

# selec



## ON GRID SOLAR INVERTER

### OPERATING INSTRUCTIONS

(3kW / 5kW / 6kW / 7kW / 7.5kW / 8kW / 10kW)

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## 1. Manual overview



### Warning

- Before using **GTI-SERIES** inverter, please read all safety and operational instructions and warnings on the unit and in this manual carefully
- **Selec Controls Pvt. Ltd.** is not liable for any damages caused by failure to observe and follow these instructions in the manual
- **Selec Controls Pvt. Ltd.** holds the rights to make future changes in this manual and accepts no responsibility to inform the users

### 1.1 What is inside the manual ?

- This manual contains all the technical information required for the installation, operation, maintenance and troubleshooting of the **GTI-SERIES** solar inverter
- All the important safety and operational guidelines are present in this manual
- To ensure correct and safe operation read this manual properly

### 1.2 Target group

- The content in this manual is meant for **qualified persons** only
- For safety reasons only a qualified person can install, operate, troubleshoot and repair this device
- Qualified person should also be familiar with local requirements, rules and regulations

### Note

- Hereby qualified person means one who has received training or has demonstrated skills and knowledge in construction and in operation of this device

### 1.3 Storage of the manual

- Keep this manual at a location from where it is accessible all time in case of any emergency

### 1.4 Additional information

- Please refer to ***www.selec.com*** for the updated version of manual

2. Product Overview

2.1 Intended use of inverter

**GTI-SERIES** inverter are Grid Tied Solar Inverter. When sunrays fall upon the PV array, DC power is generated by these arrays. This power is fed to the inverter as input. Inverter will convert this DC power into AC power and feed it to three phase utility grid. **GTI-SERIES** are two string inverter with 2 independent MPPT trackers or one string with 1 independent MPPT tracker.\*

Overview of complete Grid Tied PV system with **GTI-SERIES** inverter:

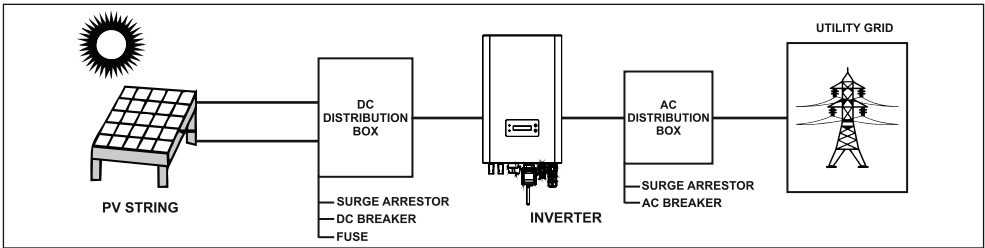


Fig. 1

As shown in Fig 1, the complete system consists of PV array, DC distribution box, GTI-SERIES inverter, AC distribution box and utility grid.

2.2 Inverter overview

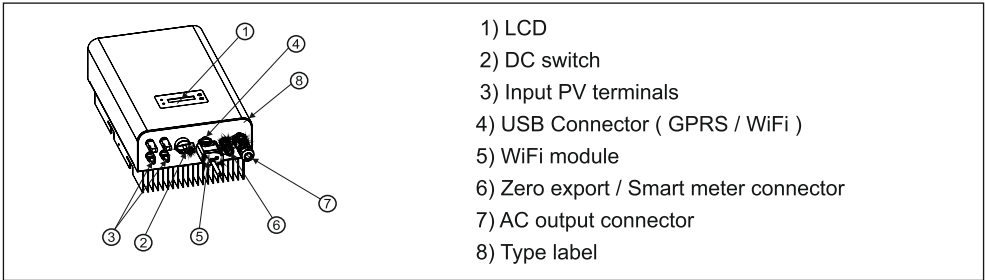


Fig. 2

2.3 Weight and Dimensions

1) Weight of the Inverter is 11 kilogram

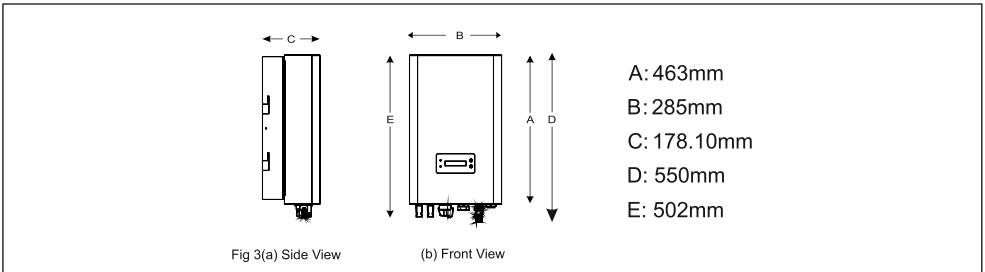


Fig. 3

## 2.4 Type of labels

Type label is present on the right hand side of inverter. Type label has information about inverter specific characteristics, Various symbols, Certificates and Approval.

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PV GRID INVERTER

Model : GTI0103PN402

DC Input Range : 120 - 1000V DC  
Max. DC Voltage : 1100V DC  
MPPT Voltage Range : 120 - 1000V  
Max. Input Current : 2\*22A  
Isc PV (Absolute maximum)  
DC per MPPT : 30A

AC Output : 240/415V AC, 50 Hz  
3P/4W/PE, cosφ 0.8lag-0.8lead  
Max. Output current : 3\*16A  
Apparent Power :  
10kVA nom, 11kVA max

Safety Level : Class 1  
Ambient Temp : -25 °C...+60 °C



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PV GRID INVERTER

Model : GTI0083PN402

DC Input Range : 120 - 1000V DC  
Max. DC Voltage : 1100V DC  
MPPT Voltage Range : 120 - 1000V  
Max. Input Current : 2\*22A  
Isc PV (Absolute maximum)  
DC per MPPT : 30A

AC Output : 240/415V AC, 50 Hz  
3P/4W/PE, cosφ 0.8lag-0.8lead  
Max. Output current : 3\*12.88A  
Apparent Power :  
8kVA nom, 8.8kVA max

Safety Level : Class 1  
Ambient Temp : -25 °C...+60 °C



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PV GRID INVERTER

Model : GTI007X53PN402

DC Input Range : 120 - 1000V DC  
Max. DC Voltage : 1100V DC  
MPPT Voltage Range : 120 - 1000V  
Max. Input Current : 2\*22A  
Isc PV (Absolute maximum)  
DC per MPPT : 30A

AC Output : 240/415V AC, 50 Hz  
3P/4W/PE, cosφ 0.8lag-0.8lead  
Max. Output current : 3\*12.07A  
Apparent Power :  
7.5kVA nom, 8.25kVA max

Safety Level : Class 1  
Ambient Temp : -25 °C...+60 °C



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PV GRID INVERTER

Model : GTI0073PN402

DC Input Range : 120 - 1000V DC  
Max. DC Voltage : 1100V DC  
MPPT Voltage Range : 120 - 1000V  
Max. Input Current : 2\*22A  
Isc PV (Absolute maximum)  
DC per MPPT : 30A

AC Output : 240/415V AC, 50 Hz  
3P/4W/PE, cosφ 0.8lag-0.8lead  
Max. Output current : 3\*11.27A  
Apparent Power :  
7kVA nom, 7.7kVA max

Safety Level : Class 1  
Ambient Temp : -25 °C...+60 °C



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PV GRID INVERTER

Model : GTI0063PN402

DC Input Range : 120 - 1000V DC  
Max. DC Voltage : 1100V DC  
MPPT Voltage Range : 120 - 1000V  
Max. Input Current : 2\*22A  
Isc PV (Absolute maximum)  
DC per MPPT : 30A

AC Output : 240/415V AC, 50 Hz  
3P/4W/PE, cosφ 0.8lag-0.8lead  
Max. Output current : 3\*9.66A  
Apparent Power :  
6kVA nom, 6.6kVA max

Safety Level : Class 1  
Ambient Temp : -25 °C...+60 °C



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PV GRID INVERTER

Model : GTI0053PN401

DC Input Range : 120 - 1000V DC  
Max. DC Voltage : 1100V DC  
MPPT Voltage Range : 120 - 1000V  
Max. Input Current : 1\*22A  
Isc PV (Absolute maximum)  
DC per MPPT : 30A

AC Output : 240/415V AC, 50 Hz  
3P/4W/PE, cosφ 0.8lag-0.8lead  
Max. Output current : 3\*8A  
Apparent Power :  
5kVA nom, 5.5kVA max

Safety Level : Class 1  
Ambient Temp : -25 °C...+60 °C



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**PV GRID INVERTER**
**Model : GTI0053PN402**

DC Input Range : 120 - 1000V DC  
 Max. DC Voltage : 1100V DC  
 MPPT Voltage Range : 120 - 1000V  
 Max. Input Current : 2\*22A  
 Isc PV (Absolute maximum)  
 DC per MPPT : 30A

AC Output : 240/415V AC, 50 Hz  
 3P/4W/PE, cosφ 0.8lag~0.8lead  
 Max. Output current : 3\*8A  
 Apparent Power :  
 5kVA nom, 5.5kVA max

Safety Level : Class 1  
 Ambient Temp : -25 °C...+60 °C

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**PV GRID INVERTER**
**Model : GTI0033PN401**

DC Input Range : 120 - 1000V DC  
 Max. DC Voltage : 1100V DC  
 MPPT Voltage Range : 120 - 1000V  
 Max. Input Current : 1\*22A  
 Isc PV (Absolute maximum)  
 DC per MPPT : 30A

AC Output : 240/415V AC, 50 Hz  
 3P/4W/PE, cosφ 0.8lag~0.8lead  
 Max. Output current : 3\*4.8A  
 Apparent Power :  
 3kVA nom, 3.3kVA max

Safety Level : Class 1  
 Ambient Temp : -25 °C...+60 °C

IP65


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## 2.5 Symbols on the inverter

| Symbol                                                                            | Description                                                                                                          |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
|  | Be careful of high voltages                                                                                          |
|  | Risk of danger. Failure to observe safety information in manual may result in serious injury or death                |
|   | Residual voltage Hazard. Please wait for 5 minutes before opening to ensure the capacitors are completely discharged |
|  | Risk of burns due to hot surfaces                                                                                    |
|  | Read the manual before installing GTI-SERIES Inverters                                                               |
|  | Do not dispose this inverter with household waste                                                                    |
|  | Protective earth terminal                                                                                            |
| IP65                                                                              | GTI-SERIES inverter complies with IP65 norms                                                                         |

Table 1

### Indications on front side of inverter:

| Indication | Description               |
|------------|---------------------------|
| Red LED    | Alarm status              |
| Green LED  | Status of grid connection |

Table 2

## 2.6 Transportation

Our inverters go out of the factory in proper electrical and mechanical condition after thorough testing and inspection. To ensure safe and careful transportation special packaging is used. If you find packing problems or find any visible damage, please immediately contact your dealer or Selec Controls Pvt Ltd. Transport of the equipment, especially by road, must be carried out with suitable means for protecting the components, in particular the electronic components from violent shocks, humidity, vibration, etc.

## 2.7 Storage

While not in load condition, Inverter should be stored in clean, dry and covered space in original packaging.

### 3. Safety instructions

This chapter contains safety instructions and guidelines that must be followed at all times while working on or with the product. To prevent personal injury, property damage and to ensure long-term operation of the product, read this section carefully and observe all safety information at all times.

#### 3.1 Safety during assembly

##### Warning

- The GTI-SERIES inverter should be operated with permanent connection with utility grid and not recommended for mobile use
- Unintended use of this inverter is sole risk of the operator and manufacturer/supplier is not responsible for any damage caused by such use
- For safety reasons only a qualified person can install, operate, troubleshoot and repair this device
- Qualified person should also be familiar with local requirements, rules and regulations

### 4. Unpacking and Accessories

#### 4.1 Unpacking

During transportation unpredictable damages may occur with inverter unit and the accessories. On receiving the unit please do thorough inspection for any visible external damages on package. If any external visible damage is found, Do not unpack inverter unit and contact the dealer as soon as possible.

#### 4.2 Accessories

Once you unpack the unit, Please ensure that all accessories are present in the box and undamaged. Please contact your dealer if anything is missing or damaged. All the accessories present in the box are listed as follow in Fig 4 & Table 3.

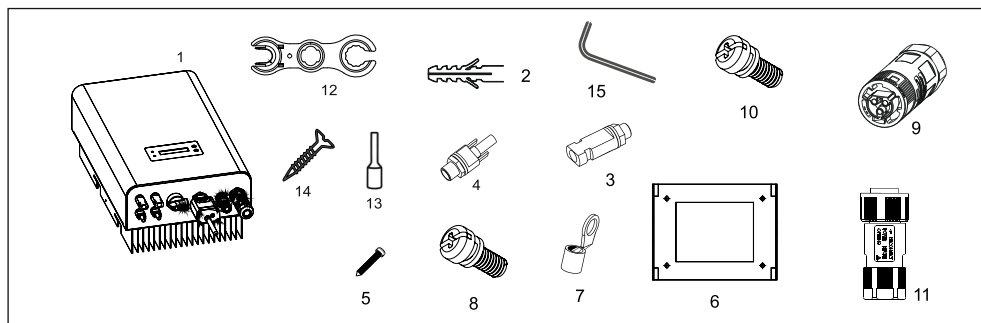


Fig. 4

| Item | Quantity | Description                                      |
|------|----------|--------------------------------------------------|
| 1    | 1        | Inverter                                         |
| 2    | 4        | Rawal plug                                       |
| 3    | 2        | PV male connector                                |
| 4    | 2        | PV female connector                              |
| 5    | 4        | Self tapping screw                               |
| 6    | 1        | Wall mounting plate                              |
| 7    | 1        | Ring type lug                                    |
| 8    | 1        | M5 x 8mm philips head screw                      |
| 9    | 1        | AC circular connector female                     |
| 10   | 2        | M4 x 10mm philips head screw (Inverter mounting) |
| 11   | 1        | Zero export / Smart meter connector              |
| 12   | 1        | MC4 opening tool                                 |
| 13   | 5        | Ferrule lug 4sqmm                                |
| 14   | 4        | Screw philips ms 14x38mm                         |
| 15   | 1        | Allen key for comm connector                     |

Table 3

## 5. Installation

This chapter guide installer how to install GTI-SERIES inverter.

### 5.1 Safety note before installation:

#### Caution

- Weight of GTI-SERIES Inverter is 12 kg. Hold inverter tightly before mounting & moving
- Mounting surface should be rigid & able to handle weight of GTI-SERIES inverter

#### Warning

- Avoid installing GTI-SERIES inverter near or on flammable materials



- Hot surface of GTI-SERIES Inverter may create a burn hazard to a person who is touching hot surface, to avoid this mount inverter at appropriate height
- Input to this inverter is DC (Direct current) which is a PV array generator. Do not connect any other source to it
- Output of inverter is AC (Alternating current) which is connected to a utility grid. Power generated from inverter is delivered to a utility grid hence it should not be connected any other AC source or generator
- Make sure DC switch is at OFF position. If it is on ON position switch it to OFF position

## 5.2 Installation of inverter

GTI-SERIES inverter is developed for use in an outdoor location with IP 65 protection but avoid direct contact of inverter with sunlight, Rainfall and snowfall. Fig 5 shows ideal locations for installation of inverter.

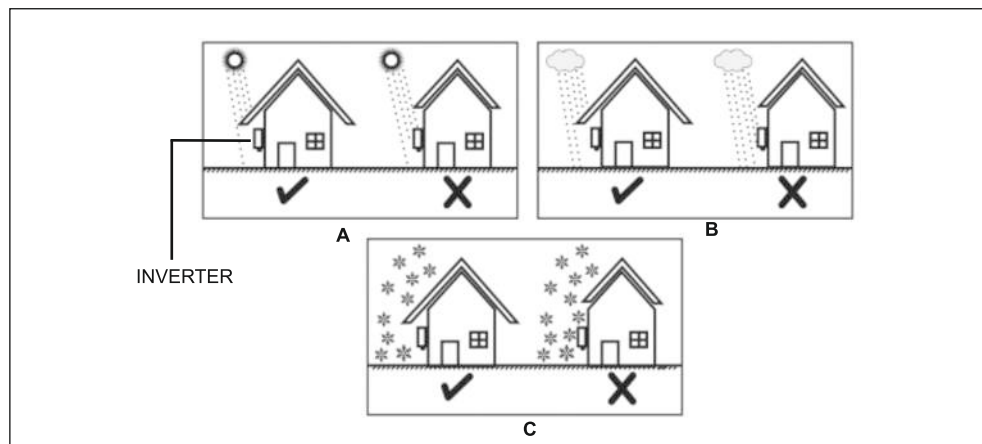


Fig. 5

Ideal installing position shown in fig 6

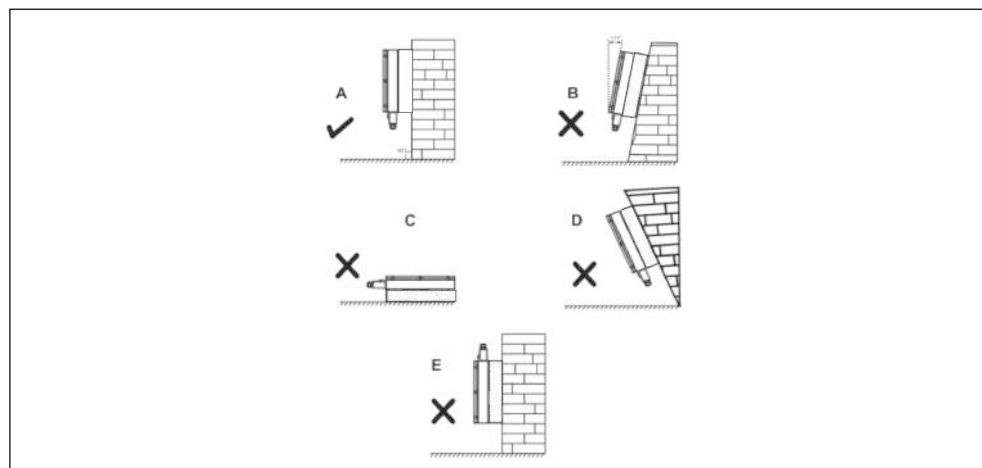


Fig. 6

### Notice

- Mount the GTI-SERIES inverter on rigid, Strong wall in such way that it can handle weight of inverter
- Mount inverter on such a height that commissioning, Decommissioning, Turning ON and turning OFF is easily possible

5.2.1 Clearance for installation

Install inverter on wall with minimum clearance as shown in fig 7.

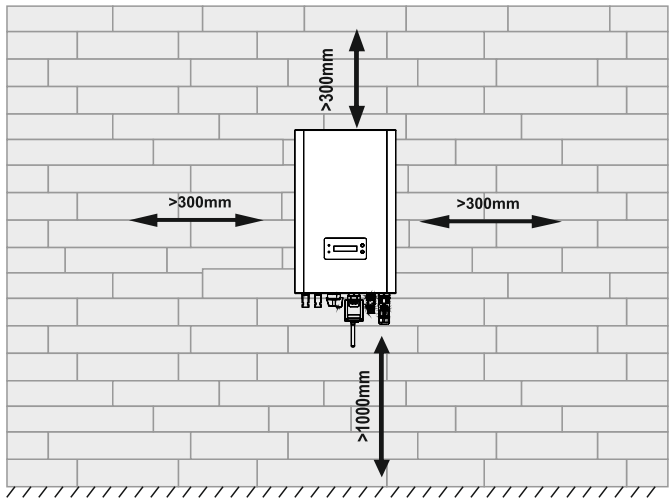


Fig. 7

To install more than one inverter in series follow fig 8. for minimum clearance. This clearance should be provided for easy installation, removal & heat dissipation of GTI-SERIES inverter.

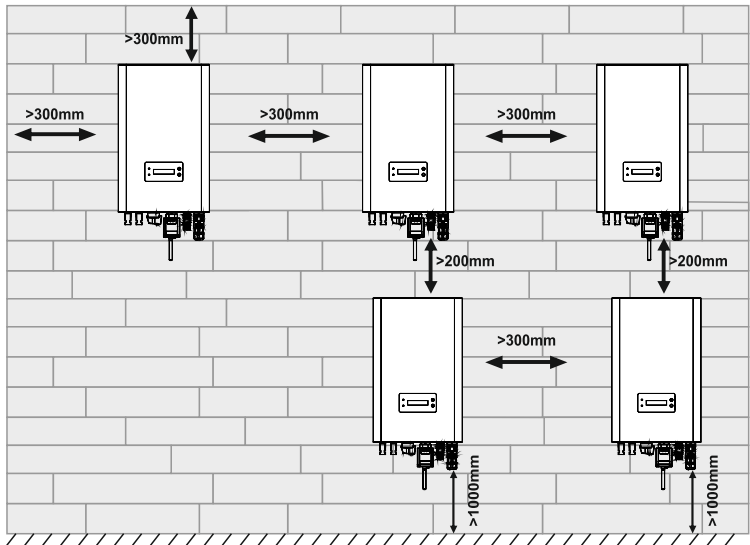


Fig. 8

## 5.2.2 Mounting inverter on wall

### Steps to mount inverter with bracket

**Step 1:** Drill four holes on wall at distance of inverter mounting position as shown in fig. 9 & insert self tapping screw in holes.

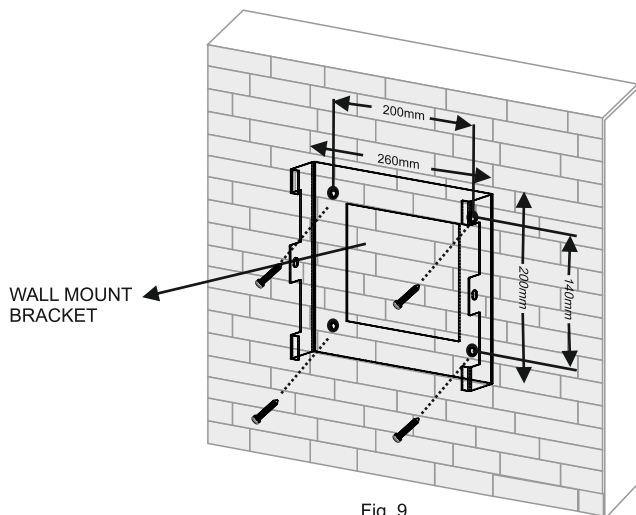


Fig. 9

**Step 2:** Mount inverter on mounting bracket with help of at least two people. Tighten the bolt and ensure inverter is properly fitted on bolt as per fig. 10.

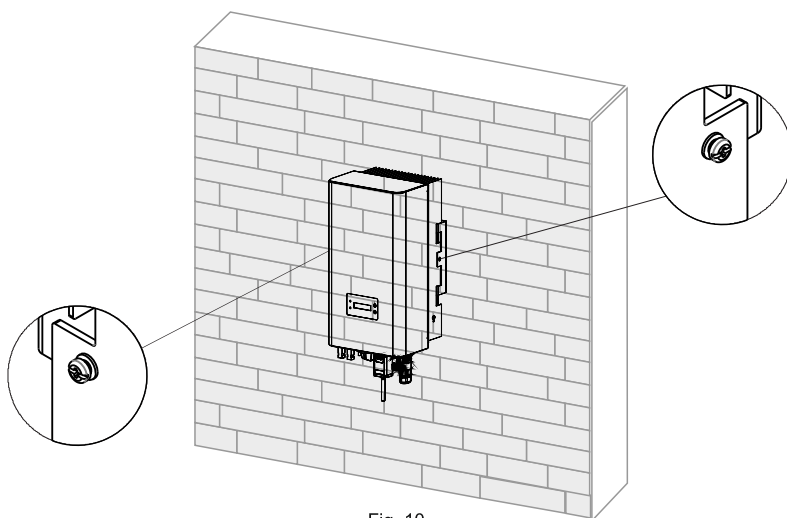


Fig. 10

6. Electrical connections

This section helps installer, how to do electrical connection to GTI-SERIES inverter. Electrical connection has to be performed by qualified and authorised person only.

 **Caution**

Check if DC Disconnect switch is in OFF position as shown in following fig 11.

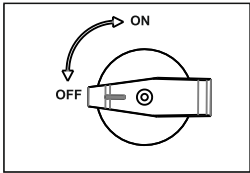


Fig. 11

 **Warning**

- Whenever a PV array is exposed to sunlight it supplies DC Voltage. Shock hazard may occurs if terminals are open. Cover PV array with opaque material before commencing any wiring
- Ensure string's open circuit voltage should be less than inverter's maximum input voltage. Applying more voltage can damage inverter
- Do not disconnect AC & DC cables under load condition

6.1 DC Connection to Inverter

| Model          | Current rating | Wire size |
|----------------|----------------|-----------|
| GTI0103PN402   | 22A            | 4 sq.mm   |
| GTI0083PN402   | 22A            | 4 sq.mm   |
| GTI007X53PN402 | 22A            | 4 sq.mm   |
| GTI0073PN402   | 22A            | 4 sq.mm   |
| GTI0063PN402   | 22A            | 4 sq.mm   |
| GTI0053PN401   | 22A            | 4 sq.mm   |
| GTI0053PN402   | 22A            | 4 sq.mm   |
| GTI0033PN401   | 22A            | 4 sq.mm   |

Table 4

- 1) Do not connect PV array positive terminal or negative terminal to the grounding of system
- 2) Make sure PV connector's (Male & female) polarity is proper
- 3) Connect PV connectors as shown in fig. 13
- 4) Make sure connectors to Inverter DC terminal are connected properly

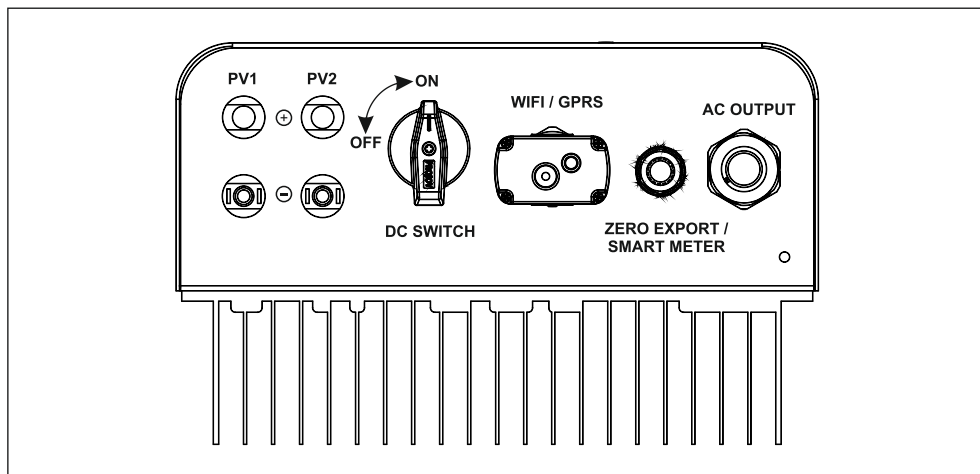


Fig. 12

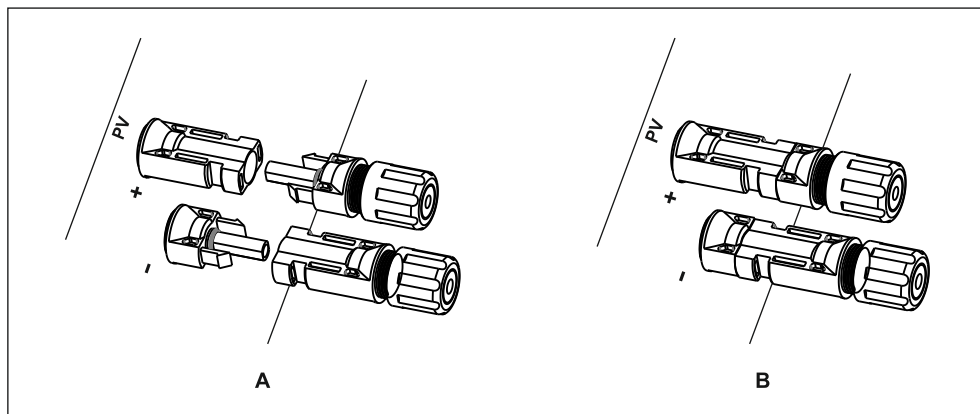


Fig. 13

## 6.2 AC Connections

### ⚠ Caution

- For the purpose of over current protection use circuit breaker between inverter & utility grid. Use 4 Pole 32A / 415 AC rated AC breaker
- Do not connect any load between inverter & Grid side circuit breaker Before starting connection make sure that circuit breaker is OFF

6.2.1 Steps for AC wiring

**Note** - This inverter has in-build residual current monitoring device. If system installer wants to use other residual current monitoring device then must use device which triggers in the event of residual current of 300mA or more.

| Model          | Current rating | Wire size |
|----------------|----------------|-----------|
| GTI0103PN402   | 16A            | 4 sq.mm   |
| GTI0083PN402   | 12.88A         | 4 sq.mm   |
| GTI007X53PN402 | 12.07A         | 4 sq.mm   |
| GTI0073PN402   | 11.27A         | 4 sq.mm   |
| GTI0063PN402   | 9.66A          | 4 sq.mm   |
| GTI0053PN401   | 8A             | 4 sq.mm   |
| GTI0053PN402   | 8A             | 4 sq.mm   |
| GTI0033PN401   | 4.8A           | 4 sq.mm   |

Table 5

- 1) Take cable side AC connector from accessories and loose the connector gland
- 2) Use 5 core AC cables of 4 sq.mm size for AC connection (Recommended wire size)
- 3) Strip AC wires and put lugs using crimping tool, it will ensure no wire strands are open & avoid accidental shorting of two wire
- 4) Put these wires in AC Connector & Screw it tightly, With help of No : 901 screw driver
- 5) Fig. 14 shows labels for AC circular connector
- 6) Insert 5 core wire through connector gland and screw a wire in respective terminals on female circular connector
- 7) Tighten the screw and fit the connector gland to female circular connector

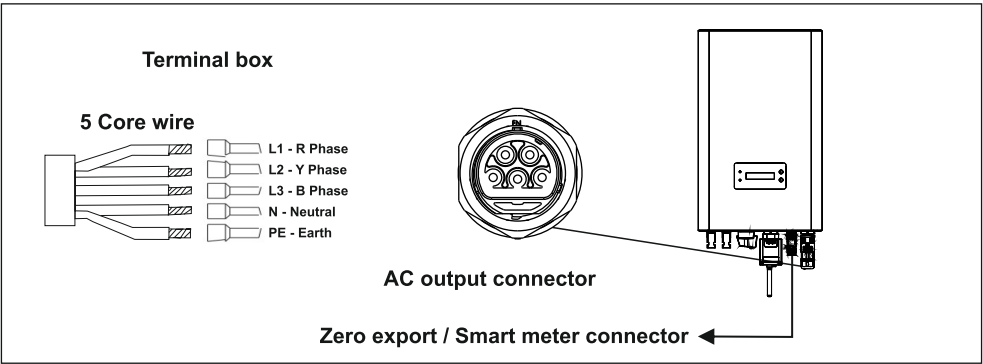


Fig. 14

6.3 Communication module

6.3.1 Communication connection

GTI-SERIES inverter's Communication terminal consist of RS485 and smart meter connections as shown in fig. 15. Table 6 explains signal connection on communication terminal.

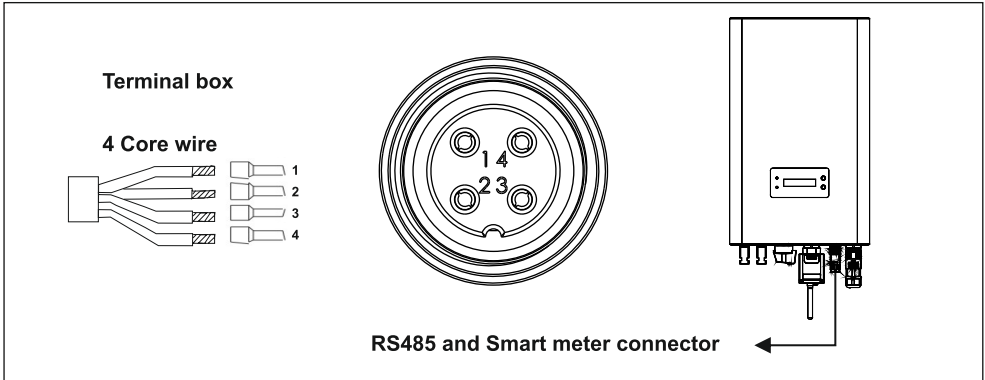


Fig. 15

6.3.1.1 Connecting signal cable

| Pin No | Definition |                                |
|--------|------------|--------------------------------|
| 1      | A+         | RS485 communication pins       |
| 2      | A-         |                                |
| 3      | SMA+       | Smart meter communication pins |
| 4      | SMA-       |                                |

Table 6

6.3.2 Steps to Communication wiring

- 1) Take a female 4 pin circular connector from accessories and loose the connector gland
- 2) Use 4 core AC cables of 1 sq.mm size for communication connection
- 3) Strip a wires & put these wires in communication connector with respect to shown in 6.3.1.1 table & Screw it tightly, with help of given allen key
- 4) Fig 15 shows labels for (RS485) com and smart meter connector
- 5) Insert 4 core wire through connector gland and screw a wire in respective terminals on female circular connector
- 6) Tighten the screw and fit the connector cap to female circular connector

6.4 AC Grounding

Grid's earth terminal must be connected to inverter's protective earth (PE) terminal as shown in fig 16.

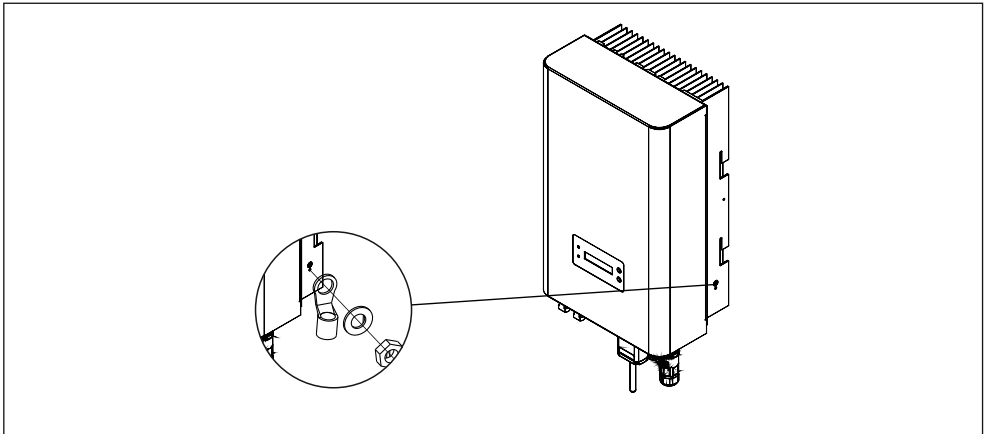


Fig. 16

7. Display, Communication and Troubleshooting

7.1 LCD Operating Steps

7.1.1 LCD Key Annotations



Fig. 17

7.1.2 LCD Operations

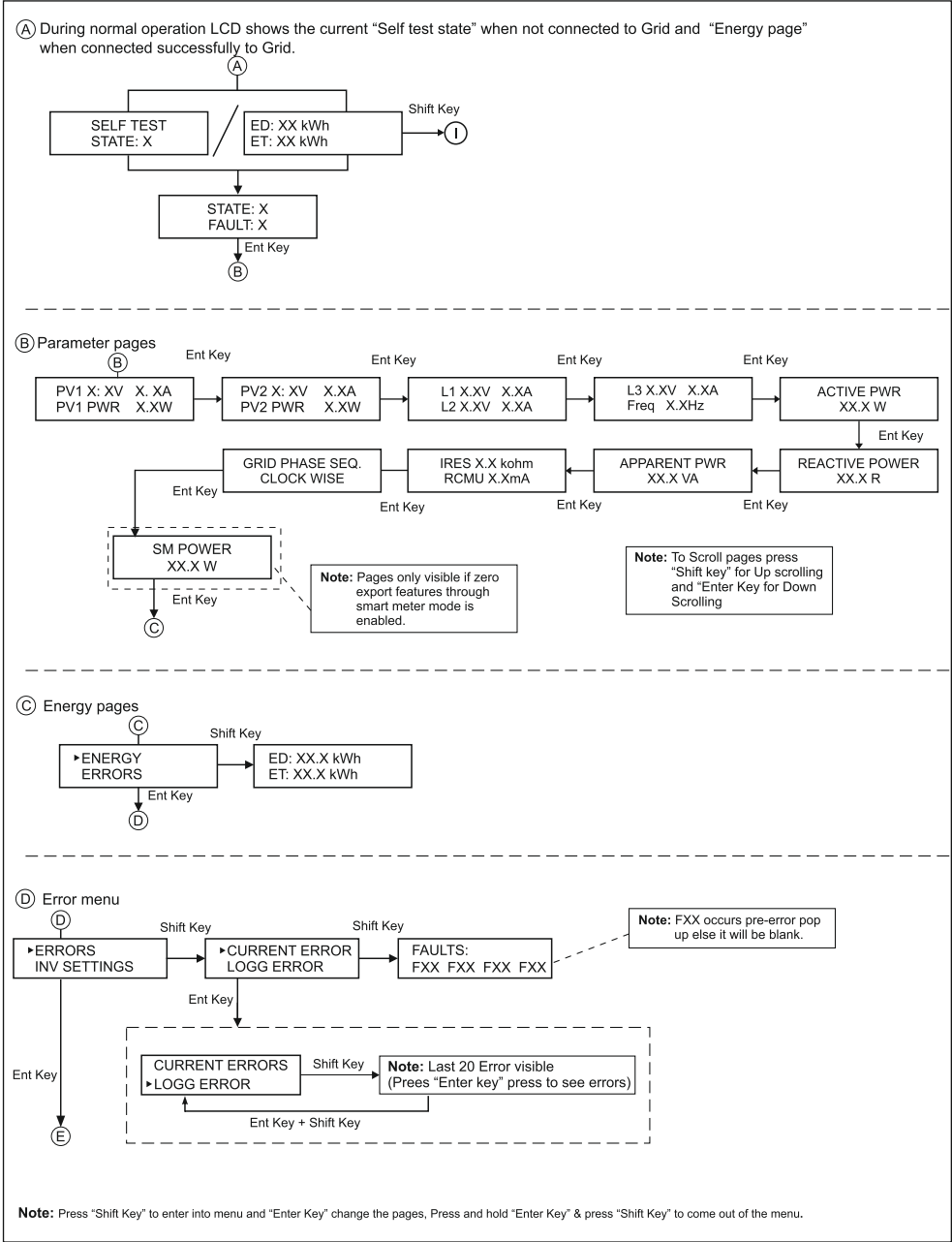


Fig. 18



7.1.4 Zero Export Control

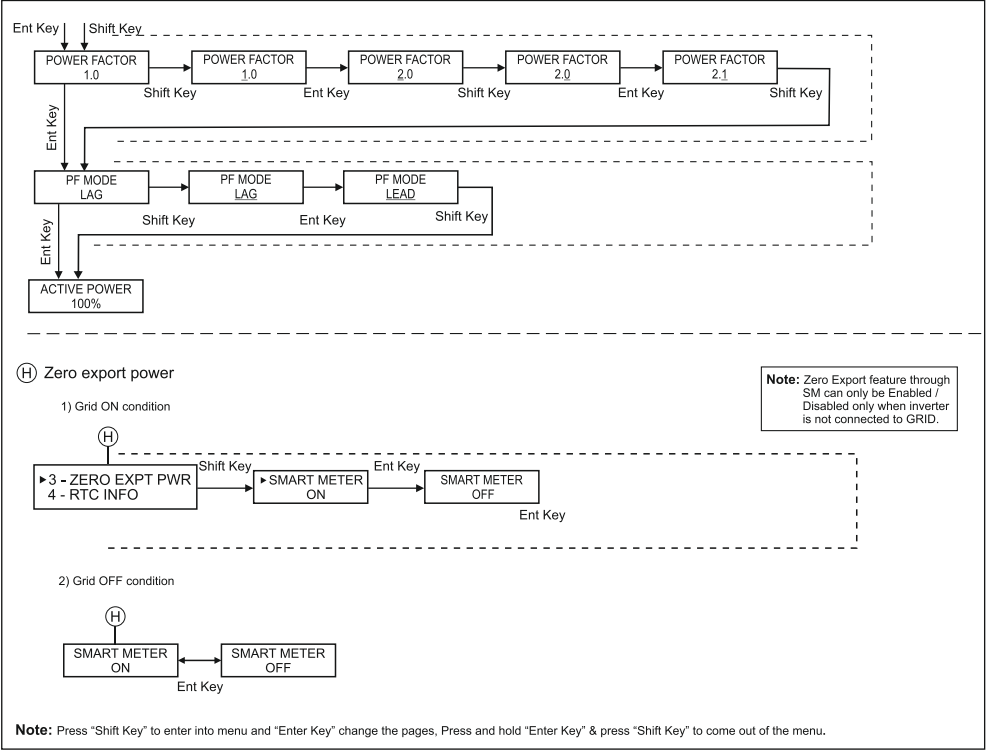


Fig. 20

7.1.5 Change Date and Time

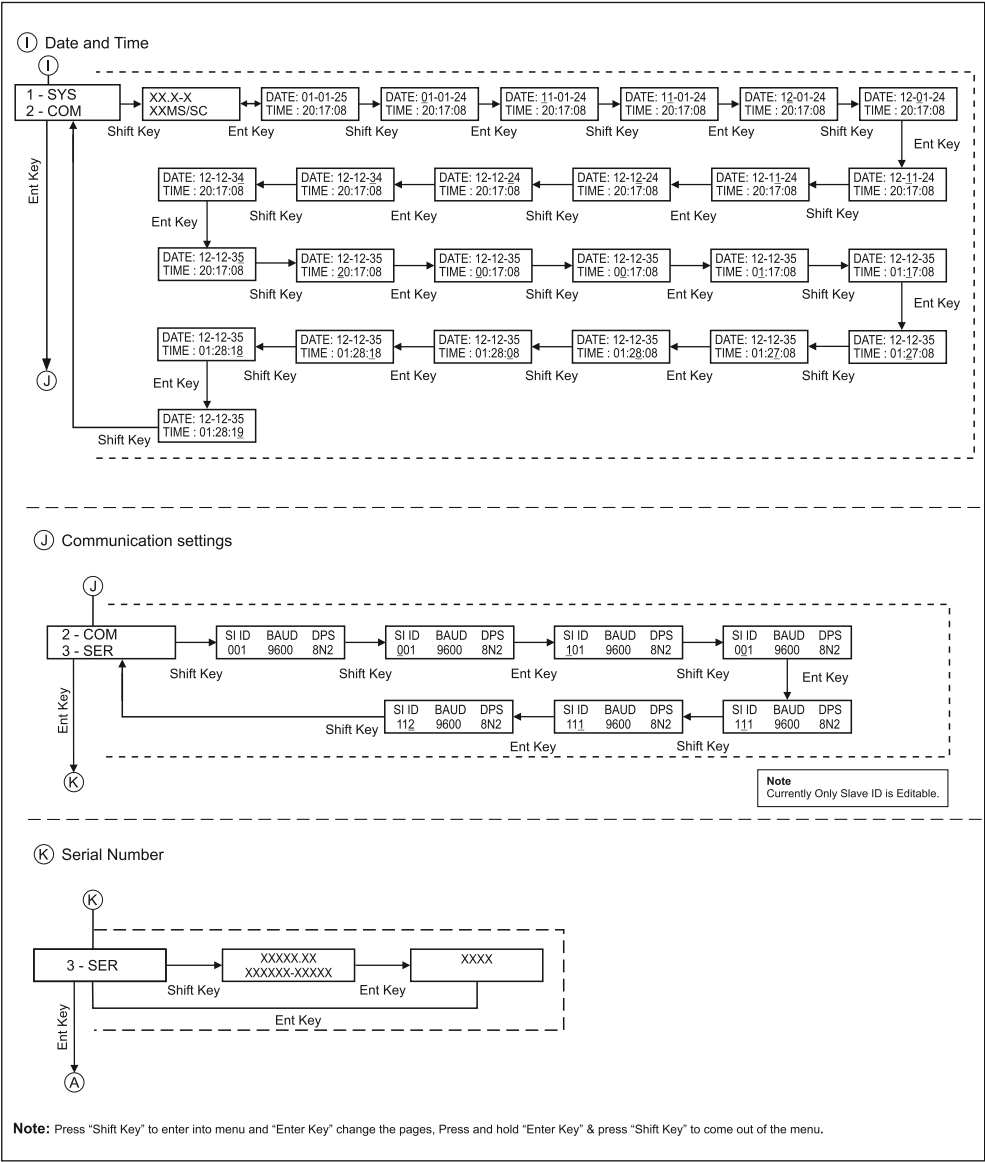


Fig. 21

## 7.2 Communication module connections

### 7.2.1 RS485 Configuration

Pin description of RS485 Communication terminal is given below in Table 5

| Pin Notation | Function |
|--------------|----------|
| A+           | Data +   |
| A-           | Data -   |

Table 7

#### Connecting single inverter for RS485 Communication:

Connect A+ & A- pin of RS485 port to the Data +, Data -

#### Following data format is used for Communication

##### Data format:

Baud rate : 19200

Data bits : 8

Stop bit : 2

Parity : NONE

7.2.2 Monitor inverter status

a) Monitor single inverter's status with RS485

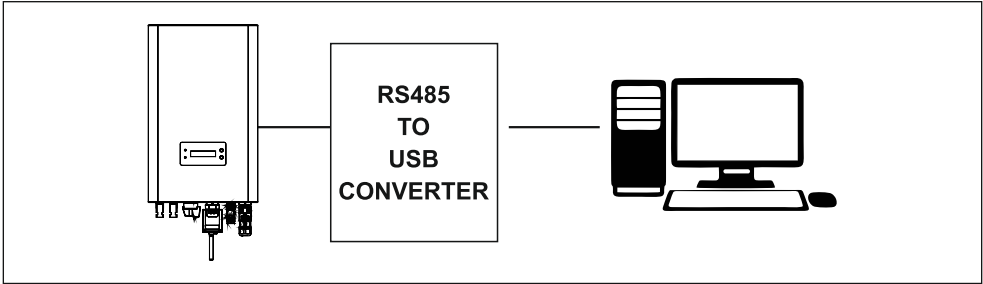


Fig. 22

b) Monitor multiple inverters with RS485

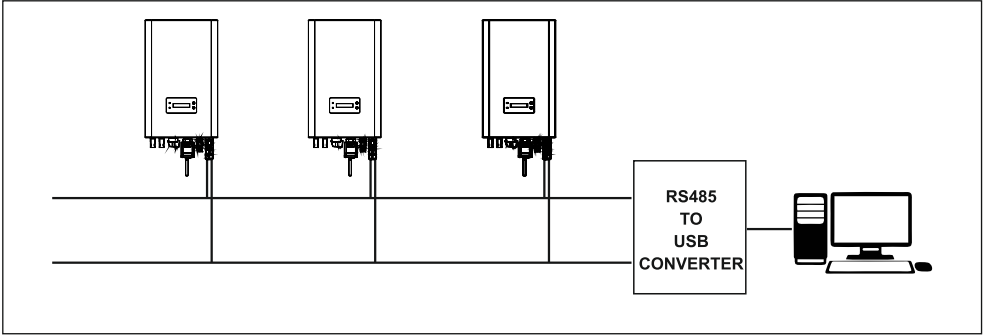


Fig. 23

c) Monitor Inverter with External wireless device

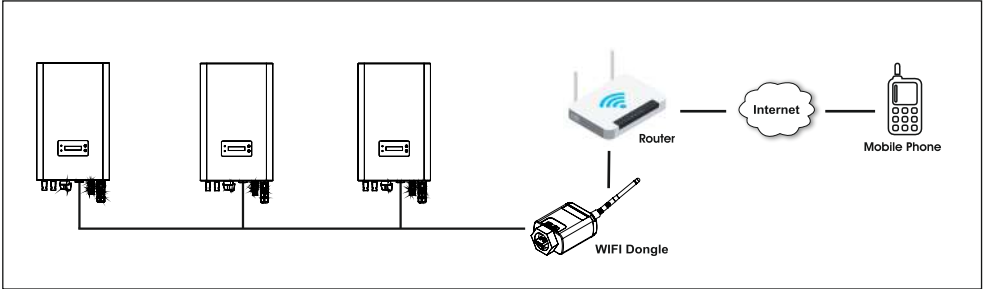


Fig. 24

## 7.3 Troubleshooting

### 7.3.1 Error logs\*

| Log variables data |          |                               |                                                                                                                                                                                                                                                                                                          |
|--------------------|----------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sr.No              | Log code | Log description               | Suggestion                                                                                                                                                                                                                                                                                               |
| 1                  | F13      | Grid over voltage L1          | <ol style="list-style-type: none"> <li>1. Check If AC Voltage on Inverter AC terminals is in the following voltage range L-N(216-264V AC), L-L (374 457V AC) with help of multimeter</li> <li>2. Restart inverter, if error persists contact Selec Controls Pvt Ltd.</li> </ol>                          |
|                    | F14      | Grid over voltage L2          |                                                                                                                                                                                                                                                                                                          |
|                    | F15      | Grid over voltage L3          |                                                                                                                                                                                                                                                                                                          |
| 2                  | F16      | Grid under voltage L1         |                                                                                                                                                                                                                                                                                                          |
|                    | F17      | Grid under voltage L2         |                                                                                                                                                                                                                                                                                                          |
|                    | F18      | Grid under voltage L3         |                                                                                                                                                                                                                                                                                                          |
| 3                  | F19      | Grid over current software L1 | <ol style="list-style-type: none"> <li>1. Restart inverter, if error persists contact Selec Controls Pvt Ltd.</li> </ol>                                                                                                                                                                                 |
|                    | F20      | Grid over current software L2 |                                                                                                                                                                                                                                                                                                          |
|                    | F21      | Grid over current software L3 |                                                                                                                                                                                                                                                                                                          |
| 4                  | F24      | Over frequency                | <ol style="list-style-type: none"> <li>1. Turn OFF DC switch</li> <li>2. Check If AC Voltage Frequency on Inverter AC terminals is in the following frequency range L-N (48.5-51.5Hz) with help of multimeter</li> <li>3. Restart inverter, if error persists contact Selec Controls Pvt Ltd.</li> </ol> |
| 5                  | F23      | Under frequency               |                                                                                                                                                                                                                                                                                                          |
| 6                  | F58      | Duty error                    |                                                                                                                                                                                                                                                                                                          |
| 7                  | F35      | Controller over temperature   | <ol style="list-style-type: none"> <li>1. Check ambient temperature</li> <li>2. Check installation environment</li> <li>3. If error persists contact Selec Controls Pvt Ltd.</li> </ol>                                                                                                                  |
| 8                  | F30      | Boost 1 over temperature      |                                                                                                                                                                                                                                                                                                          |
| 9                  | F31      | Boost 2 over temperature      |                                                                                                                                                                                                                                                                                                          |
| 10                 | F38      | PV1 over voltage              | <ol style="list-style-type: none"> <li>1. Turn OFF DC switch</li> <li>2. Check PV voltage with Multimeter</li> <li>3. PV voltage range should be between 140V DC and 1000V DC</li> <li>4. Restart Inverter, if error persists contact Selec Controls Pvt Ltd.</li> </ol>                                 |
| 11                 | F39      | PV2 over voltage              |                                                                                                                                                                                                                                                                                                          |
| 12                 | F43      | PV1 under voltage             |                                                                                                                                                                                                                                                                                                          |
| 13                 | F44      | PV2 under voltage             |                                                                                                                                                                                                                                                                                                          |
| 14                 | F48      | PV1 over current software     | <ol style="list-style-type: none"> <li>1. Restart Inverter, if error persists contact Selec Controls Pvt Ltd.</li> </ol>                                                                                                                                                                                 |
| 15                 | F49      | PV2 over current software     |                                                                                                                                                                                                                                                                                                          |
| 16                 | F53      | PV1 over current hardware     |                                                                                                                                                                                                                                                                                                          |
| 17                 | F54      | PV2 over current hardware     |                                                                                                                                                                                                                                                                                                          |
| 18                 | F59      | DC bus over voltage           | <ol style="list-style-type: none"> <li>1. Turn OFF DC switch</li> <li>2. Check PV voltage with Multimeter</li> <li>3. PV voltage range should be between 140V DC and 1000V DC</li> <li>4. Restart Inverter, if error persists contact Selec Controls Pvt Ltd.</li> </ol>                                 |
| 19                 | F60      | DC bus under voltage          |                                                                                                                                                                                                                                                                                                          |
| 20                 | F61      | DC bus unbalance              |                                                                                                                                                                                                                                                                                                          |
| 21                 | F1       | Inter common fail             |                                                                                                                                                                                                                                                                                                          |
| 22                 | F2       | PV out of range               | <ol style="list-style-type: none"> <li>1. Turn OFF DC switch</li> <li>2. Check PV voltage with Multimeter</li> <li>3. PV voltage range should be between 140V DC and 1000V DC</li> <li>4. Restart inverter, if error persists contact Selec Controls Pvt Ltd.</li> </ol>                                 |

| Log variables data |          |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------|----------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sr.No              | Log code | Log description                   | Suggestion                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 25                 | F6       | Insulation fault                  | <ol style="list-style-type: none"> <li>1. Turn OFF AC switch &amp; Turn off DC switch</li> <li>2. Check Solar PV enclosure earthing</li> <li>3. Check earthing wire connection of inverter</li> <li>4. Check panel shorting with earth</li> <li>5. Restart Inverter, if error persists contact Selec Controls Pvt Ltd.</li> </ol>                                                                                                |
| 26                 | F7       | AC voltage unbalance              | <ol style="list-style-type: none"> <li>1. Turn OFF DC switch</li> <li>2. Check AC voltage on the inverter output terminal with multimeter</li> <li>3. Voltage range should be in between L-N (216-264V AC), L-L (374-457V AC)</li> <li>4. Restart inverter, if error persists contact Selec Controls Pvt Ltd.</li> </ol>                                                                                                         |
| 27                 | F8       | Wrong grid                        | <ol style="list-style-type: none"> <li>1. Turn OFF DC switch</li> <li>2. Check if all 3 phases and Neutral and earth are correctly connected</li> <li>3. Restart inverter, if error persists contact Selec Controls Pvt Ltd.</li> </ol>                                                                                                                                                                                          |
| 28                 | F9       | Inverter relay fault              | <ol style="list-style-type: none"> <li>1. Restart Inverter, if error persists contact Selec Controls Pvt Ltd.</li> </ol>                                                                                                                                                                                                                                                                                                         |
| 29                 | F10      | Grid relay fault                  |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 30                 | F12      | CT absent fault                   |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 31                 | F22      | Grid over current hardware        |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 32                 | F26      | RCMU fault                        |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 33                 | F27      | Inv L1 over temperature           | <ol style="list-style-type: none"> <li>1. Check ambient temperature</li> <li>2. Check installation environment</li> <li>3. If error persists contact Selec Controls Pvt Ltd.</li> </ol>                                                                                                                                                                                                                                          |
| 34                 | F28      | Inv L2 over temperature           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 35                 | F29      | Inv L3 over temperature           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 36                 | F80      | Red Grid over voltage L1          | <ol style="list-style-type: none"> <li>1. Check If AC Voltage on Inverter AC terminals is in the following voltage range L-N(216-264V AC), L-L (374 457V AC) with help of multimeter</li> <li>2. Restart inverter, if error persists contact Selec Controls Pvt Ltd.</li> </ol>                                                                                                                                                  |
| 37                 | F81      | Red Grid over voltage L2          |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 38                 | F82      | Red Grid over voltage L3          |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 39                 | F83      | Red Grid under voltage L1         |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 40                 | F84      | Red Grid under voltage L2         |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 41                 | F85      | Red Grid under voltage L3         |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 42                 | F86      | Red Grid over current software L1 | <ol style="list-style-type: none"> <li>1. Restart Inverter, if error persists contact Selec Controls Pvt Ltd.</li> </ol>                                                                                                                                                                                                                                                                                                         |
| 43                 | F87      | Red Grid over current software L2 |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 44                 | F88      | Red Grid over current software L3 |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 45                 | F89      | Red over frequency                | <ol style="list-style-type: none"> <li>1. Turn OFF DC Switch &amp; Turn off AC supply</li> <li>2. Check solar PV panel earthing</li> <li>3. Check earthing wire connection of inverter</li> <li>4. Check if all 3 phases and Neutral and earth are correctly connected</li> <li>5. Check if phase and neutral are correctly connected</li> <li>6. Restart Inverter, if error persists contact Selec Controls Pvt Ltd.</li> </ol> |
| 46                 | F90      | Red under frequency               |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 47                 | F91      | Red RCMU fault                    | <ol style="list-style-type: none"> <li>1. Restart Inverter, if error persists contact Selec Controls Pvt Ltd.</li> </ol>                                                                                                                                                                                                                                                                                                         |

### 7.3.2 Self Test Error Definitions\*

| Self Test Error Definitions |                 |      |                                                                                                                                                                                                                                                |
|-----------------------------|-----------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sr.No                       | Self test error | Code | Suggestion                                                                                                                                                                                                                                     |
| 1                           | No Error        | 0    |                                                                                                                                                                                                                                                |
| 2                           | Com Error       | 1    | 1. Restart inverter, if error persists contact Selec Controls Pvt Ltd.                                                                                                                                                                         |
| 3                           | FRC Error       | 2    | 1. Restart inverter, if error persists contact Selec Controls Pvt Ltd.                                                                                                                                                                         |
| 4                           | PV Low          | 3    | 1. Turn OFF DC switch<br>2. Check PV voltage with multimeter<br>3. If voltage is less than 140V, Contact Selec Controls Pvt Ltd.                                                                                                               |
| 5                           | No Grid         | 4    | 1. Turn OFF DC switch<br>2. Check AC voltage on the inverter terminal with multimeter<br>3. Check AC wiring, whether any phase wire is swapped with Neutral or Earth<br>4. Restart Inverter, if error persists contact Selec Controls Pvt Ltd. |
| 6                           | ADC Error       | 5    | 1. Restart inverter, if error persists contact Selec Controls Pvt Ltd.                                                                                                                                                                         |
| 7                           | Earth Abs       | 6    | 1. Turn OFF DC switch<br>2. Check AC voltage on the inverter terminal with multimeter<br>3. Check AC wiring, whether any phase wire is swapped with Neutral or Earth<br>4. Restart Inverter, if error persists contact Selec Controls Pvt Ltd. |
| 8                           | Ins Res Err     | 7    | 1. Turn OFF DC Switch & Turn off AC supply<br>2. Check solar PV enclosure earthing<br>3. Check earthing of inverter<br>4. Restart inverter, if error persists contact Selec Controls Pvt Ltd.                                                  |
| 9                           | Op Rly2 Err     | 8    | 1. Restart inverter, if error persists contact Selec Controls Pvt Ltd.                                                                                                                                                                         |
| 10                          | Op Rly1 Err     | 9    |                                                                                                                                                                                                                                                |
| 11                          | PWM RLY ERR     | 10   |                                                                                                                                                                                                                                                |
| 12                          | CT Abs Err      | 11   |                                                                                                                                                                                                                                                |
| 13                          | EEPROM Err      | 12   |                                                                                                                                                                                                                                                |
| 14                          | PV Unstable     | 13   |                                                                                                                                                                                                                                                |
| 15                          | LN Swap Err     | 16   | 1. Turn OFF DC Switch.<br>2. Check AC Voltage on the inverter terminal with HMI<br>3. Check AC wiring, whether any Line wire is swapped with Neutral or Earth<br>4. Restart Inverter, if error persists contact Selec Controls Pvt Ltd.        |
| 16                          | LN-E Swap Err   | 17   |                                                                                                                                                                                                                                                |
| 17                          | Freq Err        | 18   |                                                                                                                                                                                                                                                |
| 18                          | AC Conn Err     | 19   |                                                                                                                                                                                                                                                |
| 19                          | Wrong Grid Err  | 20   |                                                                                                                                                                                                                                                |

**Note:** Table 10 is subject to change \*

Table 10

### 7.3.3 ADC Sensing Error Definitions

| ADC Sensing Error Definitions |               |                                        |                                                                           |
|-------------------------------|---------------|----------------------------------------|---------------------------------------------------------------------------|
| Sr.No                         | Error message | Error description                      | Suggestion                                                                |
| 1                             | ADC IPV       | PV current sensing error               | 1. Restart Inverter, if error persists contact<br>Selec Controls Pvt Ltd. |
| 2                             | ADC IPH       | Inverter - Phase current sensing error |                                                                           |
| 3                             | ADC IT        | Inverter module NTC sensing error      |                                                                           |

**Note:** Table 11 is subject to change \*

Table 11

## 8. Commissioning of inverter

### Caution

- Check AC & DC Voltages are within range of particular GTI-SERIES inverter specification
- Check protective earth is connected
- Check DC connectors are connected
- Check AC connectors are connected

### 8.1 Initial turn on of inverter

- Turn ON DC switch. As soon as DC switch is ON, LCD display will glow. There are two LED
- indications on front sticker. Red is alarm & Green is Grid feed status
- Inverter starts self test, for checking internal circuitry is proper or not before doing grid feed
- If any fault occurs, then alarm LED will glow in red colour this will alert user regarding a particular fault
- If every thing is normal then, inverter starts feeding power into the grid. Grid status LED will glow green

## 9. Maintenance and Cleaning

### 9.1 Maintenance

#### Warning

Before any maintenance, please switch AC and DC power off atleast 5 minutes before proceeding to avoid risk of electrical shock Normally, the inverter needs no maintenance. Check for any external visible damage and discoloration of the cables and DC switch at regular intervals. Check that all terminals, screws and cables are connected and appear as they did upon installation. If there is any visible damage or visible discoloration of cables or DC switch or if there is any impaired and loose part, please contact the installer.

#### Notice

Once a year, turn the rotary switch of the DC disconnect switch from the “ON” position to the “OFF” position 5 times in succession. This cleans the contacts of the rotary switch and prolongs the electrical endurance of the DC switch.

## 9.2 Cleaning



### Warning

- Before starting cleaning of inverter, please ensure that DC switch is turned off and the AC breaker present between GTI-SERIES inverter and grid is also turned off. After switching off the DC switch and AC breaker wait for atleast **5 minutes** to avoid risk of electric shock.



### Caution

- Risk of burns due to hot heatsink
- The heatsink may exceed 70°C during operation. Do not touch the heat sink during operation Wait atleast **30 minutes** before cleaning until the heat sink has cooled down
- Do not use water, corrosive chemicals or detergent to clean inverter and heatsink
- Please clean the inverter with an air blower, a dry & soft cloth or a soft brush
- Please ensure that there is enough space around the heatsink for ventilation. Inspect the heat sink for blockage (dust, snow, etc.) and clean them if they exist using an air blower, a dry and soft cloth

## 10. Decommissioning of inverter

- Turn OFF AC breaker
- Turn OFF DC switch
- Wait till i) Alarm LED turn OFF ii) LCD light turn off
- Wait for approx. **30 minutes** before touching Inverter. Surface may be hot
- Remove DC cables
- Unscrew AC connector
- Remove AC cables
- Unlock communication gland
- Remove RS485, Dry contact DI terminal connection if you have done any
- Unscrew mounting screws to remove inverter from wall
- Pack inverter in carton which is provided during purchase. If that carton is not available then use equal size carton
- Adopt E-waste Regulation guideline while disposing faulty inverter. Do not dispose inverter with household waste

## 11. Technical specifications

### 11.1 Three phase

| RATINGS                                           | 3kW                                                                                                                                                                                                                                                                                             | 5kW                          | 6kW          | 7kW          | 7.5kW          | 8kW          | 10kW         |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--------------|--------------|----------------|--------------|--------------|
| Models                                            | GTI0033PN401                                                                                                                                                                                                                                                                                    | GTI0053PN401<br>GTI0053PN402 | GTI0063PN402 | GTI0073PN402 | GTI007X53PN402 | GTI0083PN402 | GTI0103PN402 |
| INPUT SPECIFICATIONS (DC)                         |                                                                                                                                                                                                                                                                                                 |                              |              |              |                |              |              |
| Max. allowable PV power (kW)*                     | 4.5                                                                                                                                                                                                                                                                                             | 7.5                          | 9            | 10.5         | 11.25          | 12           | 15           |
| Nominal PV voltage (V)                            | 600                                                                                                                                                                                                                                                                                             |                              |              |              |                |              |              |
| Max. DC input voltage (V)                         | 1100                                                                                                                                                                                                                                                                                            |                              |              |              |                |              |              |
| Start-up voltage (V)                              | 140                                                                                                                                                                                                                                                                                             |                              |              |              |                |              |              |
| Operating range (V)                               | 120-1000                                                                                                                                                                                                                                                                                        |                              |              |              |                |              |              |
| MPPT voltage range (V)                            | 120-1000                                                                                                                                                                                                                                                                                        |                              |              |              |                |              |              |
| Max input current per MPPT (A)                    | 22                                                                                                                                                                                                                                                                                              | 22 / 22+22                   | 22+22        |              |                |              |              |
| Number of MPPT                                    | 1                                                                                                                                                                                                                                                                                               | 1 / 2                        | 2            |              |                |              |              |
| String per MPPT tracker                           | 1                                                                                                                                                                                                                                                                                               |                              |              |              |                |              |              |
| Maximum PV short circuit current per MPPT (Isc)   | 30                                                                                                                                                                                                                                                                                              | 30 / 30+30                   | 30+30        |              |                |              |              |
| OUTPUT SPECIFICATIONS (AC)                        |                                                                                                                                                                                                                                                                                                 |                              |              |              |                |              |              |
| Rated output power (kW)                           | 3                                                                                                                                                                                                                                                                                               | 5                            | 6            | 7            | 7.5            | 8            | 10           |
| Max. AC power (kVA)                               | 3.3                                                                                                                                                                                                                                                                                             | 5.5                          | 6.6          | 7.7          | 8.25           | 8.8          | 11           |
| Nominal AC current, RMS (A)                       | 4.16                                                                                                                                                                                                                                                                                            | 6.94                         | 8.33         | 9.72         | 10.41          | 11.11        | 13.88        |
| Max. output current (A)                           | 4.8                                                                                                                                                                                                                                                                                             | 8                            | 9.66         | 11.27        | 12.07          | 12.88        | 16           |
| Grid voltage range (V)                            | 216-264 / 374-457                                                                                                                                                                                                                                                                               |                              |              |              |                |              |              |
| Grid frequency range (Hz)                         | 50                                                                                                                                                                                                                                                                                              |                              |              |              |                |              |              |
| Power factor (at rated output power)              | >0.99 (Adjustable from 0.8 leading to 0.8 lagging)                                                                                                                                                                                                                                              |                              |              |              |                |              |              |
| Total harmonic distortion (THDi)                  | <3% at rated load                                                                                                                                                                                                                                                                               |                              |              |              |                |              |              |
| Feed-in phase / Connection phase                  | 3 phase, N, PE                                                                                                                                                                                                                                                                                  |                              |              |              |                |              |              |
| EFFICIENCY                                        |                                                                                                                                                                                                                                                                                                 |                              |              |              |                |              |              |
| Max. efficiency (%)                               | 98                                                                                                                                                                                                                                                                                              |                              |              |              |                |              |              |
| MPPT efficiency (%)                               | >99                                                                                                                                                                                                                                                                                             |                              |              |              |                |              |              |
| Euro efficiency (%)                               | 97.5                                                                                                                                                                                                                                                                                            |                              |              |              |                |              |              |
| PROTECTIONS                                       |                                                                                                                                                                                                                                                                                                 |                              |              |              |                |              |              |
| Surge protection                                  | Type II SPD on AC and DC side                                                                                                                                                                                                                                                                   |                              |              |              |                |              |              |
| Other protection                                  | DC reverse polarity protection, Short circuit protection, Over current protection, Over voltage / Under voltage protection, Over frequency / Under frequency, Insulation resistance monitoring, Residual current detection, Surge protection, Anti-Islanding protection, Temperature protection |                              |              |              |                |              |              |
| Integrated DC switch                              | Yes                                                                                                                                                                                                                                                                                             |                              |              |              |                |              |              |
| Integrated AFCI (DC ARC-Fault circuit protection) | Optional                                                                                                                                                                                                                                                                                        |                              |              |              |                |              |              |
| INTERFACE                                         |                                                                                                                                                                                                                                                                                                 |                              |              |              |                |              |              |
| DC connection                                     | MC4 connectors                                                                                                                                                                                                                                                                                  |                              |              |              |                |              |              |
| Display                                           | LCD with LED indication                                                                                                                                                                                                                                                                         |                              |              |              |                |              |              |
| Datalogger & Communication                        | RS485 (default) / Wi-Fi / GSM (To be ordered along with inverter separately)                                                                                                                                                                                                                    |                              |              |              |                |              |              |
| Topology                                          | Transformerless                                                                                                                                                                                                                                                                                 |                              |              |              |                |              |              |
| Consumption @ night (W)                           | <1                                                                                                                                                                                                                                                                                              |                              |              |              |                |              |              |
| Operating temperature range                       | -25 °C to +60 °C                                                                                                                                                                                                                                                                                |                              |              |              |                |              |              |
| Cooling method                                    | Natural convection                                                                                                                                                                                                                                                                              |                              |              |              |                |              |              |
| Relative humidity                                 | 0 to 100% non-condensing                                                                                                                                                                                                                                                                        |                              |              |              |                |              |              |
| Max. operational altitude                         | 4000m                                                                                                                                                                                                                                                                                           |                              |              |              |                |              |              |
| Noise (dBA)                                       | <30                                                                                                                                                                                                                                                                                             |                              |              |              |                |              |              |

| RATINGS                  | 3kW                                                                               | 5kW                         | 6kW          | 7kW          | 7.5kW          | 8kW          | 10kW         |
|--------------------------|-----------------------------------------------------------------------------------|-----------------------------|--------------|--------------|----------------|--------------|--------------|
| Models                   | GTI0033PN401                                                                      | GTI0053PN401 / GTI0053PN402 | GTI0063PN402 | GTI0073PN402 | GTI007X53PN402 | GTI0083PN402 | GTI0103PN402 |
| Designed lifetime        | <20 years                                                                         |                             |              |              |                |              |              |
| Warranty**               | 7 years                                                                           |                             |              |              |                |              |              |
| Ingress protection       | IP65                                                                              |                             |              |              |                |              |              |
| Dimensions in mm (W*H*D) | 285x502x178                                                                       |                             |              |              |                |              |              |
| Net weight (Kg)          | 12                                                                                |                             |              |              |                |              |              |
| Mechanical integration   | Wall mountable                                                                    |                             |              |              |                |              |              |
| Safety                   | IS 16169 : 2019 / IEC 62116 : 2014, IS 16221 (part 2) : 2015 / IEC 62109-2 : 2011 |                             |              |              |                |              |              |
| Environmental            | IEC 60529                                                                         |                             |              |              |                |              |              |
| Electrical               | IS 17980 : 2022 / IEC 62891 : 2020, IEC 61000                                     |                             |              |              |                |              |              |

**Note:** Subject to max allowable MPPT voltage & PV current.\*

If product is registered on app within 15 days of commissioning.\*\*

## 11.2 Tightening torque required

|                                 |        |
|---------------------------------|--------|
| AC terminal                     | 0.5 Nm |
| Smart Meter & RS485 cover screw | 0.2 Nm |
| Earthing screw                  | 2 Nm   |

Table 12

## 11.3 Order code for accessories and variant

In the following table you will find the optional accessories for your product. If required you can order these from Selec Controls Pvt. Ltd.

| Name                                      | Description                   | Selec order code                                                                               |
|-------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------|
| WiFi device                               | Communication interface       | AC-S2W-GTI-2                                                                                   |
| GSM device                                | Communication interface       | AC-S2G-2                                                                                       |
| 3kW<br>5kW                                | Single MPPT inverter variants | GTI0033PN401<br>GTI0053PN401                                                                   |
| 5kW<br>6kW<br>7kW<br>7.5kW<br>8kW<br>10kW | Dual MPPT inverter variants   | GTI0053PN402<br>GTI0063PN402<br>GTI0073PN402<br>GTI007X53PN402<br>GTI0083PN402<br>GTI0103PN402 |

Table 13

## Selec Controls Pvt. Ltd.

**Factory Address :** Selec Controls Pvt. Ltd., EL-27/1 Electronic Zone,  
TTC Industrial Area, MIDC Mahape, Navi Mumbai - 400710, India.

**For Sales & Support,** Mob. No. : +91-9136977315. Email: sales@selec.com | [www.selec.com](http://www.selec.com)

**For Service,** Tel. No. : +91-7498077172 / +91-7400069545. Email: service@selec.com

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