



TOPHiKu6 (All-Black)

N-type TOPCon Technology

435 W ~ 465 W

CS6.2-48TD-435 | 440 | 445 | 450 | 455 | 460 | 465

MORE POWER



Module power up to 465 W
Module efficiency up to 23.3 %



Excellent anti-LeTID & anti-PID performance.
Low power degradation, high energy yield



Lower temperature coefficient (Pmax): -0.29%/°C,
increases energy yield in hot climate



Lower LCOE & system cost

MORE RELIABLE



Tested up to ice ball of 35 mm diameter
according to IEC 61215 standard



Minimizes micro-crack impacts



Heavy snow load up to 6000 Pa,
wind load up to 4000 Pa*



Industry Leading Product Warranty on Materials and Workmanship*



Linear Power Performance Warranty*

**1st year power degradation no more than 1%
Subsequent annual power degradation no more than 0.4%**

*Subject to the terms and conditions contained in the applicable Canadian Solar Limited Warranty Statement. Also this 25-year limited product warranty is available only for products installed and operating on rooftops in certain regions.

MANAGEMENT SYSTEM CERTIFICATES*

ISO 9001: 2015 / Quality management system
ISO 14001: 2015 / Standards for environmental management system
ISO 45001: 2018 / International standards for occupational health & safety
IEC 62941: 2019 / Photovoltaic module manufacturing quality system

PRODUCT CERTIFICATES*

IEC 61215 / IEC 61730 / CE
UL 61730 / IEC 61701 / IEC 62716 / IEC 60068-2-68
UNI 9177 Reaction to Fire: Class 1 / Take-e-way



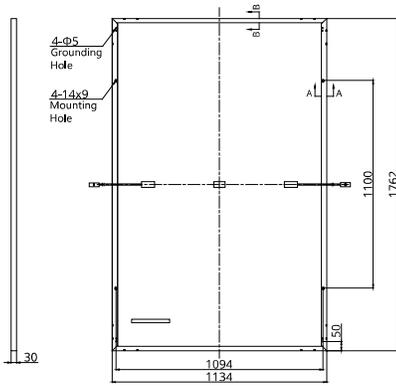
* The specific certificates applicable to different module types and markets will vary, and therefore not all of the certifications listed herein will simultaneously apply to the products you order or use. Please contact your local Canadian Solar sales representative to confirm the specific certificates available for your Product and applicable in the regions in which the products will be used.

CSI Solar Co., Ltd. is committed to providing high quality solar photovoltaic modules, solar energy and battery storage solutions to customers. The company was recognized as the No. 1 module supplier for quality and performance/price ratio in the IHS Module Customer Insight Survey. Over the past 23 years, it has successfully delivered over 133 GW of premium-quality solar modules across the world.

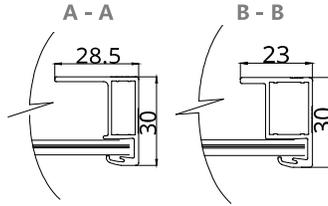
* For detailed information, please refer to the Installation Manual.

ENGINEERING DRAWING (mm)

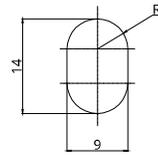
Rear View



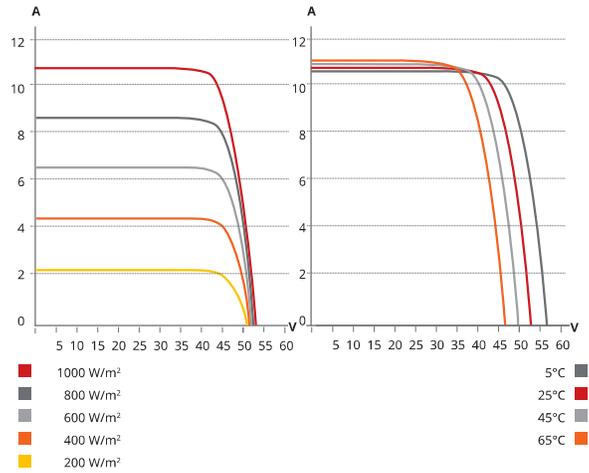
Frame Cross Section



Mounting Hole



CS6.2-48TD-455 / I-V CURVES



ELECTRICAL DATA | STC*

CS6.2-48TD	435	440	445	450	455	460	465
Nominal Max. Power (Pmax)	435 W	440 W	445 W	450 W	455 W	460 W	465 W
Opt. Operating Voltage (Vmp)	44.2 V	44.4 V	44.6 V	44.8 V	45.0 V	45.2 V	45.4 V
Opt. Operating Current (Imp)	9.85 A	9.91 A	9.98 A	10.05 A	10.12 A	10.18 A	10.25 A
Open Circuit Voltage (Voc)	52.3 V	52.5 V	52.7 V	52.9 V	53.1 V	53.3 V	53.5 V
Short Circuit Current (Isc)	10.47 A	10.54 A	10.61 A	10.68 A	10.75 A	10.82 A	10.89 A
Module Efficiency	21.8%	22.0%	22.3%	22.5%	22.8%	23.0%	23.3%
Operating Temperature	-40°C ~ +85°C						
Max. System Voltage	1500V (IEC/UL)						
Module Fire Performance	TYPE 29 (UL 61730) or CLASS C (IEC 61730)						
Max. Series Fuse Rating	20 A						
Protection Class	Class II						
Power Tolerance	0 ~ + 10 W						

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

ELECTRICAL DATA | NMOT*

CS6.2-48TD	435	440	445	450	455	460	465
Nominal Max. Power (Pmax)	328 W	332 W	336 W	339 W	343 W	347 W	351 W
Opt. Operating Voltage (Vmp)	41.7 V	41.8 V	42.0 V	42.2 V	42.4 V	42.6 V	42.8 V
Opt. Operating Current (Imp)	7.87 A	7.93 A	7.98 A	8.04 A	8.09 A	8.14 A	8.20 A
Open Circuit Voltage (Voc)	49.4 V	49.6 V	49.8 V	50.0 V	50.1 V	50.3 V	50.5 V
Short Circuit Current (Isc)	8.44 A	8.50 A	8.55 A	8.61 A	8.67 A	8.72 A	8.78 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m² spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

MECHANICAL DATA

Specification	Data
Cell Type	TOPCon cells
Cell Arrangement	144 [2 x (12 x 6)]
Dimensions	1762 × 1134 × 30 mm (69.4 × 44.6 × 1.18 in)
Weight	24.6 kg (54.2 lbs)
Front Glass	2.0 mm heat strengthened glass with anti-reflective coating
Back Glass	2.0 mm heat strengthened glass
Frame	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	4 mm ² (IEC), 12 AWG (UL)
Cable Length (Including Connector)	Portrait: 300 mm (11.8 in) (+) / 200 mm (7.9 in) (-); landscape: 1100 mm (43.3 in)*
Connector	T6 or MC4-EVO2 or MC4-EVO2A
Per Pallet	36 pieces
Per Container (40' HQ)	936 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.29 % / °C
Temperature Coefficient (Voc)	-0.25 % / °C
Temperature Coefficient (Isc)	0.045 % / °C
Nominal Module Operating Temperature	42 ± 3°C

PARTNER SECTION



* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. CSI Solar Co., Ltd. reserves the right to make necessary adjustment to the information described herein at any time without further notice. Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

CSI Solar Co., Ltd.

199 Lushan Road, SND, Suzhou, Jiangsu, China, 215129, www.csisolar.com, support@csisolar.com

SPH 3000~6000TL BL-UP

- Smart load management via dry contact
- UPS function, 10ms transition
- Scalable system configuration
- VPP interface ready
- Remote smart O&M
- 2 DC/AC Ratio



P O W E R
- I N G O
T O M O -
R R O W O

GROWATT

www.ginverter.com

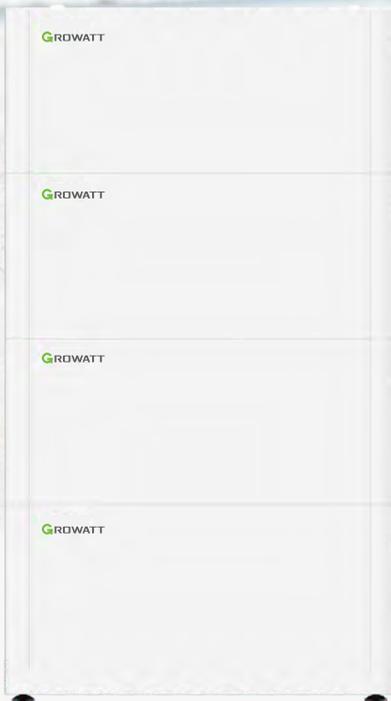
Datasheet	SPH3000TL BL-UP	SPH3600TL BL-UP	SPH4000TL BL-UP	SPH4600TL BL-UP	SPH5000TL BL-UP	SPH6000TL BL-UP
Input data(PV)						
Max. recommended PV power (for module STC)	6500W	7500W	8500W	9000W	9500W	10600W
Max. DC voltage	550V					
Start voltage	120V					
MPP voltage range/ Nominal Voltage	120-550V/370V					
No. of MPP trackers	2					
No. of PV strings per MPP tracker	1					
Max. input current per MPP tracker	13.5A					
Max. short-circuit current per MPP tracker	16.9A					
Output data(AC)						
AC nominal power	3000W	3680W	4000W	4600W	5000W	6000W
Rated AC apparent power	3000VA	3600VA	4000VA	4600VA	5000VA	6000VA
Nominal AC voltage (range)	230V/ (180Vac-260Vac)					
AC grid frequency (range)	50Hz/60Hz (45Hz-55Hz/55Hz-65Hz)					
Rated, output current	13.5A	16A	17.5A	20A	22A	27A
Adjustable power factor	0.8leading...0.8lagging					
THDi	<3%					
AC grid connection type	Single phase					
Battery data (DC)						
Battery voltage range	42~59V					
Max charging and discharging current	66A	75A	85A	85A	85A	85A
Continuous charging and discharging power	3000W	3680W	4000W	4000W	4000W	4000W
Type of battery	Lithium /Lead-acid					
Backup power(AC)						
Max. AC output power	3000W	3680W	4000W	4000W	4000W	4000W
Rated output current	13A	16A	17.5A	17.5A	17.5A	17.5A
Nominal AC output voltage	230Vac					
Nominal AC output frequency	50/60HZ					
THDv	<3%					
Switch time	<10ms					
Efficiency						
MAX. efficiency	97.20%	97.20%	97.30%	97.40%	97.50%	97.60%
European efficiency	97%	97%	97.10%	97.10%	97.20%	97.20%
MPPT efficiency	≥99.5%					
Protection devices						
DC switch	Yes					
DC reverse polarity protection	Yes					
AC/DC surge protection	Yes					
Battery reverse protection	Yes					
AC short-circuit protection	Yes					
Ground fault monitoring	Yes					
Grid monitoring	Yes					
Anti-islanding protection	Yes					
Residual-current monitoring unit	Yes					
Insulation resistance monitoring	Yes					
General data						
Dimensions (W / H / D)	565/456/188mm					
Weight	27kg					
Operating temperature range	-25°C ... +60°C					
Nighttime power consumption	< 10 W					
Topology	Transformerless					
Cooling	Natural					
Protection degree	IP65					
Relative humidity	0~100%					
Altitude	2000m					
PV DC Connection	H4/MC4(Optional)					
Battery DC Connection	OT Terminal					
AC connection	Connector					
Display	LCD+LED					
Interfaces:RS485/CAN/USB	Yes					
Monitor : RF/WIFI/GPRS	Optional					
Warranty: 5 years / 10 years	Yes/Optional					

CE, IEC62109, G98/G99, VDE0126-1-1, AS4777, CEI 0-21, VDE-AR-N4105, IEC C 15-712, EN50549, IEC 61727, IEC 62116, IEC 62040, C10/11, NRS 097-2-1

* The AC voltage range and frequency range may vary depending on specific country grid standard.
All specifications are subject to change without notice.

ALP LV Battery System

- Flexible capacity options, 5kWh to 40kWh
- Excellent safety of cobalt free LiFePO4 battery
- Easy installation with modular and stacked design
- IP66 Suitable for indoor and outdoor use



P O W E R
- I N G O
T O M O -
R R O W O

GROWATT

www.ginverter.com

Datasheet	ALP 5.0L	ALP 10.0L	ALP 15.0L	ALP 20.0L	ALP 25.0L	ALP 30.0L	ALP 35.0L	ALP 40.0L
System demo								
Battery module	ALP 5.0~40.0L LV Battery System(5.0kWh, 51.2V, 44kg)							
Parallel number	1	2	3	4	5	6	7	8
Model	ALP5.0L-E2	ALP10.0L-E2	ALP15.0L-E2	ALP20.0L-E2	ALP25.0L-E2	ALP30.0L-E2	ALP35.0L-E2	ALP40.0L-E2
Nominal energy	5kWh	10kWh	15kWh	20kWh	25kWh	30kWh	35kWh	40kWh
Rated current	75A	130A	130A	130A	130A	130A	130A	130A
Max current	90A	150A	150A	150A	150A	150A	150A	150A
Rated energy	4.6kWh	9.2kWh	13.8kWh	18.4kWh	23kWh	27.6kWh	32.2kWh	36.8kWh
Dimensions* ¹	690/185/295mm	690/185/590mm	690/185/885mm	690/185/1180mm	690/185/1475mm	690/185/1770mm	690/185/2065mm	690/185/2360mm
Weight* ²	44Kg	88Kg	132Kg	176Kg	220Kg	264Kg	308Kg	352Kg

General

Battery type	Cobalt Free Lithium Iron Phosphate (LFP)
Nominal voltage	51.2V
Voltage range	46.4~57.6V
IP rating	IP66
Storage temperature	-20°C~40°C/6 months;95%RH
Operating temperature* ³	-10°C~50°C
Cooling method	Natural cooling
Installation method	Floor/Wall mount

Features

DoD	92%
Scalability	Max.8 PACKs in parallel (Max.6 clusters in parallel)
Communication method	CAN
Warranty: 10 years	Yes

IEC 62619, IEC 63056, IEC 62040, UI1973, CE+FCC, UKCA, UN 38.3, ROHS, AU-CEC

* 1 Height dimension does not include base

* 2 Weight without base

* 3 When the temperature is below 0 °C or above 45 °C, the performance will be limited

* Nominal charge/discharge current and power derating will occur related to Temperature and SOC

* SHENZHEN GROWATT NEW ENERGY CO.,LTD All rights reserved. Subject to change without notice.

INCLUDES FREE BIRD PROTECTION



MRS BROWN

We already had solar panels installed but we're very troubled with pigeons. Deege installed the netting, the men were efficient extremely polite and tidy workers. Delighted to say we have no constant cooing now. Would highly recommend.



PROTECT BOTH YOUR INVESTMENT & WILDLIFE



ENHANCE THE AESTHETICS OF YOUR SYSTEM



MINIMISE CLEANING AND MAINTENANCE COSTS