The PVISU™ Series
Utility Scale String Inverters

P142E

Utility Scale String Inverters in 400V and 800V (European Standards)

E24 utility scale String inverters are the latest state of the art technology for the deployment of large solar powered arrays with minimal investments.

String inverters allow to connect large number of PV strings in high DC voltage directly to the inverter without combiners. The Inverters are positioned directly on the field in a decentralized topology minimizing cabling and avoiding the risks of failure of a central inverter.

E24 PVISU Utility Scale Inverters are available in posisble power options 125KW and 350KW.

The 125KW unit can be connected in either 400/230V (3Ph+N+PE) or 400V (3Ph+PE) allowing to operate without a neutral wire.

The 350KW model is only available in 800V (3Ph+PE) allowing to save on cabling costs through the reduction in current as well as the removal of the neutral wire.

Both units include PLC communication and Anti-PID when used in conjuction with PVISU3-CAPID Communication and Anti-PID Panel.

9 units of PVISU3-125KI powering a mineral water factory (1MW)

PVISU Utility Scale Inverter in 400/230V

- Outdoor installation (IP 65 Waterproof)
- 1100 Vdc maximum Solar input voltage
- Can operate in both 5 wires 400/230V (3Ph+N+PE) or 4 Wires (3Ph+PE).
- Super compact and light
- Wide Utility/Generator input voltage
- DC/AC Ratio up to 1.5
- PID Recovery (Optional)
- AFCI (Optional)
- High Efficiency up to 98.7%
- Built in Type II DC/AC Surge Protection
- Designed for large power plants and utility scale applications
- Reverse connection protection
- DC Switch included
- Over Temperature Protection
- Wifi / 4G optional
- Very wide standards compliance

In the past, large solar power plants have exclusively used central inverters, usually between 2.5 and 3 megawatts. For solar power system designers, it was a logical choice.

The disadvantage of such a topology, is that if you lose the central inverter or one of the central inverters, you lose muti-megawatts of power leading to substantial losses in productivity. Repairing central inverters is at least 3 to 4 days that is if the parts and qualified labor are available on the field which typically is never the case.

String inverters, by contrast, are lower-cost than central inverters and sufficiently lightweight to require neither a crane to lift in and out of place nor a concrete pad to rest on. Because string inverters are relatively low capacity, when one fails it doesn't have a large impact on generation.

Another disadvantage is that large and heavy central inverters have high installed costs because they have to be mounted on concrete pads and often require the use of a cranes to install them and maintain them which completely eliminated with string inverters:

- String are installed on the same metallic structures used for solar panels.

Another problem with Central inverters is uncertainty: You can run into a situation, which has come up in the last few years, where an inverter company goes out of business and then you still have to maintain an obsolete system for the 20 or 25 years of the project.

- With string inverters you may even replace one string inverter with another brand with no impact on the project.

However, in large-scale solar power plants, there are disadvantages to string inverters: "You are going to hundreds of or thousands of inverters for a multi-megawatt system leading to thousands of points of command and control, which can become very difficult and costly to manage unless those string inverters use E24 VCI™ (Virtual Central Inverter) technology.

E24 VCI™ allows to control hundreds of string inverters through PLC (Power Line Communication) making them operate as one inverters with a single command and control point while still having each inverter each inverter optimizing power production on each MPPT input.

Now you have a multi-megawatt inverter that is made up of many power modules, but the command and control is through one interface. You have instant control over all power modules of the virtual inverter, and you maintain the advantage of smaller string inverters but add to it by having a single command-and-control point.

PVISU3-350K powering a university
in Nigeria

PVISU Utility Scale Inverters 800V

- Outdoor installation (IP 65 Waterproof)
- 1100 Vdc maximum Solar input voltage
- Can operate in both 5 wires 400/230V (3Ph+N+PE) or 4 Wires (3Ph+PE).
- Super compact and light
- Wide Utility/Generator input voltage
- DC/AC Ratio up to 1.5
- PID Recovery (Optional)
- AFCI (Optional)
- High Efficiency up to 98.7%
- Built in Type II DC/AC Surge Protection
- Designed for large power plants and utility scale applications
- Reverse connection protection
- DC Switch included
- Over Temperature Protection
- Wifi / 4G optional
- Very wide standards compliance

In addition to the benefits of the standard string inverter, PVISU-350K and PVISU3-350KH make it possible to operate in 800v (3Ph + PE). The main benefit of doing so is the substantial reduction of cabling costs: By increasing the output voltage, the current is reduced accordingly and so is the section of the cables.

As a result:

- The project Capex is decreased significantly (lower cable costs) and lower labour costs

- The project Opex are also reduced through much lower transmission losses in cable resulting from the reduction of current.

PVISU 125KW Inverter Specifications

MODEL	PVISU-125KI
Input (DC)	
Max.DC Voltage	1100 V
Max.Input Current Per MPPT	45 A
Max.Short-circuit Current Per MPPT	60 A
Start Voltage	350 V
MPPT Voltage Range	200 ~ 1000 V
Nominal Voltage	650 V
Number of MPPT	8
Strings Per MPPT	2
Output (AC)	
Nominal AC Output Power	125 kW
Max. AC Apparent Power	125 kVA
Nominal AC Voltage	230 V / 400 V, 3W +PE, 3W+N+PE
AC Grid Frequency Range	50 Hz / 60 Hz (±5 Hz)
Max. Output Current	181.2 A
Power Factor (cos Φ)	0.8 (Leading) ~ 0.8 (Lagging)
THDi	< 3% (Nominal Power)
Efficiency	
Max. Efficiency	98.7%
Euro Efficiency	98.5%
Protection Devices	
DC Switch	Yes
Anti-islanding Protection	Yes
Output Over Current Protection	Yes
DC Reverse Polarity Protection	Yes
String Fault Detection	Optional
DC / AC Surge Protection	DC Type II; AC Type II
AC Short Circuit Protection	Yes
AFCI Function	Optional
Night SVG Function	Optional
PID Recovery	Optional
Insulation Detection	Yes
Residual Current Monitoring	Yes
General Specifications	
Dimensions (W x H x D)	965 x 700 x 355 mm
Weight	85 kg
Operating Temperature Range	-30 ~ 60°C
Cooling Type	Fan Cooling
Max. Operation Altitude	5000 m (> 4000 m Derating)
Max. Operating Humidity	0 ~ 100%
IP Class	IP66
Noise	≤ 80 dB
Topology	Transformerless
Communication	RS-485 / PLC / WiFi / 4G
Display	LED , Buletooth + APP
Certification & Standard	IEC 62109-1/-2; EN IEC 61000-6-1/2/3/4; EN IEC 61000-3-11/12; EN IEC 62920; IEC 61727; IEC 62116; IEC 61683; IEC 60068-2-1/2/14/30; EU RoHS Directive; EN 50549-1/2; EN 50549-10; CEI 0-16; NC RFG; C10/11; UNE 217001;

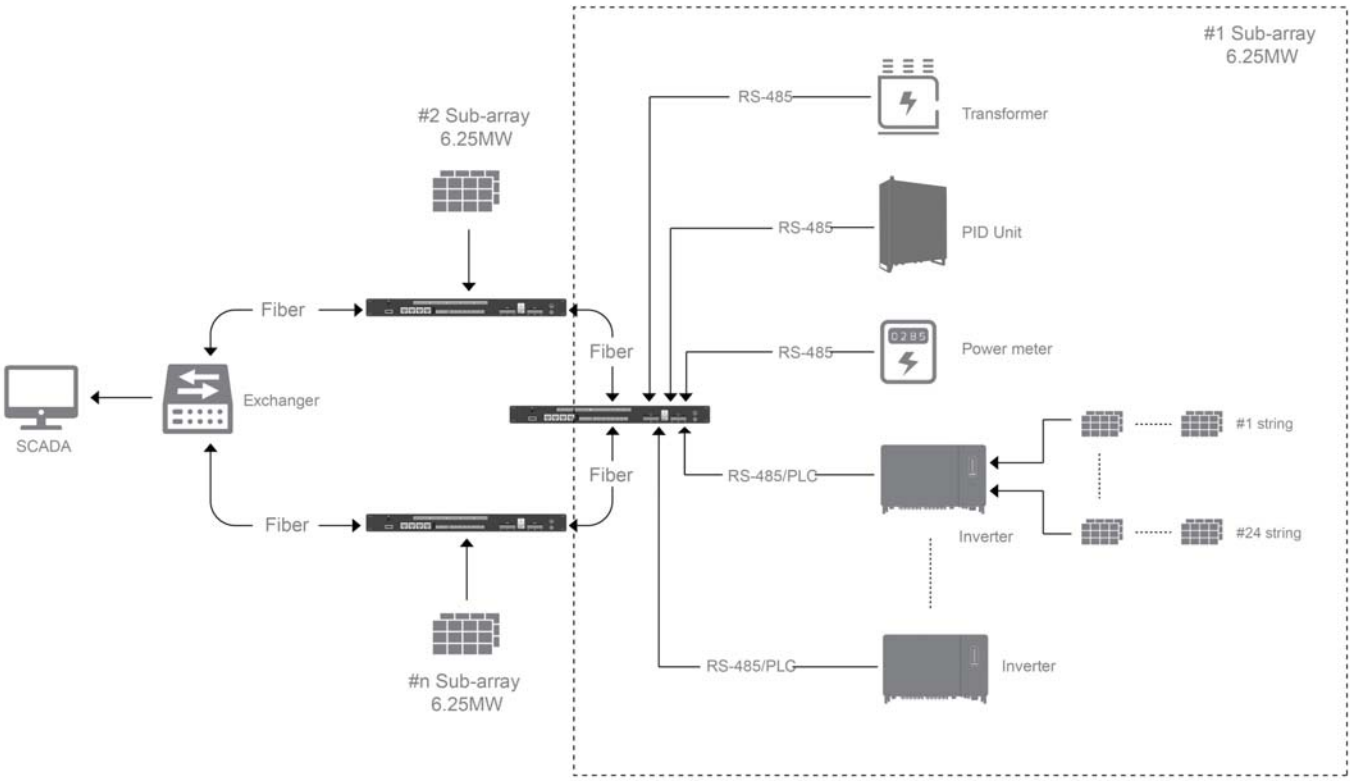
PVISU 350KW Inverter Specifications

MODEL	PVISUH-350K	PVISU-350K
Input(DC)		
Max. DC Voltage	1500 V	
Max. Input Current Per MPPT	30 A	40 A
Max. Short-circuit Current Per MPPT	45 A	60 A
Start Voltage	500 V	
MPPT Voltage Range	500 V - 1500 V	
Number of Strings	32	24
Number of MPPT	16	12
Strings Per MPPT	2	
Output(AC)		
Nominal AC Output Power	350 kW	
Max. AC Apparent Power	352 kVA	
Nominal AC Voltage	800 V, 3W+PE	
Nominal Frequency	50 / 60 Hz ±5Hz	
Frequency Range	45 ~ 55 Hz / 55 ~ 65 Hz	
Max. Output Current	254 A	
Power Factor (cosΦ)	0.8 leading - 0.8 lagging	
THDi	＜3%（Nominal Power）	
Efficiency		
Max. Efficiency	99%	
Protection Devices		
DC Switch	Yes	
Anti-islanding Protection	Yes	
Over Current Protection	Yes	
DC Reverse Polarity Protection	Yes	
String Fault Detection	Yes	
DC/AC Surge Protection	Type II	
AC Short Circuit Protection	Yes	
Residual Current Detection	Yes	
PID Recovery	Optional	
Night SVG Function	Optional	
General Specifications		
Dimensions W x H x D	1050 x 860 x 393 mm	
Weight	130 kg	
Operating Temperature Range	-30 ~ 60℃	
Cooling Type	Fan Cooling	
Max. Operation Altitude	5000 m （> 4000 m Derating）	
Max. Operating Humidity	0 ~ 100%	
AC Output Terminal Type	OT terminal	
IP Class	IP66	
Noise（dB）	≤ 75 dB	
Topology	Transformer less	
Communication	RS-485 / PLC	
Display	LED, Buletooth+APP	

Communication & Anti-PID Panel

- Anti-PID Funtion
- Multiple communication: RS-485+CAN+PLC+4G(optional)
- Built-in high performance data collector
- Maximum transmission distance up to 20km

E24 PVISU3-CAPID is used in large scale and utility scale applications to provide Anti-PID functionality as well as to collect data from all sub-arrays components on a single fiber optic network in a manner to process and display all data through a SCADA system as can be seen below:



Communication and Anti-PID Panel Specifications

Model	PVISU3-CAPID
Configuration	
Internal Data Collector Model	KSM-DCU-04
Number of RS-485 Port	8
Number of CAN Port	2
Number of PLC Port	1
4G Communication	Optional
Optical Fiber Ring Network	1 pair
Number of FE Ports	4
Number of Anti-PID Ports	1
Number of DI&DO Ports	16*DI; 8*DO
Technical Parameters	
Power Supply Voltage Range	100 ~ 240 Vac
Rated PLC Operating Range	800 Vac
Rated PID Operating Range	800 Vac
Rated Operating Frequency	50 Hz / 60 Hz
Opeical Fiber Communication	
Central Wavelength	1310 nm
Transmission Distance	20 km
General	
Operating Temperature Range	-20□ ~ 55□
Relative Humidity	5% ~ 95% (Non-condensing)
Cable access mode	Bottom in & out
Maintenance	Front
Dimensions(W x H x D)	540 x 670 x 290 mm
Weight	31 kg
IP Degree	IP65
Installation	Bracket / Wall Mounting / Pole Mounting

Accessories and Control Panels for the PVISU Series

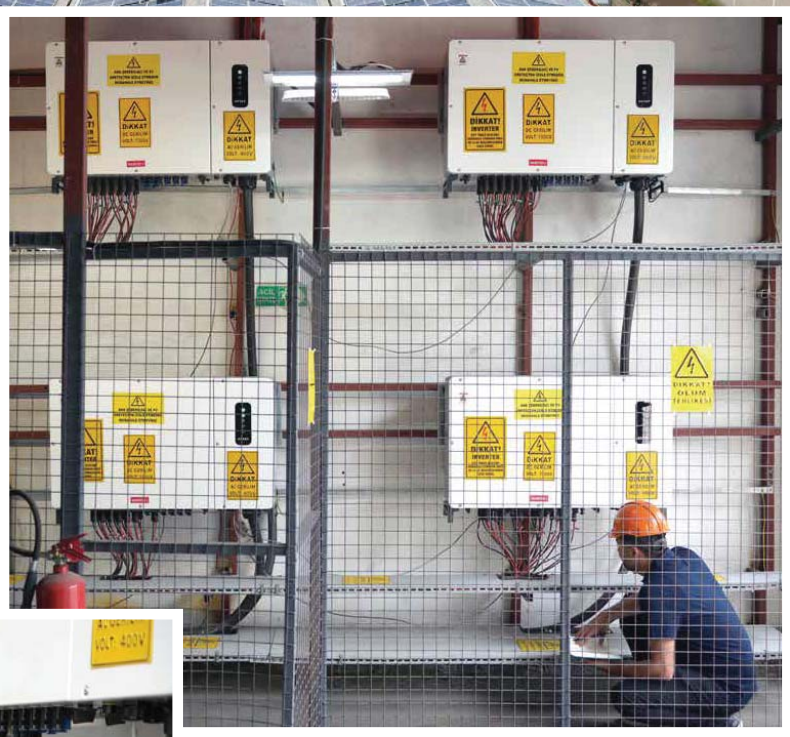
It is possible to add Wifi Module, Ethernet and Wifi or 4G Modules in order to transfer data from the inverter to the cloud for remote monitoring.

It is also possible to dynamically control the energy produced by the inverters in order to control the current or energy fed back to the grid. Indeed, it might be desirable to control the inverters to avoid feeding any energy to the grid to avoid penalties in certain jurisdiction or to avoid return power when a diesel generator is connected.

E24 offer a wide range of control panels and accessories allowing to achieve such control and communication.

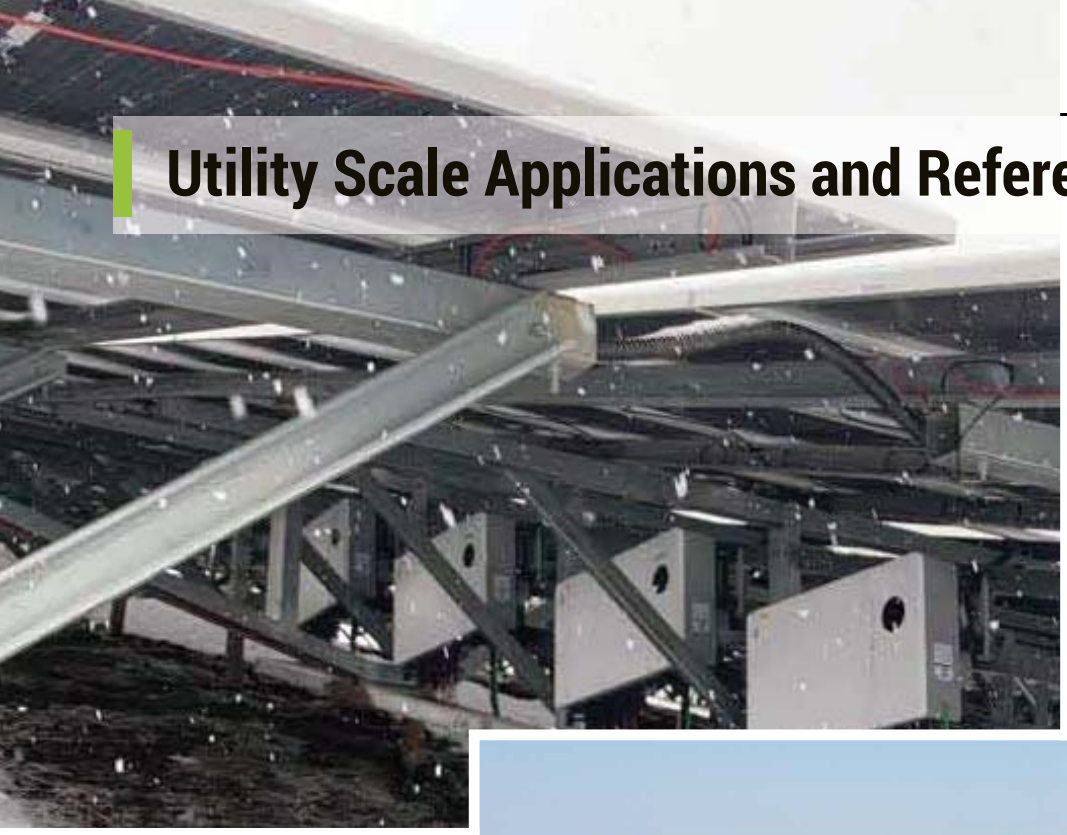
Kindly refer to E24 data sheet # P149 for further details.

Large Scale Applications and References



8 units of PVISU3-125KI powering a furniture factory in Turkey (900KW)

Utility Scale Applications and References



Utility Scale Power Plant of
80MW in Pakistan

Utility Scale Power Plant of
200MW in Ukraine

Utility Scale Power Plant of
550MW in Zhejiang

Utility scale Power Plant
in Ukraine (15MW)

"E24's technology thrives on optimization, automation, and advanced data monitoring"

Advanced Energy Management Systems, Software, IOT & Web Monitoring Technology

"That which is measured improves. That which is measured and reported improves exponentially."
- Karl Pearson

E24 Technology is all about optimization and automation allowing customers to save energy, save on the environment and improve quality of life.

At E24, advanced software is at the heart of each solution provided allowing to simplify operations while optimizing return on investment.

All solutions are software customized to best fit their working environment and the energy conditions and tariffs under which they are operated. Each customer, each application, and each region is different. This is why E24 software is designed to be easily configured upon commissioning to adapt perfectly to the application, customer requirements and load profile.

E24 offers IOT and Web monitoring services allowing customers to monitor all data related to their energy infrastructure. This includes equipment that may or may not be part of E24 provided solutions. E24 Software can, of course, be configured to notify customers of any anomaly or threshold reached for his needed actions.

Depending on the solutions purchased E24 offers adapted standard and custom designed IOT and Web Monitoring services that allow customers to monitor all data related to their energy infrastructure and see historical information dating up to 10 years.

E24 IOT & Web Monitoring Software

Cloud Monitoring add-ons allow customers to visualise all data related to their energy infrastructure from their PC, laptop or smartphone. Customers are also able to download their data dating back up to 10 years for their analysis.

IOT Solutions allow customers to view their data through a user-friendly interface, and accordingly take actions such as starting or stopping certain equipment, modifying settings or other actions, all done remotely from any internet device.

Customization Services

E24 offers customized modifications to its software to best suit customers' existing energy infrastructure. This may include setting-up communication links with SCADA systems or any bidirectional exchange of information.

Hybrid | Storage Inverter | Battery

and much more ...

E24 Modular Range Of Products For Building Easy, Flexible & Evolutive Solutions

E24 products dynamically evolve with the lifestyle and work style of its customers while easing the installation process.

E24 products are conceived in modules allowing for an easy upgrade to adjust with the needs of the customers. Being modular and easy to connect E24 products allow installers to easily configure the required modules for an optimal solution while offering easy upgrade options.

Ordering Information

Ref. Number	Description
PVISU3-125KI	Utility Scale String Inverter 8 MPP, 16 Strings, 1100Vdc, 125KW, 3W+PE or 3W+N+PE, 400/230Vac, 50/60Hz
PVISU3-350KH	Utility Scale String Inverter 16 MPP, 32 Strings, 1500Vdc, 350KW, 3W+PE, 800Vac, 50/60Hz
PVISU3-350K	Utility Scale String Inverter 12 MPP, 24 Strings, 1500Vdc, 350KW, 3W+PE, 800Vac, 50/60Hz
PVISU3-CAPID	Communication and Anti-PID Panel

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ISO 9001:2015

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