

Solar inverters

Quick installation guide

MICRO-0.25/0.3/0.3HV-I-OUTD-US-208/240

EN



In addition to what is explained in this guide, the safety and installation information provided in the technical manual must be read and followed. The technical documentation and the interface and management software for the product are available at the website.

Power and productivity  
for a better world™



The PV panels supply DC input voltage to the inverter when they are exposed to light. The installation must be carried out with the equipment disconnected from the grid and with the photovoltaic panels

When choosing installation placement, comply with the following:

- Install the MICRO underneath the photovoltaic modules in the shade, otherwise the inverter could power limit.
- Maintenance or replacement of the device could require the technician to dismount the photovoltaic module mounted on the top of the MICRO inverter; ensure distances are correct for normal test and maintenance.

**Installation**

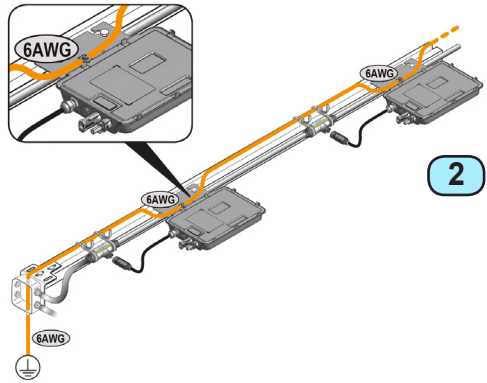
- Run the AC cable along the racking system used for installing the photovoltaic modules.
- Secure the MICRO inverter to the racking system with the logo side facing downwards.
- Torque the MICRO inverter fasteners to the values shown below, do not over torque.

6 mm (1/4") mounting hardware: 5 N m (45 to 50 in-lbs).

8 mm (5/16") mounting hardware: 9 N m (80 to 85 in-lbs).

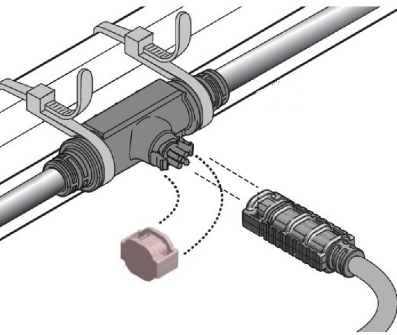
The inverter and photovoltaic modules must be connected to an equipment grounding conductor (EGC). The EGC is incorporated in the AC trunk cable. The inverter must be earth grounded using the correct clamp secured to the chassis. There are two possible configurations:

**DC grounding electrode conductor coupling all the MICRO inverters:** The conductor must have a minimum cross section of 6 AWG; torque to 2Nm (17.7 in-lb).

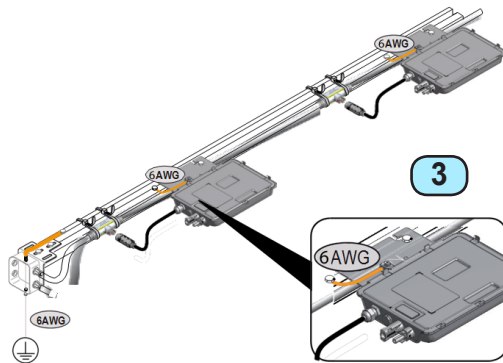


DO NOT EXCEED THE MAXIMUM NUMBER OF MICRO INVERTERS.

Fasten the AC-TRUNK cable to the frame using listed cable ties rated for 75°C. Keep connectors in a position accessible to the AC-TRUNK cable coming from the MICRO.

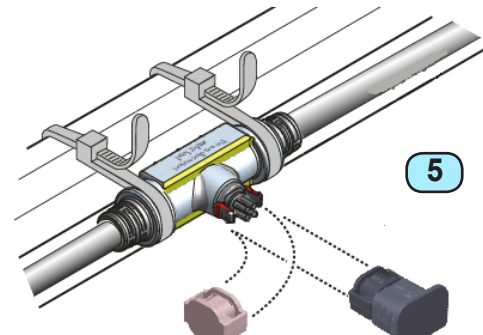


**DC grounding electrode conductor through racking system:** Conductor linking assembly to the grounding distribution structure must be at least 6AWG., torque to 2Nm (17.7 in-lb).



USE RACKING SYSTEM CERTIFIED FOR USE AS A GROUNDING STRUCTURE.

Remove temporary cap from AC-TRUNK cable connectors and connect MICRO inverters. Connectors are coupled correctly when two clicks are heard. Keep unused AC-TRUNK cable connectors watertight by fitting the AC-TRUNK PLUG CAP on them.



IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS-KEEP IN SAFE PLACE!



Made in China



C 259813 US  
CSA C22.2 No. 107.1-01  
UL 1741

www.abb.com/solar  
SOLAR GRID TIED INVERTER  
UTILITY INTERACTIVE  
MODEL: MICRO-0.3HV-I-OUTD-US-208/240

DC RATING

Nominal Input Operating Voltage	45 V
Max. Input Voltage	79 V
Range of Input Operating Voltage	19 - 75 V
Range of Input Voltage @Full Power	30 - 75 V
Max. Input Current	10.5 A
Max. Input Short Circuit Current (PV Panels)	12.5 A

(\*) For More Details Refer to the Instructions Manual

AC RATING

Nominal Output Voltage	208 V - / 2W - 10 240 V - / 3W - SP0
Operating Voltage Range	183 - 228 V - / 211 - 264V-
Nominal Output Frequency	60 Hz (factory preset)
Operating Frequency Range	57 to 59.8 (Adjustable) - 60.5 Hz
Output Power Factor	> 0.95
Max. Output Current	1.44 A (rms)@208V - / 1.25 A (rms)@240V-
Max. Continuous Output Power	300 W @ 65°C amb.
Max. Output Overcurrent Protection	20 A

Operating Ambient Temperature:  
-40 to +75 °C (-40 to +167 °F) with Output Power Derating (\*)  
Type of Enclosure: NEMA 4X  
DC Ground Fault Detector/Interrupter is Provided  
(\*) For More Details Refer to the Instructions Manual

Contains FCC ID: X6W-EMB2  
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.



SERIAL NUMBER:  
3L03021F400 0000013012

MAC ADDRESS:

AA:BB:CC:DD:EE:FF:GG:HH



Main symbols used in the guide and on the products



UL 1741; CSA-C22.2 No.  
107.1-01



General warning - Important safety information



Hazardous voltage



Hot surfaces



System earth conductor  
(main grounding protective earth, PE)



Phase



Grounding (earth)



Direct and alternating currents, respectively

Electrical Warnings

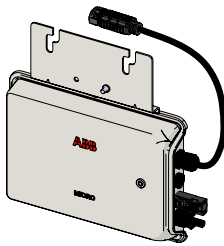
It is the responsibility of the installer to follow NEC and ANSI/NFPA 70 methods and requirements and any other local regulations when installing the required external disconnects and overcurrent protection devices, making electrical connections (conductor terminations, fuse, ground connections), and when installing the system grounding. Note input and output circuits are isolated from the inverter enclosure. Voltage and Frequency Tolerances are as follows:

COND.	Utility Interconnection and Voltage and Frequency Trip Limits and Trip Times		
	Simulated Utility Source		Max.time (sec) at 60Hz before cessation of current to the simulated utility
	Voltage	Frequency	
A	V< 50% Vnor (Not Adjustable)	Rated	0.16 sec (Not Adjustable)
B	50%Vnor≤ V< 88% Vnor Adjustable Set Points 55% to 88%	Rated	2 sec (Default) (Adj. Set Points 0.16 to 5 sec)
C	110%Vnor≤ V< 120% Vnor Adjustable Set Points 110% to 118%	Rated	1 sec (Default) (Adj. Set Points 0.16 to 5 sec)
D	V≥120% Vnor (Not Adjustable)	Rated	0.16 sec (Not Adjustable)
E	Rated	f > 60.5(Not Adjustable)	0.16 sec (Not Adjustable)
F	Rated	f < 59.3 (Default)(Adj. Set Points 59.8 Hz to 57.2 Hz)	0.16 sec (Default) (Adj. Set Points 0.16 to 300 sec)
G	Rated	f < 57.0 (Not Adjustable)	0.16 sec (Not Adjustable)

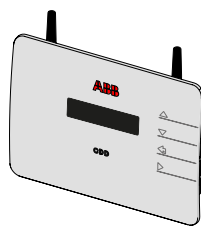
System components

Main system components

MICRO inverter



The CDD device necessary for monitoring and collecting data from the MICRO inverters



The free "AV Plant Viewer" web portal that provides remote system monitoring via Internet



The AC-TRUNK-BUS cable (and relevant accessories) are available in 3 configurations, 41", 67", or 81" depending on the type of installation and PV panel used. The installer may cut the cable to length needed for the specific installation.



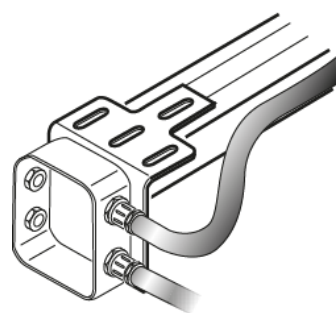
Assembly Instruction (continued)

Fit the appropriate AC-TRUNK END CAP on the unused ends of the AC-TRUNK cable.

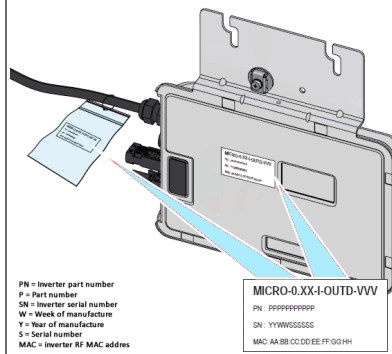
- Fit the ring nut and gasket around the cable to terminate.
- Strip 18-25 mm/0.7in - 1in of the external insulation and separate each conductor.
- Insert the conductors inside the cap to seal them.
- Insert the gasket into the cap with slight pressure.
- Tighten the ring nut to the correct pressure on the gasket (max.2.45Nm/1.8 ft-lbs).



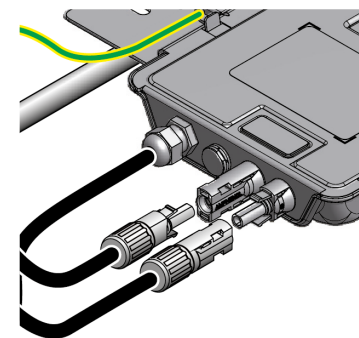
Connect the AC-TRUNK cable/s coming from the MICRO inverters to the junction box or to the AC distribution panel.



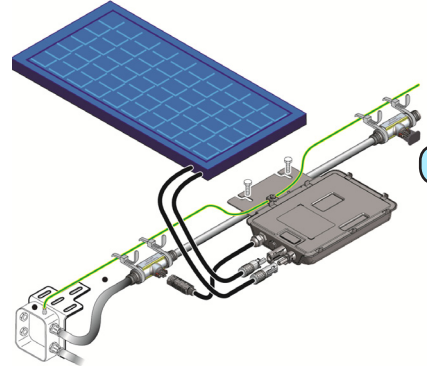
Use the duplicate label in the attached plastic bag to create the system map. Place adhesive labels on the diagram found on Page 2.



Plug the DC cables into the corresponding inputs on the MICRO inverters and install the photovoltaic modules.

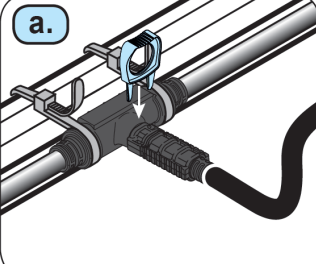


Each module must be connected to MICRO with a DC cable length less than 3m.

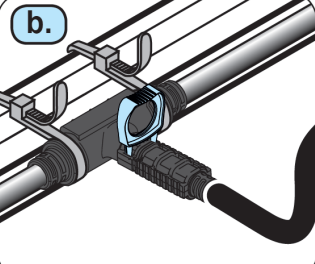


The AC-TRUNK UNLOCK TOOL must be used to disconnect the AC connector from the MICRO Inverter or to remove the AC-TRUNK PLUG CAP from the connectors on the AC- TRUNK cable

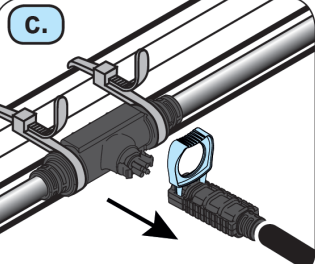
a.



b.



c.






## Protective Equipment

**ELECTRICAL CONNECTION WARNINGS** - This grid-tied inverter system operates only when properly connected to the AC distribution network. Before connecting the MICRO to the power distribution grid, contact the local power company to get appropriate approvals. Connect only to a circuit with maximum branch over current protection of 20 Amps. The AC output neutral is not bonded to ground.

Protection breaker rating		6A	10A	16A	20A
Max number of Inverters @240VAC	MICRO-0.25	4	7	12	15
	MICRO-0.3 MICRO-0.3HV	3	6	9	12
Max number of inverters @208VAC	MICRO-0.25	4	6	10	13
	MICRO-0.3 MICRO-0.3HV	3	5	8	11

 It is the installer's responsibility to adequately size the overcurrent protection, based on the number and types of MICRO inverters in the system. Connect the inverter only to a dedicated branch circuit.

**INTERFACE PROTECTION SYSTEM AND DEVICE DOWNSTREAM OF THE INVERTER** - The inverter does not include any electro-mechanical devices (relays, contactors, etc.) for automatic disconnection from the power grid. The system must be provided with external protection to physically disconnect the MICRO inverters from the grid, typically composed of an interface protection system that analyzes and controls the grid parameters and sends commands to the interface device in charge of physically disconnecting the PV installation MICRO inverters line.

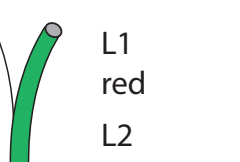
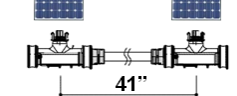
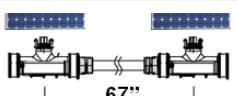

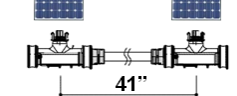
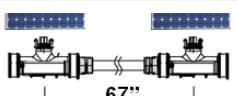

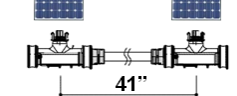
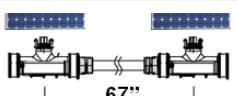

 To reduce the risk of fire, connect only to a circuit provided with 20A maximum branch circuit overcurrent protection in accordance with the National Electric Code (ANSI/NFPA 70).

## 7 Connection to AC Side

### Connection to AC side

- The AC cables coming from MICRO inverters must be joined inside a junction box.
- A single line cable must form the connection to the distribution grid
- A 4-wire AC cable must be used; the maximum trunk cable allowed beyond the last inverter is limited to 15 feet
- Grounding is obligatory.
- Line cable (not supplied) runs between the junction box and the load distribution panel.
- AC cables from the MICRO inverters have four conductors shown below.
- Close the junction box after wiring is complete. Ensure the seal is tight.


 To prevent electrical hazards, all connection operations must be carried out with the disconnect switch downstream of the inverter (grid side) open and locked.

 <p>L1 red</p> <p>L2 black</p> <p>Neutral white</p> <p>Ground Green</p>	<table border="1"> <thead> <tr> <th>Item code</th><th>Description</th></tr> </thead> <tbody> <tr> <td>AC-TRUNK SPOOL 41 inches-50 plugs</td><td>  <p>AC cable (4 conductors): 10 AWG wheelbase 41" 40 connectors</p> </td></tr> <tr> <td>AC-TRUNK SPOOL 67 inches-32 plugs</td><td>  <p>AC cable (4 conductors): 10 AWG wheelbase 67" 32 connectors</p> </td></tr> <tr> <td>AC-TRUNK SPOOL 81 inches-27 plugs</td><td>  <p>AC cable (4 conductors): 10 AWG wheelbase 81" 27 connectors</p> </td></tr> </tbody> </table>	Item code	Description	AC-TRUNK SPOOL 41 inches-50 plugs	 <p>AC cable (4 conductors): 10 AWG wheelbase 41" 40 connectors</p>	AC-TRUNK SPOOL 67 inches-32 plugs	 <p>AC cable (4 conductors): 10 AWG wheelbase 67" 32 connectors</p>	AC-TRUNK SPOOL 81 inches-27 plugs	 <p>AC cable (4 conductors): 10 AWG wheelbase 81" 27 connectors</p>
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AC-TRUNK SPOOL 81 inches-27 plugs	 <p>AC cable (4 conductors): 10 AWG wheelbase 81" 27 connectors</p>								



 The installation technician is responsible for selecting a junction box with the appropriate dimensions and insulation.  
Do not reverse the phase and the neutral!

## Map of MICRO inverters installed

The purpose of the system map is to associate the Serial Numbers of the MICRO inverters with their positions on the system. The map is helpful for identifying the position of a given MICRO inverter installed beneath its respective PV panel since the CDD device will indicate the production and any malfunctions based on the serial number.

Page ..... of .....  To sheet .....		1		2		3		4	
A	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....
B	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....
C	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....
D	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....
E	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....	Azimuth..... Tilt.....

Affix the detachable label to each field on the map bearing the serial number of the MICRO inverter

 To sheet .....  To sheet .....

## Final Steps

**Acquire and configure the MICRO inverters of the system using the CDD device.**

When connecting the inverter to the distribution grid, the configuration is made with the CDD. It is required that the CDD be installed with any MICRO inverter in compliance with UL1741, for the purpose of indication and resetting of ground faults. It is essential to plan for the pertinent standards in the country. The inverter will not begin to feed energy into the distribution grid until the association procedure by the CDD has been completed. It is required that a CDD (Concentrator Data Device) be installed with any MICRO inverter.

Refer to the CDD Instruction Manual or CDD Quick Installation Guide to perform the system commissioning operations. The Instruction Manual for the CDD can be found on the web page. Status of the commissioning will be reported on the CDD display.

For MICRO inverters with an LED on the front panel, see the table below for a description of the LED behavior. In the table, the Start-up phase happens in the first ten seconds and includes steps 1 and 2, followed by Steps 3-9, which are part of the Static phase. Refer to the MICRO technical manual online for more detail.

	Status	Description	DC	Grid	Duration	GREEN	RED
1	Start up	MICRO virgin	ON	OFF	10sec.	50% DUTY CYCLE, PERIOD 2SEC	OFF
2	Start up	MICRO acquired	ON	OFF	10sec.	SOLID GREEN	OFF
3	Off	No DC present	OFF	OFF	Continuous	OFF	OFF
4	Alarm	Boot issue	ON	OFF	Continuous	OFF	50% DUTY CYCLE, PERIOD 1SEC (refer to CDD)
5	Alarm	Ground Fault	ON	OFF	Continuous	OFF	SOLID RED
6	Alarm	Country Std. (CS) issue	ON	OFF	Continuous	OFF	50% DUTY CYCLE, PERIOD 2SEC
7	Alarm	Generic Alarm	ON	OFF	Continuous	50% DUTY CYCLE, PERIOD 2SEC	50% DUTY CYCLE, PERIOD 2SEC
8	Normal	DC on, no alarm, no Grid Conn.	ON	OFF	Continuous	50% DUTY CYCLE, PERIOD 2SEC	OFF
9	Normal	DC on, Grid Connected	ON	ON	Continuous	10% DUTY CYCLE, PERIOD 10SEC	OFF

## Commissioning

## Preliminary checks

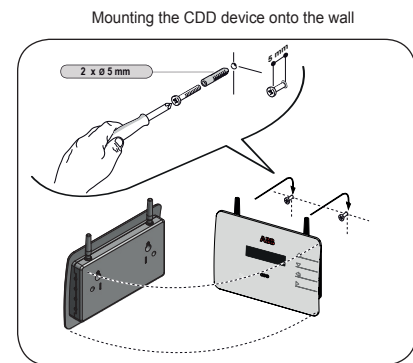
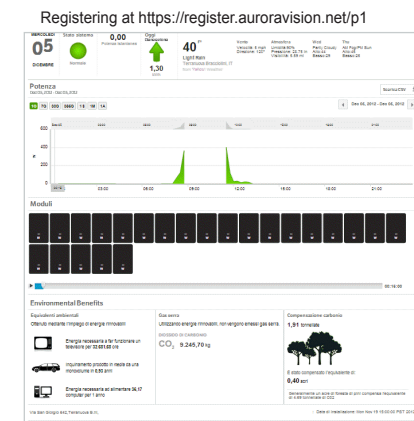
- When conducting checks, confirm that the main AC breaker (downstream from the system) and any other possible isolation switches are open.
- Confirm that all conductors and protective grounding points are connected.
- Check the position of all connection cables and the tightness of all nuts and terminals.
- Confirm that all electrical safeguards have been correctly installed.

### Sequence of operations

- Close the AC breaker (downstream from the system) and any other isolation switches to connect the system to the AC grid.
- Follow the instructions from the CDD Quick Installation Guide or technical manual for network configuration and inverter acquisition procedure.
- After the CDD network connection and inverter acquisition is completed, verify that all inverters are operation and harvesting energy by reviewing the CDD monitoring page. This step can be performed only when the PV modules have sufficient sunlight to harvest energy.

## Final steps

For MICRO inverters without an LED on the front panel, the ground fault and other indications are reported on the CDD display and monitoring webpage. Refer to the CDD technical manual for indications and error reporting information.



## Characteristics and technical data

	VALUES	MICRO-0.25-I-OUTD-US-208/240		MICRO-0.3-I-OUTD-US-208/240		MICRO-0.3HV-I-OUTD-US-208/240	
Nominal Output Power	W	250		300 <sup>1</sup>		300 <sup>1</sup>	
Rated Grid AC Voltage	V	208	240	208	240	208	240
Maximum Output Power	W	260		310		310	
Input Side (DC)							
Maximum Usable DC Input Power	Wp	265 <sup>2</sup>		320 <sup>2</sup>		320 <sup>2</sup>	
Maximum PV Panel Rating (STC)	W	300		360		360	
Absolute Maximum Voltage (Vmax)	V	65		65		79	
Start- Up Voltage (Vstart)	V	25		25		25	
Full Power MPPT Voltage Range	V	25-60		30-60		30-75	
Operating Voltage Range	V	12-60 <sup>3</sup>		12-60 <sup>3</sup>		19-75 <sup>3</sup>	
Maximum Usable Current (Idcmax)	A	10.5		10.5		10.5	
Maximum Short Circuit Current Limit	A	12.5 <sup>3</sup>		12.5 <sup>3</sup>		12.5 <sup>3</sup>	
DC Connection Type		Amphenol H4 PV connector					
Output Side (AC)							
Grid Connection Type		1Ø/2W	Split-Ø/3W	1Ø/2W	Split-Ø/3W	1Ø/2W	Split-Ø/3W
Adjustable Voltage Range (Vmin-Vmax)	V	183-228	211-264	183-228	211-264	183-228	211-264
Grid Frequency	Hz	60		60		60	
Adjustable Grid Frequency Range	Hz	57-60.5		57-60.5		57-60.5	
Maximum Output Current	A	1.20	1.04	1.44	1.25	1.44	1.25
Power Factor		> 0.95		> 0.95		>0.95	
Maximum Number of Inverters per String		13	15	11	12	11	12
Grid Wiring Termination Type		18AWG Drop Cable from Inverter to 10AWG AC Trunk Cable					
Protection Devices							
Input							
Reverse Polarity Protection		Yes; Polarized PV Connectors (Amphenol H4)					
Ground Fault Detection		Indication via CDD / LED indicator on MICRO-03.HV					
Output							
Anti-Islanding Protection		Meets UL 1741/IEEE1547 requirements					
Over-Voltage Protection Type		Varistor		Varistor		Varistor	
Maximum AC OCPD Rating	A	20		20		20	
Efficiency							
Maximum Efficiency	%	96.5		96.5		96.5	
CEC Efficiency	%	96		96		96	
Operating Performance							
Stand-by Consumption	mW	< 50		< 50		<50	
Communication							
Monitoring System		Wireless and Web-Based Monitoring through CDD (CDD required for compliance to UL1741)					
Environmental							
Ambient Air Operating Temperature Range	°F (°C)	-40 to 167 (-40 to 75) with derating above 149 (65)					
Ambient Air Storage Temperature Range	°F (°C)	-40 to 167 (-40 to +75)					
Relative Humidity	% RH	0-100 condensing					
Acoustic Noise Emission Level	db (A) @1m	< 30					
Max. Operating Altitude without Derating	ft(m)	6560 (2000)					
Mechanical Specifications							
Enclosure rating		NEMA 4X		NEMA 4X		NEMA 4X	
Cooling		Natural Convection					
Dimensions (H x W x D)	in (mm)	10.5 x 9.7 x 1.37 (266 x 246 x 35)					
Weight	lb/(kg)	< 3.5 (1.65)		< 3.5 (1.65)		< 3.5 (1.65)	
Mounting System		Rack mounting with M8, 1/4" or 5/16" bolt					
Safety							
Isolation Level		HF Transformer					
Safety and EMC Standard		UL1741, CSA C22.2 N. 107.1-01, EN61000-6-2, EN61000-6-3, FCC Part 15					
Safety Approval		cCSA <sub>us</sub>					
Warranty							
Standard Warranty	years	10		10		10	
Available Models							
Standard		MICRO-0.25-I-OUTD-US-208/240		MICRO-0.3-I-OUTD-US-208/240		MICRO-0.3HV-I-OUTD-US-208/240	

1 With derating below 200V for 208VAC operation

2 This is the maximum input power that the inverter will utilize.

3 Only use PV modules that satisfy these parameters under all operating conditions.

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2 This is the maximum input power that the inverter will utilize.  
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## Contact us

[www.abb.com/solarinverters](http://www.abb.com/solarinverters)

MICRO-0.25-0.3-0.3HV-I-OUTD-Quick Installation Guide NA  
BCM.00138.2DG\_AB  
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for a better world™ **ABB**