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DT/Smart DT SERIES USER MANUAL



SOLAR INVERTER

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1 Symbols

	Caution! - Failure to observe a warning indicated in this manual may result in minor or moderate injury.		Components of the product can be recycled.
	Danger of high voltage and electric shock!		This side up - The package must always be transported, handled and stored in such a way that the arrows always point upwards.
	Danger of hot surface!		No more than six (6) identical packages be stacked on each other.
	Product should not be disposed as normal household waste.		The package/product should be handled carefully and never be tipped over or slung.
	Refer to the operating instructions		Keep Dry – The package/product must be protected from excessive humidity and must accordingly be stored under cover.
	Signals danger due to electrical shock and indicates the time (5 minutes) to allow after the inverter has been turned off and disconnected to ensure safety in any installation operation.		CE Mark

2 Safety and Warning

DT/ Smart DT (hereinafter referred to as SDT) series inverter of Jiangsu GoodWe Power Supply Technology Co.,Ltd. (hereinafter referred to as GoodWe) strictly conforms to related safety rules in design and test. As electric and electronic equipment, Safety Regulation shall be followed during installation and maintenance. Improper operation may bring severe damage to the operator, the third party and other properties. (DT: Dual-MPPT, Three-Phase, covering 12KW/15kW/17kW/20kW/25kW/30kW; SDT: Smart Dual-MPPT, Three-Phase, covering 4KL/5KL/6KL/10KL/4KW/5KW/6KW/8KW/9KW/10KW/15KW.)

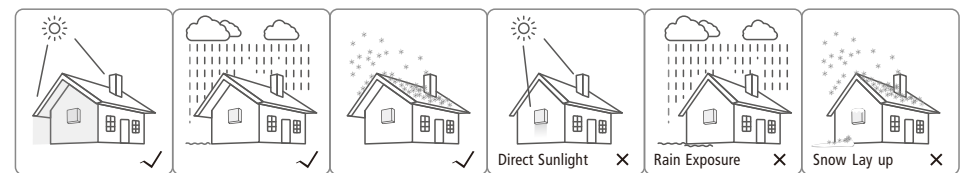
- Installation, maintenance and connection of inverters must be performed by qualified personnel, in compliance with local electrical standards, regulations and the requirements of local power authorities and/or companies.
- To avoid electric shock, must be terminated AC output of inverter then terminated DC input disconnected and wait at least 5 minutes before performing any installation or maintenance.
- The temperature of some parts of the inverter may exceed 60°C during operation. To avoid being burnt, do not touch the inverter during operation. Let it cool before touching it.
- Keep children away from the inverter.
- Without permission, open the front cover of the inverter is not allowed. Users should not touch/replace any of the components except for the DC/AC connectors. GOODWE will not bear any consequences caused by unauthorized actions which will lead to potential injury to people and damage to inverters.
- Static electricity may damage electronic components. Appropriate method must be adopted to prevent such damage to the inverter; otherwise the inverter may be damaged and the warranty will be annulled.

- Ensure the output voltage of the proposed PV array is lower than the maximum rated input voltage of the inverter; otherwise the inverter may be damaged and the warranty will be annulled.
- When exposed to sunlight, the PV array will generate very high voltage which will cause potential danger to people. Please strictly follow the instruction we provided.
- PV modules should have an IEC61730 class A rating.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Completely isolate the equipment should : switch off the DC switch, disconnect the DC terminal, and disconnect the AC terminal or AC breaker.
- Prohibit inserting or pulling the AC and DC terminals when the inverter is working.
- Only DC connectors provided by GoodWe are permitted to use, otherwise the inverter may be damaged and the warranty will be annulled.
- Person could access to inverter status through mobile phone and computer display please refers to chapter 3.4.4 and 3.4.5. and error code could be shown not only on inverter LCD display but also mobile phone APP interface.
- The inverter can exclude the possibility of DC residual currents to 6mA in the system, Where an external RCD is required in addition to the built-in RCMU, type A RCD must be used to avoid tripping.
- The default photovoltaic module is not grounded.
- If there are more than 3 PV strings on input side, an additional fuse installing will be suggested.

3 Installation

3.1 Mounting Instruction

- In order to achieve optimal performance, the ambient temperature should be kept lower than 45 °C.
- For the convenience of checking the LCD display and possible maintenance activities, please install the inverter at eye level.
- Inverters should NOT be installed near inflammable or explosive items. Any strong electro-magnetic equipment should be kept away from installation site.
- Product label and warning symbol shall be clear to read after installation.
- Please do not install inverter under direct sunlight, rain and snow.

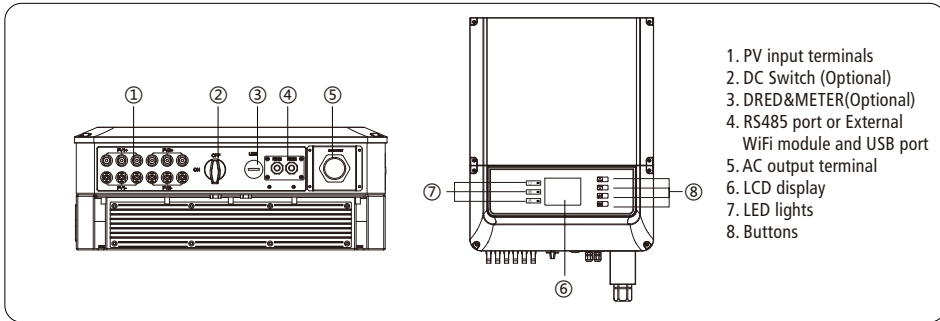


3.2 Overview and Packaging

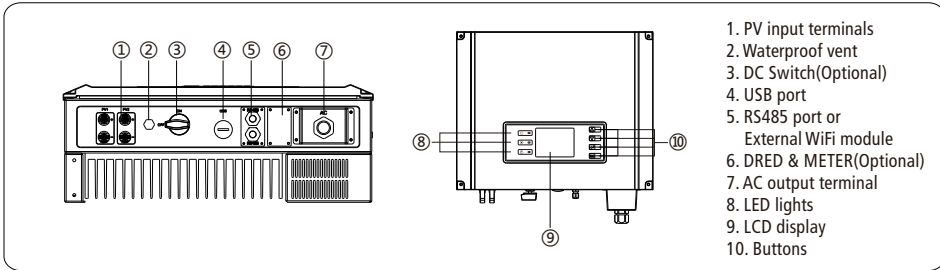
After opening the package, confirm if it is consistent with specification of inverter you purchased.

3.2.1 Inverter Overview

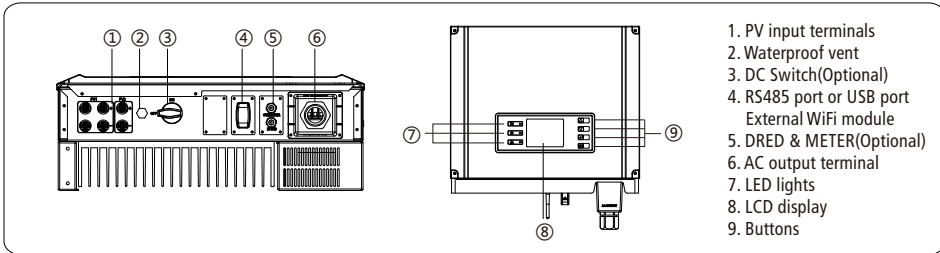
DT Series inverter illustration.



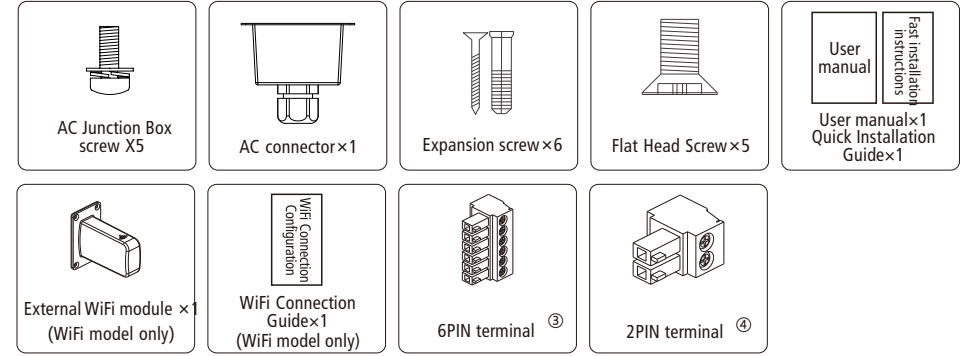
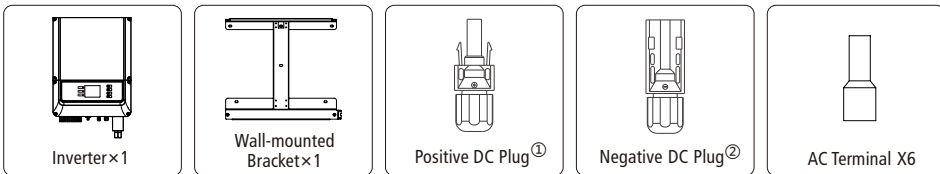
SDT4~10KW inverter illustration.



SDT10KL&SDT15KW inverter illustration.



3.2.2 Package



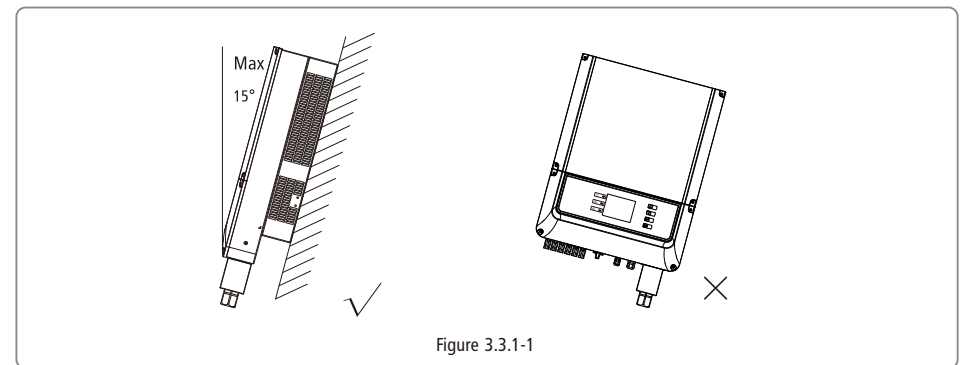
- ① Positive DC Plug:DT15~20KW 4 pairs;12KWLV 4 pairs;15KWLV,25KW 6pairs;SDT4~10KW 2 pairs;SDT15KW&10KL 3 pairs.
- ② Negative DC Plug:DT15~20KW 4 pairs;12KWLV 4 pairs;15KWLV,25KW 6pairs;SDT4~10KW 2 pairs;SDT15KW&10KL 3 pairs.
- ③ 6PIN terminal: SDT4~10KW: 1pcs for RS485 communication(optional), 1pcs for DRED(optional); SDT10KL&15KW:1pcs for DRED(optional);DT:1pcs for DRED(optional)
- ④ 2PIN terminal: SDT4~10KW:1pcs for Anti-Current(optional); SDT10KL&15KW:2pcs for RS485 communication(optional),1pcs for Anti-Current(optional); DT:2pcs for RS485 communication(optional),1pcs for Anti-Current(optional);

3.3 Inverter Installation

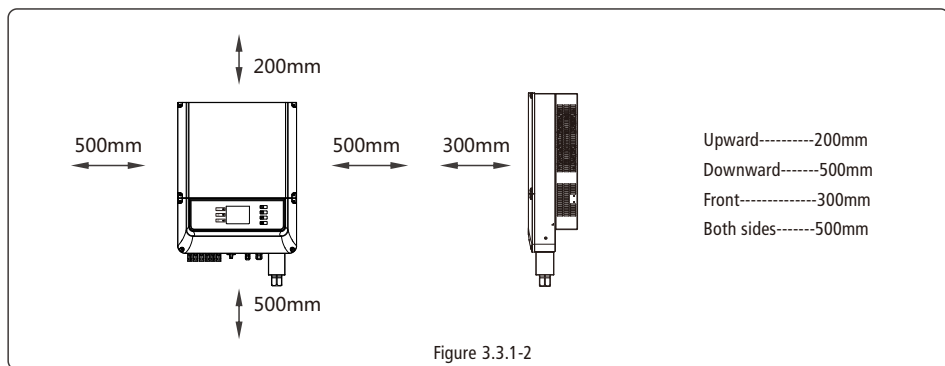
3.3.1 Selecting the Installation Position

Installation position should be selected based on the following aspects:

- The installation method and mounting location must be suitable for the inverter's weight and dimensions.
- Mount on a solid surface.
- Select a well ventilated place sheltered from direct sun radiation.
- Install vertically or tilted backward by max 15°. The device cannot be installed with a sideways tilt. The connection area must point downwards. Refer to Figure 3.3.1-1.

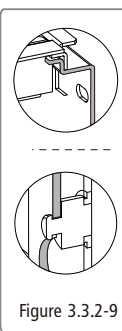
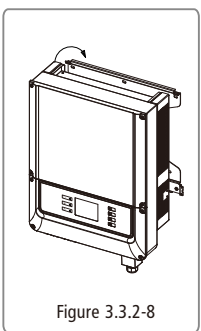
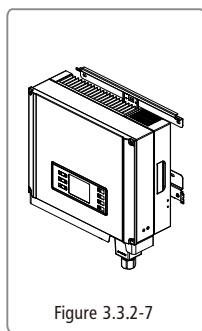
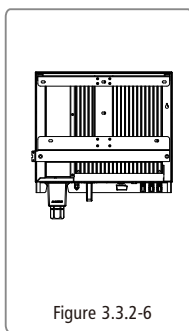
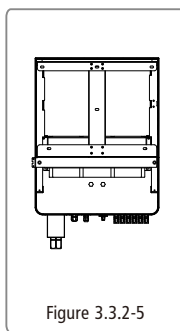
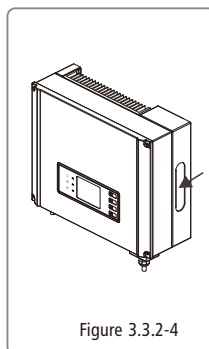
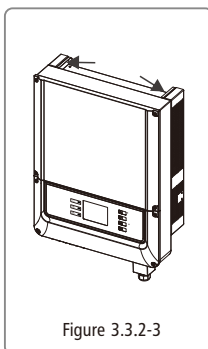
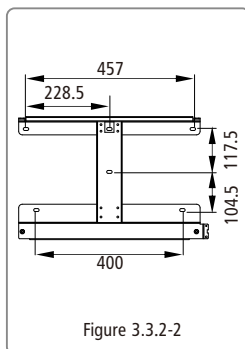
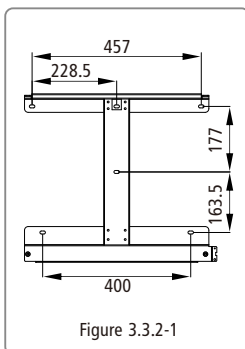


- In consideration of heat dissipation and convenient dismantlement, the minimum clearances around the inverter should be no less than the following value:
- The installation position shall not prevent access to the disconnection means.



3.3.2 Mounting Procedure

- (1) Use the wall-mounted bracket as a template and drill 6 holes on the wall, 10 mm in diameter and 80 mm deep. The inverter sizes of DT series please refer to Figure 3.3.2-1, and the size of SDT series refer to Figure 3.3.2-2.
- (2) Fix the wall mounting bracket on the wall with six expansion bolts in accessory bag.
- (3) Hold the inverter by the groove on it, (DT models please refer to Figure 3.3.2-3, and SDT models refer to Figure 3.3.2-4.)
- (4) Place the inverter on the wall-mounted bracket as illustrated in Figure 3.3.2-5、 3.3.2-6、 3.3.2-7、 3.3.2-8、 3.3.2-9.

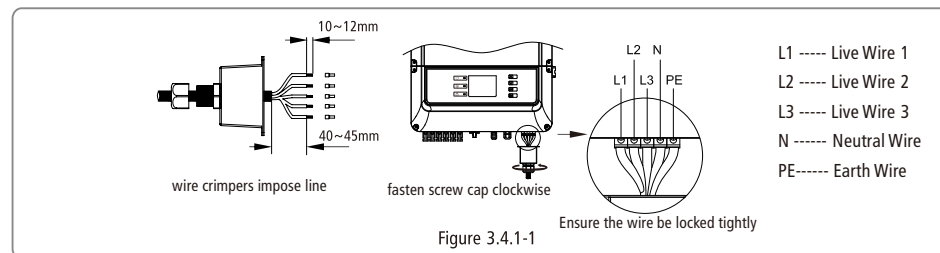


3.4 Electrical Connection

3.4.1 Connection to Grid (AC Side Connection)

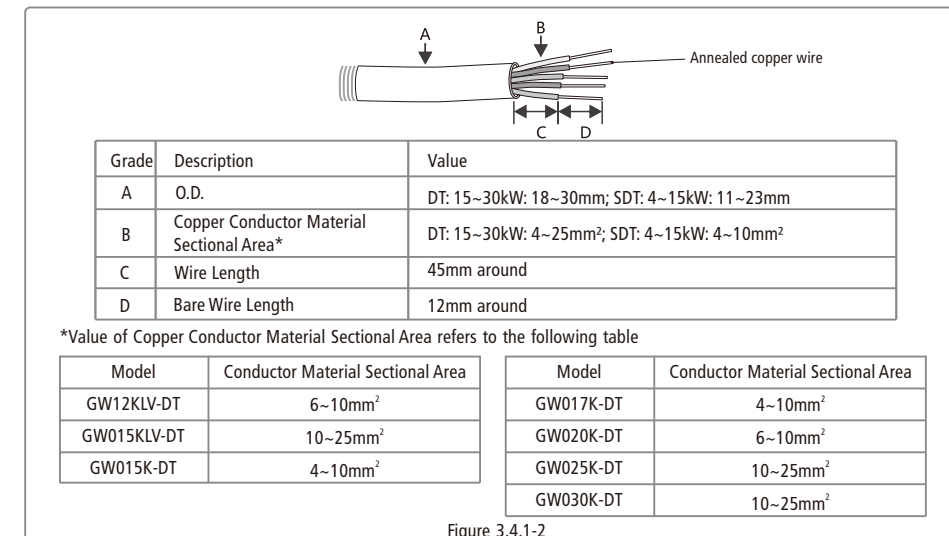
- (1) Check the grid voltage and frequency, select a suitable safety standard from inverter that comply with this requirements.
- (2) Add breaker or fuse to AC side, the specification should be more than 1.25 times of rated AC output current.
- (3) The PE line of inverter should be connected to the earth, make sure the impedance of neutral wire and earth wire less than 10 ohm.
- (4) Disconnect the breaker or fuse between the inverter and the utility.
- (5) The integrated leakage current detection device of the inverter can detect external leakage current in real time. When the detected leakage current exceeds the limit value, inverter will quickly disconnect with the grid. If the leakage current protection device is installed externally, the action current should be 300mA or higher.
- (6) Connect the inverter to the grid as follows:
- (7) Fix (Torque: 2~2.5 N.m) the connector of AC cable to the corresponding terminals.
- (8) Neutral conductor shall be blue, line conductor shall be black or brown (preferred), protective earth bonding line shall be yellow-green.
- (9) The AC line construction shall be such that if the cord should slip in its anchorage, placing a strain on conductors, the protective earthing conductor will be the last to take the strain. such as the PE line is longer than L and N.

Installation instruction of waterproof coupling series connector please refer to Figure 3.4.1-1.



Note: The N line of GW30K-DT should not be connected.

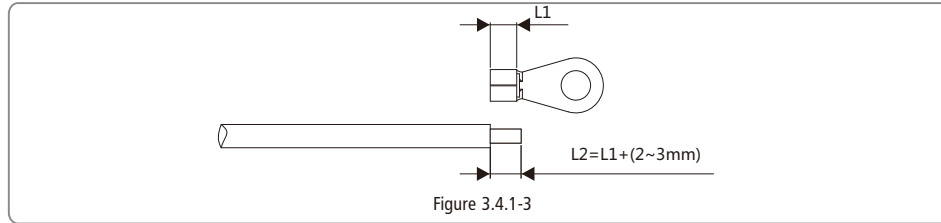
AC cable illustration please refer to Figure 3.4.1-2.



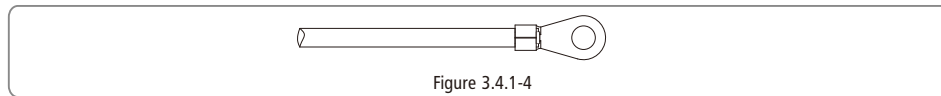
Earth terminal connection

The inverter is added earth terminal according to the requirement of EN 50178. It is suggested that installation person should connect the terminal to earthing wire.

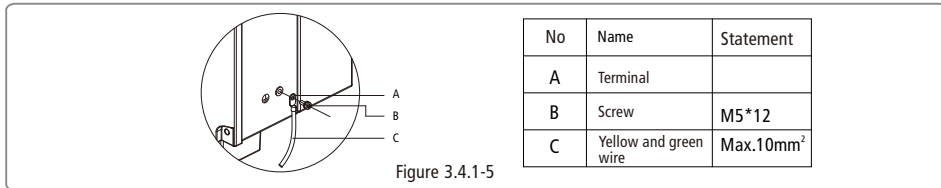
1.Strip the wire insulation sheet of a suitable length with a wire stripper, illustrated as Figure 3.4.1-3.



2.Insert the stripped wire into the terminal and compress it tightly by crimping pliers, illustrated as Figure 3.4.1-4.



3.Fix the earth wire shall on the machine, illustrated as Figure 3.4.1-5.

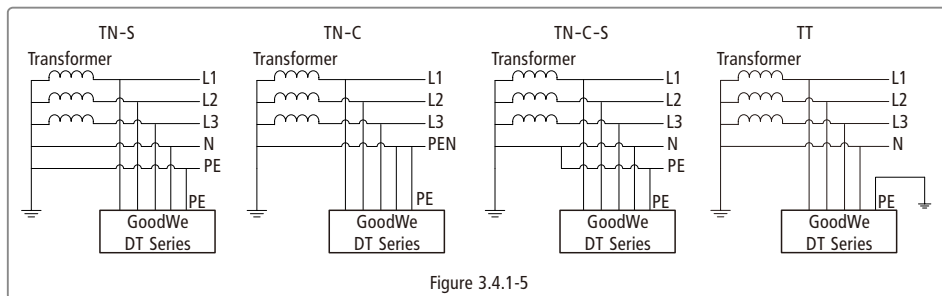


4.In order to improve the corrosion resistance of the terminal, coat the terminal with silica gel after connection.

Note : The terminal are not included in the delivery scope.

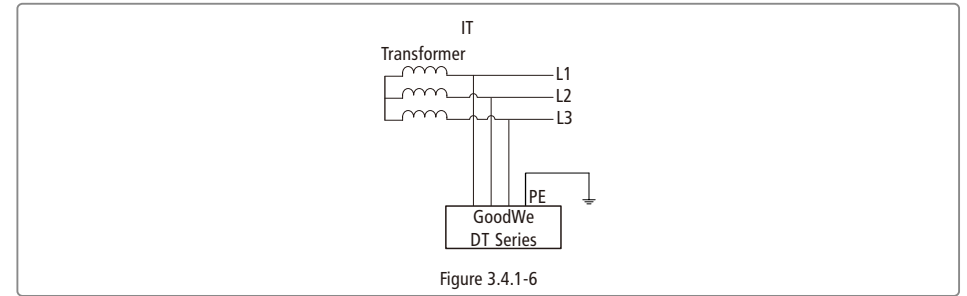
Grid compatibility

DT series GW12KLV-DT~GW25K-DT and SDT series support four different types of grid. please refer to Figure 3.4.1-5.



Note : For TT grid structure, RMS voltage between neutral wire and earth wire must be less than 20V.

GW30K-DT support IT grid type. please refer to Figure 3.4.1-6.



3.4.2 AC circuit breaker and leakage current protection device

In order to ensure that the inverter can be safe and reliable to disconnect from the power grid, please install an independent circuit breaker to protect the inverter.

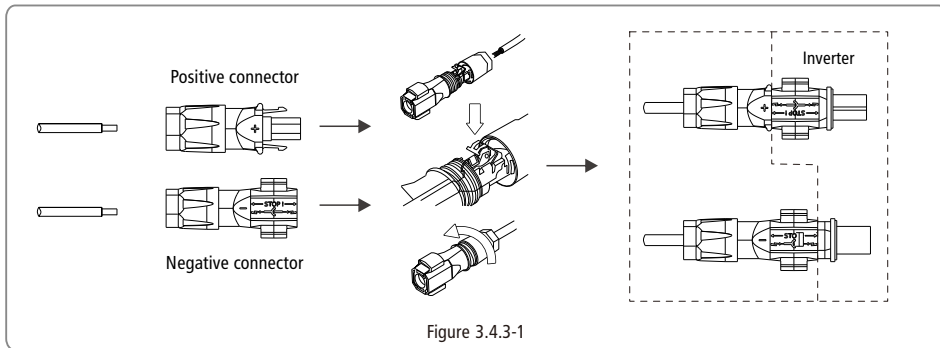
Inverter model	Recommended circuit breaker specifications
GW4000-DT GW5000-DT GW6000-DT	16A
GW8000-DT GW9000-DT GW10KN-DT	25A
GW10KL-DT GW15KN-DT	32A
GW15K-DT GW17K-DT	32A
GW20K-DT GW12KLV-DT	40A
GW25K-DT GW30K-DT GW15KLV-DT	50A

Note: Multiple inverters are not allowed to share a circuit breaker. Leakage current protector is not allowed to connect between the inverter and the circuit breaker.

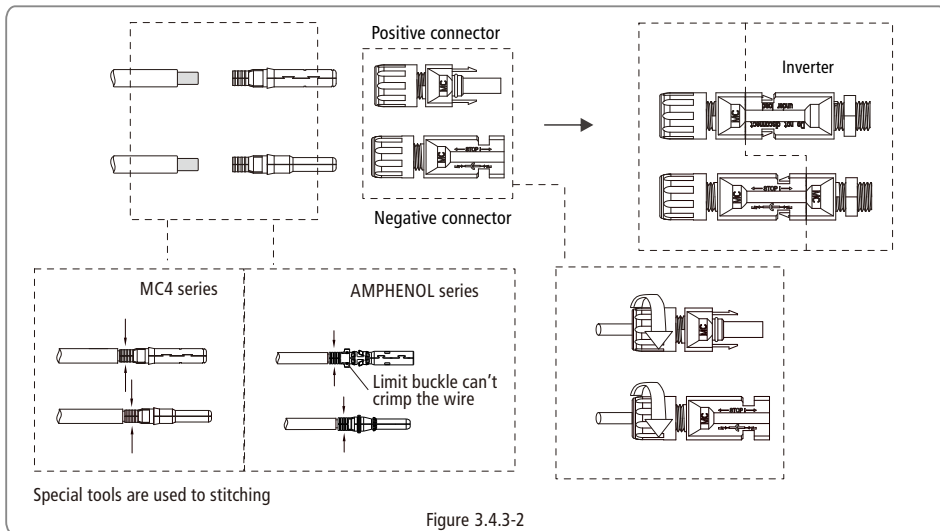
The integrated leakage current detection device of the inverter can detect external leakage current in real time. When the detected leakage current exceeds the limit value, inverter will quickly disconnect with the grid. If the leakage current protection device is installed externally, the action current should be 300mA or higher.

3.4.3 DC Side Connection

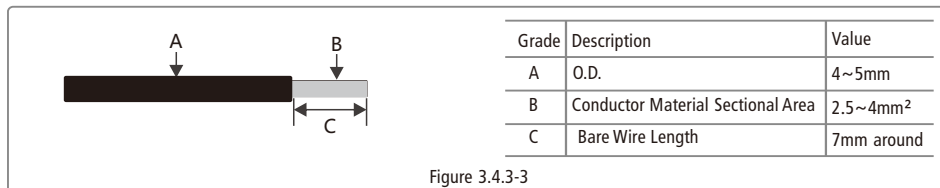
- Before connecting PV string, make sure DC switch is turned off .
- Make sure PV string polarity confirms with DC connector, otherwise, it will cause damage to inverter.
- Make sure the maximum open circuit voltage (Voc) of each PV string does not exceed the inverter input voltage Vmax under any condition.
- Do not connect positive or negative pole of PV string to earth wire. Otherwise, it will cause damage to inverter. Installation instruction of MC4 ,SUNLIX, Amphenol connectors please refer to Figure 3.4.3-1 or Figure 3.4.3-2.
- Positive shall be red, negative shall be black .
- The minimum insulation resistance to ground of the PV panels must exceed 33.3kΩ (R = 1000/30 mA), there is a risk of shock hazard if the requirement of minimum resistance is not met.



Note: For installation of Amphenol connectors, These two limit buckles of Amphenol connectors are only for installation positioning use, can't crimp the wire.



DC Cable specification please refer to Figure 3.4.3-3.



*DC Cable should be use dedicated PV cable.

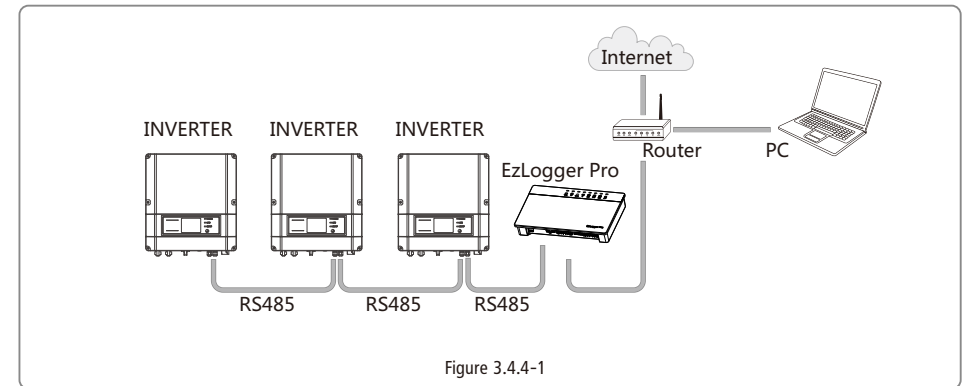
3.4.4 RS485 Communication

This function only applies to inverter with RS485 ports.

The RS485 interface is used to connect EzLogger Pro only, please make sure the connecting cables not exceed 1000m.

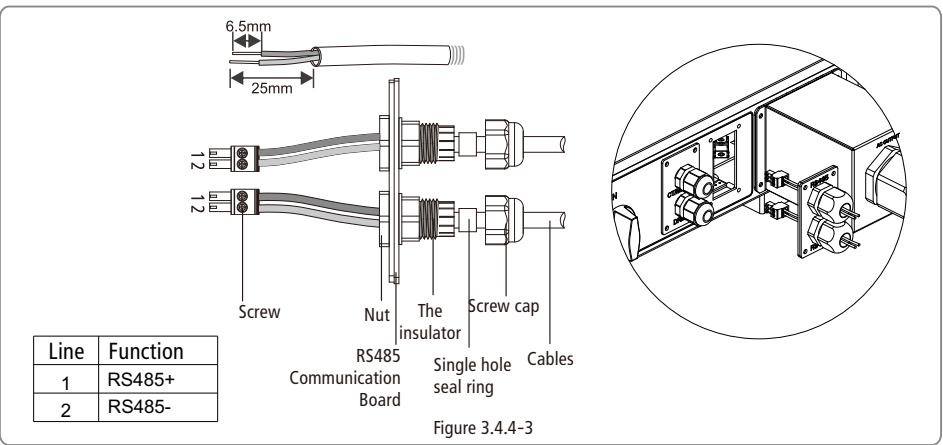
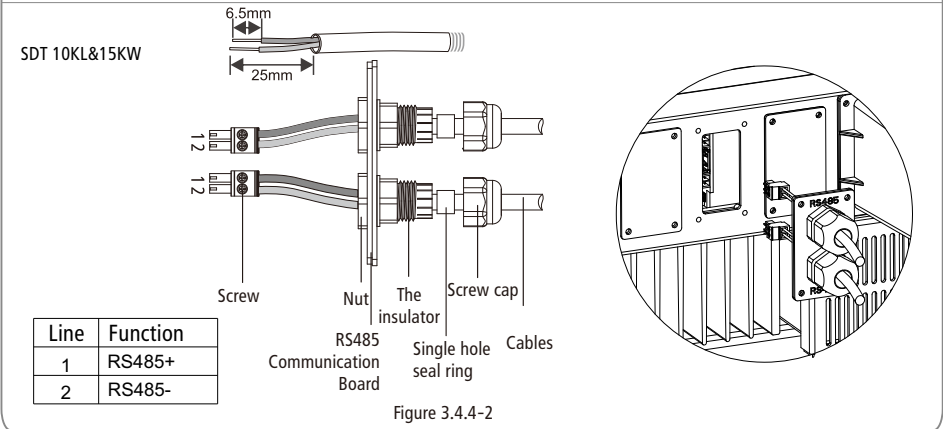
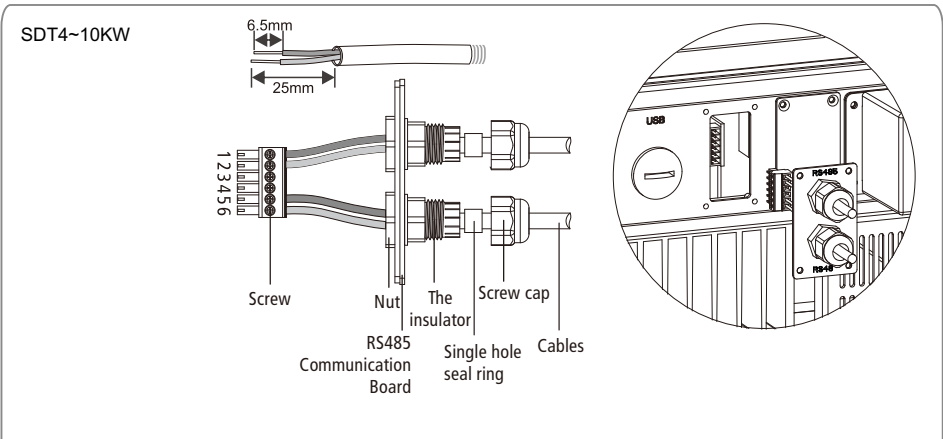
Communication lines must be separated from other power lines to avoid communications interference.

RS485 connection please refer to Figure 3.4.4-1.



(1) RS485 communication connection procedure:

- Remove the waterproof kit of RS485 cover with screwdriver.
- Remove the screw cap of the cable gland.
- Remove the one-hole sealing ring.
- Insert the RS485 cable through the components as the followings: screw cap, one-hole sealing ring, insulation body and sheet metal parts.
- Fasten the cable as Figure shown, figure 3.4.4-2(SDT), figure 3.4.4-3(DT)
- Connect the compressed cable to the built-in communication interface of inverter.
- Fasten the RS485 waterproof kit to inverter.
- Fasten the screw cap of the cable gland.

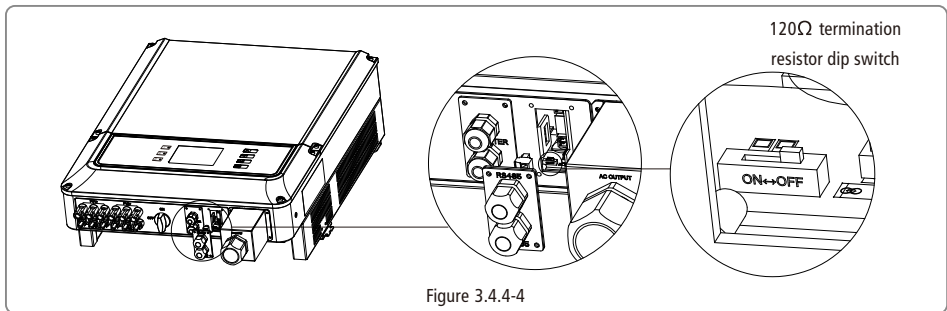


Notice

The requirement of RS485 communication cable: standard RS485 cable.

(3) The choice of 120Ω termination resistor dip switch (DT series only).

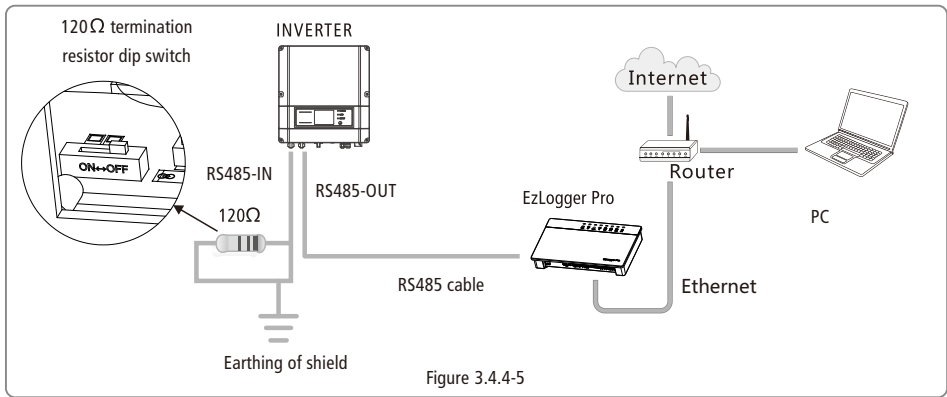
- If there is only one GoodWe DT inverter, RS485 connection cable with waterproof terminal can realize connection.
- For single inverter communication, choose one among the two terminals. Please use a waterproof cover to cover the port which is not used.
- 120Ω termination resistor is controlled by dip switch. "ON" means connected, and "OFF" means disconnected, illustrated as Figure 3.4.4-4.
- For single inverter communication, put on the dip switch near the terminal. (The default is OFF). Then shielding layer of communication cable is single point grounding, illustrated as Figure 3.4.4-5.



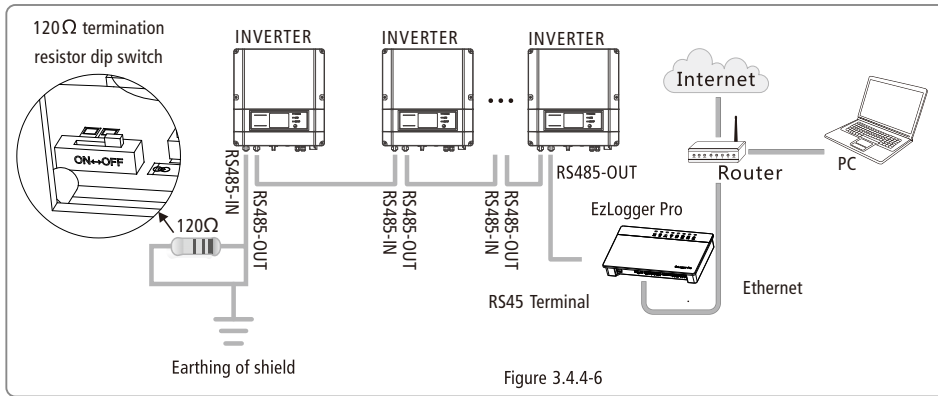
- If there are several GoodWe PV inverters, their connection can be realized by RS485 communication cables which are in daisy chain connection.
- For the end inverter in daisy chain, put on the dip switch near the terminal. (The default is OFF). Then shielding layer of communication cable is single point grounding, illustrated as Figure 3.4.4-5.

(4) RS485 communication connection method

- GoodWe DT inverter can be connected with EzLogger Pro separately for data acquisition and monitoring.
- The connection method of single GoodWe DT inverter, Ezlogger Pro and PC terminal is show in Picture3.4.4-5. The connection method of several GoodWe DT inverters, Ezlogger Pro and PC terminal is show in Picture3.4.4-6.



(2) Connect the inverter to EzLogger Pro with RS485 cable, and EzLogger Pro to switch or router with CAT5E STP cable.



If several GoodWe DT inverters linked together with EzLogger Pro, the inverter number in daisy chain could be 20 at most.

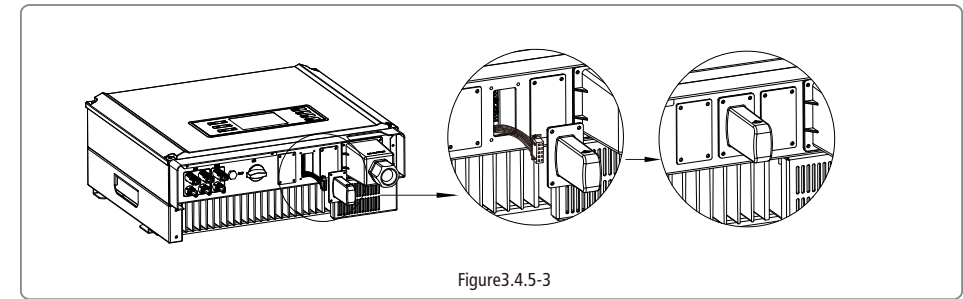
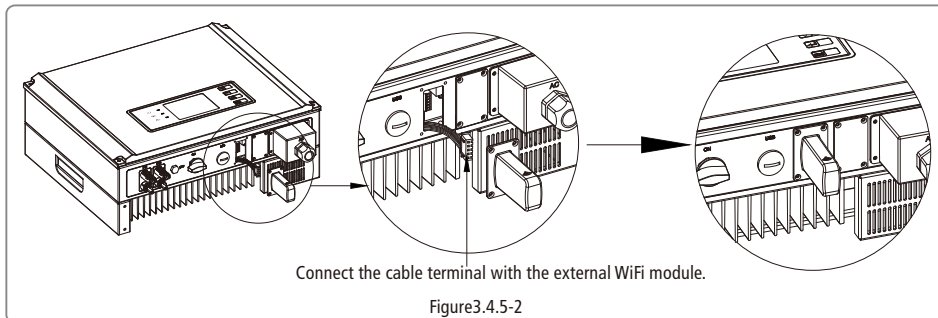
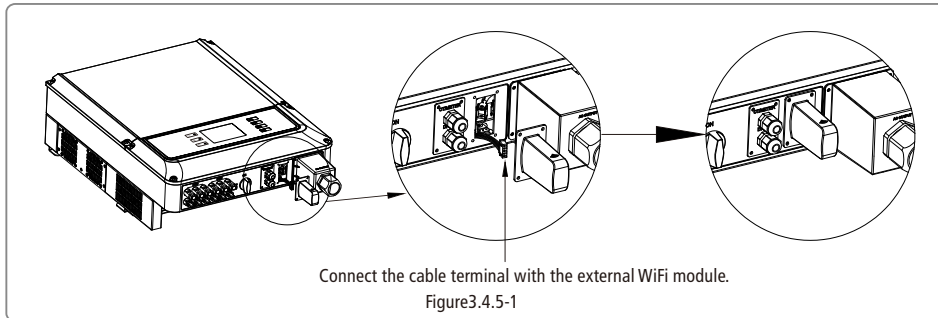
3.4.5 WiFi Communication

The WiFi communication function is only applied to WiFi models, the detailed configuration instruction can be referred to WiFi configuration in the accessory box or the "WiFi Monitoring Video" on the official website, <http://www.goodwe.com.cn/en/Download.aspx>. After configuration, please browse <http://www.goodwe-power.com> to create PV station.

Installation of DT external WiFi module, please refer to 3.4.5-1.

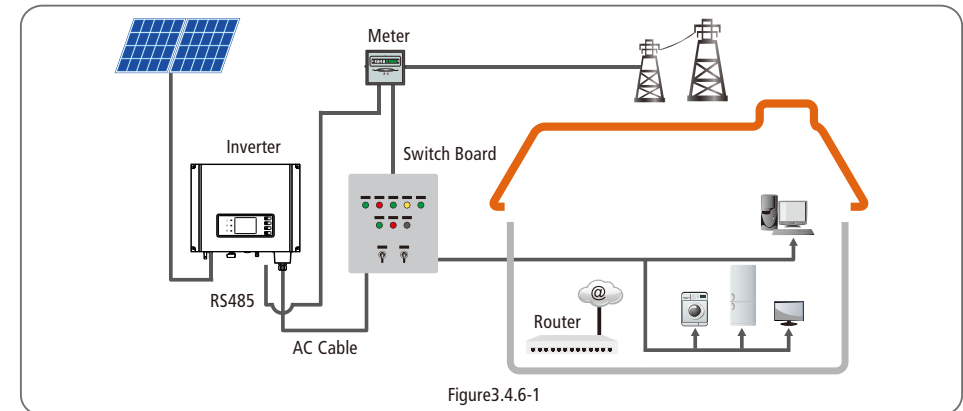
Installation of SDT external WiFi module, please refer to 3.4.5-2.

Installation of SDT10KL&15KW external WiFi module, please refer to 3.4.5-3.



3.4.6 Power Limiting Device&DRED Installation

Connection method of DT series power limiting meter please refer to Figure 3.4.6-1.



NOTE:

2-pin terminal is used to make connection to meter.You can find it in accessory bag.

6-pin terminal is used to make connection to DRED device. If DRED device is not available, please keep it not connected.

Connection Procedure:

- Put the cable through the components in this order: screw cap, one-hole sealing ring, insulation body and sheet metal parts.
- Pull out the 6-pin terminal from the socket in the cabinet and take off the resistor which is fixed in it.Cable should be connected as Figure 3.4.6-2.
- Insert the green terminal into the corresponding interior terminal of the inverter. Pull cable softly to maintain the cable not to be pulled out.
- Lock the sheet metal parts onto the box and tighten the screw cap.

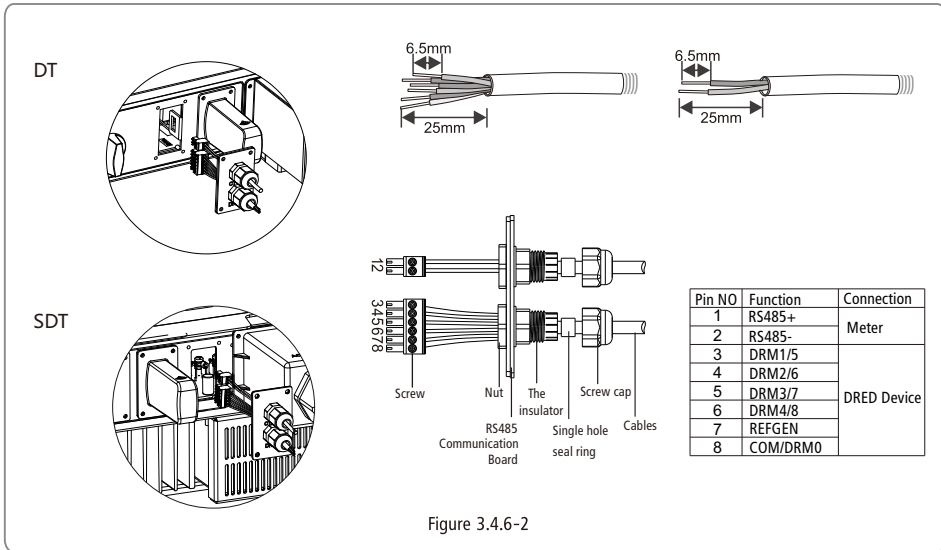


Figure 3.4.6-2

Note: 1. Meter is non-standard accessories, if the need to use a meter, please contact GOODWE sales manager.

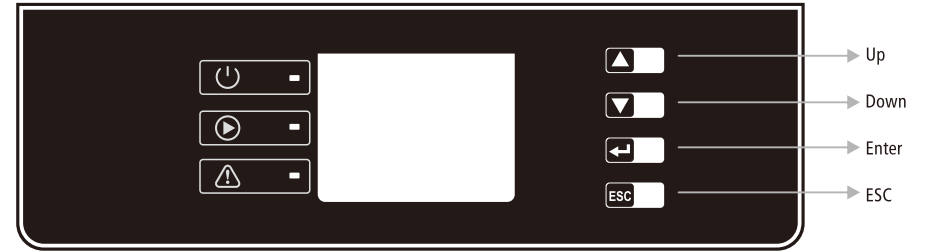
2. Supported DRM command: DRM0, DRM5, DRM6, DRM7, DRM8.
3. Please refer to Meter instruction Guide.
4. DRED connection is only available for Australia and New Zealand.
5. Meter is needed for implementing of export power limiting function. After installation, you need enable 'Power Limit' function and set export power limiting value on LCD via button according to next chapter 4.2.

3.4.7 Earth Fault Alarm

The inverter complies with IEC62109-2 chapter 13.9. When earth fault occurs, the fault indicator LED on front cover will light up, and, for wifi inverter, it will email the fault information to customer, for non wifi inverter, the buzzer in inverter will keep ringing 1 minute and ring again after half an hour unless the fault is resolved (This function is only available to Australia/ New Zealand).

4 System Operation

4.1 LED Lights



LED lights in Yellow/Green/Red correspondently refer to / /

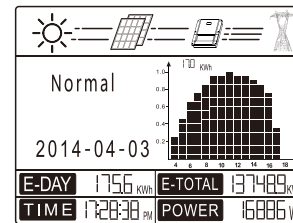
		ON=WIFI CONNECTED/ACTIVE
		BLINK 1 = WIFI SYSTEM RESETTING
		BLINK 2 = NOT CONNECT TO ROUTER
		BLINK 4 = WIFI SERVER PROBLEM
		BLINK = RS485 CONNECTED
		OFF = WIFI NOT ACTIVE
		ON = INVERTER IS FEEDING POWER
		OFF = INVERTER IS NOT FEEDING POWER AT THE MOMENT
		ON = FAULT OCCURRED
		OFF = NO FAULT

4.2 User Interface and Controls

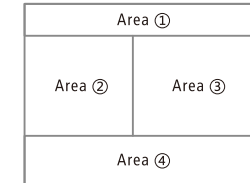
Set Safety Country:

If display shows 'Configure Safety', then long press (2S) the key to enter the second level menu. Short press to browse the safety country list available. Choose suitable safety country according to the location of installation. The inverter will store the chosen safety country after 20 seconds if no operation.

(1) The Figure of LCD display screen is shown as follow:



Display area is divided as follows:



(2) Display area

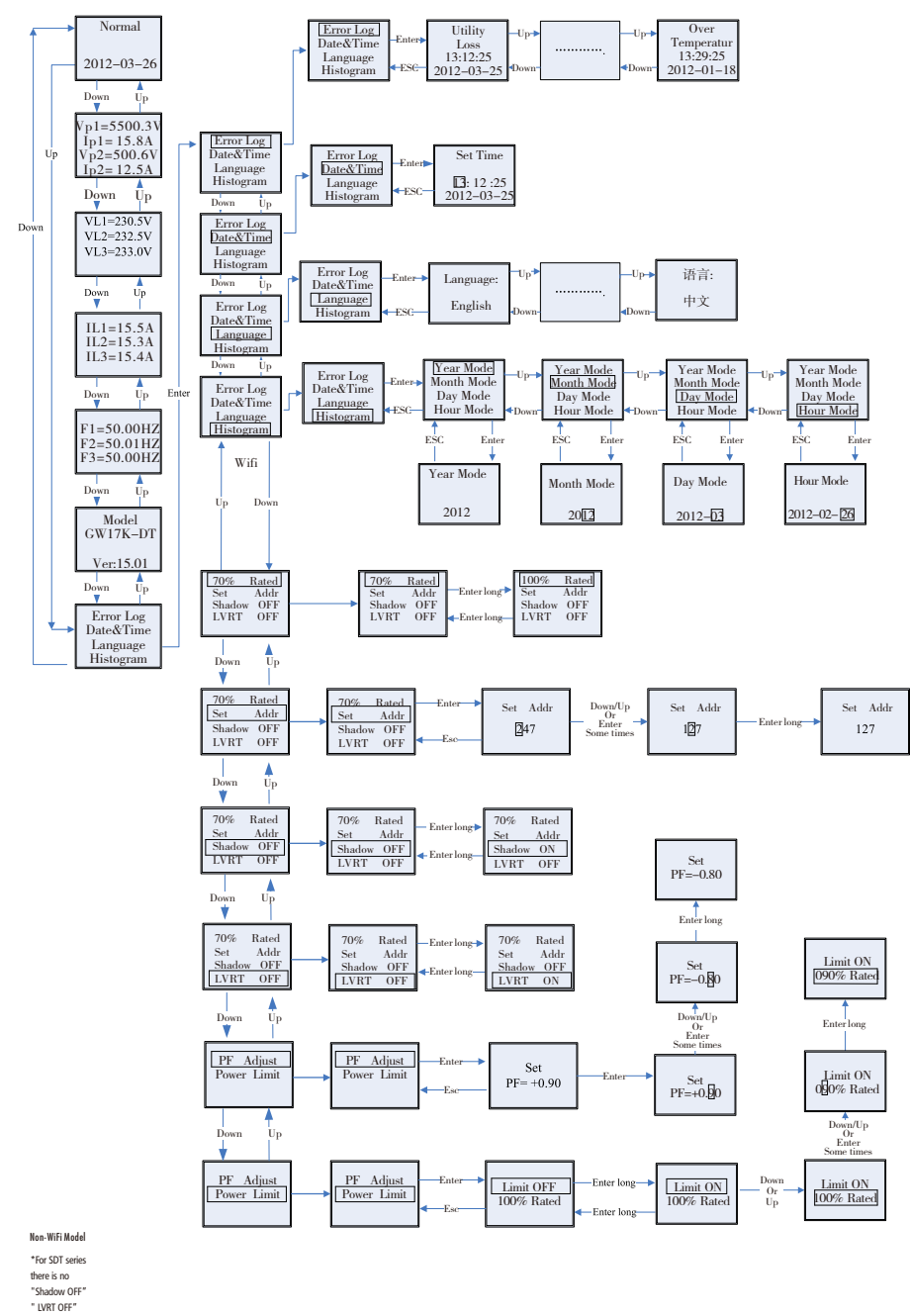
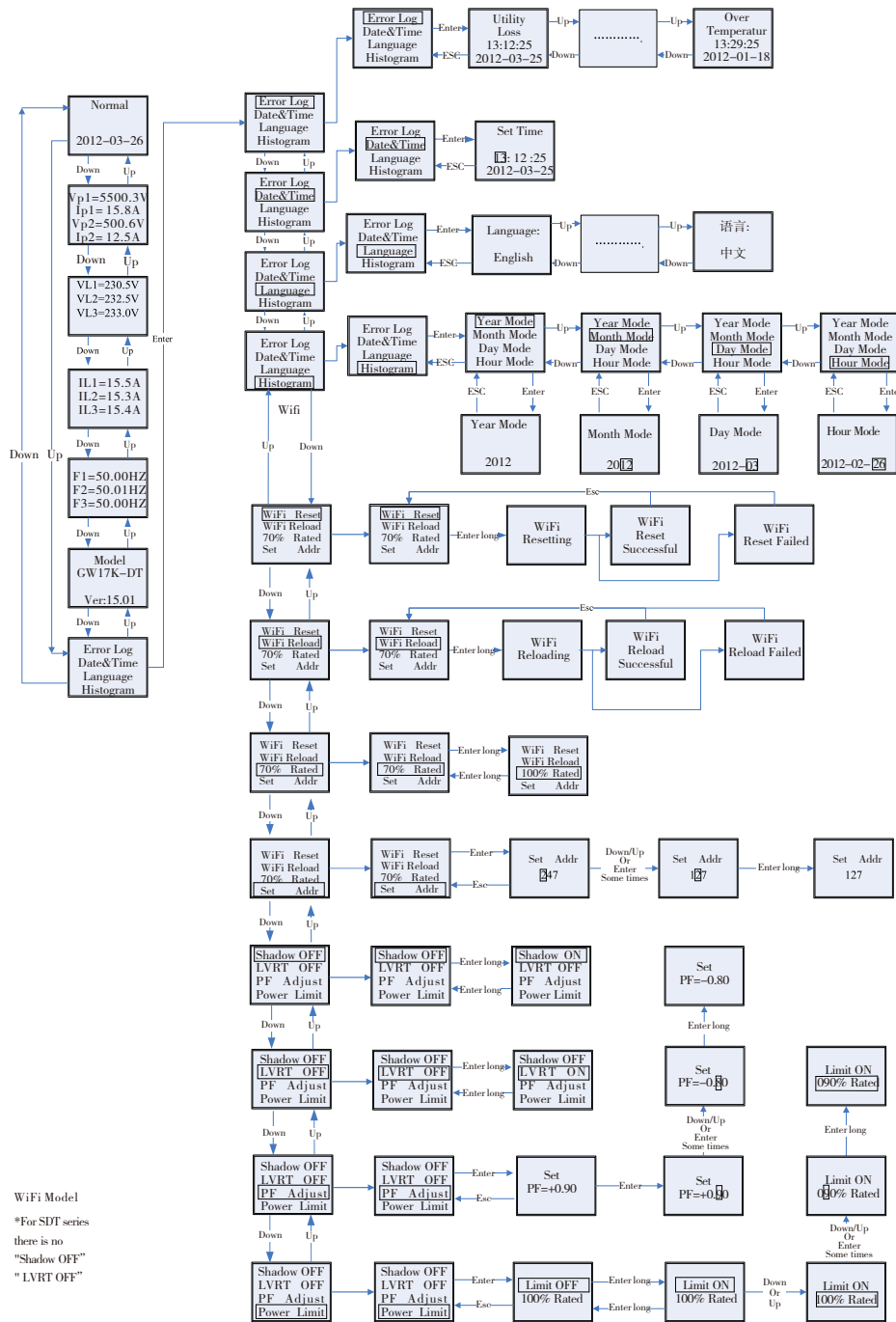
Area ①—Flow of Power Generated:

Area ① indicates the flow of energy. Full line(—)between inverter and the grid means the grid is available but inverter is not yet feeding power at the time. Flashing dashed lines(---)mean inverter is feeding power to grid. No line means grid is not available. Flashing dashed lines between the sun, modules and inverter means there is energy from the sun to modules and then from modules to inverter.

Area ②—Status Information:

Area ② displays inverter power generation status. Different inverter status like languages & time settings, error logs, historical power information etc could all be switched and displayed here through button operations.

Area 2 has 3 levels of menu. Please refer to the diagram below.



Area③ –Histogram Display:

Area③ uses histogram to demonstrate the average power generation at each hour from 4:00am to 8:00pm on one day. Each columnar points 20 scale, the left top area shows the maximum rated power generation each hour for inverter.

This area can display information in different modes, There are 5 display modes in total: real-time mode, hour mode, day mode month mode, year mode.

Real-time mode; display hourly power generation from 4:00dm to 8:00pm;

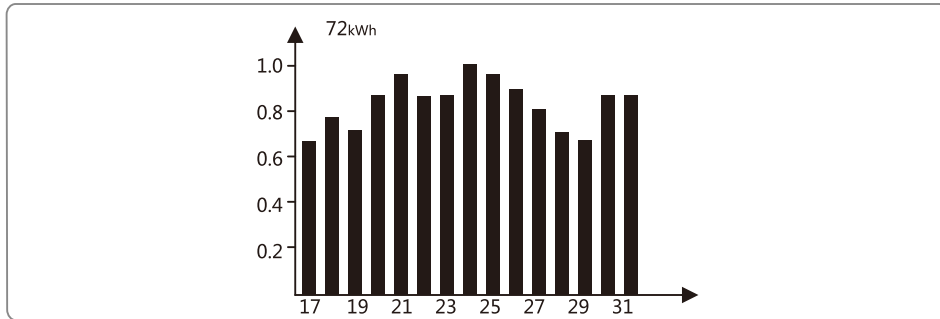
Hour mode: display the hourly power generation in a specific day from recent 14 days;

Day mode: display the daily power generation in a specific month from recent 6 months;

Month mode: display the monthly power generation for 12 months in specific year;

Year mode: display annual power generation for recent 10 years.

Take day mode for example:



72kWh means the maximum power generation of recent 16 days. The unit on the left corner sometimes turns to "MWh" from "kWh", it depends on Maximum power generation. 0.2—1.0 on the left is scare factor, which is fixed display content; 17-31 are based on current mode which shows the bar chart label.

Area④ Displays total power generation, daily power generation, real-time power generation and time information, described as follow:

Area	Description
E-DAY	Daily power generation
E-TOTAL	Gross power generation after first time use of inverter. The initial unit is "kWh"; When power generation exceeds 999.9kWh, the unit changes to "MWh".
TIME	Current system time
POWER	Real-time power Generation of the system

(3)Use of the display and LCD display:

The buttons near the LCD screen are mainly used for inverter information display, setting of time, language selection and histogram information display.

The menu in LCD display area has three levels; In the level 1 menu, first 6 interfaces showing inverter status, model, PV voltage and current, grid voltage and current, line frequency. Pressing button "Enter" to lock current menu interfaces in order to observe specific parameter. In the meanwhile, backlight will turn on for 1 min; Press "Enter" to unlock the interface for information display, the backlight will be kept on for 30S and then switch back to default initial interface.

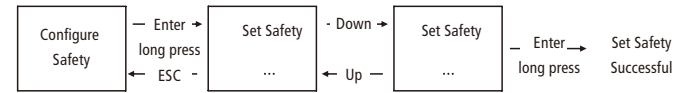
The last interface (including error Log, time and data, language setting and historical electricity generation) can be entered by pressing 'Enter' to according Level 2 menu.

In level 2 menu, move the cursor to the setting area through 'DOWN' and 'UP' key operation. For the level 2 menu which has three level menus, press 'ENTER' to get in and change the figures at cursor location through 'DOWN' and 'UP' key operation, in addition the cursor location can be changed by pressing 'ENTER'.

In all levels of menu, it will automatically enter the first item of the level 1 menu if no action is taken within 30S, meanwhile, the modified data will be stored into internal memory.

(4) Menu introduction:

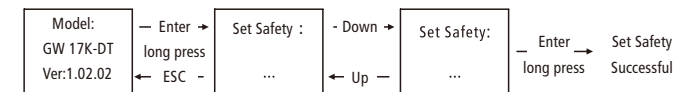
Long press 'ENTER' in the Configure Safety interface, there will be set safety interface. Press 'Down' or 'Up' to choose the safety you need and then long press 'ENTER', the safety you need can be set.



- When PV panel is feeding power to the inverter, the screen shows the first interface of level 1 menu. The interface displays current state of the system. It shows 'Waiting' in the initial state; it shows 'Normal' during power generation mode; if there is something wrong with the system, error message is shown. Error code can be referred to 4.3.
- Press any key once to turn on the LCD backlight when it is off; if the backlight is on, press 'DOWN' key to enter the next menu displaying data of Vpv and Ipv; press 'ENTER' to lock the current interface.
- In the level 1 menu, the displayed information can be switched through 'DOWN' and 'UP' key operation, there are 7 interfaces in total, which are circulatory. The level 2 menu can only be selected through 'ENTER' from the seventh interface.
- In the level 2 menu, short press 'Error Log' to enter the historical error message interface, press 'up' and 'down' to inquire the first 5 historical error message, press 'Esc' to return.
- In the level 2 menu, short press 'Date&Time' to enter the time setting interface, press 'up' and 'down' to change the data, short press 'Enter' to move cursor, long press 'Enter' to save the settings.
- In the level 2 menu, choose 'Language' and press 'Enter' to enter language setting interface, the LCD will flash, press 'up' or 'down' to change language, long press 'Enter' to save the settings, when it stops flashing, press 'Esc' to return.
- In the level 2 menu, choose 'Histogram', short press 'Enter' to enter the level 3 menu to inquire the historical power generation, in the level 3 menu, press 'up' or 'down' to inquire power generation data in Year Mode, Month Mode, Day Mode and Hour Mode, short press 'Enter' to show the historical power generation, press 'Esc' back to main menu.
- In the level 2, the Menu after 'Histogram' is communication selecting interface, if it is WiFi model, please choose 'WiFi Reset' or 'WiFi Reload' and long press 'Enter' will reset or reload the inverter WiFi mode. Wait for 20 seconds, operation result will show on display.
- In the level 2 menu, the Menu after 'Histogram' is communication selecting interface, if it is GPRS model, It shows as 'RSSI :XXX %'(000%—100%).it cannot be choose.
- In the level 2 menu, short press 'Set Addr' to get an added menu 'Set Addr:247'. Press 'Down' to choose 'Set Addr:247' and short press 'Enter' to enter Modbus address interface. Press 'Up' or 'Down' to set the address. long press 'Enter' to save the address.

This function is used for special requirements

- Long press 'ENTER' in the model type interface, there will be set safety interface Press 'Down' or 'Up' to choose the safety you need and then long press 'ENTER', the chosen safety will be set. If there is no EXACTLY proper country code, please choose '50Hz Grid Default' or '60Hz Grid Default' accordingly.




This function is used for special requirements.

- In the level 2 menu, choose 'Shadow OFF'(if shadow mode has not been turned on), long press 'Enter', it shows 'Shadow ON' indicating shadow mode has been successfully turned on. (Only available for DT series.)

This function is used for special requirements.

- In the level 2 menu, choose '70% Rated', at this time, the inverter is 100% output power, long press 'Enter', it becomes '100%

Rated', then the output power will be limited to 70%. The function is only for using with VDE AR-N 4105 standard or in France areas, and only for service person. Misuse will cause the inverter derating. This menu is not shown for other standards.

 This function is used for special requirements.

(5) Operation of Display when commissioning.

When the input voltage reaches inverter turn-on voltage, LCD displays 'waiting'. If the grid is accessible, 'Checking xxx Sec'(The time is decided by the grid connection standards from different country) will be shown up in 5sec, During the counting, the inverter is self-checking, when it shows '00Sec' you can hear the relay triggers, LCD displays 'Normal' afterwards. The instant power output will be shown at the right bottom of LCD.

4.3 Error Code

The error message in below diagram will be displayed on the LCD if a fault occurs.

Error code	Error message	Description
01	SPI Failure	Internal communication failure
02	EEPROM R/W Failure	Memory chip failure
03	Fac Failure	Grid frequency out of range
07, 25	Relay Check Failure	Relay self-checking failure
13	DC Injection High	Overhigh DC injection
14	Isolation Failure	Ground insulation impedance is too low
15	Vac Failure	Grid voltage out of range
16	EFan Fault	External Fan Failure
17	PV OverVoltage	Overvoltage at DC input
19	Over Temperature	Overtemperature on the case
20	IFan Fault	Internal Fan Failure
21	DC Bus High	Overhigh BUS voltage
22	Ground I Failure	Overhigh ground leakage current
23	Utility Loss	Grid disconnection/fault
30	Ref 1.5V Failure	1.5V reference voltage failure
31, 24	AC HCT Failure	Output current sensor failure
32, 26	GFCI Failure	Detection circuit of ground leakage current failure
Others	Device Failure	Internal device failure

4.4 WiFi Reset & WiFi Reload

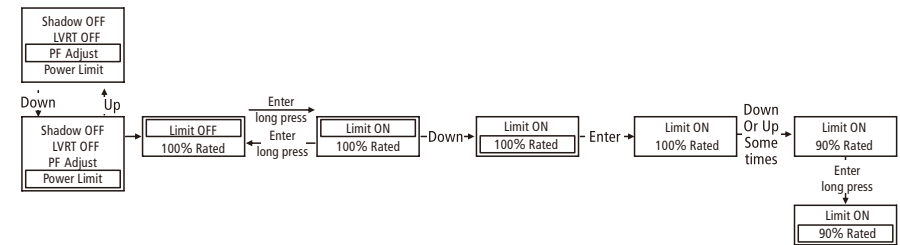
Choose 'WiFi Reset' button in level 2, long press 'Enter' to reset inverter WiFi model; wait for a while, operation result will show on display, the function can be applied when inverter is unable to connect to router or monitor server.

Choose 'WiFi Reload' button in level 2, long press 'enter' button will reload the inverter WiFi model to initial setting. Wait for a while, operation result will show on display, the function can be applied when inverter is unable to connect to WiFi model. Once WiFi model restore initial setting, WiFi model need be reset again.

Notice: WiFi model only.

4.5 Power limiting function setting

The Operations that the ON/OFF of power limiting function (the default is OFF) and the power limiting settings (the default is 2% Rated) are shown below :



Note: If the power limiting function is ON, the maximum output power of the inverter will be limited at the power limiting setting value while the inverter is without the power limiting device (such as a CT/Meter) or the power limiting device is out of work.

4.6 Special Adjustable Setpoints

The inverter has field adjustable function, such as trip points, trip times, reconnect times, active and invalid of QU curve, PU curve.

It is adjustable through special software, if you want to use it, please contact with after sales.

The methods document of using the software can download from goodwe website or contact with after sales.

5 Troubleshooting

If the Inverter is not able to work properly, please refer to the following instructions before contact your local service.

Should any problems arise, the red (FAULT) LED indicator on the front panel lights up and the LCD screen will display relevant information. Please refer to the following table for a list of error message and associated solutions.

	Display	Possible actions
System Fault	Isolation Failure	<ol style="list-style-type: none"> 1. Check the impedance between PV(+) & PV(-) and make sure the inverter is earthed. The impedance value must be greater than 200kΩ. 2. Contact local service office for help if the problem still exists.
	Ground} Failure	<ol style="list-style-type: none"> 1. The ground current is too high. 2. Unplug the inputs from the PV generator and check the peripheral AC system. 3. When the problem is cleared, reconnect the PV panel and check the Inverter status. 4. Contact local service office for help if the problem still exists.
	Vac Failure	<ol style="list-style-type: none"> 1. The PV Inverter will automatically restart within 5 minutes if the grid returns to normal. 2. Make sure grid voltage is in conformity with the specification. 3. Make sure Neutral (N) Wire and PE wire is connected well. 4. Contact local service office for help if the problem still exists.
	Fac Failure	<ol style="list-style-type: none"> 1. The PV Inverter will automatically restart within 5 minutes if the grid returns to normal. 2. Make sure grid frequency is in conformity with the specification. 3. Contact local service office for help if the problem still exists.
	Utility Loss	<ol style="list-style-type: none"> 1. Grid is not connected. 2. Check grid connection cables. 3. Check grid usability.

Display		Possible actions
Inverter failure	PV Over Voltage	<ol style="list-style-type: none"> 1. Check whether the PV open voltage is higher or too close to the maximum input voltage. 2. If the problem still exists when PV voltage is less than the maximum input voltage, contact local service office for help.
	Over Temperature	<ol style="list-style-type: none"> 1.The internal temperature is higher than normal value specified 2. Reduce ambient temperature. 3. Move the inverter to a cool place. 4. If the problem still exists, contact local service office for help.
	Relay-Check Failure	<ol style="list-style-type: none"> 1.Turn off DC switch of the inverter. 2.Wait till inverter LCD unlighted. 3.Turn on DC switch and make sure it connected. 4.If the problem still exists, contact local service office for help.
	DC Injection High	
	EEPROM R/W Failure	
	SCI Failure	
	SPI Failure	
	DC Bus High	
	GFCI Failure	
	IFan Fault	
EFan Fault		
AFan Fault		
No display	<ol style="list-style-type: none"> 1.Turn off DC switch, take off DC connector, check inverter module voltage. 2.Plug in DC connector, and turn on DC switch. 3.If voltage is lower than 250V⁽¹⁾, please check configuration of invert module. 4.If voltage is higher than 250V⁽¹⁾, please contact local office. 	

Notice: 1. At the place that marked⁽¹⁾ in the chart, DT series12KLV/15KLV/15K/17K/20K/25K-DT is 250V SDT Series 4000L/5000L/6000L/10KL/10KN/15KW-DT is 180V.

2. When sunlight is insufficient, the PV Inverter may continuously start up and shut down automatically due to insufficient power generated by the PV panel.

6 Technical Parameters and Block Diagram

6.1 Technical Parameters

Technical Data	GW4000-DT	GW5000-DT	GW6000-DT	GW8000-DT	GW9000-DT	GW10KN-DT	GW15KN-DT
PV String Input Data							
Max.DC Input Power(W)	5200	6500	7800	9600	10800	12000	19500
Max.DC Input voltage(V)	1000	1000	1000	1000	1000	1000	1000
MPPT range (V)	200~800	200~800	200~800	200~850	200~850	200~850	200~850
Start-up voltage (V)	180	180	180	180	180	180	180
MPPT Range for Full Load (V)	195~800	240~800	285~800	380~850	430~850	480~850	480~850
Nominal DC Input Voltage (V)	620	620	620	620	620	620	620
Max. Input Current (A)	11/11	11/11	11/11	11/11	11/11	11/11	22/11
Max. Short Current (A)	13.8	13.8	13.8	13.8	13.8	13.8	27.6/13.8
No.of MPP Trackers	2	2	2	2	2	2	2
No.of Input Strings per Tracker	1	1	1	1	1	1	2/1
DC Overcurrent Protection(A)	17	17	17	17	17	17	34
DC Backfeed Current	0						
Over Voltage Category	II						
AC Output Data							
Nominal Output Power (W)	4000	5000	6000	8000	9000	10000	15000
Max. Output Apparent Power (VA)	4000	5000	6000	8000	9000	10000	16500
Nominal Output Voltage (V)	400,3L/N/PE	400,3L/N/PE	400,3L/N/PE	400,3L/N/PE	400,3L/N/PE	400,3L/N/PE	400,3L/N/PE
Nominal Output Frequency(Hz)	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Max. Output Current (A)	8.5	8.5	10	12.1	13.6	15.2	24
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)						
Output THDi (@Nomina Output)	<2%						<1.5%
AC Overcurrent Protection(A)	16	16	16	25	25	25	32
AC Backfeed Current	0						
Over Voltage Category	III						
Current (inrush) a.c. A	15A 2us	15A 2us	15A 2us	15A 2us	15A 2us	15A 2us	15A 2us
Maximum output fault current a.c. A (peak and duration)	30A 40us	30A 40us	30A 40us	40A 40us	40A 40us	40A 40us	55A 15us
Efficiency							
Max. efficiency	98%			98.3%		98.3%	
Europe efficiency	>97.5%			>98%		>98.0%	
MPPT efficiency	99.9%						
Protection							
Anti-islanding Protection	AFD						
Input Reverse Polarity Protection	Integrated						
Insulation Resistor Detection	Integrated						
Residual Current Monitoring Unit	Integrated						
Output Over Current Protection	Integrated						
Output Short Protection	Integrated						

Technical Data	GW4000-DT	GW5000-DT	GW6000-DT	GW8000-DT	GW9000-DT	GW10KN-DT	GW15KN-DT
Output Over Voltage Protection	Integrated						
General Data							
Operating Temperature Range(°C)	-25~60						
Relative humidity	0~95%						
Operating Altitude(m)	≤4000						
Cooling	Natural convection						
Noise (dB)	<30					<40	
User Interface	LCD&LED						
Communication	WiFi or RS485						
Weight (kg)	24					26	
Size (Width*Height*Depth mm)	516*415*192					516*455*192	
Protection degree	IP65						
Night self consumption(W)	<1						
Topology	Transformerless						
Moisture Location Category	4K4H						
Environment category	Outdoor & Indoor						
External Environment Pollution Degree	Grade1、 2、 3						
Certifications&Standards							
Grid regulation	VDE-AR-N 4105,VDE0126-1-1 EN50438(PL),EN50438(SW) G83,IEC61727,AS4777.2 IEC62116,EN50438(IR) ERDF-NOI-RES_13E		VDE0126-1-1 EN50438(SW) G83,IEC61727,AS4777.2 IEC62116,EN50438(IR)			AS4777.2	
Safety regulation	IEC62109-1&2						
EMC	EN61000-6-1,EN61000-6-2,EN61000-6-3,EN61000-6-4						

Technical Data	GW15K-DT	GW17K-DT	GW20K-DT	GW25K-DT
PV String Input Data				
Max.DC Input Power(W)	19500	22100	26000	32500
Max.DC Input voltage(V)	1000	1000	1000	1000
MPPT range (V)	260~850	260~850	260~850	260~850
Start-up voltage (V)	250	250	250	250
MPPT Range for Full Load (V)	350~850	400~850	470~850	480~850
Nominal DC Input Voltage (V)	620	620	620	620
Max. Input Current (A)	22/22	22/22	22/22	27/27
Max. Short Current (A)	27.5/27.5	27.5/27.5	27.5/27.5	33.8/33.8
No.of MPP Trackers	2	2	2	2
No.of Input Strings per Tracker	2	2	2	3
DC Overcurrent Protection(A)	27A	27A	27A	35A
DC Backfeed Current	0			
Over Voltage Category	II			
AC Output Data				
Nominal Output Power (W)	15000	17000	20000	25000

Technical Data	GW15K-DT	GW17K-DT	GW20K-DT	GW25K-DT
Max. Output Apparent Power (VA)	15000	17000	20000	25000
Nominal Output Voltage (V)	400,3L/N/PE	400,3L/N/PE	400,3L/N/PE	400,3L/N/PE
Nominal Output Frequency(Hz)	50/60	50/60	50/60	50/60
Max. Output Current (A)	25	25	30	37
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)			
Output THDi (@Nomina Output)	<1.5%			
AC Overcurrent Protection(A)	44.5	47	49.5	59
AC Backfeed Current	0			
Over Voltage Category	III			
Current (inrush) a.c. A	100A 2us			
Maximum output fault current a.c.A (peak and duration)	64.5A <100us			
Efficiency				
Max. efficiency	98.2%		98.4%	
Europe efficiency	>97.7%		>98.1%	
MPPT efficiency	99.9%			
Protection				
Anti-islanding Protection	AFD			
Input Reverse Polarity Protection	Integrated			
Insulation Resistor Detection	Integrated			
DC SPD Protection	Integrated(Type II)			
Residual Current Monitoring Unit	Integrated			
Output Over Current Protection	Integrated			
Output Short Protection	Integrated			
Output Over Voltage Protection	Integrated			
General Data				
Operating Temperature Range(°C)	-25~60			
Relative humidity	0~95%			
Operating Altitude(m)	≤4000			
Cooling	Fan Cooling			
Noise (dB)	<30			
User Interface	LCD&LED			
Communication	WiFi or RS485			
Weight (kg)	39			40
SizeWidth*Height*Depth mm)	516*655*203			
Protection degree	IP65			
Night self consumption(W)	<1			
Topology	Transformerless			
Moisture Location Category	4K4H			
Environment category	Outdoor & Indoor			
External Environment Pollution Degree	Grade1、 2、 3			

*Maximum operating voltage is 950V.

Technical Data	GW15K-DT	GW17K-DT	GW20K-DT	GW25K-DT
Certifications&Standards				
Grid regulation	VDE-AR-N 4105,VDE0126-1-1 ERDF-NOI-RES_13E,NRS 097-2-1 EN50438(PL),EN50438(SW) G83/2,IEC61727,AS4777.2 IEC62116,EN50438(IR)	VDE-AR-N 4105, EN50438(PL),G83/2, EN50438(SW),IEC61727 IEC62116,EN50438(IR), MEA,PEA,NRS 097-2-1 ERDF-NOI-RES_13E AS4777.2,VDE0126-1-1	VDE-AR-N 4105, EN50438(PL),G83/2, EN50438(SW),IEC61727 IEC62116,EN50438(IR), NRS 097-2-1 ERDF-NOI-RES_13E AS4777.2,VDE0126-1-1	
Safety regulation	IEC62109-1&2			
EMC	EN61000-6-1,EN61000-6-2,EN61000-6-3,EN61000-6-4			

Technical Data	GW4000L-DT	GW5000L-DT	GW6000L-DT	GW10KL-DT
PV String Input Data				
Max.DC Input Power(W)	5200	6500	7800	12000
Max.DC Input voltage(V)	600	600	600	600
MPPT range (V)	200~550	200~550	200~550	200~550
Start-up voltage (V)	180	180	180	180
MPPT Range for Full Load (V)	195~550	240~550	285~550	320~550
Nominal DC Input Voltage (V)	480	480	480	480
Max. Input Current (A)	11/11	11/11	11/11	22/11
Max. Short Current (A)	13.8	13.8	13.8	27.6/13.8
No.of MPP Trackers	2	2	2	2
No.of Input Strings per Tracker	1	1	1	2/1
DC Overcurrent Protection(A)	17	17	17	34
DC Backfeed Current	0			
Over Voltage Category	II			
AC Output Data				
Nominal Output Power (W)	4000	5000	6000	10000
Max. Output Apparent Power (VA)	4000	5000	6000	10000
Nominal Output Voltage (V)	400,3L/N/PE	400,3L/N/PE	400,3L/N/PE	400,3L/N/PE
Nominal Output Frequency(Hz)	50/60	50/60	50/60	50
Max. Output Current (A)	8.5	8.5	10	15.2
Output Power Factor	~1(Adjustable from 0.8 leading to 0.8 lagging)			
Output THDi (@Nomina Output)	<2%			<1.5%
AC Overcurrent Protection(A)	25	25	25	25
AC Backfeed Current	0			
Over Voltage Category	III			
Current (inrush) a.c. A	15A 2us	15A 2us	15A 2us	15A 2us
Maximum output fault current a.c. A (peak and duration)	40A 40us	40A 40us	40A 40us	40A 40us
Efficiency				
Max. efficiency	98%			97.7%
Europe efficiency	>97.5%			>97.1%
MPPT efficiency	99.9%			

Technical Data	GW4000L-DT	GW5000L-DT	GW6000L-DT	GW10KL-DT
Protection				
Anti-islanding Protection	AFD			
Input Reverse Polarity Protection	Integrated			
Insulation Resistor Detection	Integrated			
Residual Current Monitoring Unit	Integrated			
Output Over Current Protection	Integrated			
Output Short Protection	Integrated			
Output Over Voltage Protection	Integrated			
General Data				
Operating Temperature Range(°C)	-25~60			
Relative humidity	0~95%			
Operating Altitude(m)	≤4000			
Cooling	Natural convection			
Noise (dB)	<30			
Weight (kg)	24			26
Size (Width*Height*Depth mm)	516*415*192			516*455*192
Protection degree	IP65			
Night self consumption(W)	<1			
Topology	Transformerless			
Moisture Location Category	4K4H			
Environment category	Outdoor & Indoor			
External Environment Pollution Degree	Grade1、2、3			
Certifications&Standards				
Grid regulation	AS4777.2,VDE0126-1-1,VDE-AR-N 4105,EN50438			AS4777.2
Safety regulation	IEC62109-1&2			
EMC	EN61000-6-1,EN61000-6-2,EN61000-6-3,EN61000-6-4			

Technical Data	GW12KLV-DT	GW15KLV-DT
PV String Input Data		
Max.DC Input Power(W)	15600	19500
Max.DC Input voltage(V)	800	800
MPPT range (V)	260~650	260~650
Start-up voltage (V)	180	180
MPPT Range for Full Load (V)	410~850	385~800
Max. Input Current (A)	20/10	20/20
Max. Short Current (A)	25/12.5	25/25
No.of MPP Trackers	2	2
No.of Input Strings per Tracker	2	3
DC Overcurrent Protection(A)	27	35
DC Backfeed Current	0	
Over Voltage Category	II	

Technical Data		GW12KLV-DT	GW15KLV-DT
AC Output Data			
Nominal Output Power (W)	208Vac System	11300	14200
	220Vac System	12000	15000
	240Vac System	13000	16000
Max. Output Apparent Power (VA)		13000	16000
Nominal Output Voltage (V)		150~300	150~300
Nominal Output Frequency(Hz)		50/60	50/60
Max. Output Current (A)		31.5	39.5
Output Power Factor		~1(Adjustable from 0.8 leading to 0.8 lagging)	
Output THDi (@Nomina Output)		<3%	
AC Overcurrent Protection(A)		49.5	59
AC Backfeed Current		0	
Over Voltage Category		III	
Current (inrush) a.c. A		100A 2us	
Maximum output fault current a.c. A (peak and duration)		64.5A <100us	
Efficiency			
Max. efficiency		98.4%	
Europe efficiency		>98.1%	
MPPT efficiency		99.9%	
Protection			
Anti-islanding Protection		AFD	
Input Reverse Polarity Protection		Integrated	
Insulation Resistor Detection		Integrated	
Residual Current Monitoring Unit		Integrated	
DC SPD Protection		Integrated(Type II)	
Output Over Current Protection		Integrated	
Output Short Protection		Integrated	
Output Over Voltage Protection		Integrated	
General Data			
Operating Temperature Range(°C)		-25~60	
Relative humidity		0~95%	
Operating Altitude(m)		≤4000	
Cooling		Fan Cooling	
Noise (dB)		<45	
User Interface		LCD&LED	
Communication		WiFi or RS485	
Weight (kg)		39	
Size (Width*Height*Depth mm)		516*655*203	
Protection degree		IP65	
Night self consumption(W)		<1	

Technical Data		GW12KLV-DT	GW15KLV-DT
Topology		Transformerless	
Moisture Location Category		4K4H	
Environment category		Outdoor & Indoor	
External Environment Pollution Degree		Grade1、2、3	
Certifications&Standards			
Grid regulation		IEEE1547	
Safety regulation		IEC62109-1&2	
EMC		EN61000-6-1,EN61000-6-2,EN61000-6-3,EN61000-6-4	

Zref :

- SDT4~10KW/SDT4KL~10KL :
RA = 0.24 ; XA = j 0.15 at 50 Hz; RN = 0.16 ; XN = j 0.10 at 50 Hz.
- DT15KW~25KW/SDT15KW/DT12KLV&15KLV :
RA = 0.15 ; XA = j 0.15 at 50 Hz; RN = 0.10 ; XN = j 0.10 at 50 Hz.

Note

Overvoltage category definition

Category I: applies to equipment connected to a circuit where measures have been taken to reduce transient overvoltage to a low level.

Category II: applies to equipment not permanently connected to the installation. Examples are appliances, portable tools and other plug-connected equipment;

Category III: applies to fixed equipment downstream of and including, the main distribution board. Examples are switchgear and other equipment in an industrial installation;

Category IV: applies to equipment permanently connected at the origin of an installation (upstream of the main distribution board)
Example are electricity meters, primary overcurrent protection equipment and other equipment connected directly to outdoor open lines.

Moisture location category definition

Moisture parameters	Level		
	3K3	4K2	4K4H
Temperature Range	0~+40°C	-33~+40°C	-20~+55°C
Humidity Range	5% ~ 85%	15% ~ 100%	4% ~ 100%

Environment category definition

Outdoor : the ambient air temperature is -20~50°C, Relative humidity range is 4% to 100%, applied to PD3

Indoor unconditioned: the ambient air temperature is -20~50°C, Relative humidity range is 5% to 95%, applied to PD3

Indoor conditioned: the ambient air temperature is 0~40°C, Relative humidity range is 5% to 85%, applied to PD2

Pollution degree definition

Pollution degree 1: No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.

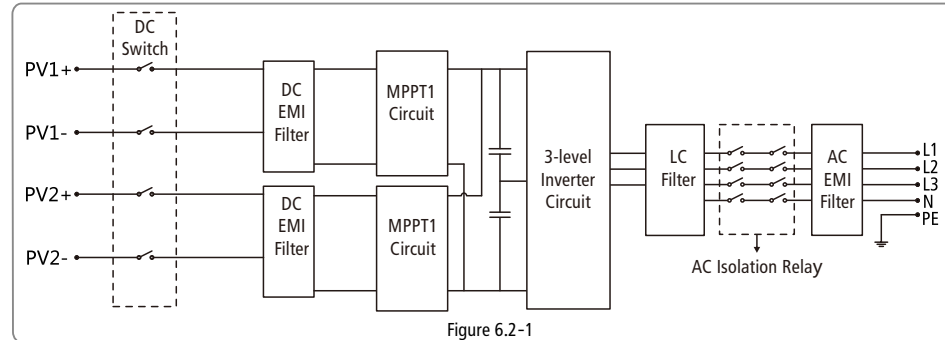
Pollution degree 2: Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected.

Pollution degree 3: Conductive pollution occurs, or, dry, non-conductive pollution occurs which becomes conductive due to condensation which is expected.

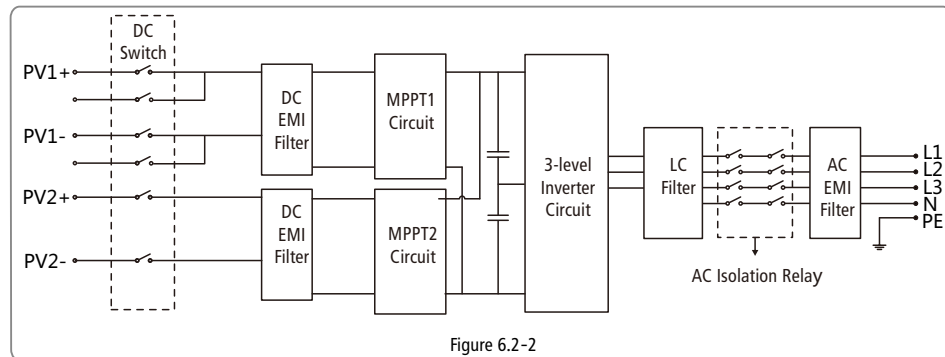
Pollution degree 4: Persistent conductive pollution occurs, for example, the pollution cause by conductive dust, rain and snow.

6.2 Block Diagram

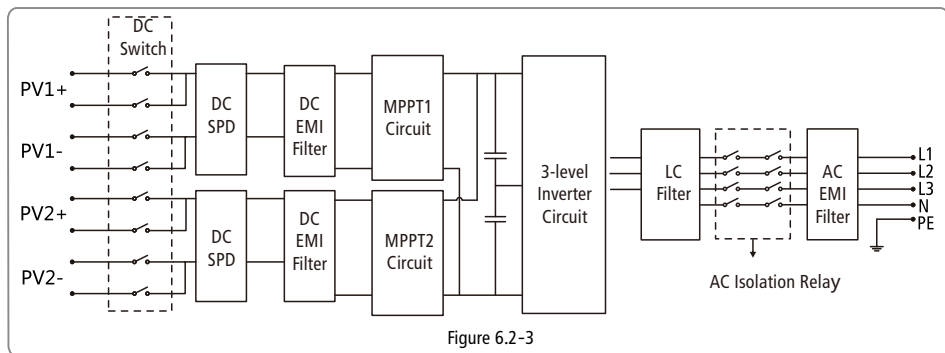
Block Diagram of SDT4~10KW refer to figure 6.2-1:



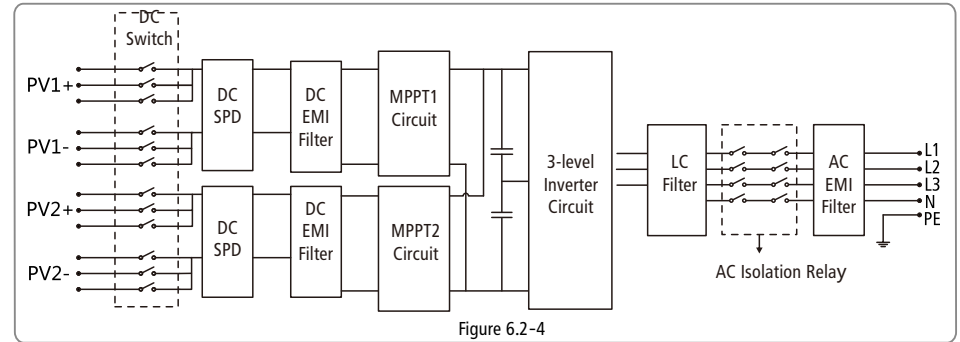
Block Diagram of SDT10KL&SDT15KW refer to figure 6.2-2:



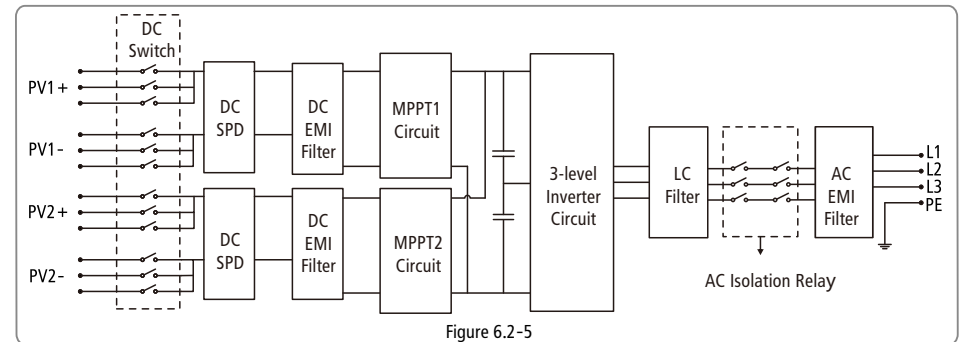
Block Diagram of GW12KLV-DT&GW15K-DT&GW17K-DT&GW20K-DT refer to Figure 6.2-3.



Block Diagram of GW15KLV-DT/GW25K-DT refer to Figure 6.2-4.



Block Diagram of GW30K-DT refer to Figure 6.2-5.



7 Maintenance

Regular maintenance ensures a long operating life and optimal efficiency of the entire PV plant.

Caution: Before maintains please disconnect the AC breaker firstly and then disconnect DC breaker. Wait 5 minutes until the residual voltage has been drained.

7.1 Cleaning

DT series inverter is fitted with two fans on its left side. The fan intakes and handle covers should be cleaned yearly with a vacuum cleaner. For more thorough cleaning, completely remove the fans.

- Disconnect the AC breaker firstly and then disconnect DC breaker.
- Wait 5 minutes until the residual voltage has been drained and the fans are no longer turning.
- Disassembly the fans (refer to Figure 7.1-1).
 - 1) Loosen the five M4 screws with a crosshead screwdriver, then remove the fans out the cabinet about 50mm slowly.
 - 2) Open the lockers of the two fan connectors and remove them from housing, then take the fans away.
- Clean the ventilation grid and the fan with a soft brush, a paint brush, a cloth, or compressed air.
- Reassembly the out fans into cabinet.
- Please use towel to clean the heatsink once a year.

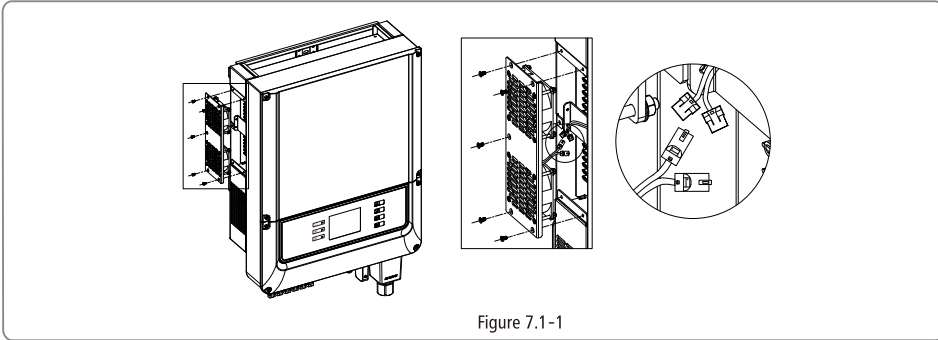


Figure 7.1-1

7.2 Checking the DC Switch

DC switch does not require any maintenance.

It is recommended, though not compulsory, to:

- Check the DC switch regularly.
- Activate the DC switch 10 times in a row once a year.

Operating the switch will clean the contacts and will extend the life of the DC switch.

Boot order

1. Turn on the breaker on AC side.
2. Turn on the DC switch.
3. Turn on the breaker on DC side.

Caution: if there is no switch, operate from step 1 to step 3.

shutdown order

1. Turn off the breaker on AC side.
2. Turn off the DC switch.
3. Turn off the breaker on DC side.

Caution: if there is no switch, operate from step 1 to step 3.

7.3 Checking the Electrical Connection

1. Check if the AC or DC wire is loose.
2. Check if the earth wire is reliable grounding.
3. Check if the waterproof covers of RS485 and USB port is fasten.
4. Please use torque wrench to tighten the AC and battery terminal wiring connection. Followed 3.4 torque instruction.

Caution: Maintenance cycle is once half a year.

8 Certificates

