

## QUICK MANUAL -INV-US PLC

This Quick Manual provides basic information for the installation of the APtronic Micro-Inverter. For detailed information, please refer to the Installation Manual provided on CD. Installation Manual to be printed out from CD on letter format paper!

### WARNING!

All electrical installations must be done by in compliance with local and national electrical codes.

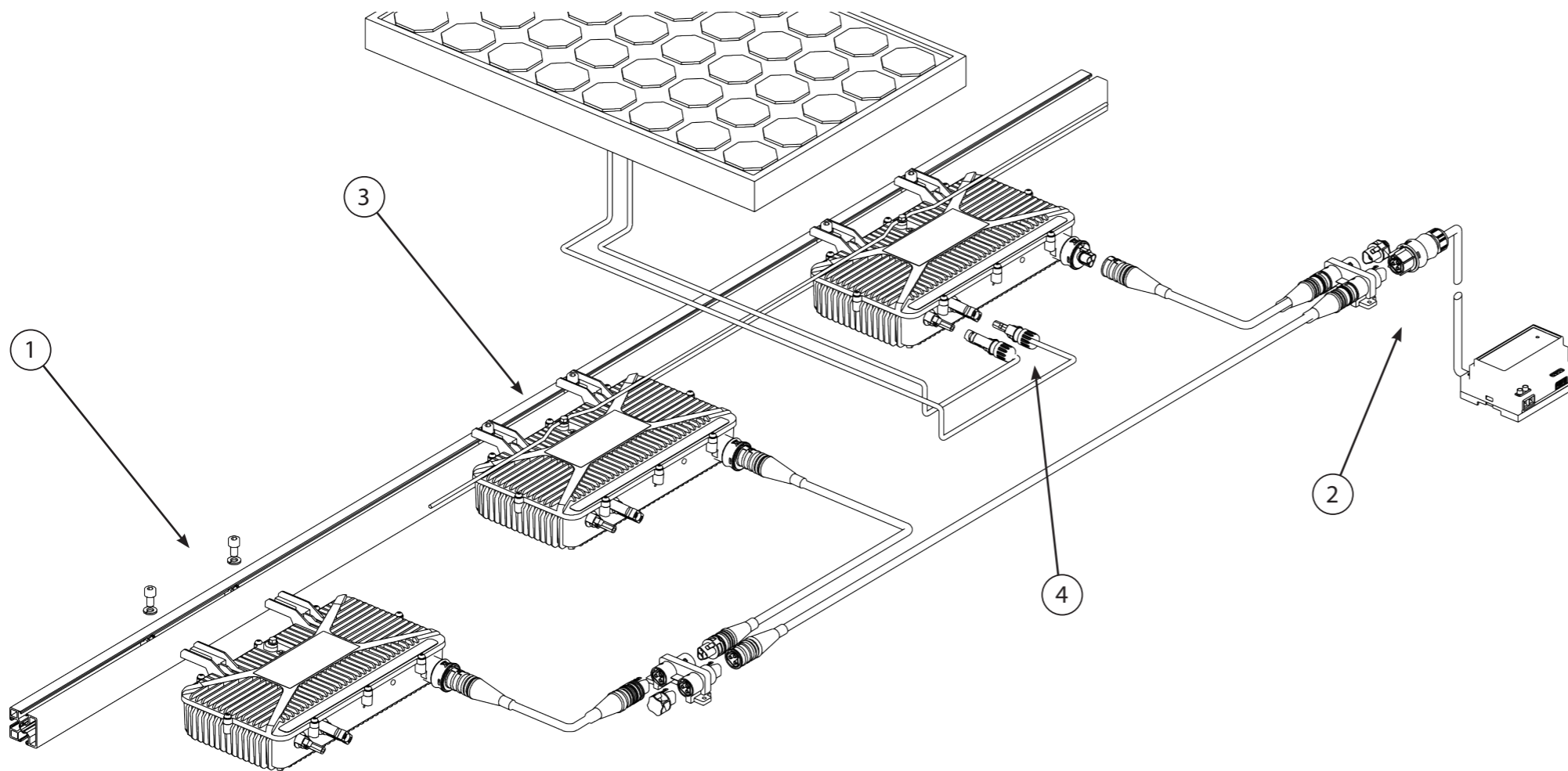
### CE Mark

The CE mark documents that according to the label the inverter fulfills the following essential requirements of relevant directives:

- Directive on the Electromagnetic Compatibility with the Directive 2004/108/EC
- Low Voltage Directive (Directive 2006/95/EC)

### Accessories needed

- 1 - Mounting accessories for PV racking system
- 2 - Distribution Block
  - Cover for Distribution Block
  - PLC Gateway
- 3 - 6-8 AWG conductor
- 4 - PV-modules including male and female connector Amhenol H4



	US/60Hz/240V Installations: 20A Circuit Breaker	US/60Hz/208V Installations: 20A Circuit Breaker
Type of inverter	Max. number of inverters in one branch	
INV250-45 US	17	15
INV350-60 US	13	11
INV350-80 US	13	11
INV500-80 US	9	8

- ① - Mark the appropriate center of each PV module on the framework for inverter placement.
- Attach the Micro-Inverter using hardware accessories that are suitable for the framework used in the PV System, i.e. screws and sliding blocks.
  - Ensure a minimum distance of 20 mm between the roof top and the bottom of the inverter. In addition, a distance of 25 mm between the back of the PV module and the top of the inverter should be complied with.

- ② - The inverters are connected using 20A 3-pin AC extension cables and distribution blocks, with one input and three outputs, to form a continuous AC power circuit.
- Make sure that the maximum number of inverters in a branch is not exceeded. (see table)
  - Any unused AC Connectors must be covered with an end cap.
  - The Gateway must be installed between the inverter infeed and a 20A circuit breaker, e.g. Trip curve No 730-3.

- ③ - Grounding Procedure:
- Each APtronic Micro-Inverter comes with a grounding fixture that can accommodate a 6-8 AWG conductor. Route a continuous grounding electrode conductor through each of the micro-inverters to the NEC-approved AC grounding electrode. An alternative method would be to connect the micro-inverter to the grounded racking using a grounding washer approved for the racking.

- ④ - Make a note of the serial numbers of each inverter and the corresponding PV module. It will help you later to create an overview of your PV system.
- Connect the PV module to the Micro-Inverter using the DC Cabling.
  - Switch in the circuit breaker to energize the AC line.

### Important Safety Information

To ensure the safe installation and service of the APtronic Micro-Inverter, this manual uses the following types of safety symbols to indicate dangerous conditions and important safety instructions that are to be noted:

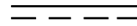
#### WARNING!

This indicates a situation where failure to follow instructions may be a safety hazard or cause equipment malfunction. Use extreme caution and follow instructions carefully.

NOTE: This indicates information particularly important for optimal system operation. Follow instructions closely.

Symbols to be noted:

Direct Current Supply Symbol:



Alternating Current Supply Symbol:



Ground Symbol:



### Safety Instructions:

Before installing the APtronic Micro-Inverter, please read all instructions and cautionary markings in the technical documentation, about the APtronic Micro-Inverter System and the PV equipment.

- Be aware that only qualified personnel should install or replace APtronic Micro-Inverters.
- WARNING! Proper grounding, wire sizing and appropriate short-circuit protection must be provided to ensure safe operation.
- Never remove the solar generator from the inverter, while it is connected to the electricity network.
- Make sure that before carrying out inspections and maintenance, the inverter is disconnected from the mains supply and is secured against restarting.
- CAUTION: Perform all electrical installations in accordance with the safety regulations all applicable local electrical codes and the National Electrical Code (NEC), ANSI/NFPA 70.
- Connect the APtronic Micro-Inverter to the electricity network only after receiving prior approval from the electrical utility company.
- The electrical connection to the central building shall be performed only by a licensed electrician.
- If you mount the inverter at high altitude, avoid possible falling risks.
- Do not plug electrically conductive parts into the plugs and sockets! Tools and working conditions must be dry.
- Do not attempt to repair the APtronic Micro-Inverter; it contains no user-serviceable parts. Tampering with or opening the APtronic Micro-Inverter will void the warranty.
- Inappropriate alterations can cause damage!
- Do NOT disconnect the PV module from the APtronic Micro-Inverter without first removing AC power.
- The installation shall be done in accordance to the wiring methods and wire diameters in accordance with the National Electrical Code (NEC), ANSI/NFPA 70. Connection schemes refer also page 24 and 25.
- NOTE: Do not connect the inverter to grids without an earthed neutral conductor.
- The installation instructions shall indicate that the wiring methods used shall be in accordance with the Canadian Electrical Code, Part I.
- WARNING: Be aware that the body of the APtronic Micro-Inverter can become very hot. The body can reach temperatures over 70°C (158°F), when the ambient temperature exceeds 25°C (77°F). To reduce risk of burns, use caution when working with Micro-Inverters.

### Target Audience

This manual is for the installer of the types of inverters listed in 1.2. Note: This guide assumes knowledge corresponding to a recognized professional qualification as an electrician and only qualified personnel should install or replace APtronic Micro Inverters.

#### WARNING!

These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that specified in the operating instructions unless you are qualified to do so.

### Storage and Transportation

For storage and transport, the following warnings are to be noted: All contacts should be kept dry and clean! Transport the inverter only in the given packaging.

### Label

The label is located on the top side of the inverter. The information on the label includes technical data, type and serial number of the device as well as safety instructions.

#### CAUTION:

Note that surfaces of equipment may be hot and create a burn hazard.

### Intendet use and Liability

The micro inverter converts the power generated by the PV modules from direct current into grid compliant alternating current. For damages resulting from failure to follow these instructions, we assume no liability. When installing the inverter, please note the following instructions for all assemblies and components of the system.

In order to ensure faultless and safe operation of this equipment, proper transport, expert storage, installation, operation and maintenance is required. During the operation of this equipment, certain equipment parts carry hazardous voltages that can cause serious injury or death. Always follow the following instructions to minimize the risk of injury or death.

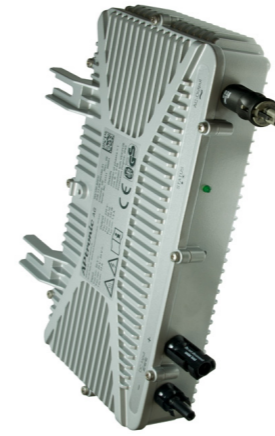
Intended use also includes compliance with the instructions and installation manual. Some of the documents that you need for the registration and inspection of your photovoltaic system are included in the installation instructions. The grid connection of the inverter must end in a sub-distribution. The feeding phase of the grid connection must be made in a sub-distribution using a circuit breaker with a breaking capacity depending on Inverter Type and Installation, for example US/60Hz/240V and US/60Hz/208V Installation use two pole 20A Circuit Breaker, e.g.Trip curve No 730-3.

### General ambient conditions

The Micro-Inverter at hand corresponds on the AC side to the Overvoltage category III, the PV side corresponds to the Overvoltage category II.

Relative Humidity: 0% ... 98%, non-condensing.

For more details refer to manual on CD.



For more information, visit  
[www.aeconversion.com](http://www.aeconversion.com)

Contact us directly  
[info@aeconversion.com](mailto:info@aeconversion.com)



## Technical Data

Type	INV250-45	INV350-60	INV350-80	INV500-80
<b>Input</b>	Maximum PV power Maximum DC voltage Min./Max. start voltage MPPT range Maximum DC current	250W 45V 18V / 45V 20V ... 40V 11A	350W 60V 18V / 60V 20V ... 50V 11A	500W 80V 40V / 80V 40V ... 70V 9A
<b>Output</b>	Maximum AC Power Nominal Current Power factor	240W 1.0A > 0.99	330W 1.4A > 0.99	480W 2.1A > 0.99
<b>Efficiency</b>	Peak inverter efficiency CEC efficiency Nominal MPP efficiency	93.5% 92.6% 99.8%	93.5% 92.3% 99.8%	95.0% 93.2% 99.8%
<b>50Hz-Version (EU)</b>	Nominal AC voltage Nom. AC voltage range Frequency Frequency range Productsafety* EMC	230V 184V ... 264V 50.0Hz 47.5Hz ... 51.5Hz IEC 62103:2003, IEC 62109-1:2010, IEC 55011B, EN 50178:1997 EN 61000-6-2, EN 61000-6-3	230V 184V ... 264V	230V 184V ... 264V
<b>60Hz-Version (US)</b>	Nominal AC voltage Nom. AC voltage range Frequency Frequency range Productsafety* EMC	208V or 240V 184V ... 264V 60Hz 59.5Hz ... 60.3Hz UL 1741:2010, IEEE 1547:2003, CSA C22.2 FCC Part 15 Class B	208V or 240V 184V ... 264V	208V or 240V 184V ... 264V
<b>Mechanical Data</b>	Weight Operating Temperature Cooling Night time power consumption Max. altitude a.s.l. Safety class	2.5kg -25°C ... +70°C Natural convection 30mW 2000m Class I		
<b>Housing</b>	Dimensions Protection Degree Enclosure material	314mm x 267mm x 66.5mm (BxHxT) IP65 (50Hz-Version) / NEMA 4 (60Hz-Version) Aluminum		
<b>Features</b>	MSD / (Mains monitoring) Communication Versions	integrated (corresponds VDE AR-N 4105) Powerline / RS-485 / No Com		

\*Various country versions available and OEM versions on request.

