



# Three Phase Hybrid Inverters











- 100** 100% unbalanced output, each phase
-  AC couple to retrofit existing solar system
- 10** Max. 10 pcs parallel for on-grid and off-grid operation; Support multiple batteries parallel
- 50** Max. charging/discharging current of 50A
- H** High voltage battery, higher efficiency
- 6** 6 time periods for battery charging/discharging
-  Support storing energy from diesel generator

# Three Phase Hybrid Inverters




	10kW	15kW	20kW
	SKU: 12168 EAN: 3800170225114	SKU: 12169 EAN: 3800170225121	SKU: 12170 EAN: 3800170225138

Battery Input Data			
Battery Type	Lithium-ion		
Battery Voltage Range (V)	160-700		
Max. Charging Current (A)	37		
Max. Discharging Current (A)	37		
Charging Strategy for Li-ion Battery	Self-adaption to BMS		
Number of Battery Input	1		
PV String Input Data			
Max. PV Input Power (W)	13000	19500	26000
Max. PV Input Voltage (V)	1000		
Start-up Voltage (V)	180		
MPPT Voltage Range (V)	150-850		
Rated PV Input Voltage (V)	600		
Max. Operating PV Input Current (A)	20+20	26+20	26+26
Max. Input Short-Circuit Current (A)	30+30	39+30	39+39
No. of MPP Trackers/ No. of Strings per MPP Tracker	2/1+1	2/2+1	2/2+2
AC Input/Output Data			
Rated AC Input/Output Active Power (W)	10000	15000	20000
Max. AC Input/Output Apparent Power (VA)	11000	16500	22000
Rated AC Input/Output Current (A)	15.2/14.5	22.8/21.8	30.4/29
Max. AC Input/Output Current (A)	16.7/16	25/24	33.4/31.9
Max. Three-phase Unbalanced Output Current (A)	22	30	35
Max. Continuous AC Passthrough (grid to load) (A)	40	80	80
Peak Power (off-grid) (W)	1.5 times of rated power, 10s		
Power Factor Adjustment Range	0.8 leading to 0.8 lagging		
Rated Input/Output Voltage/Range (V)	220/380V, 230/400V 0.85Un-1.1Un		
Rated Input/Output Grid Frequency/Range(Hz)	50/45-55, 60/55-65		
Grid Connection Form	3L+N+PE		
Total Current Harmonic Distortion THDi	<3% (of nominal power)		
DC Injection Current	<0.5% In		
Efficiency			
Max. Efficiency	97.6%		
Euro Efficiency	97.0%		
MPPT Efficiency	>99%		
Equipment Protection			
Integrated	DC Polarity Reverse Connection Protection, AC Output Overcurrent Protection AC Output Overvoltage Protection, AC Output Short Circuit Protection, Thermal Protection DC Terminal Insulation Impedance Monitoring, DC Component Monitoring, Ground Fault Current Monitoring Power Network Monitoring, Island Protection Monitoring, Earth Fault Detection, DC Input Switch Overvoltage Load Drop Protection, Residual Current (RCD) Detection, Surge protection level		
Surge Protection Level	TYPE II(DC), TYPE II(AC)		
Interface			
Communication Interface	RS485/RS232/CAN		
Monitor Mode	GPRS/WIFI/Bluetooth/4G/LAN(optional)		
General Data			
Operating Temperature Range (°C)	-40 to +60°C, >45°C Derating		
Permissible Ambient Humidity	0-100%		
Permissible Altitude	2000m		
Noise (dB)	≤55		
Ingress Protection(IP) Rating	IP 65		
Inverter Topology	Non-Isolated		
Over Voltage Category	OVC II(DC), OVC III(AC)		
Cabinet Size (WxHxD mm)	408×638×237 (Excluding Connectors and Brackets)		
Weight (kg)	30.5		
Type of Cooling	Intelligent Air Cooling		
Warranty	5 Years/10 Years the Warranty Period Depends the Final Installation Site of Inverter, More Info Please Refer to Warranty Policy		
Grid Regulation	IEC 61727, IEC 62116, CEI 0-21, EN 50549, NRS 097, RD 140, UNE 217002, OVE-Richtlinie R25, G99, VDE-AR-N 4105		
Safety / EMC Standard	IEC/EN 61000-6-1/2/3/4, IEC/EN 62109-1, IEC/EN 62109-2		

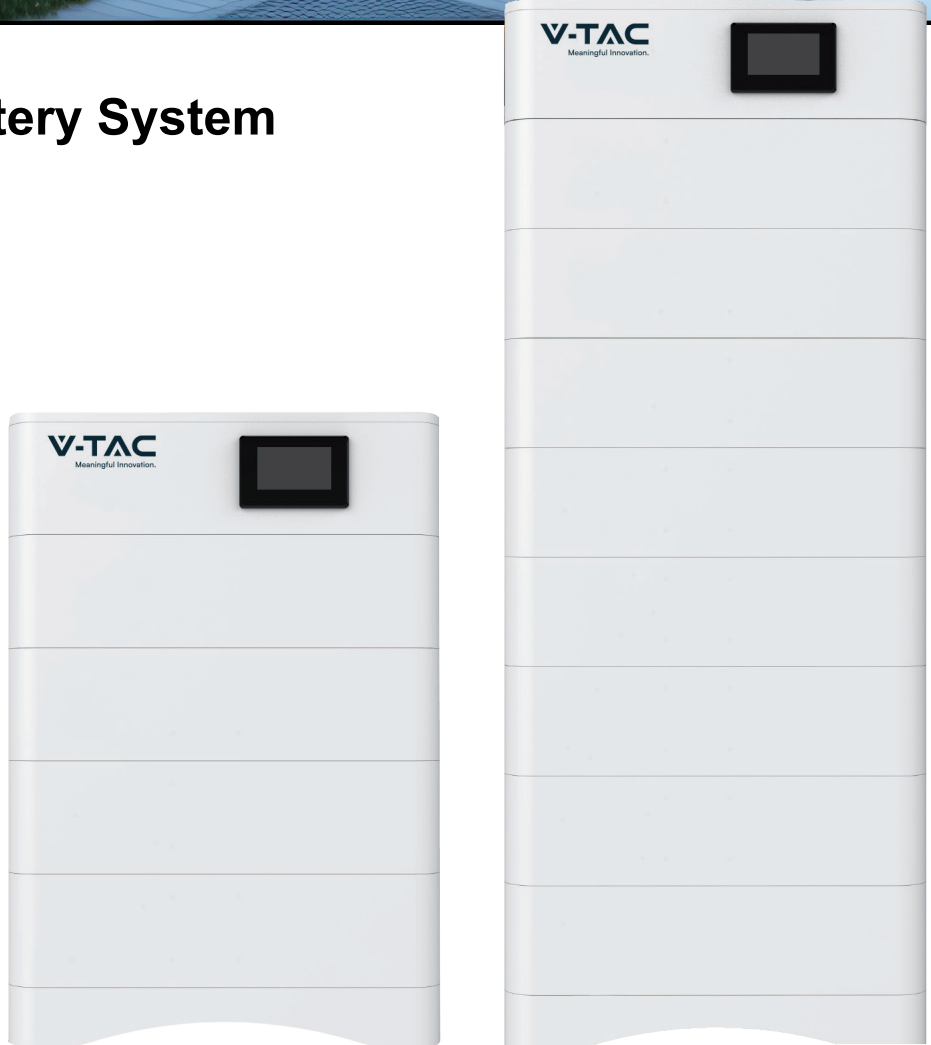


-   
Cell Balance function
-   
Voltage Protection
-   
Over Charge Protection
-   
Over Discharge Protection
-   
Over Current Protection
-   
Short-circuit Protection
-   
Temperature Protection
-   
Soft Start Function

## Stackable LiFePo4 Battery System

-  **Smaller Footprint**  
higher energy density benefit from latest LFP technology
-  **Expandable**  
Module design  
Maximum 5.12kwh\*10S\*6P
-  **Monitor**  
Real-time monitoring of battery charging and discharging, online system updates and maintenance

Compatible with:



# Stackable LiFePo4 Battery System

Battery	SKU	EAN
15.36KW 5.12 x 3	120023	3800170224285
20.48KW 5.12 x 4	120024	3800170224292
25.6KW 5.12 x 5	120025	3800170224308
30.72KW 5.12 x 6	120026	3800170224315
35.84KW 5.12 x 7	120027	3800170224322
40.96KW 5.12 x 8	120028	3800170224339



## Technical Data

Technical specification	15KWH	20KWH	25KWH	30KWH	35KWH	40KWH
Installation Mode	Stackable					
Battery Type	LifePO4(LFP)					
Module Energy(kWh)	5.12					
Module Nominal Voltage(V)	51.2					
Module Capacity(Ah)	100					
System Model	OHS15K-100	OHS20K-100	OHS25K-100	OHS30K-100	OHS35K-100	OHS40K-100
Battery Module Qty InSeries(Optional)	3	4	5	6	7	8
System Nominal Voltage(V)	153.6	204.8	256.0	307.2	358.4	409.6
System Nominal Capacity(KWh)	15.36	20.48	25.60	30.72	35.84	40.96
Usable Capacity(KWh)	12.29	16.38	20.48	24.58	28.67	32.77
Dimension (mm)	590*420*698	590*420*849	590*420*1000	590*420*1151	590*420*1302	590*420*1453
Weight (Kg)	161.4	207.0	252.6	298.2	343.8	389.4
Recommend Charge/Discharge Current (A)	40					
Communication	CAN					
Altitude	≤2000m					
Cycle Life	25±2°C,0.5C/0.5C,EOL70%≥6000					
Monitoring Parameters	System voltage,Current,cell voltage,cell temperature,module temperature					
SOC	Intelligent algorithm					
Working Temperature	0°C~45°C Charge -10°C ~55°C Discharge					
Storage Temperature	0~35°C					

1. DC Usable Energy, test conditions: 80% DOD, 0.2C charge & discharge at 25°C. System usable energy may vary due to system configuration parameters.
2. The current is affected by temperature and SOC.
3. The warranty is due whichever reached first of warranty period or life cycle power.

## System Components

Model	Description	SKU	EAN
OHS-HV100	High voltage battery cluster control box	12151	3800170224254
Operating Voltage Nominal Charge/Discharge Current Max Charge/Discharge Current Operating Temperature Range Ingress Protection Dimension (W/D/H) Weight Approximate	120 ~ 750Vdc 40A 50A -10~55°C IP65 590*420*165 mm 16.1kg		
			
OH-5K	LiFePo4 Battery Module	12002	3800170224261
Battery Type Nominal Voltage Rated Capacity Rated Energy Nominal Charge/Discharge Current Peak Discharge Current Charge Temperature Discharge Temperature Storage Temperature Ingress Protection Dimension (W/D/H) Weight Approximate	LiFePO4(LFP) 51.2Vdc 100Ah 5.12kWh 40A 50A 0~45°C -10°C ~ 55°C 0°C ~ 35°C IP65 590*420*194mm 45.6kg		
			
OH-Base	Battery module base	12152	3800170224278
Dimension (W/D/H) Weight Approximate	590*420*80mm 8.5kg		
			
COM Cable	Standard 2-meter communication cable connected to the external device		
			
Cable	Standard 2-meter power cable connected to the external PCS		
25mm <sup>2</sup> Cable			

# Vertex N

N-type i-TOPCon bifacial dual glass  
Monocrystalline module

PRODUCT: TSM-NEG21C.20  
PRODUCT RANGE: 685-710W

## 710W

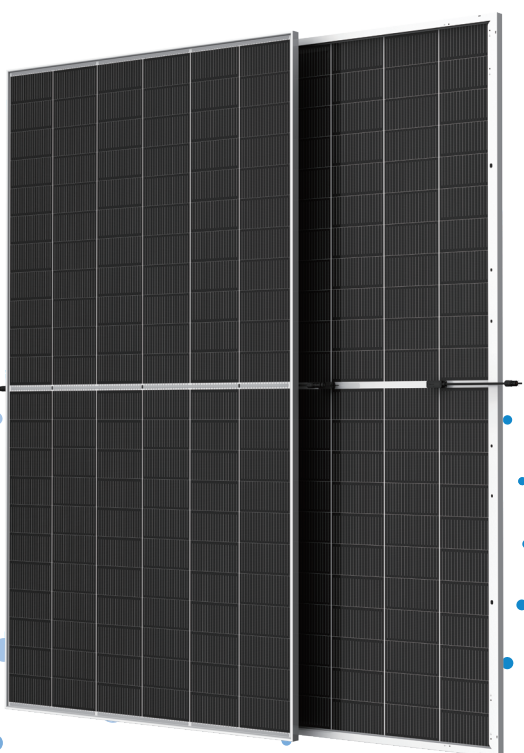
MAXIMUM POWER OUTPUT

## 0~+5W

POSITIVE POWER TOLERANCE

## 22.9%

MAXIMUM EFFICIENCY



### High customer value

- The star of LCOE (Levelized Cost Of Energy) .Higher string power feature effectively reduces BOS (Balance of System)and LCOE
- More energy harvest with cutting-edge N-type i-TOPCon technology
- Designed for compatibility with existing mainstream system components



### High power up to 710W

- Up to 22.9% module efficiency with high density interconnect technology
- SMBB (Super multi-busbar) technology for better light trapping effect, lower series resistance and improved current collection



### High reliability

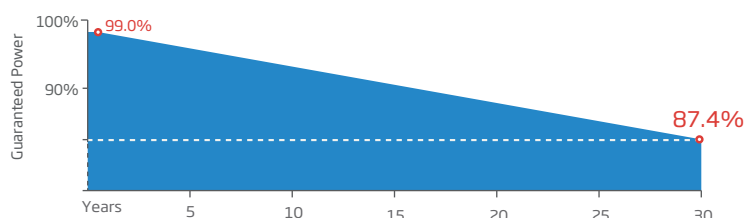
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load



### High energy yield

- Excellent product bifaciality and low irradiation performance, validated by 3rd party
- Lower degradation: 1% first year , 0.4% annually thereafter
- Lower temperature coefficient (-0.29%/°C)
- Up to 30% additional power gain from back side depending on albedo

### Trina Solar's Vertex Bifacial Dual Glass Performance Warranty



### Comprehensive Products and System Certificates



IEC61215/IEC61730/IEC61701/IEC62716

ISO 9001: Quality Management System

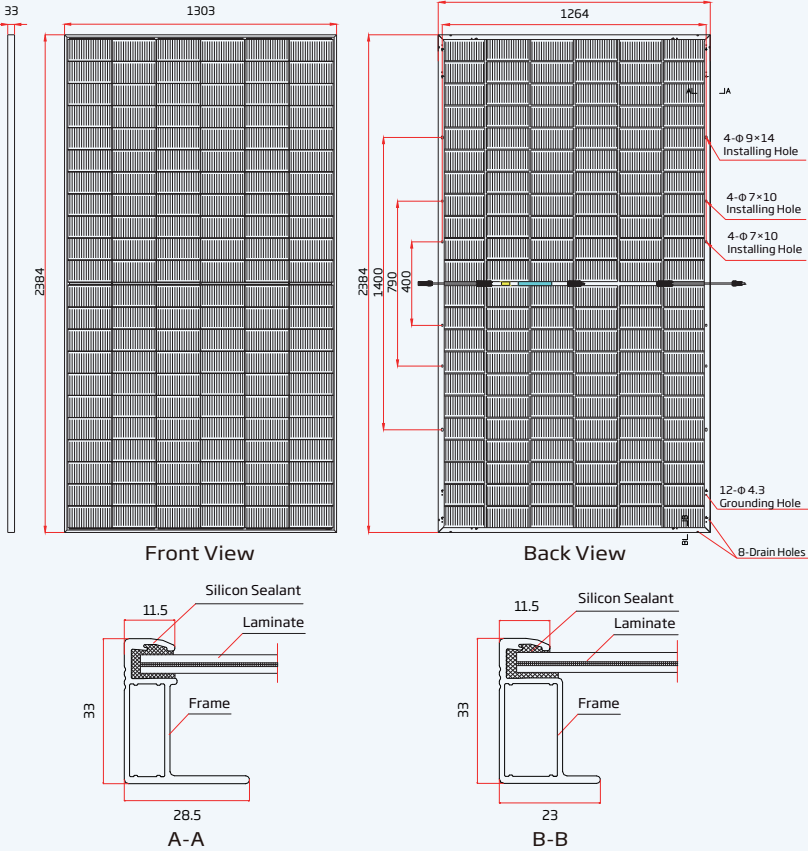
ISO 14001: Environmental Management System

ISO14064: Greenhouse Gases Emissions Verification

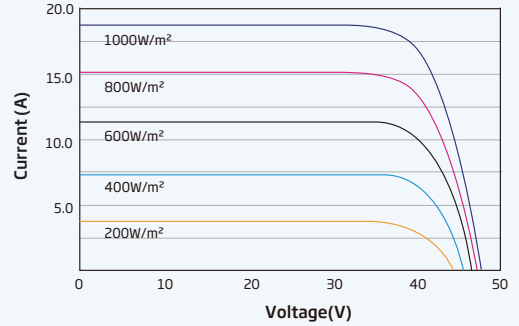
ISO45001: Occupational Health and Safety Management System



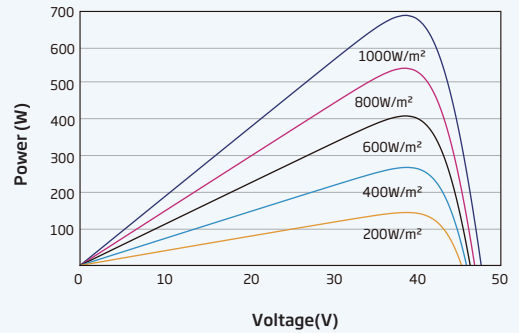
**DIMENSIONS OF PV MODULE(mm)**



**I-V CURVES OF PV MODULE(695W)**



**P-V CURVES OF PV MODULE(695 W)**



**MECHANICAL DATA**

Solar Cells	N-type Monocrystalline
No. of cells	132 cells
Module Dimensions	2384×1303×33 mm (93.86×51.30×1.30 inches)
Weight	38.3 kg (84.4 lb)
Front Glass	2.0 mm (0.08 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	POE/EVA
Back Glass	2.0 mm (0.08 inches), Heat Strengthened Glass (White Grid Glass)

Frame	33mm(1.30 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm² (0.006 inches²) Portrait: 350/280 mm(13.78/11.02 inches) Length can be customized
Connector	MC4 EVO2 / TS4 PLUS / TS4*

\*Please refer to regional datasheet for specified connector.

**ELECTRICAL DATA (STC & NOCT)**

Testing Condition	STC		NOCT		STC		NOCT		STC		NOCT		STC		NOCT	
Peak Power Watts - P <sub>MAX</sub> (Wp)*	685	522	690	526	695	531	700	534	705	540	710	543				
Power Tolerance - P <sub>MAX</sub> (W)	0 ~ +5															
Maximum Power Voltage - V <sub>MPP</sub> (V)	39.8	37.4	40.1	37.7	40.3	37.9	40.5	38.0	40.7	38.3	40.9	38.5				
Maximum Power Current - I <sub>MPP</sub> (A)	17.19	13.93	17.23	13.95	17.25	14.00	17.29	14.04	17.33	14.08	17.36	14.12				
Open Circuit Voltage - V <sub>OC</sub> (V)	47.7	45.3	47.9	45.4	48.3	45.9	48.6	46.1	48.8	46.3	49.0	46.5				
Short Circuit Current - I <sub>SC</sub> (A)	18.21	14.67	18.25	14.71	18.28	14.72	18.32	14.76	18.36	14.80	18.40	14.83				
Module Efficiency η <sub>m</sub> (%)	22.1		22.2		22.4		22.5		22.7		22.9					

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5. NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s. \*Measuring tolerance: ±3%.

**Electrical characteristics with different power bin (reference to 5% & 10% backside power gain)**

Backside Power Gain	5%		10%		5%		10%		5%		10%		5%		10%	
Total Equivalent power - P <sub>MAX</sub> (Wp)	719	754	725	759	730	765	735	770	740	776	746	781				
Maximum Power Voltage - V <sub>MPP</sub> (V)	39.8	39.8	40.1	40.1	40.3	40.3	40.5	40.5	40.7	40.7	40.9	40.9				
Maximum Power Current - I <sub>MPP</sub> (A)	18.05	18.91	18.09	18.95	18.11	18.98	18.15	19.02	18.20	19.06	18.23	19.10				
Open Circuit Voltage - V <sub>OC</sub> (V)	47.7	47.7	47.9	47.9	48.3	48.3	48.6	48.6	48.8	48.8	49.0	49.0				
Short Circuit Current - I <sub>SC</sub> (A)	19.12	20.03	19.16	20.08	19.19	20.11	19.24	20.15	19.28	20.20	19.32	20.24				

Power Bifaciality: 80±5%.

**TEMPERATURE RATINGS**

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P <sub>MAX</sub>	-0.29%/°C
Temperature Coefficient of V <sub>OC</sub>	-0.24%/°C
Temperature Coefficient of I <sub>SC</sub>	0.04%/°C

**MAXIMUM RATINGS**

Operational Temperature	-40~+85° C
Maximum System Voltage	1500V DC (IEC) 1500V DC (UL)
Max Series Fuse Rating	35A

**WARRANTY**

- 12 year Product Workmanship Warranty
  - 30 year Power Warranty
  - 1% first year degradation
  - 0.40% Annual Power Attenuation
- (Please refer to product warranty for details)

**PACKAGING CONFIGURATION**

- Modules per box: 33 pieces
- Modules per 40' container: 594 pieces