

T5 Pro Residential Solar Panel

N-type Monofacial

Double Glass Module

HSM-HHK-NM465~470

470W

Maximum Power Output

Up to 23.5% efficiency



One-third cut,
shingled cell design



Ammonia
corrosion certified



Framed
glass-glass



Salt mist corrosion
certified

High energy yield

Excellent thermal resistance and
temperature coefficient

Outstanding power generation performance

High lifetime energy production

The shingled-cell design helps to keep
cell temperatures low to produce
more power over time

Aesthetic experience

Full black module for uniform rooftop integration

Comprehensive warranty coverage

25-year Product warranty

30-year Linear power coverage

99.0% minimum warranted output at Year 1

Maximum annual degradation 0.35%



Comprehensive Products and System Certificates



IEC 61215 / IEC 61730 ISO 9001:2015 ISO 45001:2018 ISO 14001:2015

Learn more about TCL Solar panels
www.tclsolar.com/resources

Made in China
TCL Zhonghuan Energy Technology (Jiangsu) Co., Ltd.

Measurement Tolerance: P_{max} (W) ±3%; V_{oc} (V) ±3%; I_{sc} (A) ±4%* STC: Irradiance 1000W/m², Cell Temperature 25°C, AM1.5

Electrical Parameters (STC*)

Maximum Power	P _{max} (W)	465	470
Open Circuit Voltage	V _{oc} (V)	54.19	54.59
Short Circuit Current	I _{sc} (A)	10.87	10.91
Maximum Power Voltage	V _{mp} (V)	45.70	46.10
Maximum Power Current	I _{mp} (A)	10.18	10.20
Module Efficiency	(%)	23.3	23.5

Temperature Coefficient

Nominal Module Operating Temperature*	42±2°C
Temperature Coefficient of I _{sc}	+0.05%/°C
Temperature Coefficient of V _{oc}	-0.22%/°C
Temperature Coefficient of P _{max}	-0.26%/°C

Operating Parameters

Operation Temperature	-40°C to +70°C (IEC TS 63126)
Maximum System Voltage	1500V DC
Maximum Series Fuse Rating	25A
Safety Protection	Class II
Fire Rating	Class A (IEC 61730-2 / UL 790)

Mechanical Data

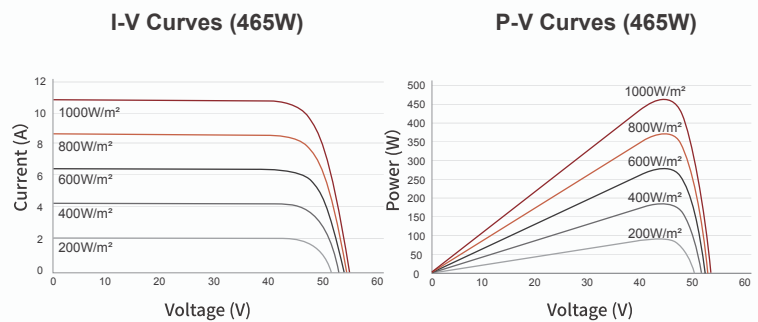
* Please refer to installation manual for details

No. of Cells	144pcs (6x24)
Dimension	1762×1134×30 mm
Weight	24.5kg±3%
Front Glass	2.0mm, Heat Strengthened, AR coating Glass
Back Glass	2.0mm, Heat Strengthened Glass
Frame	Black Anodized Aluminium Alloy
J-Box	IP68, 3 bypass diodes
Cables	4.0mm ² , +1200mm, -1200mm (can be customized)
Maximum Static Load	Front: 5400Pa/Back: 2400Pa*
Connectors	Stäubli MC4-EVO2A

Packaging Configuration

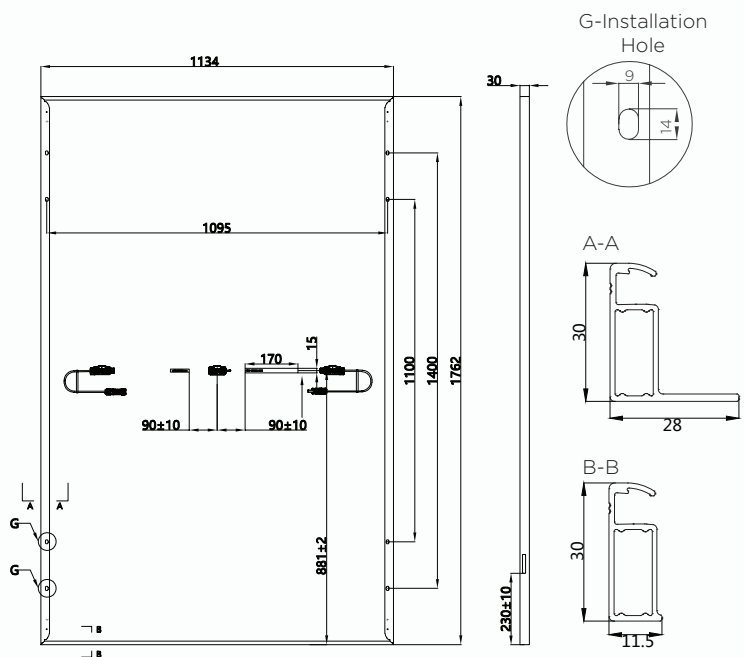
Modules per Pallet	36pcs
Modules per 40'HQ Container	936pcs
Pallets per 40'HQ Container	26pcs

Curve Graph



Engineering Drawing

[Unit: mm]

Please read the safety and installation instructions. Visit www.tclsolar.com/resources1 Tier1 BloombergNEF based on <https://taiyangnews.info/topmodules/top-solarmodules-listing-january-2026>.2 Standard Test Conditions (1000 W/m² irradiance, AM 1.5, 25° C). NREL calibration Standard: SOMS current, LACCS FF and Voltage.3 Measurement tolerance is P_{max} ± 3%, V_{oc} ±3%, I_{sc} ±4%

4 Test load as per IEC 61215-2 is equal to design load with safety factor = 1.5. See "Safety and Installation Instructions" for details.