
selectronic
POWER PERFORMANCE PASSION
2014 Catalogue

In this catalogue...

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About Selectronic

Founded in 1964 by the Scott family, Selectronic Australia quickly established itself as a major manufacturer of custom made transformers and inductors for the local electronics industry. In 1981 the company's electronics products division was established to meet a need for quality power conversion products in the emerging renewable energy market.

At the time when power inverters were new and renewable technologies were just starting to emerge, Selectronic Australia became an innovator in the field by producing its first power conversion product - a 360 watt DC to AC modified square wave inverter.

Driven by demand from the Solar Industry and a passion for green energy, Selectronic Australia expanded its product offering to include models with higher power ratings. In 1994 the company produced one of the world's first true sine wave inverters. This brand new technology overcame the shortcomings of the modified square wave products and revolutionised the quality of the customer's power in Off Grid energy systems.

Selectronic Australia has grown through a philosophy of providing products and solutions that focus on the customer needs and today this second generation family company is one of the largest Off Grid inverter manufacturers in the world. Using innovative technologies, Selectronic Australia's power conversion products provide a cutting-edge basis for efficient, cost effective and green renewable energy systems.

Our product development process

Selectronic Australia takes care of the entire process of product realisation from listening to its customers and identifying the needs of the market, through product development by an experienced Research and Development team to final commercialisation.

As part of the development process prototypes are installed in strategic field sites where they are carefully monitored for hundreds of hours in real world conditions before the design is released.

By keeping the entire process in house Selectronic Australia is able to remain agile and more responsive to its customer's needs.

Our personal commitment

At Selectronic Australia, all senior staff live by the company philosophy of "Power, Performance, Passion". They demonstrate their commitment to the company, its product and to the industry by personally owning and operating a power system with a Selectronic inverter. Some operate a Selectronic SP PRO in their Off Grid power system or their Solar Grid system while others use a KACO Powador inverter in their Solar Grid Feed system, but all are motivated by their passion for clean energy.

The Selectronic Advantage

Our long experience in manufacturing inverters and dedication to innovation has allowed Selectronic to develop one of the world's most versatile inverter power management systems. With an uncompromising commitment to quality, the Selectronic SP PRO series comprises the ultimate inverter solution that manages the seamless transition between renewable, grid, generator and battery-backup power.

The SP PRO Series: Alternative Power

Welcome to a world where electricity supply has no boundaries...

A world where reliable and cost effective electricity is possible. Limitless possibilities exist to enhance your lifestyle, while reducing your carbon foot print and monetary outlay for this energy.

Regardless of the distance to the closest power grid, the highly functional Selectronic SP PRO will supply you with intelligent, high quality options which will provide you with:

- Tariff optimization to reduce your cost of electricity
- Increase in grid capacity on weak or remote grids
- Export of Renewable Energy to the electricity grid
- Backup power during grid outages
- Electricity to remote sites, such as rural homes, mining camps, tourist resorts
- Electricity to mobile sites, such as boating and motor-homes
- Integration of Solar Power into Diesel Mini or Micro grids.

At the heart of your alternative energy power system is the intelligent Selectronic SP PRO inverter managing your renewable power source(s), battery storage and grid power (or generator power) to provide you with the most cost effective and reliable AC Sine Wave power.

Whether you're using solar panels, wind turbines, hydro-electricity or efficiently managing a diesel generator, the Selectronic SP PRO will always provide your desired level of independence.

What is an SP PRO?

The SP PRO is a bi-directional low distortion sine wave inverter capable of interacting with a number of different types of AC Sources, be they utility grid, diesel grid or diesel generators or even SWER grids.

Charge battery with **RENEWABLE POWER**

Once **BATTERY** is fully charged, renewable energy is self-consumed by the home

Automatically uses **GRID POWER** when required

Surplus power is **SOLD BACK** to the grid

Advantages of using an SP PRO

- *Australian designed and manufactured*
- *Maximum system output from interactive technology*
- *Three phase configurable (3 units)*
- *Superior protection using military grade conformal coating*
- *All ratings are real, not made up by marketing people*
- *Free SP LINK monitoring software for your PC*
- *Easy to read LED display with auto dimming*
- *Automatic Service Alerts if maintenance is required*
- *Withstands tropical environments*

Beyond power security

The SP PRO is the versatile solution. It can be used with any combination of grid, solar, wind, micro-hydro or generator backup power.

Advantages of using an SP PRO

Superior Performance

- *Low distortion sine wave interactive inverter charger with grid feed and grid support ability all in one unit*
- *Charge capacity is 100% of inverter rating*
- *Outstanding surge capacity*
- *Superbly quiet*
- *Models with nominal battery voltage of 24V, 48V and 120V available*
- *100% Australian designed and manufactured*
- *Extreme ambient temperature operating range -10˚C to 60˚C*

High reliability

- *Advance thermal techniques provide excellent high temperature performance*
- *Automatic AC transfer with anti-chatter protection to protect contractor*
- *Conformal coating on printed circuit assemblies – Mil Spec*
- *Warranty 3 to 8 years in Australia – 5 years international*
- *Monitored variable speed fan with service alert.*
- *Capacitor lifetime monitoring with service alert*

Advanced functionality

- *Five stage battery charging with a dual float stage and adjustable temperature compensation*
- *Battery mid-point monitoring with automatic battery equalisation*
- *Automatic changeover when grid fails without second inverter*
- *Grid export capability*
- *Parallel operation with grid or generator for increased output power*
- *Recharge batteries using cheapest tariff*
- *Low battery shutdown override for emergencies*
- *"Partial state of charge" control reduces generator run time and maximises renewable usage.*
- *Discretionary load control*
- *Redundant safety disconnect for pluggable AC input*

Versatile configuration

- *Install and run using standard configurations or fully customise using PC*
- *Easy to use software supplied for configuration and monitoring*
- *Configurable fully managed AC coupling to KACO grid feed inverter*
- *Configurable AC coupling to any grid feed inverter (with option)*
- *Three phase power configurable*
- *User configurable output: 4 relay and 3 digital*
- *User configurable inputs: 4 digital and 2 analogue*
- *Two user defined DC current shunt inputs*

Advanced system monitoring

- *Eighteen months of daily energy total*
- *Detailed performance data with adjustable 30, 15, 10, 5 or 1 minute sample rate*
- *Four months of detailed data at 30 minute sample rate*
- *User customised system performance viewer*
- *Simple intuitive LED display*

Flexible communications options

- *USB output*
- *RS485 output*
- *RS232 output*
- *Blue tooth connection (with option)*
- *LAN connection (with option)*

Solar Hybrid

An inverter that provides smarter energy 24/7 – putting you in control.

Affordable and reliable electricity should not be considered a luxury but as an essential part of life today. We need electricity 24/7, not just when the grid supply is available.

Renewable energy plus extra benefits.

An SP PRO inverter will convert electricity stored in batteries from Solar, Wind or Hydro (Renewable Energy) to operate your normal electrical appliances. You choose when and how the energy is used.

Renewable electricity not required by the batteries or load can then be exported to the electricity grid to effectively run your meter backwards. If however your electricity retailer does not offer you a fair price for excess electricity then you can choose to maximise your self-consumption by storing energy for later use.

To reduce your power bill even further – when you require more power than the renewables are providing during peak tariff times you can choose to have additional power provided by the batteries instead of the grid. You can then charge the batteries from the grid later at off-peak rates.

If you run a business then you'll know that the demand charge makes up a significant portion of your electricity bill. The demand charge can increase significantly if your load ever exceeds the contractual limit or historical maximum, even for a brief period. To avoid these punitive charges and to even reduce the normal demand charge the power drawn from the grid can be capped during these peak times. Any additional power required is then provided by the electricity stored in the batteries plus any available Renewable Energy.

Power outages are not uncommon these days. Bushfires, floods or storms can cause outages for hours, days or even weeks. For safety reasons conventional Solar Power Grid systems must turn off when the grid fails. This means your investment of Renewable Energy will be wasted during grid outages. The advanced technology inside the SP PRO allows your electricity supply to seamlessly continue by switching to battery backup mode, allowing you to power your 240 volt loads using the electricity stored in the batteries plus any available Renewable Energy.

In the event your batteries have become discharged during a prolonged outage, an optional Generator Controller can start an automatic generator to provide power for the home or business and charge the batteries. When grid power returns the generator will be turned off automatically. With an SP PRO you'll never know when the grid has failed except when all your neighbours are in the dark.

The complete process is seamless as the SP PRO takes care of everything, including ensuring that your batteries have enough energy at all times in preparation for the next power outage. The system can be configured to store your solar, consume it or export to the grid at different times during the day. It's your power and you are in control of how the solar is used along with how much electricity is drawn from the grid or drawn from the batteries. The tariff charges, the amount of solar generated and your electricity requirements can all vary during the day or week. The advanced Tariff optimisation features of the SP PRO give you reliable power at the lowest cost and is available in single phase and three phase configurations..

With electricity prices increasing rapidly your investment will continue to increase in value.

myGrid for Solar Hybrid

To simplify the process of installing a Solar Hybrid system the myGrid kits come pre-engineered and configured to give you everything you need other than any solar panels and associated mounting frames that might be required. Each Selectronic myGrid energy centre has been tested to ensure all components are compatible and can be installed to local standards in a quick and efficient manner, saving installers time and money. As an added bonus each SP PRO inverter sold as part of a myGrid Energy Centre will receive an additional 12 months warranty.

MG0481A shown above with optional inverter mounting panel and KACO inverter

myGrid Kits - Solar hybrid application

		Battery					
Part no	**Inverter**	**Battery type [1]**	**Battery Capacity**	**Tariff Optimisation**	**Max AC coupled PV KACO / Generic [2]**	**Battery Voltage**	**No of battery boxes [3]**
MG02400	SPMC 240	AGM standby	4.3kWh	not suitable	2kW / 2kW	24	1
MG0240A	SPMC 240	Gel cyclic	8kWh	5kWh	4kW / 3kW	24	1
MG0240B	SPMC240	Gel cyclic	16kWh	10kWh	6kW / 3kW	24	2
MG02410	SPMC241	AGM standby	4.3kWh	not suitable	2kW / 2kW	24	1
MG0241A	SPMC241	Gel cyclic	8kWh	5kWh	4kW / 4kW	24	1
MG0241B	SPMC241	Gel cyclic	16kWh	10kWh	8kW / 4.5kW	24	2
MG0481A	SPMC 481	Gel cyclic	16kWh	10kWh	8kW / 5kW	48	2
MG0481B	SPMC 481	Gel cyclic	32kWh	20kWh	10kW / 5kW	48	4
MG0482A	SPMC482	Gel cyclic	16kWh	10kWh	8kW / 7.5kW	48	2
MG0482B	SPMC482	Gel cyclic	32kWh	20kWh	15kW / 7.5kW	48	4
MG1201A	SPMC1201	Gel cyclic	40kWh	25kWh	15kW / 7.5kW	120	5
MG1201B	SPMC1201	Gel cyclic	80kWh	50kWh	15kW / 7.5kW	120	10
MG1202A	SPLC1202	Gel cyclic	40kWh	25kWh	20kW / 20kW	120	5
MG1202B	SPLC1202	Gel cyclic	80kWh	50kWh	35kW / 20kW	120	10
MG1202C	SPLC1202	Gel cyclic	160kWh	100kWh	35kW / 20kW	120	20

[1] AGM standby - Ritar AGM sealed. Gel cyclic - Sonnenschein SOLAR BLOCK. Battery capacity at C100

[2]. Max AC output power from PV grid inverter. KACO is managed AC coupled solar. Generic is unmanaged AC coupled solar

[3]. Battery boxes are stackable up to 4 boxes high when suitably anchored and mounted on a level, solid concrete slab.

myGrid kits include	Dimensions W x H x D mm	Weight	comments
Battery enclosure (per box)	800 x 500 x 470	25kg	Suitable for outdoors. Stackable up to 4 boxes high when suitably anchored and mounted on a level, solid concrete slab.
DC distribution panel Series 2	160 x 460 x 470	15kg	Suitable for outdoors. Mounted on side of battery enclosure. Includes dual pole 250A DC circuit breaker.
Inverter mounting panel (optional)	900 x 850 x 75	25kg	Option for MyGrid energy center to simplify installation of SP PRO and KACO powador inverters.
SP PRO Inverter (See pg 19 for specs)	345 x 545 x 215	29-35kg	Can mount under an eave
Grid inverter for managed AC coupled solar (optional)	Suitable for all 02 and 00 series KACO powador inverters. See KACO section for specifications		
Grid inverter for generic AC coupled solar (optional)	Any make or model of a single phase grid tie inverter that is compliant to AS4777:2005 with an AC output no greater than that specified in the above table		
Grid fail generator backup (optional)	Mounted inside SP PRO at installation. Automatically starts at a generator if required.		
SP PRO Warranty	3 years standard. 7 years when installed by an SP PRO Accredited Installer, 8 years as part of a myGrid Kit.		

myGrid for Independent Power

To simplify the process of both designing and installing an OFF grid system the myGrid kits come pre-engineered and configured to give you everything you need other than any solar panels and associated mounting frames and is ready to fully integrate with the auto start generator you choose.

Each Selectronic myGrid energy centre has been tested to ensure all components are compatible and can be installed to local standards in a quick and efficient manner, saving installers time and money.

As an added bonus each SP PRO inverter sold as part of a myGrid Energy Centre will receive an additional 12 months warranty.

MG0481A shown above with optional inverter mounting panel and KACO inverter

myGrid Kits - Off grid application

Part no	Inverter	Battery type [1]	Battery Capacity	Usable battery capacity	Max AC coupled PV KACO	Battery Voltage	No of battery boxes [3]	Max generator size [4]
MG0240A	SPMC 240	Gel cyclic	8kWh	5kWh	4kW	24	1	15kVA
MG0240B	SPMC240	Gel cyclic	16kWh	10kWh	6kW	24	2	15kVA
MG0241A	SPMC241	Gel cyclic	8kWh	5kWh	4kW	24	1	15kVA
MG0241B	SPMC241	Gel cyclic	16kWh	10kWh	8kW	24	2	15kVA
MG0481A	SPMC 481	Gel cyclic	16kWh	10kWh	8kW	48	2	15kVA
MG0481B	SPMC 481	Gel cyclic	32kWh	20kWh	10kW	48	4	15kVA
MG0482A	SPMC482	Gel cyclic	16kWh	10kWh	8kW	48	2	15kVA
MG0482B	SPMC482	Gel cyclic	32kWh	20kWh	15kW	48	4	15kVA
MG1201A	SPMC1201	Gel cyclic	40kWh	25kWh	15kW	120	5	15kVA
MG1201B	SPMC1201	Gel cyclic	80kWh	50kWh	15kW	120	10	15kVA
MG1202A	SPLC1202	Gel cyclic	40kWh	25kWh	20kW	120	5	30kVA
MG1202B	SPLC1202	Gel cyclic	80kWh	50kWh	35kW	120	10	30kVA
MG1202C	SPLC1202	Gel cyclic	160kWh	100kWh	35kW	120	20	30kVA

1. Sonnenschein SOLAR BLOCK. Battery capacity at C100

2. Max AC output power from fully managed AC coupled KACO PV grid inverter. Only KACO managed AC solar is suitable for off grid systems.

3. Battery boxes are stackable up to 4 boxes high when suitably anchored and mounted on a level, solid concrete slab.

4. Generators up to 250A can be used with an optional external generator contactor.

	Dimensions W x H x D mm	Weight	comments
Battery enclosure (per box)	800 x 500 x 470	25kg	Suitable for outdoors. Stackable up to 4 boxes high when suitably anchored and mounted on a level, solid concrete slab.
DC distribution panel Series 2	160 x 460 x 470	15kg	Suitable for outdoors. Mounted on side of battery enclosure. Includes dual pole 250A DC circuit breaker
Inverter mounting panel	900 x 850 x 75	25kg	Option for MyGrid energy center to simplify installation of SP PRO and KACO powador inverters.
SP PRO Inverter (See pg 19 for specs)	345 x 545 x 215	29-35kg	Can mount under an eave
Grid inverter for managed AC coupled solar (optional)	Suitable for all 02 and 00 series KACO powador inverters. See KACO section for specifications		
SP PRO Warranty	3 years standard. 7 years when installed by an SP PRO Accredited Installer, 8 years as part of a myGrid Kit		

Independent Power
Intelligent, reliable and plenty of it.

Welcome to a world where electricity has no boundaries. A world where reliable electricity should not be considered a luxury but an essential part of life today and into the future.

Independent power plus extra benefits
No matter how far away from grid electricity you are, an SP PRO system will provide you with a smooth ultra low distortion single phase or three phase power supply. Everyday modern appliances can be operated realiably, even large pumps and motors can be operated as the SP PRO can provide significantly more power for short periods.

An SP PRO Grid Quality Interactive Inverter/Charger will convert electricity stored in batteries to operate your normal electrical appliances.

One of the most intelligent Inverter/ Chargers in the world, the SP PRO will monitor and manage all aspects of your independent power system and ensure maximum use of any Renewable Energy, whilst maximising battery life and reducing generator running costs.

The Interactive Advantage
Unlike many other Inverter Chargers, the SP PRO will interact in parallel with your generator. Once the generator seizes the load, the SP PRO charges the batteries or supplements the generator's output to run the load. The result is TRUE NO Break performance when under SP PRO control and total safety for all appliances including computers.

Truly Australian
Selectronic has vast experience supplying remote energy to Australia's harsh outback. As a result the SP PRO offers many clever features to make your independent power experience completely satisfying. Features such as automatic Generator Control that starts the generator before the system becomes stressed, or the emergency bypass function that will continue to supply power when other inverters may have given up.

There is even a simple message that tells you when it's time for preventative maintenance. All this is backed up by a piece of mind warranty of 3 to 8 years country dependent.

Connect to the Grid or Not?
With an SP PRO you'll never know the grid is nowhere to be seen. Should you choose to connect to grid electricity one day, a quick on–site setting change will turn the SP PRO into a Grid Feeding export inverter that provides back up power.

SP PRO SERIES SPECS	SPMC240	SPMC241	SPMC481	SPMC482	SPMC1201	SPLC1202
Max output power						
GENERATOR OFF						
24/7	3 kW	4.5 kW	5 kW	7.5 kW	7.5 kW	20 kW
1 hour	3.2 kW	4.7 kW	5.3 kW	8 kW	8 kW	24 kW
30 seconds	7.5 kW	10.5 kW	12 kW	18 kW	18 kW	44 kW
GENERATOR ON						
24/7	15 kW*	15 kW*	15 kW*	15 kW*	15 kW*	30 kW*
Battery recharge 24/7	125 amps	188 amps	104 amps	156 amps	63 amps	167 amps
Battery voltage	24 V	24 V	48 V	48 V	120 V	120 V
Battery capacity	100 Ah - 10,000 Ah					
Generator transfer capacity	63A*					125A*
Max generator size	15 kVA - 63A*					30 kVA - 125A*
LED display shows	Available battery capacity, Charge status, Generator status, Output status, Alarms. All available on your PC also.					
Generator transfer	Zero interruption, NO Break*					
Warranty	5 years standard. 7 years when installed by an SP PRO Accredited Installer					
Approvals	AS/NZS 61000–6–3 2007, AS 62040.1.1–2003, AS 4777 2005 (grid connect)					
Dimensions in mm	690 H x 375 W x 220 D					870 H x 540 W x 290 D
Weight	35 kg	39 kg	40 kg	42 kg	42 kg	115 kg

* Maximum generator size and transfer capacity can be increased to 250A with an optional external contactor

Mobile / Marine Power
Stylish and powerful

Our desire to get out and enjoy the wide open spaces on land or on the high seas can now be complimented with a powerful and intelligent power system.

From large caravans, motor homes, houseboats or sailing vessels, an SP PRO based system can bring the comforts of home to your mobile lifestyle.

On board - the SP PRO will provide smooth Sine wave quality power utilising the energy stored in your house batteries. Solar Power or Wind power can be used to supplement the charge in the batteries. Should the batteries become low; the SP PRO will start your auto start generator to run the load and recharge the batteries, automatically stopping when batteries are satisfied.

When generator or shore power is not sufficient, the clever Intelligent Interactive feature of the SP PRO will add its power to that of the generator/shore power to increase the maximum possible output to the load. All this is done automatically, silently and without fuss. Changing from shore power to inverter power is break free, making sure you have no interruptions.

The SP PRO has a huge battery recharge capacity, to make sure house batteries are not only recharged quickly but completely, this will allow maximum life to be extracted from your house batteries.

A small tablet style computer can be placed at the helm or dashboard to provide a full display of system performance, or allow you to manually start the generator if needed. A simple two position switch can be placed anywhere on board to allow selection of different shore power sizes.

Mobile power can be a tough environment, so it's good to know that the SP PRO is built tough to take the pounding of rough seas and roads, and every circuit board inside is coated with a military spec coating to ensure all electronics stay dry and clean for years of trouble free operation. Safety on board hasn't been forgotten either, with a host of safety features to allow safe operation in all situations.

As you should expect from a product of this quality, all standards for suppression of radio interference have been exceeded, making sure that noise in communications equipment is totally minimised

Grid Power

Boost performance and reliability with one smart inverter.

When you need increased capacity, reliability or functionality of your electricity grid, the Selectronic SP PRO series of battery based Inverters will have the answers.

Boost customer supply capacity
In "fringe of grid" situations, a property may require more power than the grid can supply, but upgrading lines may not be practical or economical. In this situation an SP PRO is placed at the customer's premises with a battery bank. When the supply limit is exceeded additional energy will come from the SP PRO via the batteries, and when load is decreased grid energy will be used to charge batteries again if required. Renewable Energy sources can provide power to recharge the batteries, feed this into the grid or to be used onsite.

Boosting Grid supply capacity
Using an external controller, the SP PRO can be commanded to feed stored battery energy at any power factor into the grid, augmenting supply capacity. Commanding the SP PRO is a specialist feature made available under a signed agreement.

Peak lopping
An SP PRO strategically placed within a network can be programmed or commanded to cap the peak demand to a known limit, preventing line overload and the associated costs due to loss of supply. Use of this feature allows a fast and cost effective means of increasing network capacity, either temporarily or permanently. Consequently line utilisation is both predictable and controllable.

Load shedding
It is often required that a branch line will need to be isolated for safety, maintenance or load shed purposes. Properties or sub divisions with SP PRO support will enjoy an uninterrupted power supply, thus demanding a lower priority response. This gives greater flexibility and efficiency to line restoration crews.

Quality of supply
Exposure to liability claims is a major concern in today's business world. Quality of supply can be maintained regardless of line irregularities with the rapid detection and islanding capabilities of the SP PRO.

Smart Grid
Future developments will see the SP PRO integrate within the AMI infrastructure via industry standard protocols. With so much flexibility within the SP PRO and incorporated into a Smart Grid, the possibilities of control and integration into smart storage systems are numerous.

Adding Renewable or Alternate Energy sources
A line supported by an SP PRO can easily be further augmented with the inclusion of any type of Renewable or alternate energy source. Solar panels can be integrated via the DC or AC coupling method.

Balance of system
Selectronic can take the worry out of system integration by providing you with all of the components required for a system. Most batteries are compatible with an SP PRO and our pre sales design service will ensure your system achieves all of its objectives.

The Australian-made consultative advantage
With our design and development team based in Melbourne Australia, our Sales engineering team will work with you from project beginning to end, engineering the most cost effective and technically appropriate solution to your needs. As a medium sized company our ability to provide fast response time is unique in our industry.

myGrid for Grid Power

To simplify the process of both designing and installing a system that can support the grid the myGrid kits come pre-engineered and configured to give you everything you need other than any solar panels and associated mounting frames that may be required.

Each Selectronic myGrid energy centre has been tested to ensure all components are compatible and can be installed to local standards in a quick and efficient manner, saving installers time and money.

As an added bonus each SP PRO inverter sold as part of a myGrid Energy Centre will receive an additional 12 months warranty.

MG0481A shown above with optional inverter mounting panel and KACO inverter

myGrid Kits - Utility support

		Battery					
Part no	Inverter	Battery type [1]	Battery Capacity	Tariff Optimisation kW Hours	Max AC coupled PV KACO / Generic [2]	Battery Voltage	No of battery boxes [3]
MG0240A	SPMC 240	Gel cyclic	8kWh	5kWh	4kW / 3kW	24	1
MG0240B	SPMC240	Gel cyclic	16kWh	10kWh	6kW / 3kW	24	2
MG0241A	SPMC241	Gel cyclic	8kWh	5kWh	4kW / 4kW	24	1
MG0241B	SPMC241	Gel cyclic	16kWh	10kWh	8kW / 4.5kW	24	2
MG0481A	SPMC 481	Gel cyclic	16kWh	10kWh	8kW / 5kW	48	2
MG0481B	SPMC 481	Gel cyclic	32kWh	20kWh	10kW / 5kW	48	4
MG0482A	SPMC482	Gel cyclic	16kWh	10kWh	8kW / 7.5kW	48	2
MG0482B	SPMC482	Gel cyclic	32kWh	20kWh	15kW / 7.5kW	48	4
MG1201A	SPMC1201	Gel cyclic	40kWh	25kWh	15kW / 7.5kW	120	5
MG1201B	SPMC1201	Gel cyclic	80kWh	50kWh	15kW / 7.5kW	120	10
MG1202A	SPLC1202	Gel cyclic	40kWh	25kWh	20kW / 20kW	120	5
MG1202B	SPLC1202	Gel cyclic	80kWh	50kWh	35kW / 20kW	120	10
MG1202C	SPLC1202	Gel cyclic	160kWh	100kWh	35kW / 20kW	120	20
1. Sonnenschein SOLAR BLOCK. Battery capacity at C100							
2. Max AC output power from PV grid inverter. KACO is managed AC coupled solar. Generic is unmanged AC coupled solar							
3. Battery boxes are stackable up to 4 boxes high when suitably anchored and mounted on a level, solid concrete slab.							

	Dimensions W x H x D mm	Weight	comments
Battery enclosure (per box)	800 x 500 x 470	25kg	Suitable for outdoors. Stackable up to 4 boxes high when suitably anchored and mounted on a level, solid concrete slab.
DC distribution panel	160 x 460 x 470	15kg	Suitable for outdoors. Mounted on side of battery enclosure.
Inverter mounting panel	900 x 850 x 75	25kg	Option for MyGrid energy center to simplify installation of SP PRO and KACO powador inverters.
SP PRO Inverter	345 x 545 x 215	29-35kg	Can mount under an eave
Battery protection	Dual pole 250A DC circuit breaker. Remote trip option available.		
Grid inverter for managed AC coupled solar	Suitable for all 02 and 00 series KACO powador inverters. See KACO section for specifications		
Grid inverter for generic AC coupled solar	Any make or model of a single phase grid tie inverter that is compliant to AS4777:2005 with an AC output no greater than that specified in the above table		
SP PRO Warranty	5 years standard. 7 years when installed by an SP PRO Accredited Installer, 8 years as part of a myGrid Kit		

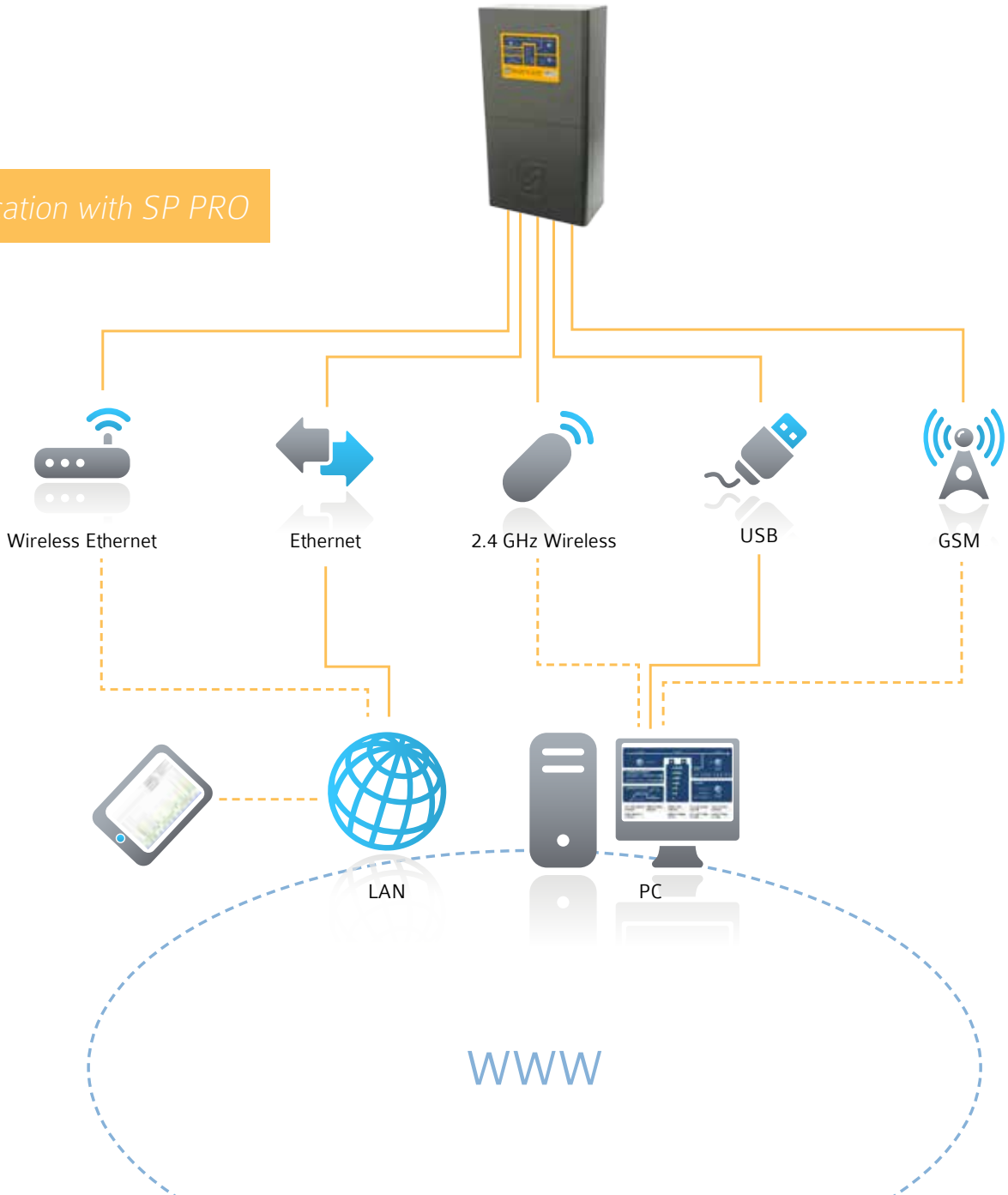
Monitoring & Software

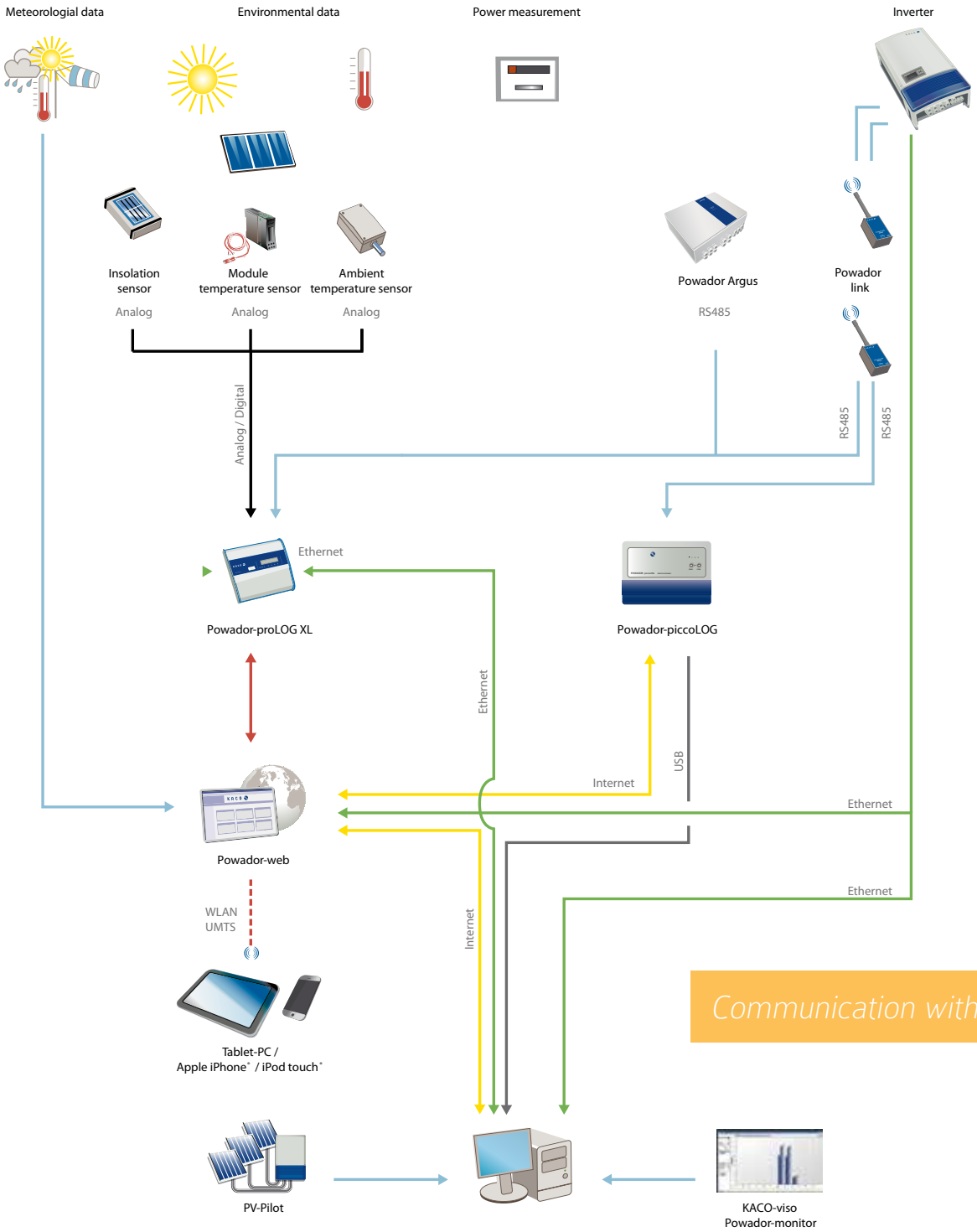
End User

Inverters are normally placed away from living or production areas. Communications back to a local computer is a very cost effective way of knowing the state of charge of your battery bank, or how much energy you have exported today. However, normally there is no need to monitor your system for correct operation as this will just work perfectly and automatically. Access from the Internet allows you keep a close eye on your investment. Should there be a pending problem, you can be notified via the computer.

Customers with battery based systems will receive SP LINK software free of charge.

Communication with SP PRO





Communication with KACO

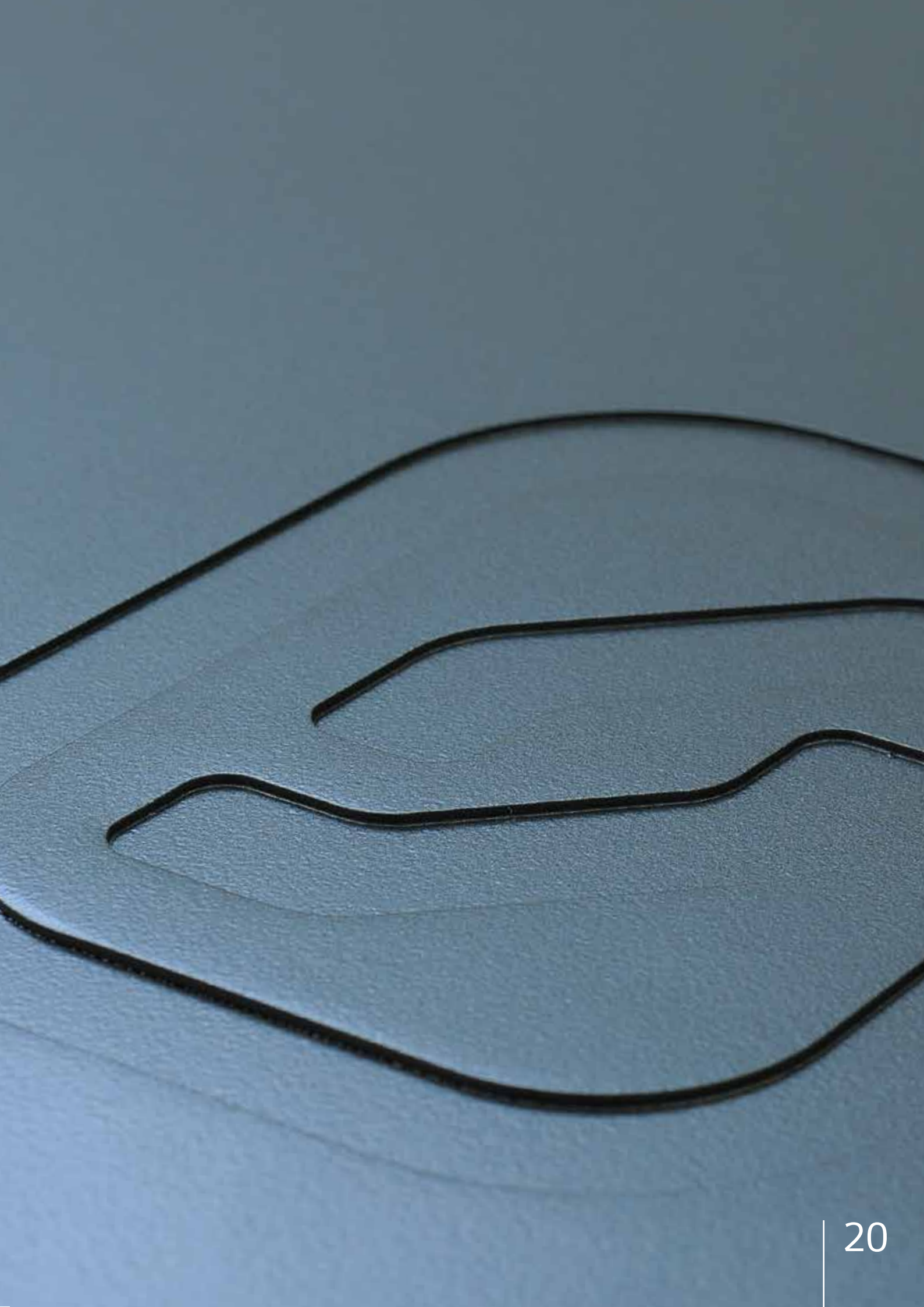
System Integrator

Travelling to site can be slow, if practical, and costly. Remote communications can allow system performance downloads for maintenance contracts or the ability to slightly change a parameter for that little bit more from the system. The SP PRO has the ability to notify you of any pending maintenance requirements. Inverter firmware updates can be easily performed with remote access. In the most simplest forms programs such as Skype can be used to access a customer's computer for remote and cost effective diagnosis.

SP PRO Specifications

SP PRO INVERTER MODEL	SPMC240	SPMC241	SPMC481	SPMC482	SPMC1201	SPLC1202
Continuous Power and Charge Current at nominal DC & AC voltage @ 25 ˚C	**3 kW / 125 A**	**4.5 kW / 188 A**	**5 kW / 104 A**	**7.5 kW / 156 A**	**7.5 kW / 63 A**	**20 kW / 167 A**
Short Term Ratings @ 25 ˚C						
30 seconds	7.5 kW	10.5 kW	12 kW	18 kW	18 kW	44 kW
1 minute	5.4 kW	7.6 kW	8.7 kW	13 kW	13 kW	30 kW
30 minute	4.2 kW	6.75 kW	7.0 kW	11.25 kW	11.25 kW	29 kW
60 minutes	3.2 kW	4.7 kW	5.3 kW	8 kW	8 kW	24 kW
Nominal battery voltage	24 V	24 V	48 V	48 V	120 V	120 V
DC input voltage range (V DC)	20 - 34	20 - 34	40 - 68	40 - 68	100 - 170	100 - 170
DC consumption: idle	8 W					
Ambient temperature operating range	-10˚C to 60˚C					
Peak Efficiency	95%	95%	96%	96%	97%	97.2%
AC OUTPUT standalone						
Setting range and accuracy	210 to 240 V+/- 0.5%					
Regulation (related to 40 ˚C ratings)	<2.25% droop @ 0-100% (load power)					<0.2% @ 100%
	<3.5% @150%, <5% @ 200% (load power)					<1.0% @ 150%
	<10% @ 300% (load rating)					<1.5% @ 200%
THD	<3% @ 0-200% rated load					
Frequency	50 or 60 Hz +/-0.005% standalone					
AC SOURCE						
Nominal voltage	210 to 240 V AC					
Tolerance on nominal voltage	programmable: - 1% to -15%; + 1 to +10%					
Nominal input frequency	50/60Hz					
Tolerance on nominal frequency	programmable +/- 1% to 10%					
Generator can be started by:	battery SoC, DC voltage, battery load, unit temperature, time & remote control					
TRANSFER CONTACTOR						
AC transfer current capacity (internal)	63 A					125 A
AC transfer current capacity (external)	Control provided by an optional 250A external contactor					
Max AC input source, (generator) W	15 kW*					30 kW*
Max total output to Load, AC source + inverter	15 kW* + inverter rating					30 kW*
AC transfer time	"no-break" (< 1/2 cycle)					
Disconnect time if grid (source) fails	<= 30 ms					
DC Circuit Breakers	-					2 pole 250A
Operating Temperature Range	-10 ˚C to 60 ˚C					
Storage Temperature Range	-25 ˚C to 70 ˚C					
Max Grid Feed capacity	rated output (2 x rated output for KACO AC Coupled)					
Battery temperature sensor	Yes					
Mid point battery voltage sensing	Yes					
Inverter display	22 x LEDs with auto adjusting intensity					
	display indicates, charger status, useable battery capacity remaining					
	alarms, AC status					
	AC status LEDs powered from AC voltage					
	Generator control button					
	On button					
	alarm silence button					
Digital Control Inputs	4 off, 12V to 60V True, < 3V False					
Shunt Inputs	Two user definable: Sutable for current shunts rated at 25mV - 100mV and 25 A - 500 A					
Analogue Inputs	2 general purpose logged 0-60V				-	
Relay Control Outputs	4 off: 60 V, 500 mA					
Digital Control Outputs	3 off: 60 V, 5 mA					
Communication Port 1	USB (slave) or RS232 or 3-phase sync (adjustable baud rate of up to 57,600)					
Communication Port 2	RS485 or RS232 (adjustable baud rate of up to 57600)					
AC Coupling	with control of KACO inverters via RS485					
PWM modulation frequency	20 kHz					
Memory retention of settings	permanent					
Memory retention of logged data	permanent					
Data storage	Up to 2.5 years					
SP LINK configuration and monitoring software	standard					
Dimensions h x w x d (mm) (d = front to mounting surface)	690 x 375 x 220					870 x 540 x 290
Mass (unpacked with wall mount)	35 kg	39 kg	40 kg	42 kg	42 kg	115 kg
STANDARDS						
Safety (UPS)	IEC 62040-1-1:2002 / AS 62040-1-1:2003 with CB certificates					
EMC (Domestic limits)	EN 61000.6.3:2007				-	
EMC (Industrial limits)	-				EN 61000.6.4:2007	
Grid Connect	AS4777.2:2005, AS4777.3:2005					
Ctick	Yes					
Protection	IP43					
Warranty	3 - 8 years (country dependent)* * when installed by a Selectronic Accredited Installer					

* 60kW with optional external 250A contactor.



Solar Systems Project — diesel grid in Outback Australia

This pioneering project used parabolic dish concentrators to focus sunlight on high efficiency photovoltaic solar cells to produce electrical energy that supplemented remote diesel grids. Selectronic Australia developed a custom designed 70kW interactive inverter to feed the power generated by the dish concentrators into the local power grid. "Cloud smoothing" and backup functions were included to allow the power system to maintain compatibility with the local power supply.

At the forefront of innovative solar projects.

Bushlight Project — solar off-grid in Outback Australia

In 2002, Bushlight began to install renewable energy systems to provide power to the small remote indigenous communities of outback Australia. After rigorous testing of a number of inverter brands, Bushlight chose a range of Selectronic inverters as the hub of their pre-packaged power systems. Bushlight currently have a large number of Selectronic inverters successfully installed in their systems.

Knox Leisureworks — solar grid backup in Melbourne, Australia

An innovative application for providing solar grid feed with backup power to an individual phase failure utilising both solar and battery supply. The centre had the objective to reduce running costs and prevent loss of critical centre management systems during outages. Utilising an SP PRO unit on each phase enables full solar export capacity plus seamless support of single and multiple phase outages.

Northern Territory - Indigenous Community.

Designed and installed by Alternative Energy Consultants this remote outback power station provides 24/7 power to a small community, a shop and 15 homes. This 3 phase AC Coupled system has had significant savings on fuel costs.

Bega Library / Dispatchable Solar Energy project pilot site

Incorporating the Selectronic SP PRO inverter, this 20kW PV solar power plant has features unavailable to the network until now. The SP PRO inverter was chosen for this project because of its versatility and its many innovative features. All of the client's unique requirements were achieved with the integration of the Selectronic SP PRO into their project.

This project has demonstrated the benefits and value of deploying a solar generation plant whose output is stable and is not impacted by local environmental variations. Most importantly, its output is able to be dispatched back into the network at times that are more beneficial to network and therefore displacing thermal base load generation.

An additional benefit of the project was to establish the Bega Library site as a small micro-grid (islanded system) to develop further understanding of the issues and practicalities of establishing such grids. As a side benefit to the wider community, a tailored marketing and education program was developed to align with this initiative.

SP PRO / KACO AC Coupling
The Selectronic advantage.

Continuing to advance the highly acclaimed SP PRO technology, Selectronic in co-operation with KACO Germany are pleased to release a further development to our AC Coupling methodology, now appropriate for Off Grid and Diesel Grid use as well as Solar Hybrid (Grid Backup).

By connecting up to 5 KACO Grid Tie inverters to the AC Load side (output) of any single phase SP PRO system, it is now possible to utilise efficient high voltage PV arrays that are located remotely from the battery bank. This allows you to continue to use a wide choice of PV installers and common components; no need to be concerned about cable loss in long, expensive low voltage cable runs.

By creating an AC Bus, an AC Coupled system will allow PV energy to be efficiently used directly by the load with excess PV energy going back through the bi-directional SP PRO to charge batteries or export to the grid.

PV energy will continue to be utilised at all times, regardless of generator or grid availability.

The battery charging system in the SP PRO has proven unmatched in control and stability. This has now been extended into PV based AC Coupled systems. The SP PRO/KACO RS485 link provides the same precise control over the AC Coupled PV. Regardless of charging source your batteries will enjoy maximum life with SP PRO charging.

The KACO grid inverter can be considered as an AC MPPT. A maximum of 5 KACO inverters can be controlled by any SP PRO, the total AC Output of the combined KACO inverters must not exceed twice the continuous power rating of the SP PRO or the SP PRO surge rating, whichever is smallest. Presently, the KACO Powador 02 series and 00 series supplied by Selectronic are suitable for AC Coupling. The 02 series range from 1.65kW to 5kW AC output. The 00 series range from 2.6kW to 8kW AC output.

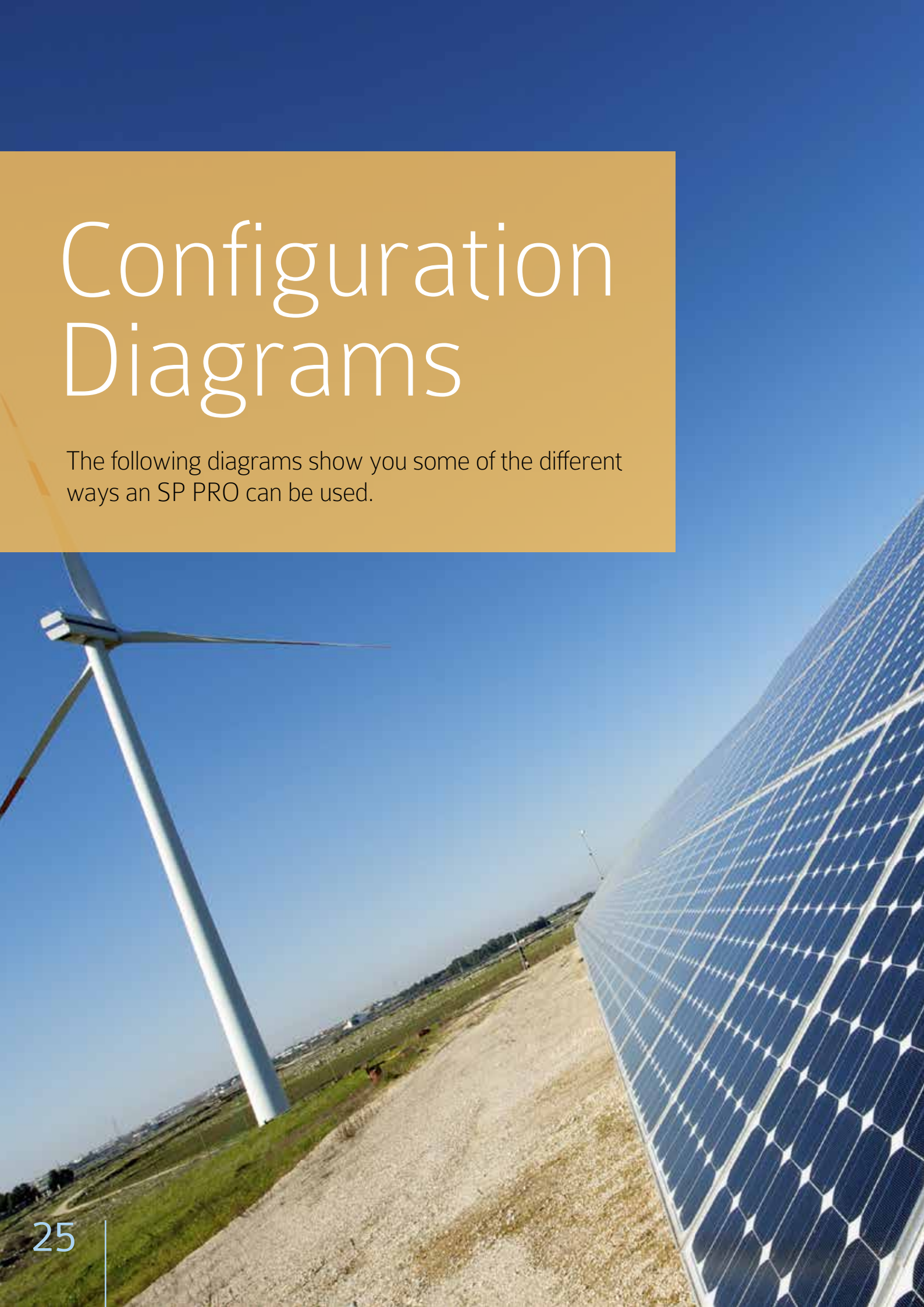
Site consumption and generation data continues to be logged by the SP PRO including the AC Coupled solar production.

Selectronic/KACO AC Coupling benefits

- *Reduced installation costs due to high voltage PV strings - up to 600V DC o/c.*
- *Maximum conversion efficiency for AC loads.*
- *PV array can be placed hundreds of meters form the battery bank with significantly reduced power loss.*
- *System components can be placed in the most appropriate position.*
- *Additional PV can be easily added later.*
- *Complete and precisely controlled battery charging to 100% SoC.*
- *All battery charging parameters controlled by one device: SP PRO.*
- *Grid backup easily added to existing KACO grid system with no rewiring of PV.*
- *If communications are disabled between the KACO and SP PRO, AC Frequency shift will be automatically implemented.*
- *Maximum cable run for RS485 wiring is 250m, Cat 5 or similar cable.*
- *KACO inverters do not need to be all the same model.*
- *Wireless RS485 communications options available.*

Configuration Diagrams

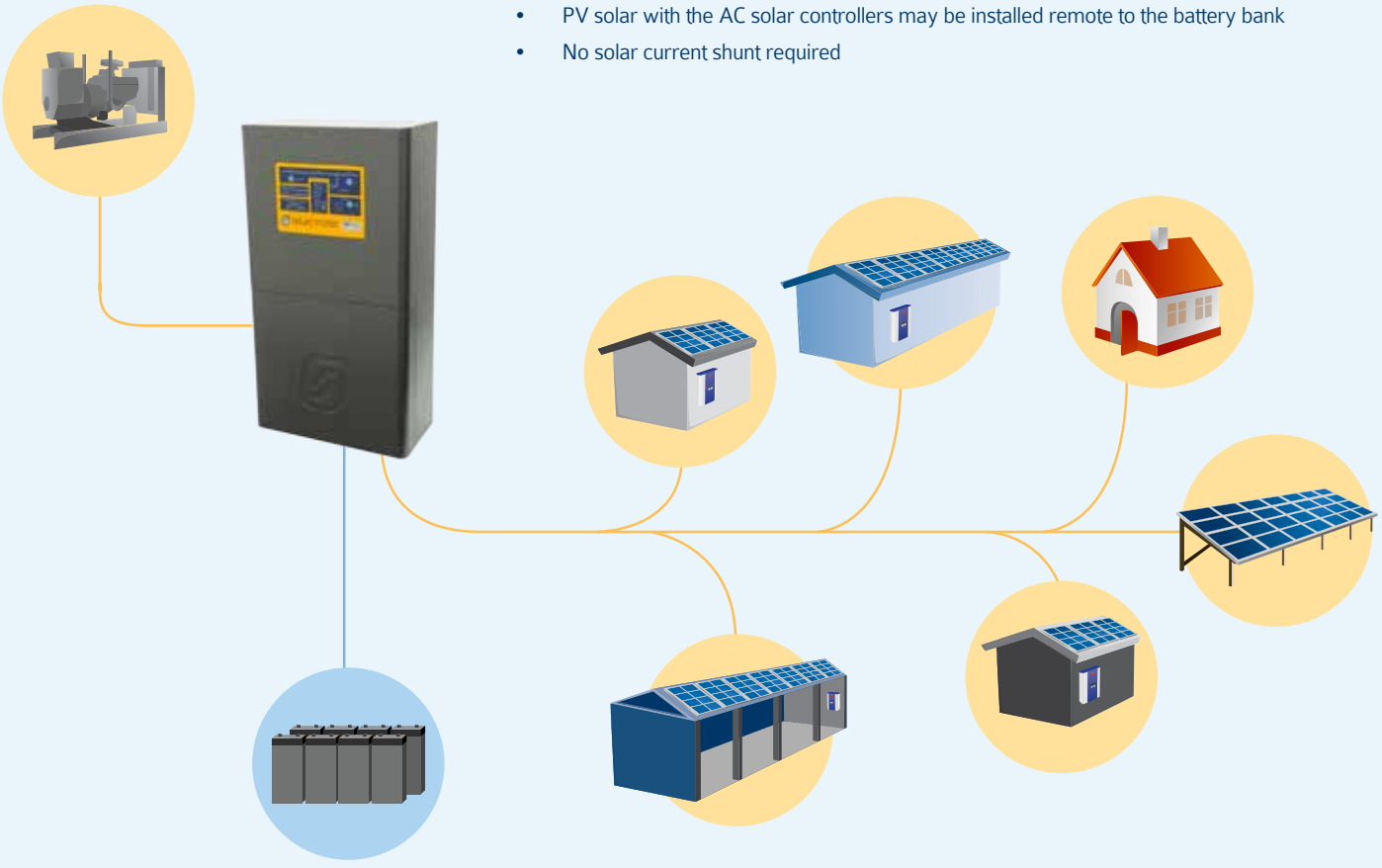
The following diagrams show you some of the different ways an SP PRO can be used.



Off Grid AC Coupled

By connecting and communicating with up to 5 x KACO 02 series or 00 series inverters to the load side of the SP PRO system, it is possible to utilise efficient high voltage PV arrays that are located remotely from the battery bank. SP PRO ensures minimal Diesel Generator running whilst maximising use of PV and extended battery life.

- Intelligent control of Diesel Generator minimising run time
- Cost effective high voltage PV solar installation up to 600V DC
- Power from the PV solar is connected directly to the customer's load giving highest system efficiency when daytime loads are high.
- Precise battery charging through multi step power control of up to five KACO "02" series or "00" series AC solar controllers
- PV solar with the AC solar controllers may be installed remote to the battery bank
- No solar current shunt required



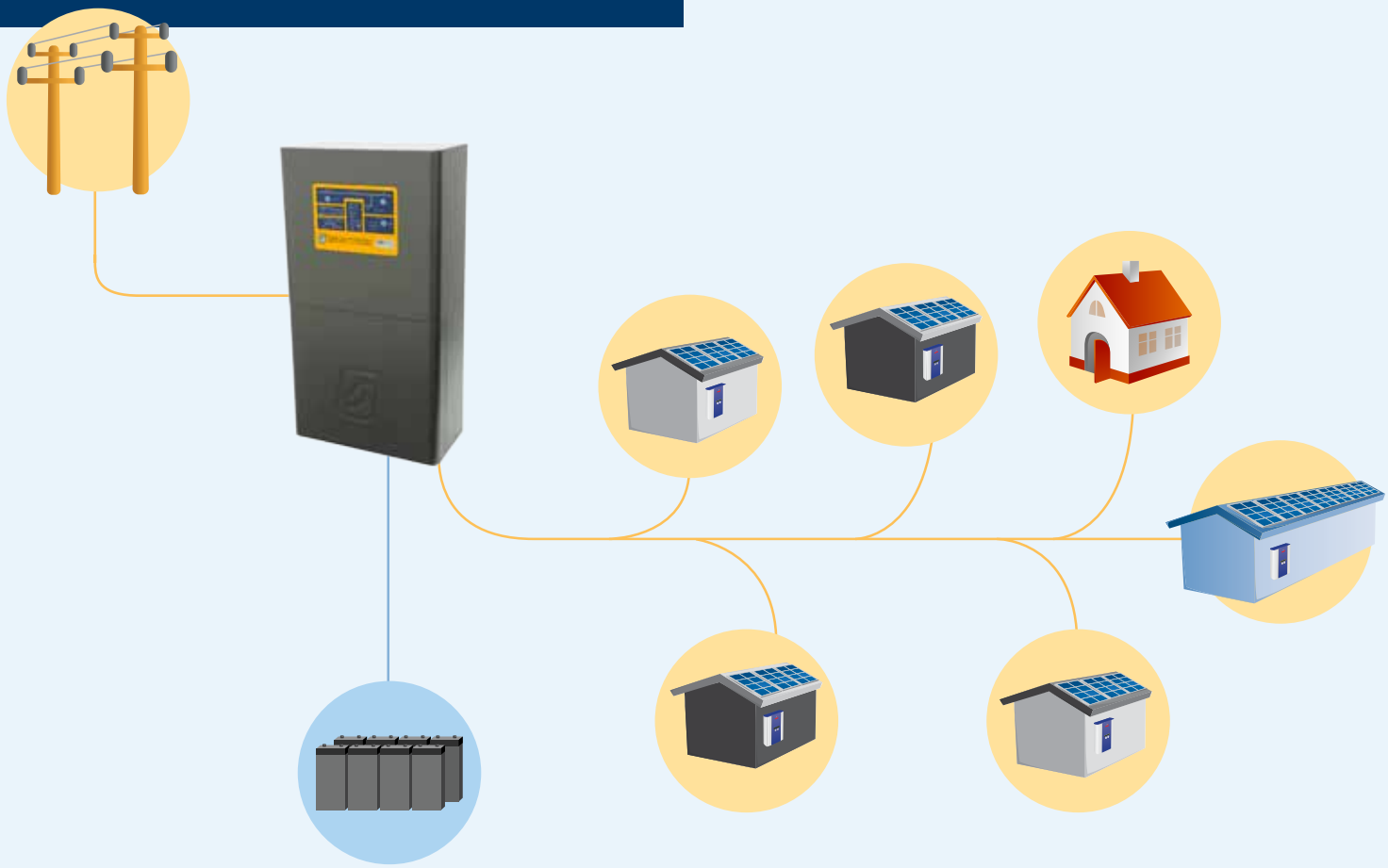
Off Grid DC Coupled

Cost effective integration of low voltage PV or wind. This method will allow safer PV array voltage to be used.

- Intelligent control of Diesel Generator minimising run time
- Low voltage PV installation possible limited to rating of the DC solar controller or MPPT
- Compatible with many sources of renewable energy including PV solar, small scale wind and micro hydro
- Battery bank is charged directly from the PV solar giving the highest system efficiency during battery charging and low daytime loads.
- Compatible with any brand of DC charge controller or MPPT.

Solar Hybrid AC Coupled KACO

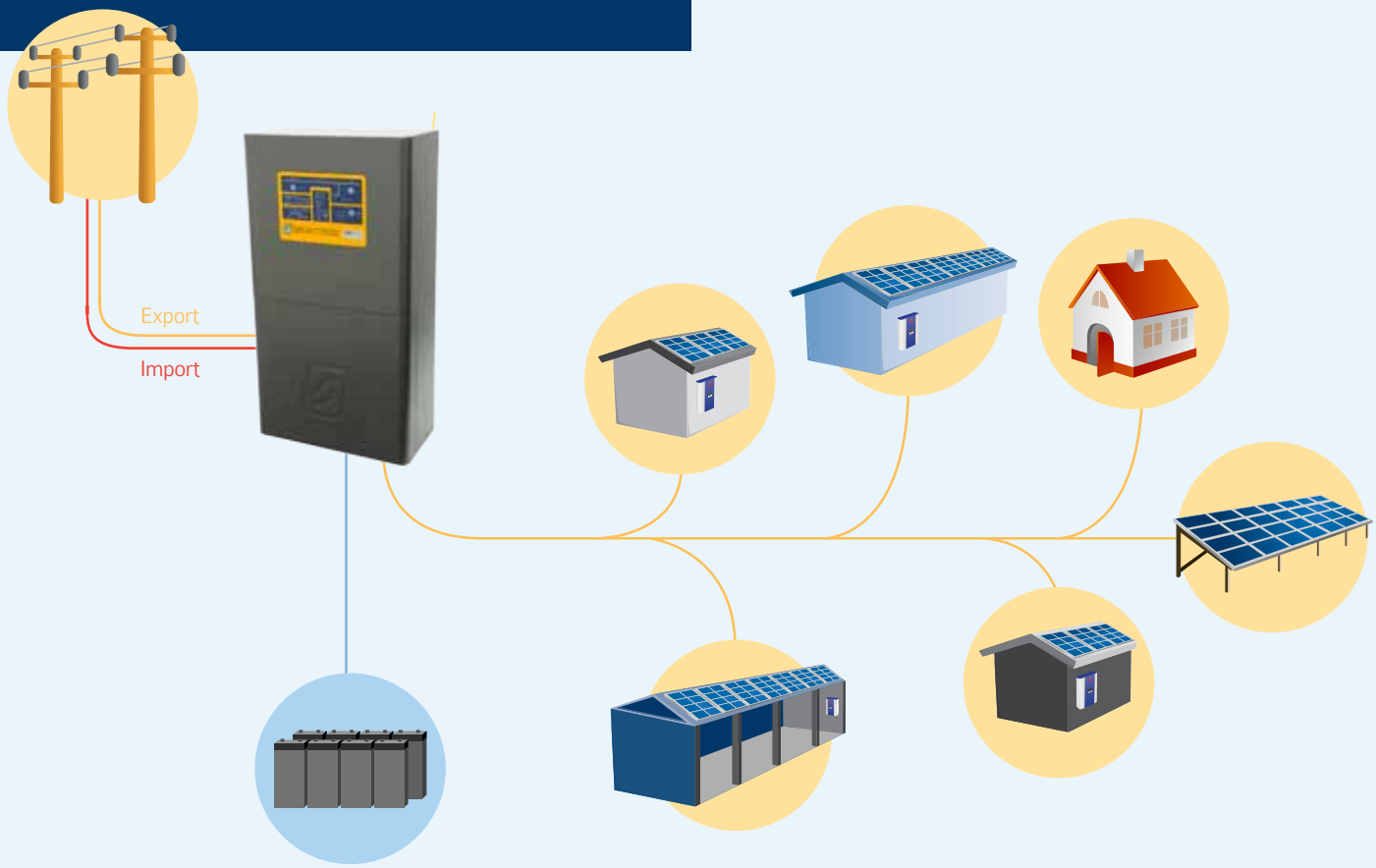
A brilliant method to add Battery Backup to a KACO Grid Tie system. The PV can be distributed for best utilisation. This method is ideal for Village electrification and Tourist Resorts



- Can be added to any existing grid system with KACO "02" series or "00" series
- Precise battery charging through multi step power control of up to five KACO "02" series or "00" series AC solar controllers Intelligent integration of electricity grid, including grid lock out times
- Able to exported excess PV solar to grid after Self Consumption
- Cost effective high voltage PV solar installation, up to 600V DC
- During a grid outage the power from the PV solar is connected directly to the customer's load giving highest system efficiency when daytime loads are high.
- Battery charging from the grid maybe done at low tariff times
- PV solar with the AC solar controllers may be installed remote from the battery bank
- Seamless shift from grid to off Grid (backup) mode
- All system parameters reported by SP LINK software

Solar Hybrid Independent Import/Export

With innovative programming options, the system designer can set the SP PRO to any size grid from 0kW to the maximum output of the SP PRO inverter. It is also possible to independently set the maximum export power from 0kW to the SP PRO's maximum output. This gives great flexibility when dealing with restricted electrical distribution lines and authorities.



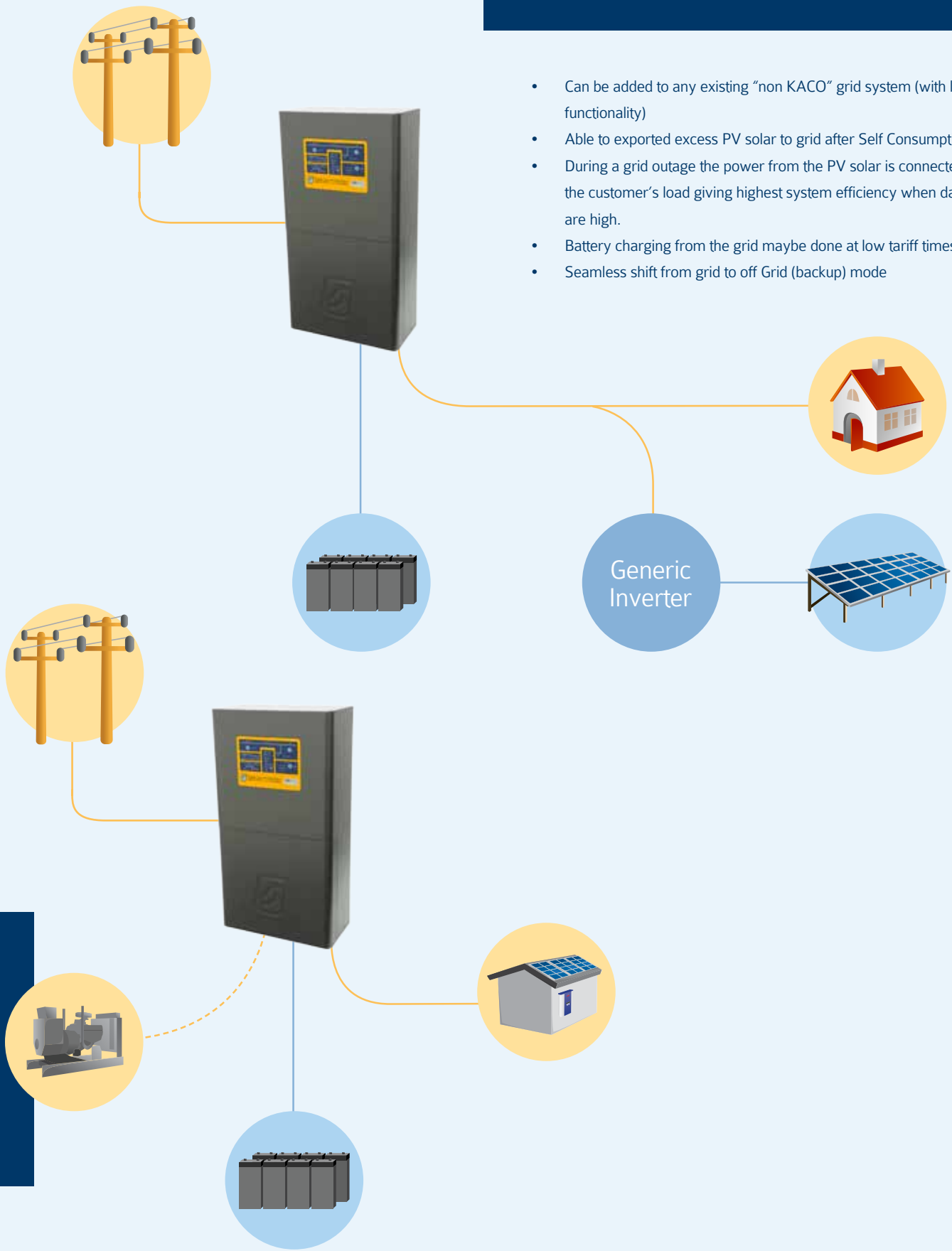
Solar Hybrid with Generator Backup

Rather than install large and expensive battery banks for extended outages, our Grid Fail Generator Backup option will start and manage and auto-start diesel generator if the batteries or load require it. This protects against extended outages caused by disasters. The diesel generator will be exercised regularly to ensure it is ready when needed.

Solar Hybrid AC Coupled, Generic Grid Inverter

Connecting any brand of Grid Inverter using the optional electronic controller. This method will maintain a stable frequency at all times.

- Can be added to any existing “non KACO” grid system (with limited functionality)
- Able to exported excess PV solar to grid after Self Consumption
- During a grid outage the power from the PV solar is connected directly to the customer’s load giving highest system efficiency when daytime loads are high.
- Battery charging from the grid maybe done at low tariff times
- Seamless shift from grid to off Grid (backup) mode



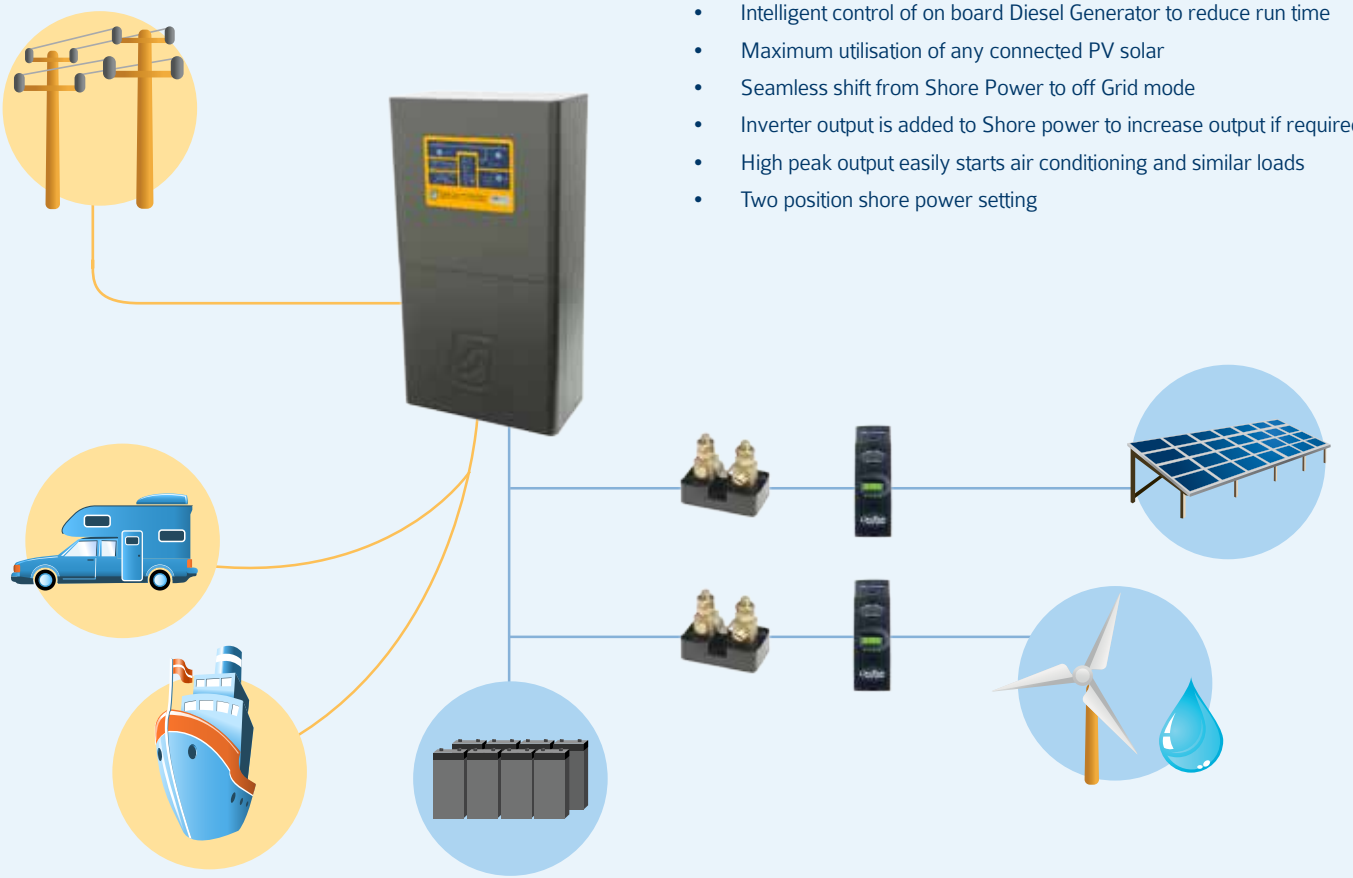
Solar/Wind Hybrid DC Coupled

The most cost effective method to achieve a Grid Tie Solar system which provides maximum self consumption, even when the grid is not there.

- SP PRO inverter performs both grid connect and backup functions
- Compatible with many sources of renewable energy including PV solar, small scale wind and micro hydro
- Compatible with any brand of DC charge controller or MPPT.
- Able to exported excess renewable energy to grid after Self Consumption
- Low voltage PV installation possible limited to rating of the DC solar controller or MPPT
- During grid outage battery bank is charged directly from the PV solar giving the highest system efficiency during battery charging and low daytime loads
- Battery charging from grid at low tariff times if needed
- Seamless shift from grid to off Grid (backup) mode

Solar/Wind Hybrid for Marine/Mobile

Take the comforts of home with you by allowing you to have reliable and silent power on board your boat or motorhome.



- Intelligent control of on board Diesel Generator to reduce run time
- Maximum utilisation of any connected PV solar
- Seamless shift from Shore Power to off Grid mode
- Inverter output is added to Shore power to increase output if required
- High peak output easily starts air conditioning and similar loads
- Two position shore power setting

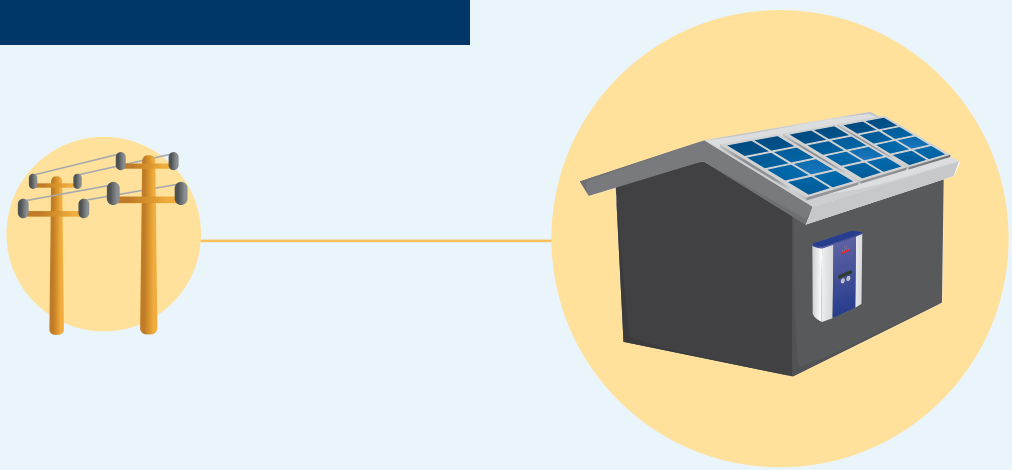
Solar Hybrid with Time Shift Export

By communicating with the SP PRO using a custom developed PLC, it is possible to have the SP PRO export or import grid power on command. This is useful for Time Shift export and Grid Support. This can only be done with approval of the electricity authority. Particularly useful if using Lithium Iron Phosphate batteries.

- Export of stored energy at any time
- Increase grid capacity with stored energy when required
- PV solar not essential
- Stable AC Frequency at all times

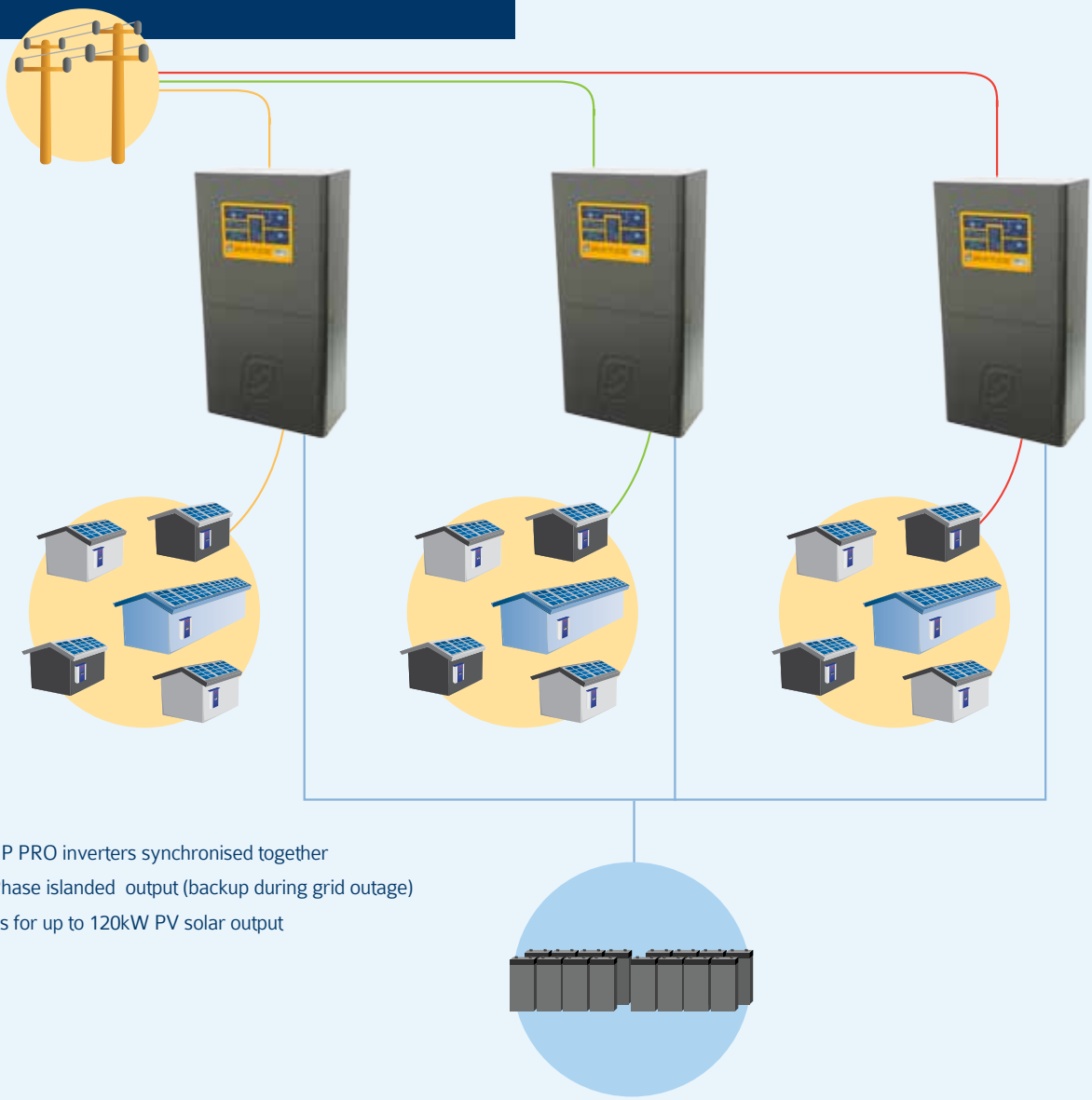
Normal Grid Tie

By installing a KACO 02 series or 00 series inverter as part of your grid-tie solar system you have the reliability and performance of a German inverter that can have integrated battery backup added at any time.



Three Phase AC Coupled

On Grid or OFF Grid, 3 x SP PRO's can be connected to achieve true 3 phase output. Each phase can control up to 5 KACO inverters. It is therefore possible to connect up to 90kW of managed PV



- Three SP PRO inverters synchronised together
- Three Phase islanded output (backup during grid outage)
- Provides for up to 120kW PV solar output

KACO new energy.

Data sheet

Powador
3200 | 4400
5500 | 6600

Less is More: No Transformer, lots of Power.

The Powador 3200 – 6600 transformerless string inverters.

Our Powador 3200 to 6600* transformerless single-phase inverters are now equipped with digital controllers so that they can be used internationally. The appropriate country settings can easily be selected on-site; the country-specific settings are stored in the software, so the inverters can be quickly installed in any country. Users can also choose a menu language regardless of the selected country setting. We have changed the product names. The maximum PV generator power for which the particular unit is optimised can now be read from the designation. All units operate with a full bridge without a step-up converter. Four IGBT power switches reproduce the sine-shaped voltage curve of the public power grid employing pulse width modulation. These are true single-stage, self-commutated units. However, the input voltage must be greater than the peak line voltage for them to be used.

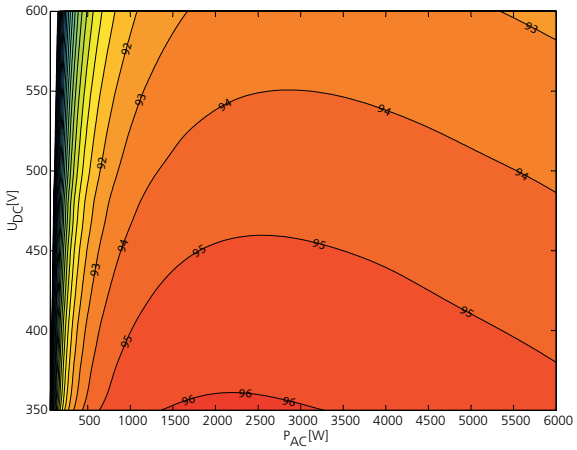
The units are equipped with a wide MPP range of 350 V to 600 V. The open circuit voltage is 800 V, which simplifies the work of installers when laying out systems. The same is true for the integrated DC disconnect. Screw terminals make connecting to the grid easy. The units contain a single- or three-phase monitoring system conforming to VDE0126-1-1, including an AC/DC-sensitive residual current protector. The units can thus be connected to the grid without any additional measures, even in installations with several inverters.

In addition, the units operate using purely passive noiseless convection cooling. The heat that is lost is, to a great degree, dissipated via the heat sink on the rear of the unit. The rest of the heat is radiated from the surface of the aluminium housing. No fans, no problems, just long service life.

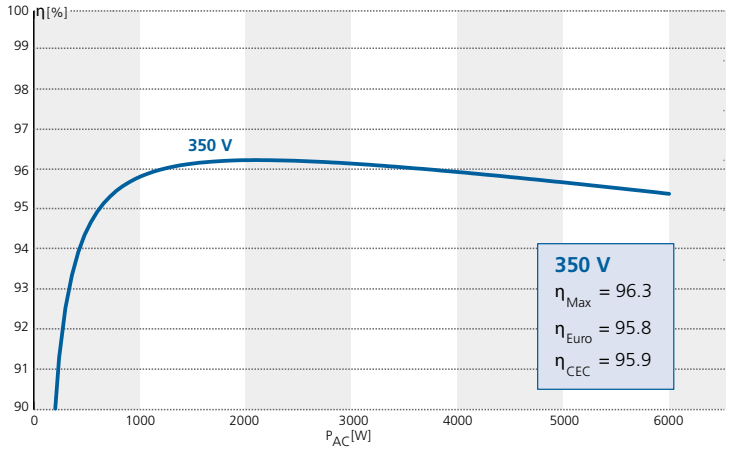
Powador
3200 | 4400
5500 | 6600

Graphical Display of efficiency

3D efficiency diagram for Powador 6600



Efficiency characteristic curve for Powador 6600



- Capable of reactive power
- Integrated potential-free fault signal
- Silent, maintenance-free convection cooling
- 5-years factory warranty plus 2-years when the unit is registered
- Preconfigured international country settings
- Menu language can be chosen as required
- Asymmetry monitoring via special KACO Sym-Bus

www.kaconewenergy.com

Technical data

Powador 3200 | 4400 | 5500 | 6600

Electrical data	3200	4400
Input variables		
Max. recommended PV generator power	3 200 W	4 400 W
MPP range	350 V … 600 V	350 V ... 600 V
No-load voltage	800 V	800 V
Max. input current	8.6 A	12.0 A
Number of strings	3	3
Number of MPP trackers	1	1
Inverse polarity protection	short-circuit diode	short-circuit diode
Output variables		
Rated output	2 600 VA	3 600 VA
Max. output	2 850 VA	4 000 VA
Supply voltage	acc. to local requirements	acc. to local requirements
Rated current	11.3 A	15.6 A
Rated frequency	50 Hz/60 Hz	50 Hz/60 Hz
cos phi	0.80 inductive ... 0.80 capacitive	0.80 inductive ... 0.80 capacitive
Number of grid phases	1	1
General electrical data		
Max. efficiency	96.6 %	96.5 %
European efficiency	95.8 %	95.9 %
Night consumption	0 W	0 W
Switching plan	self-commutated, transformerless	self-commutated, transformerless
Grid monitoring	acc. to local requirements	acc. to local requirements
Mechanical data		
Display	LCD 2 x 16 characters	LCD 2 x 16 characters
Control units	2 buttons for display control	2 buttons for display control
Interfaces	RS232/RS485, S0	RS232/RS485, S0
Fault signalling relay	potential-free NOC max. 250 V / 1 A	potential-free NOC max. 250 V / 1 A
Connections	PCB terminals within the device (max. cross section: 10mm²) cable supply via cable connections (DC connection M16, AC-connection M32)	PCB terminals within the device (max. cross section: 10mm²) cable supply via cable connections (DC connection M16, AC-connection M32)
Ambient temperature	-20 °C … +60 °C*	-20 °C … +60 °C*
Temperature monitoring heat sink	> 75 °C temperature-dependent power limitation / > 85 °C cut-out	> 75 °C temperature-dependent power limitation / > 85 °C cut-out
Cooling	free convection / no fan	free convection / no fan
Protection class	IP54	IP54
Noise emission	< 35 dB (A) (noiseless)	< 35 dB (A) (noiseless)
DC switch	integrated	integrated
Casing	aluminium	aluminium
H x W x D	500 x 340 x 200 mm	550 x 340 x 220 mm
Weight	19 kg	21 kg

*Power derating at high ambient temperatures

5500	6600
5 500 W	6 600 W
350 V … 600 V	350 V ... 600 V
800 V	800 V
15.2 A	18.0 A
3	3
1	1
short-circuit diode	short-circuit diode
4 600 VA	5 500 VA
5 060 VA	6 000 VA
acc. to local requirements	acc. to local requirements
20.0 A	23.9 A
50 Hz/60 Hz	50 Hz/60 Hz
0.80 inductive ... 0.80 capacitive	0.80 inductive ... 0.80 capacitive
1	1
96.3 %	96.3 %
95.7 %	95.8 %
0 W	0 W
self-commutated, transformerless	self-commutated, transformerless
acc. to local requirements	acc. to local requirements
LCD 2 x 16 characters	LCD 2 x 16 characters
2 buttons for display control	2 buttons for display control
RS232/RS485, S0	RS232/RS485, S0
potential-free NOC max. 250 V / 1 A	potential-free NOC max. 250 V / 1 A
PCB terminals within the device (max. cross section: 10mm²) cable supply via cable connections (DC connection M16, AC-connection M32)	PCB terminals within the device (max. cross section: 10mm²) cable supply via cable connections (DC connection M16, AC-connection M32)
-20 °C ... +60 °C*	-20 °C ... +60 °C*
> 75 °C temperature-dependent power limitation / > 85 °C cut-out	> 75 °C temperature-dependent power limitation / > 85 °C cut-out
free convection / no fan	free convection / no fan
IP54	IP54
< 35 dB (A) (noiseless)	< 35 dB (A) (noiseless)
integrated	integrated
aluminium	aluminium
600 x 340 x 220 mm	600 x 340 x 220 mm
28 kg	30 kg

*Power derating at high ambient temperatures

KACO new energy.

Data sheet

Powador
7700
8600 | 9600

Champions of the middleweights.

The transformerless string inverters Powador 7700 – 9600.

All Powador 7700 to 9600* units are equipped with digital controllers so that they can be used internationally. The appropriate country settings can easily be selected on-site; the country-specific settings are stored in the software, so the inverters can be quickly and easily installed anywhere in the world. The menu language can be selected independently from the country-specific settings.

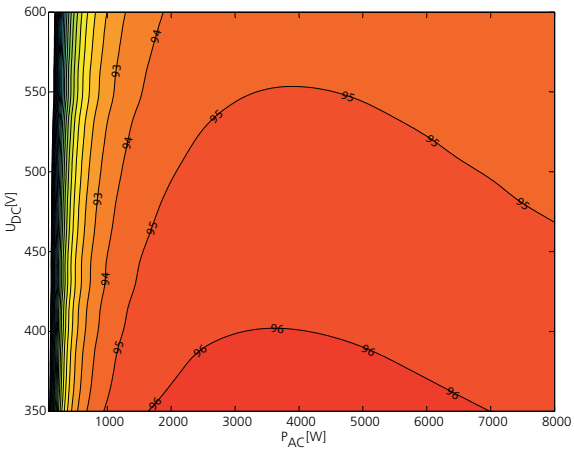
All three units include transformerless topology without a step-up converter. DC switch is already integrated. This provides maximum safety and reliability for the system operator and makes the installer's job easier.

These inverters are designed as a trio, with each unit feeding into one of the three phases. This allows each unit to optimally utilise the voltage range of a photovoltaic system that has been divided into three sub-generators. The integrated Sym-Bus ensures that any potential asymmetry does not exceed the maximum permitted limit of 4.6 kW, even when there is a fault in a unit. They represent an alternative to central inverters (depending on the system design).

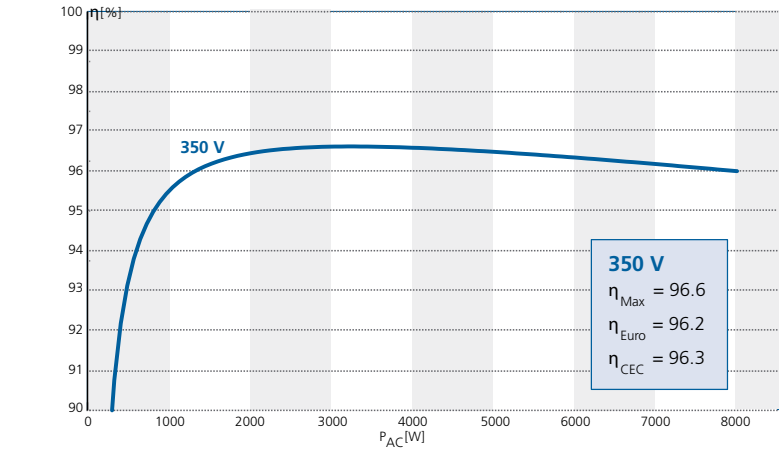
Powador
7700
8600 | 9600

Graphical Display of efficiency

3D efficiency diagram for Powador 9600



Efficiency characteristic curve for Powador 9600



- Capable of reactive power
- Additional asymmetry monitoring via special KACO Sym-Bus
- 5-years factory warranty plus 2-years when the unit is registered
- Preconfigured international country settings
- Menu language can be chosen as required

Technical data

Powador 7700 | 8600 | 9600

Electrical data	7700
Input variables	
Max. recommended PV generator power	7 700 W
MPP range	350 V … 600 V
No-load voltage	800 V
Max. input current	19.0 A
Number of strings	4
Number of MPP trackers	1
String fuses	2 short-circuit bridges (fuses optional)
Inverse polarity protection	short-circuit diode
Output variables	
Rated output	6 400 VA
Supply voltage	acc. to local requirements
Rated current	27.8 A
Rated frequency	50 Hz/60 Hz
cos phi	0.80 inductive ... 0.80 capacitive
Number of grid phases	1
General electrical data	
Max. efficiency	96.6 %
European efficiency	96.2 %
Night consumption	0 W
Switching plan	self-commutated, transformerless
Grid monitoring	acc. to local requirements
Mechanical data	
Display	LCD 2 x 16 characters
Control units	2 buttons for display control
Interfaces	RS485, S0, Sym-Bus
Fault signalling relay	potential-free NOC max. 250 V / 1 A
Connections	AC connection: PCB terminals within device (max. cross section: 10 mm²), cable supply via cable connection (M32). DC connection: 4 strings via PCB terminals (max. cross section: 6 mm²), cable supply via cable connections (M16). Optional DC connection: 1 x Plus, 1 x Minus without string fuses via PCB terminals (max. cross section: 10 mm²).
Ambient temperature	-20 °C … +60 °C*
Temperature monitoring power stage	temperature-dependent power limitation with emergency cut-out when device errors occur
Cooling	free convection / no fan
Protection class	IP54
Noise emission	< 35 dB (A) (noiseless)
DC switch	integrated
Casing	aluminium
H x W x D	810 x 340 x 220 mm
Weight	38 kg

Electrical data	8600	9600
Input variables		
Max. recommended PV generator power	8600 W	9600 W
MPP range	350 V … 600 V	350 V ... 600 V
No-load voltage	800 V	800 V
Max. input current	21.4 A	24.0 A
Number of strings	4	4
Number of MPP trackers	1	1
String fuses	2 short-circuit bridges (fuses optional)	2 short-circuit bridges (fuses optional)
Inverse polarity protection	short-circuit diode	short-circuit diode
Output variables		
Rated output	7200 VA	8000 VA
Supply voltage	acc. to local requirements	acc. to local requirements
Rated current	31.3 A	35.0 A
Rated frequency	50 Hz/60 Hz	50 Hz/60 Hz
cos phi	0.80 inductive ... 0.80 capacitive	0.80 inductive ... 0.80 capacitive
Number of grid phases	1	1
General electrical data		
Max. efficiency	96.6 %	96.6 %
European efficiency	96.2 %	96.2 %
Night consumption	0 W	0 W
Switching plan	self-commutated, transformerless	self-commutated, transformerless
Grid monitoring	acc. to local requirements	acc. to local requirements
Mechanical data		
Display	LCD 2 x 16 characters	LCD 2 x 16 characters
Control units	2 buttons for display control	2 buttons for display control
Interfaces	RS485, S0, Sym-Bus	RS485, S0, Sym-Bus
Fault signalling relay	potential-free NOC max. 250 V / 1 A	potential-free NOC max. 250 V / 1 A
Connections	AC connection: PCB terminals within device (max. cross section: 10 mm²), cable supply via cable connection (M32). DC connection: 4 strings via PCB terminals (max. cross section: 6 mm²), cable supply via cable connections (M16). Optional DC connection: 1 x Plus, 1 x Minus without string fuses via PCB terminals (max. cross section: 10 mm²).	AC connection: PCB terminals within device (max. cross section: 10 mm²), cable supply via cable connection (M32). DC connection: 4 strings via PCB terminals (max. cross section: 6 mm²), cable supply via cable connections (M16). Optional DC connection: 1 x Plus, 1 x Minus without string fuses via PCB terminals (max. cross section: 10 mm²).
Ambient temperature	-20 °C … +60 °C*	-20 °C … +60 °C*
Temperature monitoring power stage	temperature-dependent power limitation with emergency cut-out when device errors occur	temperature-dependent power limitation with emergency cut-out when device errors occur
Cooling	free convection / no fan	free convection / no fan
Protection class	IP54	IP54
Noise emission	< 35 dB (A) (noiseless)	< 35 dB (A) (noiseless)
DC switch	integrated	integrated
Casing	aluminium	aluminium
H x W x D	810 x 340 x 220 mm	810 x 340 x 220 mm
Weight	38 kg	38 kg

*Derating at higher temperatures

KACO new energy.

Powador
2002
3002
4202
5002
6002

High flexibility. Easy installation.

The galvanically isolated string inverters Powador 2002 – 6002.

The inverters from the Powador 2002 to Powador 6002, with galvanic isolation, feature effortless installation, the highest degrees of efficency, and optimum operation with thin-film modules – and make designing a PV system a piece of cake.

Installation is problem-free: All required connections for communication – RS485, S0 and fault signalling relay – are located on a single circuit board in the housing and can be connected easily. Due to the new MC4 connectors, the DC wiring can be handled by a safe and simple plug connection from the outside of the unit.

Thus the inverters can be installed even more quickly. The DC switch is integrated into the units as a matter of course. They achieve an outstanding efficiency of up to 96 %. Using a Powador 02 inverter, you can build your next PV installation wherever you want: The software knows the international requirements. This helps you to quickly and easily connect your PV installation to the grid – simply select the appropriate country setting and display language during installation.

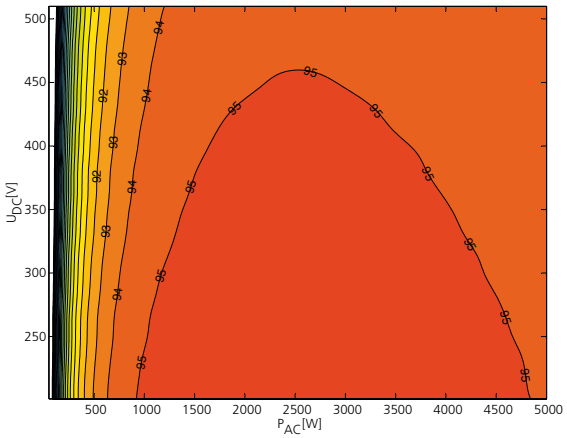
The Powador 02 series skillfully makes use of the advantages of galvanically isolated inverters. The wide input voltage range allows you to be extremely flexible in planning your PV installation. Where transformerless units are out of the question, the Powador 02 series can handle even complex PV system designs.

In addition, KACO new energy offers a generator earthing kit for this series. Thin-film modules often require generator earthing for a long service life. Moreover, the inverters can display the earthing status of the PV generator – important information especially for the safe operation of thin-film modules.

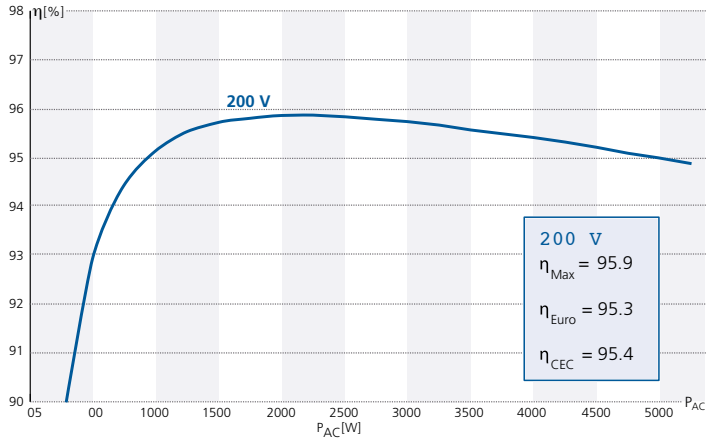
Powador
2002 | 3002 | 4202
5002 | 6002

Graphical display of efficiency

3D efficiency diagram for Powador 6002



Efficiency characteristic curve for Powador 6002



- Capable of reactive power
- Degree of efficiency up to 96.0 %
- Optimized MPP tracking for higher yield
- Grounding of PV generator possible – optimally suited for thin-film modules

Technical data

Powador 2002 | 3002 | 4202 | 5002 | 6002

Electrical data	2002	3002
Input variables		
Max. recommended PV generator power	2 000 W	3 000 W
MPP range	125 V … 510 V	200 V … 510 V
No-load voltage	600 V*	600 V*
Max. input current	14.3 A	13.5 A
Number of strings	3	3
Number of MPP trackers	1	1
Inverse polarity protection	short-circuit diode	short-circuit diode
Output variables		
Rated output	1 650 VA	2 500 VA
Max. output	1 650 VA	2 500 VA
Supply voltage	acc. to local requirements	acc. to local requirements
Rated current	7.2 A	10.9 A
Rated frequency	50 Hz / 60 Hz	50 Hz / 60 Hz
cos phi	0.80 inductive ... 0.80 capacitive	0.80 inductive ... 0.80 capacitive
Number of grid phases	1	1
General electrical data		
Max. efficiency	95.9 %	96.0 %
European efficiency	95.3%	95.4 %
Night consumption	0.4 W	0.4 W
Switching plan	self-commutated, galvanically isolated, HF transformer	self-commutated, galvanically isolated, HF transformer
Network monitoring	acc. to local requirements	acc. to local requirements
Mechanical data		
Display	LCD 2 x 16 characters, LED	LCD 2 x 16 characters, LED
Control units	2 buttons for display control	2 buttons for display control
Interfaces	RS485, S0	RS485, S0
Fault signalling relay	potential-free NOC max. DC 30 V / 3 A max. AC 250 V / 1.5 A	potential-free NOC max. DC 30 V / 3 A max. AC 250 V / 1.5 A
Connections	PCB terminals inside the unit (max. cross section. 6 mm² flexible, 10 mm² rigid), Cable connection via cable fittings (DC: solar connector, AC fitting M32 and terminal)	PCB terminals inside the unit (max. cross section. 6 mm² flexible, 10 mm² rigid), Cable connection via cable fittings (DC: solar connector, AC fitting M32 and terminal)
Ambient temperature	-20 °C … +60 °C**	-20 °C … +60 °C**
Cooling	free convection / no fan	free convection / no fan
Protection class	IP54	IP54
Noise emission	< 35 dB (A) (noiseless)	< 35 dB (A) (noiseless)
DC switch	integrated	integrated
Casing	aluminium	aluminium
H x W x D	450 x 340 x 200 mm	500 x 340 x 200 mm
Weight	14.5 kg	20 kg

Applicable standards and regulations are taken into account for each country version that is set.

*To protect the hardware, the inverter starts up only at voltages < 550 V

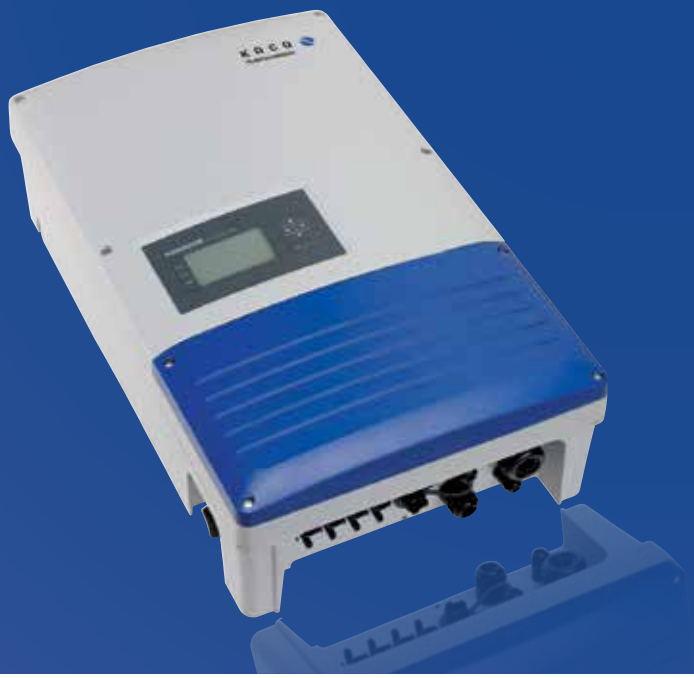
**Power derating at high ambient temperatures

4202	5002	6002
4 200 W	5 000 W	6 000 W
200 V … 510 V	200 V … 510 V	200 V … 510 V
600 V*	600 V*	600 V*
18.5 A	22.4 A	26.5 A
3	3	3
1	1	1
short-circuit diode	short-circuit diode	short-circuit diode
3 500 VA	4 200 VA	5 000 VA (Germany: 4600 VA)
3 500 VA	4 200 VA	5 000 VA
acc. to local requirements	acc. to local requirements	acc. to local requirements
15.2 A	18.3 A	21.7 A (Germany: 20.0 A)
50 Hz / 60 Hz	50 Hz / 60 Hz	50 Hz / 60 Hz
0.80 inductive ... 0.80 capacitive	0.80 inductive ... 0.80 capacitive	0.80 inductive ... 0.80 capacitive
1	1	1
95.9 %	95.9 %	95.9 %
95.1 %	95.3 %	95.3 %
0.4 W	0.4 W	0.4 W
self-commutated, galvanically isolated, HF transformer	self-commutated, galvanically isolated, HF transformer	self-commutated, galvanically isolated, HF transformer
acc. to local requirements	acc. to local requirements	acc. to local requirements
LCD 2 x 16 characters, LED	LCD 2 x 16 characters, LED	LCD 2 x 16 characters, LED
2 buttons for display control	2 buttons for display control	2 buttons for display control
RS485, S0	RS485, S0	RS485, S0
potential-free NOC max. DC 30 V / 3 A max. AC 250 V/1.5 A	potential-free NOC max. DC 30 V / 3 A max. AC 250 V/1.5 A	potential-free NOC max. DC 30 V / 3 A max. AC 250 V/1,5 A
PCB terminals inside the unit (max. cross section. 6 mm² flexible, 10 mm² rigid), Cable connection via cable fittings (DC: solar connector, AC fitting M32 and terminal)	PCB terminals inside the unit (max. cross section. 6 mm² flexible, 10 mm² rigid), Cable connection via cable fittings (DC: solar connector, AC fitting M32 and terminal)	PCB terminals inside the unit (max. cross section. 6 mm² flexible, 10 mm² rigid), Cable connection via cable fittings (DC: solar connector, AC fitting M32 and terminal)
-25 °C … +60 °C**	-25 °C … +60 °C**	-25 °C … +60 °C**
free convection / no fan	fan	fan
IP54	IP54	IP54
< 35 dB (A) (noiseless)	< 45 dB (A) (fan)	< 45 dB (A) (fan)
integrated	integrated	integrated
aluminium	aluminium	aluminium
600 x 340 x 240 mm	600 x 340 x 240 mm	600 x 340 x 240 mm
26 kg	28 kg	28 kg

Applicable standards and regulations are taken into account for each country version that is set.

*To protect the hardware, the inverter starts up only at voltages < 550 V

**Power derating at high ambient temperatures



KACO new energy.

Data sheet

Powador
6.0 TL3
7.8 TL3
9.0 TL3
10.0 TL3

Small power stations for the energy turnaround.

Transformerless three-phase inverters Powador 6.0 TL3 to 10.0 TL3.

With the new transformerless Powador 6.0 TL3 to 10.0 TL3 3-phase inverters, now even small roof systems can be realised with the most flexible line of 3-phase units on the market. With AC rated power of 5 kVA, 6,5 kVA, 7,5 kVA and 9 kVA they cover the range from the unbalanced load limit up to 10 kW.

They operate using two separate MPP trackers that can handle both symmetrical and asymmetrical loads to allow for optimum adjustment. Each tracker is able to process all of the AC output. This allows for all typical requirements of complex designs to be fulfilled; on the one hand, for example, full configuration of an east/west-facing roof (symmetrical load) or, on the other hand, the regular configuration of a south-facing roof without having to dispense with the solar yield of a dormer (asymmetrical load). The MPP trackers can also be connected in parallel: installation costs less (you do not need an additional external disconnector) when strings need to be combined before the inverter. Two strings can be connected per MPP controller, i.e. 4 strings for each unit.

The rated input voltage range is particularly broad. From 250 V the units switch to the mains and during operation they still feed in at 200 V. This means that solar yields are optimum for comparatively small areas such as dormers or carports but they also operate for more of the day. The peak efficiency is 98% and the European efficiency is also above average. The compact design weighing 40 kg combined with the DC connection via solar connectors makes installation very easy and economical. Protection class IP65 ensures the greatest possible flexibility when selecting the installation location.

It is easy to achieve perfect communication with these units. They are fitted with an integrated data logger with web server, a graphical display for showing operating data and a USB port for installing firmware updates. The current software can be downloaded free of charge from the download area of www.kaconewenergy.com/en/service. The yield data can be called from the web server or via USB for evaluation. The integrated data logger can also be connected directly to the Powador web internet portal for professional evaluation and visualisation of the inverter data.

A number of country-specific default settings are programmed into the inverters. These are easy to select during on-site installation. The interface language can be selected separately. The inverters support the functions of the Powador-protect for grid and plant protection and also power management.

Powador
6.0 TL3 | 7.8 TL3
9.0 TL3 | 10.0 TL3

- 98.0 % efficiency
- Two MPP trackers, symmetrical and asymmetrical loading possible
- Multilingual menu
- Graphical display
- Integrated web server
- USB connection for updates

www.kaconewenergy.com

Technical data

Powador 6.0 TL3 | 7.8 TL3 | 9.0 TL3 | 10.0 TL3

Electrical data	6.0 TL3	7.8 TL3
Input variables		
Max. recommended PV generator power	6 000 W	7 800 W
MPP range	200 V … 800 V [1]	200 V … 800 V [2]
Starting voltage	250 V	250 V
No-load voltage	1 000 V	1 000 V
Max. input current	2 x 11.0 A	2 x 11.0 A
Number of MPP trackers	2	2
Max. power/tracker	5.2 kW	6.7 kW
Number of strings	2 x 2	2 x 2
Output variables		
Rated output	5 000 VA	6 500 VA
Supply voltage	acc. to local requirements	acc. to local requirements
Rated current	3 x 7.25 A	3 x 9.25 A
Rated frequency	50 Hz / 60 Hz	50 Hz / 60 Hz
cos phi	0.80 inductive ... 0.80 capacitive	0.80 inductive ... 0.80 capacitive
Number of grid phases	3	3
General electrical data		
Max. efficiency	98.0%	98.0%
Europ. efficiency	> 97.0%	> 97.0%
Night consumption	≈ 1.5 W	≈ 1.5 W
Switching plan	transformerless	transformerless
Grid monitoring	acc. to local requirements	acc. to local requirements
Mechanical data		
Display	graphical display + LEDs	graphical display + LEDs
Control units	4-way navigation + 2 buttons	4-way navigation + 2 buttons
Interfaces	Ethernet, USB, RS485, S0 output	Ethernet, USB, RS485, S0 output
Fault signalling relay	potential-free NOC max. 230 V / 1 A	potential-free NOC max. 230 V / 1 A
Connections	DC: solar connector, AC: cable connection M40 and terminal (max. cross-section: 16 mm² flexible, 10 mm² rigid)	DC: solar connector, AC: cable connection M40 and terminal (max. cross-section: 16 mm² flexible, 10 mm² rigid)
Ambient temperature	-25 °C … +60 °C [5]	-25 °C … +60 °C [5]
Cooling	temperature-dependent fan	temperature-dependent fan
Protection class	IP65	IP65
Noise emission	< 45 dB (A) (noiseless when operated without fan)	< 45 dB (A) (noiseless when operated without fan)
DC switch	integrated	integrated
Casing	aluminium casting	aluminium casting
H x W x D	690 x 420 x 200 mm	690 x 420 x 200 mm
Weight	40 kg	40 kg

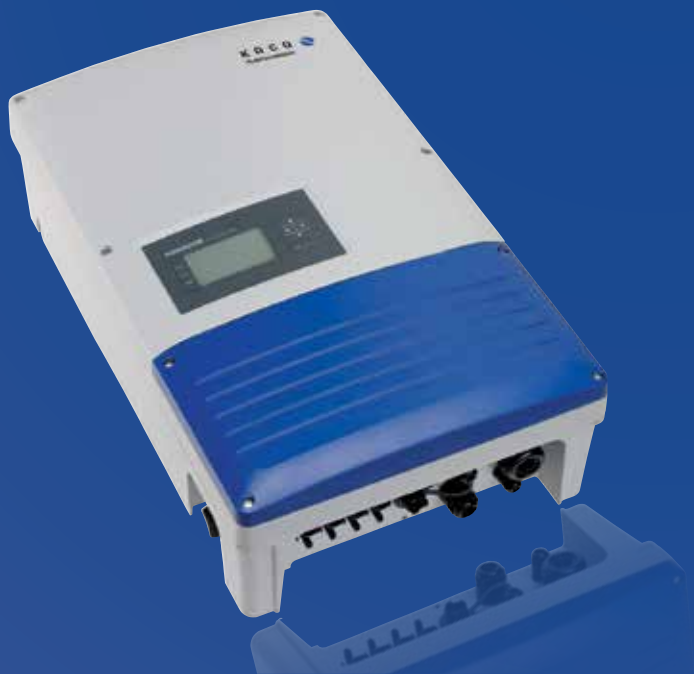
[1] The possible input power is reduced at voltages lower than 240 V. The input current is limited to 11.0 A per input.
[2] The possible input power is reduced at voltages lower than 310 V. The input current is limited to 11.0 A per input.
[3] The possible input power is reduced at voltages lower than 350 V. The input current is limited to 11.0 A per input.
[4] The possible input power is reduced at voltages lower than 420 V. The input current is limited to 11.0 A per input.
[5] Power derating at high ambient temperatures.

Conforms to the country-specific standards and regulations according to the country version that has been set.

Electrical data	9.0 TL3	10.0 TL3
Input variables		
Max. recommended PV generator power	9 000 W	10 000 W
MPP range	200 V … 800 V [3]	200 V ... 800 V [4]
Starting voltage	250 V	250 V
No-load voltage	1 000 V	1 000 V
Max. input current	2 x 11.0 A	2 x 11.0 A
Number of MPP trackers	2	2
Max. power/tracker	7.7 kW	9.2 kW
Number of strings	2 x 2	2 x 2
Output variables		
Rated output	7 500 VA	9 000 VA
Supply voltage	acc. to local requirements	acc. to local requirements
Rated current	3 x 10.9 A	3 x 13.0 A
Rated frequency	50 Hz Hz	50 Hz / 60 Hz
cos phi	0.80 inductive ... 0.80 capacitive	0.80 inductive ... 0.80 capacitive
Number of grid phases	3	3
General electrical data		
Max. efficiency	98.0%	98.0 %
Europ. efficiency	97.2%	97.4 %
Night consumption	< 1.5 W	1.5 W
Switching plan	transformerless	transformerless
Grid monitoring	acc. to local requirements	acc. to local requirements
Mechanical data		
Display	graphical display + LEDs	graphical display + LEDs
Control units	4-way navigation + 2 buttons	4-way navigation + 2 buttons
Interfaces	Ethernet, USB, RS485, S0 output	Ethernet, USB, RS485, S0 output
Fault signalling relay	potential-free NOC max. 230 V / 1 A	potential-free NOC max. 230 V / 1 A
Connections	DC: solar connector, AC: cable connection M40 and terminal (max. cross-section: 16 mm^2 flexible, 10 mm^2 rigid)	DC: solar connector, AC: cable connection M40 and terminal (max. cross-section: 16 mm^2 flexible, 10 mm^2 rigid)
Ambient temperature	-25 °C … +60 °C [5]	-25 °C … +60 °C [5]
Cooling	temperature-dependent fan	temperature-dependent fan
Protection class	IP65	IP65
Noise emission	< 45 dB (A) (noiseless when operated without fan)	< 52 dB (A) (noiseless when operated without fan)
DC switch	integrated	integrated
Casing	aluminium casting	aluminium casting
H x W x D	690 x 420 x 200 mm	690 x 420 x 200 mm
Weight	40 kg	40 kg

[1] The possible input power is reduced at voltages lower than 240 V. The input current is limited to 11.0 A per input.
[2] The possible input power is reduced at voltages lower than 310 V. The input current is limited to 11.0 A per input.
[3] The possible input power is reduced at voltages lower than 350 V. The input current is limited to 11.0 A per input.
[4] The possible input power is reduced at voltages lower than 420 V. The input current is limited to 11.0 A per input.
[5] Power derating at high ambient temperatures.

Conforms to the country-specific standards and regulations according to the country version that has been set.



KACO new energy.

Powador
12.0 TL3 | 14.0 TL3
18.0 TL3 | 20.0 TL3 NEW

The power plants of the future.

The transformerless three-phase inverters Powador 12.0 TL3 to 20.0 TL3.

Photovoltaic systems of up to several hundred kilowatts can be designed extremely flexibly in small, highly efficient units with the transformerless three-phase inverters Powador 12.0 TL3 to 20.0 TL3.

They operate using two separate MPP trackers that can handle both symmetrical and asymmetrical loads to allow for optimum adjustment. Each tracker is able to process all of the AC output. This allows for all typical requirements of complex designs to be fulfilled; on the one hand, for example, full configuration of an east/west-facing roof (symmetrical load) or, on the other hand, the regular configuration of a south-facing roof without having to dispense with the solar yield of a dormer (asymmetrical load). The MPP trackers can also be connected in parallel: installation costs less (you do not need an additional external disconnector) when strings need to be combined before the inverter. Two strings can be connected per MPP controller, i.e. 4 strings for each unit.

The input voltage range is particularly broad: the inverters switch to the grid from 250 V, and, when in operation, they still feed in at 200 V. This means that solar yields are optimum for comparatively small areas such as dormers or carports but they also operate for more of the day. The peak efficiency is 98 % and the European efficiency is also above average. The compact design weighing only 40 kg combined with the DC connection via solar connectors makes installation very easy and economical.

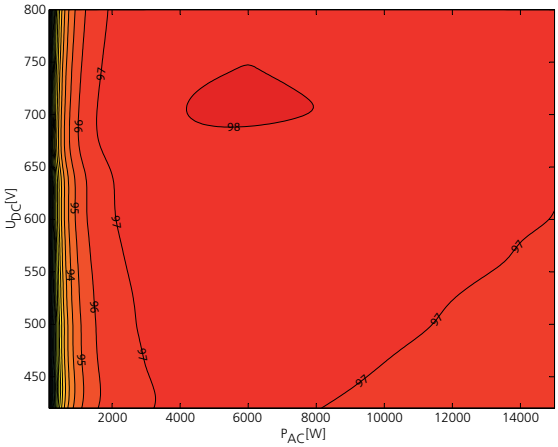
It is easy to achieve perfect communication with these units. They are fitted with an integrated data logger with web server, a graphical display for showing operating data and a USB port for installing firmware updates. The current software can be downloaded free of charge from the download area of www.kaconewenergy.com/en/service. The yield data can be called from the web server or via USB for evaluation. The integrated data logger can also be connected directly to the Powador web internet portal for professional evaluation and visualisation of the inverter data.

A number of country-specific default settings are programmed into the inverters. These are easy to select during on-site installation. The interface language can be selected separately. The inverters support the functions of the Powador-protect for grid and plant protection and also power management.

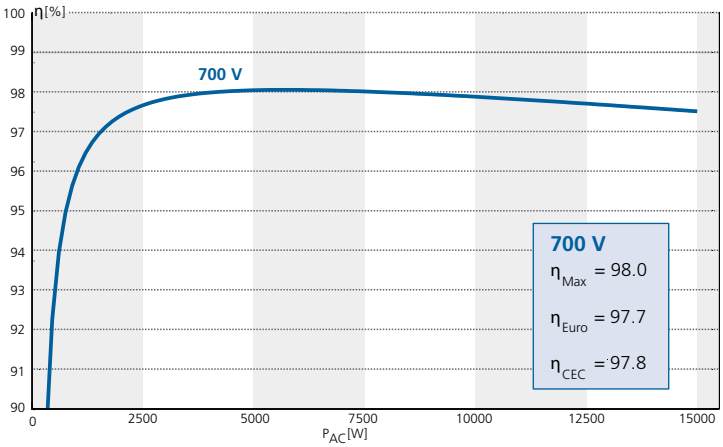
The Powador 20.0 TL3 is available as of December 2013.

Graphical Display of efficiency

3D efficiency diagram for Powador 18.0 TL3



Efficiency characteristic curve for Powador 18.0 TL3



Powador
12.0 TL3 | 14.0 TL3
18.0 TL3 | 20.0 TL3

- 98.0 % efficiency
- Two MPP trackers, symmetrical and asymmetrical loading possible
- Multilingual menu
- Graphical display
- Integrated web server
- USB connection for updates

Technical data

Powador 12.0 TL3 | 14.0 TL3 | 18.0 TL3 | 20.0 TL3

Electrical data	12.0 TL3	14.0 TL3
Input variables		
Max. recommended PV generator power	12 000 W	14 000 W
MPP range	200 V ... 800 V [1]	200 V ... 800 V [1]
Starting voltage	250 V	250 V
No-load voltage	1 000 V	1 000 V
Max. input current	2 x 18.6 A	2 x 18.6 A
Number of MPP trackers	2	2
Max. power/tracker	10.2 kW	12.8 kW
Number of strings	2 x 2	2 x 2
Output variables		
Rated output	10 000 VA	12 500 VA
Supply voltage	acc. to local requirements	acc. to local requirements
Rated current	3 x 14.5 A	3 x 18.1 A
Rated frequency	50 Hz / 60 Hz	50 Hz / 60 Hz
cos phi	0.80 inductive ... 0.80 capacitive	0.80 inductive ... 0.80 capacitive
Number of grid phases	3	3
General electrical data		
Max. efficiency	98.0 %	98.0 %
Europ. efficiency	97.5 %	97.6 %
Night consumption	1.5 W	1.5 W
Switching plan	transformerless	transformerless
Grid monitoring	acc. to local requirements	acc. to local requirements
Mechanical data		
Display	graphical display + LEDs	graphical display + LEDs
Control units	4-way navigation + 2 buttons	4-way navigation + 2 buttons
Interfaces	Ethernet, USB, RS485, S0 output	Ethernet, USB, RS485, S0 output
Fault signalling relay	potential-free NOC max. 230 V / 1 A	potential-free NOC max. 230 V / 1 A
Connections	DC: solar connector, AC: cable connection M40 and terminal (max. cross-section: 16 mm^2 flexible, 10 mm^2 rigid)	DC: solar connector, AC: cable connection M40 and terminal (max. cross-section: 16 mm^2 flexible, 10 mm^2 rigid)
Ambient temperature	-25 °C … +60 °C [4]	-25 °C … +60 °C [4]
Cooling	temperature-dependent fan	temperature-dependent fan
Protection class	IP65	IP65
Noise emission	< 52 dB (A) (noiseless when operated without fan)	< 52 dB (A) (noiseless when operated without fan)
DC switch	integrated	integrated
Casing	aluminium casting	aluminium casting
H x W x D	690 x 420 x 200 mm	690 x 420 x 200 mm
Weight	40 kg	40 kg

[1] The possible input power is reduced at voltages lower than 350 V. The input current is limited to 18.6 A per input.
[2] The possible input power is reduced at voltages lower than 420 V. The input current is limited to 18.6 A per input.
[3] The possible input power is reduced at voltages lower than 460 V. The input current is limited to 18.6 A per input.
[4] Power derating at high ambient temperatures.

Conforms to the country-specific standards and regulations according to the country version that has been set.

Electrical data	18.0 TL3	20.0 TL3 NEW
Input variables		
Max. recommended PV generator power	18000 W	20000 W
MPP range	200 V ... 800 V [2)]	200 V ... 800 V [3)]
Starting voltage	250 V	250 V
No-load voltage	1000 V	1000 V
Max. input current	2 x 18.6 A	2 x 18.6 A
Number of MPP trackers	2	2
Max. power/tracker	15.3 kW	15.3 kW
Number of strings	2 x 2	2 x 2
Output variables		
Rated output	15000 VA	17000 VA
Supply voltage	acc. to local requirements	acc. to local requirements
Rated current	3 x 21.8 A	3 x 24.6 A
Rated frequency	50 Hz / 60 Hz	50 Hz / 60 Hz
cos phi	0.80 inductive ... 0.80 capacitive	0.80 inductive ... 0.80 capacitive
Number of grid phases	3	3
General electrical data		
Max. efficiency	98.0 %	98.0 %
Europ. efficiency	97.7 %	97.7 %
Night consumption	1.5 W	1.5 W
Switching plan	transformerless	transformerless
Grid monitoring	acc. to local requirements	acc. to local requirements
Mechanical data		
Display	graphical display + LEDs	graphical display + LEDs
Control units	4-way navigation + 2 buttons	4-way navigation + 2 buttons
Interfaces	Ethernet, USB, RS485, S0 output	Ethernet, USB, RS485, S0 output
Fault signalling relay	potential-free NOC max. 230 V / 1 A	potential-free NOC max. 230 V / 1 A
Connections	DC: solar connector, AC: cable connection M40 and terminal (max. cross-section: 16 mm^2 flexible, 10 mm^2 rigid)	DC: solar connector, AC: cable connection M40 and terminal (max. cross-section: 16 mm^2 flexible, 10 mm^2 rigid)
Ambient temperature	-25 °C … +60 °C [4)]	-25 °C … +40 °C [4)]
Cooling	temperature-dependent fan	temperature-dependent fan
Protection class	IP65	IP65
Noise emission	< 52 dB (A) (noiseless when operated without fan)	< 52 dB (A) (noiseless when operated without fan)
DC switch	integrated	integrated
Casing	aluminium casting	aluminium casting
H x W x D	690 x 420 x 200 mm	690 x 420 x 200 mm
Weight	40 kg	40 kg

[1)] The possible input power is reduced at voltages lower than 350 V. The input current is limited to 18.6 A per input.
[2)] The possible input power is reduced at voltages lower than 420 V. The input current is limited to 18.6 A per input.
[3)] The possible input power is reduced at voltages lower than 460 V. The input current is limited to 18.6 A per input.
[4)] Power derating at high ambient temperatures.

Conforms to the country-specific standards and regulations according to the country version that has been set.

KACO new energy.

Data sheet

Powador
30.0 TL3 | 33.0 TL3
36.0 TL3 | 39.0 TL3
40.0 TL3 | 60.0 TL3

Efficient. Flexible. Future-oriented.

Transformerless three-phase inverters Powador 30.0 TL3 to 60.0 TL3.

The transformerless three-phase inverters Powador 30.0 TL3 to 60.0 TL3 are designed specifically for decentralised installation of photovoltaic systems for commercial and industrial applications, such as hangars and factory roofs.

These units give you extreme flexibility in designing your PV system. They operate using three separate MPP trackers that can handle both symmetrical and asymmetrical loads to allow for optimum adjustment. Each tracker is able to process 20 kW. This enables them to meet all the typical demands of more complex designs involved with inhomogenous installation of the photovoltaic generator. Three MPP trackers can also compensate for mismatches between modules, such as those resulting from temperature differences and uneven solar radiation. Depending on the design of the units, one string (variant M) or four strings (variant XL) can be connected per MPP tracker.

Each of the three MPP trackers of the Powador 60.0 TL3 XL can even be connected to five strings.

The input voltage range is particularly broad: the inverters switch to the grid from 250 V, and, when in operation, they still feed in at 200V to ensure the solar yield from comparatively small areas. The peak efficiency is 98%. The European efficiency of 97.8% is also worth noting and is due to the fact that the unit has a very high partial load efficiency in the lower power ranges. At just 5% rated power they operate at 95% efficiency.

It is easy to achieve perfect communication with these units. They are fitted with an integrated data logger with web server, a graphical display for showing operating data and a USB port for installing firmware updates. The current software can be downloaded free of charge from the download area of www.kaconewenergy.com/en/service. The yield data can be called from the web server or via USB for evaluation. The integrated data logger can also be connected directly to the Powador web internet portal for professional evaluation and visualisation of the inverter data.

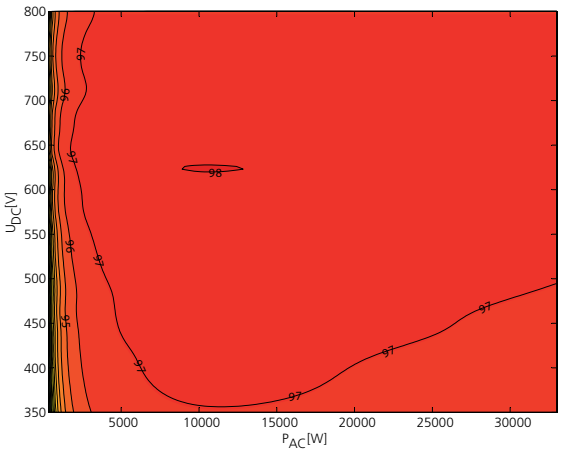
A number of country-specific default settings are programmed into the inverters. These are easy to select during on-site installation. The interface language can be selected separately. The inverters support the functions of the Powador-protect for grid and plant protection.

The integrated string collector with string fuses and overvoltage protection for the XL variant of the units opens up significant cost advantages. The M variants use the external Powador Mini-Argus string collector instead.

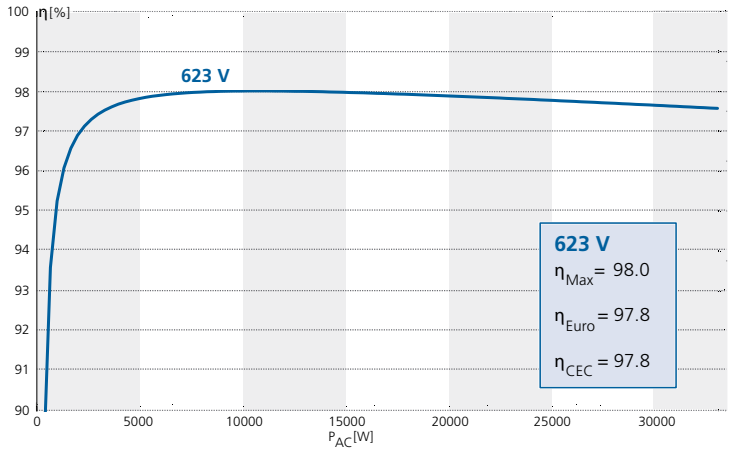
Powador
30.0 TL3 | 33.0 TL3
36.0 TL3 | 39.0 TL3
40.0 TL3 | 60.0 TL3

Graphical Display of efficiency

3D efficiency diagram for Powador 39.0 TL3



Efficiency characteristic curve for Powador 39.0 TL3



- 98.0 % efficiency
- 3 MPP trackers, symmetrical and asymmetrical loading possible
- Multilingual menu
- Cost-saving XL version with integrated combiner box
- Graphical display
- Integrated web server
- USB connection for updates

Technical data

Powador 30.0 TL3 | 33.0 TL3 | 36.0 TL3 | 39.0 TL3 | 40.0 TL3 | 60.0 TL3

Electrical data	30.0 TL3	33.0 TL3	36.0 TL3
Input variables			
Max. recommended PV generator power	30 000 W	33 000 W	36 000 W
MPP range	200 V ... 800 V*	200 V ... 800 V*	200 V ... 800 V*
Starting voltage	250 V	250 V	250 V
No-load voltage	1 000 V	1 000 V	1 000 V
Max. input current	3 x 34.0 A	3 x 34.0 A	3 x 34.0 A
Number of MPP trackers	3	3	3
Max. power/tracker	20 kW	20 kW	20 kW
Number of strings	3 x 1 based on design M 3 x 4 based on design XL	3 x 1 based on design M 3 x 4 based on design XL	3 x 1 based on design M 3 x 4 based on design XL
Output variables			
Rated output	25 000 VA	27 500 VA	30 000 VA
Line voltage	acc. to local requirements	acc. to local requirements	acc. to local requirements
Rated current	3 x 36.2 A	3 x 39.9 A	3 x 43.5 A
Rated frequency	50 Hz / 60 Hz	50 Hz / 60 Hz	50 Hz / 60 Hz
cos phi	0.80 inductive ... 0.80 capacitive	0.80 inductive ... 0.80 capacitive	0.80 inductive ... 0.80 capacitive
Number of grid phases	3	3	3
General electrical data			
Max. efficiency	98.0 %	98.0 %	98.0 %
European efficiency	97.8 %	97.8 %	97.8 %
Night consumption	1.5 W	1.5 W	1.5 W
Switching plan	self-inverted, transformerless	self-inverted, transformerless	self-inverted, transformerless
Grid monitoring	acc. to local requirements	acc. to local requirements	acc. to local requirements
Mechanical data			
Display	graphical display + LEDs	graphical display + LEDs	graphical display + LEDs
Control units	4-way navigation + 2 buttons	4-way navigation + 2 buttons	4-way navigation + 2 buttons
Interfaces	Ethernet, USB, RS485, S0 output	Ethernet, USB, RS485, S0 output	Ethernet, USB, RS485, S0 output
Fault signalling relay	potential-free NOC max. 230 V / 1 A	potential-free NOC max. 230 V / 1 A	potential-free NOC max. 230 V / 1 A
Connections	AC connection via screw terminals, bushing 1 x M50, max cross section: 50 mm² (flexible); DC connection of M version: spring-type terminals 6-35 mm² ***; DC connection of XL version: screw and spring-type terminals 10 mm², bushing 6 x M32	AC connection via screw terminals, bushing 1 x M50, max cross section: 50 mm² (flexible); DC connection of M version: spring-type terminals 6-35 mm² ***; DC connection of XL version: screw and spring-type terminals 10 mm², bushing 6 x M32	AC connection via screw terminals, bushing 1 x M50, max cross section: 50 mm² (flexible); DC connection of M version: spring-type terminals 6-35 mm² ***; DC connection of XL version: screw and spring-type terminals 10 mm², bushing 6 x M32
Ambient temperature	-20 °C ... +60 °C****	-20 °C ... +60 °C****	-20 °C ... +60 °C****
Temperature monitoring	> 75 °C temperature-dependent power limitation, > 85 °C cut-out	> 75 °C temperature-dependent power limitation, > 85 °C cut-out	> 75 °C temperature-dependent power limitation, > 85 °C cut-out
Cooling	forced cooling/RPM-regulated fan. max. 600 m³ / h	forced cooling/RPM-regulated fan. max. 600 m³ / h	forced cooling / RPM-regulated fan. max. 600 m³ / h
Protection class	IP54	IP54	IP54
Noise emission	58 dB (A) (only fan noise)	58 dB (A) (only fan noise)	58 dB (A) (only fan noise)
DC switch	integrated	integrated	integrated
Casing	sheet steel	sheet steel	sheet steel
H x W x D	1 360 x 840 x 355 mm	1 360 x 840 x 355 mm	1 360 x 840 x 355 mm
Weight	151 kg	151 kg	151 kg

* The possible input power is reduced at voltages lower than 350 V. The input current is limited to 34.0 A per input. ** The possible input power is reduced at voltages lower than 480 V. The input current is limited to 36.0 A per input. *** Only in conjunction with external Powador Mini-Argus **** Possible power derating at temperatures above 40 °C.

Conforms to the country-specific standards and regulations according to the country version that has been set.

39.0 TL3	40.0 TL3	60.0 TL3
39 000 W	40 000 W	60 000 W
200 V ... 800 V*	200 V ... 800 V*	200 V ... 850 V**
250 V	250 V	250 V
1 000 V	1 000 V	1 000 V
3 x 34.0 A	3 x 34.0 A	3 x 36.0 A
3	3	3
20 kW	20 kW	20 kW
3 x 1 based on design M 3 x 4 based on design XL	3 x 1 based on design M 3 x 4 based on design XL	3 x 1 based on design M 3 x 5 based on design XL
33 300 VA	36 000 VA	49 900 VA
acc. to local requirements	acc. to local requirements	acc. to local requirements
3 x 48.3 A	3 x 52.2 A	3 x 72.2 A
50 Hz / 60 Hz	50 Hz	50 Hz / 60 Hz
0.80 inductive ... 0.80 capacitive	0.80 inductive ... 0.80 capacitive	0.80 inductive ... 0.80 capacitive
3	3	3
98.0 %	97.5 %	97.8 %
97.8 %	97.2 %	97.6 %
1.5 W	1.5 W	1.5 W
self-inverted, transformerless	self-inverted, transformerless	self-inverted, transformerless
acc. to local requirements	acc. to local requirements	acc. to local requirements
graphical display + LEDs	graphical display + LEDs	graphical display + LEDs
4-way navigation + 2 buttons	4-way navigation + 2 buttons	4-way navigation + 2 buttons
Ethernet, USB, RS485, S0 output	Ethernet, USB, RS485, S0 output	Ethernet, USB, RS485, S0 output
potential-free NOC max. 230 V / 1 A	potential-free NOC max. 230 V / 1 A	potential-free NOC max. 230 V / 1 A
AC connection via screw terminals, bushing 1 x M50, max cross section: 50 mm^2 (flexible); DC connection of M version: spring-type terminals 6-35 mm^2 ***; DC connection of XL version: screw and spring-type terminals 10 mm^2, bushing 6 x M32	AC connection via screw terminals, bushing 1 x M50, max cross section: 50 mm^2 (flexible); DC connection of M version: spring-type terminals 6-35 mm^2 ***; DC connection of XL version: screw and spring-type terminals 10 mm^2, bushing 6 x M32	AC connection via screw terminals, bushing 1 x M50, max cross section: 50 mm^2 (flexible); DC connection of M version: spring-type terminals 6-35 mm^2 ***; DC connection of XL version: screw and spring-type terminals 10 mm^2, bushing 6 x M40
-20 °C ... +60 °C****	-20 °C ... +60 °C*****	-20 °C ... +60 °C****
> 75 °C temperature-dependent power limitation, > 85 °C cut-out	> 75 °C temperature-dependent power limitation, > 85 °C cut-out	> 75 °C temperature-dependent power limitation, > 85 °C cut-out
forced cooling / RPM-regulated fan. max. 600 m^3 / h	forced cooling / RPM-regulated fan. max. 600 m^3 / h	forced cooling / RPM-regulated fan. max. 600 m^3 / h
IP54	IP54	IP54
58 dB (A) (only fan noise)	58 dB (A) (only fan noise)	58 dB (A) (only fan noise)
integrated	integrated	integrated
sheet steel	sheet steel	sheet steel
1 360 x 840 x 355 mm	1 360 x 840 x 355 mm	1 360 x 840 x 355 mm
151 kg	151 kg	173 kg

* The possible input power is reduced at voltages lower than 350 V. The input current is limited to 34.0 A per input. ** The possible input power is reduced at voltages lower than 480 V. The input current is limited to 36.0 A per input. *** Only in conjunction with external Powador Mini-Argus **** Possible power derating at temperatures above 40 °C.

Conforms to the country-specific standards and regulations according to the country version that has been set.

KACO new energy.

Powador
48.0 TL3 Park NEW
72.0 TL3 Park NEW

- 98.0 % efficiency
- 3 MPP trackers, symmetrical and asymmetrical loading possible
- Multilingual menu
- Cost-saving XL version with integrated combiner box
- Integrated web server
- USB connection for updates
- Conforms to the German Medium Voltage Directive

The Park has the power.

The transformerless three-phase inverters Powador 48.0 TL3 Park and 72.0 TL3 Park.

The Powador 48.0 TL3 Park and 72.0 TL3 Park are transformerless three-phase inverters that with their output voltage of 480 V are particularly suitable for connection to external transformers of large decentralised systems.

These units give you extreme flexibility in designing your PV system. They operate using three separate MPP trackers that can handle both symmetrical and asymmetrical loads to allow for optimum adjustment. Every tracker of the Powador 48.0 TL3 Park can process 20 kW; the Powador 72.0 TL3 Park can process 30 kW per unit. This enables them to meet all the typical demands of more complex designs involved with inhomogenous installation of the photovoltaic generator. Three MPP trackers are also advantageous to compensate for mismatches between modules, such as those resulting from temperature differences and uneven solar radiation. Depending on the design of the units, one string (variant M) or four strings (variant XL) can be connected per MPP tracker. Each of the three MPP trackers of the Powador 72.0 TL3 Park XL can even be connected to five strings.

The rated input voltage range is from 410 to 800 V (Powador 48.0 TL3 Park) or 580 to 850 V (Powador 72.0 TL3 Park). The inverters switch to the grid from 250 V, and, when in operation, they still feed in at 200 V. The peak efficiency is 98 %. The European efficiency of 97.8 % is also worth noting and is due to the fact that the unit has a very high partial load efficiency in the lower power ranges. Even at just 5 % rated power they operate at 95 % efficiency.

It is easy to achieve perfect communication with these units. They are fitted with an integrated data logger with web server, a graphical display for showing operating data and a USB port for installing firmware updates. The current software can be downloaded from the download area of www.kaco-newenergy.de/service.

The yield data can be called via USB or the web server. The integrated data logger can also be connected directly to the Powador web internet portal for professional evaluation and visualisation of the operating data.

A number of country-specific default settings are programmed into the inverters. These are easy to select during on-site installation. The interface language can be selected separately. In addition, the inverters conform to the German Medium Voltage Directive.

The integrated string collector with string fuses and overvoltage protection for the XL variant of the units opens up significant cost advantages. The M variants use the external Powador Mini-Argus string collector instead.

The Powador 48.0 TL3 Park is available from July 2012, the Powador 72.0 TL3 Park in Q4/2012.

Technical data

Powador 48.0 TL3 Park | 72.0 TL3 Park

Electrical data	48.0 TL3 Park NEW	72.0 TL3 Park NEW
Input variables		
Max. recommended PV generator power	48 000 W	72 000 W
MPP range	200 V ... 800 V*	200 V ... 850 V**
Starting voltage	250 V	250 V
No-load voltage	1 000 V	1 000 V
Max. input current	3 x 34.0 A	3 x 36.0 A
Number of MPP trackers	3	3
Max. power/tracker	20 kW	30 kW
Number of strings	3 x 1 based on design M 3 x 4 based on design XL	3 x 1 based on design M 3 x 5 based on design XL
Output variables		
Rated output	40 000 VA	60 000 VA
Line voltage	acc. to local requirements	acc. to local requirements
Rated current	3 x 48.1 A	3 x 72.2 A
Rated frequency	50 Hz / 60 Hz	50 Hz / 60 Hz
cos phi	0.80 inductive ... 0.80 capacitive	0.80 inductive ... 0.80 capacitive
Number of grid phases	3	3
General electrical data		
Max. efficiency	98.0 %	98.0 %
European efficiency	97.8 %	97.8 %
Night consumption	≈ 1,5 W	≈ 1,5 W
Switching plan	self-inverted, transformerless	self-inverted, transformerless
Grid monitoring	acc. to local requirements	acc. to local requirements
Mechanical data		
Display	graphical display + LEDs	graphical display + LEDs
Control units	4-way navigation + 2 buttons	4-way navigation + 2 buttons
Interfaces	Ethernet, USB, RS485, S0 output	Ethernet, USB, RS485, S0 output
Fault signalling relay	potential-free NOC max. 230 V / 1 A	potential-free NOC max. 230 V / 1 A
Connections	AC connection via screw terminals, bushing 1 x M50, max cross section: 50 mm² (flexible); DC connection of M version: spring-type terminals 6-35 mm² ***; DC connection of XL version: screw and spring-type terminals 10 mm², bushing 6 x M32	
Ambient temperature	-20 °C … +60 °C****	-20 °C … +60 °C****
Temperature monitoring	> 75 °C temperature-dependent impedance matching, > 85 °C cut-out	> 75 °C temperature-dependent impedance matching, > 85 °C cut-out
Cooling	forced cooling / RPM-regulated fan. max. 600 m³ / h	forced cooling / RPM-regulated fan. max. 600 m³ / h
Protection class	IP54	IP54
Noise emission	58 dB (A) (only fan noise)	58 dB (A) (only fan noise)
DC switch	integrated	integrated
Casing	sheet steel	sheet steel
H x W x D	1 360 x 840 x 355 mm	1 360 x 840 x 355 mm
Weight	151 kg	165 kg

* The possible input power is reduced at voltages lower than 410 V. The input current is limited to 34.0 A per input. ** The possible input power is reduced at voltages lower than 580 V. The input current is limited to 36.0 A per input. *** Only in conjunction with external Powador Mini-Argus **** Power derating at high ambient temperatures Conforms to the country-specific standards and regulations according to the country version that has been set.

Selectronic Accredited Integrator Program

What is the SP PRO Accredited Integrator Program?

The SP PRO Accredited Integrator (SPAI) program is an initiative set up by Selectronic to train and support system integrators working in the field of energy storage. The aim of the program is to address a need within the industry to give system integrators a high level of competency in the design, installation and maintenance of systems that incorporate the Selectronic SP PRO inverter and energy storage technology.

Two separate accreditation categories are offered under the program, "Off Grid" and "Solar Hybrid". A system integrator may choose to be accredited under either of the categories or for both. A separate accreditation number will be issued for each category.

The program requires a commitment from both Selectronic and the SP PRO Accredited Integrator.

What will the program achieve?

Energy storage systems can be used in a vast number of applications and vary enormously in design and integration, but a common thread remains: "Electricity is considered an essential service". Being an SP PRO Accredited Integrator will enable you to achieve customer satisfaction, and enhance your profitability by supporting repeat business. Working together in a PRO-Active manner will help you to meet your obligations under the Australian Competition and Consumer Act.

Objectives

The objective of the program is to give the SP PRO Accredited Integrator the tools and support to:

- Achieve a high level of system efficiency thereby reducing the customer's energy cost.
- Achieve excellent reliability of energy storage systems.
- Minimise the costs of system maintenance.
- Continually drive down system costs through reduced support costs and design innovation.

Who can become an SP PRO Accredited Integrator?

Businesses that are active in the design and/or the installation of energy storage systems are eligible to become an SP PRO Accredited Integrator.

Why become an SP PRO Accredited Integrator?

An SP PRO Accredited Integrator will have a distinct commercial advantage in the market place. Selectronic will actively promote the program to the industry and recommend the use of accredited integrators. The result will be peace of mind to the customer and the opportunity for an SP PRO Accredited Integrator to greatly increase their business opportunities.

SP PRO Accredited Integrators will always receive priority product and integration support from Selectronic.

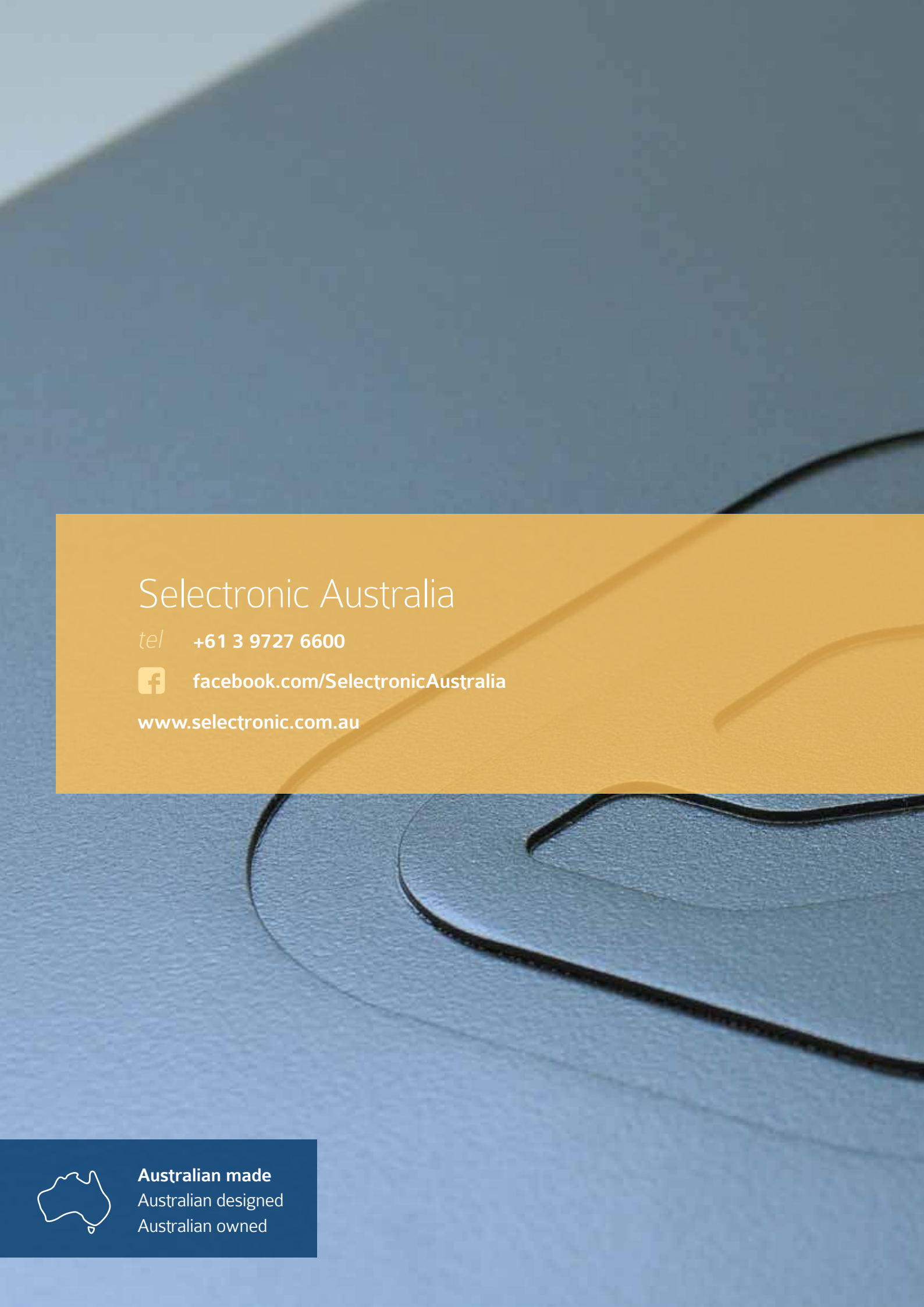
What will an SP PRO Accredited Integrator receive from Selectronic?

Additional warranty

All SP PRO inverters installed by an SP PRO Accredited Integrator will receive an additional warranty term as stated in the product documentation at the time of sale.
To receive this additional warranty, the warranty cards must state the SP PRO Accredited Integrator responsible for the integration as well as the installer of a system.
This completed warranty card must then be returned to Selectronic within 30 days of the installation after which the SP PRO Accredited Integrator and the end user will be rewarded with an additional warranty term as stated on the product documentation at the time of sale. The additional warranty provides a commercial advantage to the SP PRO Accredited Integrator

For Selectronic to ensure the greatest level of service to our customers, it is a requirement that any correspondence relating to an SP PRO inverter comes through the nominated SP PRO Accredited Integrator.

The Selectronic Accredited Integrator Program is only available in Australia. For international accreditation, please contact us directly.



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