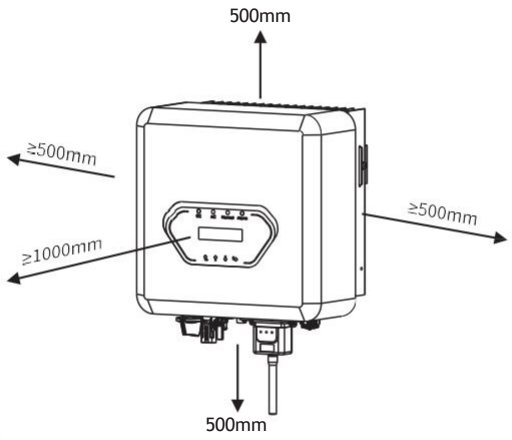
Feston
always on

Installation Guidelines:

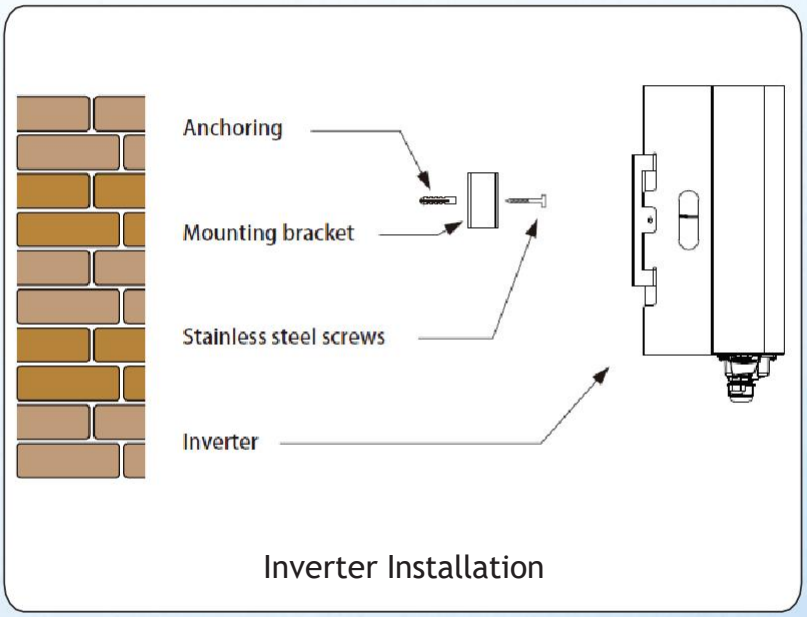
Solar Inverter

Installation Guidelines

1. Use AC and DC DB Must. (Use MCB, SPD, Fuse)
2. Per String Use SPD (3 Strings with 2 MPPT, then use 3 SPD)
3. Long String: A 5% VOC difference is possible.
4. Use Canopy When Installing Inverter Outside (This prevents direct sunlight and rain exposure, which can increase heat and cause damage)
5. Do Not Install Inverter in Closed Spaces like storage rooms
6. Use Colour Coded Wires in AC Connection
   (Red - Phase, Black - Neutral, Green - Earth)
7. Do Not Install AC and DC Boxes Very Close to the Inverter for any future service-related work
8. Use MCB, SPD, and Cable According to Standard Rating.
9. Provide Space Around the Inverter for Proper Air Circulation(500mm minimum)



Installation Gap



Inverter Installation

DC Side Protection:

DC Fuses: Install DC-rated fuses (10A-20A) for each string to protect the system from overcurrent conditions, which could damage the PV array or inverter.

DC Circuit Breakers: These should be rated to handle 1.25× the Isc (short-circuit current) of the panels. This ensures the system is protected from short circuits or excessive current.

AC Side Protection:

- MCBs (Miniature Circuit Breakers) or MCCBs (Molded Case Circuit Breakers):
- Install these on the AC side to prevent damage due to overloads or faults. The breaker should be rated for 1.25× the inverter's output current to accommodate short-term overloads safely.

The current rating of the isolator should be 1.25× inverter output current, accounting for possible overcurrent situations.

For example, if the inverter outputs 21.7A for a 5kW inverter, the isolator should be rated for 25A.

Up to 20A: Use 4mm² cables / 20A-40A: Use 6mm² cables.

Above >40A: Use 10mm² or higher, especially if the inverter is placed far from the grid connection.

For longer distances (>15m), you should increase the cable size to ensure a voltage drop of less than 1%.

Inverter Chassis Earthing:
The inverter's metal chassis must be grounded to the main earth system to prevent electric shock or fires due to faults in the inverter. Use a 6mm² copper cable for this connection.

- Ensure the earth resistance is <5 ohms to ensure safety and proper operation.

Surge Protection Devices (SPD)

DC SPD:

A DC SPD is installed between the PV array and the inverter to protect the inverter from high-voltage transients that may come from lightning or grid switching operations.

- Rating: Select a Type-2 SPD for standard installations. In areas prone to frequent lightning, a Type-1+2 SPD is recommended for better protection.
- The voltage rating of the SPD should match the inverter's DC input voltage (e.g., 1000V DC or 1500V DC).

AC SPD:

The AC SPD is installed on the AC side between the inverter and the grid connection. It protects ag·ainst surges coming from the grid.

- Rating: Ensure it is rated for the system voltage (e.g., 230V or 400V) and able to withstand current surges

1 to 3 kW Inverter (Single-Phase)

Cables

AC Output Cable:
- o Size: 2.5mm² to 4mm² copper cable.

DC Input Cable:
- o Size: 2.5mm² copper cable.
- o Voltage Rating: Rated for 1000V DC (or 1500V DC if necessary)

MCB (Miniature Circuit Breaker)

AC Side MCB:
- o Size: 16A to 20A MCB for single-phase inverters.

DC Side MCB:
- o Size: 16A to 20A DC MCB for each string.

SPD (Surge Protection Device)

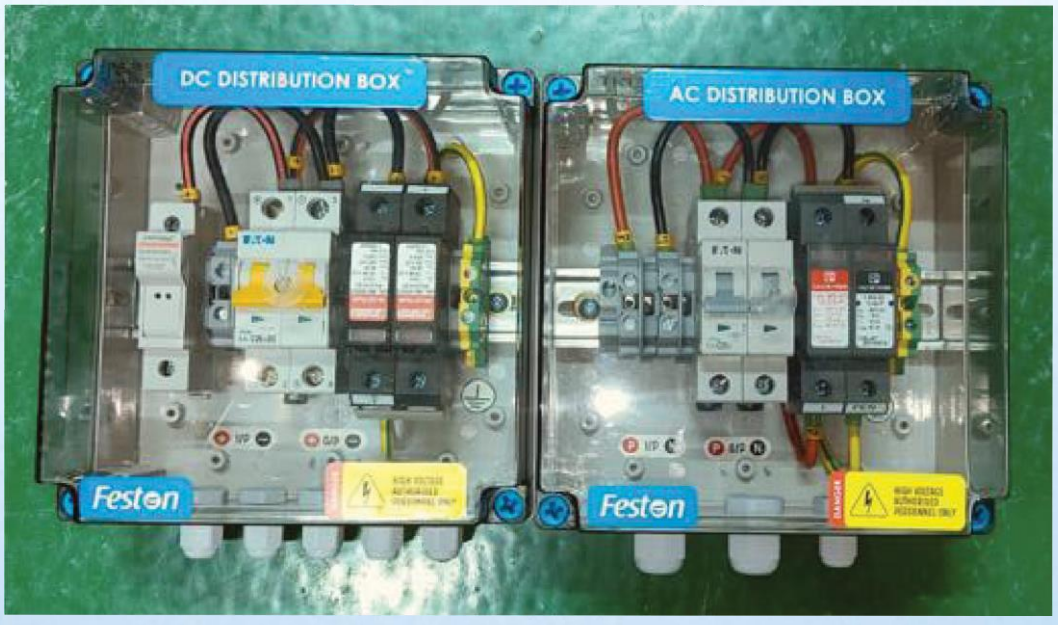
AC SPD:
- o Type: Type-2 SPD for single-phase systems.
- o Voltage Rating: 230V AC (for single-phase grid systems).

DC SPD:
- o Type: Type-2 SPD for DC side.
- o Voltage Rating: 1000V DC (or 1500V DC if applicable)

DC Fuse

Fuse Rating:
- o Size: 10A to 16A DC fuse, depending on string current.
- o Voltage Rating: 1000V DC (or 1500V DC).

Eg., Sample AC & DC BOX



4 to 6 kW Inverter (Single-Phase)

Cables

AC Output Cable:
- o Size: 4mm² copper cable.

DC Input Cable:
- o Size: 4mm² copper cable.
- o Voltage Rating: Rated for 1000V DC (or 1500V DC).

MCB (Miniature Circuit Breaker)

AC Side MCB:
- o Size: 32A MCB.
- o Tripping Characteristics: Type B or Type C for overload.

DC Side MCB:
- o Size: 32A DC MCB.

SPD (Surge Protection Device)

AC SPD:
- o Type: Type-2 SPD for single-phase.
- o Voltage Rating: 230V AC for single-phase system.

DC SPD:
- oType: Type-2 SPD for DC side.
- o Voltage Rating: 1000V DC.

DC Fuse

Fuse Rating:
- o Size: 16A to 20A DC fuse.
- o Voltage Rating: 1000V DC

Inverter (5kW to 10kW, Three-Phase)

Cables

AC Output Cable:

- Size: 6mm² to 10mm² copper cable, based on the inverter's output current and distance.

DC Input Cable:

- Size: 4mm² to 6mm² copper cable, depending on string configuration.
- Voltage Rating: Ensure cables are rated for 1000V DC (or 1500V DC if needed).

MCB (Miniature Circuit Breaker)

AC Side MCB:

- Size: 32A to 40A MCB for three-phase inverters

DC Side MCB:

- Size: 20A to 32A MCB, based on the DC input current of the inverter.

SPD (Surge Protection Device)

AC SPD:

- Type: Type-2 SPD for three-phase systems.
- Voltage Rating: Ensure the SPD is rated for 400V AC for protection against surges and lightning.

DC SPD:

- Type: Type-2 SPD for DC side.
- Voltage Rating: Ensure SPD is rated for 1000V DC (or 1500V DC depending on inverter rating).

DC Fuse

Fuse Rating:

- Size: 32A to 40A DC fuse for each string, depending on inverter DC input specifications.
- Type: Use fuses with appropriate DC voltage rating (1000V DC or 1500V DC).

10 to 15 kW Inverter (Three-Phase)

Cables

AC Output Cable:
- o Size: 6mm² to 10mm² copper cable.
- o Current Capacity: Based on the inverter output current (~21.7A to 43.5A).

DC Input Cable:
- o Size: 4mm² to 6mm² copper cable.
- o Voltage Rating: 1000V DC.

MCB (Miniature Circuit Breaker)

AC Side MCB:
- o Size: 32A to 40A MCB for each phase.

DC Side MCB:
- o Size: 20A to 32A DC MCB for each string.

SPD (Surge Protection Device)

AC SPD:
- o Type: Type-2 SPD for three-phase.
- o Voltage Rating: 400V AC for three-phase systems.

DC SPD:
- o Type: Type-2 SPD for DC side.
- o Voltage Rating: 1000V DC or 1500V DC as required.

DC Fuse

Fuse Rating:
- o Size: 20A to 40A DC fuse for each string.
- o Voltage Rating: 1000V DC.

18 to 25 kW Inverter (Three-Phase)

Cables

AC Output Cable:
- Size: 10mm² to 16mm² copper cable.

DC Input Cable:
- Size: 4mm² to 6mm² copper cable.
- Voltage Rating: 1000V DC.

MCB (Miniature Circuit Breaker)

AC Side MCB:
- Size: 40A to 63A MCB per phase.

DC Side MCB:
- Size: 32A to 40A DC MCB for each string.

SPD (Surge Protection Device)

AC SPD:
- Type: Type-2 SPD for three-phase.
- Voltage Rating: 400V AC for three-phase systems.

DC SPD:
- Type: Type-2 SPD for DC side.
- Voltage Rating: 1000V DC or 1500V DC

DC Fuse

Fuse Rating:
- Size: 32A to 63A DC fuse for each string.
- Voltage Rating: 1000V DC.

30 to 50 kW Inverter (Three-Phase)

Cables

AC Output Cable:
- o Size: 16mm² to 25mm² copper cable.

DC Input Cable:
- o Size: 4mm² to 6mm² copper cable.
- o Voltage Rating: 1000V DC.

MCB (Miniature Circuit Breaker)

AC Side MCB:
- o Size: 63A to 100A MCB for each phase.
- oTripping Characteristics: Type C or Type D.

DC Side MCB:
- o Size: 40A to 63A DC MCB for each string.

SPD (Surge Protection Device)

AC SPD:
- o Type: Type-2 SPD for three-phase.
- o Voltage Rating: 400V AC .

DC SPD:
- o Type: Type-2 SPD for DC side.
- o Voltage Rating: 1000V DC or 1500V DC

DC Fuse

Fuse Rating:
- o Size: 40A to 80A DC fuse for each string. .
- o Voltage Rating: 1000V DC.

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