DURACELL® POWER CENTER Models: D350-M1 / D700-M2 / D1500-M4 Installation Manual

Model: **D350-M1**

Grid Support Utility Interactive Inverter

Range of Input Operating Voltage	16 ~ 60 V d.c.
Range of Peak Power MPPT Voltage	33 ~ 48 V d.c.
Start-up Voltage	22 V d.c.
Max Input Current	11.5 A d.c.
Max Input Short Circuit Current	15.0 A d.c.
Nominal Output Voltage	240 V a.c.
Max Continuous Output Current	1.52 A a.c.
Nominal Output Frequency	60 Hz
Max Continuous Output Power	349 VA
Output Power Factor Rating	> 0.99 (Default)
Peak Conversion Efficiency	96.7 %
Type of Enclosure	Type 6
Operating Ambient Temp	-40 to +65 ⊠
UL1741 CSA C22.2No.107.1-16 Power Center	Made in China

DURACELL® POWER CENTER

CAUTION: Risk of electric shock – Do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel. Both ac and dc voltage sources are terminated inside this equipment. Each circuit must be individually disconnected before servicing. When the photovoltaic array is exposed to light, it supplies a dc voltage to this equipment.
ATTENTION: Risque de choc électrique – ne pas enlever le couvercle. Aucune pièce interne réparable par l'utilisateur. Toute réparation doit être uniquement confiée à du personnel qualifié. A l'intérieur de l'onduleur on retrouve 2 tensions AC et DC. Chaque circuit doit être déconnecté individuellement avant chaque entretien. Lorsque le panneau photovoltaïque est exposé à la lumière, il fournit une tension DC à cet appareil.

CAUTION: Hot surfaces – To reduce the risk of burns – Do not touch. **ATTENTION:** Les surfaces chaudes – pour réduire le risque de brûlure – Ne pas toucher.

C US 261002

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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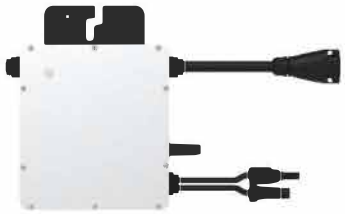

Model: **D700-M2**

Grid Support Utility Interactive Inverter

Range of Input Operating Voltage	16 ~ 60 V d.c.
Range of Peak Power MPPT Voltage	33 ~ 48 V d.c.
Start-up Voltage	22 V d.c.
Max Input Current	(2x) 11.5 A d.c.
Max Input Short Circuit Current	(2x) 15.0 A d.c.
Nominal Output Voltage	240 V a.c.
Max Continuous Output Current	2.92 A a.c.
Nominal Output Frequency	60 Hz
Max Continuous Output Power	696 VA
Output Power Factor Rating	> 0.99 (Default)
Peak Conversion Efficiency	96.7 %
Type of Enclosure	Type 6
Operating Ambient Temp	-40 to +65 ⊠
UL1741 CSA C22.2No.107.1-16 Power Center	Made in China

DURACELL® POWER CENTER

CAUTION: Risk of electric shock – Do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel. Both ac and dc voltage sources are terminated inside this equipment. Each circuit must be individually disconnected before servicing. When the photovoltaic array is exposed to light, it supplies a dc voltage to this equipment.
ATTENTION: Risque de choc électrique – ne pas enlever le couvercle. Aucune pièce interne réparable par l'utilisateur. Toute réparation doit être uniquement confiée à du personnel qualifié. A l'intérieur de l'onduleur on retrouve 2 tensions AC et DC. Chaque circuit doit être déconnecté individuellement avant chaque entretien. Lorsque le panneau photovoltaïque est exposé à la lumière, il fournit une tension DC à cet appareil.

CAUTION: Hot surfaces – To reduce the risk of burns – Do not touch. **ATTENTION:** Les surfaces chaudes – pour réduire le risque de brûlure – Ne pas toucher.

C US 261002

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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Model: **D1500-M4**

Grid Support Utility Interactive Inverter

Range of Input Operating Voltage	16 ~ 60 V d.c.
Range of Peak Power MPPT Voltage	33 ~ 48 V d.c.
Start-up Voltage	22 V d.c.
Max Input Current	(4x) 11.5 A d.c.
Max Input Short Circuit Current	(4x) 15.0 A d.c.
Nominal Output Voltage	240 V a.c.
Max Continuous Output Current	5.99 A a.c.
Nominal Output Frequency	60 Hz
Max Continuous Output Power	1438 VA
Output Power Factor Rating	> 0.99 (Default)
Peak Conversion Efficiency	96.7 %
Type of Enclosure	Type 6
Operating Ambient Temp	-40 to +65 ⊠
UL1741 CSA C22.2No.107.1-16 Power Center	Made in China

DURACELL® POWER CENTER

CAUTION: Risk of electric shock – Do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel. Both ac and dc voltage sources are terminated inside this equipment. Each circuit must be individually disconnected before servicing. When the photovoltaic array is exposed to light, it supplies a dc voltage to this equipment.
ATTENTION: Risque de choc électrique – ne pas enlever le couvercle. Aucune pièce interne réparable par l'utilisateur. Toute réparation doit être uniquement confiée à du personnel qualifié. A l'intérieur de l'onduleur on retrouve 2 tensions AC et DC. Chaque circuit doit être déconnecté individuellement avant chaque entretien. Lorsque le panneau photovoltaïque est exposé à la lumière, il fournit une tension DC à cet appareil.

CAUTION: Hot surfaces – To reduce the risk of burns – Do not touch. **ATTENTION:** Les surfaces chaudes – pour réduire le risque de brûlure – Ne pas toucher.

C US 261002

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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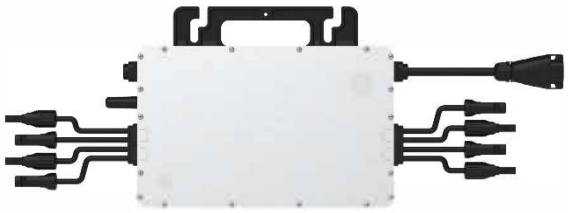

DURACELL®
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Models: D350-M1 / D700-M2 / D1500-M4
Installation Manual

About the Microinverter

This system is composed of a family of microinverters that convert direct current (DC) into alternating current (AC) and feeds it into the public grid. The system is designed for the incorporation of one microinverter for one, two, or four photovoltaic modules. Each microinverter works independently to deliver the maximum power generation of each photovoltaic module. This setup enables the user to control the production of a single photovoltaic module directly, consequently improving the flexibility and reliability of the system.

About the Manual

This manual contains important instructions for the D350-M1 / D700-M2 / D1500-M4 microinverters. It must be read in its entirety before installing or commissioning the equipment. For safety, only qualified technicians, who have received training or have demonstrated skills can install and maintain this microinverter under the guide of this document.

Other Information

Product information is subject to change without notice. Please refer to Power Center official website at www.duracellpowercenter.com for the latest version of the installation manual.

DURACELL®
POWER CENTER

Models: D350-M1 / D700-M2 / D1500-M4
Installation Manual

Contents

DURACELL® POWER CENTER

Models: D350-M1 / D700-M2 / D1500-M4 Installation Manual

1 Important Notes

1.1 Product Range

This manual describes the assembly, installation, commissioning, and maintenance of the following models of Power Center microinverters:

D350-M1 / D700-M2 / D1500-M4

1.2 Target Group

This manual is only for qualified technicians, who have been trained or have demonstrated skills to install and maintain this microinverter under the guide of this document for safety purposes.

2 Safety

2.1 Important Safety Instructions

The microinverters are designed and tested according to international safety requirements. However, certain safety precautions must be taken during installation and operation. The installer must read and follow all instructions, cautions and warnings in this installation manual.

All operations including transport, installation, start-up and maintenance, must be carried out by qualified, trained personnel.
Before installation, check the unit to ensure free of any transport or handling damage, which could affect insulation integrity or safety clearances. Choose the installation location carefully and adhere to specified cooling requirements. Unauthorized removal of necessary protections, improper use, incorrect installation and operation may lead to serious safety and shock hazards or equipment damage.
Before connecting a microinverter to the power distribution grid, contact the local power distribution grid company to get appropriate approvals. This connection must be made only by qualified technical personnel. It is the responsibility of the installer to provide external disconnect switches and Over current Protection Devices (OCPD).
Only one photo voltaic module can be connected to one input of the inverter. Do not connect batteries or other sources of power supply. The inverter can be used only if all the technical characteristics are observed and applied.
Do not install the equipment in adverse environment conditions such as flammable, explosive,corrosive, extreme high or low temperature, and humidity. Do not use the equipment when the safety devices do not work or disabled.
Use personal protective equipment, including gloves and eye protection during the installation.
Inform the manufacturer about non-standard installation conditions.
Do not use the equipment if any operating anomalies are found. Avoid temporary repairs.
All repairs should be carried out using only qualified spare parts, which must be installed in accordance with their intended use and by a licensed contractor or authorized Power Center service representative.
Liabilities arising from commercial components are delegated to their respective manufacturers.
Anytime the inverter has been disconnected from the public network, please be extremely cautious as some components can retain charge sufficient to create a shock hazard. Prior to touching any part of the inverter please ensure surfaces and equipment are under touch safe temperatures and voltage potentials before proceeding.
Power Center accepts no liability for damage from incorrect or improper operation.
Electrical Installation & Maintenance shall be conducted by a licensed electrician and shall comply with Local Wiring Rules.

2.2 Explanation of Symbols

Symbol	Usage
	**Treatment** To comply with the European Directive 2002/96/EC on waste Electrical and Electronic Equipment and its implementation as national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility. Any device no longer required must be returned to an authorized dealer or approved collection and recycling facility.
	**Caution** Indicates directions which must be fully understood and followed in entirety in order to avoid potential safety hazards including equipment damage or personal injury.
	**Danger of high voltages** Indicates a hazardous situation that can result in deadly electric shock hazards, other serious physical injury, or fire hazards.
	Indicates that the reader should stop, use caution and fully understand the operations explained before proceeding.
	**Beware of hot surface** The inverter can become hot during operation. Avoid contact with metal surfaces during operation.
	**FCC mark** The inverter complies with the requirements of part 15 of FCC rules.

2.3 Radio Interference Statement

This microinverter has been tested and found to comply with the limits for part 15 of FCC rules, which can provide reasonable protection against harmful energy. However, if not installed according to the instructions, the microinverter may cause harmful interference to radio equipment. There is no guarantee that the interference will not occur in a particular installation.

To confirm that the radio or television reception is interfered by this equipment, you can turn the equipment off and on. If this equipment does cause harmful interference to the radio or television equipment, please try to correct the interference by one or more of the following measures:

1 Relocate the receiving antenna.

2 Increase the separation between the microinverter and the receiving antenna.

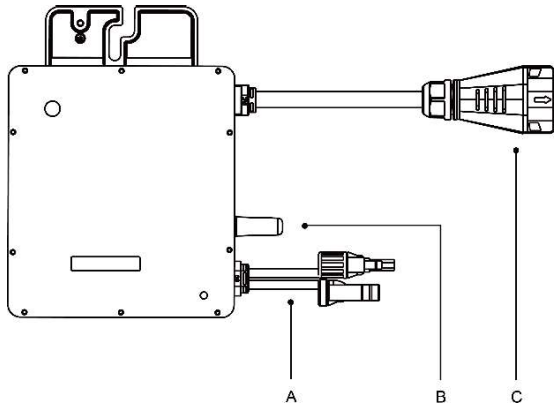
3 Contact your dealer or an experienced radio/TV technician for help.

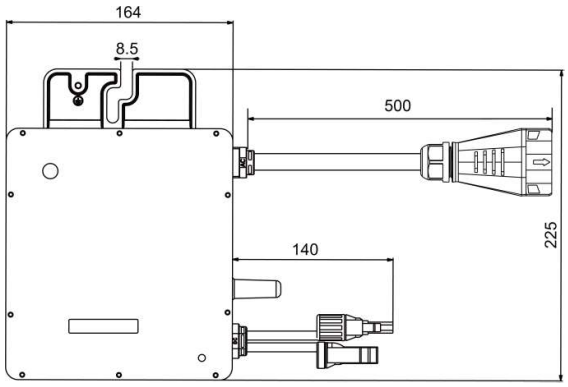
3 Product Introduction

3.1 Highlights

- Adapted to 60 & 72 cells PV panels.
- Peak efficiency 96.70%; CEC weighted efficiency 96.50%.
- Static MPPT efficiency 99.80%; Dynamic MPPT efficiency 99.76% in overcast weather.
- Power factor (adjustable) 0.8 leading……0.8 lagging.
- External antenna for stronger communication with the DTU.
- High reliability: NEMA6 (IP67) enclosure; 6000V surge protection.

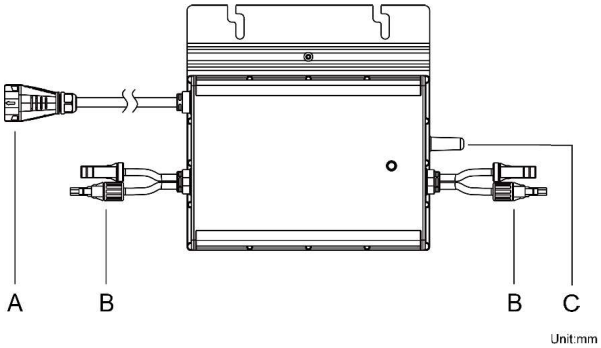
3.1.1 D350-M1: Terminals / Dimensions

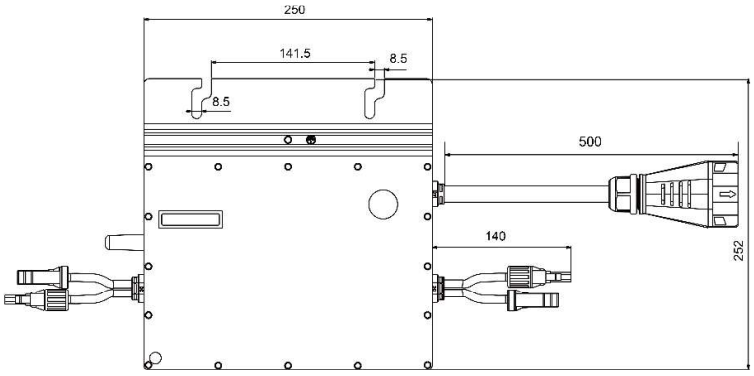




A – DC connector B – Antenna C – AC connector

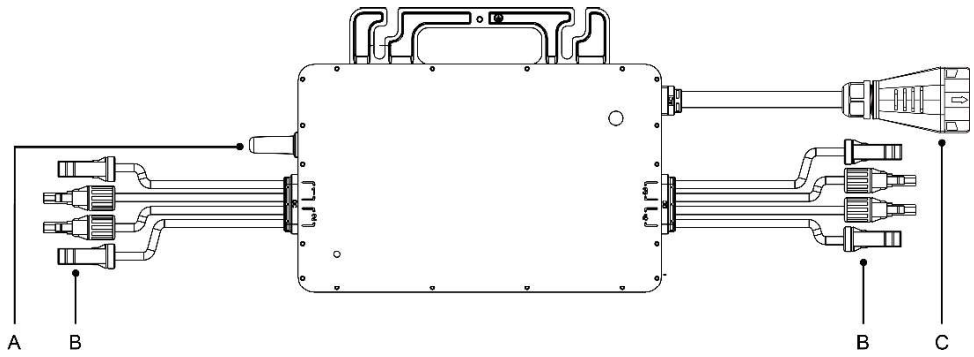
3.1.2 D700-M2: Terminals / Dimensions



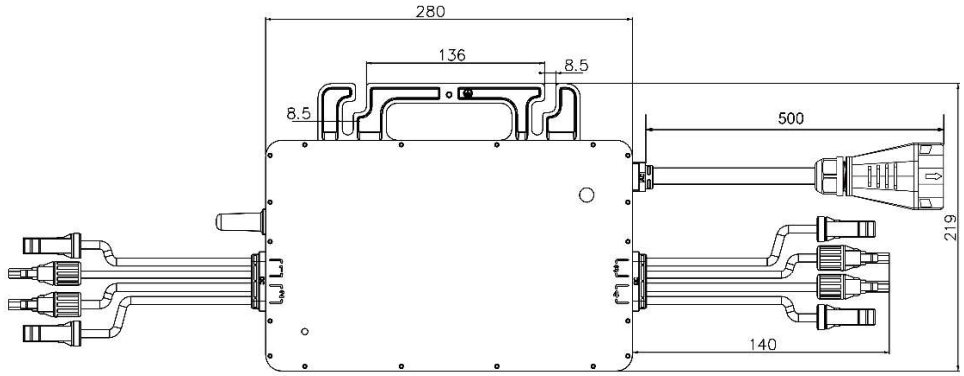


A – AC connector B – DC connector C – Antenna

3.1.3 D1500-M4: Terminals / Dimensions



A – Antenna B – DC connectors C – AC connector



Unit: mm

4 Modes of Operation

Normal: Under this mode, the microinverter is operating normally and converts DC power into AC power to support the house loads and feed into the grid.

Zero Export Control: Under this mode, the microinverter's generation is limited to the real-time house loads, and there will be no extra power feed into the grid. External metering required for this operation. Consult dealer for more details.

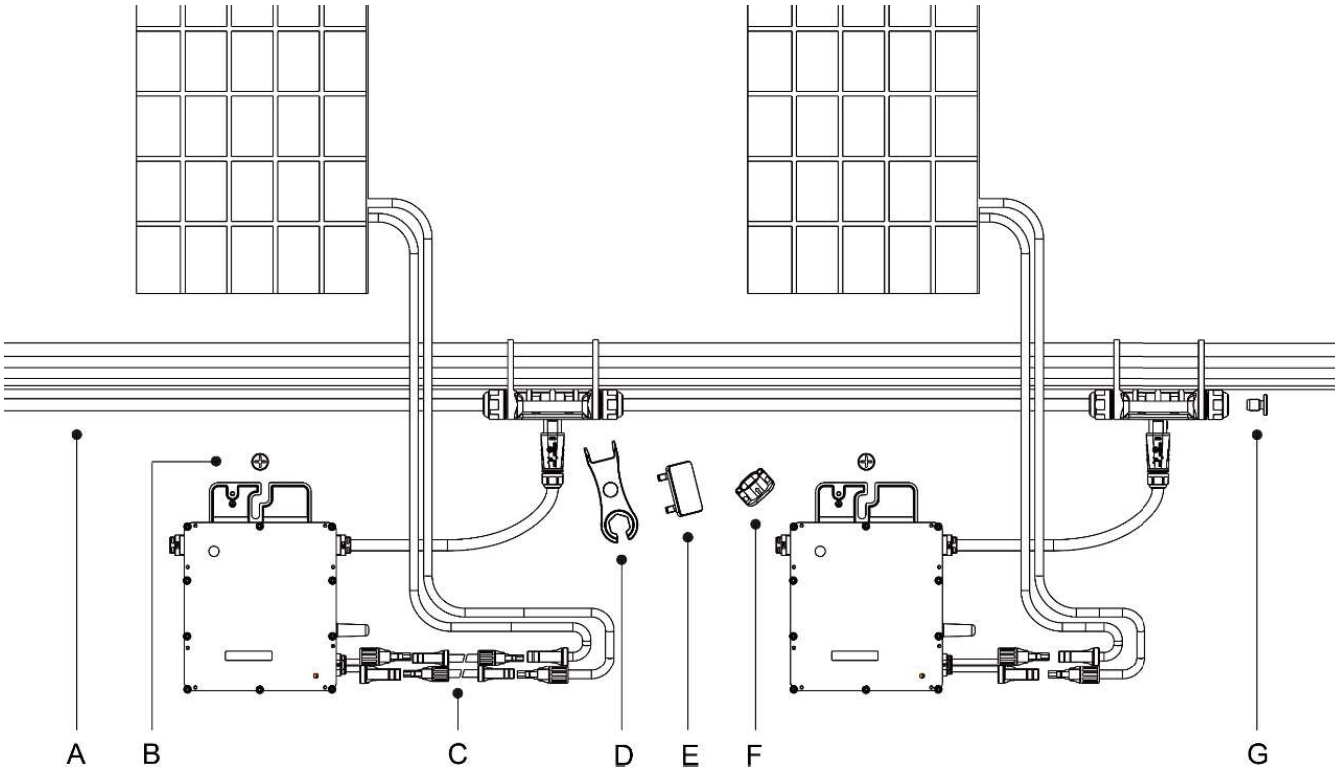
Stand by: There are several circumstance that the microinverter will stay in Standby mode:

- The current condition is outside of range of the microinverter operating requirement.
- No house loads or the Export control value has been set as "0" on the DTU while in zero export control mode.

5 Installation Planning

5.1 Accessories

(D350-M1 model shown. Accessories apply to all models.)



Item	Description
A	AC Bus Cable, 12/10 AWG Cable
B	M8 * 25 screws
C	DC Extension Cable, 1m
D	AC Connector Unlock Tool
E	Bus Connector Unlock Tool
F	AC Sub Cap
G	AC Bus End Cap, IP67

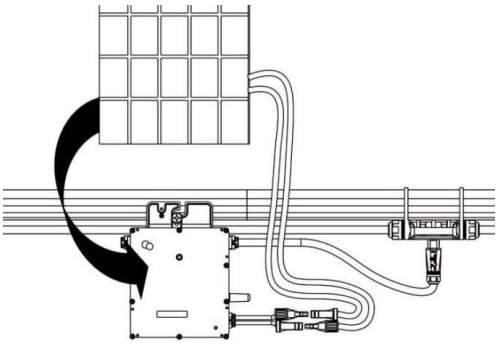
Note: All accessories above are not included in the package, and need to be purchased separately. Please contact our sales representative for the price. (M8 screws need to be prepared by installer.)

5.2 Installation Precautions

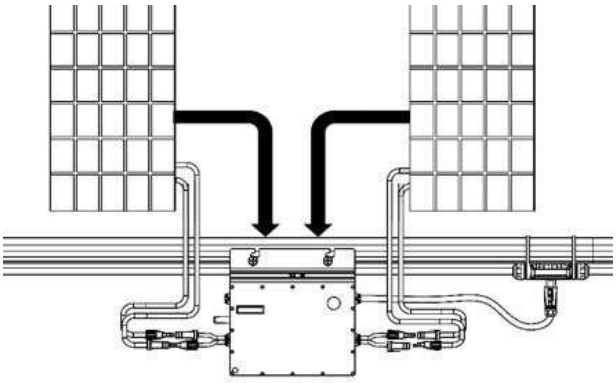
Please install the microinverter and all DC connections under a PV module to avoid direct sunlight, rain exposure, snow accumulation, UV etc. Allow a minimum of 2 cm of space around the microinverter enclosure to ensure ventilation and heat dissipation.

Warning! Be sure to verify the following before installing the microinverter system:

- Verify that the voltage and current specifications of the PV module match those of the microinverter.
- The maximum open circuit voltage rating of the PV module must within the operating voltage range of the microinverter.
- The maximum current rating at MPP is recommended to be equal to or less than the maximum input DC current. The maximum short circuit current must be equal to or less than the maximum input DC short circuit current.
- The output DC power of PV module is NOT recommended to exceed 1.35 times the output AC power of the microinverter. Refer to Warranty Terms & Conditions for more information.

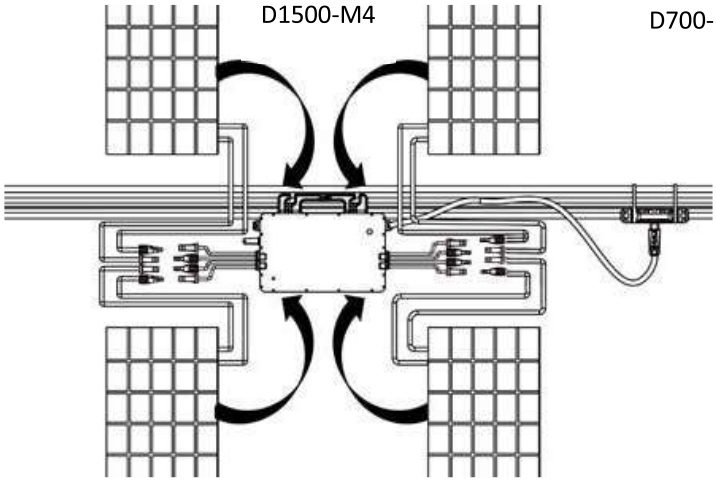


D350-M1



D700-M2

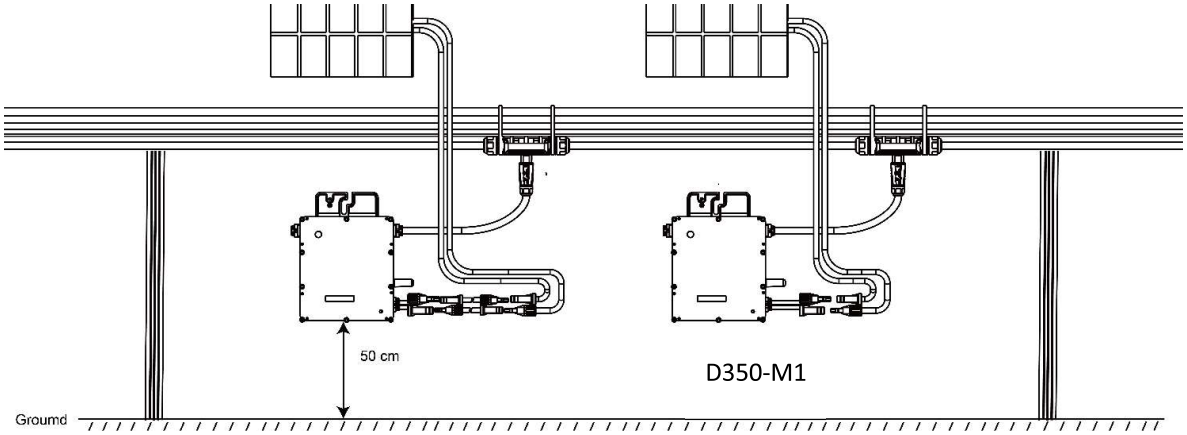
D1500-M4



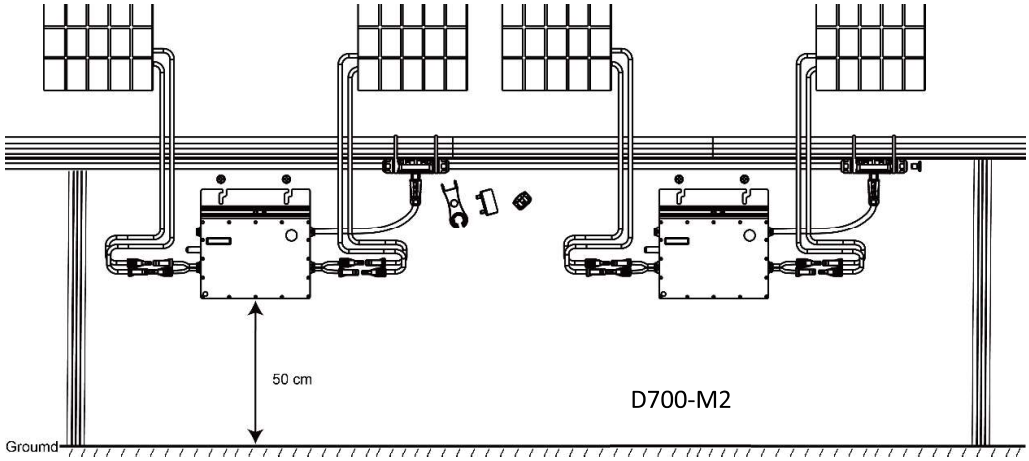
Note: For some countries the DTU will be required to meet the local grid regulation.

5.3 PC-PRO Wi-Fi communication limitations

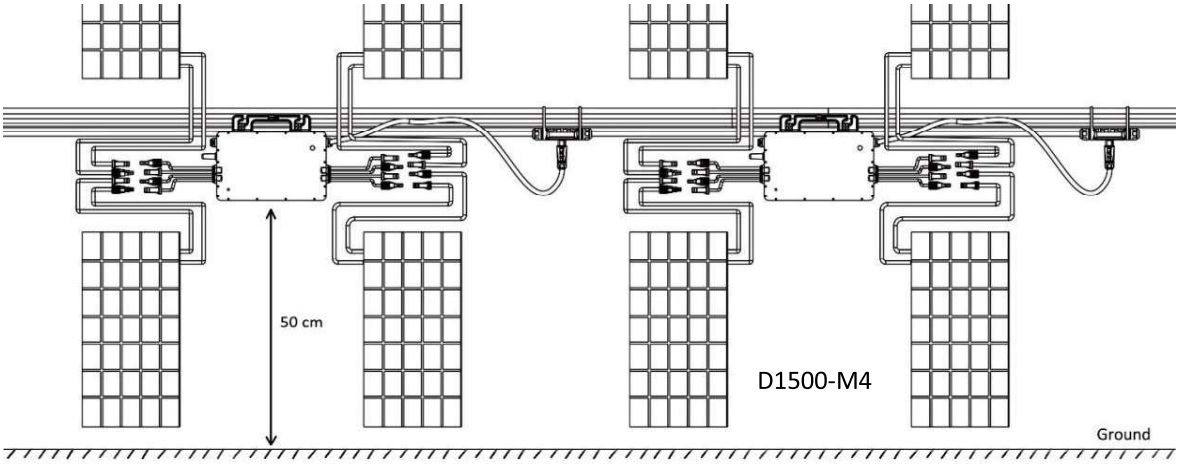
If the microinverters are installed on a concrete roof or steel roof, the communication with the PC-PRO DTU may be slightly affected. Under such installation conditions, it is better for the microinverters to be installed 50cm above the roof. Otherwise, additional DTUs (large arrays) may be required to ensure the communication quality between the DTUs and the microinverters. Residential rooftop installations with metal roofs may require the DTU to be installed closer to the PV array.



D350-M1



D700-M2



D1500-M4

5.4 Preparation

Installation of the equipment is carried out based on the system design and the place in which the equipment is installed.

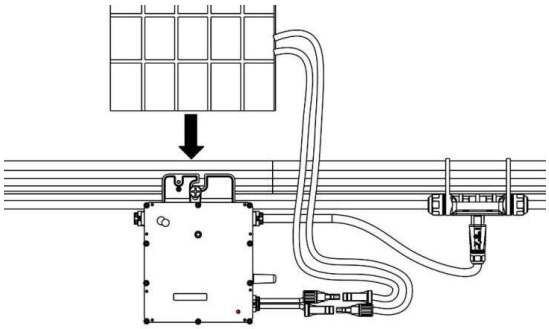
- The installation must be carried out with the equipment disconnected from the grid (powerdisconnect switch open) and with the photovoltaic modules shaded or isolated.
- Refer to the Technical Data to make sure the environmental conditions fit the microinverter's requirement (degree of protection, temperature, humidity, altitude, etc.)
- To avoid power de-rating due to an increase in the microinverter internal temperature, do not expose it to direct sunlight.

IMPORTANT! To avoid overheating, always make sure the air flow around the inverter is not blocked.

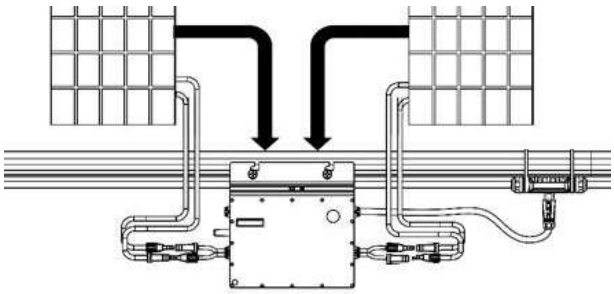
- Do not install in places where gasses or flammable substances may be present.
- Avoid electromagnetic interference that can compromise the correct operation of electronicequipment.

When choosing the position of installation, comply with the following conditions:

- Install only on structures specifically conceived for photovoltaic modules.
- Install the microinverter underneath a photovoltaic module to shade it from direct sunlight.

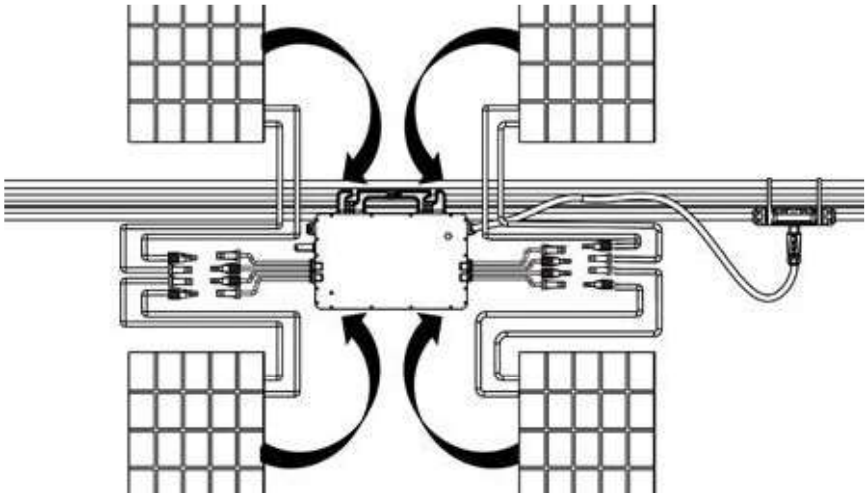


D350-M1



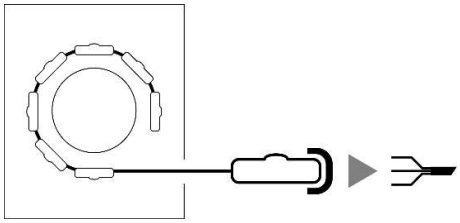
D700-M2

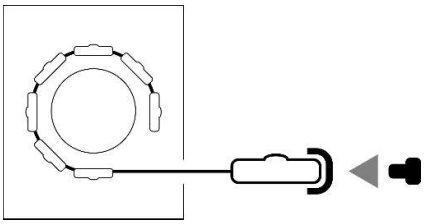
D1500-M4



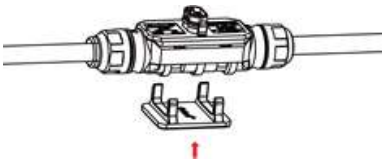
5.5 Pre-Installation: AC trunk cable end cap installation

From the open end of the trunk cable reel, replace the cable end with an end cap at the bus connector.

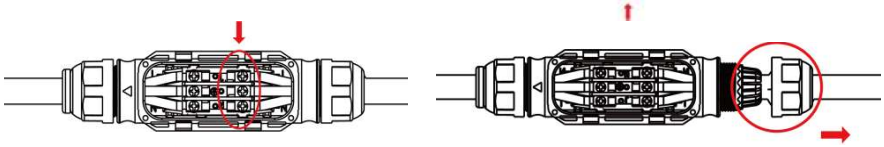




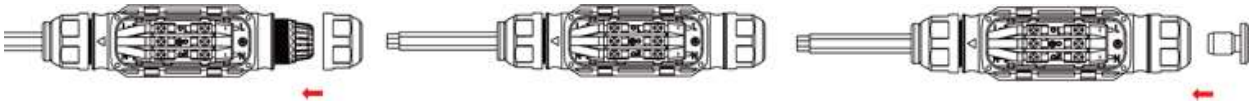
1 Use the bus connector unlock tool to unlock the port upper cover.



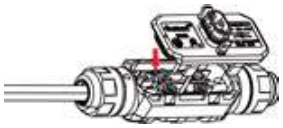
2 Loosen the three screws with the screwdriver. Untighten the cap as circled below, and remove the extra cable.



3 Screw the cap back to the port, and plug in the AC bus end cap.



4 Plug the upper cover back to the bus connector.



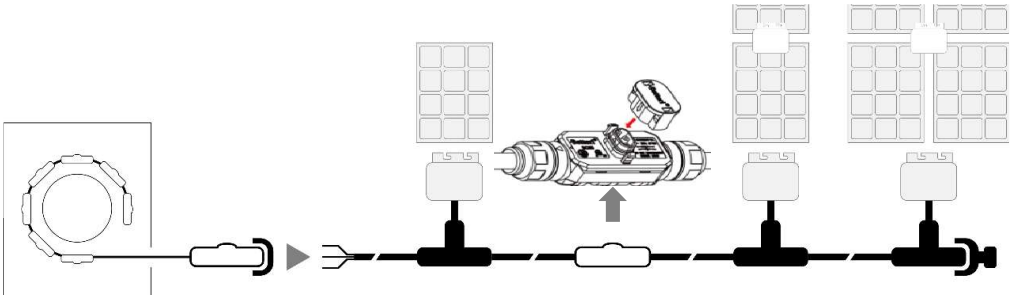
5.6 Installation: AC trunk cable

1 Route the trunk cable such that the bus connectors align with the centers of the PV module (single) and/or PV module cluster (dual / quad).

IMPORTANT! Insert the AC Sub Cap (section 5.1 - item F) over any unused bus connectors.

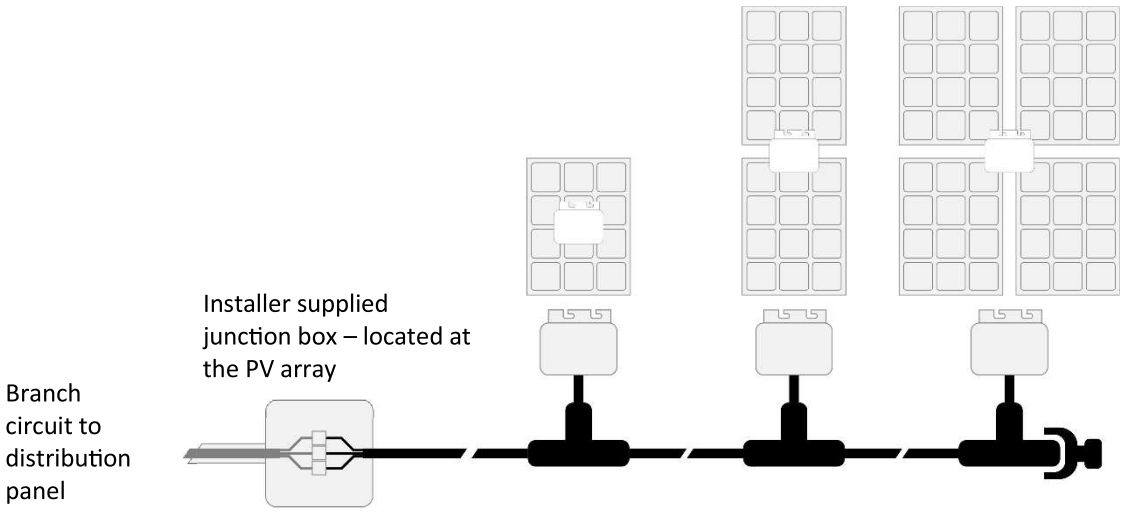
2 Repeat the steps in section 5.5 above to separate the trunk cable reel from the first unused bus connector in the PV array branch.

IMPORTANT! Do not exceed the combined AC output current rating of 24 Amps per branch. Refer to the table in Appendix D for a branch limit calculator using different microinverter combinations.



Note: Refer to Appendix B (split-phase 120/240) or Appendix C (three phase 120/208) at the end of this manual for the following instruction:

3 Terminate the loose end of the trunk cable in an AC junction box rated for use and installed as per the local electrical code.

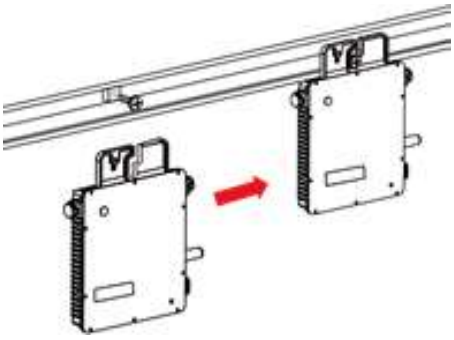


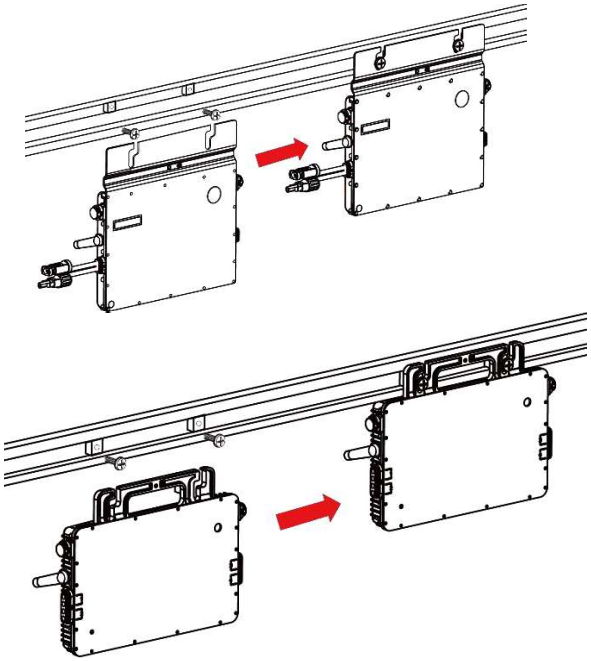
5.7 Installation: mounting the microinverter

1 Mark the approximate center of each panel / panel cluster on the frame.

2 Fix the screw(s) on the rail.

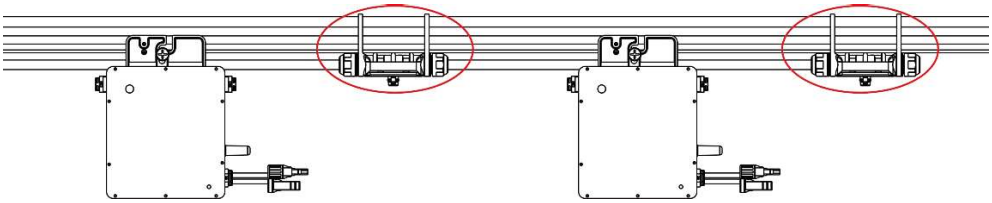
3 Hang the microinverter on the screw (see picture below), and tighten the screw(s).The silver cover side of the Microinverter should be facing the panel.



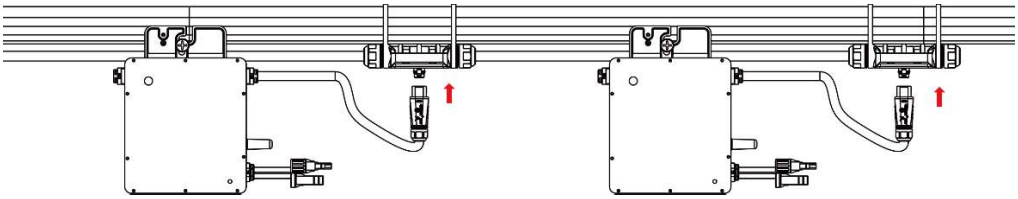


5.8 Installation: Connecting the AC trunk cable to the microinverters

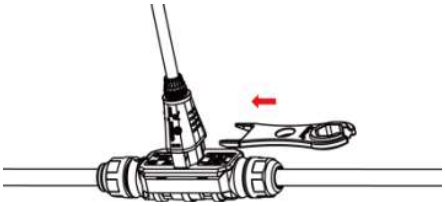
1 Attach the AC bus cable with the mounting rail, and fix the cable with tie wraps.



2 Push the AC connector of the microinverter to the trunk cable bus connector until you hear “click”.



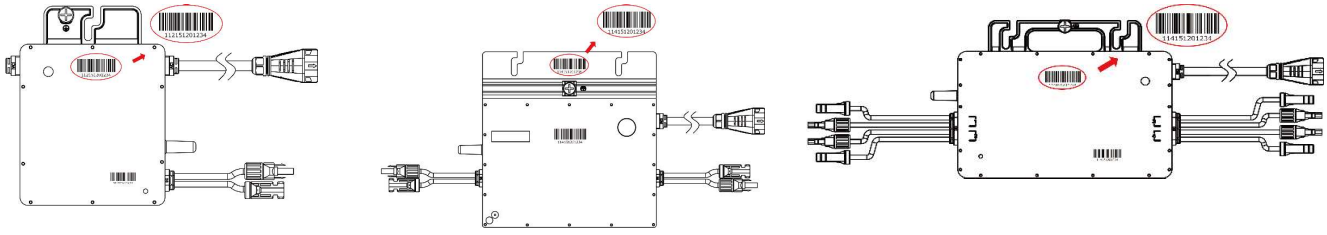
3 Plug unused AC connetors with the AC sub cap on the vacant plug to ensure waterproof and dustproof.



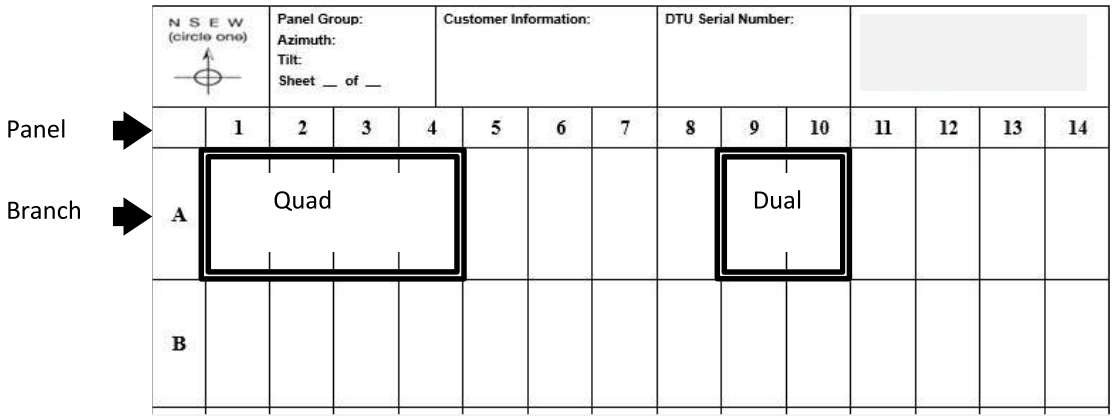
Note: If there is a need to remove the inverter AC cable from the bus port, please use the AC connector unlock tool and insert the tool into the side of AC port.

5.9 Creating an Installation Map

1 Peel the removable serial number label from each microinverter (see images below for label location).

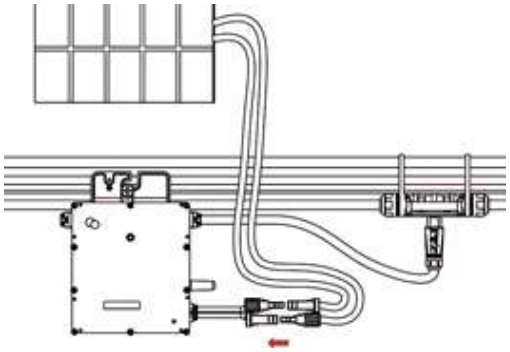


2 Affix the serial number label to the respective location on the installation map. Mark off panel clusters that share a single serial number for dual and quad microinverters as shown in the example below. Print one sheet (see - Appendix A) for each unique facing panel group based on tilt and azimuth.

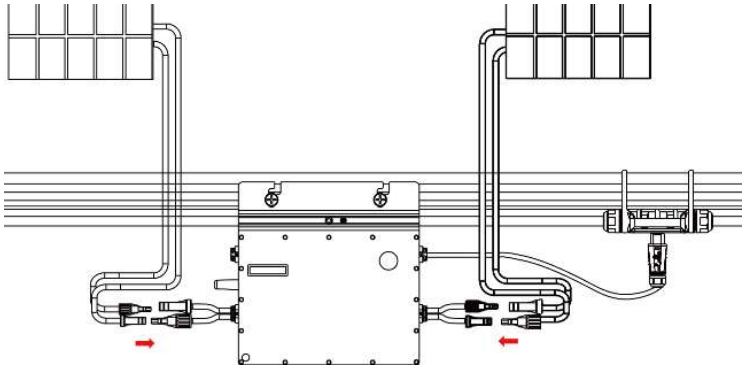


5.10 Installation: PV input port connections

1. Connect the DC cables from the PV module(s)to the PV input port(s) of the microinverter.

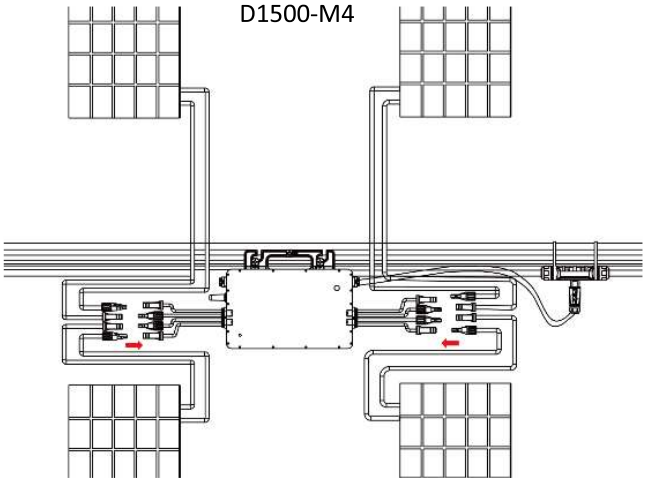


D350-M1



D700-M2

D1500-M4



6 Energizing the system

1 Turn on the AC breaker of the branch circuit.

2 Turn on the main AC breaker of the house. Your system will start to generate power after the regulated grid timing sequence has completed.

6.1 Setting up the monitoring system

Refer to the DTU User Manual or DTU Quick Install Guide, and Quick Installation Guide for Online Registration to install the DTU and set up the monitoring system. Product information is subject to change without notice.

Download reference manuals at www.duracellpowercenter.com

7 Troubleshooting

7.1 Troubleshooting List: all models

Alarm Code	Title	Suggestion
121	Over temperature protection	• Check the ventilation and ambient temperature at the microinverter. Correct as required.
125	Grid config parameter error	• Check if the grid configuration parameter is correct and upgrade again.
126	SW code 126	• If the alarm occurs accidentally and the microinverter can still worknormally, no special treatment is required.
127	Firmware error	• Check if the firmware is correct and upgrade again. • Check the communication status between the DTU and the monitoring system or between the DTU and the microinverter.
128	SW code 128	• If the alarm occurs accidentally and the microinverter can still worknormally, no special treatment is required.
129	SW code 129	
130	Offline	• Ensure that the microinverter works normally. • Check the communication status between the DTU and the monitoring system or between the DTU and the microinverter. Correct as required.
141	Grid over voltage	• Self-clearing when grid returns to normal range. • If the alarm occurs frequently, check whether the grid voltage is within the acceptable range. If not, contact the local power operator or change the grid overvoltage protection limit via the Power Center monitoring system with the consent of the local power operator.
142	10 min value grid over voltage	
143	Grid under voltage	
144	Grid over frequency	• Self-clearing when grid returns to normal range. • If the alarm occurs frequently, check whether the grid voltage is within the acceptable range. If not, contact the local power operator or change the grid over voltage protection limit via the Power Center monitoring system with the consent of the local power operator.
145	Grid under frequency	
146	Rapid grid frequency change rate	
147	Power grid outage	• Please check whether there is a power grid outage.
148	Grid disconnection	• Please check whether the AC switch or AC wiring is normal.
149	Island detected	• Self clearing when grid returns to normal range. • If the alarms occur frequently on all the microinverters in your station,contact the local power operator to check whether there is a grid island.
301 thru 308	HW code 301 thru 308	• If the alarm occurs accidentally and the microinverter can still work normally, no special treatment is required. • If the alarm occurs frequently and cannot be recovered, contact your dealer or Power Center technical support.

7.2 Troubleshooting List: D350-M1 / D700-M2

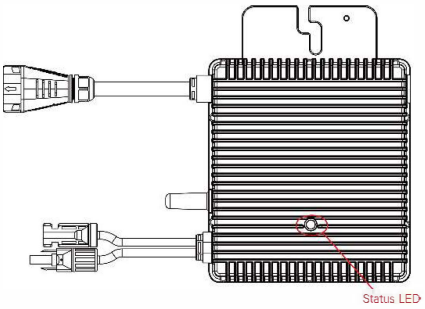
Alarm Code	Title	Suggestion
205	Port 1 over voltage	• Ensure that the PV module open-circuit voltage is less than or equal to the maximum input voltage.
206	(D700-M2 only) Port 2 over voltage	
207	Port 1 under voltage	• Ensure that the PV module open-circuit voltage is less than or equal to the maximum input voltage.
208	(D700-M2 only) Port 2 under voltage	
209	Port 1 no input	• Confirm whether this port is connected to the PV module. If the PV module is connected, please check the DC cable connectionbetween this port and the PV module.
210	(D700-M2 only) Port 2 no input	

7.3 Troubleshooting List: D1500-M4

Alarm Code	Title	Suggestion
205	Port 1 & 2 over voltage	• Ensure that the PV module open-circuit voltage is less than or equal to the maximum input voltage.
206	Port 3 & 4 over voltage	
207	Port 1 & 2 under voltage	• Ensure that the PV module open-circuit voltage is less than or equal to the maximum input voltage.
208	Port 3 & 4 under voltage	
209	Port 1 no input	• Confirm whether this port is connected to the PV module; If the PV module is connected, please check the DC cable connectionbetween this port and the PV module.
210	Port 2 no input	
211	Port 3 no input	
212	Port 4 no input	
213	Port 1 & Port 2 abnormal wiring	• Check PV input connections.
214	Port 3 & Port 4 abnormal wiring	• Check PV input connections.

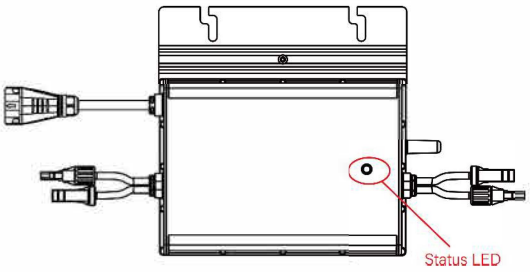
7.4 Status LED Indicator

The LED flashes five times at start up. All green flashes (1s gap) indicate normal start up.



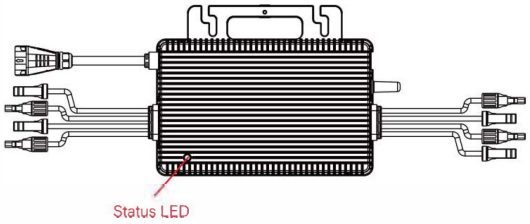
7.4.1 Start-up Modes

- Flashing green five times (0.3s gap): Start-up success
- Flashing Red five times (0.3s gap): Start-up failure



7.4.2 Run Modes

- Flashing Fast Green (1s gap): Producing power.
- Flashing Slow Green (2s gap): Producing power but one input is abnormal.
- Flashing Slow Green (4s gap): Producing power but there is no communication with the DTU.
- Flashing Red (1s gap): AC grid invalid (Voltage or frequency out of range).
- Flashing Red (0.5s gap): There is a non-grid related fault.



7.4.3 Other Status

- Flashing Red and Green alternately: Firmware is corrupted.

Note: All faults are reported to the DTU. Refer to the local App of the DTU or Power Center+ Monitoring Platform for more information.

7.5 On-site Inspection (For qualified installers only)

To troubleshoot an inoperable microinverter, follow the steps in the order shown.

1. Verify the utility voltage/frequency are within ranges as shown in the technical data.
2. Check the connection to the utility grid. Verify utility power is present at the inverter in question by removing AC, then DC power. Never disconnect the DC wires while the microinverter is producing power. Re-connect the DC module connectors and watch for five short LED flashes.
3. Check the AC branch circuit interconnection between all the microinverters. Verify each inverter is energized by the utility grid as described in the previous step.
4. Make sure that any AC breakers are functioning properly and are closed.
5. Check the DC connections between the microinverter and the PV module.
6. Verify the PV module DC voltage is within the allowable range as shown in the technical data.
7. If the problem persists, please call Power Center customer support.

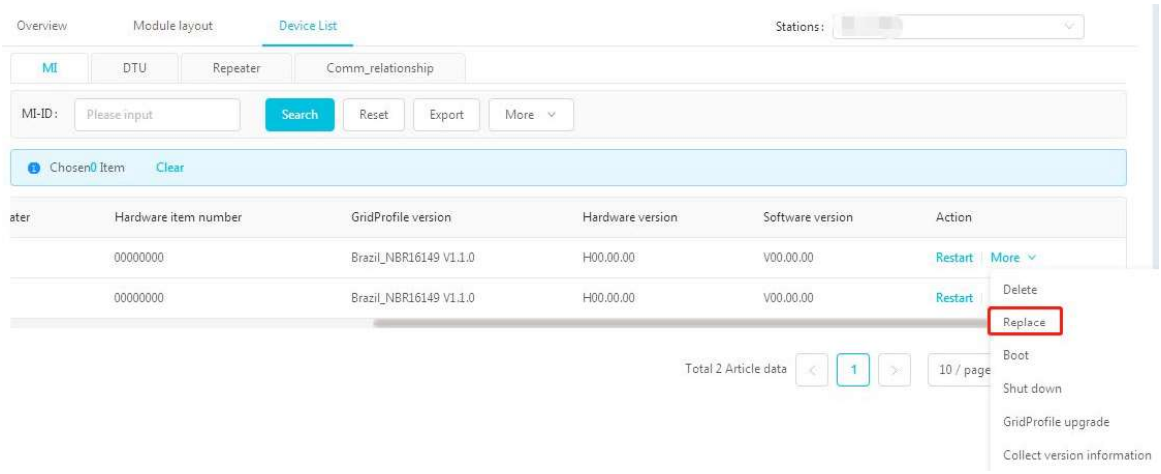
Warning! Do not try to repair the microinverter. If the troubleshooting fails, please return it to the factory for replacement.

7.6 Removing a microinverter

1. De-energize the AC branch circuit breaker.
2. Remove the PV panel that is covering the microinverter from the racking, and cover the panel(s) that connect to the PV input(s).
3. Use a DC rated clamp meter to measure and make sure there is no current flowing in the DC wires between the panel(s) and the microinverter.
4. Use the AC disconnect tool to remove the AC connectors.
5. Use the DC disconnect tool to remove the DC connectors.
6. Un-screw the fixing screw(s) on the top of the microinverter and remove the microinverter from the PV racking.

7.7 Installing the replacement microinverter

1. Record the new microinverter's serial number.
2. Ensure the AC branch circuit breaker is OFF, and follow the microinverter installationsteps to install the replacement unit.
3. In the monitoring platform (if customer already registered the PC-Pro online) select the [Device List] page and locate the device that you just replaced. Click the down arrow next to the[More] on the right side of the page, and select [Replace]. Input the new microinverter's serial number and click [Ok] to complete the station changes.



8 Decommissioning

Remove the microinverters as per section 7.6 above.

8.1 Storage and Transportation

Package and protect individual components using suitable means to make the transport and subsequent handling easier. Transportation of the equipment, especially by road, must be carried out by suitable ways for protecting the components (in particular, the electronic components) from shock, humidity, vibration, etc. The microinverter storage temperature is -40 to 85°C.

It is the customer's responsibility to examine the condition of the components transported. Upon receipt of a shipment, it is necessary to check the contents for any external damage as well as verify receipt of all items. Call the delivering carrier immediately if damage or shortage is detected. If inspection reveals damage to the inverter, contact the supplier, or an authorized distributor for repair and/or return.

8.2 Disposal

- If the equipment is not used immediately or is stored for long periods, check that it is correctly packed. The equipment must be stored in well-ventilated indoor areas that do not have characteristics that might damage the components of the equipment.
- Take a complete inspection when restarting after a long time or prolonged stop.

Please dispose the equipment properly after scrapping, which are potentially harmful to the environment, in accordance with the regulations in force in the country of installation.

9 Routine Maintenance

- Only authorized personnel are allowed to carry out the maintenance operations and are responsible to report any anomalies.
- Always use the personal protective equipment provided by the employer when carrying out the maintenance operation.
- During normal operation, check that the environmental and logistic conditions are correct. Make sure that the conditions have not changed over time and that the equipment is not exposed to adverse weather conditions and has not been covered with foreign bodies.

IMPORTANT! DO NOT use the equipment if any problems are found, and restore the normal conditions after the fault has been removed.

- Conduct an annual inspection on various components, and clean the equipment with a vacuum cleaner or special brushes.

WARNING! Do not attempt to dismantle the microinverter or make any internal repairs! In order to preserving the integrity of safety and insulation, the microinverters are not designed to allow internal repairs!

NOTE: The AC output wiring harness (AC drop cable on the microinverter) cannot be replaced. If the cord is damaged the equipment should be scrapped.

WARNING! Maintenance operations must be carried out with the equipment disconnected from the grid (power switch open) and the photovoltaic modules covered or isolated, unless otherwise indicated.

NOTE: For cleaning, do not use rags made of filamentary material or corrosive products that may corrode parts of the equipment or generate electrostatic charges.

NOTE: Avoid temporary repairs. All repairs should be carried out using only genuine spare parts.

CAUTION! Each branch should provide a circuit breaker.

10 Technical Data

Model	D350-M1	D700-M2	D1500-M4
DC input ports			
Number of PV input ports	1	2	4
Maximum module power, per port (Wdc)	440	440	470
Peak power MPPT voltage range (Vdc)	33~48	33~48	36~48
Start-up voltage (Vdc)	22		
Operating voltage range (Vdc)	16~60		
Maximum input voltage (Vdc)	60		
Max. input current (Adc), per port	11.5		
Max. input short circuit current (Adc), per port	15		
AC output			
Peak output power (VA)	350	700	1350@208V 1500@240V
Maximum continuous output power (VA)	349	696	1246@208V 1438@240V
Maximum continuous output current (A)	1.68@208V 1.52@240V	3.35@208V 2.92@240V	5.99@208V 6.25@240V
Nominal output voltage/range (V)	208/183-229 240/211-264		
Nominal frequency/range (Hz)	55-65		
Power factor	>0.99 default 0.8 leading.....0.8 lagging		
Output current harmonic distortion	<3%		
Maximum units per 20A branch	9@208V 11@240V	4@208V 5@240V	2@208V 2@240V
Maximum units per 30A branch	14@208V 16@240V	7@208V 8@240V	4@208V 4@240V
Efficiency			
Peak inverter efficiency	96.70%		
CEC weighted efficiency	96.50%		
Nominal MPPT efficiency	99.80%		
Night time power consumption (mW)	<50		
Mechanical Data			
Ambient temperature range (°C)	-40 ~ +65		
Storage temperature range (°C)	-40 ~ +85		
Dimensions (W×H×D mm)	182×164×29.5	250 x 170 x 28	280 x 176 x 33
Weight (kg)	1.75	2.60	3.35
Enclosure rating	Outdoor NEMA type 6 (IP67)		
Cooling	Natural convection – no fans		
Features			
Communication	2.4GHz Proprietary RF(Nordic)		
Monitoring	Power Center+Monitoring System (Power Center DTU is required)		
Warranty	12 years standard, 25 years optional		
Compliance	VDE-AR-N 4105:2018, EN50549-1:2019, VFR2019, AS 4777.2:2015, IEC/EN 62109-1/-2, IEC/EN 61000-3-2/-3, IEC/EN-61000-6-1/-2/-3/-4		

*Note: Voltage and frequency ranges can be extended beyond nominal if required by the utility.

11 Grid Support Details

The D350-M1 / D700-M2 / D1500-M4 microinverter is a grid support utility interactive inverter. The microinverters comply with California Rule 21. The grid support functions are controlled via the Power Center Monitoring Platform. The PC-PRO is required in this PV system.

- Only an authorized installer is allowed to make grid profile changes by following the requirements of the local electrical utility.
- Simultaneous use of Fixed Power Factor and Volt/Var is not supported.

Manufacturer stated accuracy	
Measurement	Accuracy
Volts	+/- 1%
Watts	+/- 5%
VAr	+/- 6%
Power factor	+/- 0.05
Hz	+/- 0.1

SA9: Low/High Voltage Ride Through (L/H VRT) and Must Trip Settings

Region	Voltage at PCC (% Nominal Voltage)	Ride-Through Until	Operating Mode	Maximum Trip Time (s)	Range of Adjustable Maximum Trip Time (s)
High Voltage 2 (HV2)	V ≥ 120	N/A	N/A	0.16 sec.	0.16 sec.
High Voltage 1 (HV1)	110 < V < 120	12 sec.	Momentary Cessation	13 sec.	1-13 sec.
Near Nominal (NN)	88 ≤ V ≤ 110	Indefinite	Continuous Operation	N/A	N/A
Low Voltage 1 (LV1)	70 ≤ V < 88	20 sec.	Mandatory Operation	21 sec.	21 sec.
Low Voltage 2 (LV2)	50 ≤ V < 70	10 sec.	Mandatory Operation	11 sec.	11-21 sec.
Low Voltage 3 (LV3)	V < 50	1 sec.	Momentary Cessation	1.5 sec.	1.5-2 sec.

SA10: Low/High Frequency Ride Through (L/H FRT) and Must Trip Settings

Region	System Frequency Default Settings	Ride-Through Until (s)	Ride-Through Operational Mode	Trip TimeDefault (s)	Range of Adjustable TripTime Default(s)
High Frequency 2 (HF2)	f > 62	No Ride-Through	N/A	0.16 sec.	0.16 sec.
High Frequency 1 (HF1)	60.5 < f < 62	299 sec.	Mandatory Operation	300 sec.	0.1-300 sec.
Near Nominal (NN)	58.5 < f <60.5	Indefinite	Continuous Operation	N/A	N/A
Low Frequency 1 (LF1)	57.0 < f <58.5	299 sec.	Mandatory Operation	300 sec.	0.1-300 sec.
Low Frequency 2 (LF2)	f < 57.0	No Ride-Through	Not Applicable	0.16 sec.	0.16 sec.

SA11: Ramp Rate (RR) and Soft Start (SS)

	Units	Adjustment Range		Tolerance
		Max	Min	
Ramp up rate	%Irated/s	100	1	+/- 4%
Soft ramp up rate	%Irated/s	100	1	+/- 4%

SA12: Specified Power Factor (SPF)

	Adjustment Range	
	Max	Min
Inductive, under excited, power factor	-0.8	-1.0
Capacitive, overexcited, power factor	1.0	0.8

SA13: Volt/VAr (VV)

	Units	D350-M1	D700-M2	D1500-M4
Output power rating	W	349	696	1438
Reactive power absorption (inductive, under excited)	VAr	112	223	460
Reactive power production (capacitive, overexcited)	VAr	112	223	460

SA14: Frequency-Watt (FW)

	Units	D350-M1	D700-M2	D1500-M4
Output power rating	W	349	696	1438
Manufacturer's stated P(f) accuracy	%Prated	5%		
Maximum slope of frequency droop	%Prated/Hz	100		
Minimum slope of frequency droop	%Prated/Hz	20		

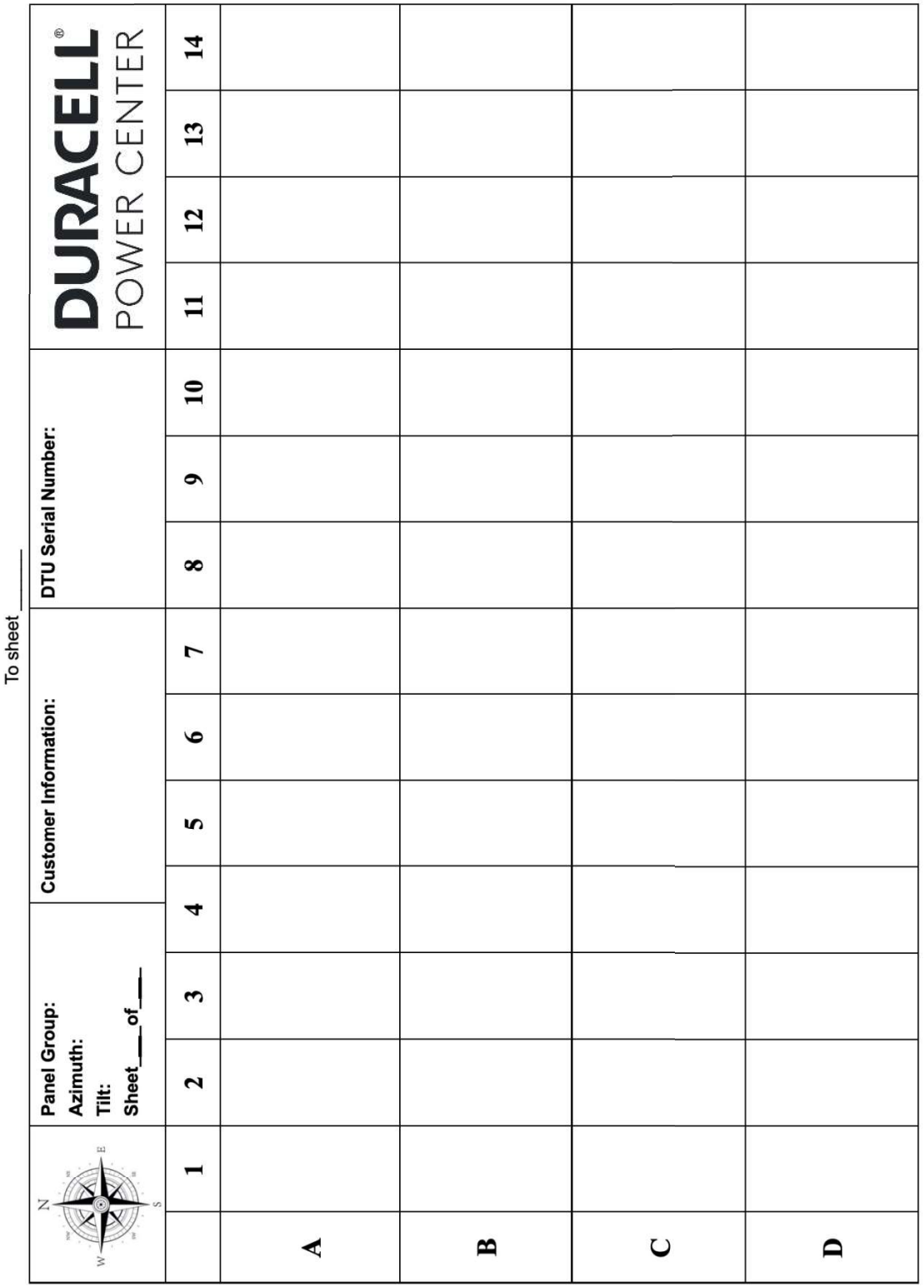
SA15: Volt-Watt (VW)

	Units	D350-M1	D700-M2	D1500-M4
Output power rating	W	349	696	1438
Output Power accuracy	%Prated	5%		
Maximum Slope of active power reduction	%Prated/Hz	50		
Minimum Slope of active power reduction	%Prated/Hz	20		

Appendix A: Installation Map Template

To sheet _____

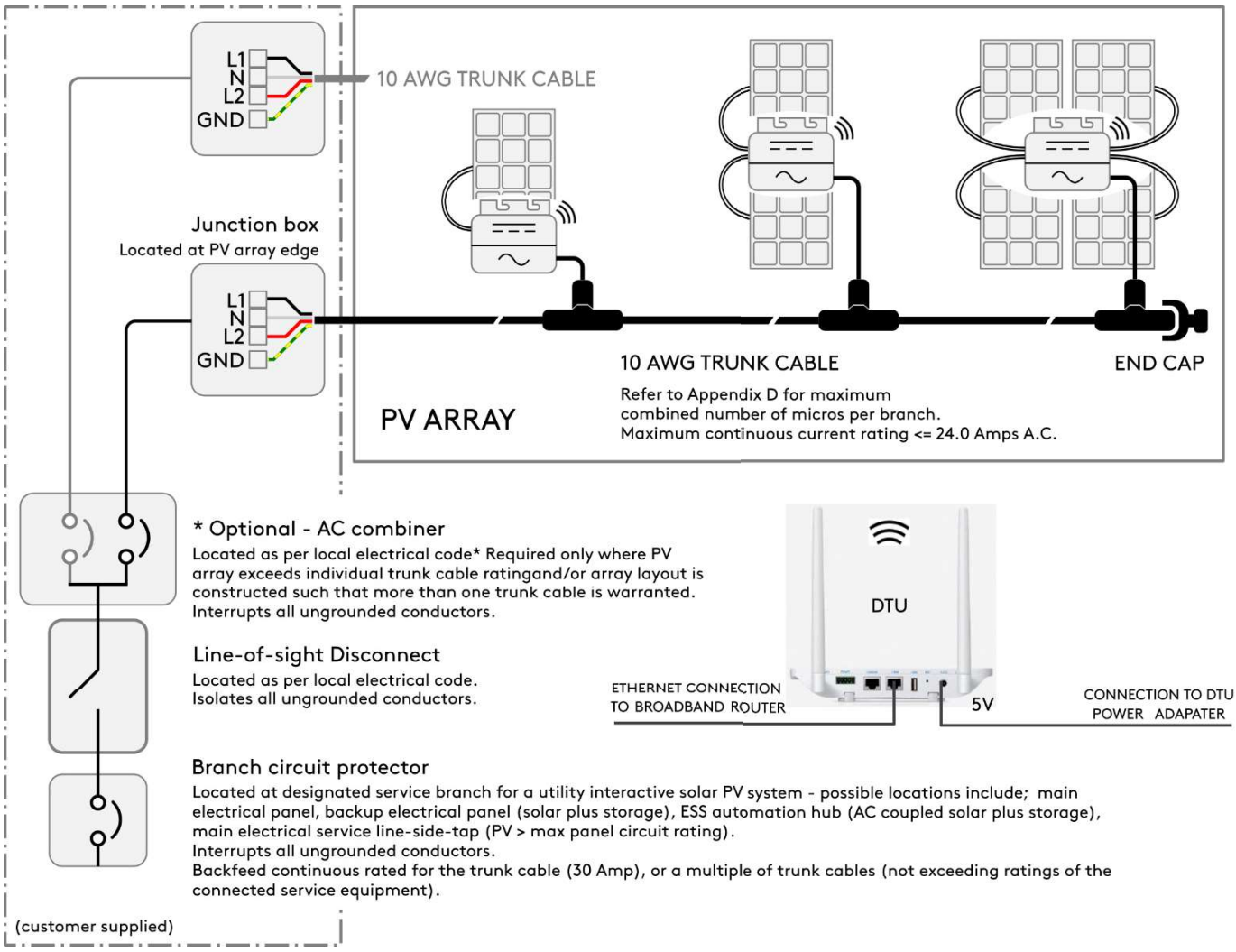
To sheet _____



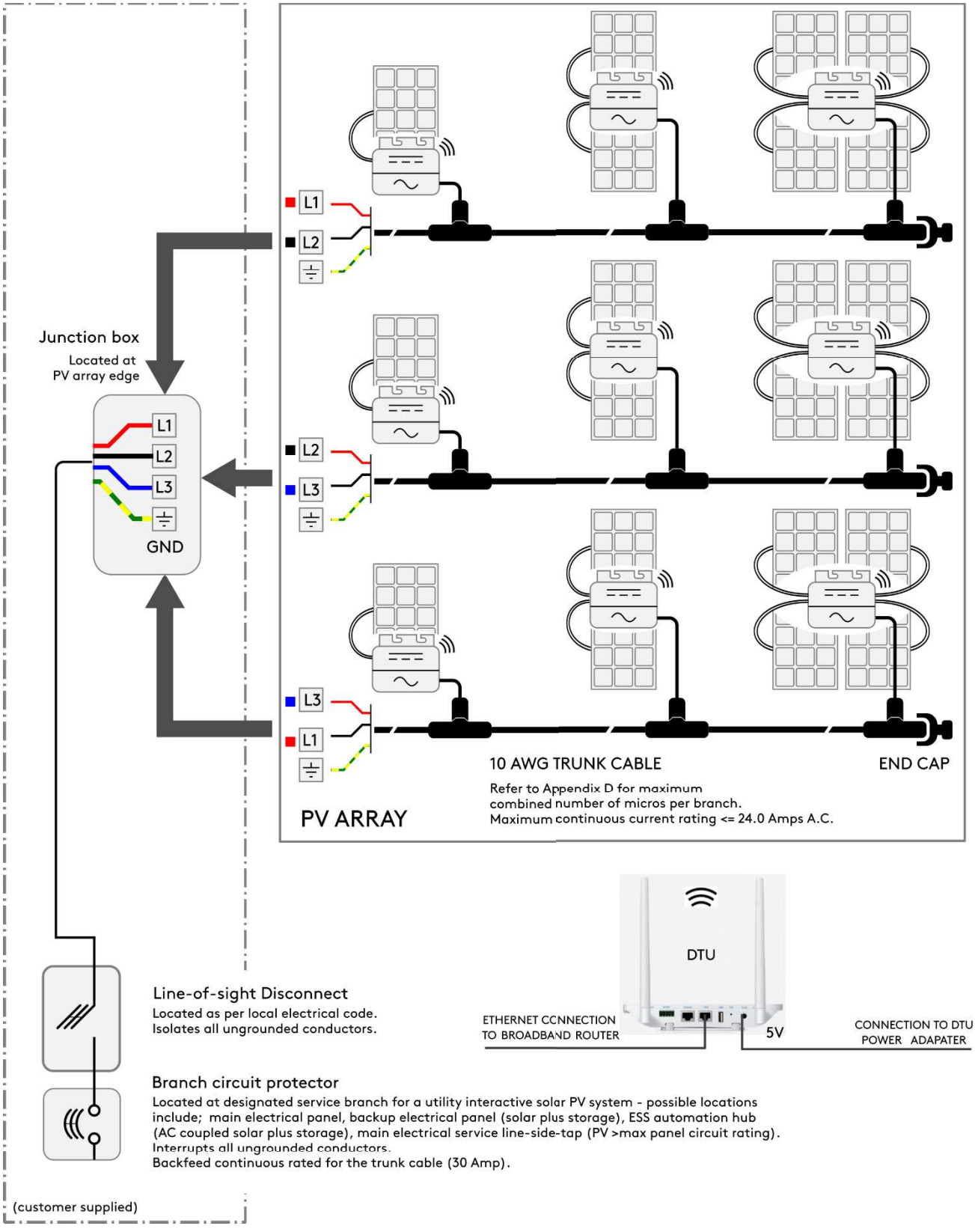
To sheet _____

To sheet _____

Appendix B: 120/240 Split-phase Electrical Single Line Diagram



Appendix C: 120/208 Three-phase Electrical Single Diagram



Appendix D: AC branch limit calculator

The following table highlights various combinations of quad, dual, and single microinverters that can be connected to a single 10 AWG trunk cable as a single AC branch with a 30 Amp circuit protection rating.
Not all possible combinations are shown.

240V		
D1500-M4 (Quad)	D700-M2 (Dual)	D350-M1 (Single)
4		
3	2	
3	1	2
3		4
2	4	
2	3	2
2	2	4
1	6	
1	5	2
1	4	4
	8	
	7	2
	6	4

208V		
D1500-M4 (Quad)	D700-M2 (Dual)	D350-M1 (Single)
4		
3	1	1
3		3
2	3	1
2	2	3
2	1	5
1	5	
1	4	2
1	3	4
	7	
	6	2
	5	4

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Models: D350-M1 / D700-M2 / D1500-M4
Installation Manual

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