Operation and Installation Manual

Soleaf

DASS Tech
Photovoltaic Grid-Connected Inverter

DSP-123K5E ver1.2

DASS Tech

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1. Cautions for safety

- Cautions for safety must be kept under any circumstances in order to prevent accident or dangers for safe and right use.
- 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 products and the operation and installation 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.

CAUTION! Authorized service personnel should reduce the risk of electrical shock by disconnecting AC, DC and battery power from the inverter before attempting any maintenance or cleaning or working on any circuits connected to the inverter. Turning off controls will not reduce this risk. Internal capacitors can remain charged for 5 minutes after disconnecting all sources of power.

CAUTION! Do not disassemble this inverter yourself. It contains no user-serviceable parts. Attempt to service this inverter yourself may cause a risk of electrical shock or fire and will void the warranty from the manufacturer.

CAUTION! Under high temperature environment, the cover of this inverter could be hot enough to cause skin burns if accidentally touched. Ensure that this inverter is away from normal traffic areas.

CAUTION! Do not operate the Inverter if it has received a sharp blow, been dropped, or otherwise damaged in any way. If the Inverter is damaged, called for an RMA (Return Material Authorization).

- After reading this operation and installation manual, keep the manual in place that anyone can read it anytime.
- Read this operation and installation manual carefully in order to use the functions of DSP series sufficiently and safely.

Warning

- **Do not operate when the cover is open.**
  It could cause electric shock as high voltage terminal or electric charging is exposed outside.

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

- **Do not open cover when power is on or in operation.**
  It could cause electric shock.

- **Do not open cover even when the power is off except for regular check.**
  The inverter is still charged even if the 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.**
  It could cause electric shock.

- **Do not use this inverter in the event of damaged wire.**
  It could cause electric shock.

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

⚠ Attention

- **Keep away from inflammables.**
  If installed on or near combustible material, it could cause fire. When there is fire or smell, stop operation immediately and contact us right away.

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

- **Do not touch the inverter for about 10 minutes even if the power is off or when the power is on.**
  The inverter is very hot and it could cause burn on your body.

- **Do not input power even if you finish installation when the inverter or a part is damaged.**
  It could cause electric shock.

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

Directions for Application

(1) Transportation

- Please transport by proper means according to product weight.
- Please check external conditions.
- Do not pile up beyond the limited level or height.
- Do not open the cover while transported.
- Do not drop or damage with shock, as this device is a precision one.

(2) Applications

- If auto-operation function is initially set up, it automatically operates when the voltage goes above the start-up voltage.
- You can operate or stop with run/stop 123 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

- In the event that the inverter gets damaged so that it becomes uncontrollable, the device can be placed in a dangerous state. In order to prevent such state, install additional safety device such as emergency brake.

(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 Descriptions.

(5) Disposal

- Dispose as a general industrial waste.

(6) Others

- The pictures in this operation and installation manual occasionally drop the cover or breaker in order to explain in detail, however, you must strictly follow the guidelines in this manual for operation after installing the cover and breaker.

Directions for Installation

(7) Installation

- Follow the instructions in this operation and installation manual.
- This product must be installed indoor. or outdoor
- Be careful not to install this device at wet, dusty, direct ray of sun light or high temperature place.
- In the event of indoor installation, secure the space at least 20cm from the top, bottom, left and right side of the inverter.
- In the event of outdoor installation, secure the space at least 1m from the ground surface.
- Installation must be carried out by a technical expert.
- Do not place any heavy items on the product.
- Do not spray or keep away from any inflammable materials.
- Installation direction must be set followed by the guidelines in this manual.
- Do not drop or add damage to the inverter, as this device is a précised one.
- Do Class 3 grounding work (200V class) for the inverter.

- Don’t place other home appliance near this device. Otherwise, a fault or noise of home appliance may happen.
- Always use T-type hanger, and be careful not to be damaged by a sharp part.
- Install the circuit breaker of solar cell side (DC) and install the inverter. And then operate this device after completing the installation and turning on the power of solar cell. If you operate the inverter when the power of solar cell (DC) is “ON”, a serious damage may happen.

(8) Wiring

- If you make wrong connection, damage may happen on the inverter.
- Please be careful in the event of wrong connection in the polarities (+/-) of DC power, damage may happen on the inverter or a serious accident may occur. Refer chapter 3 for detailed Descriptions.
- Please be careful of sorting power and ground wire when connecting AC Connecter. Refer chapter 3 for detailed Descriptions.
- The technical expert should carry out the wiring work or check.
- After install the inverter body, carry out the wiring work.

(9) Adjustment at the time of commissioning

- Confirm all setting values prior to operation

Symbols used in Equipment Markings

	Refer to the operating instructions
	Caution, risk of danger
	Caution, risk of electric shock
	Caution, risk of electric shock, Energy storage timed discharge
	Caution, hot surface

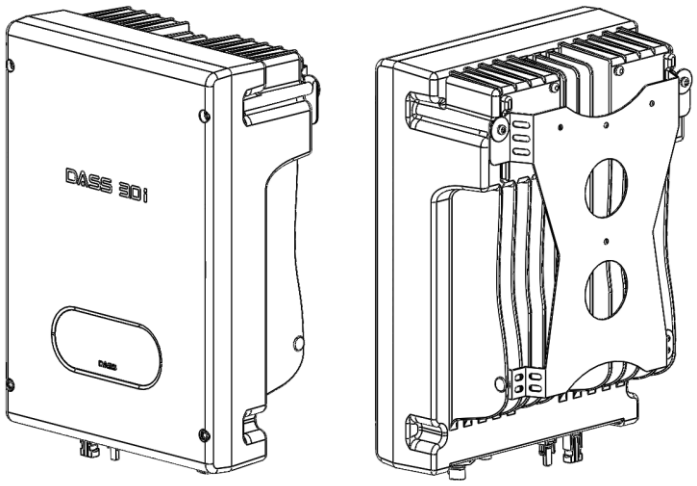
2. Product

2.1 General

2.1.1 Contents you should know before using the appliance

If you misuse the inverter, it is operated abnormally or its performance may be depreciated. 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 Appearance of the product



2.1.3 Confirmation of Products

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

(1) Inverter type

D S P - 1 2 3K 5 E

Symbol	Name
DSP	DASS Tech.

Symbol	Type
E	EURO

Symbol	Phase
1	Single phase
3	Three phase

Symbol	Series
5	Five

Symbol	AC voltage
2	230V
3	380V

Symbol	POWER
1K	1KW
3K	3.3KW

(2) Accessories – Operation & installation manual / input(DC) & output(AC) connectors / T-type hanger

2.1.4 Preparation of devices or components for operation

As the preparation for operation may be changed dependent on the installation environment more or less, prepare necessary materials and parts, i.e. – Multi Tester to check voltage and wiring, gearing tools to install T-type hanger and etc.

2.1.5 Installation

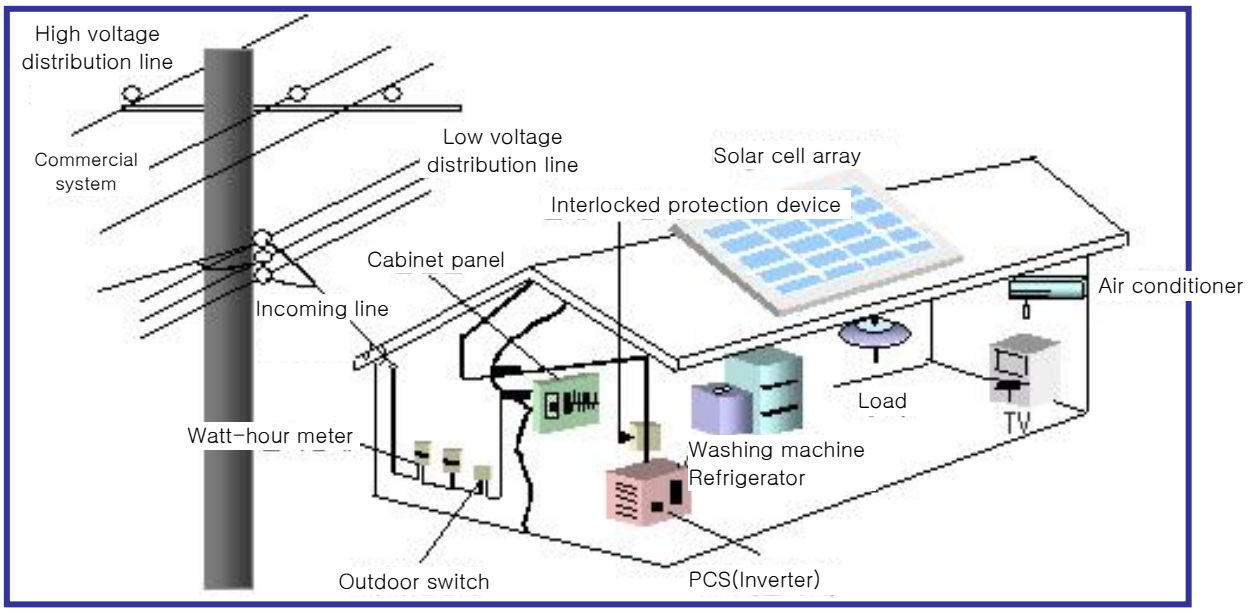
To prevent the lifetime or performance of the inverter from being depreciated, install the device exactly, considering its installed position or direction, or peripheral space.

2.1.6 Wiring

Connect solar module input (DC) and grid power (AC) by using connectors . If an accurate connection is not made, there can be problem in the inverter or peripheral devices and pls. wire carefully.

2.1.7 Construction of Solar Power System

The inverter requires the correction connection under the right selection of peripheral devices. Incorrect system construction and connection may make the normal operation impossible or cause a serious declination in lifetime. In the event of worst case, the inverter may be damaged by fire, and use this device in right manner in accordance with the contents and notices in this manual.



2.1.8 Specific Features of the Product

(1) High Efficiency Power Conversion

The inverter converts the power in a high efficiency using IGBT and has high an efficiency characteristic of 96% or more at rated power.

(2) Digital Control

It's more convenient to control the system through digital control with high performance. You can check the system through LCD keypad. LCD screen monitors and indicates the present condition of operation, input and output and any abnormality of the inverter. And its operation stops in the event of any error. It detects the voltage of solar cells to operate or stop automatically.

(3) Transformer-less circuit

DSP-123K5E inverter is of transformer-less type and is suitable for the decentralized power system designed for industry, building and residential purpose.

(4) Decentralized Power System and Profitability

Photovoltaic power generation is a power generation type which can be installed wherever the sun shines exists. The decentralized power by unit of building, housing complex and photovoltaic generating plant enables to use the system economically.

(5) MPPT (Maximum Power Point Tracking)

As the uneven direct current is generated as per ambient temperature, humidity, climate, environment and radiation for the characteristic of solar cells, the inverter controls the solar cells tracks to maintain the maximum power point through MPPT.

(6) Easy Parallel Operation

If the capacity of solar cells increases, the inverter can be added and connected for extension of capacity without any additional equipment.

(7) Convenient Installation and Operation

This product is designed for more easy and safe connection of the solar cells to the system power. Through frontal LCD keypad, it is designed to display the present condition of converter and you can stop the operation manually.

(8) High Reliability and Low Noise

The components of the inverter are optimized to reduce the causes for defaults. Especially, the inverter cooling fan that has a limited mechanical life time is removed to realize high reliability and low noise.

(9) Electromagnetic Compatibility(EMC)

By optimizing Pattern Generation of inverter, inverter is manufactured to be suitable for EMC standard.
(KSC IEC 61000-6-1, KSC IEC 61000-6-3, KSC IEC 61000-6-4)

2.2 Specification

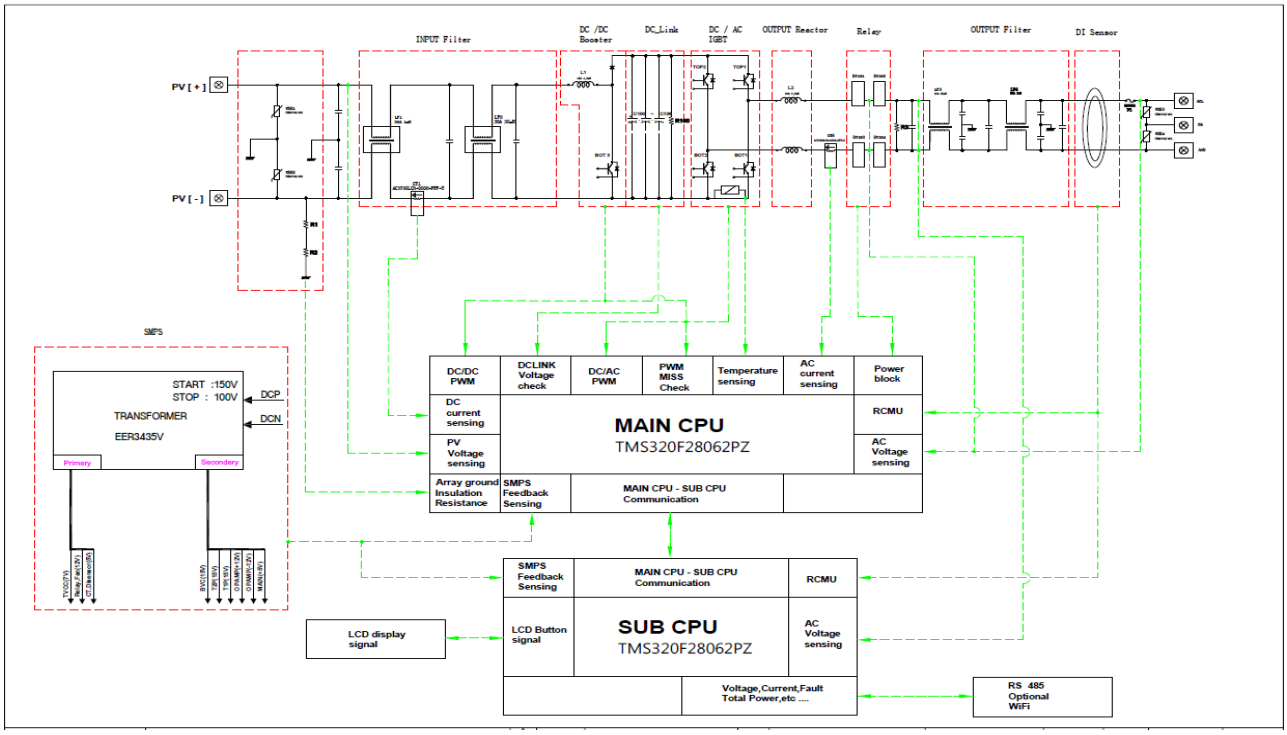
Model NO.		DSP-123K5E
Input	Voltage range(25 ℃)	100V ~ 500V
	MPPT Voltage range(25 ℃)	180V ~ 400V
	Rated voltage(25 ℃)	360V
	Start voltage(25 ℃)	160V
	Control method	Max. Power Point Tracking control(MPPT)
Output	Rated output	3.3 kW
	Rated voltage	Grid Voltage (AC 220V, 230V +10%/-12%)
	Frequency change rate	Grid Frequency (50~60Hz +0.5Hz/-0.7Hz)
	Grid connection	Single Phase 3 Wire
	Power factor	0.95 or above
	Current distortions	Total below 5%
		Individual Harmonics 3% or under
	Control method	PWM Method
	Anti-islanding	Within 0.5 sec
	Overload	110%
	Efficiency	96.5% (Maximum) / 96% (Euro)
Structure	Cooling method	Natural air cooling
	Protection structure	IP 65, Outdoor
	Equipment noise	50 dB or less
	External dimension (W x H x D)	298 * 419 * 162.5mm
	Full weight	14kg
External interface		RS 485
Monitoring Device(Option)		DSP-WR5/DSP-ZR5(Wire/Wireless, RS485)/WIFI
Protection Function	Inverter	Input overvoltage, short circuit of output, over-load, overheating, short of fuse and preventing DC output leakage
	System	Anti-islanding(IEEE1547), Over/Under voltage of grid,Over/Under frequency of grid
Environment for Operation	Ambient temperature	-20 ℃ ~ 50 ℃
	Preserving temperature	-25 ℃ ~ 65 ℃
	Ambient humidity	Below 90% RH (Under no Dewfall)
	Altitude & vibration	1,000 m or less · 5.9m/sec²(=0.6g) or less
	Ambient temperature	Shall be no corrosive gas, flammable gas, oil mist and dust

※ Specifications of this product may be changed without prior notice for quality improvement, etc. Please inquiry at the time of purchase..

3. Installation

3.1 Configuration

1) DSP-123K5E



3.2 Installation place

Install the Solar Inverter at the place satisfying following conditions.

1) Do not install the inverter at the place where the vibration exists.

2) As the lifetime of inverter is affected by surrounding temperature, make sure that the surrounding temperature around the place where the inverter is installed is lower than the allowable temperature (-20 ~ 50℃).

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

4) Install the inverter at the place with no direct sun shine.

5) As the inverter is a high temperature unit which generates the heat, it should be installed at the face of non-flammable material.

6) Secure the sufficient space around the inverter so as to install it for efficient dissipation of the heat.

7) Avoid the place where oil mist, flammable gas, fabric mote, dust and moisture do not exist.

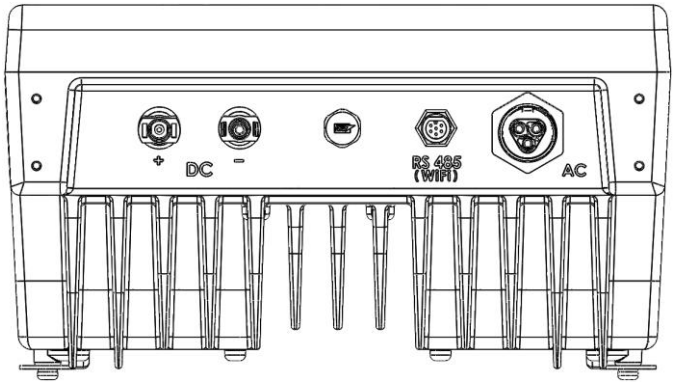
8) Install the inverter by tightening the screws firmly.

9) Install the inverter at the place where no salt exists.

3.3 Terminal connection diagram

If you uncover the cover in front on the lower part of inverter, you can find the terminal blocks as below. Read carefully this terminal connection diagram for wiring.

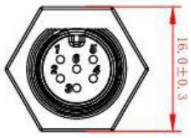
1) Description on main circuit terminal



Terminal symbol	Terminal name	Description on terminals
DC [+]	Solar input power (+)	Connected with (+) of Solar cell power
DC [-]	Solar input power (-)	Connected with (-) of Solar cell power
RS485	Communication terminal	Connect to signal line of the monitoring system
AC	Grid power connection terminal	Inverter output is connected to grid power & ground lines

2) Description on RS 485C Communication terminal and connectors.

- Communication Output Port：

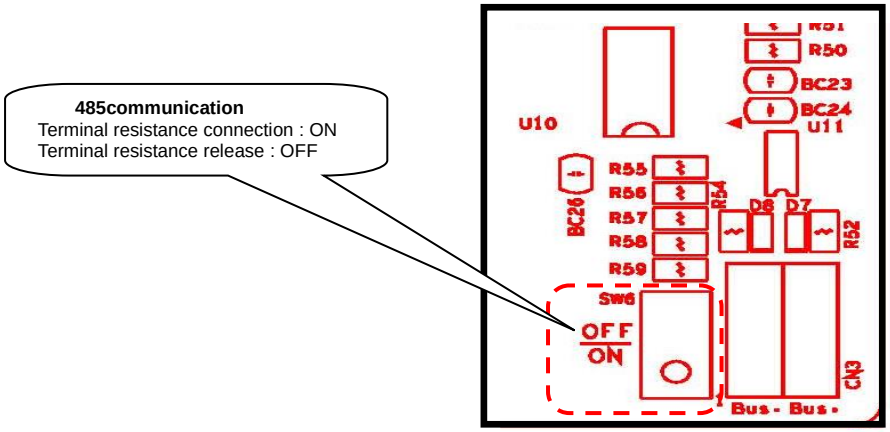


- Communication Connector terminal：

Wi-Fi Communication					
Vcc	GND	Bus(+)	Bus(-)	TX.E	RESET
Red	Black	Yellow	White	Green	Blue
①	②	③	④	⑤	⑥

(RS232/485 Communication terminals are connected as shown on the figure above and do not touch the metal part of the connector (conductor part). It may cause electric shock.)

- For parallel operation(more than 2 inverters) and using monitoring, 485 communication terminal resistance ON/OFF switch



3.4 Wiring

3.4.1 Main circuit wiring

1) Cautions for main circuit wiring

- For input power, connect the inverter's inside connector **[+]** to the inverter's outside connector **[+]** and the inverter inside connector's **[-]** to the inverter outside connector **[-],** then supply power. The inverter might be damaged by wrong connection.
- Do not disconnect the connecter while at power.
- Keep in mind that the internal capacitor of the inverter is charged even if the power is off.
- To prevent electric shock, the inverter must be earthed. Make sure that the resistance of earth is 100 mΩ or less.
- Connect the terminal of the inverter to the exclusive terminal block. Do not use a case or sash screw as an earth terminal.
- For earth wire, use exclusive earth wire complying with the standard. Connect the earth terminal to the spot adjacent to the inverter. The earth cable must be 4.0mm²or more.
- Confirm the maximum input voltage of inverter and output voltage of solar panel. If the output voltage of solar panel exceeds the maximum input voltage of inverter, the critical damage can occur to the product.

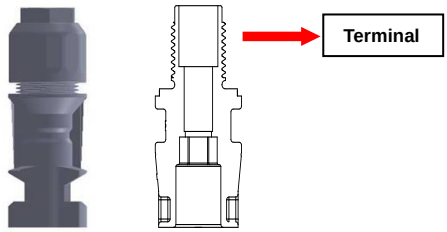
Power	Size of earth cable(mm²)
1.5 ~ 3 kW	4.0
5 kW	6.0

- Confirm the maximum input voltage of inverter and output voltage of solar panel. If the output voltage of solar panel exceeds the maximum input voltage of inverter, the critical damage can occur to the product.
- For the wiring of solar panel, check the temperature coefficient to set the output voltage. Otherwise, input over-voltage or low-voltage of inverter can occur due to the ambient temperature.

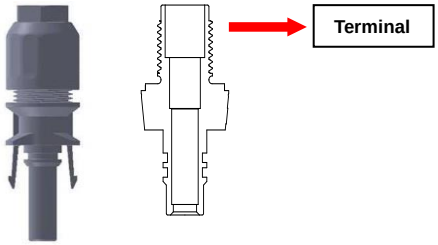
2) Configuration and installation for DC connector

- Configuration

Inverter Inside Connecter

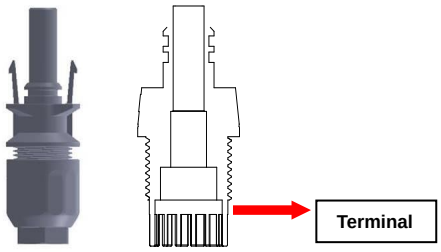


[+] Pole / Inner diagram

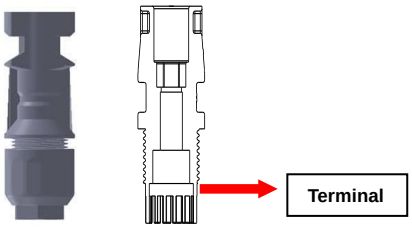


[-] Pole / Inner diagram

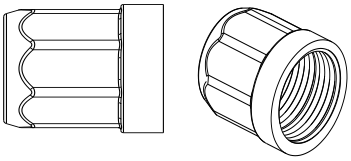
Inverter Outside Connecter



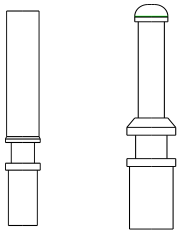
(+) Pole / Inner diagram



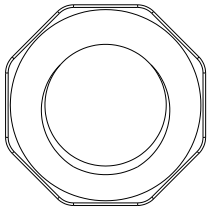
(-) Pole / Inner diagram



① CAP : tightening form when connecting cable and terminal



④ Terminal used when connecting cable and connector



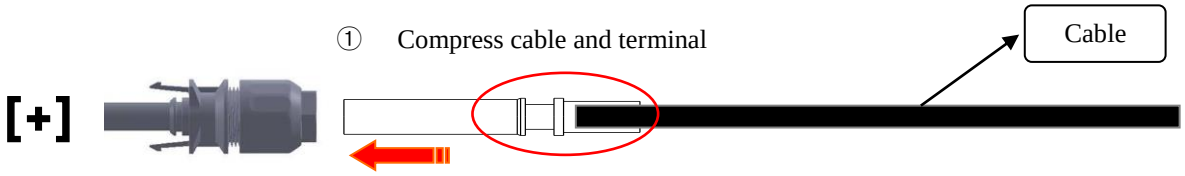
⑤ Nut to fix the connecter inside the inverter

※ To easily classify **Inside Connector and Outside Connector** is to check the difference in connection part of rear cap. When tightening, tighten the same pole shown in the connector.

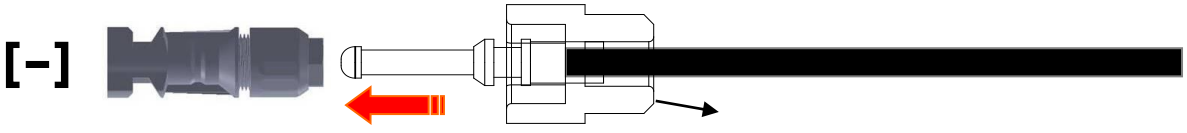
- Installation

Step 1. Coupling method of cable terminal and connector

① Compress cable and terminal



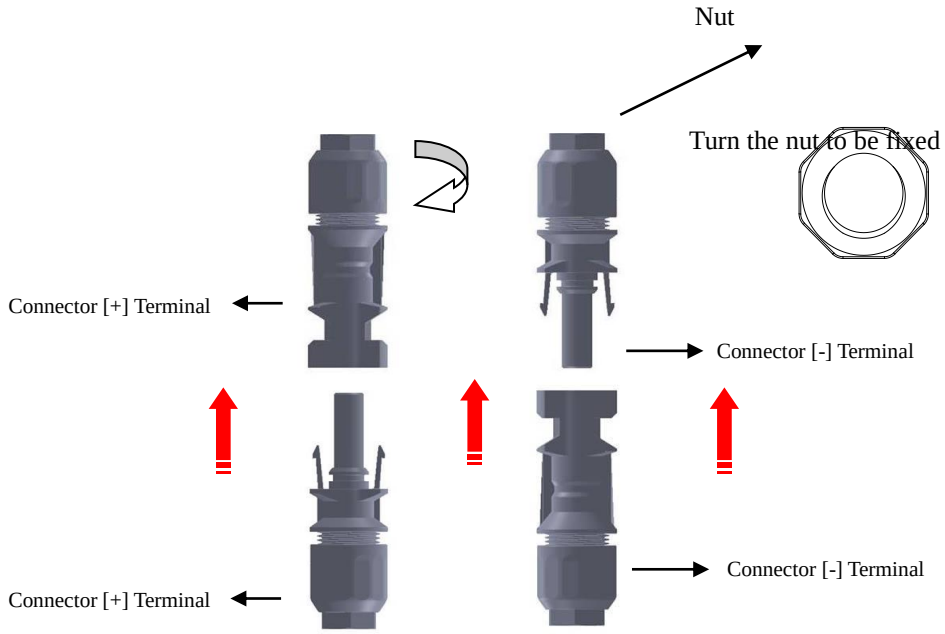
② Connect the connector to the cable which is connected to terminal



※ Terminal coupling method is only connectable with terminal and c

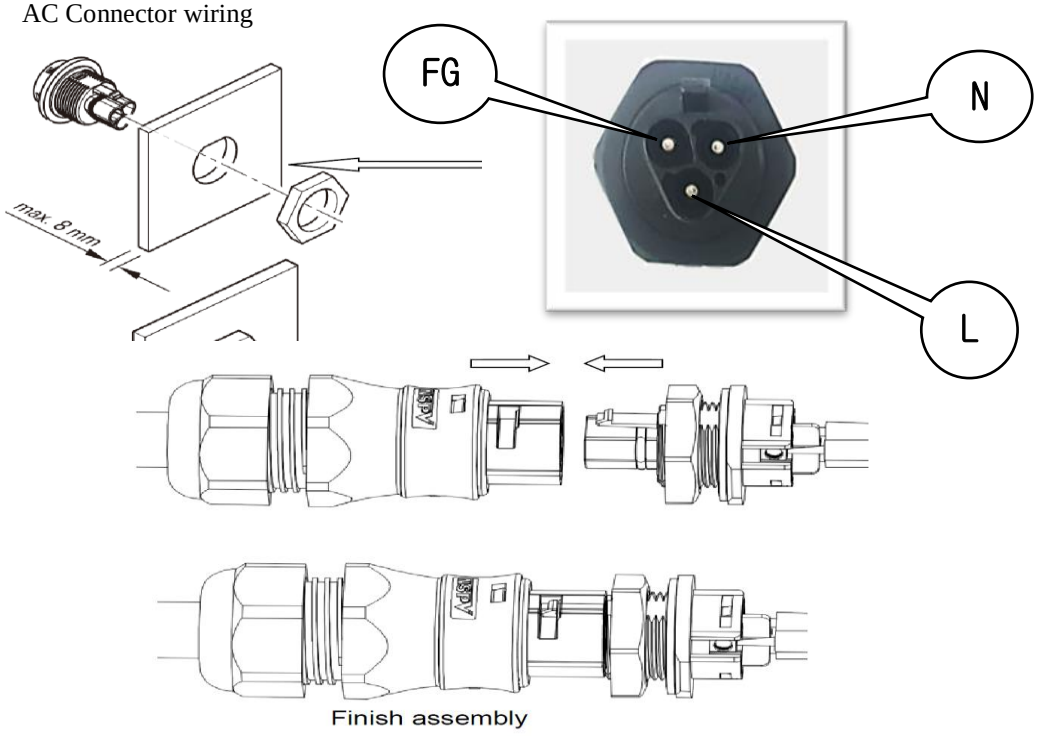
CAP is only used for PV connector

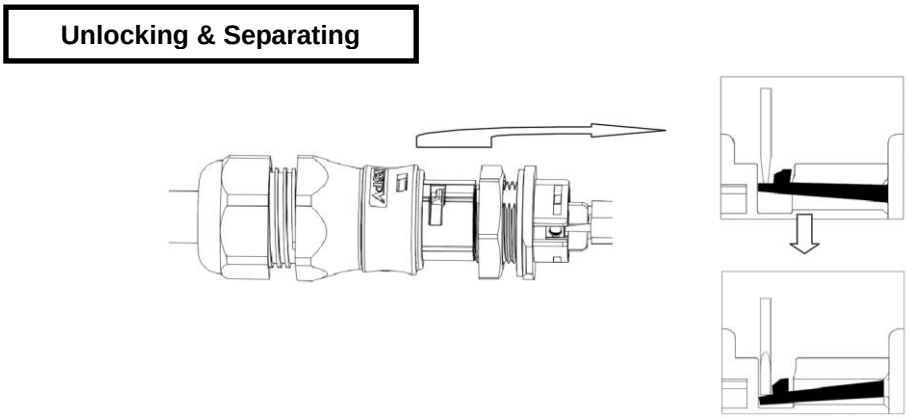
Step 2. Connection method of connector and inverter



※ Notice : Connect only the same polarity shown above [[+] ↔ [+] , [-] ↔ [-]]

2) AC Connector wiring



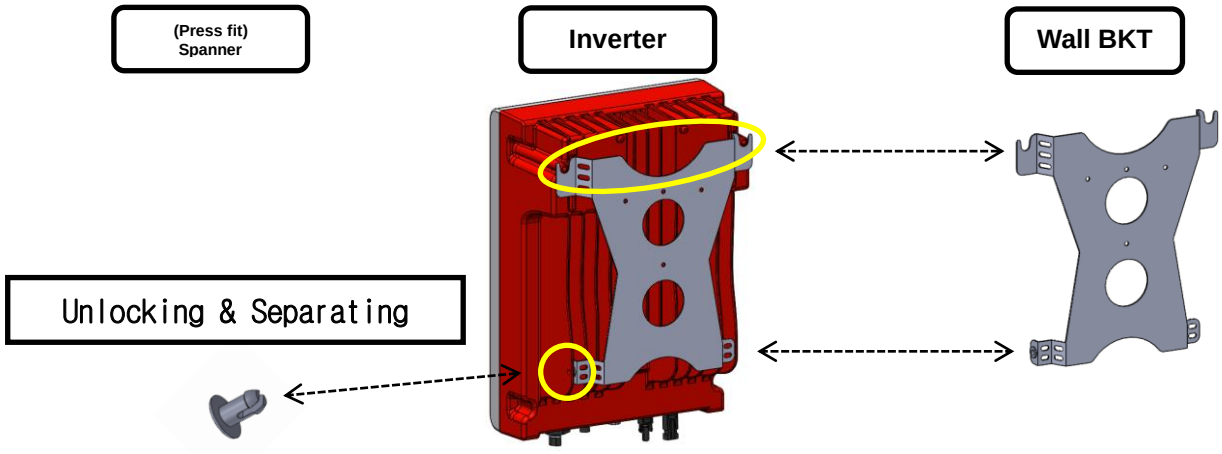


3.4.2 Communication circuit wiring

1) Notice of the communication circuit wiring

- Wiring of Control circuit terminal is to be used for communication connector. See the wiring diagram 3.3.

3.5 Cautions for mounting the inverter to the wall



▶ Installation ① Remove (press fit) spanner for the inverter by using a tool(like long nose plier)

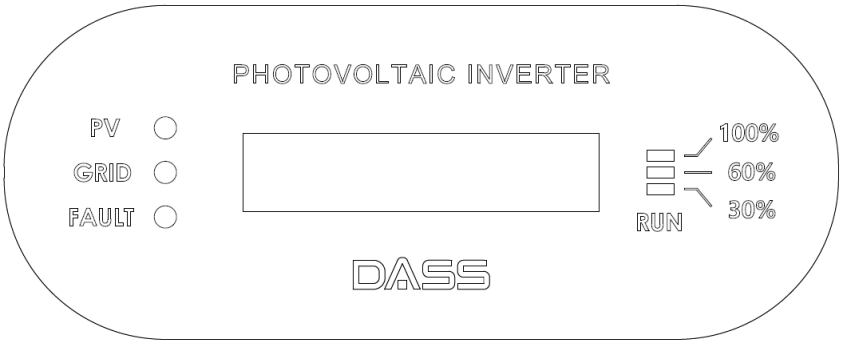
② Remove Wall BKT from the inverter and mount Wall BKT to the wall

③ Install the inverter to Wall BKT and fix it by the (press fit) spanner

4. Operation

4.1 Display

4.1.1 Appearance



4.1.2Functions of display

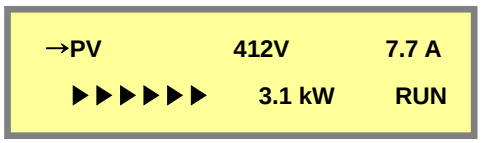
LED Status	Description
PV (in put)	Indicates the input status from solar modules. (Green light: solar module is in normal operation)
Grid (Grid)	Indicates the grid power system status. (Green light : grid power system is normal)
Run (Run)	Indicates the operation status of the inverter. (Green light : inverter generation is normal, Red flickering : 'Fault')
Fault(error)	

4.2 Basic mode (2 lines 16 characters LCD)

When the inverter power is ON, information on the LCD is updated every 10 second.

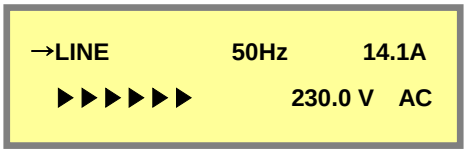
4.2.1 Input power (DC)

Display **Input voltage** **Input current**
PV: solar module D.C voltage D.C current
▶▶▶▶▶▶ **Present power generated**



4.2.2 Grid power input

Display **Grid frequency** **Grid current**
Line : grid frequency grid current
▶▶▶▶▶▶ **Grid voltage**

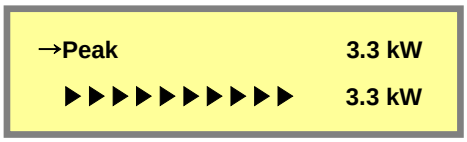


4.2.3 Total generated power

Display	Unit
Total : total generated power	kWh
▶▶▶▶▶▶ Present power generated	

4.2.4 Maximum(Peak) generated power

Display	Unit
Peak : maximum generation	kW
▶▶▶▶▶▶ Present power generated	

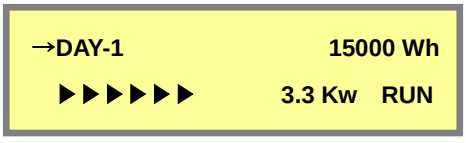


4.2.5 Daily(today) generated power

Display	Unit
Today : today's generated power	Wh
▶▶▶▶▶▶ Present power generated	

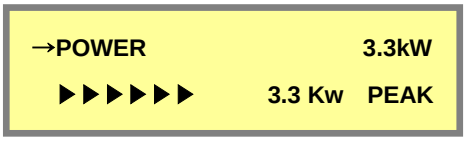
4.2.6 Daily (previous day) generated power

Display	Unit
DAY-1 : previous day's generated power	Wh
▶▶▶▶▶▶ Present power generated	



4.2.7 Present power generated

Display	Unit
RUN : operation status	kW
▶▶▶▶▶▶ Generated power(%)	

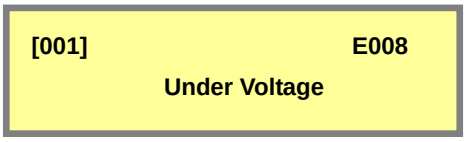


4.2.8 Fault status (Displayed for 5 seconds)

Display **Type of error**

Fault number : number of times

Fault status



4.3 Operation method

4.3.1 Check points prior to operation

-. Check the wiring and installation status of the inverter.

-. Especially, check that input polarity of solar module has been connected correctly and the line to grid has been connected correctly.

-. Direct power of solar panel is supplied to the inverter and AC power status is checked, then the inverter operates automatically after 300 seconds
(If necessary, a DC circuit breaker can be installed outside the inverter)

4.3.2 Automatic operation

The inverter is set to auto-operation mode as default setting when shipped from the factory.
The inverter operates automatically when the voltage of the solar panel is over setting value after sunrise and the inverter stops automatically when voltage of the solar panel is under setting value after sunset.

The inverter always monitors the grid power and it stops automatically in abnormal status.

5. Function

5.1 Descriptions

5.1.1 Grid monitoring

Whether the system voltage is normal or abnormal is determined by the difference from the normal voltage (Fault high voltage, Fault low voltage), and if this value is higher or lower than the specified value, it stops the inverter. If the frequency of system voltage is off the line frequency by line fault frequency, it stops the inverter's operation.

In order to start the generation at the normal system status, it operates with the system after the line transition time elapses. Frequency of used system voltage can be set in accordance with the frequency band.

5.1.2 MPPT control and total power generation

As the output of solar panel varies on surrounding temperature, humidity and solar ray intensity, MPPT (Maximum Power Point Tracking) algorithm should be carried out smoothly. The method applied to this product does not show the fluctuation in current, and it stops the inverter when the solar cells reach the PV stop voltage and the inverter cannot be operated anymore.

As the accumulated total power is stored, total generation power can be checked.

5.1.3 Initialization and action for abnormality

In case the inverter stops due to any errors, error indication is shown on the screen. At this time, examine the reason why any error occurs, remove the fault cause and then re-run the inverter. When the same problem happens or the inverter does not re-run, you should contact Dass tech or Installer.

Fault scan is stored 100 in the order in which they were generated in the past from 0 to 99 and the most recent one is No. 0. By using the Up/Down key on the keypad inside the inverter, it is able to find out the situations of the fault occurrences from the past or variables.

When the inverter is stopped, it is able to change the parametric value by using the inner keypad.
There are two initializations, which is Parameter initialization and Fault initialization. Parameter initialization sets every parameter or selection function to the Factory Default, and Fault initialization deletes the fault records occurred in the past and sets to 'ready' mode.

Controlling the inner keypad randomly shall cause malfunction of the inverter. You should contact DASS tech..

5.1.4 Fault

1) Fault

Input Overvoltage (DC OV)

In case the voltage of solar cells is higher than the specified value, stop the system to protect the inverter.

Output Over-current (Over current)

In case the output current of the inverter is over-current due to abnormal load status, stop the system to protect the inverter.

Inverter Overheat (Over heat)

In case the temperature inside the inverter is higher than 95℃, stop the system to prevent overheat. If the temperature inside the inverter returns to normal, operate the inverter normally after reset.

Earth fault

In case the current leaks due to abnormal earth, stop the system.

Line failure (Over/Under frequency, Over/Under voltage)

When abnormality occurs in the grid power, stop the system. (Anti-islanding, protection of system over/under-voltage, protection of system low voltage, protection of system over/under-frequency, protection of system low-frequency)

Abnormal PWM control (Over current 2)

If there is abnormal status found in PWM control inside the inverter, stop the system

6. Maintenance & repair

6.1 Types of error

If any error occurs, it indicates such error and stops operation.

When abnormal, its contents are displayed on the window of the keypad.

Causes of faults and corrective actions

Fault Code	Type	Indication	Causes of errors	Corrective actions
E01	Input Over-current	InsPV OC	Over current from solar module	Check the solar module then operate the inverter. If the problem isn't solved, contact us.
E02	Input Over-voltage	AvgPV OV	Over voltage from solar module	Check the solar module then operate the inverter. If the problem isn't solved, contact us.
E04	Input DC-LINK Over-voltage	AvgDC-Link OV	Over voltage from DC-LINK of the inverter	Check the solar module then operate the inverter. If the problem isn't solved, contact us.
E05	Input DC-LINK Under-voltage	AvgDC-Link UV	Under voltage from DC-LINK of the inverter	Check the solar module then operate the inverter. If the problem isn't solved, contact us.
E06	Grid Over-current	InsLine OC	Over current in grid output	Check grid status and contact your electricity authority. Then if the problem isn't solved, contact us.
E07	Grid Over-voltage	InsLine OV	Abnormal grid voltage	Check grid status and contact your electricity authority. Then if the problem isn't solved, contact us.
E08	Grid Under-voltage	InsLine UV	Abnormal grid voltage	Check grid status and contact your electricity authority. Then if the problem isn't solved, contact us.
E10	Grid Over-frequency	Over frequency	Abnormal grid frequency	Check grid status and contact your electricity authority. Then if the problem isn't solved, contact us.
E11	Grid Under-frequency	Under frequency	Abnormal grid frequency	Check grid status and contact your electricity authority. Then if the problem isn't solved, contact us.
E12	Pv low voltag	PV Waiting	Low pv voltage	Restart after checking PV voltage
E14	Internal Check	Internal Check	Wrong ISR number	Restart the inverter. If the problem happens again, please contact us.
E15	PV Insulation	PV Insulation	Defect from Insulation resistance	Restart the inverter. If the problem happens again, please contact us.
E19	Hardware OC	Hardware OC	Over current checked by inner circuit	Check the solar module and grid status. If the problem happens again, please contact us.
E21	Over Current 2	Over Current 2	Over current by PV current	Check the solar module then operate the inverter. If the problem isn't solved, contact us.
E22	Over Heat	Over Heat	High temperature problem from IGBT	Restart the inverter. If the problem happens again, please contact us.
E23	Residual OC	Residual OC	Leakage current to grid	Restart the inverter. If the problem happens again, please contact us.
E24	LINE POWER LOSS	LINE POWER LOSS	Sudden cut off grid	Restart the inverter. If the problem happens again, please contact us.

E25	LINE POWER LOSS	LINE POWER LOSS	Sudden cut off grid	Restart the inverter. If the problem happens again, please contact us.
E26	Comm. NG	Comm. NG	Communication error between two MCUs	Restart the inverter. If the problem happens again, please contact us.
E27	Self Test NG	Self Test NG	Error from inner circuit	Restart the inverter. If the problem happens again, please contact us.
E28	Fuse Open	Fuse Open	Fuse Open	Restart the inverter. If the problem happens again, please contact us.
E29	Relay Error	Relay Error	Relay Error	Restart the inverter. If the problem happens again, please contact us.
E31	RCMU Breakdown	RCMU Breakdown	Problem during RCMU self-test	Restart the inverter. If the problem happens again, please contact us.

6.2 Customer Service

Check whether the inverter is normal or not.

When the product breaks down, remember the date, time and indications on the fault.

If the product does not work normally, check the follows for requesting customer service.

1) Name of model
2) Serial number of the product
3) Purchased place
4) Purchase Date
5) Certification warranty (You can download from our website)
6) Briefly description of fault type

7. Quality Assurance

7.1 Warranty letter

Letter of warranty

Product		Grid connected power conditioning system (PCS)
Model		DSP-123K5E
Purchase date		
Warranty period		Three(5) years from the date of purchase
Customer	**Name**	
	Address	
	Contacts	
Dealer	**Name**	
	Address	
	Contacts	

• The company manufacturing this product doesn't take any responsibility for safety accident or failure due to the customer's mistake or false use violating specifications.
• The dimension or appearance design of this product can be changed without any notice.

◀ Free A/S ▶

If failure occurred under normal using condition within the warranty period, your product can be tested and repaired for free.

◀ Charged A/S ▶

For following cases, A/S could be provided at a cost

- *The product is out of order due to the customer's intention or carelessness*
- *The product is out of order due to failure in connected devices by error of applied power supply*
- *Any failure occurred by natural calamity*
- *In case the product was repaired or revised at unofficial service center/man, not designated*
- *In case of without the nameplate of DASS Tech*
- *In case any failure occurs after the user dismantled, repaired or replaced our products*
- *Replacement of consumable parts without any notice to a manufacturer in advance*
- *In case warranty period is expired*

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