# GRID CONNECTED ROOF TOP PROGRAMME

KSEB

## SOURA SUBSIDY SCHEME 2020-21
## (Domestic)

HIVE SOLAR
TURN ON THE SUN

Updated 1-4-2021

## GRID TIE SOLAR PLANTS
## 4 – 10KW

**Hive Solar** , GNA -8 , Opposite Cotton Hill L.P School , Vazhuthacaud , Trivandrum – **Kerala** 695014

**Details of Empanelled Developer**

<table>
<tr><td>Developer</td><td colspan="3">HIVE SOLAR,<br>GNA- 8, Opp Cotton Hill L P School, Vazhuthacaud,<br>Trivandrum – 14. Phone. 0471-4060061</td></tr>
<tr><td>Contact Person & Telephone No</td><td colspan="3">Robin Roy (Project Manager): 7909233000<br>Shibu Jalas: (Operations Manager): 9744866497</td></tr>
<tr><td>E Mail ID</td><td colspan="3">aswin@hivesolar.com, sivaram@hivesolar.com, sajaykumar@hivesolar.com</td></tr>
<tr><td rowspan="2">Capacity Allocated For the Developer</td><td>Capacity Range</td><td>Allocated quantum</td><td>All Incl Rate per kWp (Rs)</td></tr>
<tr><td>4 -1 0 kWp Plants</td><td>1 MW</td><td>40,900/-</td></tr>
<tr><td rowspan="2">Major Components approved for PV plant installation</td><td>PV Modules</td><td>Inverter</td><td>Mounting Structure</td></tr>
<tr><td>Vikram Solar Limited, ELDORA VSP.72.AAA.03.04 (AAA=330-335); PolyCrystalline, Efficiency ≥ 17 %</td><td>Luminous Power Technology Nxi series</td><td>*Ballast and GI structure approved by KSEBL</td></tr>
</table>

**Note:- *** If any deviation is required for mounting structure design on account of consumer requirement or site conditions, the consumer is to bear the additional cost as approved by KSEBL.

# KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Companies Act, 1956) CIN :U40100KL2011SGC027424
Reg Office: Vydyuthi Bhavanam, Pattom, Thiruvananthapuram-695004, Kerala.

**Office of the State Nodal Officer (SOURA)**

Vydyuthi Bhavanam, Pattom, Thiruvananthapuram-695004, Kerala.
Phone: +91 471 2514602, E-Mail ID :sourakseb@gmail.com, Website : www.kseb.in


Soura /Tender/4 / SOURA-Subsidy-Domestic/2020-21/321 Dt: 28.10.2020

To

**M/s HIVE SOLAR,**
**GNA- 8, Opp Cotton Hill L P School,**
**Vazhuthacaud, Trivandrum - 14**

Sir,

Sub Empanelment of Contractors for implementing Grid connected Roof Top Solar PV plants under Soura Subsidy scheme in Domestic Sector –

Ref 1 E- Tender No. 4 / SOURA-Subsidy-Domestic/2020-21 dtd 7.9.2020
2 Corrigendum I,II & III to the tender
3 Your offer submitted online, E-Mails dated 1.10.2020,9.10.2020, 13.10.2020

Kerala State Electricity Board Limited is pleased to accept your offer towards the subject tender.

| **RTS Plant Capacity** | **Empanelment Quantity** | All Inclusive Rate per kWp (Rs) |
|---|---|---|
| **4-10 kWp** | **1 MW** | 40,900.00 |

**STATE NODAL OFFICER**
**SOURA PROJECT**

# KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Companies Act, 1956) CIN :U40100KL2011SGC027424

**Office of the State Nodal Officer (SOURA)**

Vydyuthi Bhavanam, Patom, Thiruvananthapuram -695004, Kerala. Phone: +91 471 2514602, E-Mail ID :sourakseb@gmail.com, Website : www.kseb.in


## Soura Phase II Subsidy Scheme

(Amount Payable by Consumer for Solar Roof Top Plants)

### MODEL II

| CAPACITY | TOTAL AMOUNT |
|---|---|
| 4KW | 1,06,340/- |
| 5KW | 1,39,060/- |
| 6KW | 1,71,780/- |
| 7KW | 2,04,500/- |
| 8KW | 2,37,220/- |
| 9KW | 2,69,940/- |
| 10KW | 3,02,660/- |

State Nodal Officer
(Soura Project)

**Note** : The prices shown above may be subjected to change . For latest prices visit the **SOURA** Page at www.kseb.in

HIVE SOLAR
TURN ON THE SUN

www.hivesolar.in

ISO 9001:2015 CERTIFIED


# COMPANY PROFILE

## Hive Solar

Hive Solar was Established in 2013 having offices at Trivandrum and Cochin, are exclusive Distributors for LUMINOUS (part of Schneider Electric) for Backup and Solar Products for South Kerala . Since its inception, the company has made its goal to be the standard setter for the alternative energy industry and to bring clean, green electricity both to the urban and rural environment . We currently operate across Kerala and South Tamil Nadu .

We are also engaged in the distribution of Solar Panels , DC Cables and Solar Inverters, in addition we are sole Distributor in Kerala for one of India's Largest Panel Manufacturer - “VIKRAM SOLAR” and have multiple warehouses across Kerala.

We have currently established ourself as one of the largest supplier of Solar equipments in Kerala from Panels, DC Cables to Custom Safety Equipments . Our portfolio also showcase an installed capacity of more than 4MW of Solar Plants for both commercial and residential purposes and through our wide network of retailers and Integrators over the last few years .

Apart from the above we are also engaged in the manufacture and supply of Modular Solar panel Structures and Combiner/Junction Boxes for large commercial Solar Power Generation plants.

## Our Achievements

**2000+ Customers , more than 4MW of Solar Installations , 15MWh of Battery Storage provided.**

**CRISIL SOLAR GRADING** - in System Integrator (SI) category of Solar Power (SP- 2B) grading for installation category upto 500KW

**Solar Power Rated** for decentralised Solar Photovoltaic (PV) Applications . Rated - “2B”

**ISO Certified - ISO 9001**:2015 “Quality Management System (QMS)” focused on meeting customer expectations.

## Empanelment

Awarded & approved as the only Empanelled Partner from Kerala for execution of the KSEB Solar Rooftop Programme 2020-22 (SAURA) in Kerala

ANERT Empanelled AGENCY for Implementation of DOMESTIC and COMMERCIAL Solar Projects in KERALA upto Capacity of 500KW.

## Whom We Offer

We offer complete solar power systems and solar power products with comprehensive accessories:

- For private residents
- For public buildings
- For agricultural applications
- For remote DC applications
- For stand-alone installations
- Education Institutions
- Architects
- Military Establishment
- For KELETRON Projects
- MNRE Empaneled Agencies in Kerala
- Builders / Contractors

## Technical Team

Our In-house team comprises of Electrical Engineers , Electrical Supervisors to take care of Initial design and costing of the Plant . Installation of the plants are carried out by our well qualified technicians .

Apart from the above we are also associated with various Electrical and Civil Contractors at various districts at Kerala to help liaison with Various Gov Licensing Bodies

## Authorised Dealers / Companies

As part of our endeavour to reach out widely to our customers . We have identified and established a network of Dealers / Companies across Kerala with with whom we are closely associated in execution of Projects for both Commercial and Subsidy based programmes .

## Associated Companies

Hive Solar are proud to be associated with world class companies like LUMINOUS, VIKRAM SOLAR, DELTA , APC , Outback Power, OBO BetterMan, KEI for providing Electrical equipments and Safety components .

## Mounting Systems

Our mounting racks are optimised for installing PV panels easily and extremely cost efficient and designed to be easily scaleable upto any size . Our mounting systems for solar power plants also cater to every wish, including roof-parallel, flat-roof or greenfield installation.

## Design and Solutions

**Hive Solar** employ use of **Schneider Conext PV Designer Software t**o accurately size the components of your solar electric or PV system, ensuring that the system works in the most optimal manner while strictly complying to safety

A 3D rendered version of the Panel Structure helps provide customers/Architects pre-visualise and suggest necessary changes etc even before the actual installation , hence cut down on expensive post installation modification.

### Power Audit

Before selecting Power systems like Inverters/UPS or sizing a PV system for an existing home/Office etc. Our Data Loggers and Power Analysers help to evaluate your energy consumption and usage pattern and provide a detail chart on ways to reduce your electricity consumption and model an optimal system.

### Post-Installation Maintenance & Support Services

Regular maintenance extends the life of system components and allows clients to realise the maximum return on their investment. At project completion our integration team hands the reins over to Service Department for post-installation support services. Dispatches are managed by field service technicians who are experts at maintaining system components and who, when issues arise, can effectively evaluate the root cause and execute a speedy resolution.

Our support team offers a broad spectrum of services designed to cover all of a clients needs. Our AMC and preventive maintenance packages, ensure uninterrupted and trouble free operation of the installed Equipments.

## Contact Details


Firm Name : **Hive Solar Trivandrum**
Address: GNA – 8,
Opp Cotton hill L.P School,
Vazhuthacaud, **Trivandrum** - 695014
Kerala - India

Company – **HiveSolar Energy Pvt Ltd**
Address: Door No: 33/2469 F3(45/1864),
Labour Colony Road,
Thammanam,
**Kochi** - 682032
Kerala - India

**Contact by phone**
Trivandrum - +04714000061
Kochi - +0484 **2339151**

**Contact by Email**
Email : info@hivesolar.com
Web : www.hivesolar.com


For more information about us, please visit our website at www.hivesolar.com

# GRID CONNECTED ROOF TOP PROGRAMME

## SOURA SUBSIDY SCHEME 2020-21
(Domestic)

KSEB

HIVE SOLAR
TURN ON THE SUN

# APPROVED LIST OF PRODUCTS

*Note: Products detailed in the document may be subject to change or additional products may be included during the course of the Scheme

# ELDORA

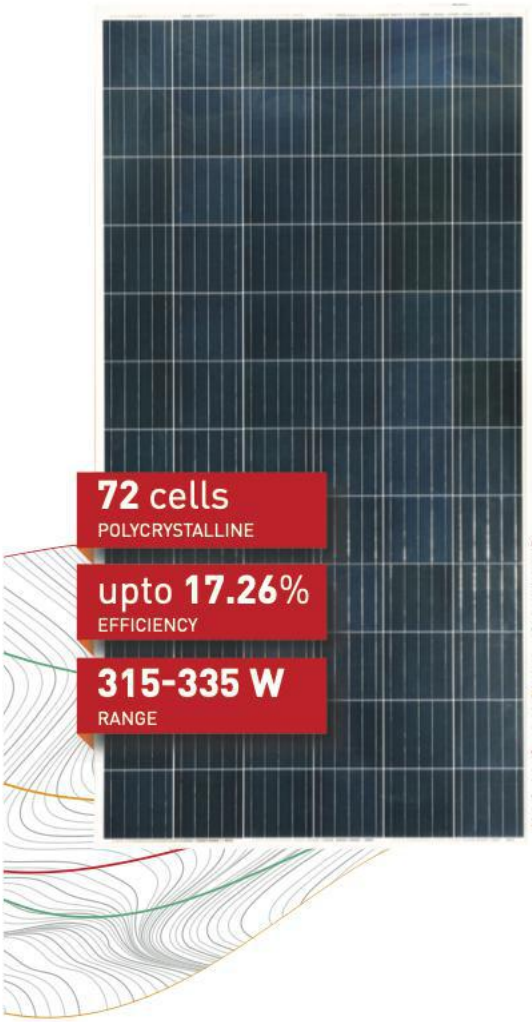
HIGH EFFICIENCY POLY-Si PV MODULES

vikramsolar™

CREATING CLIMATE FOR CHANGE

ELDORA VSP.72.AAA.03.04 | POLYCRYSTALLINE SOLAR PV MODULES | 72 CELLS | 315-335 WATT

# ELDORA GRAND SERIES




**HIGHER OUTPUT OF MODULE POWER** by reducing cell to module power loss

Extremely **NARROW POWER BINNING TOLERANCE** of +2.5 Wp to reduce current mismatch loss in single string

Designed for very **HIGH AREA EFFICIENCY** ideally suited for roof-top and ground-mounted applications

Extremely **RELIABLE PRODUCT** suiting all environment conditions

Engineered to provide **EXCELLENT LOW LIGHT RESPONSE**

## QUALITY AND SAFETY

- 27 years of linear power output warranty **
- Rigorous quality control meeting the highest international standards
- 100% EL tested to ensure micro crack free modules
- Certified for PID free
- Certified for salt mist corrosion resistance – severity VI
- Certified for ammonia resistance
- 3rd Party validated PAN file*
- Certified for sand and dust test

## APPLICATIONS

- On-grid large scale utility systems
- On-grid rooftop residential, commercial and industrial roof top installations
- Off-grid residential systems
- Solar pumping applications

# TECHNICAL DATA

## ELDORA GRAND SERIES

vikramsolar™
CREATING CLIMATE FOR CHANGE

THIS DATASHEET IS APPLICABLE FOR: ELDORA VSP.72.AAA.03.04 (AAA=315-335)

## Electrical Data[1] All Data refers to STC (AM 1.5, 1000 W/m², 25°C)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Peak Power $P_{max}$ (Wp) | 315.0 | 317.5 | 320.0 | 322.5 | 325.0 | 327.5 | 330.0 | 332.5 | 335.0 |
| Maximum Voltage $V_{mpp}$ (V) | 37.5 | 37.6 | 37.7 | 37.7 | 37.8 | 37.9 | 38.0 | 38.1 | 38.1 |
| Maximum Current $I_{mpp}$ (A) | 8.40 | 8.45 | 8.50 | 8.55 | 8.60 | 8.65 | 8.70 | 8.74 | 8.80 |
| Open Circuit Voltage $V_{oc}$ (V) | 45.8 | 45.9 | 46.0 | 46.1 | 46.2 | 46.2 | 46.3 | 46.4 | 46.5 |
| Short Circuit Current $I_{sc}$ (A) | 8.92 | 8.98 | 9.03 | 9.08 | 9.13 | 9.19 | 9.24 | 9.29 | 9.35 |
| Module Efficiency η(%) | 16.23 | 16.36 | 16.49 | 16.62 | 16.75 | 16.88 | 17.01 | 17.14 | 17.26 |

[1] STC: 1000 W/m² irradiance, 25°C cell temperature, AM 1.5g spectrum according to EN 60904-3. Average relative efficiency reduction of 5% at 200 W/m² according to EN 60904-1.

## Electrical Parameters at NOCT[2]

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Power (W) | 231.2 | 232.8 | 234.6 | 236.5 | 238.3 | 240.1 | 242.0 | 243.8 | 245.6 |
| V@$P_{max}$ (V) | 34.4 | 34.4 | 34.5 | 34.6 | 34.6 | 34.7 | 34.8 | 34.9 | 34.9 |
| I@$P_{max}$ (A) | 6.73 | 6.77 | 6.80 | 6.84 | 6.88 | 6.92 | 6.95 | 6.99 | 7.03 |
| $V_{oc}$ (V) | 42.5 | 42.5 | 42.6 | 42.6 | 42.7 | 42.7 | 42.7 | 42.8 | 42.8 |
| $I_{sc}$ (A) | 7.22 | 7.26 | 7.30 | 7.34 | 7.38 | 7.42 | 7.46 | 7.50 | 7.54 |

[2] NOCT irradiance 800 W/m², ambient temperature 20°C, wind speed 1 m/sec

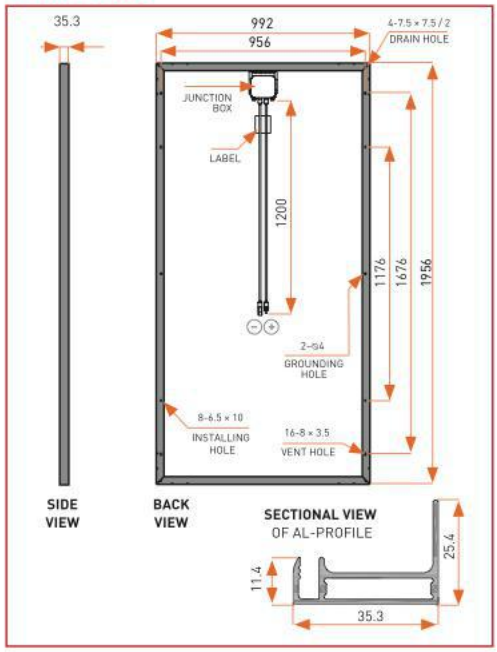
## Temperature Coefficients (Tc) permissible operating conditions

| | |
|---|---|
| Tc of Open Circuit Voltage (β) | - 0.31%/°C |
| Tc of Short Circuit Current (α) | 0.052%/°C |
| Tc of Power (γ) | -0.41%/°C |
| Maximum System Voltage | 1000 V |
| NOCT | 44°C ± 2°C |
| Temperature Range | -40°C to + 85°C |

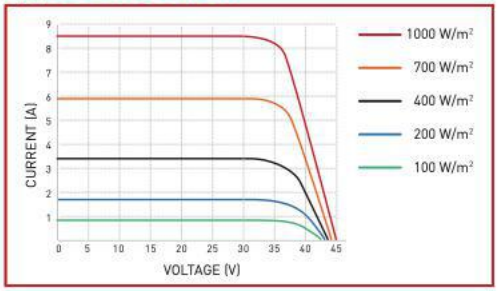
## Mechanical Data

| | |
|---|---|
| Length × Width × Height | 1956 × 992 × 36 mm (77.01 × 39.06 × 1.42 inches) |
| Weight | 20.7 kg (45.63 lbs) |
| Junction Box | IP68/IP67, 3 Bypass diodes |
| Cable & Connectors | 1200 mm (47.24 inches) length cables, MC4 Compatible/MC4 Connectors |
| Application Class | Class A (Safety class II) |
| Superstrate | 3.2 mm (0.13 Inches) high transmission low iron tempered glass, AR coated |
| Cells | 72 Polycrystalline solar cells |
| Cell Encapsulant | EVA (Ethylene Vinyl Acetate) |
| Back Sheet | Composite film |
| Frame | Anodized aluminium frame with twin wall profile |
| Mechanical Load Test | 5400 Pa (Snow load), 2400 Pa (Wind load) |
| Maximum Series Fuse Rating | 15 A |

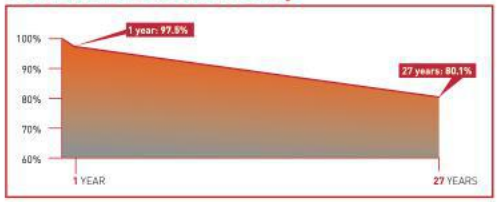
## Dimensions in mm




## Typical I-V Curves




## Performance Warranty




## Warranty and Certifications

| | |
|---|---|
| Product Warranty** | 10 years |
| Performance Warranty** | Linear power warranty for 27 years with 2.5% for 1st year degradation and 0.67% from year 2 to year 27 |
| Approvals and Certificates | IEC 61215 Ed2, IEC 61730, IEC 61701, IEC 62716, IEC 60068, IEC 62804, UL1703, CE, MCS, CEC, PV Cycle*, CAN/CSA 61730, CEC (Australia)* |

## Packaging Information

| | |
|---|---|
| Quantity/Pallet | 28 |
| Pallets/Container (40'HC) | 24 |
| Quantity/Container (40'HC) | 672 |

* All (*) certifications under progress.
** Refer to Vikram Solar's warranty document for terms and conditions.

**CAUTION:** READ SAFETY AND INSTALLATION MANUAL BEFORE USING THE PRODUCT.
Specifications included in this datasheet are subject to change without notice. Electrical data without guarantee. Please confirm your exact requirement with the company representative while placing your order.

# GROWATT 7000 - 11000 TL3-S / 3000 - 6000 TL3-S
# MIN 2500 - 6000 TL-X

- Maximum efficiency 98.4%
- Dual MPP trackers
- Type II SPD on DC side
- Supports export control
- Touch key and OLED display
- Data storage up to 25 years


POWERING TOMORROW

Growatt
powering tomorrow

www.ginverter.com

| Datasheet | MIN 2500TL-X | MIN 3000TL-X | MIN 3600TL-X | MIN 4200TL-X | MIN 4600TL-X | MIN 5000TL-X | MIN 6000TL-X |
|---|---|---|---|---|---|---|---|
| **Input Data (DC)** | | | | | | | |
| Max. recommended PV power (for module STC) | 3500W | 4200W | 5040W | 5880W | 6440W | 7000W | 8100W |
| Max. DC voltage | 500V | 500V | 550V | 550V | 550V | 550V | 550V |
| Start voltage | | | | 100V | | | |
| Nominal voltage | | | | 360V | | | |
| MPP voltage range | 80V-500V | 80V-500V | 80V-550V | 80V-550V | 80V-550V | 80V-550V | 80V-550V |
| No. of MPP trackers | | | | 2 | | | |
| No. of PV strings per MPP tracker | | | | 1 | | | |
| Max. input current per MPP tracker | | | | 12.5A | | | |
| Max. short-circuit current per MPP tracker | | | | 16A | | | |
| **Output data (AC)** | | | | | | | |
| AC nominal power | 2500W | 3000W | 600W | 4200W | 4600W | 5000W | 6000W |
| Max. AC apparent power | 2500VA | 3000VA | 3600VA | 4200VA | 4600VA | 5000VA | 6000VA |
| Nominal AC voltage（range*） | | | | 230V (180-280V) | | | |
| AC grid frequency（range*） | | | | 50/60 Hz (45-55Hz/55-65Hz) | | | |
| Max. output current | 11.3A | 13.6A | 16A | 19A | 20.9A | 22.7A | 27.2A |
| Adjustable power factor | | | | 0.8leading…0.8lagging | | | |
| THDi | | | | <3% | | | |
| AC grid connection type | | | | Single phase | | | |
| **Efficiency** | | | | | | | |
| Max.efficiency | 98.2% | 98.2% | 98.2% | 98.4% | 98.4% | 98.4% | 98.4% |
| European efficiency | 97.1% | 97.1% | 97.2% | 97.5% | 97.5% | 97.5% | 97.5% |
| MPPT efficiency | | | | 99.9% | | | |
| **Protection Devices** | | | | | | | |
| DC reverse polarity protection | | | | yes | | | |
| DC switch | | | | yes | | | |
| AC/DC surge protection | | | | Type II / Type III | | | |
| Insulation resistance monitoring | | | | yes | | | |
| AC short-circuit protection | | | | yes | | | |
| Ground fault monitoring | | | | yes | | | |
| Grid monitoring | | | | yes | | | |
| Anti-islanding protection | | | | yes | | | |
| Residual-current monitoring unit | | | | yes | | | |
| AFCI protection | | | | Optional | | | |
| **General Data** | | | | | | | |
| Dimensions (W / H / D) | 375/350/160mm | | | | | | |
| Weight | 10.8kg | | | | | | |
| Operating temperature range | –25℃ ... +60℃ | | | | | | |
| Noise emission (typical) | ≤35 dB(A) | | | | | | |
| Nighttime power consumption | < 1W | | | | | | |
| Topology | Transformerless | | | | | | |
| Cooling | Natural convection | | | | | | |
| Protection degree | IP65 | | | | | | |
| Relative humidity | 0-100% | | | | | | |
| Altitude | 4000m | | | | | | |
| DC connection | H4/MC4(Optional) | | | | | | |
| AC connection | Connector | | | | | | |
| Display | OLED+LED/WIFI+APP | | | | | | |
| Interfaces: RS485 / USB/Wi-Fi/ GPRS/ RF/LAN | Yes/Yes/Optional/Optional/Optional /Optional | | | | | | |
| Warranty: 5 years / 10 years | Yes /Optional | | | | | | |

CE, IEC62109, VDE0126-1-1, AS4777, AS/NZS 3100, VDE-AR-N4105, CQC, IEC61683, IEC60068, IEC61727, IEC62116, INMETRO

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

**GROWATT NEW ENERGY TECHNOLOGY Co.,LTD** A: No.28 Guangmming Road, Longteng Community, Shiyan, Baoan District, Shenzhen, P.R.China.
T: + 86 755 2747 1900 F: + 86 755 2749 1460 E: info@ginverter.com

| Datasheet | 3000TL3-S | 4000TL3-S | 5000TL3-S | 6000TL3-S |
|---|---|---|---|---|
| **Input Data** | | | | |
| Max. recommended PV power (for module STC) | 3600W | 4800W | 6000W | 7200W |
| Max. DC voltage | 1000V | 1000V | 1000V | 1000V |
| Start Voltage | 140V | 140V | 140V | 140V |
| MPPT voltage range | 140V-1000V | 140V-1000V | 140V-1000V | 140V-1000V |
| Nominal voltage | 620V | 620V | 620V | 620V |
| Max. input current | 11A/11A | 11A/11A | 11A/11A | 11A/11A |
| Number of independent MPP trackers/strings per MPP tracker | 2/1 | 2/1 | 2/1 | 2/1 |
| **Output (AC)** | | | | |
| Rated AC output power | 3000W | 4000W | 5000W | 6000W |
| Max. AC apparent power | 3000VA | 4000VA | 5000VA | 6000VA |
| Max. output current | 5.1A | 6.8A | 8.5A | 10.2A |
| AC nominal voltage | 230V/400V；320-478V | 230V/400V；320-478V | 230V/400V；320-478V | 230V/400V；320-478V |
| AC grid frequency | 50Hz/60Hz, ±5Hz | 50Hz/60Hz, ±5Hz | 50Hz/60Hz, ±5Hz | 50Hz/60Hz, ±5Hz |
| Power factor | 0.8leading - 0.8laging | 0.8leading - 0.8laging | 0.8leading - 0.8laging | 0.8leading - 0.8laging |
| THDi | <3% | <3% | <3% | <3% |
| AC grid connection type | 3W+N+PE | 3W+N+PE | 3W+N+PE | 3W+N+PE |
| **Efficiency** | | | | |
| Max.efficiency | 97.5% | 97.8% | 98.0% | 98.0% |
| Euro - eta | 96.5% | 96.7% | 96.9% | 97.1% |
| MPPT efficiency | 99.5% | 99.5% | 99.5% | 99.5% |
| **Protection Devices** | | | | |
| DC reverse polarity protection | yes | yes | yes | yes |
| DC switch | yes | yes | yes | yes |
| Output over current protection | yes | yes | yes | yes |
| Output AC overvoltage Protection - Varistor | yes | yes | yes | yes |
| Ground fault monitoring | yes | yes | yes | yes |
| Grid monitoring | yes | yes | yes | yes |
| Integrated all-pole sensitive leakage current monitoring unit | yes | yes | yes | yes |
| **General Data** | | | | |
| Dimensions (W / H / D) in mm | 480/448/200 | 480/448/200 | 480/448/200 | 480/448/200 |
| Weight | 21.2kg | 21.2kg | 21.2kg | 21.2kg |
| Operating temperature range | -25 °C ... +60 °C | -25 °C ... +60 °C | -25 °C ... +60 °C | -25 °C ... +60 °C |
| Noise emission (typical) | ≤35 dB(A) | ≤35 dB(A) | ≤35 dB(A) | ≤35 dB(A) |
| Altitude | 3000m | 3000m | 3000m | 3000m |
| Self-consumption night | < 0.5W | < 0.5W | < 0.5W | < 0.5W |
| Topology | Transformerless | Transformerless | Transformerless | Transformerless |
| Cooling concept | Natural | Natural | Natural | Natural |
| Environmental Protection Rating | IP65 | IP65 | IP65 | IP65 |
| Relative humidity | 0~100% | 0~100% | 0~100% | 0~100% |
| **Features** | | | | |
| DC connection | H4/MC4(opt) | H4/MC4(opt) | H4/MC4(opt) | H4/MC4(opt) |
| AC connection | Connector | Connector | Connector | Connector |
| Display | LCD | LCD | LCD | LCD |
| Interfaces:RS232/RS485/RF/ Ethernet/Wi-Fi | yes/yes/opt/opt/opt | yes/yes/opt/opt/opt | yes/yes/opt/opt/opt | yes/yes/opt/opt/opt |
| Warranty:5 years/10 years | yes/opt | yes/opt | yes/opt | yes/opt |

CE, IEC 62109-1/2, VDE 0126-1-1, Greece, UTE C 15-712, VDE-AR-N4105, G98, EN50438, CEI 0-21, AS4777, IEC 61727, IEC 62116, CQC

**GROWATT NEW ENERGY TECHNOLOGY Co.,LTD** A: No.28 Guangmming Road, Longteng Community, Shiyan, Baoan District, Shenzhen, P.R.China.
T: + 86 755 2747 1900 F: + 86 755 2749 1460 E: info@ginverter.com

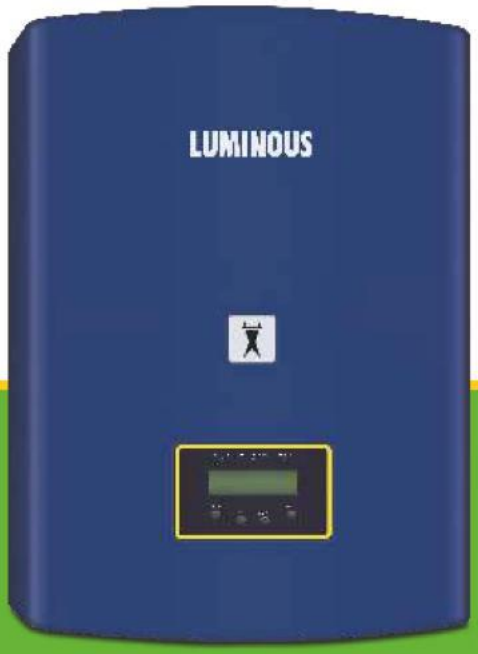
| Datasheet | 7000TL3-S | 8000TL3-S | 9000TL3-S | 10000TL3-S | 11000TL3-S |
|---|---|---|---|---|---|
| **Input Data** | | | | | |
| Max. recommended PV power (for module STC) | 8400W | 9600W | 10800W | 12000W | 13200W |
| Max. DC voltage | 1000V | 1000V | 1000V | 1000V | 1000V |
| Start Voltage | 160V | 160V | 160V | 160V | 160V |
| MPPT voltage range | 160V-1000V | 160V-1000V | 160V-1000V | 160V-1000V | 160V-1000V |
| Nominal voltage | 600V | 600V | 600V | 600V | 600V |
| Max. input current | 11.5A/11.5A | 11.5A/11.5A | 11.5A/11.5A | 13A/13A | 13A/13A |
| Number of independent MPP trackers/strings per MPP tracker | 2/1 | 2/1 | 2/1 | 2/1 | 2/1 |
| **Output (AC)** | | | | | |
| Rated AC output power | 7kW | 8kW | 9kW | 10kW | 11kW |
| Max. AC apparent power | 7.7kVA | 8.8kVA | 9.9kVA | 11kVA | 12.1kVA |
| Max. output current | 11.7A | 13.3A | 15A | 16.7A | 18.3A |
| AC nominal voltage | 230V/400V ; 320-478V | 230V/400V ; 320-478V | 230V/400V ; 320-478V | 230V/400V ; 320-478V | 230V/400V ; 320-478V |
| AC grid frequency | 50/60Hz, ±5Hz | 50/60Hz, ±5Hz | 50/60Hz, ±5Hz | 50/60Hz, ±5Hz | 50/60Hz, ±5Hz |
| Power factor | 0.8leading - 0.8laging | 0.8leading - 0.8laging | 0.8leading - 0.8laging | 0.8leading - 0.8laging | 0.8leading - 0.8laging |
| THDi | <3% | <3% | <3% | <3% | <3% |
| AC grid connection type | 3W+N+PE | 3W+N+PE | 3W+N+PE | 3W+N+PE | 3W+N+PE |
| **Efficiency** | | | | | |
| Max.efficiency | 98.3% | 98.3% | 98.4% | 98.4% | 98.4% |
| Euro - eta | 97.5% | 97.8% | 98% | 98% | 98% |
| MPPT efficiency | 99.5% | 99.5% | 99.5% | 99.5% | 99.5% |
| **Protection Devices** | | | | | |
| DC reverse polarity protection | yes | yes | yes | yes | yes |
| DC switch | yes | yes | yes | yes | yes |
| Output over current protection | yes | yes | yes | yes | yes |
| Output AC overvoltage Protection - Varistor | yes | yes | yes | yes | yes |
| Ground fault monitoring | yes | yes | yes | yes | yes |
| Grid monitoring | yes | yes | yes | yes | yes |
| Integrated all-pole sensitive leakage current monitoring unit | yes | yes | yes | yes | yes |
| **General Data** | | | | | |
| Dimensions (W / H / D) in mm | 480/448/200 | 480/448/200 | 480/448/200 | 480/448/200 | 480/448/200 |
| Weight | 21.6kg | 21.6kg | 21.6kg | 21.6kg | 21.6kg |
| Operating temperature range | -25 °C ... +60 °C | -25 °C ... +60 °C | -25 °C ... +60 °C | -25 °C ... +60 °C | -25 °C ... +60 °C |
| Noise emission (typical) | ≤35 dB(A) | ≤35 dB(A) | ≤35 dB(A) | ≤35 dB(A) | ≤35 dB(A) |
| Altitude | 3000m | 3000m | 3000m | 3000m | 3000m |
| Self-consumption night | < 0.5W | < 0.5W | < 0.5W | < 0.5W | < 0.5W |
| Topology | Transformerless | Transformerless | Transformerless | Transformerless | Transformerless |
| Cooling concept | Natural | Natural | Natural | Natural | Natural |
| Environmental Protection Rating | IP65 | IP65 | IP65 | IP65 | IP65 |
| Relative humidity | 0~100% | 0~100% | 0~100% | 0~100% | 0~100% |
| **Features** | | | | | |
| DC connection | H4/MC4(opt) | H4/MC4(opt) | H4/MC4(opt) | H4/MC4(opt) | H4/MC4(opt) |
| AC connection | Screw terminal | Screw terminal | Screw terminal | Screw terminal | Screw terminal |
| Display | LCD | LCD | LCD | LCD | LCD |
| Interfaces:RS232/RS485/RF/Wi-Fi | yes/yes/opt/opt | yes/yes/opt/opt | yes/yes/opt/opt | yes/yes/opt/opt | yes/yes/opt/opt |
| Warranty:5 years/10 years | yes/opt | yes/opt | yes/opt | yes/opt | yes/opt |

CE, IEC 62109-1/2, VDE 0126-1-1, Greece, VFR 2014, VDE-AR-N4105, G98, EN50438, CEI 0-21, AS4777, IEC 61727, IEC 62116, CQC

**GROWATT NEW ENERGY TECHNOLOGY Co.,LTD** A: No.28 Guangmming Road, Longteng Community, Shiyan, Baoan District, Shenzhen, P.R.China.
T: + 86 755 2747 1900 F: + 86 755 2749 1460 E: info@ginverter.com

LUMINOUS

JIS PE DESH KARE BHAROSA




# Solar Grid Tie

Grid Tie Inverters are power inverters that convert direct current (DC) electricity into alternating current (AC) with an ability to synchronize with mains line.

Grid Tie Inverters are designed to quickly disconnect from the grid if the utility grid goes down. It ensures that in the event of a blackout, the grid tie inverter will shutdown to prevent the energy it transfers from harming any line workers who are sent to fix the power grid.

| | | |
|---|---|---|
| Range available: | Single Phase (kW) | 1.5/2/3/3.6/4/5 |
| | Three Phase (kW) | 8/10/15/20/25/30 |

| Features | Benefits |
|---|---|
| Transformerless inverters | No transformers loss so efficiency is >97% |
| Dual MPPT charge controller | Complete utilization of PV arrays even in partial shading |
| Wide operating volatge | Extends the day thus harnessing maximum power from sun |
| IP 65 enclosure | Completely dust and water proof so can be installed outside |
| Modbus comms | For efficient remote monitoring |

# LUMINOUS

## Single Phase

| MODEL | Nxi 110 | Nxi 120 | Nxi 130 | Nxi 140 | Nxi 150 |
|---|---|---|---|---|---|
| **Input DC** | | | | | |
| Max. DC Input Power (kW) | 1.2 | 2.3 | 3.5 | 4.6 | 5.8 |
| Max. DC Input Voltage (V) | 600 | | | | |
| Start-up Voltage [V] | 60 | 90 | | 120 | |
| MPPT Voltage range (V) | 50-500 | 80 - 500 | | 100 - 500 | |
| Max input current per MPPT (A) | 11A | | | 11A+11A | |
| Number of MPPT | 1 | | | 2 | |
| Max Input Strings Number | 1 | | | 2 | |
| **Output (AC)** | | | | | |
| Rated output power (kW) | 1 | 2 | 3 | 4 | 5 |
| Max. output power [kW] | 1.1 | 2.2 | 3.3 | 4.4 | 5 |
| Max. output Current [A] | 5.2 | 10.5 | 15.7 | 21 | 25 |
| Grid voltage range (V) | 160-285 | | | | |
| Grid Frequency range (Hz) | 50/60 Hz | | | | |
| Power Factor (at rated output power) | 0.8 ...1... 0.8 | | | | |
| Total harmonic distortion [THDi] | < 1.5% | | | | |
| Feed-in phase/connection phase | Single Phase | | | | |
| **Efficiency** | | | | | |
| Max. Efficiency | >97.2% | | 97.5% | > 98.1% | |
| MPPT Efficiency | >99.5% | | | | |
| **Protection** | | | | | |
| Inbuilt Protections | DC Reverse Polarity Protection, Short Circuit Protection, O/P Over Current Protection, O/P Over voltage protection, Insulation resistance monitoring, Residual current detection, surge protection, Islanding Protection, Temperature Protection | | | | |
| **Interface** | | | | | |
| DC Connection | MC4 Connectors | | | | |
| Display | LCD 2X 20 Z | | | | |
| Datalogger & Communication | RS485/GSM/Wifi* (Optional) | | | | |
| **General Data** | | | | | |
| Topology | Transformerless | | | | |
| Consumption @ night | < 1 W | | | | |
| Operating Temperature Range | -25°C to 60°C | | | | |
| Cooling Method | Natural Convention | | | | |
| Relative Humidity | 0 - 100 % | | | | |
| Max. Operational Altitude | 4000m | | | | |
| Noise [dBA] | <20dBA | | <30dba | <30 dba | |
| Designed Lifetime | > 20 years | | | | |
| Ingress Protection | IP65 | | | | |
| Dimensions (W*H*D) [mm] | 310W*373H*160D(mm) | | | 310W *543H *160D | |
| Net weight (Kg) | 7.4 | | 7.7 | 11.5 | |
| **Standards** | | | | | |
| Safety/EMC | IEC62109-1/-2, NB/T 32004, EN61000-6-1, EN61000-6-3 | | | | |

* Check availablity of GSM or wifi dongle before ordering.

Technical specifications are subject to change without prior notice.

## Three Phase

| MODEL | Nxi 360 | Nxi 310 | Nxi 315 | Nxi 320 | Nxi 325 | Nxi 350 |
|---|---|---|---|---|---|---|
| **Input DC** | | | | | | |
| Max. DC Input Power (kW) | 6.9 | 11.5 | 16.5 | 23 | 28 | 55 |
| Max. DC Input Voltage (V) | 1000 | | | | | 1100 |
| Start-up Voltage [V] | 250 | | | 350 | | 200 |
| MPPT Voltage range (V) | 200 - 800 | | | | | 200 - 1000 |
| Max input current per MPPT (A) | 15A + 15A | 18A+18A | | 18A+18A+18A +18A | | 28.5A+28.5A+28.5A+28.5A |
| Number of MPPT | 2 | | | 4 | | 4 |
| Max Input Strings Number | 2 | 4 | | 8 | | 12 |
| **Output (AC)** | | | | | | |
| Rated output power (kW) | 6 | 10 | 15 | 20 | 25 | 50 |
| Max. output power [kW] | 6.6 | 11 | 15 | 22 | 27.5 | 55 |
| Max. output Current [A] | 10 | 16.7 | 25 | 33.3 | 41.7 | 83.3 |
| Grid voltage range (V) | 313 - 470 | | | 304-460 | | |
| Grid Frequency range (Hz) | 50/60 Hz | | | | | |
| Power Factor (at rated output power) | 0.8 ...1... 0.8 | | | | | |
| Total harmonic distortion [THDi] | <3% | | | | | |
| Feed-in phase/connection phase | Three Phase | | | | | |
| **Efficiency** | | | | | | |
| Max. Efficiency | 98.20% | | 98.30% | 98.60% | | 98.80% |
| MPPT Efficiency | 99.50% | | | 99.90% | | |
| **Protection** | | | | | | |
| Inbuilt Protections | DC Reverse Polarity Protection, Short Circuit Protection, O/P Over Current Protection, O/P Over voltage protection, Insulation resistance monitoring, Residual current detection, surge protection, Islanding Protection, Temperature Protection | | | | | |
| **Interface** | | | | | | |
| DC Connection | MC4 Connectors | | | | | |
| Display | LCD 2X 20Z | | 7" Color Display | | LCD 2X 20Z | |
| Datalogger & Communication | RS485/GSM/Wifi* (Optional) | | | | | |
| **General Data** | | | | | | |
| Topology | Transformerless | | | | | |
| Consumption @ night | < 1 W | | | | | |
| Operating Temperature Range | -25°C to 60°C | | | | | |
| Cooling Method | Natural Convention | | | Intelligent redundant fan cooling | | |
| Relative Humidity | 0 to 100% | | | | | |
| Max. Operational Altitude | 4000m | | | | | |
| Noise [dBA] | <30 dBA | | | | | |
| Designed Lifetime | > 20 years | | | | | |
| Ingress Protection | IP65 | | | | | |
| Dimensions (W*H*D) [mm] | 430W*613H*269D | | 530W*700H*356.5D | | 630W *700H *357D | |
| Net weight (Kg) | 29 | | 30 | 57.2 | 58.2 | 63 |
| **Standards** | | | | | | |
| Safety/EMC | EN61000 - 6 - 1: 2007, EN61000 - 6 - 3: 2007, IEC 62109-1, 62109-2: AS3100 | | | | | |

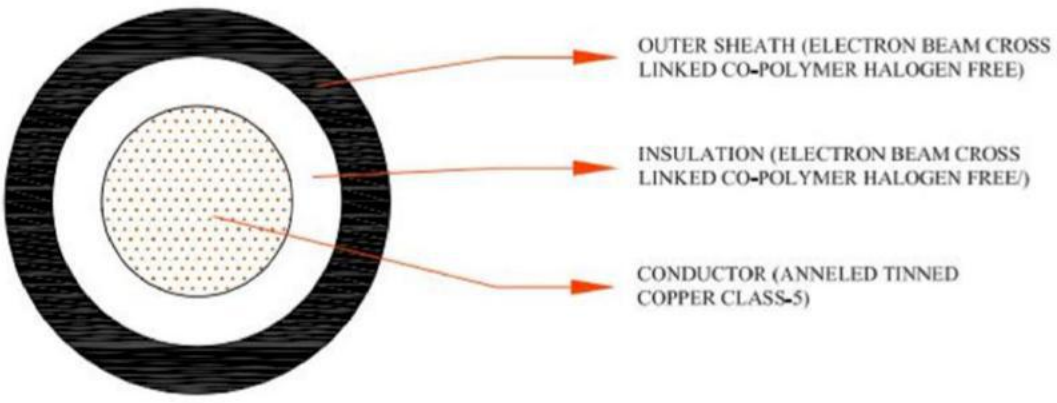
* Check availablity of GSM or wifi dongle before ordering.
Technical specifications are subject to change without prior notice.

Solar

CATALOG

# Solar DC Cables 1000V & Connectors for Solar Photovoltaic Systems

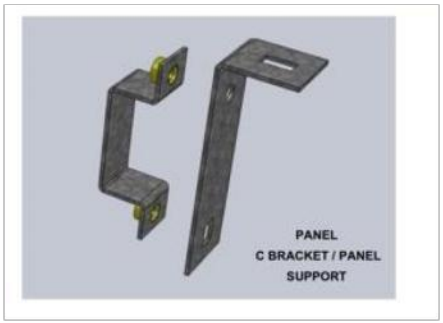

**KEI** single core Solar DC cables are weather, abrasion and UV-resistant. These halogen free, double insulated, cross-linked solar cables are suitable for permanent outdoor use. They are for use on photovoltaic systems both for cabling of solar modules among themselves and as connection to the DC / AC inverter.

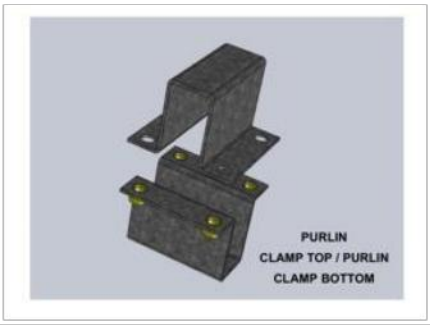


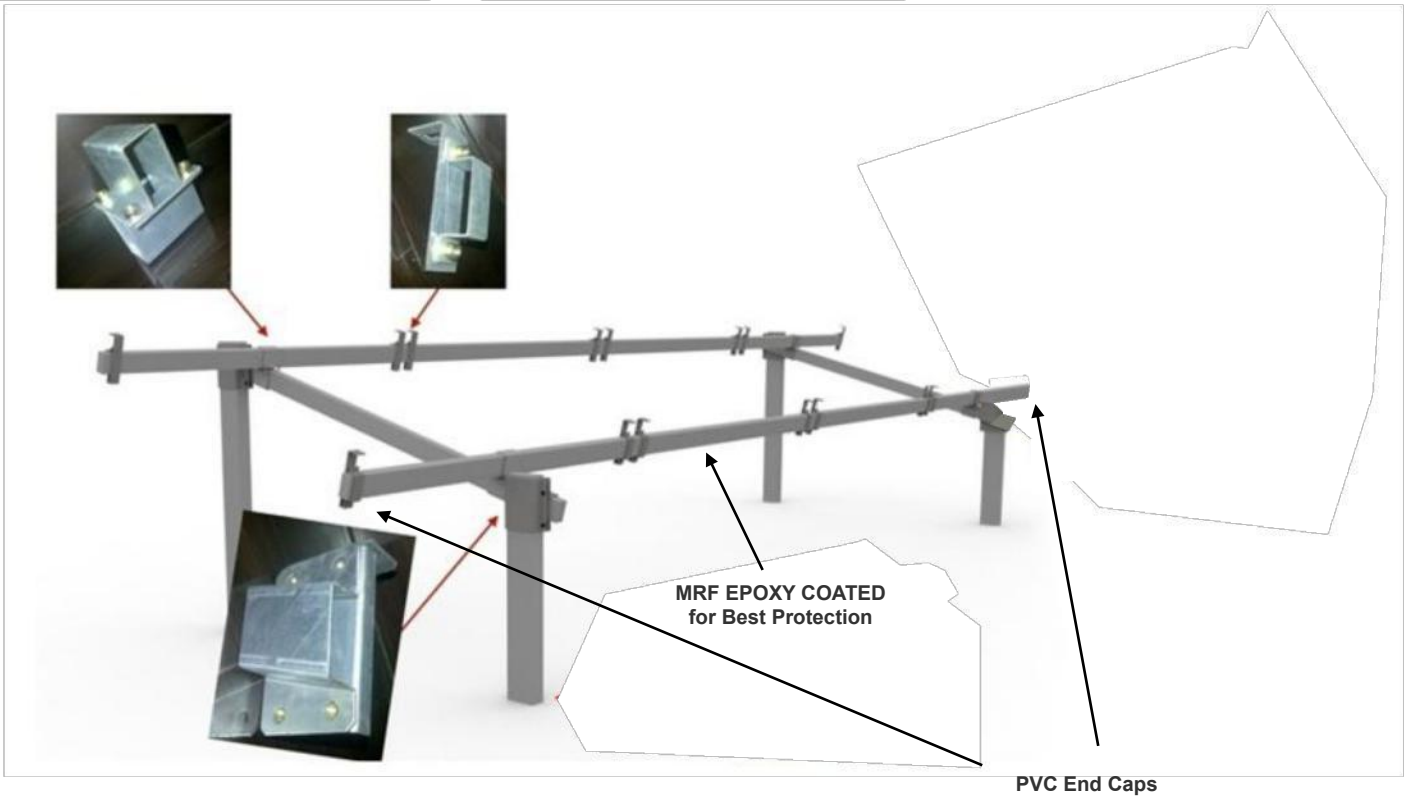
HIVE SOLAR
TURN ON THE SUN
ISO 9001:2015 Certified

CATALOG

# SOLAR FRAME & FASTNERS




*** Note : Actual Product design may vary from that shown in image**

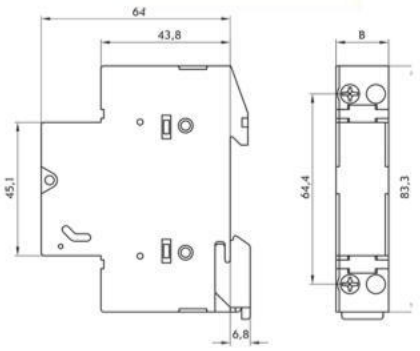
# ETI Fuse enclosure and Fuse

## PCF 10 DC - Fuse disconnector

| General characteristics | | |
|---|---|---|
| Rated voltage | 900V d.c. | 1000V d.c. |
| Rated current | max. 25A | max. 20A |
| Max. fuse link power dissipation | 3 W | |
| Cross section of connecting wire | 0,5 mm² - 10 mm² (AWG 8-20 solid) | |
| Pole build-in width | 18 mm | |
| Mouting on the rail | EN 60715 | |
| Utilization category | DC-20B | |
| Standards Fuse-links | IEC 60269-2:2006 UL 284-4 | |
| Standards - Fuse disconnector | IEC 60947-1 Ed. 4.0 EN 60947-1:1999+A1+A2<br>IEC 60947-3 Ed. 2.1 EN 60947-3:1999+A1:2001 | |

**PCF 10 DC**

| Number of poles | $U_e/U_i$ [V] | $I_{max.}$ [A] | Code No. | Indicator | Weight [g] | Packaging [pcs] |
|---|---|---|---|---|---|---|
| 1P | 900 | 25 | 002550301 | - | 58 | 12/336 |
| 2P | 900 | 25 | 002550303 | - | 120 | 6/168 |
| 1P | 900 | 25 | 002550311 | LED | 58 | 12/336 |
| 2P | 900 | 25 | 002550313 | LED | 120 | 6/168 |
| 1P | 1000 | 20 | 002550201 | - | 58 | 12/336 |
| 2P | 1000 | 20 | 002550203 | - | 120 | 6/168 |
| 1P | 1000 | 20 | 002550211 | LED | 58 | 12/336 |
| 2P | 1000 | 20 | 002550213 | LED | 120 | 6/168 |




## Section rail 10 mm²

**PCF 10 DC**

| Type | Description | Code No. | Cross section (mm²) | Length (m) | Weight [g] | Packaging [pcs] |
|---|---|---|---|---|---|---|
| IZS10/1F/54 | 10 mm², 1 pole, 54 mod | 002921101 | 10 | 1 | 150 | 40 |

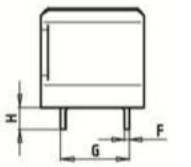
For use with PCF10 DC, VLC10 DC

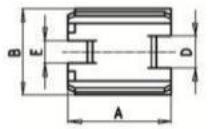

## Fuseholder for 10 x 38 mm fuse links

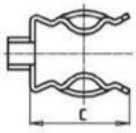
**Fuseholder for 10 x 38 mm fuse links**

| Code | Type | Weight(g) | Packaging [pcs] |
|---|---|---|---|
| 006710335 | HK10383 | 1 | 250 |

| Type | Dimensions [mm] | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H |
| HK10383 | 12,3 | 9,8 | 19,0 | 2,0 | 2,0 | 0,75 | 11,0 | 4,0 |




Fixing to be soldered

# PTG PV SPD

## Description

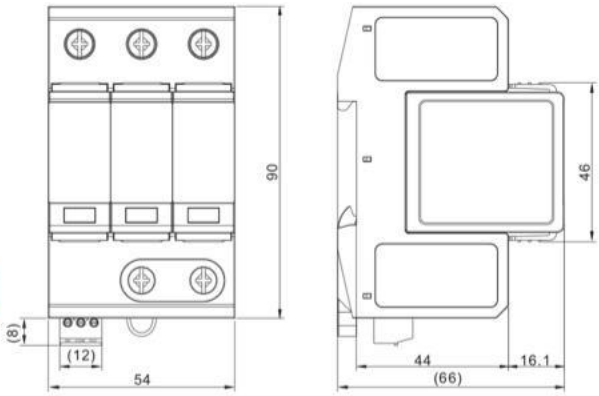
DIN rail, Type 2 /Class II SPD with anti-vibration pluggable module for use in PV d.c. system at boundaries from LPZ $0_B$-1 and higher.

## Features

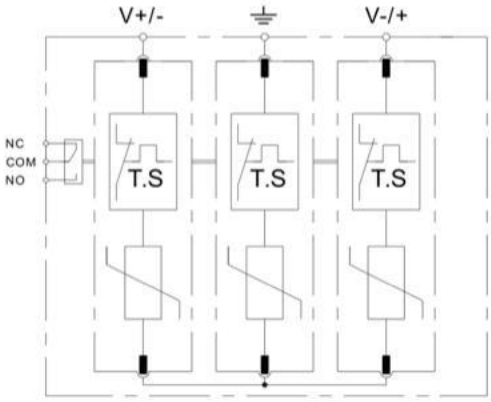
- Non-destructive screening technology for MOV
- Uniform current flow technology of MOV
- Y circuit
- Reliable thermo disconnect device
- High discharge capacity
- Consisting of a base part and pluggable modules
- Easy replacing and anti-vibration due to module releasing and locking system
- Multifunctional terminals for connecting conductors and busbars
- Visual and remote status indication
- DIN rail installation

| Type | PTV 1000-40M2-21R |
|---|---|
| Part No. | 94 21 27 |
| **Electrical** | |
| SPD according to EN 50539-11:2013 | Type 2 |
| SPD according to CGC/GF 026:2013 | Type 2 |
| Number of ports | 1 |
| Technology | MOV |
| Max. continuous operating d.c. voltage ($U_{CPV}$) | 1000 V |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA |
| Voltage protection level ($U_P$) | 3.8 kV |
| Voltage protection level for 5kA ($U_P$) | 3.3 kV |
| Response time ($t_A$) | ⩽ 25 ns |
| Max. overcurrent protection | ⩽ 125 AgL/gG |
| Short-circuit withstand capacity ($U_{SCWPV}$) | 1000 A |
| **Mechanical** | |
| Method of mounting | 35 mm DIN rail |
| Enclosure dimensions (HxWxD) | 90 mm ×54 mm × 66 mm |
| Cross-sectional area (max.) | 25 mm² stranded / flexible |
| Cross-sectional area (min.) | 1.5 mm² stranded / flexible |
| Stripping length terminals | 10 mm |
| Torque contacts | 3 N*m |
| **Indication** | |
| Operating status/fault indication | Green / red |
| Type of remote signaling contact | Changeover contact |
| Switching capacity | 125 Vac / 1 A, 125 Vdc / 0.2 A |
| Cross-sectional area for remote signaling terminals (max.) | 1.5 mm² |
| Stripping length for remote signaling terminals | 7 mm |
| Torque contacts for indication terminals | 0.2 N*m |
| **Environmental** | |
| Location category | Indoor only |
| Operation temperature range ($T_U$) | -40°C ... +80°C |
| Relative humidity | ⩽ 95% |
| Operation altitude | ⩽ 4 km |
| Degree of protection | IP 20 |
| Enclosure material | Themoplastic, UL 94 V-0 |

## Dimension drawing




## Circuit diagram



FIBOX
Enclosing innovations

# QUICK CAB PCQ 604021 T

Sample photo

| | | | |
|---|---|---|---|
| **Order symbol**: | CAB PCQ 604021 T | **EAN**: | 6418074011121 |
| **Product nbr**: | 8113078 | **El. number**: | |
| **Description**: | Cabinet, PC | Finland: | 3421926 |
| **Remarks**: | Smoked transparent cover | Electric No. Italy: | 7682060 |
| | | Electric No. Sweden: | 2540109 |

Including: Base with screws for mounting plate/DIN-rail, internal corner plugs, cover with PUR gasket and CS 12137 cover screws.

| **Dimensions**: | **Length** | **Width** | **Height** |
|---|---|---|---|
| **mm**: | 600 | 400 | 210 |
| **inch**: | 23.6 | 15.7 | 8.3 |

| **Materials**: | |
|---|---|
| **Material**: | Polycarbonate |
| **Base colour**: | RAL 7035 -light grey |
| **Cover screws material**: | Polyamide |
| **Cover colour**: | Smoked grey |
| **Cover screws colour**: | RAL 5023 |
| **Gasket material**: | Polyurethane |

| **Temperatures**: | |
|---|---|
| **Temperature °C (short term)**: | -40 … 120 °C |
| **Temperature °C (continuous)**: | -40 … 80 °C |
| **Temperature °F (short term)**: | -40 … 250 °F |
| **Temperature °F (continuous)**: | -40 … 175 °F |

| **Accessories**: | |
|---|---|
| EKIV 64H | Mounting plate |

| **Accessories**: | |
|---|---|
| EKIV 37 | DIN-35 Mounting rail |
| FP A 64 | Swing-out door/Front plate |
| MB 12225 AL | Swing door set |
| FP 18x3-64 | Front plate |
| DRF 63/64 | DIN rail frame set |
| PAT 12040 | Hinge set |

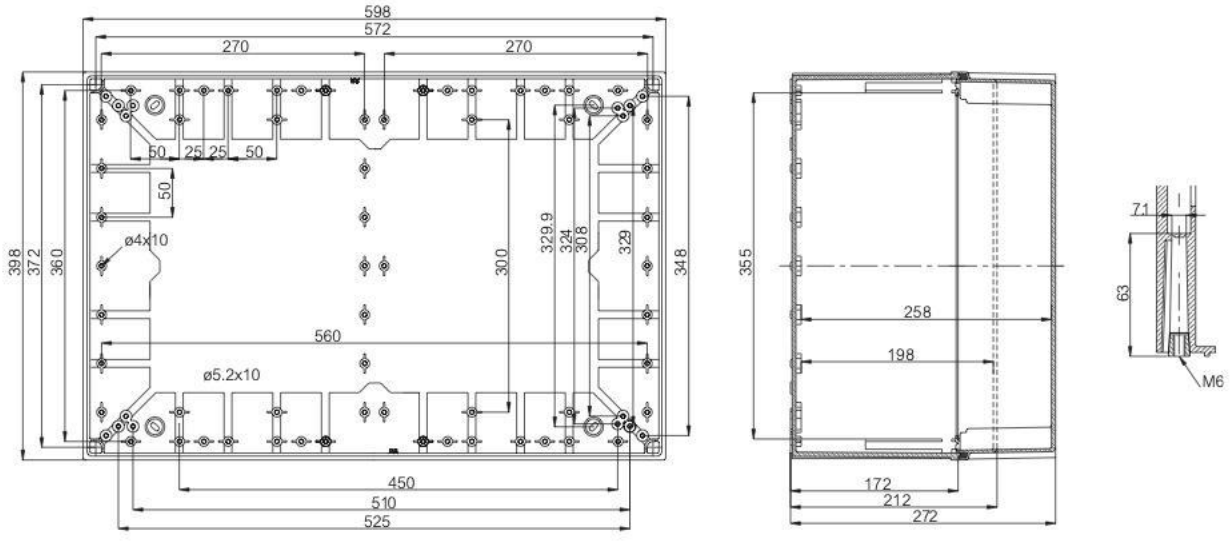
**Rating**:

Ingress Protection (EN 60529): IP66/IP67
Impact Resistance (EN 62262): IK08
Electrical insulation: Totally insulated
Halogen free (DIN/VDE 0472, Part 815): 1
UV resistance: UL 508
Flammability Rating: UL 746C 5"
Glow Wire Test (IEC 695-2-1) °C: 960
NEMA Class: NEMA 1, 4, 4X, 12, 13

**Certificates**:

SGS Fimko
Gost R

QUICK 600x400x210-270



# CHINT PV MCB/ISOLATOR

## NB1-63DC
## DC Circuit Breaker

### 1. General

1.1 Certificates: CCC,CE,CB,TUV;

1.2 Standard: IEC/EN 60947-2 ,RoHS;

1.3 Rated voltage up to 1000V, Rated current up to 63A;

1.4 Protection of circuits against overload currents;

1.5 Protection of circuits against short-circuit currents;

1.6 NB1-63 DC circuit-breakers are used in communication systems and PV DC systems.

### 2. Features

2.1 Excellent breaking capacity

2.2 Double connection function of lead wire and bus bar

2.3 Stored energy operation, fast closing, long service life

2.4 Convenient installation, disassembly

2.5 Contact on-off indication, higher security

2.6 Green environmental protection and energy saving

### 3. Type designation

N B 1 - 63 DC

- Direct Current
- Frame size rated current
- Designed sequence number
- MCB
- Company code

### 4. Operating conditions

4.1 Ambient temperature:-35℃~+70℃(Refer to 5.3)

4.2 The atmosphere condition:≤95%

4.3 Pollution degree:II

4.4 Altitude:≤2000m(if exceed 2000m,Refer to 5.4)

### 5. Technical data

5.1 Classification

5.1.1 Rate Current In:
1A,2A,3A,4A,6A,10A,13A,16A,20A,25A,32A,40A,50A,63A

5.1.2 Number of poles: 1P,2P,4P

5.1.3 Tripping curves: C Type,(7~10)In

5.2 Parameters

5.2.1 Rated breaking capacity Icu

| Rated current In (A) | Number of poles | Rated voltage Ue (V) | Rated breaking capacity Icu (A) |
|---|---|---|---|
| 1~63 | 1 | 250 | 6000 |
| | 2 | 500 | 6000 |
| | 4 | 1000 | 6000 |

5.2.2 Electrical and mechancial life

a. Electrical life: > 1500

b. Mechancial life: > 20,000

5.2.3 Rated impulse withstand voltage Uimp:4KV

5.2.4 (28-32)℃ ambient temperature over-current protection features.

| Test | Test current | Initial state | Time limit for tripping or not tripping | Expected result | Remarks |
|---|---|---|---|---|---|
| a | 1.05In | Cold state | t≤1h | Not tripping | |
| b | 1.30In | Right after test number a | t < 1h | Tripping | The current is rising within 5s |
| c | 7In | Cold state | t≤0.2s | Not tripping | |
| d | 10In | Cold state | t < 0.1s | Tripping | |

-

# - ADDITIONAL WORK -

## SOURA-Subsidy-Domestic/2020-21

As per Clause 4.11.4 detailed by KSEB to Contractor . The Contractor shall be eligible for additional payment for the mutually agreed additional works between Contractor and consumer, if any additional work is required to be carried out at any location due to site peculiarities/difficulties which are not foreseen and which are necessary for completing the installation or as per requirement of consumer in case of slanted/structured roof etc. The contractor is eligible to claim such additional work invoice from the consumer, subjected to approval of the estimate by KSEB Ltd.

Schedule of rates for additional works: (due to the requirement of special design): The Rates of additional electrical work within the premises will be decided at par rates of Delhi Schedule Of Rates (DSR), for Electrical works, Central Public Works Department , amended from time to time; The rates of additional civil work shall be as per at par the rates of Delhi Schedule Of Rates (DSR) for building works, Central Public Works Department, amended from time to time;

## Assessment of additional work

During the initial site assessment / feasibility study .. Any areas that may incur additional charges shall be discussed with the consumer and agreed Upon . A work report detailing the type of work and applicable additional costs including taxes shall be signed off by the consumer . A copy of the same to be handed over to relevant Soura Officer incharge for approval and later feasibility approval..

Approved charges should be remitted before commencement of Installation.

## Scope of work that may incur additional Charges..

### STRUCTURE

:

- If height of structure need to be raised .
- If structure needs to be mounted on sheeted roof .
- If structure needs to be mounted on any Slanted roof .
- If existing standard structure needs to be modified in any manner .
- If multiple structures need to be placed at various points in the roof .
- If safe and easy access to roof is not available which results in extra labour .

### CABLING

- If DC cable distance between solar panels and inverter point exceeds 15 mtrs .
- If AC cable distance between inverter and Meter Point exceeds 3 mtrs .
- If safe access for electrical cabling is not available eg non availability of parapets , unsafe ledges etc or areas were extra labour may be required .

## EARTHING / LIGHTNING CONDUCTORS

- Additional civil work for earthing eg: routing and excavation over cemented , tiled etc.
- If additional earthing and accessories may be required .

## CIVIL WORK

- Any concrete reinforcement to the base of the structure.
- Any unseen hinderance or obstacle in any of the aspect of Installation that may result in extra manpower.

## UNLOADING OF MATERIALS

- Local Union unloading or head-loading charge has to be borne by the consumer .
- If movement of equipment by the Technicians to the roof etc is difficult and that may require extra man-power.

## LOSS OF MAN HOURS

- In the event the consumer is unable to make the site available for the installation team on pre - agreed schedule and man hours are lost .
- Any reasonable circumstances that may result in prolonged loss of manpower may incur additional charges.