earth terminal.

●For the earth wire, use exclusive earth wire complying with the standard. Connect the earth contacts to the spot adjacent to the inverter.

●Apply determined torque to the bolts. If they are fastened loose, it causes short or false operation.

●For the electric wires, use copper wire more than 600V, 75℃.

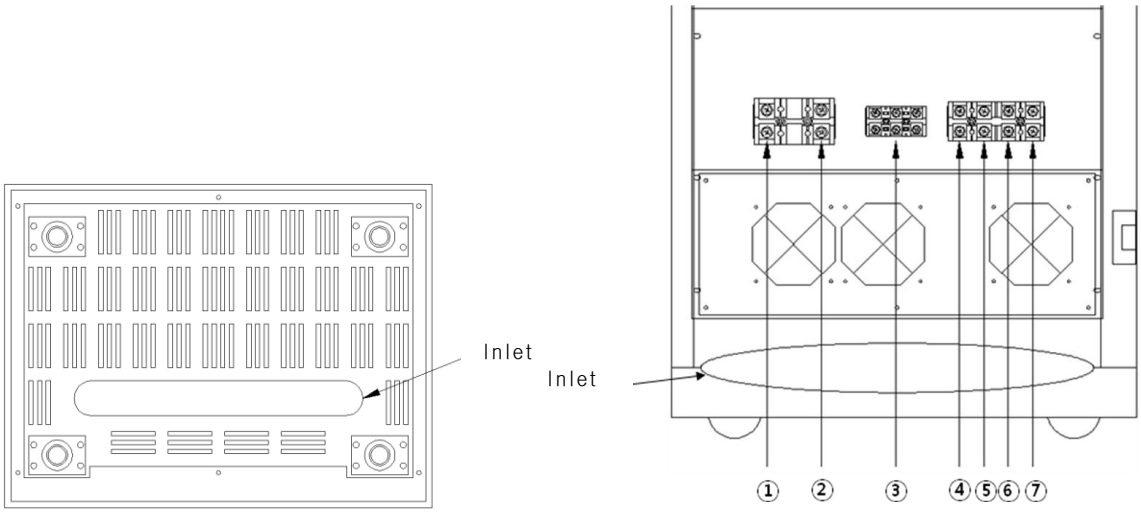
●Place the wires according to the specification of electricity supplier or electricity safety regulation for detailed standard.

●Input & Output Contacts(Terminal Blocks) and Specification of Wires

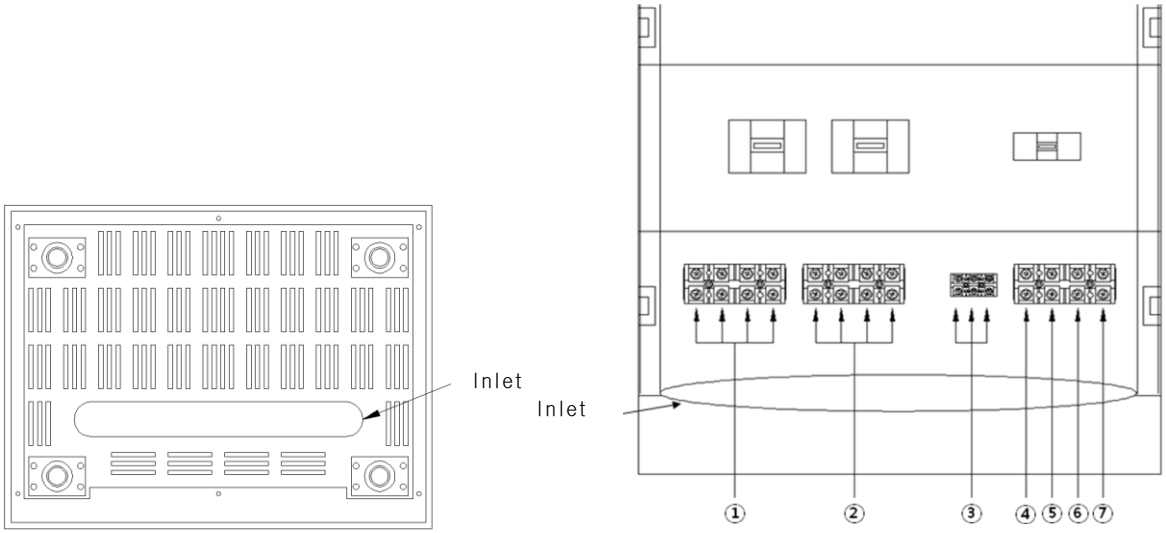
Capacity	Purpose	Standard	Remark
10kW	PV[+] Wiring	M8 - 16SQ	
	PV[-] Wiring	M8 - 16SQ	
	Earth Wiring	M8 - 4SQ	
	AC Output Wiring	M8 - 10SQ	
15kW ~ 30kW	PV[+] Wiring	M8 - 35SQ	
	PV[-] Wiring	M8 - 35SQ	
	Earth Wiring	M8 - 16SQ	
	AC Output Wiring	M8 - 25SQ	
40kW ~ 50kW	PV[+] Wiring	M10 - 70SQ	
	PV[-] Wiring	M10 - 70SQ	
	Earth Wiring	M8 - 25SQ	
	AC Output Wiring	M8 - 35SQ	
100kW	PV[+] Wiring	M10 - 70SQ * 2	Standard of S50kW connecting panel is
	PV[-] Wiring	M10 - 70SQ * 2	
	Earth Wiring	M8 - 25SQ	
	AC Output Wiring	M12 - 70SQ	
200kW ~ 250kW	PV[+] Wiring	M8 - 70SQ * 4~5	Standard of S50kW connecting panel is
	PV[-] Wiring	M8 - 70SQ * 4~5	
	Earth Wiring	M8 - 35SQ Over	
	AC Output Wiring	M12 - 185SQ Over	
	Integrated Keypad Wiring	M4 - 2.5SQ Over	

※ This wiring size could be changed according to the method of wiring construction (Refer to IEC specification)

3.2.1 Wiring Diagram of DSP-3310K~3350K



3.2.2 Wiring Diagram of DSP-33100K

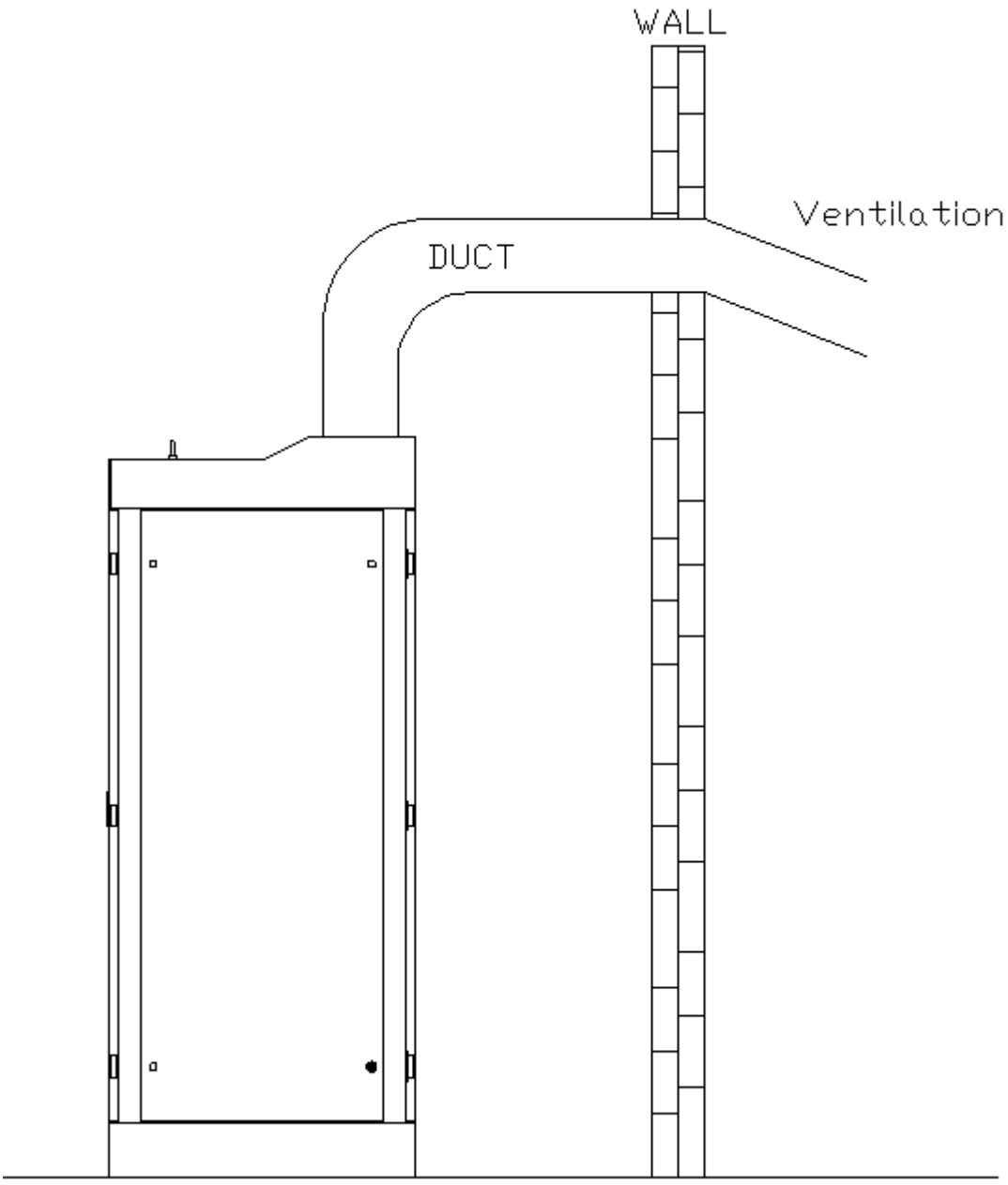


No.	Name of Contact	Explanation
⑦	Positive(+) Terminal Block of Input Power	Connect positive (PV [+]) of DC line inlet from the contacting panel.
②	Positive(-) Terminal Block of Input Power	Connect negative (PV [-]) of DC line inlet from the contacting panel.
③	Earth Terminal Block	Connect the earth wire.
④	Terminal Block of Output Power (3Φ3W 380V)	Output of the inverter is connected to R phase of GRID series line.
⑤		Output of the inverter is connected to S phase of GRID series line.
⑧		Output of the inverter is connected to T phase of GRID series line.
⑨	Neutral Terminal Block	Output of the inverter isn't connected to GRID series line.

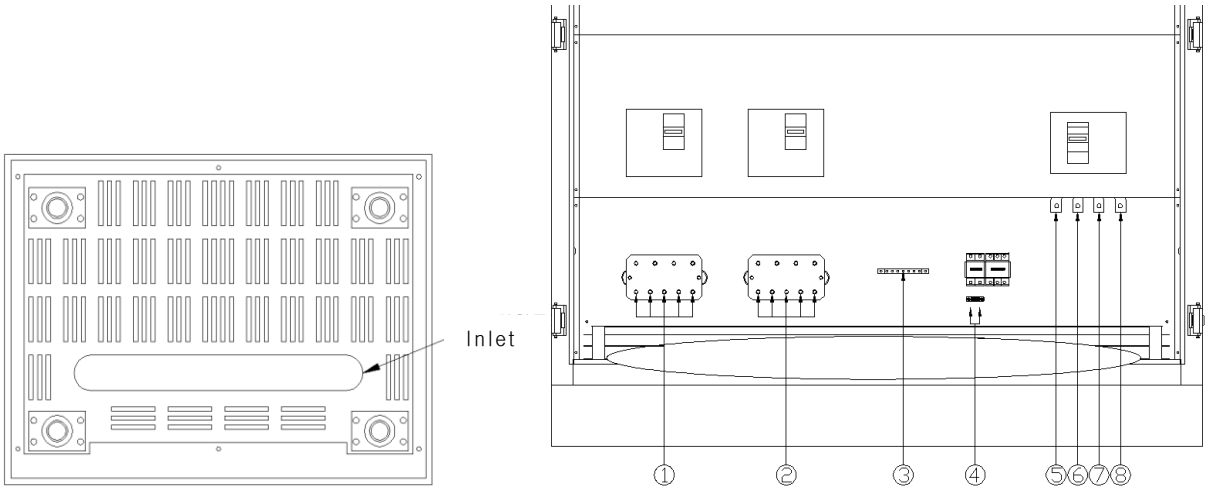
3.2.3 DSP-33200K~33250K

3.2.3 DSP-M33200K~M33250K

⚠ If the ambient temperature of installing site could be over 40℃, please install duct for ventilation to prevent ambient temperature from rising. There is an example picture below.



< The example for 200kW ~ 250kW inverter >



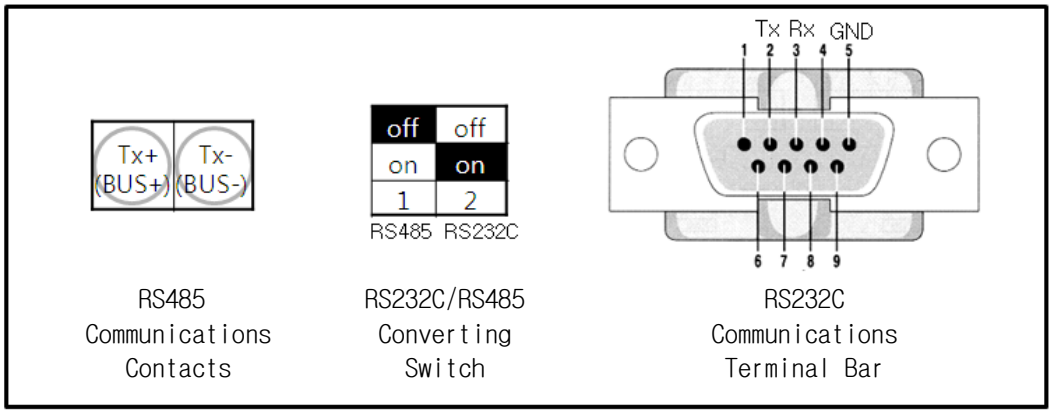
No.	Name of Contact	Explanation
①	Positive(+) Terminal Block of Input Power	Connect positive (PV [+]) of DC line inlet from the contacting panel.
②	Positive(-) Terminal Block of Input Power	Connect negative (PV [-]) of DC line inlet from the contacting panel.
③	Earth Terminal Block	Connect the earth wire.
④	Integrated Keypad Terminal Block	Connect the power of integrated keypad(1Φ 220Vac).
⑤	Terminal Block of Output Power (3Φ3W 380Vac)	Output of the inverter is connected to R phase of GRID series line.
⑥		Output of the inverter is connected to S phase of GRID series line.
⑦		Output of the inverter is connected to T phase of GRID series line.
⑧	Neutral Terminal Block	Output of the inverter isn't connected to GRID series line.

3.3 Wiring of Web Communications Module (Monitoring)

3.3.1 Web Communications module of DSP-3310 ~ 100K

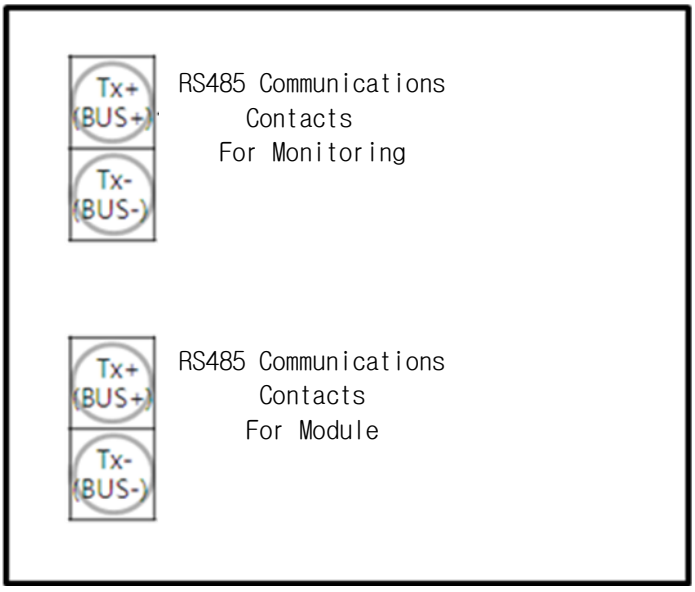
The keypad is mounted on the internal part of frontal cover. Open the frontal door and connect RS232C/485 communications contacts to web communications module. In wiring communications cable, be careful of not to pass the cable near the power wire, or any error might happen for web monitoring system.

DSP-3310 ~ 100K series products support 2 communications methods such as RS232C and RS485. Each communications methods can be converted through operating the switch. In installing communications line, be careful of not to cut the cables of keypad.



3.3.2 Web Communications module of DSP-33200 ~ 250K

DSP-33200 ~ 250K series products support only RS485 communications method. Communications contacts are located on the rear and left side of the integrated keypad mounted on the frontal door. As the lower contact between 2 communications contacts is a communications contact between modules, use 485 contacts for the contact for monitoring.



4. The Condition of Run and Operation

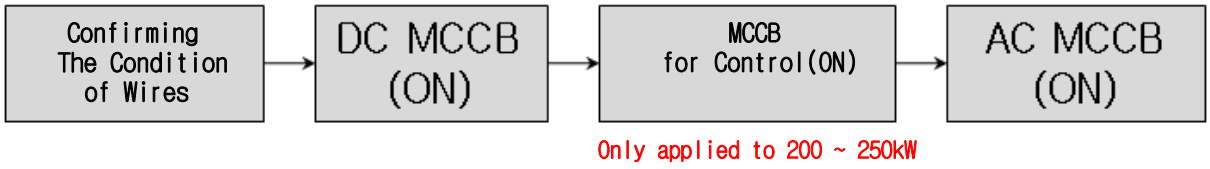
Photovoltaic inverter of DSP-33 series is the system connected to fully automate digital control. For DSP-33 series, the power of inverter (keypad) is turned on automatically and begins to generate its power if PV voltage becomes more 400V.)
If PV voltage becomes under 200V at set of sun, the inverter stops automatically. Also, if the voltage charged into the equipment is discharged, the power (keypad) is turned off.

4.1 Running and Resting (Stopping)

Electrically charged current is never run on the photovoltaic inverter. Any failure might occur due to wrong run, so follow the below procedures in operating or resting the converter.

※ Please, perform run/rest procedures, referring the name and function of each component on Item 2.3.

4.1.1 Run

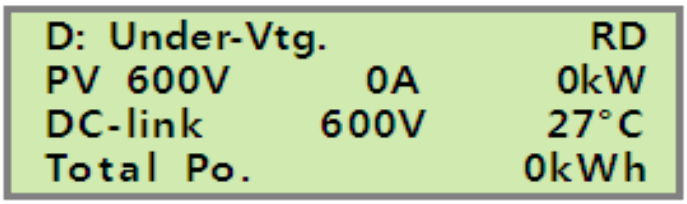


(1) **Confirm the wiring condition for input/output.**
Confirm the wiring condition after turning off the power of all the breakers. Be careful of the polarity of DC input contacts. Any damage or fire might happen due to false wiring of the polarities.

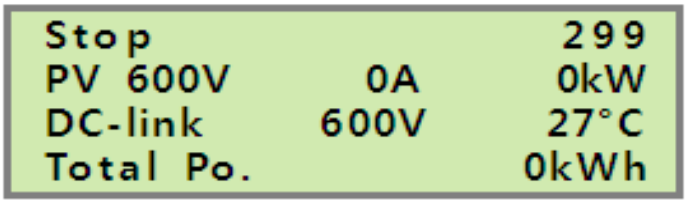
(2) **Turn on DC MCCB (DC Breaker)**
After turning on the breaker, buzzer rings and light is lit on the keypad. After all the LEDs is lit, the breaker is turned off and PV LEDs is lit (Except for less than PV 400V)
※2 DC input breakers are mounted on 100kW ~ 250kW. Please, turn all on.

(3) **Turn on the integrated keypad and controlled power breaker.**
[Only 200~ 250kW series are applied.]
Integrated keypad indicates the integrated information of Master / Slave Inverter. As controlled power breaker is used only for MC of the inverter and for the power of the cooling pan, it is necessary component.

(4) **Confirm the screen of the keypad.**
The input voltage and internal temperature of the present photovoltaic system on the LCD screen and the inverter is maintained as standby condition.

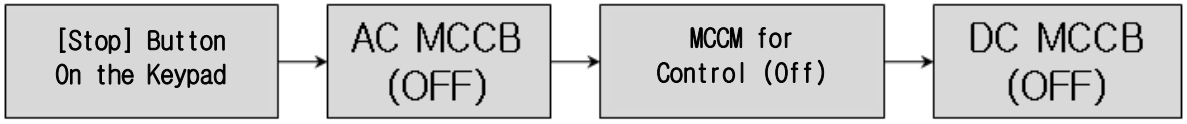


(5) **Turn on AC MCCB (Output Breaker).**
If AC MCCB is turned on, grid LED on the keypad is out of lit and operation standby count starts (300 secs, 5 mins). At this time, if you want to run it without rest, press [RUN] button on the keypad to run it.



(6) **Confirm input/output voltage, current and amount of power generation.**
The LED of operation and screen on the keypad will be display for inverter running, press [TURN] key on the keypad to confirm the condition of generation of the inverter. Please, see "**4.2 Explanation of the Functions on the Keypad**".

4.1.2 Stop



Only applied to 200 ~ 250kW

(1) **Rest the inverter to press "Stop" button on the keypad.**
After the functions of inverter are stopped, count (300 secs, 5 mins) for re-start begins. If you don't want to re-run the inverter, turn off the output breaker.

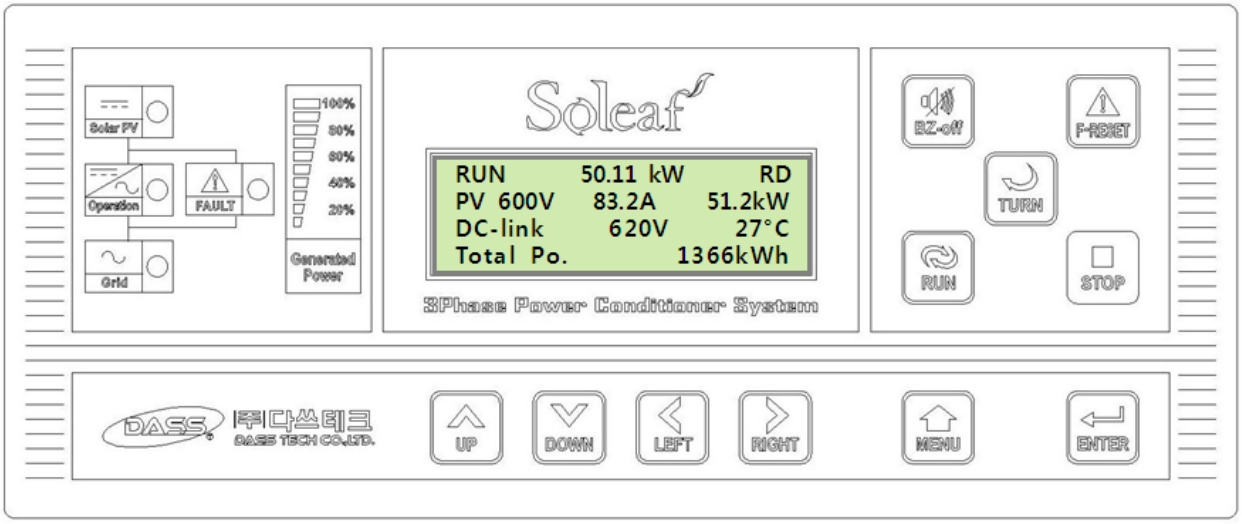
(2) **Turn off the AC output breaker.**
It is grid connected inverter. If the power of the grid is turned off, the inverter is of standby condition, so it does not generate power.

(3) **Turn off MCCB for control** [For only 200 ~ 250k series]
This function is used when you operate the inverter for a long time. You don't need to turn off when you leave the inverter for a while.

(4) **Turn off DC breaker.**
Even if DC is disconnected from the photovoltaic module, the power (keypad) isn't turned off in any time due to the inner charged voltage. It takes more than 1 hour for the charged voltage to be discharged.

4.2 Explanation of the Functions on the Keypad

4.2.1 Outlook of Keypad



4.2.2 The Functions of Buttons on the Keypad and Indications of LED

(1) Explanation of the Functions for the Buttons on the Keypad

Key	Explanation
Menu	You can get into or out from the set menu in the mode of indicating condition. You can move to the upper set mode from the lower set mode. In setting parameters, you can move the position of cursor "_" .
Enter	You can set a menu in the set menu. You can select lower set menu. You can save the set value of parameters in set parameters.
∧ ∨ < >	Direction Key You can change the kind of set menu and condition indicated contents. In setting parameters, the position of "_" cursor is changed and the values of parameters on the position where the cursor exist increases/decreases.
Turn	You can convert condition indicating mode.
BZ-off	If any error occurs, this function turns off alarm and "Fault" is on the screen continuously.
F-RESET	If you put this key when any error happens, the inverter's functions are initialized.
RUN	You can re-operate the stopped inverter. If you press this button, waiting period of 300 seconds is omitted and the inverter begins to be operated in no time.
STOP	You can stop the run inverter.

(2) Explanation of Indicating the condition of LED

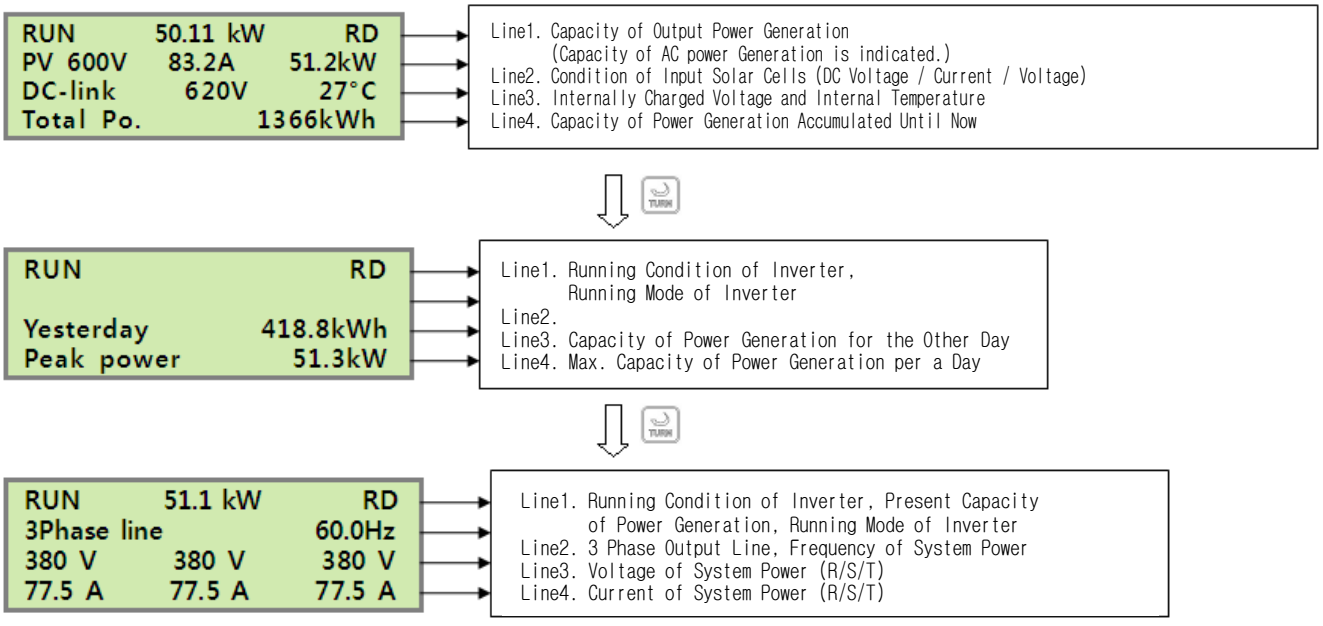
Condition of LED	Explanation
Solar PV	Input condition from the module of solar cells is indicated (Red LED is lit: More than 400V of PV voltage)
Operation	Operated condition of the inverter is indicated (Green LED is lit: The inverter runs in sound).
Grid	The condition of system is indicated (Yellow LED is lit: The system is normal).
FAULT	occurs for the operation of the inverter (Red LED is lit: Error occurs).

LED Indicating the Amount of Generated Power	Explanation
100% LED	When the rate of generated power is up to 81~100%, 100% LED is lt. When the rate is below 90%, 100% LED flickers.
80% LED	When the rate of generated power is up to 61 ~ 80%, 80% LED is lt. When the rate is below 70%, 80% LED flickers.
60% LED	When the rate of generated power is up to 41 ~ 60%, 60% LED is lit. When the rate is below 50%, 60% LED flickers.
40% LED	When the rate of generated power is up to 21 ~ 40%, 40% LED is lit. When the rate is below 30%, 40% LED flickers.
20% LED	When the rate of generated power is up to 5 ~ 20%, 20% LED is lit. When the rate is below 10%, 20% LED flickers.

4.3 Basic Condition Indicated Modes (4 Lines)

The below screens are for DSP-33010K ~ 100K series. Refer to Item 4.4 for 200~250K series.

4.3.1 Basically Indicated Contents



4.4 Displayed Screen of 200 ~ 250k Series

200~250K applies active parallel running algorithm and only Master (low load) Inverter is operated when the sun rises. If the rate of power generation in Master (Module 1) Inverter is up to 70% of the rated capacity for the increased radiation, Slave Inverter (Module 2) begins to run in parallel mode.

If the rate of power generation decreases below 30% of the rated capacity for the decreased radiation, Slave Inverter is stopped to be standby mode.

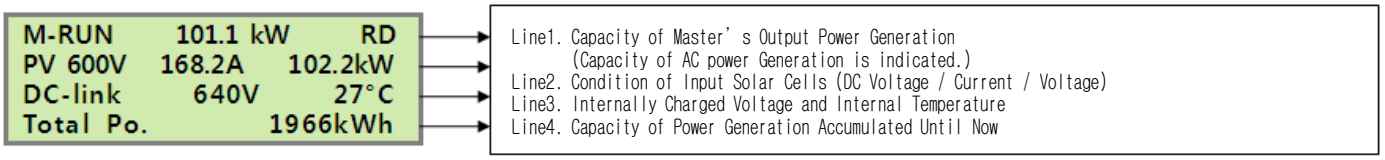
2 keypads are mounted in the keypad responding to each module (Master, Slave) of 200~250K series.

Upper Keypad: Exclusive Keypad for Master Inverter (Module 1)

Lower Keypad: Exclusive Keypad for Slave Inverter (Module 1)

4.4.1 Basically Indicated Screen for Master Inverter

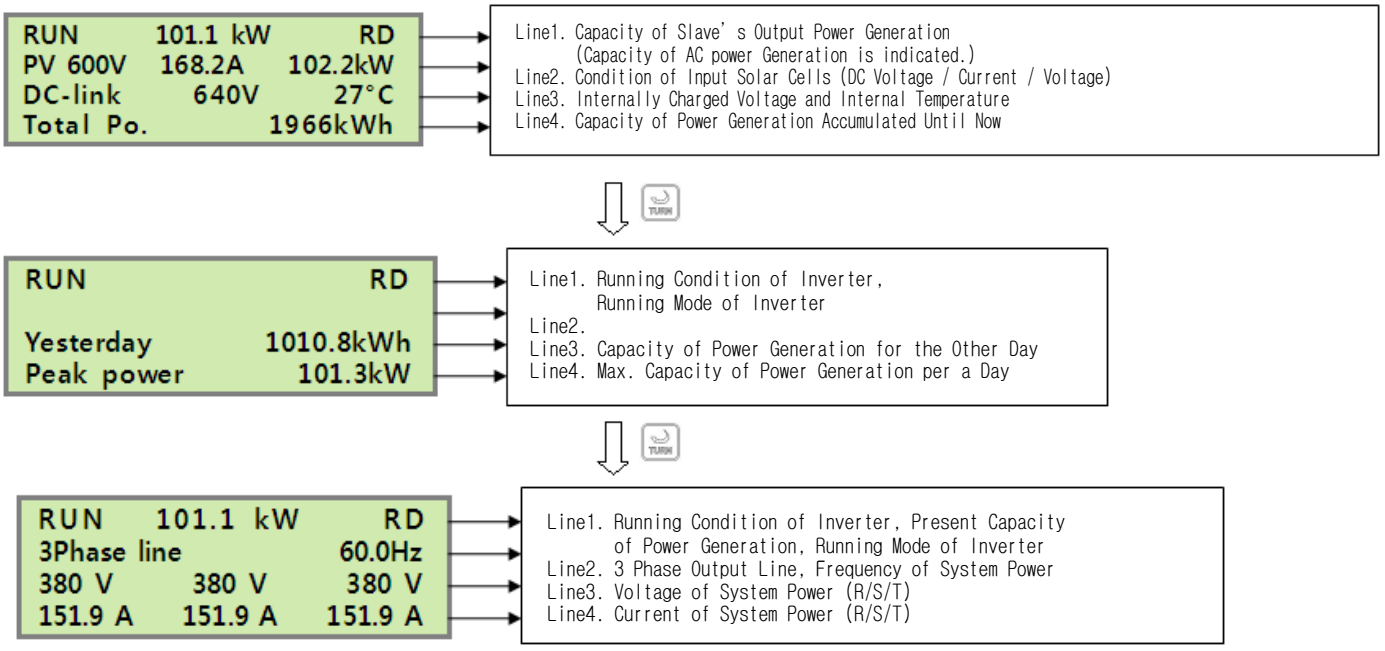
In operating Master Inverter, "**M-Run**" is indicated on the first low of LCD on the upper keypad.



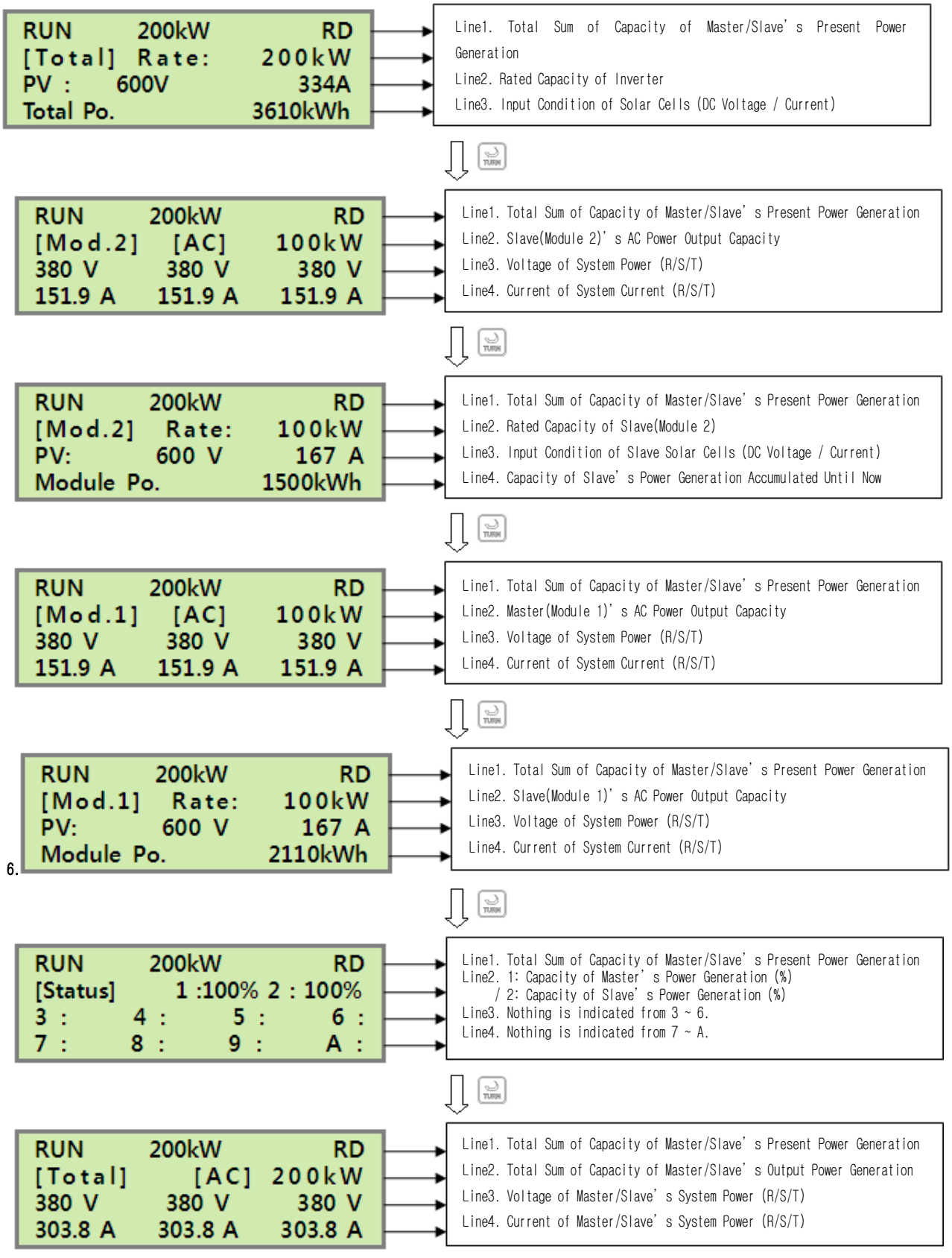
4.4.2 Basically Indicated Screen for Slave Inverter

In operating Slave Inverter, "**Run**" is indicated on the first low of LCD on the lower keypad.

If you press "TURN" button on each pad of Master/Slave Inverter, you can confirm the data about inverter running.



4.4.3 Screen of Integrated Keypad



6.

5. Maintenance & Repair

5.1 Initialization & Measure against Any Error

In case the inverter is stopped due to any error, buzzer rings and error indication is presented on the screen. At this time, press "F-RESET" key to stop the buzzer's ringing, examine the reason why any error occurs, remove the cause and then re-run the inverter. You can confirm 'Fault Scan' again. 500 causes from No. 0~499 are stored and the most recent one is No. 0. Making use of the up/down key(△, ▽) on the keypad, you can comprehend if any parameter occurs or any error used to happen or not.

5.2 Buzzer and Fault

5.2.1 Buzzer

If any abnormal cause such as moment overload which may be the cause of failure happens, the buzzer rings consecutively. If the moment overload is cancelled, buzzer doesn't ring any more.

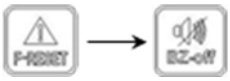
If you press [BZ-off] button on the keypad when the buzzer rings, the buzzer doesn't ring any more. If you press this button again, the buzzer rings. In case any error occurs for the condition that alarm doesn't ring any more, the buzzer rings normally.

5.2.2 Failure

Over voltage

In case the voltage of solar cells is more than the determined voltage, stop the system of inverter to protect the system.

5.2.3 Method to Cancelling Failure and Alarm



※In case of DSP-33200K ~ 250K series, if you want to cancel the alarm, you should reset the entire integrated keypad and internal Master/Slave keypad.

If serious damage occurs for the inverter, the inverter indicates that any error happens on the LCD screen and buzzer rings at this time. If you press [F-RESET] and then [BZ-off] on the keypad to cancel the alarm and error, the alarm or error is cancelled. After the alarm is cancelled, the converter begins run standby counts(300 secs, 5 mins). In case the alarm is continued to ring, stop the inverter completely and then contact to the headquarters to fix the converter.

5.3 Symptoms of Failure

If any error happens, indicate this error and stop running.

If any error happens, the result is indicated on the window of the keypad.

The Cause of Failure and Measured Contents

Order	Cause of Error	Indication	Occurred Cause	Measures
1	Input Overvoltage	DC Over voltage	If the voltage of solar cells is higher than the determined voltage.	After inspecting the module of solar cells, run the inverter. If re-run is impossible, ask for service center.
2	Output Overvoltage	Over voltage	If the system voltage is higher than the determined voltage.	After inspecting system voltage, re-run the inverter. If re-run is impossible, ask for service center.
3	Output Over-current	Over current	In case the output of inverter is of over-current	Remove the cause of over-current such as short, run the inverter. If re-run is impossible, ask for service center.
4	Overheating of Converter	Over heat	In case the temperature inside the inverter is higher than 85℃	Check the temperature sensor and cable. And remove the cause of over heat. If re-run is impossible, ask for service center.
5	Error of Earth	Earth fault	In case leaked current occurs	Confirm the condition of earth and insulation. If re-run is impossible, ask for service center.
6	Error of Element	IGBT Error	In case inverter switching element and controlling board is out of order	Check the IGBT and Control board. If there is no reason, re-run the inverter. If re-run is impossible, ask for service center.
7	RST phase sequence mismatch	Reverse Phase	RST phase sequence is mismatch	Check the phase sequence. And Change the R to S cable. If re-run is impossible, ask for service center.
8	Malfunction of ACB	MC Error	Malfunction of ACB	Check the ACB or signal cable to operate ACB. If re-run is impossible, ask for service center.

5.4 Asking for A/S

If the inverter doesn't work normally, confirm the cause of failure.

1) Name of Model
2) Number of Manufacturing
3) Purchased Place
4) Purchased Year
5) Certification Liaison
6) Contents of Failure

6. Specification of Products

Name of Type: D S P-▨ ▨ ▨ ▨ K		3310	3315	3320	3325	3330
Input	Max. Open Circuit Voltage	820 Vdc				
	Range of MPPT Voltage	200 ~ 820 Vdc				
	(Run) Starting Voltage	400 Vdc				
	Max. Input Current	30A	43A	60A	72A	80A
	Method of Control	Max. Power Point Tracking Control (MPPT Control)				
Output	Rated Output Capacity	10 kW	15 kW	20kW	25KW	30KW
	Rated Voltage	System Voltage (AC 380V ±38 V)				
	Perturbed Rate of Frequency	System Frequency(60Hz ±0.2 Hz)				
	Constant	3 Phase & 4 Lines Type (Non-transformer Type) (Option: Transformer)				
	Power Factor	Above 0.95				
	Current Distorted Rate (Current THD)	Total Below 5%				
		Below 3% for Each Difference				
	Method of Control	PWM METHOD				
	Prevention of Independent Operation	Within 0.5 Seconds				
	Over-load	110%				
	Efficiency	Above 95%				
Structure	Cooling Method	Forced Air-cooling Type(AC Fan)				
	Protective Structure	IP 20				
	Noise of Equipment	Below 60 dB				
	Outer Dimension(WxHxD)	520 X 850 X 385 mm	650 X 1400 X 500 mm	650 X 1400 X 500 mm	650 X 1400 X 500 mm	650 X 1400 X 500 mm
	Full Weight	120 kg	140 kg	150 kg	90 kg	160 kg
Outer Interface		RS 232C/RS485				
Protective Function	Inverter	Overvoltage of Input, Short of Output, Over-load, Protecting Inverter from Overheating, Short of Fuse, Preventing DC Output				
	System	Preventing Independent Run, Overvoltage of System, Protection of Low Voltage, Over-frequency of System				
Applicative Environment	Ambient Temperature	-10 ℃ ~ 40 ℃				
	Preserving Temperature	-20 ℃ ~ 65 ℃				
	Ambient Humidity	Relative humidity is below 90% RH(No Dewfall)				
	Altitude & Vibration	Below 1,000 m · Below 5.9m/sec² (=0.6g)				
	Ambient Temperature	Corrosive gas, flammable gas, oil mist and dust should not exist.				

Name of Type: D S P-▨ ▨ ▨ ▨ K		3350	33100
Input	Max. Open Circuit Voltage	820 Vdc	
	Range of MPPT Voltage	200 ~ 820 Vdc	
	(Run) Starting Voltage	400 Vdc	
	Max. Input Current	150A	300A
	Method of Control	Max. Power Point Tracking Control (MPPT Control)	
Output	Rated Output Capacity	50 kW	100KW
	Rated Voltage	System Voltage (AC 380V ±38 V)	
	Perturbed Rate of Frequency	System Frequency(60Hz ±0.2 Hz)	
	Constant	3 Phase & 4 Lines Type (Non-transformer Type) (Option: Transformer)	
	Power Factor	Above 0.95	
	Current Distorted Rate (Current THD)	Total Below 5%	
		Below 3% for Each Difference	
	Method of Control	PWM METHOD	
	Prevention of Independent Operation	Within 0.5 Seconds	
	Over-load	110%	
	Efficiency	Above 95%	
Structure	Cooling Method	Forced Air-cooling Type(AC Fan)	
	Protective Structure	IP 20	
	Noise of Equipment	Below 60 dB	
	Outer Dimension(WxHxD)	650 X 1400 X 650 mm	1000 X 1650 X 750 mm
	Full Weight	140 kg	300 kg
Outer Interface		RS 232C/RS485	
Protective Function	Inverter	Overvoltage of Input, Short of Output, Over-load, Protecting Inverter from Overheating, Short of Fuse, Preventing DC Output	
	System	Preventing Independent Run, Overvoltage of System, Protection of Low Voltage, Over-frequency of System	
Applicative Environment	Ambient Temperature	-10 ℃ ~ 40 ℃	
	Preserving Temperature	-20 ℃ ~ 65 ℃	
	Ambient Humidity	Relative humidity is below 90% RH(No Dewfall)	
	Altitude & Vibration	Below 1,000 m · Below 5.9m/sec² (=0.6g)	
	Ambient Temperature	Corrosive gas, flammable gas, oil mist and dust should not exist.	

Name of Type: D S P-▨ ▨ ▨ ▨ K		33200	33250
Input	Max. Open Circuit Voltage	820 Vdc	
	RANGE OF MPPT VOLTAGE	200 ~ 820 Vdc	
	(Run) Starting Voltage	400 Vdc	
	Max. Input Current	570A	720A
	Method of Control	Max. Power Point Tracking Control (MPPT Control)	
Output	Output Capacity of Rated Output	200kW	250kW
	Rated Voltage	System Voltage (AC 380V ±38 V)	
	Perturbed Rate of Frequency	System Frequency (60Hz ±0.2 Hz/50Hz ±0.2 Hz)	
	Constant	3 Phase & 3 Lines Type (Non-transformer Type) (Option: Transformer)	
	Power Factor	Above 0.95	
	Current (Current THD)	Total Below 5%	
		Below 3% for Each Difference	
	Method of Control	PWM METHOD	
	Prevention of Independent Operation	Within 0.5 Seconds	
	Over-load	100%	
	Efficiency	Above 95%	
Structure	Cooling Method	Forced Air-cooling Type(AC Fan)	
	Protective Structure	IP 20	
	Noise of Equipment	Below 60 dB	
	Outer Dimension(WxHxD)	1600 X 2100 X 850 mm	1600 X 2100 X 850 mm
	Full Weight	950 kg	970 kg
Outer Interface		RS485	
Protective Function	Inverter	Overvoltage of Input, Short of Output, Over-load, Protecting Inverter from Overheating, Short of Fuse, Preventing DC Output	
	System	Preventing Independent Run, Overvoltage of System, Protection of Low Voltage, Over-frequency of System	
Applicative Environment	Ambient Temperature	-10 ℃ ~ 50 ℃	
	Preserving Temperature	-20 ℃ ~ 65 ℃	
	Ambient Humidity	Relative humidity is below 90% RH(No Dewfall)	
	Altitude & Vibration	Below 1,000 m · Below 5.9m/sec² (=0.6g)	
	Ambient Temperature	Corrosive gas, flammable gas, oil mist and dust should not exist.	

※ The scale of this product might be changed without any notice. Please, ask for the matter in purchasing our products.

7. Quality Guaranteed

7.1 Quality Liaison

Quality Liaison

DASS Tech

Name of Product		System Connected Photovoltaic Inverter(SCPI)
Name of Model		
Purchased Data		
Period of QG (Quality Guaranteed)		Within 5 years from the product purchased date
Customer	Name	
	Address	
	Tel	
Shop	Name	
	Address	
	Tel.	

- The company manufacturing this product doesn't take a responsibility for safety accident or failure due to the customer's mistake or false use violating the specifications.
- The size or outlook of this product can be changed without any notice.
- This liaison is valid only in Republic of Korea.
- As this liaison is not reissued, keep this liaison with the manual, please.

◀ Introduction of Compensatory A/S(A/S for free) ▶

If failure occurred under normally using condition within the period of quality guaranteed, your product can be tested and fixed for free.

◀ Introduction of Non-compensatory A/S(Payment Charged A/S) ▶

If the failure of our products that you have is related to the below contents,
we will repair the product through payment charged A/S

- The product was out of order due to the customer's intention or carelessness
- The product was out of order due to error of applied current or inferiority of the connected product.
- Any failure occurred by natural calamity.
- In case the product was repaired or revised at the other shop, not at the designated service center
- In case of the nameplate of Dass Tech
- In case any failure occurs after the user dismantled, repaired or replaced our products

- In case you replaced the component of our product because the lifetime of our product was over
- In case other person, not our designated service staff, revised or fix our products.
- In case the period of compensatory A/S is over

The scale of this product might be changed without any notice. Please, ask for the matter in purchasing our products.

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