YHI ENERGY

# Solar Power

- 4TH EDITION -

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# BRANDS

Trinasolar is a leading global manufacturer of next generation photovoltaic products, committed to building strategic, mutually beneficial collaborations with their partners.

As market leader for solar inverters, SMA is setting benchmarks again and again: leading-edge efficiencies of 98% and new technology ensures maximum yields and the highest user convenience.

SolaX's product range incorporates the very latest in solar innovation, driving them ever further towards their vision of being a world leader in the development, production and distribution of solar inverters and batteries for energy storage.

As the leading manufacturer of deep-cycle batteries, Trojan powers golf, renewable energy, floor machine, aerial work platform, transportation, marine and recreational vehicle applications.

US based technology company designing intelligent product solutions in the solar market, Enphase Energy has over 10 million microinverters shipped world wide and continues to push the boundaries of technology.

With self-developed key technologies and dedication to ESS applications, Pylontech has been pioneering the global ESS market since 2013. They strongly believe a bright future for the world will be achieved with greener and more efficient power systems.

Morningstar Corporation is a world-leading supplier of solar charge controllers & inverters whose products have been recognised in international solar markets as the most advanced and highest quality products available.

C&D Technologies produces battery power solutions and services for the solar, telecommunications, UPS, switchgear and emerging markets at the highest standard.

Neuton Power provide an extensive range of high quality power products, including automotive and deep cycle batteries, PV modules, mounting components, and solar charge controllers.

Vision sealed lead acid batteries have gained an enviable reputation for quality and reliability in both New Zealand and overseas markets. Throughout their whole range, Vision can provide the battery to suit your application.

CONTENTS


**YHI (New Zealand) Ltd is a leading New Zealand energy products distribution company. At YHI, our aim is to continuously provide our customers with quality products and distinctive customer service so as to build strong customer relationships.**

YHI operates warehouses throughout New Zealand to ensure the specific needs of your local market are met with personalised service and experience.


YHI (New Zealand) Ltd is a proud member of:

Sustainable Energy Association New Zealand

DRIVE ELECTRIC

ECO WARRANTY www.intlcert.com

YHI

# THE WORLD
# IS OUR MARKET

With operations in 16 countries, YHI International Ltd offers a wide range of industrial power products from solar panels, inverters and EV chargers to UPS (uninterruptible power supply) and automotive and rechargeable batteries for commercial and industrial use from many well-known brands. They include SMA, Trojan, Trina Solar, Eaton, Delta, Vision, SolaX and the Group's own proprietary brand, Neuton Power.

**90** STAFF NATIONWIDE

**9** WAREHOUSES NATIONWIDE

**14** ENERGY BRANDS

BATTERIES

SOLAR EQUIPMENT

EV CHARGING

UPS PRODUCTS & SERVICES

ENERGY MANAGEMENT

MARINE & RV

GOLF

DC POWER SYSTEMS AND SERVICES

# 1

YHI stock a range of high-quality, high-efficiency polycrystalline and monocrystalline PV modules from world leading brands to suit all your solar requirements.

| PARTCODE | DESCRIPTION | DIMENSIONS H/W/D |
|---|---|---|
| **Neuton Power** | | |
| NPV15 | Neuton Power 15W Polycrystalline Module | 385 x 350 x 25mm |
| NPV30 | Neuton Power 30W Polycrystalline Module | 656 x 350 x 25mm |
| NPV55 | Neuton Power 55W Polycrystalline Module | 670 x 530 x 30mm |
| NPV100 | Neuton Power 100W Polycrystalline Module | 1020 x 670 x 35mm |
| NPV160 | Neuton Power 160W Polycrystalline Module | 1476 x 670 x 35mm |
| NPV50WFLEX | Neuton Power 50W Flexible Module | 660 x 600 x 3mm |
| NPV160WFLEX | Neuton Power 160W Flexible Module | 1540 x 660 x 3mm |
| **Trina Solar** | | |
| N/A | Trina Solar Honey Polycrystalline Modules | 1698 x 1004 x 35mm |
| N/A | Trina Solar Honey Black M Monocrystalline Modules | 1698 x 1004 x 35mm |

# Neuton Power
## Polycrystalline Module

YHI Part Codes **NPV15, NPV30, NPV55**

**FEATURES**

- Lightweight
- Transportable

| MODULE | NPV15 | NPV30 | NPV55 |
|---|---|---|---|
| **Electrical Characteristics STC** | | | |
| Maximum Power at STC (Pmax) | 15W | 30W | 55W |
| Maximum Power Voltage (Vmp) | 18.0V | 18.0V | 18.2V |
| Maximum Power Current (Imp) | 0.83A | 1.67A | 2.78A |
| Open-circuit voltage (Voc) | 21.8V | 22.0V | 22.2V |
| Short-circuit Current (Isc) | 0.88A | 1.75A | 2.92A |
| Maximum system voltage | 600V | 600V | 600V |
| Power tolerance -1%~+3% | 0 to +3% | 0 to +3% | 0 to +3% |
| Nominal Operating cell temperature (NOCT) 45 | 45±2 °C | 45±2°C | 45±2°C |
| **Mechanical Data** | | | |
| Cell Type | Polycrystalline | Polycrystalline | Polycrystalline |
| No of Cells | 36pcs | 36pcs | 36pcs |
| Dimensions (H x W x D) | 385 x 350 x 25mm | 656 x 350 x 25mm | 670 x 530 x 30mm |
| Weight (Kg) | 1.8Kg | 2.2Kg | 4Kg |

# Neuton Power
## Polycrystalline Module

YHI Part Codes **NPV100, NPV160**

**FEATURES**

- Lightweight
- Transportable

| MODULE | NPV100 | NPV160 |
|---|---|---|
| **Electrical Characteristics STC** | | |
| Maximum Power at STC (Pmax) | 100W | 160W |
| Maximum Power Voltage (Vmp) | 18.5V | 18.4V |
| Maximum Power Current (Imp) | 5.56A | 8.89A |
| Open-circuit voltage (Voc) | 22.4V | 22.6V |
| Short-circuit Current (Isc) | 5.85A | 9.36A |
| Maximum system voltage | 600V | 1000V |
| Power tolerance -1%~+3% | 0 to +3% | 0 to +3% |
| Nominal Operating cell temperature (NOCT) 45 | 45±2°C | 45±2°C |
| **Mechanical Data** | | |
| Cell Type | Polycrystalline | Polycrystalline |
| No of Cells | 36pcs | 36pcs |
| Dimensions (H x W x D) | 1020 x 670 x 35mm | 1476 x 670 x 35mm |
| Weight (Kg) | 8Kg | 12Kg |

# Neuton Power Flexipanel
Flexible Module

YHI Part Code **NPV50WFLEX**

**FEATURES**

- Lightweight
- Transportable
- Ideal for mounting to irregular surfaces

Flexible solar panels are ideal for mounting to irregular surfaces such as an RV roof or boat. The lack of any large, rigid frame and extremely thin design allows easier transportation in a caravan or car. The solar cells are implanted in very distinctive and highly resilient polymers that offer greater durability. The flexible non-glass area of the solar panel is even tough enough to walk on.

**SPECIFICATIONS:**

- MC4 terminated cables (negative is plug, positive is socket)
- Maximum recommended bending degree: 20°

| Electrical Characteristics STC | NPV50WFLEX |
|---|---|
| Max. Power | 50W |
| Maximum Power Current (IMP) | 2.92A |
| Maximum Power Voltage (VMP) | 18.5V |
| Short Circut Current (Isc) | 3.00A |
| Open Circuit Voltage (Voc) | 22.6V |

| Mechanical Data | NPV50WFLEX |
|---|---|
| Dimensions (H x W x D) | 660 x 600 x 3mm |
| Weight | 1.3Kgs |

| Cell | NPV50WFLEX |
|---|---|
| Cell Technology | Monocrystalline |
| Number of cells per module | 36pcs |
| Cell type | Sunpower mono |

# Neuton Power Flexipanel
## Flexible Module

YHI Part Code **NPV160WFLEX**

**FEATURES**

- Lightweight
- Transportable
- Ideal for mounting to irregular surfaces

Flexible solar panels are ideal for mounting to irregular surfaces such as an RV roof or boat. The lack of any large, rigid frame and extremely thin design allows easier transportation in a caravan or car. The solar cells are implanted in very distinctive and highly resilient polymers that offer greater durability. The flexible non-glass area of the solar panel is even tough enough to walk on.

**SPECIFICATIONS:**

- MC4 terminated cables (negative is plug, positive is socket)
- Maximum recommended bending degree: 20°

| Electrical Characteristics STC | NPV160WFLEX |
|---|---|
| Max. Power | 160W |
| Maximum Power Current (IMP) | 8.38A |
| Maximum Power Voltage (VMP) | 19.1V |
| Short Circut Current (Isc) | 8.88A |
| Open Circuit Voltage (Voc) | 23.0V |

| Mechanical Data | NPV160WFLEX |
|---|---|
| Dimensions (H x W x D) | 1540 x 660 x 3mm |
| Weight | 2.8Kgs |

| Cell | NPV160WFLEX |
|---|---|
| Cell Technology | Monocrystalline |
| Number of cells per module | 36pcs |
| Cell type | Sunpower mono |

# Trina Solar Honey
Polycrystalline Module

285W, 290W, 295W, 300W

Honey

The HONEY series is perfect for small rooftop systems. HONEY panels can generate high amounts of energy even when space is limited.

As one of the industry's most trusted panels, the HONEY module is a popular option for residential and commercial customers because of its reliability, pleasing aesthetics and compatibility with all major balance of system components and module electronics.

**60 CELL**
**POLYCRYSTALLINE MODULE**

**16.7 - 17.6%**
**MAXIMUM EFFICIENCY**

**0~+5W**
**POSITIVE POWER TOLERANCE**

### HALF-CELL DESIGN BRINGS HIGHER EFFICIENCY

- Low thermal coefficients for greater energy production at high operating temperature
- Half-cell layout = low cell connection power loss

### IDEAL FOR LARGE SCALE INSTALLATIONS

- Reduce BOS cost with higher power bin

### HIGHLY RELIABLE DUE TO STRINGENT QUALITY CONTROL

- Over 30 in-house tests (UV, TC, HF & many more)
- In-house testing goes well beyond certification requirements - 100% EL double inspection
- PID resistent

### CERTIFIED TO WITHSTAND CHALLENGING ENVIRONMENTAL CONDITIONS

- 2400 Pa wind load
- 5400 Pa snow load
- 35mm hail stones at 97 km/h

### COMPREHENSIVE PRODUCTS AND SYSTEM CERTIFICATES

ISO 9001, ISO14001, ISO14064, OHSAS18001 Certified. Conforms with IEC61215, IEC61730, UL1703, IEC61701, IEC62716

APPROVED PRODUCT

| MODULE | 285W | 290W | 295W | 300W |
|---|---|---|---|---|
| **Electrical Characteristics STC** | | | | |
| Max. Power (Pmax) | 285W | 290W | 295W | 300W |
| Power Output Tolerance | 0 ~ +5W | | | |
| Module Efficiency | 16.7% | 17.0% | 17.3% | 17.6% |
| Maximum Power Current (Imp) | 9.05A | 9.12A | 9.19A | 9.29A |
| Maximum Power Voltage (Vmp) | 31.5V | 31.8V | 32.1V | 32.3V |
| Short Circuit Current (Isc) | 9.53A | 9.60A | 9.67A | 9.77A |
| Open Circuit Voltage (Voc) | 38.8V | 39.2A | 39.5A | 39.8A |

STC: Irradiance 1000 W/m$^2$ , Cell Temperature 25ºC, Air Mass AM1.5.
*Measuring tolerance: ±3%.

| | | | | |
|---|---|---|---|---|
| **Electrical Characteristics NMOT** | | | | |
| Max. Power (Pmax) | 216W | 219W | 223W | 227W |
| Maximum Power Current (Imp) | 7.24A | 7.29A | 7.35A | 7.42A |
| Maximum Power Voltage (Vmp) | 29.8V | 30.1V | 30.4V | 30.6V |
| Short Circuit Current (Isc) | 7.69A | 7.74A | 7.80A | 7.88A |
| Open Circuit Voltage (Voc) | 36.5V | 36.9V | 37.2V | 37.4V |

NOCT: Irradiance at 800 W/m$^2$, Ambient Temperature 20ºC, Wind Speed 1 m/s

| Dimensions | ALL MODULES |
|---|---|
| Height (H) | 1698mm |
| Width (W) | 1004mm |
| Depth (D) | 35mm |

| Max. Ratings | ALL MODULES |
|---|---|
| Operating Temperature | -40~+85ºC |
| Max. System Voltage | 1000V DC (IEC) 1000V DC (UL) |
| Max. Series Fuse Rating | 20A |

| Characteristics | ALL MODULES |
|---|---|
| Temperature Coefficient of VOC | - 0.31%/ºC |
| Temperature Coefficient of Isc | 0.05%/ºC |
| Temperature Coefficient of Pmax | - 0.38%/ºC |
| Nominal Operating Cell Temp. (NMOT) | 41ºC (±3ºC) |

| Mechanical Characteristics | ALL MODULES |
|---|---|
| Cell Type | 120 cells (6 x 20) pcs in series |
| Glass | 3.2mm (0.13 inches), High Transmission, AR Coated Tempered Glass |
| Frame | 35mm Amodized Aluminium Alloy |
| Junction Box | IP 68 rated |
| Output Cable | Photovoltaic Technology Cable 4.0mm<br>Portrait: N 140mm/P 285mm, Landscape: N 1200mm /P 1200mm |
| Weight | 18.7kg |

# Trina Solar Honey Black M
Monocrystalline Module

320W, 325W, 330W, 335W, 340W

With uniform, black monocrystalline multi busbar cells, the Honey Black M combines great aesthetics and efficiency with proven reliability and quality.

HoneyBlack M integrates various technologies like half-cut and multi busbar (MBB) cells, which can shorten over 50% of the current conduction distance and thus lower the internal ribbon resistance loss. Finer and narrower busbars mean that more sunlight can be reflected back to the round ribbon, thus increasing energy efficiency.

**60 CELL**
**MONOCRYSTALLINE MODULE**

**18.8 - 19.9%**
**MAXIMUM EFFICIENCY**

**0~+5W**
**POSITIVE POWER TOLERANCE**

### OUTSTANDING VISUAL APPEARANCE

- Designed with aesthetics in mind
- Thinner wires that appear all black at a distance

### HALF-CELL DESIGN BRINGS HIGHER EFFICIENCY

- Low cell connection power loss due to half-cell layout (120 monocrystalline)
- Low thermal coecients for greater energy production at high

### HIGHLY RELIABLE DUE TO STRINGENT QUALITY CONTROL

- Over 30 in-house tests (UV, TC, HF & many more)
- In-house testing goes well beyond certification requirements
- 100% EL double inspection

### CERTIFIED TO WITHSTAND CHALLENGING ENVIRONMENTAL CONDITIONS

- 2400 Pa wind load
- 5400 Pa snow load
- 2400/5400 is the measured load

### COMPREHENSIVE PRODUCTS AND SYSTEM CERTIFICATES

ISO 9001, ISO 14001, ISO14064, OHSAS18001 Certified. Conforms with IEC61215, IEC61730, UL1703, IEC61701, IEC62716

APPROVED PRODUCT

| MODULE | 320W | 325W | 330W | 335W | 340W |
|---|---|---|---|---|---|
| **Electrical Characteristics STC** | | | | | |
| Max. Power (Pmax) | 320W | 325W | 330W | 335W | 340W |
| Power Tolerance | 0W~+5W | | | | |
| Module Efficiency | 18.8% | 19.1% | 19.4% | 19.7% | 19.9% |
| Maximum Power Current (Imp) | 9.58A | 9.67A | 9.76A | 9.85A | 9.94A |
| Maximum Power Voltage (Vmp) | 33.4V | 33.6V | 33.8V | 34.0V | 34.2V |
| Short Circuit Current (Isc) | 10.20A | 10.30A | 10.39A | 10.48A | 10.55A |
| Open Circuit Voltage (Voc) | 40.3V | 40.4V | 40.6V | 40.7V | 41.1V |

STC: Irradiance 1000 W/m$^2$, Cell Temperature 25°C, Air Mass AM1.5.
*Measuring tolerance: ±3%.

| **Electrical Characteristics NOCT** | | | | | |
|---|---|---|---|---|---|
| Max. Power (Pmax) | 241W | 245W | 249W | 253W | 256W |
| Maximum Power Current (Imp) | 7.75A | 7.84A | 7.90A | 7.96A | 8.02A |
| Maximum Power Voltage (Vmp) | 31.1V | 31.3V | 31.5V | 31.7V | 32.0V |
| Short Circuit Current (Isc) | 8.23A | 8.31A | 8.38A | 8.45A | 8.50A |
| Open Circuit Voltage (Voc) | 38.0V | 38.1V | 38.2V | 38.3V | 38.7V |

NOCT: Irradiance at 800 W/m$^2$, Ambient Temperature 20°C, Wind Speed 1 m/s.

| **Dimensions** | ALL MODULES |
|---|---|
| Height | 1698mm |
| Width | 1004mm |
| Depth | 35mm |

| **Max. Ratings** | ALL MODULES |
|---|---|
| Operating Temperature | -40~+85°C |
| Max. System Voltage | 1000V DC (IEC) 1000V DC (UL) |
| Max. Series Fuse Rating | 20A |

| **Characteristics** | ALL MODULES |
|---|---|
| Temperature Coefficient of VOC | - 0.29%/°C |
| Temperature Coefficient of Isc | 0.05%/°C |
| Temperature Coefficient of Pmax | - 0.37%/°C |
| Nominal Operating Cell Temp. (NOCT) | 41°C (±2°C) |

| **Mechanical Characteristics** | ALL MODULES |
|---|---|
| Cell Type | 120 cells (6 x 20) pcs in series |
| Glass | 3.2mm (0.13 inches), High Transmission, AR Coated Tempered Glass |
| Frame | Silver Anodized Aluminium Alloy (DD05AII); Black (DD05A.08II, DD05A.05II) |
| Junction Box | IP 68 rated |
| Output Cable | Photovoltaic Technology Cable 4mm x 1000mm |
| Weight | 18.7kg |
| Backsheet | White/Black |

# 2

YHI are proud to provide microinverters from Enphase Energy. Enphase microinverters offer the most advanced inverter technology on the market, which means higher production, greater reliability, and unmatched intelligence.

| PARTCODE | DESCRIPTION | PEAK OUTPUT POWER | BATTERY CAPABLE |
|---|---|---|---|
| **Enphase** | | | |
| IQ7-60-2-INT | Enphase IQ7 Microinverter | 250VA | YES |
| IQ7PLUS-72-2-INT | Enphase IQ7+ Microinverter | 295VA | YES |
| ENV-S-WM-230 M | Enphase S Metered Envoy +DRM | N/A | YES |
| B270-1200-LN-ETC | Enphase AC Battery 270W/1.2KWH 230 VAC | 270VA | N/A |

# Enphase IQ7 & IQ7+
Micro Inverter

YHI Part Codes **IQ7-60-2-INT, IQ7PLUS-72-2-INT**

**FEATURES**

- Optimised for 60-cell modules (IQ7) and 72-cell modules (IQ7+)
- Lightweight and simple
- Faster installation with improved, lighter two-wire cabling
- More than 1 million hours of testing
- Industry-leading warranty, up to 25 years

The high-powered smart grid-ready **Enphase IQ7 Micro™** and **Enphase IQ7+ Micro™** dramatically simplify the installation process while achieving the highest system efficiency.

| MICROINVERTER | IQ7 | IQ7+ |
|---|---|---|
| **Input Data (DC)** | | |
| Commonly used module pairings | 235W-350W+ | 235W-440W+ |
| Maximum input DC voltage | 48V | 60V |
| Peak power tracking voltage | 27V - 37V | 27V - 45V |
| Operating range | 16V - 48V | 16V - 60V |
| Min/Max start voltage | 22V / 48V | 22V / 48V |
| Max DC short circuit current | 15A | 15A |
| **Output Data (AC)** | | |
| Peak output power | 250VA | 295VA |
| Maximum continuous output power | 240VA | 290VA |
| Nominal voltage/range | 240V / 211-264V or 208V / 183-229V | |
| Nominal output current | 0.95A | 0.95A |
| Nominal frequency/range | 60Hz/47-68Hz | 60Hz/47 - 68Hz |
| Power factor at rated power | 1.0 | 1.0 |
| Maximum units per 20 A branch circuit | 16 (240VAC) / 13 (208VAC) | 13 (240VAC) / 11 (208VAC) |
| AC backfeed current to module | 0mA | 0mA |
| Power factor (adjustable) | 0.7 leading ... 0.7 lagging | 0.7 leading ... 0.7 lagging |

| Mechanical Data | |
|---|---|
| Ambient temperature range | -40°C to +65°C |
| Enclosure environmental rating | IP66 |
| Connector type, MC4 | IQ7-60-B-US / IQ7PLUS-72-B-US |
| Connector type, Amphenol H4 | IQ7-60-2-US / IQ7PLUS-72-2-US |
| Dimensions (WxHxD - without bracket) | 212 mm x 175 mm x 30.2 mm |
| Weight | 1.08kg |
| Cooling | Natural convection - No fans |
| Humidity range | 4% - 100% (condensing) |

| Efficiency | IQ7 | IQ7+ |
|---|---|---|
| Peak CEC efficiency | 97.6% @ 240V<br>97.6% @ 208V | 97.5% @ 240V<br>97.3% @ 208V |
| CEC weighted efficiency | 97.0% @ 240V<br>97.0% @ 208V | |

# Enphase Envoy
S Metered +DRM

YHI Part Code **ENV-S-WM-230 M**


The Enphase Envoy-S Metered™ communications gateway delivers solar production and energy consumption data to Enphase Enlighten™ monitoring and analysis software for comprehensive, remote maintenance and management of the Enphase System.

With production metering and consumption monitoring options, Envoy-S is the platform for total energy management and integrates with the Enphase AC Battery™.

**FEATURES**

- Enables web-based monitoring and control
- Bidirectional communications for remote upgrades
- Power export limiting and phase imbalance management*
- AS/NZS 4777.2:2105 DRM (Demand Response Mode) ready*
- Easy system configuration using Enphase Installer Toolkit™ mobile app
- Flexible networking with Wi-Fi, Ethernet, or mobile
- Designed for installation indoors or in an outdoor enclosure
- 5 year warranty

| ENVOY | ENV-S-WM-230 M |
|---|---|
| **Power Requirements** | |
| Hardwired | 230VAC or 400Y/230VAC, 50Hz. Max 20A over current protection required |
| **Capacity** | |
| No. of microinverters polled | Up to 600 |
| **Mechanical Data** | |
| Dimensions (WxHxD) | 213 x 126 x 45mm |
| Weight | 0.5kg |
| Ambient temperature range | -40° to 65°C<br>-40° to 46°C if installed in an enclosure |
| Environmental rating | IP30. For installation indoors or in an IP54-rated (or better) enclosure. |
| Max. altitude | 2000 metres |
| USB ports | Two USB 2.0 ports, auto-sensing, auto-negotiation |
| **Internet Connection Options** | |
| Integrated Wi-Fi | 802.11b/g/n |
| Ethernet | 802.3, Cat5E (or Cat 6) UTP Ethernet cable (not included) |
| Cellular | Optional, CELLMODEM-02 (not included) |

| | ENV-S-WM-230 M |
|---|---|
| **Compliance** | |
| Compliance | IEC/EN 61010-1:2010, EN50065-1, C-Tick, EN61000-4-5, EN61000-6-1, EN61000-6-2 |
| **Advanced Functions** | |
| Power export limiting | Configurable for zero export when installed with S-Series microinverters |
| Phase imbalance management | Configurable for phase imbalance management when installed with S-Series microinverters |
| DRM | Terminal block connections for Demand Response Enabling Device (DRED) |

***When used with the Enphase AC Battery™**

# Enphase Enlighten Manager
## For Solar Professionals

Get it in the App Store or Google Play Store.

**Comes with Enphase Envoy**

Designed for the Solar Professional, Enlighten Manager streamlines the operations and maintenance processes and enables efficient management of multiple Enphase systems.

- View detailed performance data from a fleet of PV installations down to the individual module
- Remotely diagnose and resolve issues impacting system performance and easily determine whether an unplanned truck roll is necessary.
- Streamline operations and easily monitor activations in process.


- Access performance reports 24/7 with secure, backed-up online data storage.
- Compare actual system performance data against modelled performance data.
- Access performance data for PV module warranty claims.

# Enphase MyEnlighten
## For System Owners

Get it in the App Store or Google Play Store.

**Comes with Enphase Envoy**

MyEnlighten connects system owners to their solar experience through an engaging interface that displays energy production, system health and environmental benefits.

- Social media buttons make it easy to brag to friends and family about all your energy savings.
- Easily compare current performance against a previous day, week or month.
- System status indicator tells you when the system is not performing as expected and what can be done to restore performance.


- Easily verify system health and performance at a glance.
- One click sharing with integrated social media buttons. Accessible from any device with an internet connection.
- View historical weather data to understand variations in performance.

# Enphase AC Battery
Storage

YHI Part Code **B270-1200-LN-ETC**

Enphase Partcode: B270-1200-LN-I-AU00-RV0


**FEATURES**

- Lithium iron phosphate (LFP) chemistry for long cycle life
- Modular design promotes redundancy
- Interconnects with standard household AC wiring
- No high voltage DC in system
- Cells safety-tested and certified by TÜV Rheinland
- Prismatic cells are highly stable over time

The Enphase AC Battery™ is simple to install, safe, very reliable, and provides the lowest lifetime energy cost for both new solar customers and retrofit customers. In addition, as an installer, you can design the right system size to meet the needs of the homeowner.

**Wall Mount Bracket options available for mounting Enphase AC Battery. See below for specifications and product codes.**

| BATTERY | B270-1200-LN-ETC |
|---|---|
| **Output Data (AC)** | |
| Peak output power | 270VA |
| Rated (continuous) output power | 260VA |
| Nominal frequency | 50Hz |
| Extended line to neutral voltage range | 184 to 276VAC |
| Extended frequency range | 45 to 55Hz |
| Power factor | 0.7 leading to 0.7 lagging |
| Maximum units per 20 A branch circuit | 13 |
| Peak inverter efficiency | 96.9% |
| **Battery Chemistry** | |
| Capacity | 1.2kWh |
| Depth of discharge (usable capacity) | >95% |
| Ambient temperature range | -20°C to 45°C |
| Chemistry | Lithium Iron Phosphate (LFP) |
| Cell safety certifications | TUV Rheinland, UL |
| Roundtrip cell efficiency[1] | 96% |

| | B270-1200-LN-ETC |
|---|---|
| **Mechanical Data** | |
| Dimensions | 390 (W) x 325 (H) x 220 (D) mm |
| Weight | 25kg |
| Installation | Wall mounted in an indoor, unoccupied space using standard AC wiring in conduit or in wall, where allowed. |
| Enclosure | IP20 |
| Cooling | Natural convection – No active or passive cooling infrastructure required |
| Grid configuration | TN-C-S |
| **Features and Compliance** | |
| Compatibility | Compatible with PV systems using the Enphase Envoy-S™ Metered gateway |
| Communication | Power Line Communication (PLC), TCP/IP through Envoy-S |
| Services | Maximising self-consumption, time of use optimisation, power export limiting2 |
| Monitoring | Enlighten Manager and MyEnlighten monitoring options |
| Compliance | AS/NZS 4777.2, AS/NZS CISPR 22, AS/NZS 62040.1.1, UN 38.3 |
| Limited Warranty[3] | >80% capacity, up to 10 years or 7300 cycles |

1. At 25°C.
2. Optional.
3. Whichever occurs first. Restrictions apply.

## Wall Mount Accessories

BWM-450MM-A

Accommodates 16 inch (400mm) battery-to-battery spacing
To suit 450mm stud centres
Weight: 3.5 kg

BWM-600MM-A

Accommodates 16 inch (400mm) battery-to-battery spacing
To suit 600mm stud centres
Weight: 3.5 kg

# Enphase Cabling & Connectors

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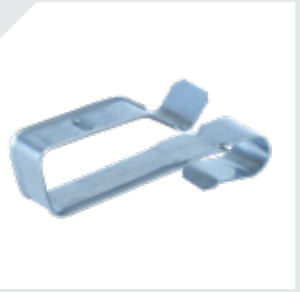

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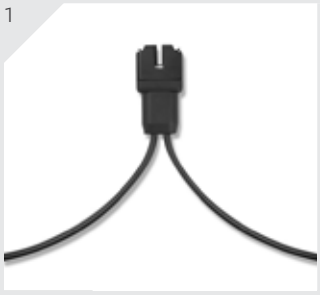
| YHI PRODUCT CODE | DESCRIPTION | PICTURE NUMBER |
|---|---|---|
| CELLMODEM-02 | Enphase Cellular Modem | 1 |
| CT-100-SPLIT | Enphase Split Core Current Transformer | 2 |
| CT-200-SPLIT | Enphase Split Core Current Transformer (CT Clamp) | 3 |
| EFM-35MM | Enphase 35mm Frame Mount | 4 |
| EFM-40MM | Enphase 40mm Frame Mount | 5 |
| EFM-CC | Enphase Connector Clip | 6 |
| EPLC-04 | Enphase Power Line Carrier Ethernet Bridge Pair Au | 7 |
| ET-CLIP-100 | Enphase Cable Clip | 8 |
| LCF-250-PC | Enphase 3 Phase Comms Filter | 9 |
| LPC-01 | Enphase Legrand Phase Coupler | 10 |

# Enphase Q Cabling & Connectors

1


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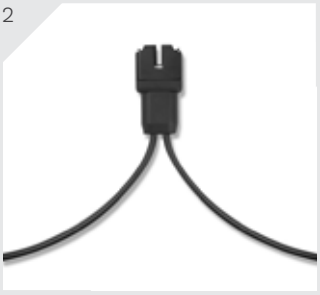

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12


| YHI PRODUCT CODE | DESCRIPTION | PICTURE NUMBER |
|---|---|---|
| Q-25-10 | Enphase Q Cable Single Phase Portrait | 1 |
| Q-25-10-3P | Enphase Q Cable Three Phase Portrait | 2 |
| Q-25-RAW | Enphase Q Cable Raw No Connectors Per Metre | 3 |
| Q-CONN-R-F | Enphase Field Wireable Q Connector, Female | 4 |
| Q-CONN-R-M | Enphase Field Wireable Q Connector, Male | 5 |
| Q-DCC-2-INT | Enphase Q Cable to MC4 Adaptor | 6 |
| Q-DISC-SING | Enphase Q Series Disconnect Tool Single | 7 |
| Q-RELAY-1P-INT | Enphase Relay Controller for IQ Microinverters | 8 |
| Q-RELAY-3P-INT | Enphase 3P Relay Controller for IQ Microinverters | 9 |
| Q-SEAL | Enphase Q Sealing Caps | 10 |
| Q-TERM-3P | Enphase Terminator Cap for 3P Q Cable | 11 |
| Q-TERM-R | Enphase Q Cable Terminator | 12 |

# 3

YHI offers a wide range of innovative and market leading inverters from SMA, SolaX Power and Morningstar.

## Morningstar Inverters

| PARTCODE | DESCRIPTION | MPPT | NOMINAL OUTPUT | IP RATING | WIFI |
|---|---|---|---|---|---|
| MS-MW-4048-230 | Morningstar 4kW MultiWave Inverter | N/A | 4000W | IP65 | N/A |
| MS-SI300 | Morningstar 300W SureSine Inverter | N/A | 300W | IP65 | N/A |

## SMA Inverters

| | | | | | |
|---|---|---|---|---|---|
| SMASB1.5-40 | SMA 1500W Sunny Boy Inverter | 2 | 1500W | IP65 | Included |
| SMASB2-40 | SMA 2000W Sunny Boy Inverter | 2 | 2000W | IP65 | Included |
| SMASB2.5-40 | SMA 2500W Sunny Boy Inverter | 2 | 2500W | IP65 | Included |
| SMASB3-41 | SMA 3000W Sunny Boy Inverter | 2 | 3000W | IP65 | Included |
| SMASB3.6-41 | SMA 3680W Sunny Boy Inverter | 2 | 3680W | IP65 | Included |
| SMASB4-41 | SMA 4000W Sunny Boy Inverter | 2 | 4000W | IP65 | Included |
| SMASB5-41 | SMA 5000W Sunny Boy Inverter | 2 | 5000W | IP65 | Included |
| SMASB6-41 | SMA 6000W Sunny Boy Inverter | 2 | 6000W | IP65 | Included |
| SMASTP5-40 | SMA 5000W Sunny Tripower Inverter | 2 | 5000W | IP65 | Included |
| SMASTP6-40 | SMA 6000W Sunny Tripower Inverter | 2 | 6000W | IP65 | Included |
| SMASTP7-40 | SMA 7000W Sunny Tripower Inverter | 2 | 7000W | IP65 | Included |
| SMASTP8-40 | SMA 8000W Sunny Tripower Inverter | 2 | 8000W | IP65 | Included |
| SMASTP9-40 | SMA 9000W Sunny Tripower Inverter | 2 | 9000W | IP65 | Included |
| SMASTP10-40 | SMA 10000W Sunny Tripower Inverter | 2 | 10000W | IP65 | Included |
| SMASTP15000TL-30 | SMA 15000W Sunny Tripower Inverter | 2 | 15000W | IP65 | Included |
| SMASTP20000TL-30 | SMA 20000W Sunny Tripower Inverter | 2 | 20000W | IP65 | Included |
| SMASTP25000TL-30 | SMA 25000W Sunny Tripower Inverter | 2 | 25000W | IP65 | Included |
| SMASTP50-40 | SMA 50000W Sunny Tripower CORE1 Inverter | 6 | 50000W | IP65 | Included |
| SMASHP75-10 | SMA 75000W Sunny Highpower PEAK 1 Inverter | 1 | 75000W | IP65 | Included |

## SMA Battery Inverters

| | | | | | |
|---|---|---|---|---|---|
| SMASI4.4M-12 | SMA 3300W Sunny Island Battery Inverter | N/A | 3300W | IP54 | Included |
| SMASI6H-12 | SMA 4600W Sunny Island Battery Inverter | N/A | 4600W | IP54 | Included |
| SMASI8H-12 | SMA 6000W Sunny Island Battery Inverter | N/A | 6000W | IP54 | Included |
| SMASBS2.5-10 | SMA 2500W Sunny Boy Storage Battery Inverter | N/A | 2500W | IP65 | Included |
| SMASBS3.7-10 | SMA 3680W Sunny Boy Storage Battery Inverter | N/A | 3680W | IP65 | Included |
| SMASBS5-10 | SMA 5000W Sunny Boy Storage Battery Inverter | N/A | 5000W | IP65 | Included |
| SMASBS6-10 | SMA 6000W Sunny Boy Storage Battery Inverter | N/A | 6000W | IP65 | Included |

| PARTCODE | DESCRIPTION | MPPT | NOMINAL OUTPUT | IP RATING | WIFI |
|---|---|---|---|---|---|
| **SMA Accessories** | | | | | |
| N/A | SMA String Combiner | N/A | N/A | IP54 | N/A |
| N/A | SMA Fuel Save Controller | N/A | N/A | IP65 | N/A |
| SMAHM2 | SMA Sunny Home Manager 2.0 | N/A | N/A | IP2X | N/A |
| SMAEDMS | SMA Data Manager M | N/A | N/A | IP20 | N/A |
| SMACOMGW | SMA Com Gateway | N/A | N/A | IP20 | N/A |
| EMETER20 | SMA Energy Meter 20 | N/A | N/A | IP20 | N/A |
| SMATS4-R-M | SMA TS4-R-M Module Technology | N/A | N/A | IP67 | N/A |
| SMATS4-R-S | SMA TS4-R-S Module Technology | N/A | N/A | IP67 | N/A |
| SMATS4-R-O | SMA TS4-R-O Module Technology | N/A | N/A | IP67 | N/A |
| **SMA Software** | | | | | |
| N/A | SMA Sunny Portal | N/A | N/A | N/A | N/A |
| N/A | SMA Sunny Explorer | N/A | N/A | N/A | N/A |
| **SolaX Single Phase Inverters** | | | | | |
| SKTL5000E | SolaX 5000W Hybrid Ready Inverter | 2 | 4600W | IP20 | Included |
| SKBMU5000 | SolaX 5000W External Charger | N/A | 5000W | IP20 | N/A |
| SKSU5000 | SolaX 5000W Hybrid Inverter EPS | 2 | 4600W | IP20 | Included |
| X1MINI1.1KW | SolaX X1 Mini 1.1KW Inverter | 1 | 1100W | IP65 | Included |
| X1MINI1.5KW | SolaX X1 Mini 1.5KW Inverter | 1 | 1500W | IP65 | Included |
| X1MINI2KW | SolaX X1 Mini 2KW Inverter | 1 | 2000W | IP65 | Included |
| X1AIR2.5KW | SolaX X1 Air 2.5KW Inverter | 1 | 2500W | IP65 | Included |
| X1AIR3.3KW | SolaX X1 Air 3.3KW Inverter | 1 | 3300W | IP65 | Included |
| X1BOOST5KW | SolaX X1 Boost 5KW Inverter | 2 | 4999W | IP65 | Included |
| X1-3000EHV | SolaX 3000W Hybrid HV Inverter | 2 | 3000W | IP65 | Included |
| X1-5000EHV | SolaX 5000W Hybrid HV Inverter | 2 | 5000W | IP65 | Included |
| X1-FIT-3700E | SolaX 3700W AC Retrofit Hybrid Inverter | 2 | 3700W | IP65 | Included |
| X1-FIT-4600E | SolaX 4600W AC Retrofit Hybrid Inverter | 2 | 4600W | IP65 | Included |
| X1-FIT-5000E | SolaX 5000W AC Retrofit Hybrid Inverter | 2 | 5000W | IP65 | Included |

| PARTCODE | DESCRIPTION | MPPT | NOMINAL OUTPUT | IP RATING | WIFI |
|---|---|---|---|---|---|
| **SolaX Three Phase Inverters** | | | | | |
| ZDNYTL10000 | SolaX TL 10KW Three Phase Inverter | 2 | 10000W | IP65 | Included |
| ZDNYTL12000 | SolaX TL 12KW Three Phase Inverter | 2 | 20000W | IP65 | Included |
| ZDNYTL15000 | SolaX TL 15KW Three Phase Inverter | 2 | 15000W | IP65 | Included |
| ZDNYTL17000 | SolaX TL 17KW Three Phase Inverter | 2 | 17000W | IP65 | Included |
| ZDNYTL20000 | SolaX TL 20KW Three Phase Inverter | 2 | 20000W | IP65 | Included |
| X3HB6000WDT | SolaX Gen3 6KW Three Phase Inverter | 2 | 6000W | IP65 | Included |
| X3HB10000WDT | SolaX Gen3 10KW Three Phase Inverter | 2 | 10000W | IP65 | Included |
| X3-6000T | SolaX MIC 6000W Three Phase Inverter | 2 | 6000W | IP65 | Included |
| X3-10000T | SolaX MIC 10000W Three Phase Inverter | 2 | 10000W | IP65 | Included |
| **SolaX Accessories** | | | | | |
| SKEPSBOX | SolaX EPS Relay Box | N/A | N/A | IP20 | Included |
| X3EPSBOX | SolaX 3 Phase EPS Relay Box | N/A | N/A | IP20 | Included |

YHI Part Codes **MS-MW-4048-230**


**FEATURES**

- Modern, lightweight design; easier to install and maintain
- Eliminates cooling fans through superior thermal design, for long-term reliability and greater efficiency
- Built-in multi-function display
- Power Factor-corrected charger
- Flexible modes of operation: Off-Grid, UPS, and Solar Priority
- 5 year warranty

The MultiWave™ inverter/charger establishes a new benchmark for battery-based inverters. Combining the surge and power capabilities of a low-frequency inverter with the agility and compactness of a high-frequency design, MultiWave is a radical all-new design built with advanced energy storage technologies in mind—one leapfrogging decades of incremental progress in power conversion.

MultiWave's innovative, software-driven digital architecture can deliver more power with less weight, achieve peak efficiency of 95% across a wide load range, and is fast enough for use in uninterrupted power supply (UPS) applications. The new inverter's unprecedented charging capabilities—up to 100 Amps*— are ideal for quickly and effectively charging advanced batteries including lithium types. With adjustable voltage and frequency settings, the new 4kW 230Vac Inverter/Charger is truly designed for the global marketplace.

Flexible and easy to install, MultiWave features a high-resolution display for programming and data access. A built-in DIN-rail module mounting expansion system allows adding on generator control, system monitoring alert capabilities, battery management systems (BMS) and other future-ready features as they become available.

| MULTIWAVE PHASE INVERTER | MW-4048-230 |
|---|---|
| DC operating voltage range | 36 - 64 VDC |
| Minimum DC input voltage | 12V |
| Peak efficiency | 95% |
| Charging | 4000W / 80A at 50VDC / 100A max output |
| AC input frequency range | 42 - 68 Hz |
| AC output frequency (selectable) | 50/60Hz |
| AC transfer time | <10ms |
| Standby consumption | 6W |
| Zero-load consumption | 16W |
| Max power continuous (+40°C) | 4000W |
| Surge capacity (5 seconds) | 8000W |
| Nominal AC output volts | 230Vac |
| Temperature range | -40°C to +60°C |
| Total harmonic distortion (THD) | < 5% |
| Cooling method | Passive (fanless) |
| Communications Interfaces | RS-232, EIA-485, 4 x RJ45 for TCP/IP, Type-B USB |
| Unit dimensions | 46.8 x 47.9 x 23.8cm |
| Unit weight | 20.9kg |

YHI Part Code **MS-SI300**

### FEATURES

- Pure Sine Wave
- Handles up to 200% surge
- 55mA self consumption (standby mode)
- Toroidal transformer design
- Adjustable & programmable
- Peak efficiency of 92%
- Extensive electronic protections with automatic recovery

SureSine is a pure sine wave inverter delivering AC power in off-grid solar applications, including rural electrification, telecom, remote homes, RVs, caravans and boats. A cast, anodized aluminum enclosure with no internal cooling fan needed ensures long-term reliability in the harshest tropical and marine conditions.

**Improved load operation** – Pure sine wave provides quality AC equivalent to grid power. Toroidal transformer design generates good wave form throughout the range of input voltages. Handles 200% surge up to 600W.

**High reliability** – No internal cooling fan or other moving parts. Uses epoxy encapsulation, conformal coating, stainless steel hardware and an anodized aluminum enclosure to protect against harsh tropical and marine environments.

**More power available** – High efficiency and low self consumption maximizes power to the loads. Automatic stand-by reduces consumption during no load conditions.

| SURESINE INVERTER | SI-300-220V |
|---|---|
| Continuous Power Rating | 300W @ 25°C |
| Peak Power Rating (10 minutes) | 600W @ 25°C |
| DC Input System Voltage | 10.0 - 15.5V |
| Waveform | Pure Sine Wave |
| AC Output Voltage (RMS) | 220V +/- 10% |
| AC Output Frequency | 50 Hz +/- 0.1% |

| GENERAL INFORMATION | |
|---|---|
| Ambient Operating Temperature | -40°C to + 45°C |
| Terminal | 2.5 $mm^2$-35 $mm^2$ 14 AWG-2 AWG |
| Product Weight | 4.5 kg |
| Unit Shipping Weight | 5.2 kg |
| Dimensions | 21.3 x 15.2 x 10.5 cm |
| Warranty | 2 years |

| OPTIONS | |
|---|---|
| Remote Meter (RM-1) | YES |
| PC MeterBus Adapter (MSC)minutes) | YES |
| Relay Driver (RD-1) | YES |
| Waveform | YES |
| EIA-485 Adapter (RSC-1)* | YES |
| Ethernet Meterbus Converter (EMC-1) | YES |

* The EIA-485/RS-232 Adapter can be used in conjunction with the PC Meter-Bus Adapter to enable the SureSine to communicate over a 485 network. 200% surge up to 600W.

# SMA
## Sunny Boy Inverter 1.5 / 2.0 / 2.5

YHI Part Codes **SMASB1.5-40, SMASB2-40, SMASB2.5-40**

**FEATURES**

- One person installation - only 9.2kg
- Compact design means minimal space requirements
- Use of surplus energy through dynamic active power limitation
- 100% plug and play installation
- Wide input voltage range

The Sunny Boy 1.5 / 2.0 / 2.5 is the perfect inverter for customers with small PV systems. Thanks to its broad input voltage range of 80V to 600V, its versatility, flexibility in module compatibility and low weight for easy installation are impressive.

After smooth commissioning via the integrated web interface, the Sunny Boy 1.5 / 2.0 / 2.5 is ideal for local monitoring via the device's own wireless home network or for online monitoring with Sunny Portal or Sunny Places.

### Input (DC)

| | SMASB1.5-40 | SMASB2-40 | SMASB2.5-40 |
|---|---|---|---|
| Max. PV array power | 3000Wp | 4000Wp | 5000Wp |
| Max. input voltage | | 600V | |
| MPP voltage range | 160V to 500V | 210V to 500V | 260V to 500V |
| Rated input votlage | | 360V | |
| Min. input voltage/initial input voltage | | 50V/80V | |
| Max. input current per string | | 10A | |
| Max. short-circuit current per string | | 18A | |
| Number of independent MPP inputs/strings per MPP input | | 1/1 | |

### Output (AC)

| | SMASB1.5-40 | SMASB2-40 | SMASB2.5-40 |
|---|---|---|---|
| Rated power (at 230V, 50Hz) | 1500W | 2000W | 2500W |
| Max. apparent power AC | 1500VA | 2000VA | 2500VA |
| Nominal AC voltage | | 220V / 230V / 240V | |
| Nominal AC voltage range | | 180V to 290V | |
| AC grid frequency/range | | 50Hz, 60Hz/-5Hz to +5Hz | |
| Rated grid frequency/rated grid voltage | | 50Hz/230V | |
| Max. output current | 7A | 9A | 11A |
| Power factor at rated power | | 1 | |
| Adjustable displacement power factor | | 0.8 overexcited to 0.8 underexcited | |
| Feed-in/connection phases | | 1/1 | |

## Efficiency

| | SMASB1.5-40 | SMASB2-40 | SMASB2.5-40 |
|---|---|---|---|
| Max. efficiency/Euro-eta | 97.2%/96.1% | 97.2%/96.4% | 97.2%/96.7% |

## Protective Devices

| | |
|---|---|
| Input-side disconnection point | Yes |
| Ground fault monitoring/ grid monitoting | Yes/Yes |
| DC reverse polarity protection/ AC short circuit current capability/galvanically isolated | Yes/Yes/No |
| All-pole-sensitive residual-current monitoring unit | Yes |
| Protection class (as per IEC 62103)/overvoltage category (according to IEC 60664-1) | I/III |

## General Data

| | SMASB1.5-40 | SMASB2-40 | SMASB2.5-40 |
|---|---|---|---|
| Dimensions (W x H x D) | 460mm x 357mm x 122mm | | |
| Weight | 9.2kg | | |
| Operating temperature range | -40°c to +60°c | | |
| Noise emission, typical | < 25dB | | |
| Self-consumption (at night) | 2.0W | | |
| Topology | Transformerless | | |
| Cooling method | Convection | | |
| Degree of protection (as per IEC 60529) | IP65 | | |
| Climatic category (as per IEC 60721-3-4) | 4K4H | | |
| Max. permissable value for relative humidity (non-condensing) | 100% | | |

## Equipment

| | SMASB1.5-40 | SMASB2-40 | SMASB2.5-40 |
|---|---|---|---|
| DC connection/AC connection | SUNCLIX/AC connector | | |
| Display via smartphone, tablet, laptop | Yes | | |
| Interfaces: WLAN, Speedwire/ Webconnect | Yes/Yes | | |
| Warranty: 5/10/15/20 years | Yes/Optional/Optional/Optional | | |
| Certificates and approvals | AS4777, C10/11, CE, CEI0-21, DIN EN 62109-1/IEC 62109-1, DIN EN 62109-2/IEC 62109-2, EN50438, G83/2, IEC61727, IEC62116, NBR16149, NEN-EN50438, NRS097-2-1, RfG konform, VDE-AR-N4105, VDE 0126-1-1, VFR2014 | | |
| Country availability of Smart Connected | AU, AT, BE, CH, DE, ES, FR, IT, LU, NL, UK | | |
| Type designation | SB 1.5-1VL-40 | SB2.0-1VL-40 | SB2.5-1VL-40 |

# SMA
## Sunny Boy Inverter 3.0 / 3.6 / 4.0 / 5.0 / 6.0

YHI Part Codes **SMASB3-41, SMASB3.6-41, SMASB4-41, SMASB5-41, SMASB6-41**

**FEATURES**

- Investment security included
- Safe plug and play installation
- Commissioning via smartphone or tablet
- WLAN and intuitive webserver
- PV system data viewable via smartphone
- Dynamic feed-in control

The new Sunny Boy 3.0–6.0 ensures maximum energy yields for private homes. This inverter combines the integrated Service SMA Smart Connected service and intelligent technology for all ambient requirements. Thanks to its extremely light design, the device can be installed quickly and easily. The Sunny Boy can be commissioned quickly via smartphone or tablet thanks to its integrated web interface.

For specific requirements on the roof, such as shading, the TS4-R module optimizers can be added into the system, with all communication and monitoring facilitated through the inverter. Current communication standards make the inverter future-proof, meaning intelligent energy management solutions as well as SMA storage solutions can be flexibly added anytime.

### Input (DC)

| | SMASB3-41 | SMASB3.6-41 | SMASB4-41 | SMASB5-41 | SMASB6-41 |
|---|---|---|---|---|---|
| Max. generator power | 5500Wp | 5500Wp | 7500Wp | 7500Wp | 9000Wp |
| Max. input voltage | 600V | | | | |
| MPP voltage range/rated input voltage | 110V to 500V | 130V to 500V | 140V to 500V | 175V to 500V | 210V to 500V |
| Rated input voltage | 365V | | | | |
| Min. input voltage/initial input voltage | 100V/125V | | | | |
| Max. input current input A/ input B | 15A/15A | | | | |
| Max. DC short-circuit input A/ input B | 22A/22A | | | | |
| Number of independent MPP inputs/strings per MPP input | 2/A:2; B:2 | | | | |

### Output (AC)

| | SMASB3-41 | SMASB3.6-41 | SMASB4-41 | SMASB5-41 | SMASB6-41 |
|---|---|---|---|---|---|
| Rated power (at 230V, 50Hz) | 3000W | 3680W | 4000W | 5000W[1)] | 6000W |
| Max. apparent power AC | 3000VA | 3680VA | 4000VA | 5000VA[1)] | 6000VA |
| Nominal AC voltage/range | 220V, 230V, 240V/180V to 280V | | | | |
| AC power frequency/range | 50Hz, 60Hz/-5Hz to +5Hz | | | | |
| Rated power frequency/rated grid voltage | 50Hz/230V | | | | |
| Max. output current | 16A | 16A | 22A | 22A[2)] | 26.1A |
| Power factor at rated power | 1 | | | | |
| Adjustable displacement power factor | 0.8 overexcited to 0.8 underexcited | | | | |
| Feed-in/connection phases | 1/1 | | | | |

## Efficiency

| | SMASB3-41 | SMASB3.6-41 | SMASB4-41 | SMASB5-41 | SMASB6-41 |
|---|---|---|---|---|---|
| Max. efficiency/European efficiency | 97.0%/96.4% | 97.0%/96.5% | 97.0%/96.5% | 97.0%/96.5% | 97.0%/96.6% |

## Protective Devices

| | SMASB3-41 | SMASB3.6-41 | SMASB4-41 | SMASB5-41 | SMASB6-41 |
|---|---|---|---|---|---|
| Input-side disconnection point | Yes | | | | |
| Ground fault monitoring/grid monitoting | Yes/Yes | | | | |
| DC reverse polarity protection/AC short circuit current capability/galvanically isolated | Yes/Yes/No | | | | |
| All-pole-sensitive residual-current monitoring unit | Yes | | | | |
| Protection class (as per IEC 62103)/overvoltage category (according to IEC 60664-1) | I/III | | | | |

## General Data

| | SMASB3-41 | SMASB3.6-41 | SMASB4-41 | SMASB5-41 | SMASB6-41 |
|---|---|---|---|---|---|
| Dimensions (W x H x D) | 435mm x 470mm x 176mm | | | | |
| Weight | 17.5kg | | | | |
| Operating temperature range | -25°c to +60°c | | | | |
| Noise emission, typical | 25dB(A) | | | | |
| Self-consumption (at night) | 5.0W | | | | |
| Topology | Transformerless | | | | |
| Cooling method | Convection | | | | |
| Degree of protection (as per IEC 60529) | IP65 | | | | |
| Climatic category (as per IEC 60721-3-4) | 4K4H | | | | |
| Max. permissable value for relative humidity (non-condensing) | 100% | | | | |

## Equipment

| | SMASB3-41 | SMASB3.6-41 | SMASB4-41 | SMASB5-41 | SMASB6-41 |
|---|---|---|---|---|---|
| DC connection/AC connection | SUNCLIX/AC connector | | | | |
| Display via smartphone, tablet, laptop | Yes | | | | |
| Interfaces: WLAN, Ethernet, RS485 | Yes/Yes/Yes | | | | |
| Communication Protocols | Modbus (SMA, Sunspec), Webconnect, SMA Data, TS4-R | | | | |
| Warranty: 5/10/15 years | Yes/Optional/Optional | | | | |
| Certificates and approvals | AS 4777.2, C10/11, CE, CEI 0-21, EN 50438, G59/3-4, G83/2-1, DIN EN 62109/IEC 62109, NEN-EN50438, IE-EN50438, NT_Ley20.571, ÖVE/ÖNORM E 8001-4-712 & TOR D4, PPDS, PPC, RD1699, TR3.2.1, UTE C15-712, VDE-AR-N 4105, VDE0126-1-1, VFR 2014, RfG compliant | | | | |
| Certificates and approvals (planned) | DEWA, IEC 61727, IEC 62116, MEA, NBR16149, PEA, SI4777, TR3.2.2 | | | | |
| Type designation | SB3.0-1AV-41 | SB3.6-1AV-41 | SB4.0-1AV-41 | SB5.0-1AV-41 | SB6.0-1AV-41 |

[1] 4600W/4600VA according to VDE-AR-N 4105
[2] AS 4777: 21.7A

# SMA
## Sunny Tripower Inverter

YHI Part Codes **SMASTP3-40, SMASTP4-40, SMASTP5-40, SMASTP6-40, SMASTP8-40, SMASTP10-40**

**FEATURES**

- Maximum efficiency of 98%
- DC input voltage of up to 1000V
- Integrated grid management functions
- Reactive power supply
- Module-tailored design with Optiflex
- Multifunction relay comes standard
- Three-phase feed-in

Not only for your home, but also perfectly suited to the design of the traditional residential PV system up to the higher power outage range. Users benefit from numerous tried-and-tested product features.

When it comes to system design in the 5kW to 12kW power classes, the Sunny Tripower is the optimum product solution – for applications ranging from use in your own home & larger PV rooftop systems to implementation of smaller-scale PV farms.

### Input (DC)

| | SMASTP3-40 | SMASTP4-40 | SMASTP5-40 | SMASTP6-40 | SMASTP8-40 | SMASTP10-40 |
|---|---|---|---|---|---|---|
| Max. generator power | 6000Wp | 8000Wp | 9000Wp | 9000Wp | 15000Wp | 15000Wp |
| Max. input voltage | 850V | | | | 1000V | 1000V |
| MPP voltage range/rated input voltage | 140V to 800V/580V | 175V to 800V/580V | 215V to 800V/580V | 260V to 800V/580V | 260V to 800V/580V | 300V to 800V/580V |
| Min. input voltage/initial input voltage | 125V/150V | | | | | |
| Max. input current input A/ input B | 12A/12A | 12A/12A | 12A/12A | 12A/12A | 20A/12A | 20A/12A |
| Max. short-circuit input input A/ input B | 18A/18A | 18A/18A | 18A/18A | 18A/18A | 30A/18A | 30A/18A |
| Number of independent MPP inputs/strings per MPP input | 2/A:1; B:1 | | | | | |

### Output (AC)

| | SMASTP3-40 | SMASTP4-40 | SMASTP5-40 | SMASTP6-40 | SMASTP8-40 | SMASTP10-40 |
|---|---|---|---|---|---|---|
| Rated power (at 230V, 50Hz) | 3000W | 4000W | 5000W | 6000W | 8000W | 10000W |
| Max. apparent power AC | 3000VA | 4000VA | 5000VA | 6000VA | 8000VA | 10000VA |
| Nominal AC voltage/range | 3/N/PE; 230/400V | | | | | |
| AC power frequency/range | 50Hz/-5Hz to +5Hz | | | | | |
| Rated power frequency/rated grid voltage | 50Hz/230V | | | | | |
| Max. output current | 3 x 4.5A | 3 x 5.8A | 3 x 7.6A | 3 x 9.1A | 3 x 12.1A | 3 x 14.5A |
| Power factor at rated power | 1 | | | | | |
| Adjustable displacement power factor | 0.8 overexcited to 0.8 underexcited | | | | | |
| Feed-in/connection phases | 3/3 | | | | | |

## Input (DC)

| | SMASTP3-40 | SMASTP4-40 | SMASTP5-40 | SMASTP6-40 | SMASTP8-40 | SMASTP10-40 |
|---|---|---|---|---|---|---|
| Max. efficiency/European efficiency | 98%/97.1% | 98%/97.4 | 98%/97.5 | 98%/97.6 | 98%/97.6 | 98%/97.6 |

## Proctective Devices

| | SMASTP3-40 | SMASTP4-40 | SMASTP5-40 | SMASTP6-40 | SMASTP8-40 | SMASTP10-40 |
|---|---|---|---|---|---|---|
| Input-side disconnection point | Yes | | | | | |
| Ground fault monitoring/ grid monitoting | Yes/Yes | | | | | |
| DC reverse polarity protection/ AC short circuit current capability/galvanically isolated | Yes/Yes/No | | | | | |
| All-pole-sensitive residual-current monitoring unit | Yes | | | | | |
| Protection class (as per IEC 62103)/overvoltage category (according to IEC 60664-1) | I/III | | | | | |

## General Data

| | SMASTP3-40 | SMASTP4-40 | SMASTP5-40 | SMASTP6-40 | SMASTP8-40 | SMASTP10-40 |
|---|---|---|---|---|---|---|
| Dimensions (W x H x D) | 435mm x 470mm x 176mm | | | | 460mm x 497mm x 176mm | |
| Weight | 17kg | | | | 20.5kg | |
| Operating temperature range | -25°C to +60°C | | | | | |
| Noise emission, typical | 30db(A) | | | | | |
| Self-consumption (at night) | 5W | | | | | |
| Topology/cooling concept | Transformerless/Opticool | | | | | |
| Degree of protection (as per IEC 60529) | IP65 | | | | | |
| Climatic category (as per IEC 60721-3-4) | 4K4H | | | | | |
| Max. permissable value for relative humidity (non-condensing) | 100% | | | | | |

## Features

| | SMASTP3-40 | SMASTP4-40 | SMASTP5-40 | SMASTP6-40 | SMASTP8-40 | SMASTP10-40 |
|---|---|---|---|---|---|---|
| DC connection/AC connection | SUNCLIX/spring-cage terminal | | | | | |
| Display | Graphic | | | | | |
| Interfaces: RS485, Modbus, Speedwire, Webconnect | Optional/Yes/Yes | | | | | |
| Multifunction relay/power control module | Yes/Optional | | | | | |
| Warranty: 5/10/15 years | Yes/Optional/Optional/Optional | | | | | |
| Certificates and permits | AS 4777.2:2015, CE, CEI 0-21:2016, C10/11:2012, DIN EN 62109-1, EN 504381, G59/3, G83/2, IEC 61727/MEA, IEC 62109-2, NEN EN 50438, NRS 097-2-1, PPC, PPDS, RD 661/2007, RD 1699:2011, SI 4777, UTE C15-712-1, VDE0126-1-1, VDE AR-N 4105, VFR 2013, VFR 2014 | | | | | |
| Type designation | STP 5000TL-20 | STP 6000TL-20 | STP 7000TL-20 | STP 8000TL-20 | STP 9000TL-20 | STP 10000TL-20 |

# SMA
## Sunny Tripower Inverter

YHI Part Codes **SMASTP15000TL-30, SMASTP20000TL-30, SMASTP25000TL-30**

### FEATURES

- Maximum efficiency of 98.4%
- DC surge arrester (SPD type II) can be integrated
- DC input voltage of up to 1000 V
- Multistring capability for optimum system design
- Cutting-edge grid management functions with Integrated Plant Control
- Reactive power available 24/7 (Q on Demand 24/7)

The Sunny Tripower is the ideal inverter for large-scale commercial and industrial plants. It offers enormous design flexibility and compatibility with many PV modules thanks to its multistring capabilities and wide input voltage range.

| Input (DC) | SMASTP15000TL-30 | SMASTP20000TL-30 | SMASTP25000TL-30 |
|---|---|---|---|
| Max. generator power | 27000Wp | 36000Wp | 45000Wp |
| DC rated power | 15330W | 20440W | 25550W |
| Max. input voltage | | 1000V | |
| MPP voltage range/rated input range | 240V to 800V/600V | 320V to 800V/600V | 390V to 800V/600V |
| Min. input voltage/start input voltage | | 150V/188V | |
| Max. input current input A/B | | 33A/33A | |
| Number of independent MPP inputs/strings per MPP input | | 2/A:3; B:3 | |

| Output (AC) | SMASTP15000TL-30 | SMASTP20000TL-30 | SMASTP25000TL-30 |
|---|---|---|---|
| Rated power (at 230V, 50Hz) | 15000W | 20000W | 25000W |
| Max. apparent power AC | 15000VA | 20000VA | 25000VA |
| AC nominal voltage | | 3/N/PE; 230V/400V | |
| AC grid frequency/range | | 50Hz/44Hz to 55Hz | |
| Rated power frequency/rated grid voltage | | 50Hz to 230V | |
| Max./rated output current | 29A/21.7A | 29A/29A | 36.2A/36.2A |
| Power factor at rated power/ adjustable displacement power factor | | 1/0 overexcited to 0 underexcited | |
| THD | | ≤ 3% | |
| Feed-in/connection phases | | 3/3 | |

| Efficiency | SMASTP15000TL-30 | SMASTP20000TL-30 | SMASTP25000TL-30 |
|---|---|---|---|
| Max. efficiency/European efficiency | 98.4%/98.0% | 98.4%/98.0% | 98.3%/98.1% |

# SMA
## Sunny Tripower Inverter

### Proctective Devices

| | SMASTP15000TL-30 | SMASTP20000TL-30 | SMASTP25000TL-30 |
|---|---|---|---|
| DC-side disconnection device | Yes | | |
| Ground fault monitoring/ grid monitoting | Yes/Yes | | |
| DC surge arrester (Type II can be integrated) | Optional | | |
| DC reverse polarity protection/ AC short circuit current capability/galvanically isolated | Yes/Yes/No | | |
| All-pole-sensitive residual-current monitoring unit | Yes | | |
| Protection class (as per IEC 62103)/overvoltage category (according to IEC 60664-1) | I/AC: III; DC: II | | |

### General Data

| | SMASTP15000TL-30 | SMASTP20000TL-30 | SMASTP25000TL-30 |
|---|---|---|---|
| Dimensions (W x H x D) | 661mm x 682mm x 264mm | | |
| Weight | 61kg | | |
| Operating temperature range | -25°C to +60°C | | |
| Noise emission, typical | 51db(A) | | |
| Self-consumption (at night) | 1W | | |
| Topology/cooling concept | Transformerless/Opticool | | |
| Degree of protection (as per IEC 60529) | IP65 | | |
| Climatic category (as per IEC 60721-3-4) | 4K4H | | |
| Max. permissable value for relative humidity (non-condensing) | 100% | | |

### Features

| | SMASTP15000TL-30 | SMASTP20000TL-30 | SMASTP25000TL-30 |
|---|---|---|---|
| DC connection/AC connection | SUNCLIX/spring-cage terminal | | |
| Display | Optional | | |
| Interface: RS485, Speedwire, Webconnect | Optional/Yes | | |
| Data interface: SMA Modbus/ SunSpec Modbus | Yes/Yes | | |
| Multifunction relay/power control module | Optional/Optional | | |
| OptiTrac Global Peak/Integrated Plant Control/Q on demand 24/7 | Yes/Yes Yes | | |
| Off-gird cable/SMA Fuel Save Controller compatible | Yes/Yes | | |
| Warranty: 5/10/15 years | Yes/Optional/Optional/Optional | | |
| Certificates and permits | ANRE 30, AS 4777, BDEW 2008, C10/11:2012, CE, CEI 0-16, CEI 0-21, DEWA 2.0, EN 50438:2013*, G59/3, IEC 60068-2-x, IEC 61727, IEC 62109-1/2, IEC 62116, MEA 2013, NBR 16149, NEN EN 50438, NRS 097-2-1, PEA 2013, PPC, RD 1699/413, RD 661/2007, Res. n°7:2013, SI4777, TOR D4, TR 3.2.2, UTE C15-712-1, VDE 0126-1-1, VDE-AR-N 4105, VFR 2014 | | |
| Type designation | STP 15000TL-30 | STP 20000TL-30 | STP 25000TL-30 |

# SMA
## Sunny Tripower CORE1

YHI Part Code **SMASTP50-40**

### FEATURES

- Floor-mounted device, easy to install
- No DC fuses required
- Integrated DC connector and Wi-Fi access with any mobile device
- 12 direct string inputs reduce labour and material costs
- Optional AC/DC overvoltage protection

The Sunny Tripower CORE1 is the world's first free-standing string inverter for decentralized rooftop and ground-based PV systems as well as covered parking spaces. The CORE1 is the third generation in the successful Sunny Tripower product family and is revolutionizing the world of commercial inverters with its innovative design.

SMA engineers developed an inverter that combines a unique design with an innovative installation method to significantly reduce installation time and provide all target groups with a maximum return on investment. The Sunny Tripower CORE1 generates widespread savings in logistics, labor, materials and services. Commercial PV installations are now quicker and easier to complete than ever before.

| Input (DC) | SMASTP50-40 |
|---|---|
| Max. generator power | 75000Wp |
| Max. input voltage | 1000V |
| MPP voltage range/rated input voltage | 500V to 800V/670V |
| Min. input voltage/start input voltage | 150V/188V |
| Max. operating input current/ per MPPT | 120A/20A |
| Max. short circuit current per MPPT/per string input | 30A/30A |
| Number of independent MPPT inputs/strings per MPP input | 6/2 |

| General Data | SMASTP50-40 |
|---|---|
| Dimensions (W x H x D) | 621mm x 733mm x 569mm |
| Weight | 84kg |
| Operating temperature range | -25°c to +60°c |
| Noise emission, typical | < 65dB(A) |
| Self-consumption (at night) | 4.8W |
| Topology/cooling concept | Transformerless/OptiCool |
| Degree of protection (as per IEC 60529) | IP65 |
| Climatic category (as per IEC 60721-3-4) | 4K4H |
| Max. permissable value for relative humidity (non-condensing) | 100% |

| Output (AC) | SMASTP50-40 |
|---|---|
| Rated power (at 230V, 50Hz) | 50000W |
| Max. apparent power AC | 50000VA |
| AC nominal voltage | 220V/380V, 230V/400V, 240V/415V |
| AC voltage range | 202V to 305V |
| AC grid frequency/range | 50Hz/44Hz to 55Hz, 60Hz/54Hz to 65Hz |
| Rated power frequency/ rated grid voltage | 50Hz/230V |
| Max./rated output current | 72.5A/72.5A |
| Output phases/AC connection | 3/3-(N)-PE |
| Power factor at rated power/ adjustable displacement power factor | 1/0.0 leading to 0.0 lagging |
| THD | <3% |

| Protective Devices | SMASTP50-40 |
|---|---|
| Input-side disconnection point | Yes |
| Ground fault monitoring/ grid monitoting | Yes/Yes |
| DC reverse polarity protection/ AC short circuit current capability/ galvanically isolated | Yes/Yes/No |
| All-pole-sensitive residual-current monitoring unit | Yes |
| Protection class (as per IEC 62103)/overvoltage category (according to IEC 60664-1) | I/AC: III; DC:II |
| AC/DC surge arrester (type 1, type 1/2) | Optional |

## Equipment

| | SMASTP50-40 |
|---|---|
| DC connection/AC connection | SUNCLIX/screw terminal |
| Mounting feet | Yes |
| LED indicators (status, fault, communication) | Yes |
| LC display | Optional |
| Interface: Ethernet, WLAN, RS485 | Yes (2 ports)/Yes/Optional |
| Data interface: SMA Modbus/ SunSpec Modbus/Speedwire, Webconnect | Yes/Yes/Yes |
| Multi-Function relay/Expansion Module Slots | Yes/Yes (2 ports) |
| OptiTrac Global Peak/Integrated Plant Control/Q on Demand 24/7 | Yes/Yes/Yes |
| Off-grid capable/SMA Fuel Save Controller compatible | Yes/Yes |
| Guarantee: 5/10/15/20 years | Yes/Optional/Optional/Optional |
| Certificates and permits | ANRE 30, AS 4777, BDEW 2008, C10/11:2012, CE, CEI 0-16, CEI 0-21, EN 50438:2013*, G59/3, IEC 60068-2-x, IEC 61727, IEC 62109-1/2, IEC 62116, MEA 2016, NBR 16149, NEN EN 50438, NRS 097-2-1, PEA 2016, PPC, RD 1699/413, RD 661/2007, Res. n°7:2013, SI4777, TOR D4, TR 3.2.2, UTE C15-712-1, VDE 0126-1-1, VDE-ARN 4105, VFR 2014, P.O.12.3, NTCO-NTCyS, GC 8.9H, PR20, DEWA |
| Type designation | STP 50-40 |

# SMA
## Sunny Highpower PEAK1 Inverter

YHI Part Code **SMASHP75-10**

**FEATURES**

- Superior power density: 75kW with only 77 kg of weight
- Max. yield thanks to possible DC/AC ratio of 150%
- SMA Inverter Manager as central control unit
- DC input voltage of up to 1000V
- Flexible DC solutions with customer-specific PV array combiner boxes
- Cutting-edge system design
- Innovative active cooling concept

The new Sunny Highpower PEAK1 is part of an innovative global system solution for commercial and industrial PV systems. This solution combines the advantages of a decentralized system layout with the benefits of centralized inverter designs in order to get the best of two worlds.

High efficiency, flexible system design, easy installation, simple commissioning and low maintenance requirements contribute decisively to reducing the operating costs for the entire system.

| Input (DC) | SUNNY HIGHPOWER PEAK1 |
|---|---|
| Max. generator power | 112500Wp |
| Rated power (DC) | 76500W |
| Max. input voltage | 1000V |
| MPP voltage range (at 400 Vac/480Vac) | 570V to 800V/685V to 800V |
| Min. input voltage (at 400 Vac/480Vac) | 565V/680V |
| Start input voltage (at 400 Vac/480Vac) | 600V/720V |
| Max. input/max. short circuit current | 140A/210A |
| Number of independent MPP inputs/strings per MPP input | 1/1 (split up in external combiner box) |
| Rated DC input voltage (at 400 Vac/480Vac) | 630V/710V |

| Output (AC) | SUNNY HIGHPOWER PEAK1 |
|---|---|
| Rated power at nominal voltage | 75000W |
| Max. apparent AC power | 75000VA |
| Max. reactive power | 75000var |
| Nominal AC voltage | 3/PE, 400V to 480V, ±10% |
| AC voltage range | 360V to 530V |
| AC power frequency/range | 50Hz/44Hz to 55Hz 60Hz/54Hz to 65Hz |
| Rated power frequency/rated grid voltage | 50Hz/400V |
| Max. output current (at 400Vac) | 109A |
| Power factor rated power/ displacement power factor adjustable | 1/0 overexcited to 0 underexcited |
| THD | ≤ 1% |
| Feed-in phases/connection phases | 3/3 |

| Efficiency | SUNNY HIGHPOWER PEAK1 |
|---|---|
| Max. efficiency/Euro-eta | 98.8%/98.2% |

## Protective Devices

| | SUNNY HIGHPOWER PEAK1 |
|---|---|
| Input-side disconnection point | Yes |
| Ground fault monitoring/ grid monitoting | Yes/Yes |
| Integrated DC surge arrester/AC surge arrester | Type II/Type II + Type III (combined) |
| AC short-circuit current capability/galvanically isolated | Yes/No |
| All-pole sensitive residual-current monitoring unit | Yes |
| Protection class (as per IEC 62109-1)/overvoltage category (as per IEC 62109-1) | I/AC: III; DC:III |

## General Data

| | SUNNY HIGHPOWER PEAK1 |
|---|---|
| Dimensions (W x H x D) | 570mm x 740mm x 306mm |
| Weight | 77kg |
| Operating temperature range | -25°c to +60°c |
| Noise emission, typical | 58dB(A) |
| Self-consumption (at night) | < 3W |
| Topology/cooling concept | Transformerless/active |
| Degree of protection (as per IEC 60529) | IP65/NEMA 3R |
| Climatic category (as per IEC 60721-3-4) | 4K4H/4Z4/4B2/4S3/4M2/4C2 |
| Max. permissable value for relative humidity (non-condensing) | 95% |

## Features/Function/Accessories

| | SUNNY HIGHPOWER PEAK1 |
|---|---|
| DC connection/AC connection | Screw terminal/screw terminal |
| Display | Graphical |
| Data interface | SunSpec Modbus TCP (via external SMA Inverter Manager) |
| Off-grid capable/PV-diesel capable | No/Yes |
| Warranty: 5/10/15/20 years | Yes/Optional/Optional/Optional |
| Planned certificates & approvals | AS 4777, BDEW 2008, C10/11:2012**, CEI 0-16, DEWA 2015, EN 50438*, G59/3, IEC 60068-2-x, IEC 61727, IEC 62109-1/2, IEC 62116, LEY Nº 20751, NEN EN 50438, NRS 097-2-1, PEA 2015, R.D.661/2007, Res. n°7:2013, SI4777, TORD4**, UTE C15-712-1, VDE 0126-1-1, VDE-AR-N 4105**, VFR 2014 |
| Type designation | SHP 75-10 |

* Does not apply to all national appendixes of EN 50438
** Restricted (Note Manufacturer's Declaration)

# SMA
## Sunny Island Battery Inverter

YHI Part Codes **SMASI4.4M-12, SMASI6H-12, SMASI8H-12**

**FEATURES**

- Can be easily configured and monitored thanks to communication via Ethernet and WLAN
- Particularly high overload capability
- Works with self-consumption systems, battery backup systems and off-grid systems
- Ideal for retrofits or modular expansions of single-phase and three-phase systems

The Sunny Island battery inverter supports a wide range of on and off-grid installations with compelling product features - from operation in off-grid areas to home energy management.

Being a core element in the SMA Flexible Storage System, the Sunny Island temporarily stores self-generated power thus making it possible to use solar power around-the-clock.

| **Operation on the utility grid or generator** | **SMASI4.4M-12** | **SMASI6H-12** | **SMAS8H-12** |
|---|---|---|---|
| Rated grid voltage/AC voltage range | 230V/172.5V to 264.5V | | |
| Rated grid frequency/permitted frequency range | 50Hz/40Hz to 70Hz | | |
| Maximum AC current for increased self-consumption (grid operation) | 14.5A | 20A | 26A |
| Maximum AC power for increased self-consumption (grid operation)range | 3.3kVA | 4.6kVA | 6kVA |
| Maximum AC input current voltage | 50A | | |
| Maximum AC input power input B | 11500W | | |

| **Stand-alone or emergency power operation** | **SMASI4.4M-12** | **SMASI6H-12** | **SMAS8H-12** |
|---|---|---|---|
| Rated grid voltage/AC voltage range | 230V/202V to 253V | | |
| Rated frequency/frequency range (adjustable) | 50Hz/45Hz to 65Hz | | |
| Rated power (at Unom, fnom/25°C / cos = 1) | 3300W | 4600W | 6000W |
| AC power at 25°C for 30 min/ 5 min/3 sec | 4400W/4600W/5500W | 6000W/6800W/11000W | 8000W/9100W/11000W |
| AC power at 45°C continuously | 3000W | 3700W | 5430W |
| Rated current/maximum output current (peak) | 14.5A/60A | 20A/120A | 26A/120A |
| Total harmonic distortion output voltage/power factor at rated power | < 5%/–1 to +1 | < 1.5%/–1 to +1 | < 1.5%/–1 to +1 |

## Battery DC Input

| | SMASI4.4M-12 | SMASI6H-12 | SMAS8H-12 |
|---|---|---|---|
| Rated input voltage/DC voltage range | 48V/41V to 63V | | |
| Maximum battery charging current/rated DC charging current/DC discharging current | 75A/63A/75A | 110A/90A/103A | 140A/115A/130A |
| Battery type/battery capacity (range) | Li-Ion[1)], FLA, VRLA/100 Ah to 10000 Ah (lead-acid) 50 Ah to 10000 Ah (li-Ion) | | |
| Charge control | IUoU charge procedure with automatic full charge and equalization charge | | |

## Efficiency/self-consumption of the device

| | SMASI4.4M-12 | SMASI6H-12 | SMAS8H-12 |
|---|---|---|---|
| Maximum efficiency | 95.5% | 95.8% | 95.8% |
| No-load efficiency/standby | 18W/6.8W | 25.8W/6.5W | 25.8W/6.5W |

## Protective Devices (Equipment)

| | ALL VERSIONS |
|---|---|
| AC short-circuit/AC overload | Yes/Yes |
| DC reverse polarity protection/ DC fuse | No/No |
| Overtemperature/battery deep discharge | Yes/Yes |
| Overvoltage category as per IEC 60664-1 | III |

## Features/function

| | 4.4M | 6.0H | 8.0H |
|---|---|---|---|
| WLAN, Speedwire/Webconnect/ SI-SYSCAN (Multicluster) | Yes/Yes/ No | Yes/Yes/ Optional | Yes/Yes/ Optional |
| Micro SD memory card for extended data logging | Optional | | |
| Display via smartphone, tablet, laptop/multifunction relay | Yes/2 | | |
| Three-phase systems (including rotating magnetic field)/battery-backup function | Yes/Yes | | |
| State of charge calculation/full charge/equalization charge | Yes/Yes/Yes | | |
| Battery temperature sensor/ data cables | Optional/Yes | | |
| Certificates and approvals | www.SMA-solar.com | | |
| Cover color yellow/aluminum white | Optional/Optional | | |
| Warranty 5/10 years | Yes/Yes[3] | | |
| **For off-grid applications** | | | |
| Automatic rotating magnetic field detection/generator support | Yes/Yes | | |
| Parallel connection/Multicluster | No/No | Yes/Yes | Yes/Yes |
| Integrated soft start | Yes | | |

## General Data

| | 4.4M | 6.0H | 8.0H |
|---|---|---|---|
| Dimensions (W x H x D) | 467mm x 612mm x 242mm | | |
| Weight | 44kg | 63kg | 63kg |
| Operating temperature range | -25°C to +60°C | | |
| Protection class in accordance with IEC 62103 | I | | |
| Climatic category as per IEC 60721 | 3K6 | | |
| Degree of protection according to IEC 60529 | IP54 | | |

## Accessory

| | ALL VERSIONS | | |
|---|---|---|---|
| **For off-grid applications** | | | |
| Battery fuse[2] | Optional | | |
| Sunny Island Charger SIC50-MPT[2]/SMA Cluster Controller | Optional/Optional | | |
| **For off-grid applications** | | | |
| Sunny Home Manager/SMA Energy Meter/automatic transfer switch for battery backup[1] | Optional/Optional/Optional | | |
| Type designation | SI4.4M-12 | SI6.0H-12 | SI8.0H-12 |

[1] See 'List of Approved batteries' at www.SMA-solar.com
[2] Procurement via external supplier
[3] With registration via the information sheet provided

# SMA
## Sunny Boy Storage 2.5 Battery Inverter

YHI Part Codes **SMASBS2.5-10**


**FEATURES**

- Multiple configuration options and extendable PV design
- For new and existing systems
- Compatible with high-voltage lithium-ion batteries
- One-person installation
- Transparency thanks to its direct connection to Sunny Portal/Sunny Places

Sunny Boy Storage is the battery inverter designed for new high voltage batteries from leading manufacturers. With a charge and discharge power of 2.5 kW, it is ideally suited to handle the electricity demand of a private household. The device combines the flexibility of the AC coupling with the advantages of high voltage technology, enabling a significant reduction in system and installation costs.

Thanks to the integrated web server and the direct portal access, commissioning is simple, and the energy flows in the household are as transparent as possible. No matter how the energy is produced and consumed—whether with existing or new PV systems, wind energy or a CHP plant—Sunny Boy Storage can handle everything, today and in the future. Systems with Sunny Boy Storage also have complete flexibility to meet a system owner's changing needs allowing either the generator or battery storage to be individually extended or upgraded at any time.

| **AC Connection** | **SMASBS2.5-10** |
|---|---|
| Rated power (at 230V, 50Hz) | 2500W |
| Max. apparent AC power | 2500VA |
| Nominal AC voltage/range | 220V, 230V, 240V/180V to 280V |
| AC power frequency/range | 50 Hz, 60 Hz/-5 Hz to +5 Hz |
| Rated power frequency/rated grid voltage | 50Hz/230V |
| Max AC current | 11A |
| Power factor at rated power | 1 |
| Adjustable displacement power factor | 0.8 overexcited to 0.8 underexcited |
| Feed-in phases/connection phases | 1/1 |

| **Battery DC Input** | **SMASBS2.5-10** |
|---|---|
| Max. DC power (at cos =1) | 2650W |
| Max. DC voltage | 500V |
| DC voltage range/DC rated voltage | 100V to 500V/360V |
| Min. DC voltage/start DC voltage | 100V/100V |
| Max. DC current | 10A |
| Max. DC short-circuit current | 18A |
| Battery type | Li-ion* |

| Efficiency | SMASBS2.5-10 |
|---|---|
| Max. efficiency/Euro-eta | 96.8%/96.1% |
| Self-consumption with no load and battery consumption/standby | ≤ 10W/≤ 2W |

| Protective Devices | SMASBS2.5-10 |
|---|---|
| Ground fault monitoring/grid monitoring | Yes/Yes |
| DC reverse polarity protection /AC short circuit current capability/galvanically isolated | No/Yes/No |
| All-pole-sensitive residual-current monitoring unit | Yes |
| Protection class (as per IEC 62103)/overvoltage category (according to IEC 60664-1) | I/III |

| General Data | SMASBS2.5-10 |
|---|---|
| Dimensions W x H x D | 450mm x 357mm x 122mm |
| Inverter weight | 9.2kg |
| Operating temperature range in battery operation | -40°C to +60°C |
| Noise emission, typical | < 25 dB |
| Topology | Transformerless |
| Cooling method | Convection |
| Degree of protection (according to IEC 60529)/ climate category (according to IEC 60721-3-4) | IP65/4K4H |
| Max. permissible value for relative humidity (non-condensing) | 100% |

| Features/function/accessories | SMASBS2.5-10 |
|---|---|
| DC connection/AC connection | SUNCLIX/AC connector |
| Display via Smartphone, tablet or laptop | Yes |
| Integrated webserver | Yes |
| Interfaces: Ethernet/WLAN | Yes/Yes |
| Communication protocols | Modbus (SMA, Sunspec), Webconnect |
| Battery communication | CAN bus |
| Integrated dynamic active power limitation | Yes |
| Warranty: 5/10 years | Yes/Yes** |
| Certificates and approvals | AS4777, C10/11/2012, CEI0-21, CE, DIN EN 62109-1 / IEC 62109-1, G59/3 EN50438, G83/2, NEN 50438, VDE-AR-N4105, VDE0126-1-1, VFR 2014 |

| Features/function/accessories | SMASBS2.5-10 |
|---|---|
| Certificates and approvals (planned) | IEC61727, NRS097, PPC, PPDS, RD 1699 |
| Sunny Home Manager/ SMA Energy Meter | Optional/Optional |
| Retrofittable battery-backup function | Planned |
| SMA inverter with Webconnect | Yes |
| SMA inverter without Webconnect | Optional |
| Retrofit with inverters from other suppliers | Optional |
| Type designation | SBS2.5-1VL-10 |

* See "List of Approved Batteries" at www.SMA-Solar.com
** With registration in Sunny Portal/Sunny Places

# SMA
# Sunny Boy Storage 3.7 / 5.0 / 6.0 Battery Inverter

YHI Part Code **SMASBS3.7-10, SMASBS5-10, SMASBS6-10**

**FEATURES**

- Integrated secure power supply function
- Fully automated battery-backup function
- 5 year warranty, or 10 years with registration in Sunny Portal/Sunny Places
- Can be extended at any time by connecting up to three batteries
- Ideal for both retrofitting and new installations

With the Sunny Boy Storage multistring battery inverter, for the first time, up to three different high-voltage batteries can be connected to one battery inverter. To connect larger batteries, three DC inputs can also be connected in parallel. The Sunny Boy Storage has integrated emergency power, which can be switched manually. Furthermore, it can even take over the entire electricity supply of the three line conductors via the optional automatic transfer unit.

Thanks to proven AC coupling, the Sunny Boy Storage is ideally suited to new and retrofitted systems. The integrated webserver enables fast and easy commissioning, which is also possible via smartphone or laptop. Energy flows in the household are fully transparent thanks to the direct connection to Sunny Portal and Sunny Places.

| **AC Connection** | **SMASBS3.7-10** | **SMASBS5-10** | **SMASBS6-10** |
|---|---|---|---|
| Rated power (at 230V, 50Hz) | 3680W | 5000W[1] | 6000W[1] |
| Overload capacity (at 25°C to max. 60 sec)[2] | 4600W | 6300W | 7500W |
| AC nominal current output (at 230 V, 50 Hz) | 16A | 21.7A[3] | 26A |
| Nominal AC voltage/AC voltage range | 230V/172.5V to 264.5V | | |
| AC grid frequency/range | 50Hz/45Hz to 65Hz | | |
| Adjustable displacement power factor | 0.8 overexcited to 0.8 underexcited | | |
| Feed-in phases/connection phases | 1/1 | | |

| **Battery DC Input** | **SMASBS3.7-10** | **SMASBS5-10** | **SMASBS6-10** |
|---|---|---|---|
| Max. DC voltage | 600V | | |
| DC voltage range/DC rated voltage | 100V to 550V/360V | | |
| Min. DC voltage/start DC voltage | 100V/100V | | |
| Max. DC current per DC input/ number of DC inputs | 10A/3 x 10A | | |
| Max. short-circuit current | 40A | | |
| Battery types | Li-ion[4] | | |

| **Efficiency** | **SMASBS3.7-10** | **SMASBS5-10** | **SMASBS6-10** |
|---|---|---|---|
| Max. efficiency | 97.5% | | |

| Protective Devices | SMASBS3.7-10 | SMASBS5-10 | SMASBS6-10 |
|---|---|---|---|
| DC reverse polarity protection/AC short-circuit current capability | Yes/Yes | | |
| Ground fault monitoring/grid monitoring | Yes/Yes | | |
| All-pole-sensitive residual-current monitoring unit | Yes | | |
| Protection class/surge category | I/IV | | |

| General Data | SMASBS3.7-10 | SMASBS5-10 | SMASBS6-10 |
|---|---|---|---|
| Dimensions (W x H x D) | 535mm x 730mm x 198mm | | |
| Dimensions including packaging (W x H x D) | 600mm x 800mm x 300mm | | |
| Weight/weight inlcuding packaging | 26kg/30kg | | |
| Operating temperature range in battery operation | -25°C to +60°C | | |
| Max. installation height above MSL | 3000m | | |
| Noise emission, typical (at 1m distance) | 39 dB(A) | | |
| Self-consumption standby/ self-consumption with no load | < 5W/< 10W (without supply for batteries or grid switching unit) | | |
| Topology | Transformerless | | |
| Cooling method | Convection | | |
| Ingress protection | IP65 | | |
| Climatic category | 4K4H | | |
| Max. permissable value for relative humidity | 100% | | |

| Features/Function | SMASBS3.7-10 | SMASBS5-10 | SMASBS6-10 |
|---|---|---|---|
| Secure Power Supply emergency electricity supply function | Yes (max. 16A, activated by manual switch) | | |
| Interfaces | Ethernet/WLAN/CAN/RS485 | | |
| Communication/protocols | Modbus (SMA/Sunspec)/Webconnect/Modbus RTU (RS485) | | |
| Battery communication | CAN bus | | |
| Display/Web User Interface | Integrated webserver/via smartphone, tablet, laptop | | |
| Remote monitoring | Sunny Portal via Webconnect | | |

| Accessories | SMASBS3.7-10 | SMASBS5-10 | SMASBS6-10 |
|---|---|---|---|
| Automatic transfer switch for battery backup system | Available from SMA (Sunny Boy Storage Automatic Backup Unit) and external suppliers | | |
| Sunny Home Manager/ Home Manager 2.0 | Compatible | | |
| SMA Energy Meter | Compatible | | |
| Type designation | SBS3.7-10 | SBS5.0-10 | SBS6.0-10 |

[1] VDE: AR-N 4105; PAC; r 4600, Smax 4600VA. [2] Only in battery-backup operation with an automatic transfer switch; overload capacity depends on the battery used. [3] AS4777: Iac max.: 21.7A. [4] Battery types approved by SMA. e.g. LG Chem, BYD, etc. (see www.SMA-Solar.com)

# SMA Accessories
## String Combiner

### FEATURES

- Stable housing made of glass-reinforced polyester
- IP54 rating makes indoor & outdoor installation possible
- Easy to install due to low weight and compact structure
- Integrated DC load-break switch for ulta-high safety
- For PV array voltages of 1000V and 1500V
- Collection and safeguarding of 16, 24 or 32 strings for flexibility during the system design phase

The boxes can be installed quickly, safely and easily both indoors and outdoors thanks to their compact dimensions, while their robust enclosure guarantees durability and reliable safety in the PV field.

The SMA String-Combiners with 24 and 32 string inlets are fitted with two cable outlets per pole as standard and cover – just like the Combiner with 16 string inlets – a sealing range of 17 to 38.5 millimeters. Cables with cross-sections of 70 to 400 mm can be inserted.

| Input (DC) | 16 String 1000V | 24 String 1000V | 32 String 1000V | 16 String 1500V | 24 String 1500V | 32 String 1500V |
|---|---|---|---|---|---|---|
| Rated voltage | 1000V | 1000V | 1000V | 1500V | 1500V | 1500V |
| Altitude derating (rated voltage) | 2001m to 3000m above MSL = reduction by 1.0% per 100m<br>3001m to 4000m above MSL = reduction by 1.2% per 100m | | | | | |
| Number of string inputs/ fuse holders per hole | 16 | 24 | 32 | 16 | 24 | 32 |
| Rated current | 13.75A | 12.5A | 12.5A | 17.2A | 13.75A | 10.31A |
| Fuse type* | 10.3 x 85 - 1000VDC - gPV | | | 10.3 x 85 - 1500VDC - gPV | | |
| String connection | Connection to the fuse holder | | | | | |
| Sealing range of cable gland | 5mm to 8mm | | | | | |

| Output (DC) | 16 String 1000V | 24 String 1000V | 32 String 1000V | 16 String 1500V | 24 String 1500V | 32 String 1500V |
|---|---|---|---|---|---|---|
| Rated current | 220A | 300A | 360A | 275A | 330A | 330A |
| Temperature derating (rated current) | >50°c operating temperature = reduction by 1% per K | | | | | |
| DC switch (load-break switch) | 250A/1000V | 400A/1000V | 400A/1000V | 400A/1500V | 400A/1500V | 400A/1500V |
| Surge arrester | Type 2, In = 15 kA; Imax = 40 kA | | | | | |
| DC output | Busbar (ring terminal lug M12) | | | | | |
| Number of DC outputs | 1 | 1/2 | 1/2 | 1 | 1/2 | 1/2 |
| Conductor cross-section | Busbar 70mm² to 400mm²² | | | | | |
| Sealing range of cable glands | 17mm to 38.5mm | | | | | |

*accessory required

| Enclosure/Ambient Parameters | 16 String 1000V | 24 String 1000V | 32 String 1000V | 16 String 1500V | 24 String 1500V | 32 String 1500V |
|---|---|---|---|---|---|---|
| IP degree of protection according to IEC 60529 | IP54/self-ventilated | | | | | |
| Enclosure material | Glass-fiber reinforced plastic/UV-resistant | | | | | |
| Dimensions (W x H x D) including wall mounting bracket and string cable harness | 550 x 650 x 260mm | | 590 x 790 x 285mm | 550 x 650 x 260mm | | 590 x 790 x 285mm |
| Max. weight | 24.2kg | 27.4kg | 34kg | 25kg | 28kg | 40kg |
| Protection class (according to IEC 61140) | II | II | II | II | II | II |
| Mounting type | Wall mounting | | | | | |
| Ambient temperature in operation/during storage | -25°c to +60°c/-40°c to +70°c | | | | | |
| Relative humidity | 0% to 95%, non-condensing | | | | | |
| Max. altitude above MSL | 4000mm | | | | | |

| Standards | |
|---|---|
| Compliance | CE, IEC 61439-1, IEC 61439-2 |

# SMA Accessories
## Fuel Save Controller

### FEATURES

- Top-quality, robust industrial components ensure the highest reliability
- Complete system is comprehensively tested in the unique SMA hybrid test center
- Second generation of the globally successful SMA Fuel Save Controller
- Modular system design for customized configuration and system expansion
- The right product version and system configuration for every system size

The SMA Fuel Save Controller (FSC) is a key component of the SMA solution for photovoltaic/diesel hybrid systems. It allows the use of cost-efficient solar energy to generate power in order to lower fuel consumption from diesel generators. As the interface connecting the diesel generator, the PV system and the load, it manages need-based PV feed-in according to load and generation profiles of the system as a whole.

The FSC performs comprehensive grid management functions, ensures maximum operational safety, and minimizes operating expenditure and CO2 emissions. The second generation of the FSC is available for system sizes of 100 kW to 50 MW. Hybrid systems with SMA technologies offer modular expansion at any time and optimum system control through remote monitoring.

| General System Design Characteristics | S | M | L | CUSTOMISER |
|---|---|---|---|---|
| System size (PV system size) | Up to 500kW | Up to 1000kW | Up to 5000kW | Up to 50MW |
| Maximum number of generators via measurement/communication | 3/8 | 8/8 | 8/16 | Upon request |

| General Data | S, M, L | CUSTOMISER |
|---|---|---|
| Dimensions W x H x D (mm) | 760 x 760 x 210 | Upon request |
| Weight | 48kg | |
| Degree of protection in accordance with DIN EN 60529 | IP65 | |

| Ambient Conditions | ALL VERSIONS |
|---|---|
| Operating temperature range | -10°c to +50°c |
| Maximum operating altitude | 2000m above mean sea level[1] |
| Humidity | 5% to 95% (non-condensing) |

| Power Supply | ALL VERSIONS |
|---|---|
| Voltage Supply (nominal value) | 110 to 240VAC (50 to 60Hz) |
| Power consumption (max./ average) | 200W/120W |

# SMA Accessories
## Fuel Save Controller

| Communication | S | M | L | CUSTOMISER |
|---|---|---|---|---|
| System Communication for system monitoring, SCADA and remote monitoring | Modbus/TCP, http, FTP over Ethernet 10 BASE-T and 100 BASE-T(X) | | | |
| Communcation between modules/max. cable length | Ethernet 100BASE-FX and TX 2000m[1] | | | |
| Communication to inverters/ maximum cable length | Sunny Central: Ethernet 100 BASE-FX und 100 BASE-TX (optional)/Sunny Tripower: 100m, Sunny Central: 2000m | | | |
| Communication protocol to genset controllers | Modbus/TCP Master via Ethernet 100BASE-FX and TX or CAN/CANOpen[2] | | | |
| Communication device | Switch | Router supporting remote access and VPN | | |

| Other Interfaces | S | M | L | CUSTOMISER |
|---|---|---|---|---|
| Multi-functional digital inputs for potential-free contacts | 10 | 10 | 10 | Upon request |
| Power measurement<br>- Built-in Current measurement: 1A[3] sensor input[4]<br>- Built-in Voltage measurement: 480V sensor input | 4<br>2 | 2/6<br>1/3 | 2/6<br>1/3 | Upon request<br>Upon request |
| Integrated external power meters | No | SMA FSC-11-DAQ<br>UMG 604 JANITZA[5] | SMA FSC-11-DAQ<br>UMG 604 JANITZA[5] | Upon request |

| Visualisation & Data Logging | ALL VERSIONS |
|---|---|
| Visualisation & configuration interface | Web interface for local and remote monitoring |
| Data & event logging | 5 second values for 2 days, 5 minute average values for 30 days |

| Compatible Inverters | S | M | L | CUSTOMISER |
|---|---|---|---|---|
| Inverters | Sunny Tripower<br>STP TL-30, STP US-10, STP 60 | | Sunny Tripower STP TL-30, STP US-10, STP 60,<br>Sunny Central CP-XT, Sunny Central, Sunny Central Storage | |
| Type designation | FSC-20-M | | | |

[1]Individual altitude, cable length upon request
[2]Protocol implementation upon request
[3]A sensor available upon request
[4]Cable length up to 100m
[5]Should be brought directly by the customer an d is not delivered by SMA

# SMA Accessories
## Data Manager M

YHI Part Code **SMAEDMS**


### FEATURES

- Simple integration of I/O systems & energy meters
- Can be flexibly expanded to satisfy new requirements & changing customer needs via software expansion packs
- Detailed analytics, alert system & reporting
- Convenient and secure remote monitoring and parameterization of all connected components

In combination with the new Sunny Portal powered by ennexOS, the Data Manager M optimizes communication, monitoring and control of PV systems. With its new ennexOS software platform based on the "Internet of Things" for energy management, is both easily expandable and well equipped to handle new business models of the energy market future. Plus, it is possible to change system and inverter parameters via Sunny Portal, avoiding further time on-site.

With its impressive and efficient user interface powered by ennexOS, the Data Manager M is the ideal platform and professional system interface for power supply companies, direct marketers, service technicians and PV system operators.

| Connections | SMAEDMS |
|---|---|
| Voltage supply | 2-pin connection, MINI COMBICON |
| Network (LAN) | 2 x RJ45, switched, 10BaseT/100BaseT |
| USB | 1 x USB 2.0, type A |

| Voltage Supply | SMAEDMS |
|---|---|
| Input voltage | 10V to 30V |
| Voltage supply | External power supply unit (available as an accessory) |
| Power consumption | Typically 4W |

| Ambient conditions in operation | SMAEDMS |
|---|---|
| Environment | Restricted class 3K7 reg. IEC60721-3-3 |
| Ambient temperature | -20°C to +60°C |
| Permissible range for relative humidity (non-condensing) | 5% to 95% |
| Maximum operating altitude above MSL | 0 m to 3,000m (≥70 kPa) |
| Degree of protection according to IEC 60529 | IP20 |

| General Data | SMAEDMS |
|---|---|
| Dimensions W x H x D | 161.1mm x 89.7mm x 67.2mm |
| Weight | 220g |
| Mounting location | Indoors |
| Mounting type | Top-hat rail mounting/ wall mounting |
| Status display | LEDs for system & communication status |

| Communications | SMAEDMS |
|---|---|
| Supported devices | Max. 50 devices: Inverters, I/O systems & meters, Ethernet, 100 Mbit/s |

| Features | SMAEDMS |
|---|---|
| Warranty | 2 years |
| Certificates & approvals | www.SMA-solar.com |

| Accessories (optional) | SMAEDMS |
|---|---|
| Top-hat rail power supply unit | Input: 100V to 240V AC/45Hz to 65Hz; Output: 24V DC/2.5A |
| I/O system by Moxa Europe GmbH | ioLogik E1242 (4AI/4DI/4DIO), SMA order number: eIO-E1242; ioLogik E1260(6RTD), SMA order number: eIO-E1260 |
| I/O system by WAGO Kontakttechnik GmbH & Co. KG | WAGO I/O SYSTEM 750 (8DI, 8DO, 4AI, 4AO, 2RTD), SMA order number: eIO-750Bundle |
| Type designation | EDMM-10 |

# SMA Accessories
## Com Gateway

YHI Part Code **SMACOMGW**


**FEATURES**

- Integration into existing RS485 systems
- Data loggers can be easily replaced
- Top-hat rail or wall mounting
- Supports up to 50 x RS485 devices
- Investment security for existing
- Integration into current and future SMA solutions

The SMA Com Gateway is a simple way to integrate existing PV systems into modern plant control and monitoring solutions. When upgrading a system or replacing a data logger such as the Sunny WebBox, the SMA Com Gateway enables the use of the SMA Data Manager or SMA Cluster Controller.

Easy integration into the SMA Speedwire data communication supports the incorporation into existing and future communication, system monitoring and control solutions (e.g. commercial energy management systems or the SMA Smart Home), thereby guaranteeing the security of investment for the PV system.

| Connections | SMACOMGW |
|---|---|
| Voltage supply | 2-pole connection, MINI COMBICON |
| RS485 | 6-pole connection, MINI COMBICON |
| SMA data logger/network (LAN) | 2 x RJ45, switched, 10BASE-T/100BASE-T |
| USB | 1 x USB 2.0, type A |

| Voltage Supply | SMACOMGW |
|---|---|
| Input voltage | 10V to 30V |
| Voltage supply | External power supply unit (available as an accessory) |
| Power consumption | Typically 4W |

| Ambient conditions in operation | SMACOMGW |
|---|---|
| Environment | Restricted class 3K7 reg. IEC60721-3-3 |
| Ambient temperature | -20°C to +60°C |
| Permissible range for relative humidity (non-condensing) | 5% to 95% |
| Maximum operating altitude above MSL | 0 m to 3,000m (≥70 kPa) |
| Degree of protection according to IEC 60529 | IP20 |

| General Data | SMACOMGW |
|---|---|
| Dimensions W x H x D | 161.1mm x 89.7mm x 67.2mm |
| Weight | 202g |
| Mounting location | Indoors |
| Mounting type | Top-hat rail mounting/ wall mounting |
| Status display | LEDs for system, RS485 & Ethernet status |

| Communications | SMACOMGW |
|---|---|
| RS485 devices | RS485, max. 50 devices, 1200 baud or 19200 baud |
| SMA data logger | Speedwire, 10/100 Mbit/s |

| Features | SMACOMGW |
|---|---|
| Warranty | 2 years |
| Certificates & approvals | www.SMA-solar.com |

| Accessories (optional) | SMACOMGW |
|---|---|
| Top-hat rail power supply unit | 230V/400V |
| Type designation | COMGW-10 |

# SMA TS4-R & TS4-R Duo Module Technology
## Optimiser

YHI Part Codes **SMATS4-R-M, SMATS4-R-S, SMATS4-R-O**

**FEATURES**

- Up to 192 W/m$^2$ power density
- Low thermal coefficients for greater energy production at high operating temperatures
- Selective deployment of DC optimizers as needed
- Easy installation on the ground reduces roof time
- Less components means reduced operation and maintenance costs
- Long service life due to demand-specific bypass operation
- 25 year warranty

The TS4-R module technology is a cost-effective system that fits into any PV module design, making it the right solution for every application. TS4-R ensures maximum energy yields and configuration flexibility; only fit the modules affected by partial shading or output loss. Tool free installation and selective deployment saves you time and risk whilst allowing for simple upgrades at any time. With TS4-R you can be sure of maximum energy yields, system reliability and miniumum maintenance costs.

| **Electrical Ratings** | **TS4-R-M** | **TS4-R-S** | **TS4-R-O** |
|---|---|---|---|
| Nominal DC input power | 375W | 475W | 475W |
| Absolute max. input voltage $V_{in}$ | N/A | N/A | N/A |
| Max. PV module open-circuit voltage (VOC) at STC | 52V | 75V | 75V |
| Max. current | 12A | 12A | 12A |
| Min. $V_{MPP}$ | 16V | 16V | 16V |

| **Output** | **TS4-R-M** | **TS4-R-S** | **TS4-R-O** |
|---|---|---|---|
| Output power range | 0W to 375W | 0W to 475W | 0W to 475W |
| Output voltage range | 0V to $V_{oc}$ | 0V to $V_{oc}$ | 0V to $V_{oc}$ |
| Communication | 802.15.4, 2.4 GHz | 802.15.4, 2.4 GHz | 802.15.4, 2.4 GHz |
| Impedance matching capability | No | No | Yes |
| Output voltage limit | No | No | No |
| Maximum system voltage | 1000V | 1000V | 1000V |
| Max. series fuse rating | 15A | 15A | 15A |

# SMA TS4-R & TS4-R Duo Module Technology
## Optimiser

| Mechanical | TS4-R-M | TS4-R-S | TS4-R-O |
|---|---|---|---|
| Operating temperature range | -40°c to +75°c | -40°c to +75°c | -40°c to +75°c |
| Storage temperature range | -40°c to +75°c | -40°c to +75°c | -40°c to +75°c |
| Cooling method | Natural convection | Natural convection | Natural convection |
| Dimensions (with cover) | 195.5mm x 158mm x 23mm | | |
| Weight (with cover) | 670g | 670g | 720g |
| Max. series fuse rating | IP65/IP67, NEMA 3R | | |

| Cabling | TS4-R-M | TS4-R-S | TS4-R-O |
|---|---|---|---|
| Cabling type | PV1-F | | |
| Output cable length | 1.0m - other lengths available upon request | | |
| Connector | MC4 | MC4 | MC4 |
| UV resistance | 500h with UVB light between 300 and 400mm at 65°c | | |
| Max. string voltage | 600V UL/1000V IEC | 1000V UL/1000V IEC | |
| Outer cable diameter | 6.25mm ± 0.25mm | 7.15mm ± 0.25mm | |
| Conductor cross-section | 4.0mm² (12 AWG) | 4.0mm² (12 AWG) | 4.0mm² (12 AWG) |

| Functions | TS4-R-M | TS4-R-S | TS4-R-O |
|---|---|---|---|
| Monitoring[1] | Yes | Yes | Yes |
| Shutdown[1] | - | Yes | Yes |
| Optimisation | - | - | Yes |

[1]Cloud Connect Advanced and Gateway are required

# SMA Accessories
## Sunny Home Manager 2.0

YHI Part Code **SMAHM2**


**FEATURES**

- Energy manager with integrated measuring device
- Consumption analysis of individual loads
- Optimized battery charging in SMA storage systems
- Quick plug-and-play installation
- Overview of all relevant appliances, PV generation and battery systems
- Energy balance and load data shown in interactive diagrams

The Sunny Home Manager 2.0 is SMA's intelligent energy manager and enables the most efficient use of solar energy in the home. It optimizes PV self-consumption and significantly reduces electricity costs. To do this, it measures the power of PV generation, purchased electricity as well as grid feed-in, and gives an overview of all relevant energy flows in the household. By means of local PV generation forecasts and the measured household consumption profile, the self-learning device prompts the user with energy-related action recommendations.

Operation of the controlled appliances is coordinated in a way to optimize the use of self-generated solar energy. The path to intelligent energy management is quite easy. Simply install the Sunny Home Manager 2.0 at the grid connection point, connect it to the internet router using an Ethernet cable, then register the PV system in Sunny Portal or Sunny Places free of charge and join more than 30,000 systems already installed worldwide in benefiting from greater energy efficiency.

| **Home Manager 2.0** | **SMAHM2** |
|---|---|
| Connection to the local router | Via Ethernet cable (10/100 Mbit/s, RJ45 plug) |
| Connection of SMA PV inverters and battery systems | Ethernet or WLAN via local router |
| Connection of appliances for energy management<br>For examples of applications for appliance connection and controls, see technical information on the Sunny Home Manager 2.0 product page at www.sma-solar.com | a. Direct data connection (EEBUS, SEMP)<br>(e.g., intelligent heat pumps, electric car charging stations, heating elements, household appliances, etc.)<br>b. WLAN EDIMAX SP-2101W radio-controlled socket (available via the online shop)<br>(on/off controls for household devices of up to 12A of power) |

| **Integrated Measuring Device** | **SMAHM2** |
|---|---|
| Measurement accuracy, measuring cycle | 1%, 1000 ms |
| Standard application | Measurement of purchased electricity and grid feed-in at the grid connection point |
| Alternative application | a. Measurement of PV generation power<br>b. Measurement inactive (L1, N, network) |

| **Max. number of devices on the system*** | **SMAHM2** |
|---|---|
| Total number of devices in the system | Up to 24 |
| Of which devices as appliances in active energy management | Up to 12 |

*Excluding the SMA Energy Meter

| Inputs (voltage and current) | SMAHM2 |
|---|---|
| Nominal voltage | 230V/400V |
| Frequency | 50 Hz/±5% |
| Nominal current/limiting current per line conductor | 5A/63A (>63A can be covered via external current transformers) |
| Connection cross-section | 10mm²to 16mm²(for 63A application) |
| Torque for screw terminals | 2.0Nm |

| Ambient Conditions in Operation | SMAHM2 |
|---|---|
| Ambient temperature | -25°C to +40°C |
| Storage temperature range | -25°C to +70°C |
| Protection class (according to IEC 60529) | II |
| Degree of protection (according to IEC 60529) | IP2X |
| Max. permissable value for relative humidity (non-condensing) | 5% to 90% |
| Operation altitude range | 0m to 2000m |

| General Data | SMAHM2 |
|---|---|
| Dimensions W x H x D | 70mm x 88mm x 65mm |
| Top hat-rail width units | 4 |
| Weight | 0.3kg |
| Mounting location | Switch or meter cabinet |
| Mounting type | Top-hat rail mounting |
| Status display | 3 x LED |
| Self-consumption | <3W |

| Features | SMAHM2 |
|---|---|
| Operation & visulisation | Via Sunny Portal, Sunny Places, Sunny Portal Pro |
| Update function | Automatic for the Sunny Home Manager & the connected SMA devices |
| Warranty | 2 years |
| Certificates & approvals | www.SMA-solar.com |

| Accessories | SMAHM2 |
|---|---|
| SMA Energy Meter as complement to integrated measuring device | Precise three-phase measuring, connection via Ethernet in the local network. |
| Last updated: March 2017 | |
| Type designation | HM-20 |

# SMA Accessories
## Energy Meter 20

YHI Part Code **EMETER20**


### FEATURES

- Quick plug-and-play installation
- Graphic visualization of current measured values in Sunny Portal and local web UI
- Space-saving, top-hat rail mounting in household distribution thanks to compact enclosure
- Flexible use in applications > 63A thanks to external current transformers
- 2 year warranty

A high-performance measurement solution for intelligent energy management in PV systems with SMA devices. The SMA Energy Meter calculates phase-exact and balanced electrical measured values and communicates these via Ethernet in the local network. In this way, all data on grid feed-in and purchased electricity as well as PV generation by other PV inverters can be communicated to SMA systems frequently and with a high level of precision.

| Communication | EMETER20 |
|---|---|
| Connection to the local router | Via Ethernet cable (10/100 Mbit/s, RJ45 plug) |

| Features | EMETER20 |
|---|---|
| Certificates & permits (more available on request) | www.SMA-Solar.com |

| Inputs (Voltage & Current) | EMETER20 |
|---|---|
| Nominal voltage | 230V/400V |
| Frequency | 50Hz/±5% |
| Nominal current/limiting current per line conductor | 5A/63A (>63A can be connected via external current transformers) |
| Start-up current | <25mA |
| Connection cross-section | 10mm² to 16mm² [1] (for 63A fusing) |
| Torque for screw terminals | 2.0Nm |

| Ambient Conditions in Operation | EMETER20 |
|---|---|
| Ambient temperature | -25°c to +40°c |
| Storage temperature range | -25°c to +70°c |
| Protection class (according to IEC 62103) | II |
| Degree of protection (according to IEC 60529) | IP2X |
| Maximum permissable value for relative humidity (non-condensing) | 5% to 90% [2] |
| Elevation above MSL | 0m to 2000m |

| General Data | EMETER20 |
|---|---|
| Dimensions (W x H x D) | 70mm x 88mm x 65mm |
| Top-hat rail width units | 4 |
| Weight | 0.3kg |
| Mounting location | Switch or meter cabinet |
| Mounting type | Top-hat rail mounting |
| Status display | 2 LEDs |
| Self-consumption | <3W |
| Measurement accuracy & cycle | 1% & 1000ms |

1) Mechanical 1.5mm to 25mm²
2) 95% only on up to 30 days of the year

# SMA Software
## Sunny Explorer

### FEATURES

- PC software free of charge for wireless monitoring of the PV plant via Bluetooth
- Quick overview of yields and status
- Long-term archiving via data export in CSV format
- Rapid diagnosis via access to measured values and event memory

Switch on your laptop or PC, activate the Bluetooth interface, and start Sunny Explorer – that's all that's needed to give operators and installers an overview of their PV plant. The free PC software is thus the optimum addition to the new generation of inverters with integrated Bluetooth.

The key plant data can be visualized on the PC or laptop quickly and wirelessly with Bluetooth. Energy values and events can be archived long-term by means of data export in CSV format, and processed and visualized in Excel. Sunny Explorer also provides support during inverter parameterization: because no complicated cabling is needed, PV plant maintenance is convenient and fast.

| Languages | SUNNY EXPLORER |
|---|---|
| Available languages | German, English, Spanish, Italian, French, Czech, Greek, Korean, Portuguese, Dutch |

| Communication | SUNNY EXPLORER |
|---|---|
| Inverter communciation | Bluetooth |
| Max. number of devices | 1 Master: 50 or 2 Masters: 25 |

| Hardware (minimum requirements) | SUNNY EXPLORER |
|---|---|
| Processor | PIII 800MHz (XP)/P4 1GHz (Vista) |
| Main Memory | 512MB (XP)/1GB (Vista) |
| Free hard disk space | 265MB (240MB .Net/ 25MB application) |
| Resolution | 1024 x 768 pixels |

| System Requirements | SUNNY EXPLORER |
|---|---|
| Supporting operating systems | Windows XP (Service Pack 2), Windows Vista (32 Bit), Windows 7 |
| Supporting Bluetooth stacks | Microsoft, Toshiba, BlueSoleil, Broadcom |

| System Information | SUNNY EXPLORER |
|---|---|
| Plant overview | Ideally suited for an overview over the entire PV plant by presentation of the most important data |
| System settings | Simple parameter setting for an entire device class |
| Current system values | Summary of current device data. The display of minimum and maximum values, sums and averages (depicted for every device category) provides the operator with detailed information about the current status of their PV plant |

| Device Information | SUNNY EXPLORER |
|---|---|
| Device overview | The most important device information at a single glance |
| Device settings | Individual parameter adjustment for each device |
| Current device values | Detailed information on the current values of the selected device |
| Events | Rapid event analysis with use of the device analysis functions and direct viewing of recorded events |

| Data Export | SUNNY EXPLORER |
|---|---|
| Daily data | Easy overview of the PV plant performance data stored every 5 minutes, with daily storage of a file containing the values for all inverters |
| Monthly files | Long-term overview of the PV plant daily yields, with monthly storage of a file containing the values for all inverters |
| Events | Rapid overview of all events that were written to a file for a selected time frame |

# SMA Software
## Sunny Portal

### FEATURES

- Central administraion of all customer and plant data
- Easy-to-understand reporting
- World-wide access via the Internet – via PC and mobile phones
- Individual configuration of pages and diagrams
- Individual yield and event reports sent via E-mail
- Fully automatic yield comparison of devices in a plant

Whether for a small home system or a large solar park – central administration and monitoring of several PV plants saves time and money. Plant operators, installers and SMA service technicians have access to key data at any time, from any location. Pre-configured standard pages can be easily customized or supplemented with individually designed pages.

Whether as a data table or as a highly configurable diagram: SMA solutions allow almost infinite options for analyzing measured data or visualizing yields. The yields of all inverters in a plant are compared fully automatically, permitting detection of even the smallest deviations. The powerful reporting functions provide regular updates via E-mail to help insure yields.

| Languages | SUNNY PORTAL |
|---|---|
| Available languages | German, English, Spanish, Italian, French, Czech, Greek, Korean, Portuguese, Dutch |

| Software | SUNNY PORTAL |
|---|---|
| Recommended browsers | Internet Explorer Version 7 & up, Firefox & Safari |
| Other | Javascript & cookies enabled |
| Supported data logger | Sunny WebBox |

| Plant Management | SUNNY PORTAL |
|---|---|
| Sunny Portal Account | One password for all plants in Sunny Portal |

| System Requirements | SUNNY PORTAL |
|---|---|
| Supporting operating systems | All/optimized access for mobile end devices |

| Plant Information | SUNNY PORTAL |
|---|---|
| Plant description | Overview of the key properties of the PV system |
| Annual comparison | Quick yield overview of the entire operating period |
| Plant log book | Access to messages regarding plant events |
| Device overview | Properties and parameters of the devices in the PV system |

| Page Design | SUNNY PORTAL |
|---|---|
| Standard pages | Automatic standard pages for the most common plant monitoring and presentation needs |
| Personalised pages | A variety of templates for page construction |
| Page modules | Tables, diagrams, own images, free text, plant overview ($CO_2$, remuneration, energy) |

| Visualisation of yield & measured values | SUNNY PORTAL |
|---|---|
| Diagram types | Selection of six diagram types for optimal presentation of yield & measurement values, bar graphs, area charts, and line charts (with, without, or only tags), as well as XY diagrams |
| Tables | Individual configuration of charts for all yield and measured values |
| Time periods | From 5 minutes to 1 year, various time intervals selectable |

| Monitoring | SUNNY PORTAL |
|---|---|
| Inverter comparison | Fully automatic and ongoing inverter yield comparison and E-mail alarms |
| Communication monitoring | Ongoing monitoring and, when necessary, alarms for the connection between Sunny Portal and Sunny WebBox |

| Status Reports | SUNNY PORTAL |
|---|---|
| Information reports | Daily or monthly reports on energy yield, maximum output, remuneration, $CO_2$ reduction, via E-mail, and a self-defined page can also be sent from Sunny Portal |
| Event reports | Hourly or daily reports on events, warnings, faults and errors, with personalized content and recipients |
| Report format | Text, PDF, HTML |

| Individual Access | SUNNY PORTAL |
|---|---|
| Publication of specific pages | Access via the public area on Sunny Portal by all Internet users ideal for personalized presentations on personal Web sites |
| User roles | By assigning the roles of “guest”, “standard user”, “installer” and “plant administrator”, you can easily determine who has which viewing and configuration rights |

**SolaX**
Hybrid Ready Inverter

YHI Part Codes **SKTL5000E**


**FEATURES**

- Save money by becoming independent from ever increasing energy prices.
- European and American made
- Highly effective solar power utilization and long battery life by intelligent charging module.
- Intelligent interaction mode
- 5 year warranty

When looking for a quality stand alone inverter that boasts performance and allows you to gain the most from your feed-in-tarrif, the SK-TL Series is a powerful investment.

| INVERTER | SK-TL5000E |
|---|---|
| **Input (DC)** | |
| Max. recommended DC power (W) | 5000W |
| Max. DC voltage (V) | 550V |
| Norminal DC operating voltage (V) | 360V |
| MPPT voltage range (V) | 125V - 530V |
| Max. input current (A) | 12A/12A |
| Max. short circuit current (A) | 15A/15A |
| Number of MPP trackers | 2 |
| Strings per MPP tracker | 1 |

| | SK-TL5000E |
|---|---|
| **Output (AC)** | |
| AC nominal power [W] | 4600W |
| Nominal AC voltage; range [V] | 230VAC 50/6 Hz 180~270VAC |
| AC nominal current [A] | 20A |
| Max. AC current [A] | 22.1A |
| Total harmonic distortion (THD) | < 3% |
| Power factor (rated power) | 1 |
| Displacement Power Factor | 0.9 leading to 0.9 lagging |

| **Efficiency** | SK-TL5000E |
|---|---|
| MPPT efficiency | 99.9% |
| Euro-efficiency | 97.0% |
| Max. efficiency | 97.6% |
| Standby losses | < 7W |

| **Display** | SK-TL5000E |
|---|---|
| LCD | Backlight 16 x 4 character |
| Communication interfaces | Ethernet/Dry contact/WiFi |
| LED light | 4 |
| Button | 4 |

| **Other** | SK-TL5000E |
|---|---|
| DC switch | Optional |
| Max No. of supported external charger | 1 |
| Operating temperature range | -10°C ~+50°C (derating at 40°C) |
| Storage stability range | -20°C ~+60°C |
| Altitude | < 2000m |
| Cooling concept | Forced airflow |
| Noise emission (typical) | < 40dB |
| Humidity (%) | 0~90 (non-condensing) |
| Degree of protection | IP20 (for indoor use) |
| Overvoltage category | III (electric supply side), II (PV side) |
| EMC | IEC61000-6-1/2/3/4 |
| Topology | Transformer-less |
| Dimensions (W x H x D) | 475 x 591 x 151mm |
| Weight | 21.5kg |
| Certificate | Germany, Australia, Belgium, Netherlands, Denmark, Austria, UK, Italy |

YHI Part Codes **SKBMU5000**

**FEATURES**

- Battery reverse polarity protection
- Battery anti-shock design
- 5 year warranty

The SolaX battery manager can be used with SK-TL series inverter for extending the battery capability of self use. Three options gives you flexibility when building your own energy storage system.

| EXTERNAL CHARGER | SKBMU5000 |
|---|---|
| **Battery Manager** | |
| Battery type | Lead-acid battery/lithium battery |
| Battery nominal voltage | 48V |
| Battery voltage range | 40V - 60V |
| Battery capacity | 20kWh |
| Max. charging current | 100A |
| Charging curve | 3-stage adaptive with maintenance |
| Over-current protection/ Over-temperature protection | Yes |
| Communication Interfaces | Can/RS232 |

| **Charge** | SKBMU5000 |
|---|---|
| Max. power | 4600W |
| Max. charge current | 100A (50A from grid) |

| **Discharge** | SKBMU5000 |
|---|---|
| Max. power | 4600W |
| Max. discharge current | 100A |
| Depth of discharge | 80% for lithium battery/50% for lead-acid battery (adjustable) |

| EXTERNAL CHARGER | SKBMU5000 |
|---|---|
| **Other** | |
| Operating temperature range | -10 °C~+50 °C (derating at 40) |
| Storage stability range | -20 °C~+60 °C |
| Altitude | < 2000m |
| Cooling concept | Forced airflow |
| Noise emission (typical) | < 40dB |
| Humidity (%) | 0~95 (non-condensing) |

| **Other Continued** | SKBMU5000 |
|---|---|
| Protection class | IP20 (for indoor use) |
| EMC standard | IEC61000-6-1/2/3/4 |
| Dimensions (W x H x D) | 460 x 595 x 167mm (5000) |
| Weight | 23kg |

YHI Part Codes **SKSU5000**


**FEATURES**

- European and American made
- Highly effective solar power utilisation and long battery life by intelligently designed charging module
- Intelligent interaction mode
- 5 year warranty

The SKSU series of hybrid inverter includes 1 built-in battery manager unit and solar MPPT.

This intelligent hybrid inverter provides a full solution for energy consumers to maximize the use of their generated solar energy and minimize their energy bills.

| HYBRID INVERTER | SKSU5000 |
|---|---|
| **Input Data (DC)** | |
| Max. recommended DC power | 5000W |
| Max. DC voltage | 550V |
| Norminal DC operating voltage | 360V |
| MPPT voltage range | 125V - 530V |
| Max. input current | 12A/12A |
| Max. short circuit current | 15A/15A |
| Number of MPP trackers | 2 |
| Strings per MPP tracker | 1 |

| **Output (AC)** | SKSU5000 |
|---|---|
| AC nominal power | 4600W |
| Nominal AC voltage; range | 230VAC 50Hz; 180~270VAC |
| AC nominal current | 20A |
| Max. AC current | 22.1A |
| Total harmonic distortion | < 3% |
| Power factor (rated power) | 1 |
| Displacement Power Factor | 0.95 leading...0.95 lagging |

| **Charge** | SKSU5000 |
|---|---|
| Max.power | 2500W |
| Max.charge current | 50A |

| **Discharge** | SKSU5000 |
|---|---|
| Max.power | 2500W |
| Max.discharge current | 50A |
| Depth of discharge | 80% |

| HYBRID INVERTER | SKSU5000 | | SKSU5000 |
|---|---|---|---|
| **Efficiency** | | **Display** | |
| MPPT efficiency | 99.9% | LCD | Backlight 16*4 character |
| Euro-efficiency | 97.0% | Communication interfaces | Ethernet/Dry contact/WiFi |
| Max. efficiency | 97.6% | LED light | 4 |
| Standby losses | < 7W | Button | 4 |

| EPS with internal charger | SKSU5000 |
|---|---|
| EPS rated power | 2000VA |
| EPS rated voltage, Frequency | 230VAC 50/60HZ |
| EPS rated current | 9A |
| EPS peak power | 1.5VAxPrated, 10s |
| Total harmonic distortion | < 3%THD |
| Switch time | < 5s |

| Other | SKSU5000 |
|---|---|
| DC switch | Optional |
| Max No. of supported external expansion | 0 |
| Operating temperature range | -10 °C~+50 °C (derating at 40 °C) |
| Storage stability range | -20 °C~+60 °C |
| Altitude | < 2000m |
| Cooling concept | Forced airflow |
| Noise emission (typical) | < 40dB |
| Humidity (%) | 0~90 (non-condensing) |
| Degree of protection | IP20 (for indoor use) |
| Overvoltage category | III (electric supply side), II (PV side) |
| EMC | IEC61000-6-1/2/3/4 |
| Topology | Transformer-less |
| Warranty | 5 years |
| Dimensions (W/H/D) | 680 x 595 x 167mm |
| Weight | 32kg |
| Certificate | Germany, Australia,Belgium, Netherlands, Denmark, Austria |

# SolaX
X1 Mini Inverter

YHI Part Codes **X1MINI1.1KW, X1MINI1.5KW, X1MINI2KW**


**FEATURES**

- Maximum efficiency up to 97.1%
- Small and lightweight
- IP65 protection allows indoor & outdoor use
- 5 year warranty
- Integrated WiFi

SolaX X1 Mini, a range of inverters designed and engineered specifically for the global market and the growing demand for smaller PV arrays.

With a start-up voltage of just 60V and a maximum efficiency of 97.1%, the X1 Mini promises unrivalled performance, allowing you to harvest the maximum amount of energy possible from your PV system.

| MINI INVERTER | X1MINI1.1KW | X1MINI1.5KW | X1MINI2KW |
|---|---|---|---|
| **Input (DC)** | | | |
| Max. recommended DC power | 1250W | 1650W | 2200W |
| Max. input DC voltage | 400V | 400V | 400V |
| Max. input current | 10A | 10A | 10A |
| MPPT voltage range | 70V-380V | 70V-380V | 70V-380V |
| Start input/output voltage | 60V/90V | 60V/90V | 60V/90V |
| Number of MPP tracker/ strings per MPP tracker | 1/1 | | |
| **Output** | | | |
| AC nominal power | 1100W | 1500W | 2000W |
| Max. AC power | 1100VA | 1500VA | 2000VA |
| Nominal AC voltage; range | 220V/230V/240V;180V-280V | 220V/230V/240V;180V-280V | 220V/230V/240V;180V-280V |
| AC grid frequency; range | 50Hz/60Hz; ±5Hz | 50Hz/60Hz; ±5Hz | 50Hz/60Hz; ±5Hz |
| Max. AC current | 5.5A | 7.5A | 9.5A |
| Power factor (full load) | 0.8 leading - 0.8 lagging | 0.8 leading - 0.8 lagging | 0.8 leading - 0.8 lagging |
| Total harmonic distortion (THD) | < 1.5% | < 1.5% | < 1.5% |
| **Power Consumption** | | | |
| Standby power | < 10W | < 10W | < 10W |
| **Efficiency** | | | |
| MPPT Efficiency | 99.9% | 99.9% | 99.9% |
| Euro Efficiency | 95.5% | 96% | 96.5% |
| Max. Efficiency | 97.1% | 97.1% | 97.1% |

| MINI INVERTER | X1MINI1.1KW, X1MINI1.5KW & X1MINI2KW |
|---|---|
| **Safety & Protection** | |
| Over voltage protection | YES |
| Over current protection | YES |
| DC isolation impedance monitoring | YES |
| Ground fault current monitoring | YES |
| DC injection monitoring | YES |
| RCD protection | YES |
| Safety | EN62109-1/-2; G83/2:AS4777.2-2015;VDE4105; EN50438;CQC |
| EMC | EN61000-6-2;EN61000-6-3;EN61000-3-2;EN61000-3-3 |
| **Environment Limits** | |
| Protection class | IP65 |
| Operating temperature | -20°C~+60°C (derating at 45°C) |
| Humidity (%) | 0~95%, no condensation |
| Altitude (m) | 2000m |
| Storage temperature | -20°C~+60°C |
| Noise emission | < 30dB |
| **Dimension & Weight** | |
| Dimensions (W x H x D) | 248 x 350 x 124mm |
| Weight | 7kg |
| **General Data** | |
| Topology | Transformerless |
| Communication interface | RS 485/ WiFi/ DRM/ USB |
| LED display | 6 LED |
| Warranty | 5 years |
| Cooling type | Natural |

# SolaX
## X1 Air Inverter

YHI Part Codes **X1AIR2.5KW, X1AIR3.3KW**


The X1 Air series are a high quality dual MPPT inverter offering efficiency and reliability at an unbeatable cost.

SolaX have developed a range of single phase inverters unrivaled in the industry for their quality, reliability and efficiency. The SolaX single phase inverters boast a wide MMPT voltage range to allow for more energy harvesting and have a maximum input voltage of 600V, with maximum efficiency of 97.6%

| AIR INVERTER | X1AIR2.5KW | X1AIR3.3KW |
|---|---|---|
| **Input (DC)** | | |
| Max. recommended DC power | 2700W | 3450W |
| Max. input DC voltage | 600V | |
| Max. input current | 10A | |
| MPPT voltage range | 100V-580V | |
| Start input/output voltage | 65V/120V | |
| Number of MPP tracker/ strings per MPP tracker | 1/1 | |
| **Output** | | |
| AC nominal power | 2500W | 3300W |
| Max. AC power | 2500VA | 3300VA |
| Nominal AC voltage; range | 220V/230V/240V;180V-280V | |
| AC grid frequency; range | 50Hz/60Hz; ±5Hz | |
| Max. AC current | 12A | 15A |
| Power factor (full load) | 0.8 leading - 0.8 lagging | |
| Total harmonic distortion (THD) | < 1.5% | < 1.5% |
| **Power Consumption** | | |
| Input Standby power | < 10W | < 10W |
| **Efficiency** | | |
| MPPT Efficiency | 99.9% | 99.9% |
| Euro Efficiency | 96.5% | 96.5% |
| Max. Efficiency | 97.6% | 97.6% |

| AIR INVERTER | X1AIR2.5KW & X1AIR3.3KW |
|---|---|
| **Safety & Protection** | |
| Over voltage protection | YES |
| Over current protection | YES |
| DC isolation impedance monitoring | YES |
| Ground fault current monitoring | YES |
| DC injection monitoring | YES |
| RCD protection | YES |
| Safety | EN62109-1/-2; G83/2; AS4777.2-2015; VDE4105; EN50438;CQC |
| EMC | EN6 l 000-6-2; EN6 l 000-6-3; EN6 l 000-3-2; EN6 l 000-3-3 |
| **Environment Limits** | |
| Protection class | IP65 |
| Operating temperature | -20°C~+60°C (derating at 45°C) |
| Humidity (%) | 0~95%, no condensation |
| Altitude | 2000m |
| Storage temperature | -20 °C~+6°C |
| Noise emission | < 30dB |
| **Dimension & Weight** | |
| Dimensions (W x H x D) | 323 x 402 x 119mm |
| Weight | 9.5kg |
| **General Data** | |
| Topology | Transformerless |
| Communication interface | RS 485/ WiFi/ DRM/ USB |
| LED display | 11 LED |
| Warranty | 5 years (10 years optional) |
| Cooling type | Natural |

YHI Part Codes **X1BOOST5KW**


The X1 Boost series are a high quality single MPPT inverter offering efficiency and reliability at an unbeatable cost.

SolaX have developed a range of single phase inverters, unrivaled in the industry for their quality, reliability and efficiency. The SolaX single phase inverters boast a wide MPPT voltage range to allow for more energy harvesting and have a maximum input voltage of 600V, with a maximum effeciency of 97.8%.

| BOOST INVERTER | X1BOOST5KW |
|---|---|
| **Input (DC)** | |
| Max. recommended DC power | 5200W |
| Max. DC voltage | 600V |
| Norminal DC operating voltage | 360V |
| Max. Input current | 12A/12A |
| Max. short circuit current | 15A/15A |
| MPPT voltage range | 125V-580V |
| MPPT voltage range (full load) | 220V-550V |
| Start input voltage | 110V |
| Start output voltage | 150V |
| Shut down input voltage | 70V |
| No. of MPP trackers | 2 |
| Strings per MPP tracker | 1 |
| **Output (AC)** | |
| AC nominal power | 4999W |
| Max. AC power | 4999VA |
| Rated grid voltage (AC voltage range) | 220V/230V/240V;180V-280V |
| Rate grid frequency (AC range) | 50Hz(45Hz to 55Hz)/60Hz(55Hz to 65hz) |
| Max. output current (A) | 21A |
| Displacement power factor | 0.8 overexcited to 0.8 underexcited |
| Total harmonic distortion (THD) | < 2% |

| BOOST INVERTER | X1BOOST5KW |
|---|---|
| **Efficiency** | |
| MPPT Efficiency | 99.9% |
| Euro Efficiency | 97.0% |
| Max. Efficiency | 97.8% |
| **Power Consumption** | |
| Input standby power | < 2W |
| **Standard** | |
| Safety | IEC62109-1/-2 AS3100 |
| EMC | EN 61000-3-2/EN 61000-3-3/EN 61000-3-11/EN 61000-3-12/ EN 61000-6-2/EN 61000-6-3 |
| Certification | VDE 0126-1-1 A1:2012/VDE-AR-N 4105/G83/G59/AS4777 |
| **Environment Limits** | |
| Protection class | IP65 |
| Operating temperature | -20°C~+60°C(derating at +45°C) |
| Humidity (%) | 0~95%, no condensation |
| Altitude | < 2000m |
| Storage temperature | -20°C~+60°C |
| Noise emission | < 25db |
| Mounting | Wall hanging |
| **Others** | |
| Dimensions (W x H x D) | 420 x 339 x 143mm |
| Weight | 16.7kg |
| Cooling Concept | Natural |
| Topology | Transformerless |
| Communication | Wifi, RF, Meter, RS485, USB, DRM |
| LCD display | LCD |
| Button | 4 (CapSense Button) |
| Warranty | 5 years |

# SolaX
## X1 Single Phase Hybrid HV Inverter

YHI Part Codes **X1-3000EHV, X1-5000EHV**


More than just an inverter, the innovative X-Hybrid is an intelligent energy management system that stores surplus energy in batteries for later use.

The X-Hybrid makes it possible to utilize solar power time-independently by storing unused capacity. It converts and directs solar power to where it is needed, when it is needed. X-Hybrid is also supplied EPS (Emergency Power Supply) function, allowing the end-user to user their stored energy in the event of a power outage.

| SINGLE PHASE HYBRID HV INVERTER | X1-3000EHV | X1-5000EHV |
|---|---|---|
| **Input (DC)** | | |
| Max. DC Input power | 4000W | 6000W |
| Max. DC Input voltage | 600V | |
| Max. Input current (A) | 10/10 | |
| MPPT Voltage range | 125-550V | |
| Min. DC Voltage/Start Voltage | 360V | |
| No. of MPP trackers/ Strings per MPP tracker | 2 / 1 | |
| **Output (AC)** | **X1-3000EHV** | **X1-5000EHV** |
| AC Nominal Power | 3000W | 4999W |
| Max. AC Power | 3000W | 4999W |
| Nominal AC Voltage; Range | 230 (180 to 270) | |
| AC Grid Frequency; Range | 50/60Hz | |
| Max. AC Current | 14.4A | 21.7A |
| Power Factor (full load) | 0.8 leading ... 0.8 lagging | |
| Total Harmonic Distortion (THD) | <2% | |
| **Output DC (Battery)** | **X1-3000EHV & X1-5000EHV** | |
| Battery voltage range | 85-400V | |
| Recommended battery voltage | 300V | |
| Max. charging/discharging power | 6000W | |
| Max. charging/discharging power | 20A | |
| Communication interfaces | CAN/RS485 | |
| Reverse connect protection | Yes | |

# SolaX
## X1 Single Phase Hybrid HV Inverter

| SINGLE PHASE HYBRID HV INVERTER | X1-3000EHV | X1-5000EHV |
|---|---|---|
| **EPS Output (with battery)** | | |
| EPS rated power | 4000VA | 5000VA |
| EPS rated voltage, frequency | 230V, 50/60Hz | 230V, 50/60Hz |
| EPS rated current | 17.4A | 21.7A |
| EPS peak power, duration | 8000W, 10 seconds | |
| Switch time (s) | <0.5 seconds | |
| Total harmonic distortion (THD, linear load) | <2% | |
| **Efficiency** | **X1-3000EHV & X1-5000EHV** | |
| MPPT Efficiency | 99.9% | |
| Euro Efficiency | 97.0% | |
| Max. Efficiency | 97.8% | |
| Euro Efficiency | 98.5% | |
| **Power Consumption** | | |
| Standby consumption (night) | <7W | |
| EMC | YES | |
| **Standard** | **X1-3000EHV & X1-5000EHV** | |
| Safety | IEC62109-1/-2 AS3100 | |
| EMC | EN 61000-3-2/EN 61000-3-3/EN 61000-3-11/EN 61000-3-12/EN 61000-6-2/EN 61000-6-3 | |
| Certification | VDE 0126-1-1 A1:2012/VDE-AR-N 4105/G83/G59/AS4777 | |
| **Environment Limits** | **X1-3000EHV & X1-5000EHV** | |
| Protection class | IP65 | |
| Operating temperature | -20°C~+60°C (derating at +45°C) | |
| Humidity (%) | 0~95%, no condensation | |
| Altitude | <2000m | |
| Storage temperature | -20°C~+60°C | |
| Noise emission | <30dB | |
| Mounting | III (electric supply side), II (PV side) | |
| **Others** | **X1-3000EHV & X1-5000EHV** | |
| Dimensions (W x H x D) | 482mm x 464mm x 182mm | |
| Weight | 26.9kg | |
| Cooling Concept | Natural | |
| Topology | Transformerless | |
| Communication | Ethernet, Meter, WIFI (optional), RF (optional), DRM, USB, ISO alarm, Parallel operation | |
| LCD display | Backlight 20 x 4 character | |
| Warranty | 5-10 years | |

YHI Part Codes **X1-FIT-3700E, X1-FIT-5000E**


**FEATURES**

- Integrated WiFi monitoring
- High charge/discharge rate
- Charge from the grid
- High performance lithium-ion batteries
- Use solar energy 24/7

The AC retrofit hybrid inverter can be installed on existing PV installations, on new systems that require charge from grid flexibility, but also in properties with no solar - enabling the end user to store cheap overnight electricity for use during high-tariff periods.

| RETROFIT INVERTER | X1-FIT-3700E | X1-FIT-5000E |
|---|---|---|
| **Input (AC)** | | |
| Nominal AC power | 3680W | 4999W |
| Max. AC current | 16A | 21.7A |
| Rated grid voltage [AV voltage range] | 220V/230V/240V (180V to 270V) | |
| Rated grid frequency (Hz) | 50/60Hz | |
| Displacement power factor | 0.8 leading to 0.8 lagging | |

| **Output (AC)** | X1-FIT-3700E | X1-FIT-5000E |
|---|---|---|
| AC Nominal Power | 3680W | 4999W |
| Max. AC Power | 6000W | 10000W |
| Rated grid voltage [AV voltage range] | 220V/230V/240V (180V to 270V) | |
| Rated grid frequency | 50/60Hz | |
| Nominal AC Current | 16A | 21.7A |
| Displacement power factor | 0.8 leading to 0.8 lagging | |
| Total Harmonic Distortion (THD) | <2% | |

| **EPS Output (with battery)** | X1-FIT-3700E | X1-FIT-5000E |
|---|---|---|
| EPS max power (VA) | 5000 | 6000 |
| EPS rated power (VA) | 4000 | 4000 |
| EPS rated current (A) | 17.4 | 21.7 |
| EPS max current (A) | 21.7 | 26 |
| EPS peak power (W) | 8000, 10s | |

| RETROFIT INVERTER | X1-FIT-3700E & X1-FIT-5000E |
|---|---|
| **Battery** | |
| Battery voltage range | 85V-400V |
| Recommended battery voltage | 300V DC |
| Max. charge/discharge power | Up to 6000W |
| Max. charge/discharge power | 20A (adjustable) |
| Peak charge/discharge power | 30A, 30s |

| **Environment Limit** | X1-FIT-3700E & X1-FIT-5000E |
|---|---|
| Ingress protection | IP65 |
| Operating temperature range | -20..... +60°C (derating at +45 °)C |
| Humidity | 0~95 (non-condensing) |
| Over voltage category | III (electric supply side), II (battery side) |

| **Dimension & Weight** | X1-FIT-3700E & X1-FIT-5000E |
|---|---|
| Dimensions [WxHxD] (mm) | 460*477*181.5 |
| Weight | 26.85kg |
| Communication | Ethernet, Meter, Wifi (optional), RF (optional), DRM, USB, ISO alarm |
| Standard warranty | 5 years |

| **Efficiency** | X1-FIT-3700E | X1-FIT-5000E |
|---|---|---|
| Max. battery charge efficiency (AC t=o BAT) (@full load) | 95.60% | 95.60% |
| Max. battery discharge efficiency (BAT to AC) (@full load) | 97.00% | 97.00% |

YHI Part Codes **ZDNYTL10000, ZDNYTL12000, ZDNYTL15000, ZDNYTL17000, ZDNYTL20000**


SolaX have developed a range of three phase inverters unrivalled in the industry for their quality, reliability and efficiency.

The X3 three phase inverters boast a wide MPPT voltage range to allow for more energy harvesting, and at 98.2% have the highest maximum efficiency available in the market today. In addition all SolaX X3 inverters are IP65 rated, have an integrated DC switch, WiFi as standard and an 'OptiCool' temperature controlled fan.

| ZDNY THREE PHASE INVERTER | ZDNYTL10000 | ZDNYTL12000 | ZDNYTL15000 | ZDNYTL17000 | ZDNYTL20000 |
|---|---|---|---|---|---|
| **Input (DC)** | | | | | |
| Max. DC Input power | 10260W | 12300W | 15370W | 17420W | 20500W |
| Max. DC Input voltage | 1000V | | | | |
| Max. Input current (A) | A:22/B:11 | A:22/B:11 | A:22/B:22 | A:22/B:22 | A:22/B:22 |
| MPPT Voltage range | 320V-800V | 380V-800V | 350V-800V | 400V-800V | 480V-800V |
| Min. DC Voltage/Start Voltage | 220V/250V | | | | |
| No. of MPP trackers/ Strings per MPP tracker | 2/A:3 B:1 | 2/A:3 B:1 | 2/A:3 B:3 | 2/A:3 B:3 | 2/A:3 B:3 |
| **Output (AC)** | | | | | |
| AC Nominal Power | 10000W | 12000W | 15000W | 17000W | 20000W |
| Max. AC Power | 10000W | 12000W | 15000W | 17000W | 20000W |
| Nominal AC Voltage; Range | 3/N/PE 230V/400V; 160V-280V | | | | |
| AC Grid Frequency; Range | 50Hz; 44-55Hz | | | | |
| Max. AC Current | 16A | 20A | 24A | 25A | 29A |
| Power Factor (full load) | 0.9 leading ... 0.9 lagging | | | | |
| Total Harmonic Distortion (THD) | < 3% | | | | |
| **Efficiency** | | | | | |
| MPPT Efficiency | 99.9% | | | | |
| Euro Efficiency | 97.6% | | | | |
| Max. Efficiency | 98.2% | | | | |

| ZDNY THREE PHASE INVERTER | ZDNYTL10000 | ZDNYTL12000 | ZDNYTL15000 | ZDNYTL17000 | ZDNYTL20000 |
|---|---|---|---|---|---|
| **Power Consumption** | | | | | |
| Input standby power | < 10W | | | | |
| Internal Consumption (Night) | < 1W | | | | |
| **Safety and Protection** | | | | | |
| DC Disconnect | Yes | | | | |
| Internal Overvoltage Protection | Yes | | | | |
| DC Current/Insulation Monitoring | Yes/Yes | | | | |
| Grid Monitoring/Earth Fault Monitoring | Yes/Yes | | | | |
| Islanding Protection | Yes | | | | |
| RCD Protection | Yes | | | | |
| Protection Class/Overvoltage Category | IEC62103 (1)/IEC60664-1 (3) | | | | |
| **Environment Limits** | | | | | |
| Degree Of Protection | IP65 (IP54 for fan) | | | | |
| Operating temperature | -20°C~+60°C(derating at +45°C) | | | | |
| Humidity (%) | 0~95%, no condensation | | | | |
| Altitude Limit (m) | < 2000 | | | | |
| Storage temperature | -20°C~+60°C | | | | |
| Noise emission | < 50dB | | | | |
| **Others** | | | | | |
| Dimensions (W x H x D) | 513 x 651.5 x 207mm | | | | |
| Weight | 48kg | 48kg | 50.5kg | 50.5kg | 51kg |
| Cooling Concept | 'OptiCool' temperature controlled fan | | | | |
| Topology | Transformerless | | | | |
| Communication Interfaces | Ethernet/WiFi | | | | |
| LCD display | Graphic LCD | | | | |
| Warranty | 5 years | | | | |
| **Standard** | | | | | |
| Safety | IEC62109-1/-2 AS3100 | | | | |
| EMC | EN 61000-3-2/EN 61000-3-3/EN 61000-3-11/EN 61000-3-12/ EN 61000-6-2/EN 61000-6-3 | | | | |
| Certification | VDE 0126-1-1 A1:2012/VDE-AR-N 4105/G83/G59/AS4777 | | | | |

YHI Part Code **X3HB6000WDT, X3HB10000WDT**


More than just an inverter, the innovative X-Hybrid is an intelligent energy management system that stores surplus energy in batteries for later use.

The X-Hybrid makes it possible to utilize solar power time-independently by storing unused capacity. It converts and directs solar power to where it is needed, when it is needed. X-Hybrid is also supplied EPS (Emergency Power Supply) function, allowing the end-user to user their stored energy in the event of a power outage.

| X3 THREE PHASE INVERTER | X3HB6000WDT | X3HB10000WDT |
|---|---|---|
| **Input (DC)** | | |
| Max. DC Input power | 8000W | 13000W |
| Max. DC Input voltage | 720V | |
| Max. Input current (A) | 11/11 | 20/11 |
| MPPT Voltage range | 280V-800V | 330V-800V |
| Min. DC Voltage/Start Voltage | 720V | |
| No. of MPP trackers & Strings per MPP tracker | 2 & 1 | 2 & 2/1 |

| **Output (AC)** | X3HB6000WDT | X3HB10000WDT |
|---|---|---|
| AC Nominal Power | 6000W | 10000W |
| Max. AC Power | 6000W | 10000W |
| Nominal AC Voltage; Range | 400 (360 to 440) | |
| AC Grid Frequency; Range | 50/60Hz | |
| Max. AC Current | 9A | 15A |
| Power Factor (full load) | 0.8 leading ... 0.8 lagging | |
| Total Harmonic Distortion (THD) | <2% | |

| **Efficiency** | X3HB6000WDT & X3HB10000WDT |
|---|---|
| MPPT Efficiency | 99.9% |
| Euro Efficiency | 97.0% |
| Max. Efficiency | 97.6% |

| X3 THREE PHASE INVERTER | X3HB6000WDT | X3HB10000WDT |
|---|---|---|
| **Output DC (Battery)** | | |
| Battery voltage range | 170-500W | |
| Recommended battery voltage | 8000W | 10000W |
| Max. charging/ discharging power | 11/11 | 20/11 |
| Max. charging/ discharging current | 25A | |
| Communication interfaces | CAN/RS485 | |
| Reverse connect protection | No | |

| EPS Output (with battery) | X3HB6000WDT | X3HB10000WDT |
|---|---|---|
| EPS rated power | 6000W | 10000W |
| EPS rated voltage, frequency | 400/380V, 50/60Hz | |
| EPS rated current | 400 (360 to 440) | |
| EPS peak power, duration (sec) | 12000W, 60s | 16000W, 60s |
| Switch time (sec) | <0.5s | |
| Total harmonic distortion (THD) | <2% | |
| Parallel operation | Yes | |

| Standard | X3HB6000WDT & X3HB10000WDT |
|---|---|
| Safety | IEC62109-1/-2 AS3100 |
| EMC | EN 61000-3-2/EN 61000-3-3/EN 61000-3-11/EN 61000-3-12/EN 61000-6-2/EN 61000-6-3 |
| Certification | VDE 0126-1-1 A1:2012/VDE-AR-N 4105/G83/G59/AS4777 |

| Environment Limits | X3HB6000WDT & X3HB10000WDT |
|---|---|
| Protection class | IP65 |
| Operating temperature | -20°C~+60°C (derating at +45°C) |
| Humidity (%) | 0~95%, no condensation |
| Altitude | <2000m |
| Storage temperature | -20°C~+60°C |
| Noise emission | <30dB |
| Mounting | III (electric supply side), II (PV side) |

YHI Part Code **X3-6000T, X3-10000T**


**FEATURES**

- Secure & reliable with software & hardware protection
- Maximum efficiency up to 98.5%
- Wide MPPT voltage range & two MPPT trackers
- High protection class – IP65
- Multiple protections: Over voltage/under voltage, earth protection, anti-islanding, overload, over temperature and RCD protection

The new X3-MIC range of inverters from SolaX offers a small, compact and easy to install solution for three-phase installations of 6kW & 10kW.

| MIC THREE PHASE INVERTER | X3-6000T | X3-10000T |
|---|---|---|
| **Input (DC)** | | |
| Max. DC Input power | 7800W | 12000W |
| Max. DC Input voltage | 800V | 1000V |
| Max. Input current (A) | 11/11 | |
| MPPT Voltage range | 285V-750V | 470V-800V |
| Min. DC Voltage/Start Voltage | 600V | |
| No. of MPP trackers/ Strings per MPP tracker | 2/A:2 B:1 | 2/A:2 B:1 |
| **Output (AC)** | | |
| AC Nominal Power | 6000W | 10000W |
| Max. AC Power | 6000W | 10000W |
| Nominal AC Voltage; Range | 3/N/PE, 230/400(310-480) | |
| AC Grid Frequency; Range | 50/60;+-5 | |
| Max. AC Current | 9.6A | 16A |
| Power Factor (full load) | 0.8 leading ... 0.8 lagging | |
| Total Harmonic Distortion (THD) | <2% | |
| **Efficiency** | | |
| MPPT Efficiency | 99.9% | |
| Euro Efficiency | 97.8% | 98% |
| Max. Efficiency | 98.3% | 98.5% |

| Power Consumption | X3-6000T & X3-10000T |
|---|---|
| Night consumption | <3W |

| Standard | X3-6000T & X3-10000T |
|---|---|
| Safety | EN62109-1/-2 |
| EMC | EN61000-6-1;EN61000-6-2;EN61000-6-3;EN61000-3-2;EN61000-3-3 |
| Certification | AS4777.2-2015; VDE4105 |

| Environment Limits | X3-6000T & X3-10000T |
|---|---|
| Protection class | IP65 |
| Operating temperature | -25~+60 (derating at 45) |
| Humidity (%) | 0~100, condensing |
| Altitude | 4000 (derating at 3000) |
| Storage temperature | -25~60 |
| Noise emission | <35 |
| Mounting | III(electric supply side), II(PV side) |

| General | X3-6000T & X3-10000T | | | | | | |
|---|---|---|---|---|---|---|---|
| Dimensions (W x H x D) | 460 x 400 x 180mm | | | | | | |
| Weight | 23kg | 23kg | 23kg | 26kg | 26kg | 26kg | 26kg |
| DC input type | MC4 | | | | | | |
| Cooling concept | Natural | | | | | | |
| Topology | Transformerless | | | | | | |
| Earth fault alarm | Yes (80dB) | | | | | | |
| Communication | RS485/DRM/WIFI (optional)/LAN (optional)/USB/RF | | | | | | |
| LED | 3 | | | | | | |
| LCD display | Backlight 20 x 4 character | | | | | | |
| Warranty | 5 | | | | | | |

YHI Part Codes **SKEPSBOX, X3EPSBOX**



| EPS BOX | SKEPSBOX | X3EPSBOX |
|---|---|---|
| **Grid** | | |
| MAX. AC Input Current | 63A | 32A |
| Rated AC Voltage | 230V | 400V |
| Rated AC Frequency | 50Hz/60Hz | 50Hz/60Hz |
| **Load** | | |
| Rated Load Output Current, Grid Mode | 63A | 32A |
| Rated Load Output Current, EPS Mode | 17A | See inveter limits |
| Rated Grid Voltage | 230V | 400V |
| Rated Grid Frequency | 50Hz/60Hz | 50Hz/60Hz |
| **General Information** | | |
| Dimension (W x H x D) | 300 x 220 x 170mm | 350 x 220 x 170mm |
| Operating Temperature Range | -10°C~+50°C | -10°C~+50°C |
| Degree Of Protection | IP20 | IP20 |
| Warranty | 1 Year | 1 Year |

Inverter & Battery Compatibility Matrix

| | AC Battery | Phantom | Force LV | Force HV | Powercube | Triple Power |
|---|---|---|---|---|---|---|
| ENPHASE. IQ7 | 👍 | | | | | |
| ENPHASE. IQ7+ | 👍 | 👍 | 👍 | | | |
| SOLAX POWER SKTL | | 👍 | 👍 | | | |
| SOLAX POWER SKSU | | | | 👍 | 👍 | 👍 |
| SOLAX POWER X1 Hybrid | | | | 👍 | 👍 | 👍 |
| SOLAX POWER X1 Retrofit | | | | 👍 | 👍 | 👍 |
| SOLAX POWER X3 Hybrid | | | | | | |
| SMA Sunny Island | | 🕒 | 🕒 | | | |
| SMA Sunny Boy Storage | | | | 🕒 | 🕒 | |

**KEY** 👍 = Supported 🕒 = Support Pending (Due 2020)

# 4

The introduction of the Energy Storage System is set to revolutionise the solar industry. YHI provide energy storage solutions from world-class brands SolaX Power, Pylontech and Enphase.

| PARTCODE | DESCRIPTION | VOLTAGE | KW | IP RATING |
|---|---|---|---|---|
| **Enphase** | | | | |
| B270-1200-LN-ETC | Enphase 270W AC Battery | 230V | 0.27kW | IP20 |
| **SolaX Power** | | | | |
| PS-SKTL-3.3LG | SolaX 3.3kW Powerstation 3.3kW LG Battery | 48V | 3.3kW | IP54 |
| PS-SKTL-6.5LG | SolaX 6.5kW Powerstation 6.5kW LG Battery | 48V | 6.5kW | IP54 |
| MC0500 | SolaX Triple Power Master Box | N/A | N/A | IP55 |
| T45 | SolaX Triple Power Battery Module 4.5kWh | 100.8V | 4.5kW | IP55 |
| T63 | SolaX Triple Power Battery Module 6.3kWh | 100.8V | 6.3kW | IP55 |
| **Pylontech** | | | | |
| XLIBPLUS | Pylontech Lithium Phantom Battery Plus | 48V | 2.4kWh | IP20 |
| XLIBPHANT | Pylontech Lithium Phantom Battery | 48V | 2.4kWh | IP20 |
| US3000 | Pylontech Lithium Phantom Battery 3.5kWh | 48V | 3.5kWh | IP20 |
| N/A | Pylontech Force L1 | 44.5~54V | 7.10kWh | IP55 |
| N/A | Pylontech Force L2 | 44.5~54V | 10.65kWh | IP55 |
| N/A | Pylontech Force H1 | 48V | 24.86kWh | IP55 |
| N/A | Pylontech Force H2 | 96V | 14.21kWh | IP55 |
| N/A | Pylontech Powercube | N/A | N/A | IP20 |
| **Storage Accessories** | | | | |
| OD1310-LV | Pylontech Outdoor 6 Battery Cabinet | N/A | N/A | IP65 |
| XLIBCAB | Pylontech Indoor 4 Battery Cabinet | N/A | N/A | IP20 |
| XLIBCAB2 | Pylontech Indoor 7 Battery Cabinet | N/A | N/A | IP20 |
| ELTK-HEXCAB | Eltek Battery Cabinet | N/A | N/A | IP55 |
| RAFS-600 | Battery Cabinet Shelf | N/A | N/A | N/A |

# Enphase AC Battery
Storage

YHI Part Code **B270-1200-LN-ETC**

Enphase Partcode: B270-1200-LN-I-AU00-RV0


**FEATURES**

- Lithium iron phosphate (LFP) chemistry for long cycle life
- Modular design promotes redundancy
- Interconnects with standard household AC wiring
- No high voltage DC in system
- Cells safety-tested and certified by TÜV Rheinland
- Prismatic cells are highly stable over time

The Enphase AC Battery™ is simple to install, safe, very reliable, and provides the lowest lifetime energy cost for both new solar customers and retrofit customers. In addition, as an installer, you can design the right system size to meet the needs of the homeowner.

**Wall Mount Bracket options available for mounting Enphase AC Battery. See below for specifications and product codes.**

| BATTERY | B270-1200-LN-ETC |
|---|---|

## Output Data (AC)

| | |
|---|---|
| Peak output power | 270VA |
| Rated (continuous) output power | 260VA |
| Nominal frequency | 50Hz |
| Extended line to neutral voltage range | 184 to 276VAC |
| Extended frequency range | 45 to 55Hz |
| Power factor | 0.7 leading to 0.7 lagging |
| Maximum units per 20 A branch circuit | 13 |
| Peak inverter efficiency | 96.9% |

## Battery Chemistry

| | |
|---|---|
| Capacity | 1.2kWh |
| Depth of discharge (usable capacity) | >95% |
| Ambient temperature range | -20°C to 45°C |
| Chemistry | Lithium Iron Phosphate (LFP) |
| Cell safety certifications | TUV Rheinland, UL |
| Roundtrip cell efficiency[1] | 96% |

## Mechanical Data

| | |
|---|---|
| Dimensions | 390 (W) x 325 (H) x 220 (D) mm |
| Weight | 25kg |
| Installation | Wall mounted in an indoor, unoccupied space using standard AC wiring in conduit or in wall, where allowed. |
| Enclosure | IP20 |
| Cooling | Natural convection – No active or passive cooling infrastructure required |
| Grid configuration | TN-C-S |

## Features and Compliance

| | |
|---|---|
| Compatibility | Compatible with PV systems using the Enphase Envoy-S™ Metered gateway |
| Communication | Power Line Communication (PLC), TCP/IP through Envoy-S |
| Services | Maximising self-consumption, time of use optimisation, power export limiting2 |
| Monitoring | Enlighten Manager and MyEnlighten monitoring options |
| Compliance | AS/NZS 4777.2, AS/NZS CISPR 22, AS/NZS 62040.1.1, UN 38.3 |
| Limited Warranty[3] | >80% capacity, up to 10 years or 7300 cycles |

1. At 25°C.
2. Optional.
3. Whichever occurs first. Restrictions apply.

## Wall Mount Accessories

BWM-450MM-A

Accommodates 16 inch (400mm) battery-to-battery spacing
To suit 450mm stud centres
Weight: 3.5 kg

BWM-600MM-A

Accommodates 16 inch (400mm) battery-to-battery spacing
To suit 600mm stud centres
Weight: 3.5 kg

YHI Part Codes **PS-SKTL-3.3LG, PS-SKTL-6.5LG, PS-SKTL-6.6X2LG**

The Power Station is SolaX's latest product release, offering a highly attractive, scalable all-in one PV storage solution that includes a 5kW X1-Hybrid inverter, battery management system and either one or two LG Chem 6.5kWh lithium batteries.

The SolaX Power Station is the first all-in-on storage solution that is scalable with ease, allowing customers the option of starting their battery storage journey with one 6.5kWh battery and adding another as required, or selecting a full 13kWh system from the start.

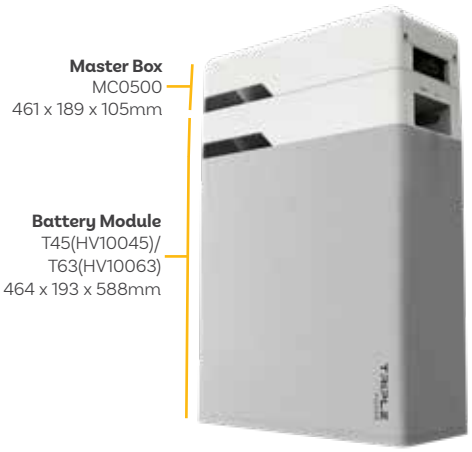
All components of the Power Station including cabling and circuit breakers are housed in a sleek compact case that is only 36cm deep and finished in a contemporary neutral colour palette.

| STORAGE BATTERY | PS-SKTL3.3LG | PS-SKTL6.5LG | PS-SKTL6.6X2LG |
|---|---|---|---|
| **General Information** | | | |
| Module Type | LG rack mount | | |
| Battery Type | Li-ion (NMC) | | |
| Components | Battery Cells + BMS + Protection Device (Beaker) | | |
| **Performance** | | | |
| | **PS-SKTL3.3LG** | **PS-SKTL6.5LG** | **PS-SKTL6.6X2LG** |
| Nominal capacity[1] (Ah) | 63 | 126 | 252 |
| Nominal energy[1] (kWh) | 3.3 | 6.5 | 13 |
| Nominal voltage (V) | 51.8 | | |
| Operating voltage (V) | 42~58.8 | | |
| Max. charge/discharge current[2] (A) | 63 | 63 | 100 |
| Max. charge/discharge power[2] (kW) | 3.3 | 3.3 | 5 |
| Continuous charge/discharge power[2] (kW) | 3.0 | 3.0 | 5 |
| Round-trip efficiency | ≥95 | | |
| Cooling | Natural convection | | |
| Communication interface | Protocol - CAN 2.0B or Modbus 485 / Port - RJ48 | | |
| Dry contact | 2cH (Warning or Fault 1/Fault 2) | | |
| Cabinet dimensions | 750*1570*367 | | |
| **Operating Conditions** | | | |
| | **PS-SKTL3.3LG** | **PS-SKTL6.5LG** | **PS-SKTL6.6X2LG** |
| Operating temperature range (°C) | -10~45 | | |
| Optimal operating temperature (°C) | 15~30 | | |
| Self-discharge rate during storage (°C | Less than 6% per year at 25 | | |
| Humidity (%) | 5~95 | | |
| IP Rating | IP54 | | |

[1] **At standard conditions:**
Charge: CC-CV, with 0.3CC, to 58.8V (3.15A cut off) at 25°C
Discharge: CC, with 0.3CC, to 42V at 25°C
[2] **It can be de-rated in accordance with the power limit by BMS.**

# SolaX
## Triple Power Storage Battery

YHI Part Code **MC0500, T45, T63**




### FEATURES

- Scalable up to 25.2kWh
- Up to 6kW charge/discharge
- Floor and wall mountable
- High voltage
- Compact Design
- Compatible with: X1 Hybrid, X1-Fit, X3-Hybrid and X3-Fit

SolaX Power is delighted to announce compatibility with the new Triple Power high-voltage battery solution. Designed and manufactured in partnership with SolaX, Triple Power will be offering 4.5 & 6.3kWh options, each of which can be installed in series with up to 3 more batteries of the same size. Boasting a 6000 cycle lifespan with a 5-year warranty and 90% depth of discharge, the new Triple Power battery is a flexible, practical, high-performance energy storage solution.

### General Data

| | MC0500 | T45 | T63 |
|---|---|---|---|
| Nominal voltage (VDC) | N/A | 100.8 | 100.8 |
| Operating voltage (VDC): | 70-500 | 85-118 | 85-118 |
| Nominal capacity (kWh): | N/A | 4.5 | 6.3 |
| Max. charge/discharge current (A): | 30 | 30 | 30 |
| Recommend charge/discharge current (A): | 25 | 25 | 25 |
| Standard power (kW) | N/A | 2.5 | 2.5 |
| Maximum power (kW) | N/A | 3 | 3 |
| Dimension (W x D x H in mm) | 461 x 189 x 105 | 464 x 193 x 588 | 464 x 193 x 588 |
| Weight (kg) | 5.7 | 56.6 | 67.5 |
| Faradic charge efficiency (25°C) (%) | 99 | | |
| Battery roundtrip efficiency (C/3, 25°C) (%) | 95 | | |
| Cycle life (90% DOD, 25°C) | 6000 | | |
| Available temperature range (°C) | 0-45 | | |
| Optimal operating temperature (°C) | 12-30 | | |
| Ingress protection | IP55 | | |
| Scalability | Up to 4 modules (HV10045/10063) | | |
| Warranty (years) | 10 | | |
| Certificates | **T-Bat System Safety:** CE, FCC, RCM, TUV, (IEC 62619), UL 1973. **Battery Cell Safety:** UL1642. **UN Number:** UN3480. **Hazardous Materials Classification:** Class 9. **UN Transportation Testing Requirements:** UN38.3 | | |

### T-BAT SYS-HV Configuration List

| System | 4.5kWh | 9.0kWh | 13.5kWh | 18.0kWh | 6.3kWh | 12.6kWh | 18.9kWh | 25.2kWh |
|---|---|---|---|---|---|---|---|---|
| Master box | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Battery module | T45 x 1 | T45 x 2 | T45 x 3 | T45 x 4 | T63 x 1 | T63 x 2 | T63 x 3 | T63 x 4 |
| Voltage (V) | 85-118 | 170-236 | 255-354 | 340-472 | 85-118 | 170-236 | 255-354 | 340-472 |

YHI Part Codes **XLIBPLUS, XLIBPHANT, US3000**

The Pylontech storage battery range is the product of Pylontech's abundant experience in delivering high quality equipment to thousands of homes. Their batteries have the longest life and highest energy and power densities in the industy, making their innovations sought after in terms of storage, but also with regards to of their stylish designs and ease of installation.

| PYLONTECH STORAGE BATTERIES | XLIBPLUS | XLIBPHANT | US3000 |
|---|---|---|---|
| **Technical Specifications** | | | |
| Nominal Voltage (V) | 48 | 48 | 48 |
| Nominal Capacity (Wh) | 2400 | 2400 | 3522 |
| Usable Capacity (Wh) | 2200 | 2200 | 3200 |
| Dimensions (mm) | 442 x 410 x 89 | 440 x 440 x 88.5 | 442 x 420 x 132 |
| Weight (kg) | 24 | 24 | 32 |
| Discharge Voltage (V) | 45~53.5 | 45~53.5 | 45~53.5 |
| Charge Voltage (V) | 52.5~53.5 | 52.5~53.5 | 52.5~53.5 |
| Charge/Discharge Current (A) (Recommend) | 25 | 25 | 37 |
| (Continuous) | 50 | 50 | 74 |
| (Peak @ 15 seconds) | 100 | 100 | 100 |
| Communication Port | RS485, CAN | RS485, CAN | RS485, CAN |
| Single string quantity (pcs) | 8 | 8 | 8 |
| Working temperature | 0~50 | 0~50 | 0~50 |
| Shelf temperature | -20~60 | -20~60 | -20~60 |
| Humidity | 5%~85% | 5%~85% | 5%~85% |
| Altitude (m) | <2000 | <2000 | <2000 |
| Design Life | 15+ years (25°C) | 15+ years (25°C) | 15+ years (25°C) |
| Cycle Life | >6000 (25°C) | >6000 (25°C) | >6000 (25°C) |
| Authentication Level | UL/IEC62619/CE/UN38.3 | IEC62619/CE/UN38.3 | IEC62619/CE/UN38.3 |

The Pylontech Force L1 & L2 are the latest versions of HESS (home energy storage system) that has inherited Pylontech's modular design concept combined with easy installation, simple connectors and outdoor compatibility. This advanced new technology is the ideal place to store your valuable force - electricity. With a quick connector to save installation time and an IP55 protection class to make outdoor application easy, Pylontech Force Batteries are the great new solution to your energy storage requirements.

| PYLONTECH FORCE L1 | L1 x 2 | L1 x 3 | L1 x 4 | L1 x 5 | L1 x 6 | L1 x 7 |
|---|---|---|---|---|---|---|
| **Technical Specifications** | | | | | | |
| Battery System Capacity (kWh) | 7.10 | 10.65 | 14.21 | 17.76 | 21.31 | 24.86 |
| Voltage Range (V) | 44.5~54 | | | | | |
| Dimensions (W x D X H in mm) | 600 x 380 x 530 | 600 x 380 x 700 | 600 x 380 x 870 | 600 x 380 x 1040 | 600 x 380 x 1210 | 600 x 380 x 1380 |
| Weight (kg) | 84 | 119 | 154 | 189 | 224 | 259 |
| Depth of Discharge | 90% | | | | | |
| Charge/Discharge Current (A) (Recommend) | 30 | 45 | 60 | 75 | 90 | 100 |
| (Continuous) | 75 | 100 | 100 | 100 | 100 | 100 |
| (Peak @ 15 seconds) | 105 | 105 | 105 | 105 | 105 | 105 |
| Communication | CAN, RS485 | | | | | |
| Protection Class | IP55 | | | | | |
| Working Temperature (°C) | 0~50 | | | | | |
| Storage Temperature (°C) | -20~60 | | | | | |
| Humidity | 5%-95% | | | | | |
| Altitude (M) | <2000 | | | | | |
| Design Life | 15+ years (25°C) | | | | | |
| Cycle Life | >6000 (25°C) | | | | | |
| Authentification Level | VDE/IEC62619/CE/UN38.3 | | | | | |

# Pylontech Force L2
Storage

The Pylontech Force L1 & L2 are the latest versions of HESS (home energy storage system) that has inherited Pylontech's modular design concept combined with easy installation, simple connectors and outdoor compatibility. This advanced new technology is the ideal place to store your valuable force - electricity. With a quick connector to save installation time and an IP55 protection class to make outdoor application easy, Pylontech Force Batteries are the great new solution to your energy storage requirements.

| PYLONTECH FORCE L2 | L2 x 2 | L2 x 3 | L2 x 4 |
|---|---|---|---|
| **Technical Specifications** | | | |
| Battery System Capacity (kWh) | 7.10 | 10.65 | 14.21 |
| Voltage Range (V) | 44.5~54 | | |
| Dimensions (W x D X H in mm) | 450 x 300 x 820 | 450 x 300 x 1120 | 450 x 300 x 1410 |
| Weight (kg) | 83 | 119 | 155 |
| Depth of Discharge | 90% | | |
| Charge/Discharge Current (A) (Recommend) | 30 | 45 | 60 |
| (Continuous) | 75 | 100 | 100 |
| (Peak @ 15 seconds) | 105 | 105 | 105 |
| Communication | CAN, RS485 | | |
| Protection Class | IP55 | | |
| Working Temperature (°C) | 0~50 | | |
| Storage Temperature (°C) | -20~60 | | |
| Humidity | 5%-95% | | |
| Altitude (M) | <2000 | | |
| Design Life | 15+ years (25°C) | | |
| Cycle Life | >6000 (25°C) | | |
| Authentification Level | VDE/IEC62619/CE/UN38.3 | | |

The Force H1 & H2 are the latest versions of high voltage battery storage systems produced by Pylontech. These newly designed systems provide easy connection which saves valuable time for installers. The stacking system also provides flexible configurations from 96V to 336V voltage and 7KWh to 24.5KWh capacity (expandable to 120KWh with external device).

| PYLONTECH FORCE H1 & H2 | FORCE H1 | FORCE H2 |
|---|---|---|
| **Technical Specifications** | | |
| Battery Module | FH48074 | FH9637M |
| Battery Module Voltage (VDC) | 48 | 96 |
| Battery Module Capacity (Ah) | 74 | 37 |
| Battery Module Quantity (Optional) | 2-7 pieces | 2-4 pieces |
| Battery System Capacity (kWh) | 24.86 | 14.21 |
| Battery System Voltage (V) | 336 | 384 |
| Dimensions (W x D x H) | 600 x 380 x 1380 | 450 x 296 x 1415 |
| Weight (kg) | 259 | 155 |
| Depth of Discharge | 90% | 90% |
| Charge/Discharge Current (A) | 14.8 (Recommend) 37 (Max) | 7.4 (Recommend) 37 (Max) |
| Communication | CAN, Modbus | |
| Protection Class | IP55 | |
| Working Temperature (°C) | 0-50 | |
| Storage Temperature (°C) | -20-60 | |
| Design Life | 15+ years (25°C) | |
| Authentification Level | UL/IEC62619/CE/UN38.3 | |

# Pylontech Powercube
## High Voltage Energy Storage System

Pylontech is proud to announce their High Voltage energy storage system serving the commercial/industrial/grid level customers – Powercube series.

Powercube series products with its modular design concept, enables the highest flexibility both for rack mounted and container based constructions, giving the flexibilities for customer to deploy the system nearly in any nodes in the grid, supporting the services such as emergency power, new energy stabilizer,energy shifting, load shaving, grid stabilizer, frequency responding (under development).

With our deep experience in BESS (battery energy storage system), vertical industrial chain consolidation and fantastic ROI control, Pylontech Powercube will be your trustable system in all ESS application.

| MODELS | SC0500-100S | SC1000-100S | SC1000-200E |
|---|---|---|---|
| Related Product | X1 | H1/H2 | M1 |
| Controller Working Voltage | 100~430VDC | 200~1000VDC | 220Vac |
| System Operation Voltage | 100~430VDC | 200~1000VDC | 220Vac |
| Charge Current (Max.)(A) | 100 | 100 | 200 |
| Discharge Voltage (VDC) | 100~430 | 200~1000 | 0~1000 |
| Discharge Current (Max.) (A) | 100 | 100 | 200 |
| Self-Consumption Power (W) | 8 | 8 | 8 |
| Dimensions (W x D x H - mm) | 442 x 390 x 132 | 442 x 390 x 132 | 330 x 628 x 150.5 |
| Communication | RS485/CAN | RS485/CAN | RS485/CAN |
| Protection Class | IP20 | IP20 | IP20 |
| Weight (kg) | 8.2 | 8.2 | 17.5 |
| Operation Life | 15 years | 15 years | 15 years |
| Operation Temperature | -20~65℃ | -20~65℃ | -20~65℃ |
| Storage Temperature | -40~80℃ | -40~80℃ | -40~80℃ |
| Product Certificate | TUV, CE | TUV, CE | TUV, CE |

| MODELS | H48050 | H48074 | H32148 |
|---|---|---|---|
| Capacity (kWh) | 2.4 | 3.55 | 4.74 |
| Nominal Voltage (VDC) | 48 | 48 | 32 |
| Nominal Capacity (AH) | 50 | 74 | 148 |
| Voltage Range (VDC) | 45~54 | 45~54 | 30~36 |
| Depth of Discharge | 80% (10~90%) | 80% (10~90%) | 80% (10~90%) |
| Dimensions (W x D x H - mm) | 442 x 390 x 100 | 442 x 390 x 132 | 330 x 628 x 150.5 |
| Communication | RS485/CAN | RS485/CAN | RS485/CAN |
| Protection Class | IP20 | IP20 | IP20 |
| Weight (kg) | 24 | 32 | 48 |
| Operation Life | 10+ years | 10+ years | 10+ years |
| Operation Life Cycle | 4000 | 4000 | 4000 |
| Operation Temperature | 0~50℃ | 0~50℃ | 0~50℃ |
| Storage Temperature | -20~60℃ | -20~60℃ | -20~60℃ |
| Product Certificate | TUV, CE | TUV, CE | TUV, CE |

# Delta E5 Hybrid Energy Storage System
Storage


**FEATURES**

- **Delta integrated solution** - E5 inverter, BX6.0 battery and S4 monitoring system seamlessly integrate for a complete solution
- **Easy plug & play installation** - the compact design of the setup makes for quick and simple installation
- **Zero export cable** - some areas require limiting the energy exported to the grid, and with the colour touch screen and power CT, this requirement can be met.

With the E5 Hybrid Inverter and Battery Storage System, you create your own secure supply of energy when the grid lets you down.

Powered by Panasonic's own cell "pack", the BX6.0 includes 6 safety mechanisms, layered steel casing, 5000kg impact tested and an IP55 rating for the battery and IP65 rating for the inverter, making it the safest home energy storage device.

## Technical Specifications

| DELTA E5 HYBRID ENERGY STORAGE SYSTEM | | Hybrid Inverter |
|---|---|---|
| DC Input | Startup power | 30W / 125VDC |
| | Rated voltage | 97.2% |
| | Recommended PV power | 96.5% |
| | MPPT | 370VDC |
| | Max. input current | 7kW |
| | Operating voltage range | 2 |
| | MPP voltage range | 2×12Adc |
| AC Output | Rated output power | 100VDC ~ 550VDC |
| | Rated voltage | 220VDC ~ 450VDC |
| | THD | 5000VA |
| Efficiency | Peak efficiency | 230Vac |
| | European efficiency | < 3% at rated power |
| Information | Communication port | RS-485 |
| | Display | 20 x 4 LCD |
| Standalone power | | 3600VA |
| Communication | | RS-485 |
| Environment | | Outside |
| Operating temperature | | -25 ~ 60°C |
| Relative humidity | | 0 ~ 100%, non-condensing |
| Dimensions(unit) | | 510 x 445 x 177 mm |
| Weight | | 27kg |
| Cooling | | Natural cooling |
| Installation type | | Indoor/outdoor |
| Enclosure rating | | IP65 |
| Certificates | | IEC 62109-1/-2 IEC 62040 ARN-4105, IEC-62116 |

| DELTA E5 HYBRID ENERGY STORAGE SYSTEM | Power Meter 1 | Power Meter 2 |
|---|---|---|
| **Technical Specifications** | | |
| Model | PPM P1E-000 | PPM P3E-000 |
| Phase | 1 | 3 |
| Communication | RS-485 | RS-485 |
| Information | LED indicator | LED indicator |
| Rated operating voltage(L - N) | 100Vac ~ 240Vac | 230Vac |
| Operating voltage range(L - N) | 85Vac ~ 264Vac | 130Vac ~ 260Vac |
| Operating current limit | 120A | 120A |
| Rated frequency | 45 ~ 65 Hz | 45 ~ 65 Hz |
| Power consumption | Max. 2 Watt | Max. 3 Watt |
| Power consumption with N1 | Max. 4 Watt | Max. 6 Watt |
| Safety standard | IEC 60950-1 | |
| Emission | EN 55022 class B | |
| Immunity | EN 61000-6-2 | |
| Operation temperature | -20°C ~ 50°C | |
| Storage temperature | -20°C ~ 60°C | |
| Relative humidity | 30% ~ 85% | |
| Dimensions | 93 × 47.3 × 66.5 mm | 93 × 70 × 66.5 mm |
| Weight | 145 g without CT | 200 g without CT |

| | Battery |
|---|---|
| **Technical Specifications** | |
| Model | BX_6.0 |
| Battery supplier | Panasonic |
| Nominal capacity | 6kWh |
| Usable capacity (80% DoD) | 4.8kWh |
| Cycle stability (80% DoD) | 6000 |
| Voltage range | 85 ~ 104 VDC |
| Nominal charging power | 2.5kW |
| Nominal discharging power | 3.6kW |
| Max. charging current | 30A |
| Max. discharging current | 35A |
| Battery technology | Li-ion |
| Dimensions | 552 x 596 x 200 mm |
| Weight | 75kg |
| Enclosure rating | IP55 |
| Installation type | Indoor/outdoor |
| Ambient temperature range | -10 ~ 45°C |
| Permitted humidity | 0 ~ 90% |
| Certificates | UN38.3 |
| Warranty | 10 Years / 12.6MWh* |

## Accessories
Battery Cabinet

YHI Part Code **ELTK-HEXCAB**



**HOLDS UP TO 11 BATTERIES**

**IP55 RATED**

## Accessories
Outdoor Battery Cabinet

YHI Part Code **OD1310-LV**



**HOLDS UP TO 7 BATTERIES**

**IP65 RATED**

YHI Part Code **XLIBCAB**


**HOLDS UP TO 4 BATTERIES**

**IP20 RATED**

YHI Part Code **RAFS-600**

**Battery Cabinet Shelf**

Compatible with XLIBCAB and XLIBCAB2.

**Accessories**
Indoor Battery Cabinet

YHI Part Code **XLIBCAB2**


**HOLDS UP TO 7 BATTERIES**

**IP20 RATED**

# 5

**YHI supplies a comprehensive range of PV mounting and electrical components that can be used to create a customized solution for your solar system.**

**Silver GD Rail Cap**

GSADRCSG

**Black GD Rail Cap**

GSADRGN

### FEATURES

- **Easy Installation:** The tilt-in module can be put into the extruded rail from any section and can be pre-assembled with the clamp and roof hook, minimising time and cost of installation
- **Flexibility & Adjustable:** These systems accommodate most commercially available framed or frameless solar panels and diverse roof types
- **Safety & reliability:** The racking systems can stand up to the extreme weather and comply with AS/NZS 1170 load standards

Neuton Power Pitched Roof designs have great flexibility for both commercial and residential roof solar systems. Suitable for installing framed and frameless modules flush to a pitched roof. Special extruded aluminium rail, pre-assembled clamps and varied roof hooks or brackets with tilt-in modules ensure easy and quick installation, saving on labour time and cost. The customised rail lengths do not require on-site cutting or welding - maximising the appearance, structural strength and anti-corrosive performance.

### Technical Information

| | |
|---|---|
| Install Site | Pitched roof |
| Tilt angle | Flush with roof up to 60° |
| Building height | Up to 20 metres |
| Max wind speed | Up to 60 metres/ second |
| Snow load | Up to 1.4 KN/m2 |
| Material | High class aluminium alloy, stainless steel |
| Anti-corrosive life | Anodized |
| Product life expectancy | More than 20 years |
| Warranty | 10 years |

### FEATURES

- Material: AI6005-T5
- Patent extruded aluminium section
- High class anodized aluminium

**RAIL**

### PV Mounting Rail

| | |
|---|---|
| GSDR2560 | Rail with a standard length of 2560mm |
| GSDR3405 | Rail with a standard length of 3405mm |
| GSDR4200 | Rail with standard length of 4200mm |
| GSDR4200BLACK | Black rail with standard length of 4200mm |

**Rail Splice Kit**

GSDRSP

**Rail Splice Kit Black**

GSDRSPBLACK

### FEATURES

- Material: AI6005-T5 & A2-70 bolt
- Connects two rail units


| PRODUCT CODE | DESCRIPTION | NO. |
|---|---|---|
| **Framed Module Clamps** | | |
| GSEC35 | End clamp kit 35mm | 1 |
| GSEC35BLACK | End clamp kit 35mm black | 2 |
| GSEC40 | End clamp kit 40mm | 1 |
| GSEC40BLACK | End clamp kit 40mm black | 2 |
| GSEC46 | End clamp kit 46mm | 1 |
| GSEC50 | End clamp kit 50mm | 1 |
| GSECL80 | Glass panel end clamp kit 80mm | 5 |
| GSIC35 | Inter clamp kit 35mm | 3 |
| GSIC35BLACK | Inter clamp kit 35mm black | 4 |
| GSIC40 | Inter clamp kit 40mm | 3 |
| GSIC40BLACK | Inter clamp kit 40mm black | 4 |
| GSIC46 | Inter clamp kit 46mm | 3 |
| GSIC50 | Inter clamp kit 50mm | 3 |
| GSICL80 | Glass panel inter clamp kit 80mm | 6 |


| PRODUCT CODE | DESCRIPTION | NO. |
|---|---|---|
| **Pitched Roof Racking** | | |
| GSDM25 | GS tilt-in set for tile hook | 1 |
| GSIK01 | Fixed tile bracket stainless steel | 2 |
| GSIK05 | Aluminium tin interface kit | 3 |
| GSIK05BLACK | Aluminium tin interface kit black | 4 |
| GSIKH04 | Hanger bolt hook | 5 |
| BRKTADJTILE | Solar adjustable tile bracket | 6 |
| BRKTFLASH | Solar flashfoot single bracket | 7 |
| SOLAREJOT10050 | EJOT solarbolt for steel purlins | 8 |

**For further technical information view online at www.yhienergy.co.nz**

# Neuton Power Mounting Systems
## Tilt Racking System

Neuton Power Adjustable Tilt Solar Racking System is applicable to install the usual framed module to tilt a certain angle with the roof.

The solar system can be a fixed angle or adjustable such as 10~15 deg, 15~30 deg and 30~60 deg for your requirement. The special extruded aluminium rail, the tilt-in module, the clamp kit and the round leg can be pre-assembled and make the installation easy and quick to save your labour costs and time. The customised length can eliminate the need to weld and cut on site to keep the high anticorrosive performance, the structures strength and the appearance.

### Technical Information

| | |
|---|---|
| Install Site | Low profile roof or flat roof |
| Tilt angle | 10 ~ 60° |
| Building height | Up to 20 metres |
| Max wind speed | Up to 60 metres/ second |
| Snow load | Up to 1.4 KN/m2 |
| Standards | AS/NZS 1170 and other international standards |
| Material | High class aluminium alloy, stainless steel |
| Anti-corrosive | Anodized aluminium & stainless steel |
| Product expectancy | More than 20 years |
| Warranty | 10 years |

### FEATURES

- **Easy Installation:** The tilt-in module can be put into the extruded rail from any section and can be pre-assembled with the clamp and roof hook, minimising time and cost of installation
- **Durability:** Providing broad installation flexibility. These systems can accommodate most commercially available framed solar panels and diverse roof types. They can also scale easily from small to large, multi-megawatt installations
- **Flexibility & Adjustable:** These systems accommodate most commercially available framed or frameless solar panels and diverse roof types
- **Safety & reliability:** The racking systems comply with AS/NZS 1170 safety standards and other international structure load standards. Main support components have been tested to guarantee structure and load carrying capacity

1

2

3

4

5

6

7

8

| PRODUCT CODE | DESCRIPTION | NO. |
|---|---|---|
| BRKTTILTINT | Solar tilt interface bracket kit | 1 |
| GSADFL | Adjustable front leg for tin roof | 2 |
| GSADRLBLACK | Adjustable rear leg 10-15 degrees | 3 |
| GSADRL1015 | Adjustable rear leg 10-15 degrees | 4 |

| PRODUCT CODE | DESCRIPTION | NO. |
|---|---|---|
| GSADRL1530 | Adjustable rear leg 15-30 degrees | 5 |
| GSADRL1530BLACK | Black adjustable front leg for tin roof | 6 |
| GSADRL3060 | Adjustable rear leg 30-60 degrees | 7 |
| GSADRL3060BLACK | Black adjustable rear leg 15-30 degrees | 8 |

# Neuton Power Mounting Systems
## Grounding Components

### Grounding Lug Aluminium

GSGGL

**FEATURES**

- Connect system to equipment ground conductor

### Grounding Clip

GSGGC

**FEATURES**

- Material: SUS304 stainless steel
- Works with Inter Clamp to install on Neuton Power rail.

### Bonding Jumper

GSGBJA

**FEATURES**

- Material: Braided copper wire & stainless steel clip & A2-70 bolt
- Electrically connects spliced rails
- Excellent electricity conductivity

Neuton Power Ground Mounting System is suitable for framed or frameless module PV arrays.

GROUNDMTASSY

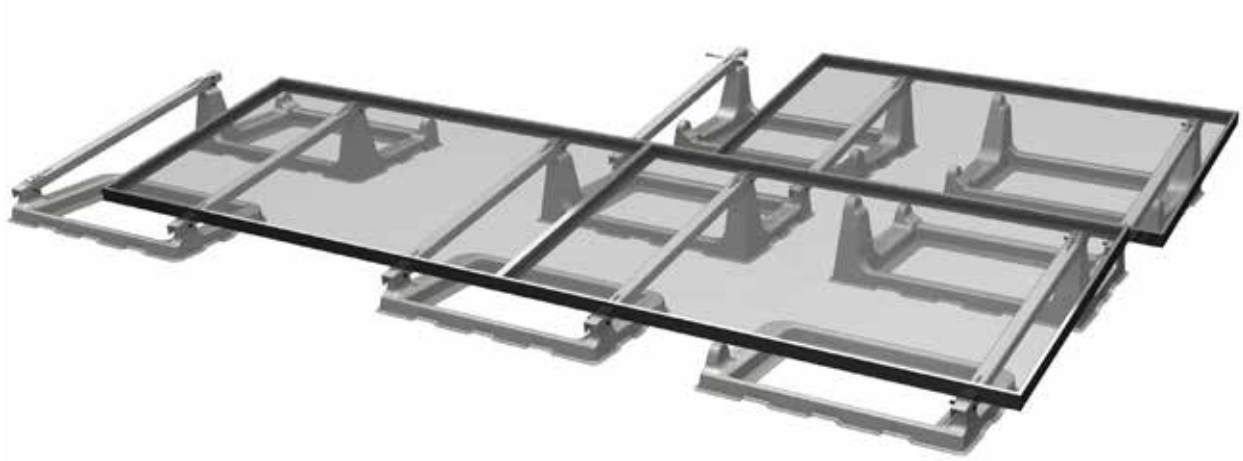
Neuton Power grounding products can be used to bond solar modules to the aluminium rails and the aluminium rails to the ground, so the entire solar system is grounded and safe. Grounding products include the stainless steel grounding clip and aluminium grounding lug, which are all designed to comply with the requirement of AS5033, UL467 for bonding or grounding systems.

**FEATURES**

- **Easy Installation:** Parts have been pre-assembled in the factory to save on installation time
- **Flexibility & Adjustability:** Smart design reduces the difficulty of installations in most conditions
- **Safety & Reliability:** The structure has been checked and tested rigorously against extreme weather conditions


| PRODUCT CODE | DESCRIPTION | NO. |
|---|---|---|
| GSGM3405GROUND | Ground mount rail 3405mm | 1 |
| GSBRSC60 | Ground mount clamp | 2 |
| GSBRSP | Ground mount rail splice kit | 3 |
| GSPGBA | Ground mount support beam | 4 |
| GSPGOP2950 | Ground mount support open post 2950mm | 5 |
| GSPGTC | Ground mount support beam top cap | 6 |

# Dynoraxx Mounting Systems
## PV Mounting System



DynoRaxx Evolution FR delivers a tool-less ballasted racking system for mounting PV solar panels on flat roofs and surfaces. The proprietary design of the DynoRaxx ballasted-racking system has been created to simplify and speed installation without compromising quality or performance. With DynoRaxx Evolution FR, buying commercial solar panel racking has never been more cost-effective.

### RUGGED CONSTRUCTION

Baskets – Fibreglass

Rails – Fibreglass

Clamps – 304 stainless steel

### EASY INSTALLATION

Initial measurement and chalk line needed for placement of first row

Precision components require no field measuring

Assembles without tools

Saves time and labour to install more modules per hour

Ballast weight to be supplied by customer

### HIGH PERFORMANCE

PE Certified

ASCE 7-05 compliant

IBC 2006 compliant

Wind tunnel tested

### WARRANTY

DynoRaxx Evolution carries a 10-year limited material and workmanship warranty

| PRODUCT CODE | DESCRIPTION |
|---|---|
| **Dynoraxx Mounting System** | |
| DR2LBASKET | Two leg basket |
| DR4LBASKET | Four leg basket |
| DRBOND | Dynobond 8" |
| DRBOND38 | Dynobond 38" |
| DREVOPRCLAMP | Evolution pitched roof clamp |
| DREVOPRRAIL | Evolution pitched roof rail |
| DRLOCKINGPIN | Locking pin |
| DRRAIL | Rail with dynoslide and pins |

### FEATURES

- Fibreglass
- Proprietary racking enables fast installation in less than half the time of other systems
- No tools needed for assembly — one-step pivot clamp secures panels to racking
- Versatility to accommodate all framed PV solar panels on the market
- Eliminates need to penetrate roof with fasteners on most installations
- Smaller footprint than competitive systems saves roof space and adds flexibility
- 10° tilt available
- Elevated system — does not impede water drainage
- Non-corrosive
- No thermal expansion

# PV Mounting Systems
## Floating PV Mounting System

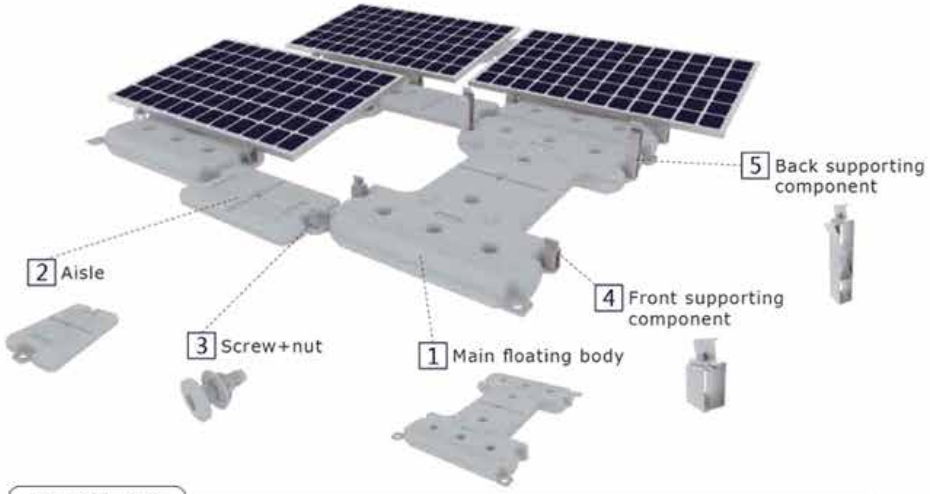
YHI Part Code **GSFLOATING**

- The mounting system material is outdoor rated and resists constant environmental changes such as fluctuating temperatures. The mounting system is also UV-proof, anti-aging, pollution-free and recyclable.
- The upper surface of the floating body applies a non-slip pattern design, which guarantees the safety and stability of the installation team. The four corners are all obtuse to avoid injury caused by slipping and coming into contact with the core structure.
- The floating body is stable and durable.
- The system needs no maintenance and boasts a low total cost of ownership.
- Assembly is simple, quick and flexible.

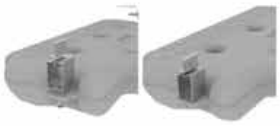
## PRODUCT ADVANTAGES

| | Floating PV Plant | Normal Plant |
|---|---|---|
| Power Generation Efficiency | Good cooling effect to the PV components, 10% higher efficiency, long term advantage | General efficiency |
| Cost | 5%-8% higher initial output | Less cost |
| Construction | Less work, shorter construction period | More work, longer construction period |
| Maintenance | Strong resistance to natural disasters, requires simple cleaning and maintenance | Weaker resistance to natural disaster |
| Ecology | Pollution-free, inhibits algae growth and water evaporation | Ecological damage during construction |
| Occupied Area | 200 acre/10MW | 300 acre/10MW |
| Site Requirement | Water area, depth over 1 metre | High requirements |

## Product assembly




## Assembly step



Step 1

Fix the front supporting component to the main floating body

Step 2

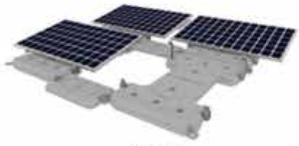
Fix the back supporting component to the main floating body

Step 3

Connecting floating body and aisle with plastic screw +nuts, and put the connection part into the designated position in the water seriatim.

Step 4

Put the solar panel on the supporting components which is hooked on to the bottom frame of the panel tightly



Step 5

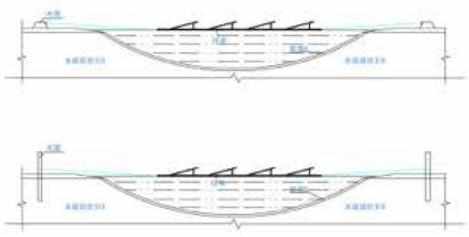
Install other solar panels according to step 4.

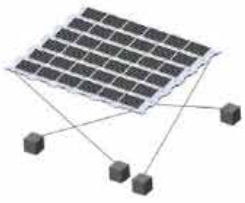
Step 6

Installation completed

## Fixation

1. **Precast concrete**
   applied to the proper sedimentation, low, stable and close to the bank side area
2. **Underwater fixation**
   applied to the large water area with depth over 6 meters and complex topographic condition





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12


| PRODUCT CODE | DESCRIPTION | PICTURE NO. |
|---|---|---|
| S-5-K GRIP MINI | Grip mini alumunium utility clamp | 1 |
| S-5-PROTEA BRACKET | Protea bracket stainless steel utility clamp | 2 |
| S-5-PV EDGE GRAB KIT | Edge grab kit end clamp | 3 |
| S-5-S CLAMP | Aluminium utility clamp | 4 |
| S-5-U MINI | Mini aluminium utlity clamp | 5 |
| S-5PVKIT | PV kit solar mounting bracket mid clamp | 6 |
| S-5TOPFIXCORBRKTAU | Top fix corru bracket-au | 7 |
| S-5TOPFIXCORBRKTAUMINI | Top fix corru bracket-au mini | 8 |
| S-5TRAPBRKTKSRW | Trap bracket KSRW | 9 |
| S-5-E CLAMP | PV kit solar mounting bracket mid clamp | 10 |
| S-5-E MINI | Top fix corru bracket-au | 11 |
| S-5-S MINI | Top fix corru bracket-au mini | 12 |

1

2

3

| YHI PRODUCT CODE | DESCRIPTION | PICTURE NO. |
|---|---|---|
| ST20A1PAC230V | Suntree 20A 230V 1POLE AC isolator | 1 |
| ST20A3PAC415V | Suntree 20A 415V 3POLE AC isolator | 2 |
| ST35A3PAC415V | Suntree 35A 415V 3POLE AC isolator | 3 |

# DC Isolators, Power Enclosures & Surge Protectors
## Electrical Components

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| YHI PRODUCT CODE | DESCRIPTION | PICTURE NO. |
|---|---|---|
| ST32A4PDC1000V | Suntree 32A 1000V 4POLE DC isolator | 1 |
| SPAN4D | IP65 4 pole PV power enclosure | 2 |
| SPAN8D | IP65 8 pole PV power enclosure | 3 |
| SPD150I | 1Phase 150kA, 1 mode, DIN, surge diverter | 4 |
| SPD360NI | 3 Phase, 60kA, 2 mode, (L-N & N-E), surge diverter | 5 |

# Neuton Power RV Roof Mount Kit
## Solar Panel Roof Mount Kit For RV

YHI Part Code **RVMOUNTKIT**

The Neuton Power RV Mount Kit can be used with any sized aluminum framed solar panel to provide secure mounting to RVs, boats and many flat surface applications. The PV Mount Kit will support the solar panel at the optimum height above the surface to enable airflow from underneath, ensuring the solar panel functions as efficiently as possible.

NOTE: The mount kit can be installed without penetrating the mounting surface using the recommended sealant.

Material: ABS Plastic

7 piece kit:
4 x Solar panel corner moulds
1 x Solar cable junction box
2 x Solar panel side mounts

**APPLICATIONS**

- RV
- Boat
- Caravan
- Enclosed trailer
- Other Mobile Applications

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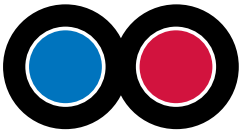

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| YHI PRODUCT CODE | DESCRIPTION | PICTURE NO. |
|---|---|---|
| CABLE4MMTWIN | 4mm twin core solar cable | 1 |
| CABLE6MM4CF | 6mm 4 core flex cable | 2 |
| CABLE6MMEARTH | 6mm earth cable | 3 |
| CABLE6MMTWIN | 6mm twin core solar cable | 4 |
| GSAPC01 | Plastic cable clip | 5 |

# Cabling & Connectors
## PV Accessories

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| YHI PRODUCT CODE | DESCRIPTION | PICTURE NO. |
|---|---|---|
| GSSSCC05 | S/S cable clip for 2 cables | 1 |
| DC4BRANCHSET | DC4 branch connector set | 2 |
| MC4CONNSET | MC4 connector set | 3 |
| JMTHYSET | JMTHY connector set | 4 |
| GSCT01 | Plastic coated S/S cable ties (100 per bag) | 5 |
| SPVBATTLABEL | Battery label kit | 6 |

# 6

Neuton Power and Morningstar provide a wide range of highly-efficient solar charge controllers.

| PARTCODE | DESCRIPTION | VOLTAGE | AMPS |
|---|---|---|---|
| **Morningstar** | | | |
| MS-TS-M-2-600V | Morningstar TriStar 600V MPPT Charge Controller | 24, 36, 48 or 60VDC | 60A |
| MS-TSMPPT-30 | Morningstar TriStar MPPT Charge Controller | 12,24 or 48VDC | 30A |
| MS-TSMPPT-45 | Morningstar TriStar MPPT Charge Controller | 12,24 or 48VDC | 45A |
| MS-TSMPPT-60 | Morningstar TriStar MPPT Charge Controller | 12,24 or 48VDC | 60A |
| MS-TSMPPT-60M | Morningstar TriStar MPPT Charge Controller Metered | 12,24 or 48VDC | 60A |
| MS-PSMPPT-25 | Morningstar ProStar MPPT Charge Controller | 12 or 24VDC | 25A |
| MS-PSMPPT-25M | Morningstar ProStar MPPT Charge Controller Metered | 12 or 24VDC | 25A |
| MS-PSMPPT-40 | Morningstar ProStar MPPT Charge Controller | 12 or 24VDC | 40A |
| MS-PSMPPT-40M | Morningstar ProStar MPPT Charge Controller Metered | 12 or 24VDC | 40A |
| MS-SSMPPT-15L | Morningstar SunSaver MPPT Charge Controller | 12 or 24VDC | 15A |
| MS-TSPWM-45 | Morningstar TriStar PWM Charge Controller | 12, 24 or 48VDC | 45A |
| MS-TSPWM-60 | Morningstar TriStar PWM Charge Controller | 12, 24 or 48VDC | 60A |
| MS-TSPWM-60M | Morningstar TriStar PWM Charge Controller Metered | 12, 24 or 48VDC | 60A |
| MS-PSPWM-15 | Morningstar ProStar PWM Charge Controller | 12 or 24VDC | 15A |
| MS-PSPWM-15M | Morningstar ProStar PWM Charge Controller Metered | 12 or 24VDC | 15A |
| MS-PSPWM-30 | Morningstar ProStar PWM Charge Controller | 12 or 24VDC | 30A |
| MS-PSPWM-30M | Morningstar ProStar PWM Charge Controller Metered | 12 or 24VDC | 30A |
| MS-SSPWM12-6 | Morningstar SunSaver PWM Charge Controller | 12VDC | 6A |
| MS-SSPWM12-6L | Morningstar SunSaver PWM Charge Controller | 12VDC | 6A |
| MS-SSPWM12-10 | Morningstar SunSaver PWM Charge Controller | 12VDC | 10A |
| MS-SSPWM12-10L | Morningstar SunSaver PWM Charge Controller | 12VDC | 10A |
| MS-SSPWM24-10L | Morningstar SunSaver PWM Charge Controller | 24VDC | 10A |
| MS-SSPWM12-20L | Morningstar SunSaver PWM Charge Controller | 12VDC | 20A |
| MS-SSPWM24-20L | Morningstar SunSaver PWM Charge Controller | 12VDC | 20A |
| MS-SSDPWM-12-25 | Morningstar SunSaver Duo PWM Charge Controller | 12VDC | 25A |
| MS-SSDPWM-12-25RM | Morningstar SunSaver Duo PWM Charge Controller Metered w/ remote | 12VDC | 25A |
| MS-SKPWM12-6 | Morningstar SunKeeper PWM Charge Controller | 12VDC | 6A |
| MS-SKPWM12-12 | Morningstar SunKeeper PWM Charge Controller | 12VDC | 12A |
| MS-SLPWM12-10L | Morningstar SunLight PWM Charge Controller | 12VDC | 10A |
| MS-SLPWM12-20L | Morningstar SunLight PWM Charge Controller | 24VDC | 20A |
| MS-SLPWM24-10L | Morningstar SunLight PWM Charge Controller | 12VDC | 10A |
| MS-SLPWM24-20L | Morningstar SunLight PWM Charge Controller | 24VDC | 20A |
| MS-SGPWM12-4 | Morningstar SunGuard PWM Charge Controller | 12VDC | 4.5A |
| MS-EBMPPT-20 | Morningstar EcoBoost MPPT Charge Controller | 12 or 24VDC | 20A |
| MS-EBMPPT-20M | Morningstar EcoBoost MPPT Charge Controller Metered | 12 or 24VDC | 20A |
| MS-EBMPPT-30 | Morningstar EcoBoost MPPT Charge Controller | 12 or 24VDC | 30A |
| MS-EBMPPT-30M | Morningstar EcoBoost MPPT Charge Controller Metered | 12 or 24VDC | 30A |
| MS-EBMPPT-40 | Morningstar EcoBoost MPPT Charge Controller | 12 or 24VDC | 40A |
| MS-EBMPPT-40M | Morningstar EcoBoost MPPT Charge Controller Metered | 12 or 24VDC | 40A |

| PARTCODE | DESCRIPTION | VOLTAGE | AMPS |
|---|---|---|---|
| **Morningstar** | | | |
| MS-ECPWM-10 | Morningstar EcoPulse MPPT Charge Controller | 12 or 24VDC | 10A |
| MS-ECPWM-10M | Morningstar EcoPulse MPPT Charge Controller Metered | 12 or 24VDC | 10A |
| MS-ECPWM-20 | Morningstar EcoPulse MPPT Charge Controller | 12 or 24VDC | 20A |
| MS-ECPWM-20M | Morningstar EcoPulse MPPT Charge Controller Metered | 12 or 24VDC | 20A |
| MS-ECPWM-30 | Morningstar EcoPulse MPPT Charge Controller | 12 or 24VDC | 30A |
| MS-ECPWM-30M | Morningstar EcoPulse MPPT Charge Controller Metered | 12 or 24VDC | 30A |
| MS-SHS12-6 | Morningstar SHS MPPT Charge Controller | 12VDC | 6A |
| MS-SHS12-10 | Morningstar SHS MPPT Charge Controller | 12VDC | 10A |
| MS-SHS12-6-NL | Morningstar SHS Night Light MPPT Charge Controller | 12VDC | 6A |
| MS-SHS12-10-NL | Morningstar SHS Night Light MPPT Charge Controller | 12VDC | 6A |
| **Morningstar Accessories** | | | |
| MS-TS-M-2-600V | Morningstar TriStar 600V Remote Meter | N/A | N/A |
| MS-TS-M-2 | Morningstar TriStar Digital Meter | N/A | N/A |
| MS-TS-RM-2 | Morningstar TriStar Remote Meter | N/A | N/A |
| MS-RM-1 | Morningstar Remote Meter | N/A | N/A |
| MS-HUB-1 | Morningstar MeterHub | N/A | N/A |
| MS-MSC | Morningstar PC MeterBus Adapter | N/A | N/A |
| MS-RSC-1 | Morningstar RIA-485/RS-232 Communications Adapter | N/A | N/A |
| MS-UMC-1 | Morningstar USB MeterBus Adapter | N/A | N/A |
| MS-EMC-1 | Morningstar Ethernet MeterBus Adapter | N/A | N/A |
| MS-RTS | Morningstar Remote Temperature | N/A | N/A |
| MS-DIN-1 | Morningstar DIN Rail Clips | N/A | N/A |
| MS-GFPD-150V | Morningstar Ground Fault Protection Device 150V | 12, 24, 36 or 48VDC | 50A |
| MS-GFPD-600V | Morningstar Ground Fault Protection Device 600V | 12, 24, 36 or 48VDC | 60A |
| MS-RD-1 | Morningstar Relay Driver | N/A | N/A |
| MS-MPPTS-WB | Morningstar Wire Box | N/A | N/A |
| **Neuton Power** | | | |
| SLC12/24-20 | Neuton Power SLC Charge Controller | 12 or 24VDC | 20A |
| ENS12/24-20D | Neuton Power ENS Charge Controller | 12 or 24VDC | 20A |

# Morningstar MPPT Charge Controller
## TriStar 600V

MORNINGSTAR PROFESSIONAL SERIES

YHI Part Code **MS-TS-M-2-600V**

### FEATURES

- Accommodates PV systems > 150 Voc with long wire runs from the array to the controller.
- Uses Morningstar's patented 4-stage charging algorithm to optimize battery health.
- Features extensive system networking, monitoring and communications.
- Optimized for harsh environments and equipped with electronic protections.
- Enables battery back-up for grid-tied systems using more efficient DCcoupling

The TriStar MPPT 600V (TS-MPPT-600V) is a breakthrough in charge controller design. By accepting PV array input up to 600 Voc, it enables installers to design systems with longer, fewer strings, reducing cabling and hardware which make installation and wiring easier and faster.

Morningstar's advanced digital engineering combined with superior thermal management make the TS-MPPT-600V with TrakStar technology the only charge controller in its class that doesn't require a cooling fan or fans, making it both extremely reliable and efficient (with 97.9% peak efficiency). Ideal for DC-coupled energy storage applications.

| TRISTAR 600V MPPT CONTROLLER | ALL VERSIONS |
|---|---|
| Maximum Battery Current | 60A |
| Nominal Maximum Operating Power | 3200Wp |
| Maximum Solar Open Circuit Voltage | 600V |
| Battery Operating Voltage Range | 16 - 72 VDC |
| Nominal System Voltage | 24, 36, 60 VDC |
| Input Operating Voltage Range | PV Voltage to 525V |

| Options | ALL VERSIONS |
|---|---|
| Ground Fault Protection Device (GFPD-150V and GFPD-600V) | YES |
| MeterHub (HUB-1) | YES |
| TriStar Meter-2-600V (TS-M-2-600V) | YES |
| TriStar Remote Meter-2 (TS-RM-2) Range | YES |
| Ethernet MeterBus Converter (EMC-1) | YES |
| Remote Temperature Sensor (RTS) | INCLUDED |

| GENERAL INFORMATION | ALL VERSIONS |
|---|---|
| Ambient Operating Temperature | -40 °C to +45 °C |
| Power terminals | 2.5 $mm^2$–35 $mm^2$ 14 AWG-2 AWG |
| Product Weight | 8.98 kg |
| Unit Shipping Weight | 9.9 kg |
| Dimensions | 39.2 x 22.1 x 14.9 cm |
| Warranty | 5 years |

# Morningstar MPPT Charge Controller
TriStar

MORNINGSTAR
PROFESSIONAL SERIES

YHI Part Codes **MS-TSMPPT-30, MS-TSMPPT-45, MS-TSMPPT-60, MS-TSMPPT-60M**


**FEATURES**

- Maximizes energy harvest
- Extremely high reliability
- Very high efficiency
- Extensive networking and communication capabilities
- Metering and data logging
- Certified to IEC 62093

The industry-leading TriStar MPPT with TrakStar Technology is an advanced maximum power point tracking controller for larger off-grid photovoltaic (PV) energy systems up to 3kWp.

An acclaimed design, TriStars have been proven in solar installations around the globe and remain the first choice for designers of mission-critical systems where failure is not an option.

| TRISTAR MPPT CONTROLLER | TS MPPT- 30 | TS MPPT-45 | TS MPPT-60 | TS MPPT-60M |
|---|---|---|---|---|
| Maximum Battery Current | 30A | 45A | 60A | 60A |
| Nominal Solar Input | | | | |
| 12V Battery Bank<br>24V Battery Bank<br>48V Battery Bank | 400Wp<br>800Wp<br>1800Wp | 600Wp<br>1200Wp<br>2400Wp | 800Wp<br>1600Wp<br>3200Wp | 800Wp<br>1600Wp<br>3200Wp |
| Maximum Open Circuit Voltage | 150V | | | |
| Nominal System Voltage | 12, 24 or 48VDC | | | |

| Options | TS MPPT- 30 | TS MPPT-45 | TS MPPT-60 | TS MPPT-60M |
|---|---|---|---|---|
| TriStar Meter-2 (TS-M-2) | YES | YES | YES | PRE-INSTALLED |
| TriStar Remote Meter 2 (TS-RM-2) | YES | | | |
| MeterHub (HUB-1) | YES | | | |
| Ethernet Port | NO | | INCLUDED | |
| EIA-485 Adapter (RSC-1)w | YES | | INCLUDED | |
| Remote Temperature Sensor | INCLUDED | | | |
| Ground Fault Protection Device (GFPD-150V and GFPD-600V) | YES | | | |
| Ethernet MeterBus Converter (EMC-1) | YES | | | |

| GENERAL INFORMATION | ALL VERSIONS |
|---|---|
| Ambient Operating Temperature | -40°C to +45°C |
| Terminals | 35 mm² / 2 AWG |
| Product Weight | |
| MS-TS-MPPT-30 | 3.6 kg |
| MS-TS-MPPT-45 | 3.6 kg |
| MS-TS-MPPT-60 | 4.1 kg |
| MS-TS-MPPT-60M | 4.3 kg |
| Unit Shipping Weight | |
| MS-TS-MPPT-30 | 4.5 kg |
| MS-TS-MPPT-45 | 4.5 kg |
| MS-TS-MPPT-60 | 5.0 kg |
| MS-TS-MPPT-60M | 5.2 kg |
| Dimensions | 29.1 x 13.0 x 14.2 cm |
| Warranty | 5 years |

# Morningstar MPPT Charge Controller
ProStar

MORNINGSTAR
PROFESSIONAL SERIES

YHI Part Codes **MS-PSMPPT-25, MS-PSMPPT-25M, MS-PSMPPT-40, MS-PSMPPT-40M**


**FEATURES**

- Maximizes energy harvest
- Custom programmable
- Advanced self-diagnostics
- Data logging
- Automatic Lighting Control
- Extensive electronic protections
- Fanless design

Prostar MPPT solar charge controller is an advanced maximum power point tracking (MPPT) battery charger for off-grid photovoltaic (PV) systems up to 1100 watts. All versions have TrakStar Technology and include load control.

The ProStar design has been proven in over two decades of use in the world's most demanding installations—and ProStar today reflects Morningstar's policy of continuous improvement through regular upgrades and enhancements. Because Morningstar's employee-owned culture never "rests on success," ProStar customers can own both a legend and the latest in a single product.

| PROSTAR MPPT CONTROLLER | PS-MPPT-25 | PS-MPPT-25M | PS-MPPT-40 | PS-MPPT-40M |
|---|---|---|---|---|
| Maximum Battery Current | 25A | 425A | 40A | 40A |
| 12 volt battery<br>24 volt battery | 350W @45C<br>700W @60C | 350W @45C<br>700W @60C | 550W @45C<br>1100W @60C | 550W @45C<br>1100W @60C |
| Maximum Open Circuit Voltage | 120 Volts (without damage to unit | | | |
| Nominal System Voltage | 12V or 24V | | | |

| GENERAL INFORMATION | ALL VERSIONS |
|---|---|
| Ambient Operating Temperature | -40 °C to +45 °C |
| Terminals | 16 mm² / 2 AWG |
| Product Weight | 1.4 kg |
| Unit Shipping Weight | 1.9 kg |
| Dimensions | 20 x 17 x 7 cm |
| Warranty | 5 years |

## Options

| | PS-MPPT-25 | PS-MPPT-25M | PS-MPPT-40 | PS-MPPT-40M |
|---|---|---|---|---|
| Digital Meter | NO | INCLUDED | NO | INCLUDED |
| Remote Meter (RM-1) | YES | | | |
| Remote Temperature Sensor (RTS) | YES | | | |
| MeterHub (HUB-1) | YES | | | |
| Wire Box (PS-MPPT-WB) | YES | | | |
| PC Meterbus Adapter | YES | | | |
| USB MeterBus Adapter (UMC-1) | YES | | | |
| Relay Driver (RD-1) | YES | | | |
| Ethernet MeterBus Converter (EMC-1) | YES | | | |

# Morningstar MPPT Charge Controller
## SunSaver

MORNINGSTAR PROFESSIONAL SERIES

YHI Part Code **MS-SSMPPT-15L**


**FEATURES**

- Maximizes energy harvest
- Use of high voltage modules
- Converts 36V or 24V arrays
- Automatic lighting control
- Extensive electronic protections

SunSaver MPPT with TrakStar technology is the perfect charging solution for smaller off-grid solar systems up to 400Wp.

An industrial-grade design proven in challenging applications and environments, SunSaver has been called the “single most successful charge controller in the solar industry.”

| SUNSAVER MPPT CONTROLLER | SS-MPPT-15L |
|---|---|
| Maximum Battery Current | 15A |
| 12V Battery Bank<br>24V Battery Bank | 200Wp<br>400Wp |
| Maximum Open Circuit Voltage | 75V |
| Nominal System Voltage | 12/24 VDC |

| Options | SS-MPPT-15L |
|---|---|
| Remote Meter (RM-1) | YES |
| Remote Temperature Sensor (RTS) | YES |
| MeterHub (HUB-1) | YES |
| PC MeterBus Adapter (MSC) | YES |
| DIN Rail Clips (DIN-1) | YES |
| Remote Temperature Sensor (RTS) | YES |
| Ground Fault Protection Device (GFPD-150V and GFPD-600V) | YES |
| Ethernet MeterBus Converter (EMC-1) | YES |

| GENERAL INFORMATION | SS-MPPT-15L |
|---|---|
| Ambient Operating Temperature | -40 °C to +45 °C |
| Terminals | 16 mm² / 6 AWG |
| Product Weight | 0.60 kg |
| Unit Shipping Weight | 0.70 kg |
| Dimensions | 15.2 x 5.5 x 3.4cm |
| Warranty | 5 years |

# Morningstar PWM Charge Controller
TriStar

MORNINGSTAR PROFESSIONAL SERIES

YHI Part Codes **MS-TSPWM-45, MS-TSPWM-60, MS-TSPWM-60M**


### FEATURES

- Built for reliability and performance
- More information with LED indicators.
- Communications capability
- Fully adjustable
- Extensive electronic protection
- Fanless design

Three-function PWM controller for larger systems, providing reliable PWM solar battery charging or load control or diversion regulation.

| TRISTAR PWM CONTROLLER | TS-45 | TS-60 | TS-60M |
|---|---|---|---|
| Rated Solar, Load or Diversion Current | 45A | 60A | 60A |
| Nominal System Voltage | 12, 24 or 48VDC | | |

| Options | TS-45 | TS-60 | TS-60M |
|---|---|---|---|
| TriStar Meter-2 (TS-M-2) | YES | YES | PRE-INSTALLED |
| TriStar Remote Meter-2 (TS-RM-2) | YES | | |
| MeterHub (HUB-1) | YES | | |
| EIA-485 Adapter (RSC-1) | YES | | |
| Remote Temperature Sensor (RTS)* | YES | | |
| Ground Fault Protection Device (GFPD- 150V and GFPD-600V) | YES | | |

| GENERAL INFORMATION | ALL VERSIONS |
|---|---|
| Ambient Operating Temperature | -40 °C to +45 °C |
| Terminals | 35 mm² / 2 AWG |
| Product Weight<br>TS-45<br>TS-60<br>TS-60M | <br>1.6 kg<br>1.6 kg<br>1.8 kg |
| Unit Shipping Weight<br>TS-45<br>TS-60<br>TS-60M | <br>2.0 kg<br>2.0 kg<br>2.2 kg |
| Dimensions | 26.0 x 12.7 x 7.1 cm |
| Warranty | 5 years |

# Morningstar PWM Charge Controller
## ProStar

YHI Part Codes **MS-PSPWM-15, MS-PSPWM-15M, MS-PSPWM-30, MS-PSPWM-30M**


### FEATURES

- Longer battery life through 4-stage charging and temperature
- More information with three battery-level LED indicators.
- Extensive electronic protection against reverse polarity, reverse current at night, short circuits, overcurrent and excessive temperature
- Fanless design for long-term reliability.

Mid-range PWM solar charge controller for both professional and consumer applications, incorporating legendary ProStar design and performance.

| PROSTAR PWM CONTROLLER | PS-15 | PS-15M | PS-30 | PS-30M |
|---|---|---|---|---|
| Rated Solar Current | 15A | | 30A | |
| Rated Load Current * | 15A | | 30A | |
| Nominal System Voltage | 12/24 VDC | | | |

| Options | PS-15 | PS-15M | PS-30 | PS-30M |
|---|---|---|---|---|
| Digital Meter | NO | INCLUDED | NO | INCLUDED |
| Remote Meter (RM-1) | YES | | | |
| Ethernet MeterBus Converter (EMC-1) | YES | | | |
| Remote Temperature Sensor (RTS) | YES | | | |
| Ground Fault Protection Device (GFPD- 150V and GFPD-600V) | YES | | | |

* Low Voltage Disconnect is included in all ProStar Controllers.

| GENERAL INFORMATION | ALL VERSIONS |
|---|---|
| Ambient Operating Temperature | -40 °C to +60 °C |
| Terminals | 16 mm² / 6 AWG |
| Product Weight | |
| PS-15 | 0.3 kg |
| PS-15M | 0.4 kg |
| PS-30 | 0.3 kg |
| PS-30M | 0.4 kg |
| Unit Shipping Weight | |
| PS-15 | 0.6 kg |
| PS-15M | 0.7 kg |
| PS-30 | 0.6 kg |
| PS-30M | 0.7 kg |
| Dimensions | 15.3 x 10.5 x 5.5 cm |
| Warranty | 5 years |

# Morningstar PWM Charge Controller
## SunSaver

MORNINGSTAR PROFESSIONAL SERIES

YHI Part Codes **MS-SSPWM12-6, MS-SSPWM12-6L, MS-SSPWM12-10, MS-SSPWM-10L, MS-SSPWM24-10L**

**MS-SSPWM12-20L, MS-SSPWM24-20L**


### FEATURES

- Ideal for oil/gas applications.
- Longer battery life
- Tropicalization - hardened for field use with anodized aluminum enclosure, epoxy encapsulation, marine-rated terminals.
- Additional features
- L-versions include low-voltage load disconnect

The world's leading small solar controller for industrial and consumer markets. Proven in demanding locations, including mines and oilfields, the SunSaver includes standard features and capabilities not found in any other small PV controller.

| SUNSAVER PWM CONTROLLER | SS-6-12V | SS-6L-12V | SS-10-12V | SS-6-12V | SS-10-24V | SS-20-12V | SS-20-24V |
|---|---|---|---|---|---|---|---|
| Rated Solar Current | 6A | | 10A | | | 20A | |
| Rated Load Current | 6A | | 10A | | | 20A | |
| Nominal System Voltage | 12 VDC | | | | 24 VDC | 12VDC | 24 VDC |
| Low Voltage Disconnect | NO | YES | NO | YES | | | |

| Options | ALL VERSIONS |
|---|---|
| DIN Rail Clips (DIN-1) | YES |
| Ground Fault Protection Device (GFPD-150V and GFPD-600V) | YES |

| General Information | ALL VERSIONS |
|---|---|
| Ambient Operating Temperature | -40 °C to +45 °C |
| Terminals | 5 $mm^2$ / 2 AWG |
| Product Weight | 0.23 kg |
| Unit Shipping Weight | 0.4 kg |
| Dimensions | 15.2 x 5.5 x 3.4 cm |
| Warranty | 5 years |

# Morningstar PWM Charge Controller
## SunSaver Duo

MORNINGSTAR PROFESSIONAL SERIES

YHI Part Codes **MS-SSDPWM12-25, MS-SSDPWM12-25RM**


### FEATURES

- Rugged design - epoxy encapsulation protects against dust and high humidity.
- User adjustable - set parameters with on-board DIP switches or furthercustomize with a PC using Morningstar MSView software.
- Dual battery charging capability; house and vehicle for example.

Morningstar SunSaver Duo ™ is an advanced PWM two battery controller for RVs, caravans, boats and cottages. Also can include an optional remote meter which displays digital image and status information about the solar power system.

| SUNSAVER DUO PWM CONTROLLER | SSD-25 | SSD-25RM |
|---|---|---|
| Rated Solar Current | 25A | |
| Rated Load Current* | NONE | |
| Nominal System Voltage | 12VDC | |

| Options | SSD-25 | SSD-25RM |
|---|---|---|
| Remote Meter (RM-1) | YES | INCLUDED |
| Remote Temperature Sensor | YES | |
| PC MeterBus Adapter (MSC) | YES | |
| DIN Rail Clips (DIN-1) | YES | |
| EIA-485 Adapter (RSC-1)** | YES | |
| Ground Fault Protection Device (GFPD-150V and GFPD-600V) | YES | |
| Ethernet MeterBus Converter (EMC-1) | YES | |

| GENERAL INFORMATION | ALL VERSIONS |
|---|---|
| Ambient Operating Temperature | -40 °C to +45 °C |
| Terminals | 16 mm² / 6 AWG |
| Product Weight<br>SSD-25<br>SSD-25RM | <br>0.26 kg<br>0.27 kg |
| Unit Shipping Weight<br>SSD-25<br>SSD-25RM | <br>0.6 kg<br>1.0 kg |
| Dimensions: | 17.0 x 5.6 x 4.1 cm |
| Warranty | 5 years |

*There is no load connection on the SunSaver Duo.
** The EIA-485 / RS-232 Adapter can be used in conjunction with the PCMeterBus Adapter to enable these devices to communicate over a 485 network.

# Morningstar PWM Charge Controller
SunKeeper

MORNINGSTAR PROFESSIONAL SERIES

YHI Part Codes **MS-SKPWM12-6, MS-SKPWM12-12**


## FEATURES

- High temperature rated – to 70° for operation in high temperatures at the solar module; no need to de-rate.
- IP65 rated with UV-resistant case; epoxy encapsulated electronics and watertight connection to junction box.
- Ideal for oil/gas applications.
- Approved for use in hazardous locations: Class 1, Division 2, Groups A-D.

Compact "point of use" design mounts directly to the solar module junction box or module frame and eliminates the need for an additional controller housing.

| SUNKEEPER PWM CONTROLLER | SK-6 | SK-12 |
|---|---|---|
| Rated Solar Current | 6A | 12A |
| Rated Load Current* | NONE | |
| Nominal System Voltage | 12VDC | |

| Options | SK-6 | SK-12 |
|---|---|---|
| Remote Temperature Sensor (RTS)** | YES | |

| GENERAL INFORMATION | ALL VERSIONS |
|---|---|
| Ambient Operating Temperature | -40 °C to +70 °C |
| Terminals | 2.0mm² / 14 AWG |
| Product Weight | 0.11 kg |
| Unit Shipping Weight | 0.2kg |
| Dimensions | 9.9 x 5.1 x 1.3 cm |
| Warranty | 5 years |

* There is no load connection on the SunKeeper.
** Installation of the RTS to the SunKeeper requires some soldering

# Morningstar PWM Charge Controller
## SunLight

MORNINGSTAR PROFESSIONAL SERIES

YHI Part Codes **MS-SLPWM12-10L, MS-SLPWM12-20L, MS-SLPWM24-10L, MS-SLPWM24-20L**


### FEATURES

- Provides 10 lighting options with accurate on-board timer. User adjustable for 2 to 10 hours ON or for ON all night. Unique ON/OFF/ON settings conserve energy and turn lights on again for 1 or 2 hours before sunrise. Timer accuracy is within 2 seconds.
- Easy to set-up, with test-button feature and LED indicator. To confirm correct installation, test button turns light on during the day and LED indicates selected lighting option.
- Rugged design with anodized aluminum enclosure, epoxy encapsulation, corrosion-resistant terminals.

World's leading solar lighting controller for street and pathway lighting, parking areas, bus stations, signage, and much more.

| SUNLIGHT PWM CONTROLLER | SL-10L-12 | SL-10L-24 | SL-20L-12 | SL-20L-24 |
|---|---|---|---|---|
| Rated Solar Current | 10A | | 20A | |
| Rated Load Current* | 10A | | 20A | |
| Nominal System Voltage | 12VDC | 24VDC | 12VDC | 24VDC |
| **Options** | **SL-10L-12** | **SL-10L-24** | **SL-20L-12** | **SL-20L-24** |
| DIN Rail Clips (DIN-1) | YES | | | |
| Group Fault Protection Device (GFPD-150 and GFDP-600V) | YES | | | |

| GENERAL INFORMATION | ALL VERSIONS |
|---|---|
| Ambient Operating Temperature | -40 °C to +60 °C |
| Terminals | 5.2mm² / 10 AWG |
| Product Weight | 0.27 kg |
| Unit Shipping Weight | 0.3 kg |
| Dimensions | 16.8 x 5.5 x 3.4 cm |
| Warranty | 5 years |

* Low Voltage Disconnect is included in all SunLight Controllers.

# Morningstar PWM Charge Controller
SunGuard

YHI Part Codes **MS-SGPWM12-4**


## FEATURES

- Rugged design - 100% solid state, epoxy encapsulated; rated for 25% overloads (no need to de-rate)
- Longer battery life - series design PWM charging (instead of shunt) with temperature compensation, low self-consumption.
- Easy to install - outdoor rated connecting wires make a waterproof connection to the solar module and battery.

Single module, compact solar charge controller for small systems, ideal for both professional and consumer use

| SUNGUARD PWM CONTROLLER | SG-4 |
|---|---|
| Rated Solar Current | 4.5A |
| Rated Load Current* | None |
| Nominal System Voltage | 12VDC |

| GENERAL INFORMATION | ALL VERSIONS |
|---|---|
| Ambient Operating Temperature | -40 °C to +60 °C |
| Terminals | 5.2mm² / 10 AWG |
| Product Weight | 0.1 kg |
| Unit Shipping Weight | 0.1 kg |
| Dimensions | 6.4 x 5.1 x 3.8 cm |
| Warranty | 5 years |

# Morningstar MPPT Charge Controller
## EcoBoost

MORNINGSTAR ESSENTIAL SERIES

YHI Part Codes **MS-EBMPPT-20, MS-EBMPPT-20M, MS-EBMPPT-30, MS-EBMPPT-30M, MS-EBMPPT-40**

**MS-EBMPPT-40M**


**FEATURES**

- Four stage battery charging
- Two USB ports for directly charging mobile phones and otherconsumer electronics devices
- Lighting and load control
- 30 days of data logging
- Rugged, weatherized design with electronic protections

An affordable Maximum Power Point Tracking (MPPT solar charge controller for residential and other consumer applications. Metered and non-metered versions available at 20, 30, and 40-amp charge ratings for 12 and 24-volt battery systems.

| ECOBOOST MPPT CONTROLLER | EB-MPPT -20 | EB-MPPT -20M | EB-MPPT -30 | EB-MPPT -30M | EB-MPPT -40 | EB-MPPT -40M |
|---|---|---|---|---|---|---|
| Norminal Battery Voltage | 12V or 24V Automatic Sensing and Setting | | | | | |
| Load Current Rating | 120V | | | | | |
| Maximum PV Open Circuit Voltage | 20A | | 30A | | 40A | |

| Options | EB-MPPT -20 | EB-MPPT -20M | EB-MPPT -30 | EB-MPPT -30M | EB-MPPT -40 | EB-MPPT -40M |
|---|---|---|---|---|---|---|
| Digital Meter | NO | INCLUDED | NO | INCLUDED | NO | INCLUDED |
| Remote Temperature Sensor (RTS) | YES | | | | | |
| Mobile phone holder (one included) | INCLUDED | | | | | |

| GENERAL INFORMATION | ALL VERSIONS |
|---|---|
| Ambient Operating Temperature | -40 °C to +65 °C |
| Terminals | 2.5-16mm²/14-6 AWG |
| Weight | 1.4 kg |
| Dimensions | 19.6 x 17.3 x 7.1cm |
| Warranty | 2 years |

# Morningstar PWM Charge Controller
## EcoPulse

MORNINGSTAR ESSENTIAL SERIES

YHI Part Codes **MS-ECPWM-10, MS-ECPWM-10M, MS-ECPWM-20, MS-ECPWM-20M, MS-ECPWM-30**

**MS-ECPWM-30M**


### FEATURES

- Four-stage battery charging
- Dusk-to-dawn lighting control
- Load control
- Rugged, weatherized design with electronic protections

A Pulse Width Modulation (PWM) solar charge controller delivering essential off-grid battery regulation functions in an easy-to use-package. Available in metered and non-metered versions.

| ECOPULSE MPPT CONTROLLER | EC-10 | EC-10M | EC-20 | EC-20M | EC-30 | EC-30M |
|---|---|---|---|---|---|---|
| Norminal Battery Voltage | 12V or 24V auto-detect | | | | | |
| Maximum PV Open Circcuit Voltage | 10A, 20A or 30A | | | | | |
| Load Current Rating | 10-35V | | | | | |
| **Options** | **EC-10** | **EC-10M** | **EC-20** | **EC-20M** | **EC-30** | **EC-30M** |
| Digital Meter | NO | INCLUDED | NO | INCLUDED | NO | INCLUDED |
| Remote Temperature Sensor (RTS) | YES | | | | | |

| GENERAL INFORMATION | ALL VERSIONS |
|---|---|
| Ambient Operating Temperature | -40 °C to +65 °C |
| Terminals | Power: 2.5-16mm2/ 14-6 AWG Battery/Temp. Sense: 0.25-1.0mm2/ 24-16 AWG |
| Weight | 0.4 kg |
| Dimensions | 15.3 x 10.5 x 5.5 cm |
| Warranty | 2 years |

# Morningstar MPPT Charge Controller
## SHS & SHS Night Light

MORNINGSTAR ESSENTIAL SERIES

YHI Part Codes **MS-SHS12-6, MS-SHS12-10, MS-SHS12-6-NL, MS-SHS12-10NL**


### FEATURES

- High reliability - built-in electronic fuse protection ensures wiring mistakes during installation will not damage the controller. Conformal coating for protection against harsh environments
- Lighting control built-in for dawn-to-dusk operation (Night Light version)
- Easy to set-up and use - control functions are automatic, requiring no user adjustments. LED indicators monitor battery and system status.

Low cost, affordable solar charge controllers featuring advanced electronic technology, for rural electrification solar home systems. Includes low-voltage disconnect for residential use.

| SHS CONTROLLER | SHS-6 | SHS-10 |
|---|---|---|
| Rated Solar Current | 6A | 10A |
| Rated Load Current* | 6A | 10A |
| Nominal System Voltage | 12VDC | |

| SHS NIGHT LIGHT CONTROLLER | SHS-6 | SHS-10 |
|---|---|---|
| Rated Solar Current | 6A | 10A |
| Rated Load Current | 6A | 10A |
| Nominal System Voltage | 12VDC | |

| GENERAL INFORMATION | ALL VERSIONS |
|---|---|
| Ambient Operating Temperature | -25 °C to +50 °C- |
| Terminals | For wire sizes to 4mm$^2$ |
| Weight | 0.2 kg |
| Dimensions | 15.1 x 6.6 x 3.6 cm |
| Warranty | 2 years |

* Low Voltage Disconnect included on all SHS controllers.

# Morningstar Accessories
## TriStar 600V Remote Meter

YHI Part Code **MS-TS-M-2-600V**


### FEATURES

- 2 x 16 character LCD display
- Mounts to the controller*
- Displays extensive system and controller information, logged data, bar graph metering as well as alarms and faults for easy troubleshooting
- Choice of 5 languages (English, French, German, Portuguese or Spanish)

* Replaces stock front faceplate

On-Board Advanced Digital Display for the TriStar MPPT 600V Controller. Displays extensive system and controller information, logged data, bar graph metering, as well as alarms and faults for easy troubleshooting.

### COMPATIBLE WITH:

ProStar MPPT Controller
SunSaver MPPT Controller
SunSaver Duo Controller
SureSine Inverter
ProStar Controller

# Morningstar Accessories
## TriStar Digital Meter

YHI Part Code **MS-TS-M-2**


### FEATURES

- 2 x 16 character LCD display
- Mounts to the controller*
- Displays extensive system and controller information, logged data, bargraph metering as well as alarms and faults for easy troubleshooting
- Choice of 5 languages (English, French, German, Portuguese or Spanish)

* Replaces stock front faceplate

On-Board Advanced Digital Display for the TriStar and TriStar MPPT Controllers. The meter will display a great deal of information about your TriStar controller and the operation of your system.

In addition, the meter enables manual functions and controller diagnostics. These capabilities will increase your confidence that the system is working properly and will help you to improve reliability, battery life and system performance.

### COMPATIBLE WITH:

TriStar MPPT Controller
TriStar Controller
MeterHub

# Morningstar Accessories
## TriStar Remote Meter

YHI Part Code **MS-TS-RM-2**


### FEATURES

- 2 x 16 character LCD display• Displays extensive system and controller information, logged data, bar graph metering, as well as alarms and faults for easy troubleshooting
- Choice of 5 languages (English, French, German, Portuguese or Spanish)

Remote Digital Display for the TriStar Family Controllers. The TS-RM-2 provides the same data display as the TS-M-2, except that it ships with 30 meters of cable and a flat faceplate. These features enable convenient mounting away from the controller.

### COMPATIBLE WITH:

TriStar MPPT 600V Controller
TriStar MPPT Controller
TriStar Controller
MeterHub

# Morningstar Accessories
## Remote Meter

YHI Part Code **MS-RM-1**


### FEATURES

- Easy to install and use
- Low self-consumption
- 4 digit display with custom icons
- Displays systems information, logged data*, alarms and errors
- May be mounted in the wall or on the wall with included frame

Remote Digital Display for viewing a controller or inverter in a separate location. This meter provides comprehensive system information for easy monitoring including voltage, current and temperature.

### COMPATIBLE WITH:

ProStar MPPT Controller
SunSaver MPPT Controller
SunSaver Duo Controller
SureSine Inverter
ProStar Controller

# Morningstar Accessories
## MeterHub

YHI Part Code **MS-HUB-1**


This product electrically isolates devices that supply power to the network, preventing damage to the network in the event of grounding problems.

### FEATURES

- Allows several Morningstar products to communicate over a MeterBus network (maximum 15 devices)
- In multi-controller systems the TS-M-2, TS-M-2-600V and TS-RM-2 are networkable using Morningstar's MeterHub to allow individual controller data and aggregate system data to be displayed together on a single meter.
- Enables multiple controllers to share a TriStar Meter or Relay Driver

### COMPATIBLE WITH:

TriStar MPPT 600V Controller
TriStar MPPT Controller
ProStar MPPT Controller
SunSaver MPPT Controller
TriStar Controller
TriStar Meter 2
TriStar Remote Meter 2
Relay Driver

# Morningstar Accessories
## PC MeterBus Adapter

YHI Part Code **MS-MSC**

### FEATURES

- Displays systems information, logged data*, alarms and errors
- May be mounted in the wall or on the wall with included frame
- Includes 10 meters of cable

* Logged data only available for the SunSaver MPPT, ProStar MPPT and ProStar controllers

Morningstar's PC Meterbus Adapter (MSC) converts a controller's meter port (RJ-11 phone type connector) to a standard RS-232 serial connector for connection to a PC or other equipment.

### COMPATIBLE WITH:

ProStar MPPT Controller
SunSaver MPPT Controller
SunSaver Duo Controller
SureSine Inverter
ProStar Controller

## Morningstar Accessories
RIA-485/RS-232 Communications Adapter

YHI Part Code **MS-RSC-1**

**COMPATIBLE WITH:**

TriStar MPPT Controller
SunSaver MPPT Controller
TriStar Controller
SunSaver Duo Controller
SureSine Inverter
Relay Driver

**FEATURES**

- Allows up to 128 Morningstar products to communicate on the samecommunications bus and over much greater distances than with RS-232
- All data is transmitted via MODBUS™ protocol
- Removable four (4) position EIA-485 terminal
- 9-pin RS-232 connector (male)
- Status LED for monitoring and diagnostics
- Molded tabs for attachment to 35mm standard DIN rail
- RS-232 ribbon cable (not shown) with low-profile connectors
- Adding Morningstar PC Meterbus Adapters (MSC) for use with anRJ-11 port in multi-device networks
- Adding Morningstar's Relay Driver (RD-1) to a network
- Integrating any compatible Morningstar product into an existing EIA-485network, such as those used by industrial control or SCADA systems

## Morningstar Accessories
USB MeterBus Adapter

YHI Part Code **MS-UMC-1**

**FEATURES**

- Used to connect a Morningstar controller orinverter to a PC or other third party serial enabled device
- Communications link enables monitoring and logging of data as well as customizing of set points

**COMPATIBLE WITH:**

ProStar MPPT Controller
SunSaver MPPT Controller
SunSaver Duo Controller
SureSine Inverter

## Morningstar Accessories
Ethernet MeterBus Converter

YHI Part Code **MS-EMC-1**


### FEATURES

- Allows communication between a computer and compatible Morningstar products
- Can be used for:
  Programming custom charging set-points
  Logging live data
- Communication with third party hardware that supports MODBUS™ communication compatible

Converts the MeterBus RJ-11 to a standard USB 2.0 interface

### COMPATIBLE WITH:

ProStar MPPT Controller
SunSaver MPPT Controller
SunSaver Duo Controller
SureSine Inverter
ProStar Controller

## Morningstar Accessories
Remote Temperature Sensor

YHI Part Code **MS-RTS**

### COMPATIBLE WITH:

TriStar MPPT Controller
ProStar MPPT Controller
SunSaver MPPT Controller
TriStar Controller
ProStar Controller
SunSaver Duo Controller
SureSine Inverter

### FEATURES

- Connects to any meterbus enabled controller to provide enhanced data and network features
- Adds IP based MODBUS connectivity for remote communication and control
- Live View displays system status and log data directly from the EMC in an easy to view webpage
- Adds SNMP and email notifications for system status changes
- Powered via meterbus port on controller, PoE or DC Input for 12,24 or 48V systems
- Gateway to EnVision™, a cloud-based site manager

YHI Part Codes **MS-GFPD-600V, MS-GFPD-150V**


Morningstar's Ground Fault Protection Device (GFPD) prevents current from following any unintended paths during a ground fault.

Other ground fault detection/interruption products break the bond to the grounded conductor. When this occurs, not only is the earth bond compromised, but the battery and DC loads can also be left ungrounded and floating. For a negatively grounded system this means that the negative side of the battery and loads can float to negative Voc in relation to ground and the positive side can float to (negative Voc + Vbat). Morningstar's GFPD better isolates the array from the battery and loads, while maintaining the bond to ground.

**COMPATIBLE WITH:**

TriStar MPPT-600V
Controller
TriStar MPPT Controller

**FEATURES**

- Disconnects both the positive and negative conductor and completely isolates PV source circuits
- Trips at 300mA compared to 1A for alternative solutions
- Provides design flexibility to accommodate large and small array configurations
- Uses high quality breaker solutions rather than fuses which are problematic to replace at remote sites• Works like a traditional AC GFI
- Maintains the integrity of earth bond for battery and loads
- Does not require an extra warning label at the battery per U.S. National Electric Code requirements
- Makes it easier to locate and troubleshoot ground faults
- Powered via the PV system's battery
- Equipped with both visual and audible alarms
- Built to support both single controller and multiple controller systems
- When the earth bond is not broken, Morningstar's GFPD will only shut off affected controllers
- All loads will continue to operate safely with the battery remaining bonded to ground
- Multiple controllers and GFPDs can be added on an as-needed basis

| Ground Fault Protection Device | GFPD-150V | GFPD-600V |
|---|---|---|
| Number of Poles | 2 | 2 |
| Maximum Solar Voltage | 150V | 600V |
| Maximum Solar Current | 60A | 50A |
| Trip Method | Relay | |
| Mounting | DIN-rail or Panel-Mount | |
| Input Voltage | 8-72 VDC | |
| Self- Voltage | <0.5W | |
| Ground Fault Threshold Current | 300mA +/- 10% | |
| Output Trip Signal | 12V | |
| Norminal System Voltage | 12,24,36 or 48VDC | |

| General Information | GFPD-150V & GFPD-600V |
|---|---|
| Ambient Operating Temperature | -40 °C to +60 °C<br>-40 °F to +140 °F |
| Terminals | 25mm2/4 AWG and 35mm2/2 AWG |
| Weight<br>GFPD-150V<br>GFPD-600V | <br>2.0 kg<br>4.4 kg |
| Dimensions<br>GFPD-150V<br>GFPD-600V | <br>26.9 x 12.8 x 11.2cm<br>35.7 x 22.1 x 10.6cm |
| Warranty | 5 years |

YHI Part Code **MS-DIN-1**

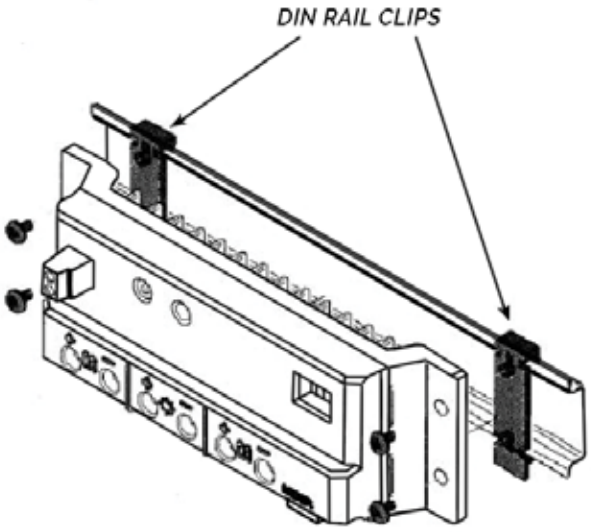
### FEATURES

- Rugged plastic clips match SunSaver and SunLight mounting holes
- Provides a simple way to install controllers to DIN rails
- Enables removal of controllers from DIN rails without removing the clips
- Polypropylene clips
- Fits all 35mm standard DIN rails
- Includes mounting screws

For installing controllers and accessories to DIN Rails.


### COMPATIBLE WITH:

SunSaver MPPT Controller
SunSaver Controller
SunSaver Duo Controller
SunLight Controller



# Morningstar Accessories
## Relay Driver

YHI Part Code **MS-RD-1**


Logic Module for system control functions. The Relay Driver provides high level system control functions such as high/low voltage alarms, load control and generator start.

### FEATURES

- Cost-effective and highly reliable
- Fully Programmable
- Advanced Generator Control
- Industrial Design
- LED Indicators
- 4 independent relay driver outputs (relays not included)
- Used for high/low voltage alarms, load control, and generator start
- Reads digital data inputs from 'compatible' controllers and inverters
- Reads battery voltage in systems with other controllers

### COMPATIBLE WITH:

TriStar MPPT 600V Controller
TriStar MPPT Controller
ProStar MPPT Controller
SunSaver MPPT Controller
TriStar Controller
ProStar Controller
SunSaver Duo Controller
SureSine Inverter
MeterHub

# Morningstar Accessories
## Wire Box

YHI Part Code **MS-MPPTS-WB**

### FEATURES

- Material: High strength polycarbonate Lexan
- Enclosure space: accommodates 35mm2 wire
- Meets NEC standards for conduits and wire bending

An optional two-piece enclosure accessory for ProStar MPPT. Provides effective cover for wires and conduit leading to and from the ProStar MPPT controller. This Wire Box may be required or recommended by authorities having jurisdiction to reduce hazards associated with exposed wires, conduits and connections.

### COMPATIBLE WITH:

ProStar MPPT Controller

# Neuton Power Charge Controller
Solar Charge Controller

YHI Part Codes **SLC12/24-20**


**FEATURES**

- 12/24VDC Auto Detect
- Automatic Day/Night recognition
- Simplistic Digital LED menu for easy-to-use quick key settings
- Intelligent dual timer function
- Suitable for use with GEL, Sealed Lead Acid & Flooded Batteries
- 1 year warranty

Fully automatic operation, utilising pulse width modulation (PWM) for increased battery life & optimised system performance.

| CONTROLLER | SLC12/24-20 |
|---|---|
| **Technical Specification** | |
| Nominal system voltage | 12V/24V DC Auto Work |
| Maximum battery voltage | 32V |
| Rated charge current | 20A |
| Charge circuit voltage drop | ≤ 0.26V |
| Discharge circuit voltage drop | ≤ 0.15V |
| Self consumption | ≤ 6mA |
| NTTV (night time threshold voltage) | 12V System: 5V/24V System: 10V |
| DTTV (daytime threshold voltage) | 12V System: 6V/24V System: 12V |
| Temperature compensation coefficient (TEMPCO) | -30Mv/°C/12V (25°C ref) |
| Working temperature | -35°C to +55°C |
| Storage temperature | -35°C to +80°C |
| Humidity | 10% - 90% NC |
| Case protection | IP30 |
| Overall dimension (L x W x H) | 150 x 82 x 50 mm |
| Terminal | 6mm$^2$ |
| Net Weight | 0.35kg |

# Neuton Power Charge Controller
## Solar Charge Controller

YHI Part Codes **ENS12/24-20D**


Highly efficient charge controller that utilises pulse width modulation (PWM) for increased battery life & optimised system performance.

### FEATURES

- 12/24VDC Auto Detect
- LCD screen displaying battery voltage, PV charge current, load discharge current, total PV discharge Ah, low voltage disconnect, low voltage reconnect
- Electronic Protection Functions
- External temperature sensor
- Temperature compensation automatically regulates charging and discharging parameters for improved battery life
- Dual solar input terminals
- 1 year warranty

| CONTROLLER | ENS12/24-20D |
|---|---|
| **Technical Specification** | |
| Nominal voltage | 12/24, Automatic Recognition |
| Nominal battery current | 20A |
| Max PV input power | 300W@12V<br>600W@24V |
| Max solar input voltage VOC | 30V/48V |
| Min solar input voltage VMP | 16V/32V |
| Power conversion efficiency | Max 90% |
| Standby power consumption | < 15mA |
| Length ≤1m charge loop drop | < 0.25V |
| Length ≤1m discharge loop drop | < 0.05V |
| Temperature compensation | -3 mv/cell *K |
| Dimensions (L x W x H) | 172 x 126 x 73 mm |
| Weights | 0.35kg |
| Ambient temperature range | -40 to +50˚C |
| Case protection | IP22 |
| Float charge | 13.8V/27.6V |
| Constant voltage charge | 14.6V (14~15V settable) 29.2V (28~30V Settable) |
| Low disconnect voltage | 11V (10.4~11.4V settable) 22V (20.8~22.8V Settable) |
| Low reconnect voltage | 12.8V (12.2~13.2V Settable) 25.6V (24.4~26.4V Settable) |
| Grounding | Positive Grounding |
| Battery Type | GEL, AGM, Wet Battery |

# 7

**YHI stocks a comprehensive range of Lead Carbon, Gel, Deep Cycle and SLA/AGM batteries from world leading brands C&D Technologies, Trojan and Vision.**

YHI Part Codes **TRSIND06610, TRSIND06920, TRSIND061225, TRSIND021990, TRSIDN022450**


**FEATURES**

- 17 year battery life based on IEC 61427
- Increased energy & maximum sustained performance

Deep-cycle batteries used in off-grid and unstable grid applications are heavily cycled at partial state of charge (PSOC). Operating at PSOC on a regular basis can quickly diminish the overall life of a battery, which results in frequent and costly battery replacements.

To address the impact of PSOC on deep-cycle batteries in renewable energy (RE), inverter backup and telecom applications, Trojan Battery has now included Smart Carbon™ as a standard feature in its Solar Industrial and Solar Premium flooded battery lines.

| DEEP CYCLE SOLAR FLOODED BATTERY | TRSIND06610 | TRSIND06920 | TRSIND061225 | TRSIND021990 | TRSIND022450 |
|---|---|---|---|---|---|
| Model | SIND 06 610 | SIND 06 920 | SIND 06 1225 | SIND 02 1990 | SIND 02 2450 |
| Voltage | 6V | | | 2V | |
| Capacity | 610Ah @ 100Hr | 920Ah @ 100Hr | 1225Ah @ 100Hr | 1990Ah @ 100Hr | 2450 @ 100Hr |
| Material | Polypropylene (internal cell container) & Polyethylene (outer container) | | | | |
| Battery | Deep-cycle flooded/advanced lead acid battery | | | | |
| Colour | Maroon | | | | |
| Watering | Single-point watering kit (optional) | | | | |

## Capacity Amp-Hours (Ah)

| | TRSIND06610 | TRSIND06920 | TRSIND061225 | TRSIND021990 | TRSIND022450 |
|---|---|---|---|---|---|
| 10 hours | 421Ah | 627Ah | 835Ah | 1393Ah | 1712Ah |
| 20 hours | 472Ah | 708Ah | 942Ah | 1547Ah | 1882Ah |
| 48 hours | 540Ah | 813Ah | 1083Ah | 1771Ah | 2166Ah |
| 72 hours | 578Ah | 870Ah | 1159Ah | 1889Ah | 2318Ah |
| 100 hours | 610Ah | 920Ah | 1225Ah | 1990Ah | 2450Ah |

## Operational Data

| | |
|---|---|
| Operating Temperature | -20°C to 50°C at temperatures below 0°C maintain a state of charge greater than 60%. |
| Self Discharge | 5 - 15% per month depending on storage temperature conditions |

## Product & Physical Specifications

| | TRSIND06610 | TRSIND06920 | TRSIND061225 | TRSIND021990 | TRSIND022450 |
|---|---|---|---|---|---|
| Terminal Type | IND | IND | IND | IND | IND |
| Dimensions - L x W x H (mm) | 389 x 260 x 610 | 262 x 567 x 610 | 689 x 265 x 610 | 389 x 260 x 610 | 440 x 260 x 610 |
| Weight | 100kg | 143kg | 188kg | 107kg | 125kg |

## Terminal Configurations

| Terminal Height | Torque Values (in-lb) | Bolt |
|---|---|---|
| 38mm | 100 - 120 | 5/16"-18 |

# Trojan Batteries
Trillium

YHI Part Codes **TR24-LI, TR27-LI, TRU1-LI**


Designed and engineered in the USA, Trillium™ can be used in a variety of stationary and motive power applications. From its superior cell and battery design to its intelligent, built-in diagnostics, Trillium offers a range of advanced safety, environmental and electronic features not found in competitive products. With a life expectancy of well over 5,000 cycles, Trillium will deliver outstanding return on investment over time, plus the legendary quality Trojan Battery is known for.

| TRILLIUM BATTERIES | TR24-LI | TR27-LI | TRU1-LI |
|---|---|---|---|
| Model | TR 25.6-25 Li-ion | TR 12.8-110 Li-ion | TR 25.6-25 Li-ion |
| Voltage | 12.8V | 12.8V | 25.6V |
| Nominal Capacity | 92Ah (1,180Wh) | 110Ah (1,400Wh) | 25Ah (640Wh) |
| Case | PC/PBT Resin Blend, IP67 Enclosure, UL94 V-0 | | |
| Battery | Deep-Cycle Lithium Iron Phosphate | | |
| Colour | Maroon | | |
| Cycle Life | >5,000 cycles @ 80% DOD* | | |
| Intelligence | Integrated Microprocessor, State of Charge Gauge, Integrated Contractor, Current Sensor, Fuse | Integrated Microprocessor, State of Charge Gauge, Integrated Contractor, Current Sensor, Fuse | MOFSETS |

## Product & Physical Specifications

| | TR24-LI | TR27-LI | TRU1-LI |
|---|---|---|---|
| Terminal Type | M8 | Stud and 1/4" - 20 threaded insert | M6 |
| Dimensions - L x W x H (mm) | 259 x 168 x 216 | 307 x 168 x 221 | 198 x 132 x 173 |
| Weight | 12.3kg | 13.6kg | 5.3kg |
| Install Orientation | Horizontal & Vertical | Horizontal & Vertical | Horizontal & Vertical |

## Electrical Specifications

| | TR24-LI | TR27-LI | TRU1-LI |
|---|---|---|---|
| Short Circuit Current | Fused at 400 Amps | Fused at 500 Amps | Fused at 125 Amps |

## Operational Data

| | TR24-LI | TR27-LI | TRU1-LI |
|---|---|---|---|
| Operating Temperature Range | -20°C to 60°C at temperatures below 0°C charging current reduced. | | |
| Storage Temperature Range | -40°C to 60°C | | |

## Electrical Features

| | TR24-LI | TR27-LI | TRU1-LI |
|---|---|---|---|
| Continuous Discharge Current | 250 Amps | 300 Amps | 50 Amps |
| Pulse Discharge Current @ 25°C | 350 Amps for 30 seconds | 400 Amps for 30 seconds | 70 Amps for 30 seconds |
| Series Connections | Up to 4S (51.2V) | Up to 4S (51.2V) | Up to 2S (51.2V) |
| Parallel Connections | Up to 20P | Up to 20P | Up to 20P |

YHI Part Codes **TRSAGM06220, TRSAGM06375, TRSAGM12105, TRSAGM12205**


Engineered for best value and worry-free storage, Trojan Solar AGM maintenance-free batteries can be counted on day in and day out as a reliable power source for a wide range of off-grid and unreliable grid applications, including:

- Telecom
- Oil & gas
- Remote micro-grids
- Off-grid cabins/tiny house
- Solar home systems
- Solar street signs/lights
- Residential & commercial backup

| SOLAR AGM BATTERIES | TRSAGM06220 | TRSAGM06375 | TRSAGM12105 | TRSAGM12205 |
|---|---|---|---|---|
| Model | SAGM 06 220 | SAGM 06 375 | SAGM 12 105 | SAGM 12 205 |
| Voltage | 6V | 6V | 12V | 12V |
| Capacity | 220Ah @ 20Hr | 375Ah @ 20Hr | 105Ah @ 20Hr | 205Ah @ 20Hr |
| Material | Polypropylene | | | |
| Battery | VRLA AGM / Non-Spillable / Maintenance-Free | | | |
| Colour | Maroon | | | |
| Watering | No watering required | | | |
| IEC 61427 | 8+ years of life | | | |

## Product & Physical Specifications

| | TRSAGM06220 | TRSAGM06375 | TRSAGM12105 | TRSAGM12205 |
|---|---|---|---|---|
| Terminal Type | LT | LT | LT | LT |
| Dimensions - L x W x H (mm) | 261 x 177 x 273 | 294 x 175 x 414 | 324 x 172 x 237 | 380 x 176 x 357 |
| Weight | 31kg | 52kg | 30kg | 59kg |

## Capacity Amp-Hours (Ah)

| | TRSAGM06220 | TRSAGM06375 | TRSAGM12105 | TRSAGM12205 |
|---|---|---|---|---|
| 10 hours | 190Ah | 329Ah | 94Ah | 174Ah |
| 20 hours | 220Ah | 375Ah | 105Ah | 205Ah |
| 48 hours | 228Ah | 389Ah | 109Ah | 210Ah |
| 72 hours | 231Ah | 394Ah | 111Ah | 213Ah |
| 100 hours | 235Ah | 400Ah | 113Ah | 216Ah |
| Energy 20-Hr | 1.32kWh | 2.25kWh | 1.26kWh | 2.46kWh |

## Operational Data

| | TRSAGM06220 | TRSAGM06375 | TRSAGM12105 | TRSAGM12205 |
|---|---|---|---|---|
| Operating Temperature Range | -20°C to 50°C at temperatures below 0°C maintain a state of charge greater than 60%. | | | |
| Self Discharge | Less than 3% per month depending on storage temperature conditions | | | |

### FEATURES

- Enhanced power stability and reliability in cyclic applications
- Endurable power system with a longer service life
- Fast capacity recovery for next discharge cycle
- Minimised total ownership
- Long life-cycle service design
- Excellent Partial State of Change (PSoC) and cyclic performance
- Leading charging acceptance
- Compliant to major global specifications
- Extreme temperature tolerance
- 3 year warranty

C&D's lead-carbon batteries combine the high energy density of a battery and the high specific power of a super-capacitor in a single low cost but top quality device.

**LEAD CARBON**

## Technical Specification

| Product Code | Voltage | 10Hr Ah Rate | Length | Width | Height | Total Height | Weight |
|---|---|---|---|---|---|---|---|
| SHC12150FT | 12V | 150Ah | 559mm | 126mm | 285mm | 285mm | 50kg |
| SHC12200FT | 12V | 172Ah | 559mm | 126mm | 328mm | 328mm | 60kg |
| SHC2300-24 | 24V | 300Ah | 750mm | 393mm | 565mm | 565mm | 400kg |
| SHC2300-48 | 48V | 300Ah | 750mm | 393mm | 1029mm | 1029mm | 732kg |
| SHC2400-24 | 24V | 400Ah | 750mm | 393mm | 661mm | 661mm | 480kg |
| SHC2400-48 | 48V | 400Ah | 750mm | 393mm | 1221mm | 1221mm | 902kg |
| SHC2600-24 | 24V | 600Ah | 908mm | 427mm | 851mm | 851mm | 635kg |
| SHC2600-48 | 48V | 600Ah | 829mm | 427mm | 1599mm | 1599mm | 1,194kg |

C&D Tubular GEL (OPzV) Series range of valve regulated lead acid stationary batteries combine the benefits of recombination technology (i.e. virtually no maintenance due to very low gas).

**FEATURES**

- Design life: 15 Years
- Tubular Positive Plate - Special grid construction, pressure cast from antimony free alloy, with highly porous gauntlets that retain the active material.
- Pasted negative plate - service lives consistent with the positive plates
- Separators - extremely high porosity and low internal resistance
- Electrolyte - Gel Structure
- Containers and lids - Made of plastic (ABS) material
- Cells are normally installed in an upright position on steel stands
- One way relief value - opens at low pressure and is fitted with a flame arrestor device
- 2 year warranty on standby applications

**OPZV GEL**

## Technical Specification

| Product Code | Voltage | 10Hr Ah Rate | Length | Width | Height | Weight | Terminal Type |
|---|---|---|---|---|---|---|---|
| CD2200TGEL | 2V | 200Ah | 103mm | 206mm | 354mm | 19kg | M10 |
| CD2250TGEL | 2V | 250Ah | 124mm | 206mm | 354mm | 23kg | M10 |
| CD2300TGEL | 2V | 300Ah | 145mm | 206mm | 354mm | 28kg | M10 |
| CD2350TGEL | 2V | 350Ah | 124mm | 206mm | 471mm | 31kg | M10 |
| CD2420TGEL | 2V | 420Ah | 145mm | 206mm | 471mm | 36kg | M10 |
| CD2490TGEL | 2V | 490Ah | 166mm | 206mm | 471mm | 41kg | M10 |
| CD2600TGEL | 2V | 600Ah | 145mm | 206mm | 643mm | 49kg | M10 |
| CD2800TGEL | 2V | 800Ah | 210mm | 191mm | 664mm | 65kg | M10 |
| CD21000TGEL | 2V | 1000Ah | 210mm | 233mm | 646mm | 80kg | M10 |
| CD21200TGEL | 2V | 1200Ah | 210mm | 275mm | 665mm | 93kg | M10 |
| CD21500TGEL | 2V | 1500Ah | 210mm | 275mm | 796mm | 115kg | M10 |
| CD22000TGEL | 2V | 2000Ah | 214mm | 399mm | 771mm | 155kg | M10 |
| CD22500TGEL | 2V | 2500Ah | 214mm | 487mm | 769mm | 200kg | M10 |
| CD23000TGEL | 2V | 3000Ah | 214mm | 576mm | 771mm | 235kg | M10 |

# Vision Batteries
## CL Series

### FEATURES

- Sealed construction
- Long service life, float or cyclic
- Maintenance-free operation
- Low pressure venting system
- Heavy duty grids
- Low self discharge
- 48 month warranty

Vision's CL series of VRLA batteries are recognised as the most reliable and high quality battery system in the industry.

Vision CL series batteries are designed with advanced AGM (Absorbent Glass Mat) technology, long service life designed with 20 years, the batteries also comply to the most popular international standards, such as IEC896-2, BS6290-4, Eurobat Guide.

**CL BATTERY**

### Technical Specification

| Product Code | Voltage (V) | 10Hr Ah Rate | Length | Width | Height | Total Height | Weight | Teminal Type |
|---|---|---|---|---|---|---|---|---|
| CL100 | 2V | 100Ah | 171mm | 72mm | 206mm | 211mm | 7.2kg | M8 |
| CL200 | 2V | 200Ah | 173mm | 111mm | 330mm | 364mm | 15kg | M8 |
| CL300 | 2V | 300Ah | 171mm | 151mm | 330mm | 364mm | 21kg | M8 |
| CL400 | 2V | 400Ah | 210mm | 176mm | 330mm | 367mm | 28kg | M8 |
| CL500 | 2V | 500Ah | 241mm | 175mm | 330mm | 365mm | 33kg | M8 |
| CL600 | 2V | 600Ah | 302mm | 175mm | 330mm | 367mm | 42kg | M8 |
| CL800 | 2V | 800Ah | 410mm | 175mm | 330mm | 367mm | 57kg | M8 |
| CL1000 | 2V | 1000Ah | 475mm | 175mm | 330mm | 367mm | 66.5kg | M8 |
| CL1500 | 2V | 1500Ah | 400mm | 350mm | 345mm | 382mm | 100kg | M8 |
| CL2000 | 2V | 2000Ah | 490mm | 350mm | 345mm | 382mm | 132kg | M8 |
| CL3000 | 2V | 3000Ah | 710mm | 350mm | 345mm | 382mm | 204kg | M8 |


**FEATURES**

- Stable quality & high reliability
- Higher power density
- Reliable construction
- Valve regulating
- Excellent recovery from deep discharge
- 36 month warranty

Vision FM series are designed for general-purpose applications, such as UPS, telecom, and electrical utilities. With 10 years design life, the batteries comply to the most popular international standards, such as IEC896-2, BS6290-4, Eurobat Guide.

With more than 15 years of production experience, the Vision FM series of VRLA batteries are recognised as the most reliable and high quality battery system in the industry.

**FM BATTERY**

### Technical Specification

| Product Code | Voltage (V) | 10H Ah Rate | Length | Width | Height | Total Height | Weight | Terminal Type |
|---|---|---|---|---|---|---|---|---|
| 3FM180DX | 6V | 180Ah | 306mm | 167mm | 220mm | 220mm | 28.6kg | M8 |
| 3FM200DX | 6V | 200Ah | 240mm | 185mm | 275mm | 275mm | 32.5kg | M8 |
| 3FM225 | 6V | 225Ah | 320mm | 176mm | 225mm | 247mm | 30.5kg | M8 |
| 6FM33 | 12V | 33Ah | 195mm | 130mm | 155mm | 168mm | 10.2kg | M6 |
| 6FM33X-D | 12V | 33Ah | 195mm | 130mm | 155mm | 168mm | 10.7kg | M6 |
| 6FM40 | 12V | 40Ah | 197mm | 165mm | 170mm | 170mm | 13.5kg | M6 |
| 6FM45X-D | 12V | 45Ah | 197mm | 165mm | 170mm | 170mm | 16.8kg | M6 |
| 6FM55 | 12V | 55Ah | 229mm | 138mm | 208mm | 213mm | 19kg | M6 |
| 6FM60 | 12V | 60Ah | 258mm | 166mm | 206mm | 215mm | 24kg | M6 |
| 6FM65 | 12V | 65Ah | 350mm | 167mm | 179mm | 179mm | 23.4kg | M6 |
| 6FM75 | 12V | 75Ah | 258mm | 166mm | 206mm | 215mm | 24kg | M6 |
| 6FM80 | 12V | 80Ah | 350mm | 167mm | 179mm | 179mm | 24kg | M6 |
| 6FM100 | 12V | 100Ah | 330mm | 171mm | 215mm | 222mm | 32kg | M6 |
| 6FM100X-D | 12V | 100Ah | 330mm | 171mm | 215mm | 220mm | 32kg | M6 |
| 6FM120 | 12V | 120Ah | 410mm | 176mm | 227mm | 227mm | 38kg | M8 |
| 6FM120SX | 12V | 200Ah | 522mm | 238mm | 218mm | 223mm | 38kg | M6 |
| 6FM150 | 12V | 150Ah | 485mm | 172mm | 240mm | 240mm | 47kg | M8 |
| 6FM200 | 12V | 200Ah | 522mm | 238mm | 218mm | 223mm | 65kg | M8 |
| 6FM230 | 12V | 230Ah | 520mm | 269mm | 203mm | 208mm | 72.6kg | M8 |

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