



ALLIS ELECTRIC CO.,LTD.

**SOLAR  
POWER**



# Photovoltaic Inverter

Renewable Energy -  
Environmentally Friendly and Low Cost Energy Solutions



Since 1968





## TOUGH 3-PHASE SERIES

Three-Phase Grid-tied  
10kW/12.5kW/15kW



- Dual independent MPPTs, each MPPT can work up to 60% rated power.
- Auto selected parallel or independent MPPT working mode.
- Ultra low AC consumption (<1W at night)
- Modular external inductors design for best thermal dispatch.
- Special modular external bus-capacitors design for high ambient temperature operation.
- Iconic LCD display easy to monitor operation status.
- Intelligent force cooling, reduce fans operation duty to achieve life time improvement.
- Intuitive control bottom, easy to onsite operation.



## Specification

<b>Model</b>	<b>TOUGH-10K</b>	<b>TOUGH-12.5K</b>	<b>TOUGH-15K</b>
<b>Output Data ( Grid )</b>			
Maximum AC Output	10KVA	12.5KVA	15KVA
Maximum Output Current/phase	16.5 a. c. A	20 a. c. A	25 a. c. A
Nominal AC Voltage	230 a. c. Vp/400 a. c. VL		
Grid Frequency	50/60Hz, auto-selection		
Power Factor	>0.99@ 20% load		
Reactive Power Factor	1or adjustable from : -0.8 to +0.8*		
Total Harmonic Distortion	<5%		
AC Connection/Grid Forms	3P4W+PE / TN-C, TN-S, TN-C-S		
<b>Input Data ( Solar )</b>			
Maximum DC Input Power	11KW	13.75KW	17.6KW
Maximum DC Input Current	2x15 d. c. A	2x15 d. c. A	2x17.5 d. c. A
MPP Trackers	2		
Maximum DC Voltage	1000 d. c. V		
MPP Tracking Voltage Range	300-900 d. c. V		
Peak Power MPPT Voltage Range	500-850 d. c. V		
<b>Efficiency</b>			
MPPT Efficiency	>99.9%		
Maximum Efficiency	98.0%	98.1%	98.2%
Euro. Efficiency	97.2%	97.3%	97.4%
Consumption : Standby / Night	< 20W / 1W		
<b>General Specification</b>			
Dimensions (W x H x D) in mm	437 x 607 x 167		
Weight	22.5kg		
Colling Concept	Forced Air Colling		
Acoustic Noise Level	< 45 dB(A)		
Max Ambient Without Derating	+50 ° C	+45° C	+45 ° C
Ambient Temperature Range	-25 to+60° C		
Relative Humidity	0 to 95% non-condensing		
Protection Degree	IP65		
Topology	Transformer Less		
<b>Features</b>			
DC Connection	PV4, MC4		
DC Disconnect	Yes		
AC Connection	Anderson Connectors		
Display	Large Iconic LCD Screen		
Communication Interface	RS485, Ethernet (Option) ,Wifi (Option)		
Safety	VDE-AR-N 4105 : IEC 62109-1 / -2		
Warranty	5 years		

\* Adjustable from 0.95 over-excited to 0.95 under-excited with VDE-AR-N 4105.



# Success Applications

## Oversea

- Project: 50kW Off-Grid System
- Model: Central Inverter Series
- Location: Indonesia
- Application: Micro grid for no utility island



- Project: 300kW Grid-tide System
- Model: Tough Series
- Location: Taichung
- Application Environment: Install on the roof of railway stations



- Project: 2MW Grid-tide System (FIT)
- Model: Trinergy Plus Series
- Location: Taoyuan



## Taiwan

- Project: 6kw Self-Consumption System
- Location: Central Japan International Airport, Nagoya



- Project: 45 kW Self-Consumption System
- Model: Selfnergy Series
- Location: Ho Chi Minh, Vietnam
- Application: PV-Genset Fuel saving solution



- Project: 30kW Self-Consumption System
- Model: Trinergy plus Series
- Location: South Africa



- Project: 15kW Self-Consumption System
- Model: Tough Series
- Location: Philippines
- Application: Home power saving solution



- Project: 10kW net metering
- Model: Tough Series
- Location: Cebu, Philippines



- Project: 5kW Self-consumption system
- Model: Selfnergy Series
- Location: Cebu, Philippines



- Project: 5kW Self-Consumption System
- Model: Selfnergy Series
- Location: Philippines
- Application : Home power storage solution



- Project: 499kW Grid-tide System (FIT)
- Model: Trinergy Plus Series
- Location: Changhua Coastal Industrial Park
- Application: Roof top PV site at a Belt Factory



- Project: 100kW Grid-tide System (FIT)
- Model: Tough Series
- Location: Gangshan District, Kaohsiung
- Application Environment: Piggery



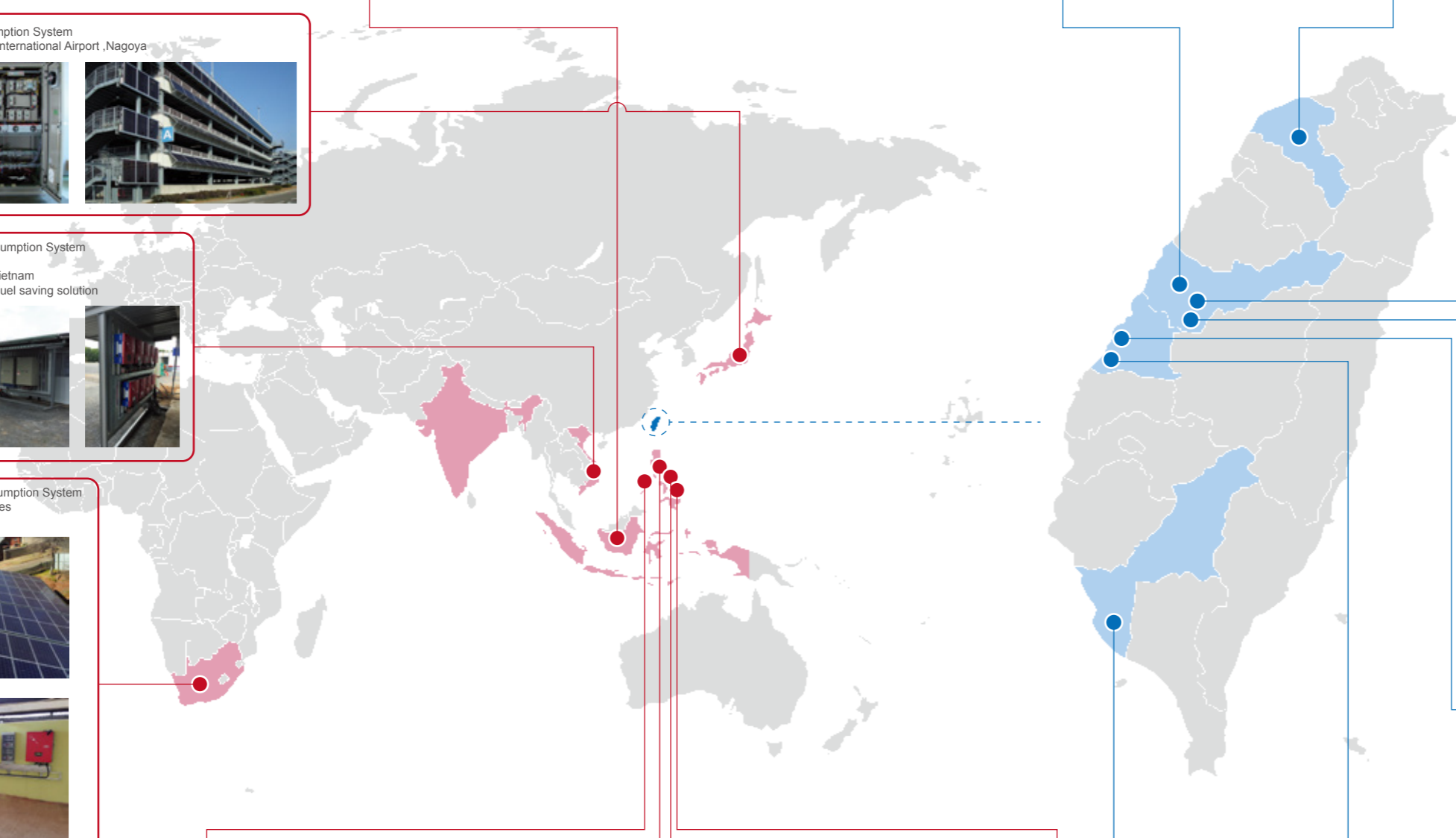
- Project: 70kW Grid-tide System (FIT)
- Model: Tough Series
- Location: Taichung
- Application: Roof top PV site of a Motor Factory



- Project: 850kW Grid-tide System (FIT)
- Model: Trinergy Plus Series
- Location: Wufeng Industrial Park, Taichung
- Application: Roof top PV site at a Steel Factory



- Project: 1MW Grid-tide System (FIT)
- Model: Trinergy Plus Series
- Location: Changhua Coastal Industrial Park
- Application: land mount PV site



Have installed more than 200MW PV sites since 2011...



# Solar Power System Demonstration

## Feed-in Tariff Application at Yangmei Factory

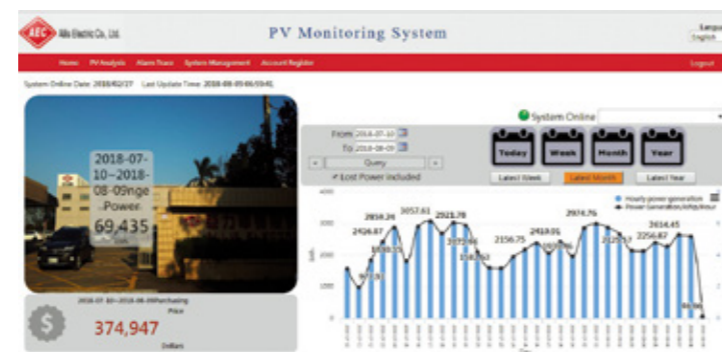
- System Capacity : 498 kW
- PV Modules : 295W × 1,961 pieces
- Inverter Model : Trinergy plus 30 kW × 14 units and 20 kW × 2 units
- Average power generation estimated by year: ≒ 492,104 kWh  
( about 2.9 kWh/day/kW × 498 kW × 365days)



Rooftop Mounting PV System



Trinergy plus PV Inverter



Advanced Web Monitoring System

## Why Solar Power...

- Electrical bill saving
- Safe, reliable and efficient power generator
- Reduce carbon footprint and emit no pollution
- Versatile and convenient
- Customized design

## Why Allis' Inverter...

- Optimum productivity
- Wide range of MPPT voltage
- Full range product line from 3.3kW to 1,260kW, single to three phase
- 50 years stable operation company with professional experience in power electricity

## Product Catalog

Model	Max. DC Voltage (d.c.V)	Max. Input Current (d.c.A)	Max. DC Input Power (W)	MPPT	Battery
Tough-3300	650	10 × 2	3,600	2	No
Tough-5000		15 × 2	5,300	2	
Trinergy Plus-10kW	1,000	12.5 × 2	11,000	2	
Trinergy Plus-20kW		25 × 2	20,800	2	
Trinergy Plus-30kW		33 × 2	33,000	2	
Trinergy Plus-40kW		74 × 1	55,000	1	
Trinergy Plus-50kW	1,100	90 × 1	66,000	1	
Trinergy Plus-60kW		120 × 1	72,000	1	
Trinergy Plus-70kW		120 × 1	77,000	1	
Selfnergy-3300	650	18 × 1	3,600	1	
Selfnergy-5000		24.5 × 1	5,300	1	
Selfnergy-L 3.6K	550	11 × 2	4,000	2	
Selfnergy- L 5K		11 × 2	5,500	2	
AEC500K-B	1,000	1,200 × 1	560,000	1	No
AEC630K-B		1,350 × 1	710,000	1	
AEC1000K-B	1,000	2 × 1,200 × 2	1,120,000	2	
AEC1260K-B		2 × 1,350 × 1	1,420,000	2	





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