



/ STP 12-50 / STP 15-50 / STP 20-50 / STP 25-50



Sunny Tripower X

12 / 15 / 20 / 25

Integrated intelligence for future-proof system design

powered by
ennexOS



System manager function

- Monitoring and control for up to 5 inverters (max. 135 kVA) included
- Direct access to Sunny Portal powered by ennexOS
- SMA Dynamic Power Control

Safety included

- SMA ArcFix arc-fault circuit interrupter
- DC overvoltage protection (optional)
- Simplified grid and PV system protection

Maximum yields

- Yield increase through integrated SMA ShadeFix
- I-V generator diagnostics
- Direct selling with SMA SPOT
- SMA Smart Connected

More flexibility

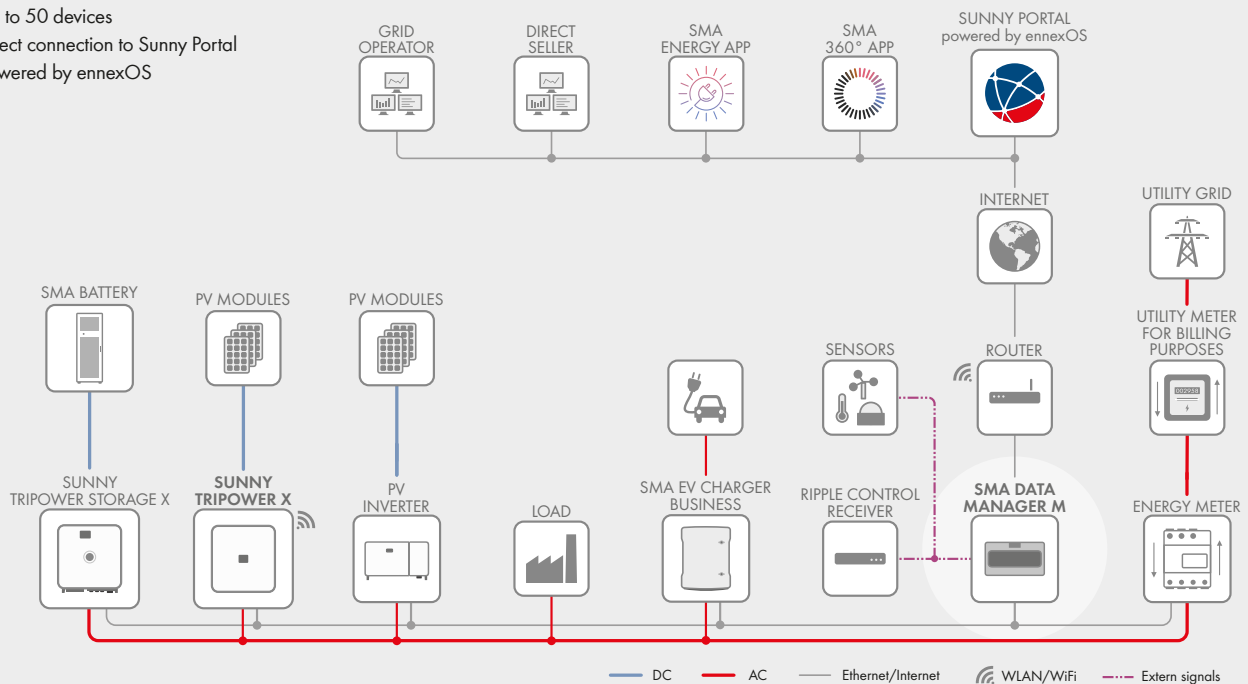
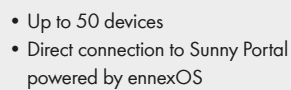
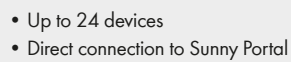
- 3 MPP trackers
- High input current for high-performance PV modules
- Modular design allowing expansion for future energy management functions

The new Sunny Tripower X is the innovative system solution for commercial and large home PV systems.

The integrated System Manager function with direct access to Sunny Portal powered by ennexOS monitors up to five SMA inverters and one energy meter. This enables the dynamic closed-loop control of active and reactive power via SMA Dynamic Power Control. Thanks to the wide input voltage range and the high input current capability, it is compatible with the latest generation of high-performance PV modules. The innovative enclosure design ensures efficient cooling of the electronic components and thus guarantees maximum lifetime of the Sunny Tripower X.

Commissioning can be performed quickly and easily as well as centrally for all devices in the system. During operation, users benefit from integrated software solutions: SMA ShadeFix increases PV yields even in the event of partial shading, while SMA ArcFix detects electric arcs effectively and can reliably reduce the risk of fire.

- Up to 5 inverters and 1 energy meter
- Direct connection to Sunny Portal powered by ennexOS



| Technical Data | Sunny Tripower X 12 | Sunny Tripower X 15 | Sunny Tripower X 20 | Sunny Tripower X 25 |
|---|--|---------------------|---------------------|---------------------|
| Input (DC) | | | | |
| Max. PV array power | 18000 Wp, STC | 22500 Wp, STC | 30000 Wp, STC | 37500 Wp, STC |
| Max. input voltage | 1000 V | | | |
| MPP voltage range at nominal power | 210 V to 800 V | 260 V to 800 V | 345 V to 800 V | 430 V to 800 V |
| Rated input voltage / MPP voltage range | 600 V / 150 V to 1000 V | | | |
| Min. input voltage / initial input voltage | 150 V / 188 V | | | |
| Max. usable input current per MPP tracker | 24 A | | | |
| Max. short-circuit current per MPP tracker | 37.5 A | | | |
| Number of independent MPP trackers / strings per MPP tracker | 3 / 2 | | | |
| Output (AC) | | | | |
| Rated power (at 230 V, 50 Hz) | 12000 W | 15000 W | 20000 W | 25000 W |
| Rated apparent power / max. apparent power | 12000 VA / 12000 VA | 15000 VA / 15000 VA | 20000 VA / 20000 VA | 25000 VA / 25000 VA |
| Nominal AC voltage | 220 V / 380 V; 230 V / 400 V ; 240 V / 415 V | | | |
| Voltage range | 176 V to 275 V / 304 V to 477 V | | | |
| Grid frequency / range | 50 Hz / 44 Hz to 56 Hz 60 Hz / 54 Hz to 66 Hz | | | |
| Rated grid frequency / rated grid voltage | 50 Hz / 230 V | | | |
| Rated output current / max. output current | 17.4 A / 20 A | 21.7 A / 25 A | 29 A / 36.6 A | 36.2 A / 36.6 A |
| Feed-in phases / AC connection | 3 / 3-(N)-PE | | | |
| Power factor at rated power / adjustable displacement power factor | 1 / 0 overexcited to 0 underexcited | | | |
| Harmonic (THD) | < 3 % | | | |
| Efficiency | | | | |
| Max. efficiency / European efficiency | 98.2 % / 97.6 % | 98.2 % / 97.8 % | 98.2 % / 97.9 % | 98.2 % / 98.0 % |
| Protective devices | | | | |
| Input-side disconnection point | ● | | | |
| Ground fault monitoring / grid monitoring | ● / ● | | | |
| DC reverse polarity protection / AC short-circuit current capability | ● / ● | | | |
| All-pole sensitive residual-current monitoring unit | ● | | | |
| Protection class (according to IEC 62109-1) / overvoltage category (according to IEC 62109-1) | I / AC: III; DC: II | | | |
| Arc-fault circuit interrupter (AFCI) / I-V generator diagnostics | ● / ● | | | |
| DC surge arrester (type 2, type 1/2) | ○ | | | |
| General data | | | | |
| Dimensions (W/H/D) | 728 mm / 762 mm / 266 mm (28.7 in / 30.0 in / 10.5 in) | | | |
| Weight | 35 kg (77 lbs) | | | |
| Operating temperature range | -25°C to +60°C (-13°F to +140°F) | | | |
| Noise emission, maximum (1 m) | 59 dB(A) | | | |
| Self-consumption (night) | < 5 W | | | |
| Topology / cooling concept | No galvanic isolation / OptiCool | | | |
| Degree of protection (according to IEC 60529) | IP65 | | | |
| Climatic category (according to IEC 60721-3-4) | 4K26 | | | |
| Corrosivity classification according to IEC 61701 | C5 | | | |
| Max. permissible value for relative humidity (non-condensing) | 100 % | | | |
| Features / functions / accessories | | | | |
| DC connection / AC connection | SUNCLIX / spring-cage terminal | | | |
| LED display (Status / Fault / Communication) | ● | | | |
| Interface: Ethernet / local WLAN / RS485 (client) ¹⁾ | ● (2 ports) / ● / ○ | | | |
| Data protocols: SMA Modbus / SunSpec Modbus ²⁾ / Speedwire | ● / ● / ● | | | |
| Multi-function relay / slot for expansion module | ● / ● (1 port) | | | |
| Number of digital inputs | 6 | | | |
| Wi-Fi range in free-field conditions | 10 m | | | |
| Mounting type | Wall mounting | | | |
| SMA ShadeFix / Integrated Plant Control / Q on Demand 24/7 | ● / ● / ● | | | |
| Off-grid capable | ● | | | |
| Warranty: 5 / 10 / 15 / 20 years | ● / ○ / ○ / ○ | | | |
| Certificates and approvals (more available upon request) | AS4777.2:2020; C10/C11:2019 & V1:2020 LV&MV; CE; EHS 2018:2; EN 50549-1/-2:2018; EN50549-10:2022; EREC G99/1-8:2021 Type A; IEC 61727; IEC62109-1/-2; IEC62116; NA/EEA-NE7; NBR 16149:2013; NRS 097-2-1:2017; PSE 2018; TED/749/2020 inkl. NTS2.1; TOR Erzeuger Typ A:2019-12; UKCA; UNE 217002:2020; VDE 0126-1-1:2013/ A1:2012; VDE-AR-N 4105:2018 incl. PAV,E; VDE-AR-N 4110:2018; VFR 2019; CEI 0-16/0-21:2019 & V1:2020 | | | |
| System manager function | | | | |
| Total number of subordinate devices with SMA Speedwire (inverters, charging stations and energy meters) | 5 | | | |
| Maximum nominal system power of PV inverters (nominal AC power) | 135 kVA | | | |
| Centralized commissioning of all devices in the system | ● | | | |
| Remote parameterization of SMA devices with Sunny Portal powered by ennexOS | ● | | | |
| Direct selling via SMA SPOT (Germany) | ● | | | |
| SMA Dynamic Power Control (e.g., zero export / Q(U)) | ● | | | |
| Type designation | STP 12-50 | STP 15-50 | STP 20-50 | STP 25-50 |

● Standard features ○ Optional — Not available "STC" Standard test conditions Data in nominal conditions Last revision: 02/2025 1) no System Manager functions available
2) For details, see document: [Technical Information - SUNSPEC MODBUS \[sma-solar.com\]](#)

Accessories



SMA Sensor Module
MD.SEN-40



SMA RS485 Module
MD.485-41¹⁾



DC surge arrester
(Type 1+2): DC_SPD_KIT7_T1T2
(Type 2): DC_SPD_KIT6-10



DC terminal cover
DC-TERM-COVER



Roof Mount Kit
210462-00.01

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SMA ShadeFix – Intelligent energy yield optimization

Established product features and integrated software solutions will provide yield optimization throughout the system's entire service life. Even in the shade. SMA ShadeFix is a proprietary inverter software that optimizes energy yield in nearly every situation. SMA Smart Connected inverter monitoring offers enhanced safety by detecting errors at an early stage and automatically reporting them to the installer.



SMA ArcFix – Effectively preventing electric arcs

The arc-fault circuit interrupter (AFCI) effectively detects possible electric arcs in the PV system and the inverter stops feed-in operation before a fire can develop. SMA was one of the pioneers when AFCIs were introduced in the U.S. and has kept steadily improving this solution over the last decade. We will be equipping all our string inverters worldwide with our AFCI solution SMA ArcFix in the future. In this way, we will consistently raise the already high safety standard of PV systems yet further.



SMA Smart Connected – Proactive communication in the event of faults

SMA Smart Connected* allows you to monitor your inverter via the SMA Sunny Portal for free. If an inverter fails, SMA will proactively inform the system operator and the installer. This saves valuable working time and costs.

With SMA Smart Connected, the installer benefits from rapid diagnostics by SMA. This allows the installer to rectify the fault quickly and offer customers a range of additional and highly attractive services.

* For details, see document [Description of Services - SMA SMART CONNECTED](#)