UFLEX

RENEWABLE ENERGY

2023

ULTRAFLEX GROUP

88 years 1935-2023

1935 - 2023

Ultraflex Group has 88 years of experience in manufacturing and distributing the highest quality and most innovative products. The Ultraflex Group affiliate Companies that design and produce widely known equipments in the marine, industrial, architectural, Led technology and alternative energy fields.

ULTRAFLEX
Steering and control systems
for pleasure boats

UFLEX
Manufacturing of steering wheels and
distribution of technical marine accessories

UFLEX - Renewable Energy
Systems and accessories
for alternative energy applications

ULTRAFLEX CONTROL SYSTEMS
Window and skylight remote controls.
Building automation

INDUSTRIA di LEIVI
Mechanical remote controls
in the industrial field

UFLEX USA
Steering and control systems
for pleasure boats

CERTIFICATO
SISTEMA DI GESTIONE

Si certifica che il sistema di gestione di

UFLEX S.r.l. - Sede Legale e Operativa
Via Mille Ignoto, 8/A - 16012 Busalla (GE) - Italia
e i siti come elencati nell'Appendix che accompagna questo certificato

è conforme allo Standard:
ISO 9001:2015

Questa certificazione è valida per il seguente campo applicativo:
Progettazione, realizzazione e commercializzazione di sistemi ed accessori per la nautica e per l'utilizzo di energie rinnovabili; verniciatura di componenti in materiale composito, plastica alluminio e altri
(IAF 18, 19, 17)

MANAGEMENT SYSTEM
CERTIFICATE

This is to certify that the management system of

UFLEX S.r.l. - Sede Legale e Operativa
Via Mille Ignoto, 8/A - 16012 Busalla (GE) - Italy
and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Quality Management System standard:
ISO 9001:2015

This certificate is valid for the following scope:
Design, production and trade of accessories and systems for marine and renewable energy application. Composite material, alloy plastic and others components painting
(IAF 18, 19, 17)

ULTRAFLEX - Factory in Casella

UFLEX & ULTRAFLEX - Headquarter in Busalla

UFLEX - Factory in Tregnago

UCS - UFLEX - Factory in Borgo Fornari

IL - Factory in Leivi

UFLEX USA - Factory in Sarasota

Management System

The Ultraflex and Uflex Management Systems are certified in conformity with the UNI EN ISO 9001:2015 and
UNI EN ISO 14001:2015 rules and involve all the company resources and processes starting from the design, in order to:

- Define and comply with the customer requirements
- Set up the actions to maintain and improve the quality standards constantly
- Pursue a continuous process improvement to meet the market needs, through research, innovation and developing prducts and processes.
- Maintain and verify conformity with ABYC requirements.
- Pursuing environmental protection, including pollution and continuous improvement aimed at environmental performance
- Constantly test the products to verify their conformity with the 2013/53 EU and ABYC (American Boat and Yacht Council) requirements.

MORNINGSTAR® - GENNSTAR MPPT page 21

STUDER® - NEXT 3 page 39

UFLEX® - ICPV-TWIN INVERTER OFF-GRID pages 37 to 38

NEW

VICTRON ENERGY® - MULTI RS SOLAR 48/6000 - INVERTER RS SMART SOLAR 48/6000 page 60

VICTRON ENERGY® - QUATTRO-II page 65

UFLEX® - INVERTER SR SUPERCAPACITOR READY page 76

VICTRON ENERGY® -
EV CHARGING STATION page 81

INGETEAM® -
EV CHARGING STATIONS page 82

UFLEX & KILOWATTLABS® - SUPERCAPACITORS pages 101 to 104

IMEON ENERGY® -
LITHIUM BATTERIES page 111

PYLONTECH® -
BATTERIES page 112

NEW

1 SELF-CONSUMPTION & ENERGY STORAGE SYSTEM

SECTION 1 **PAGES 6 to 9**

2 PV MODULES

SECTION 2 **PAGES 10 to 20**

3 ELECTRICAL EQUIPMENTS

SECTION 3 **PAGES 21 to 82**

4 ELECTRICAL COMPONENTS

SECTION 4 **PAGES 83 to 100**

5 SUPERCAPACITORS AND BATTERIES

SECTION 5 **PAGES 101 to 114**

6 WIND GENERATORS

SECTION 6 **PAGES 115 to 120**

7 HYBRID GENERATORS

SECTION 7 **PAGES 121 to 123**

8 PV SYSTEMS FOR WATER PUMPING

SECTION 8 **PAGES 124 to 131**

9 ELECTRICAL LINEAR ACTUATORS AND CONTROL PANELS

SECTION 9 **PAGES 132 to 136**

10 SALES CONDITIONS AND REFERENCES

SECTION 10 **PAGES 137 to 141**

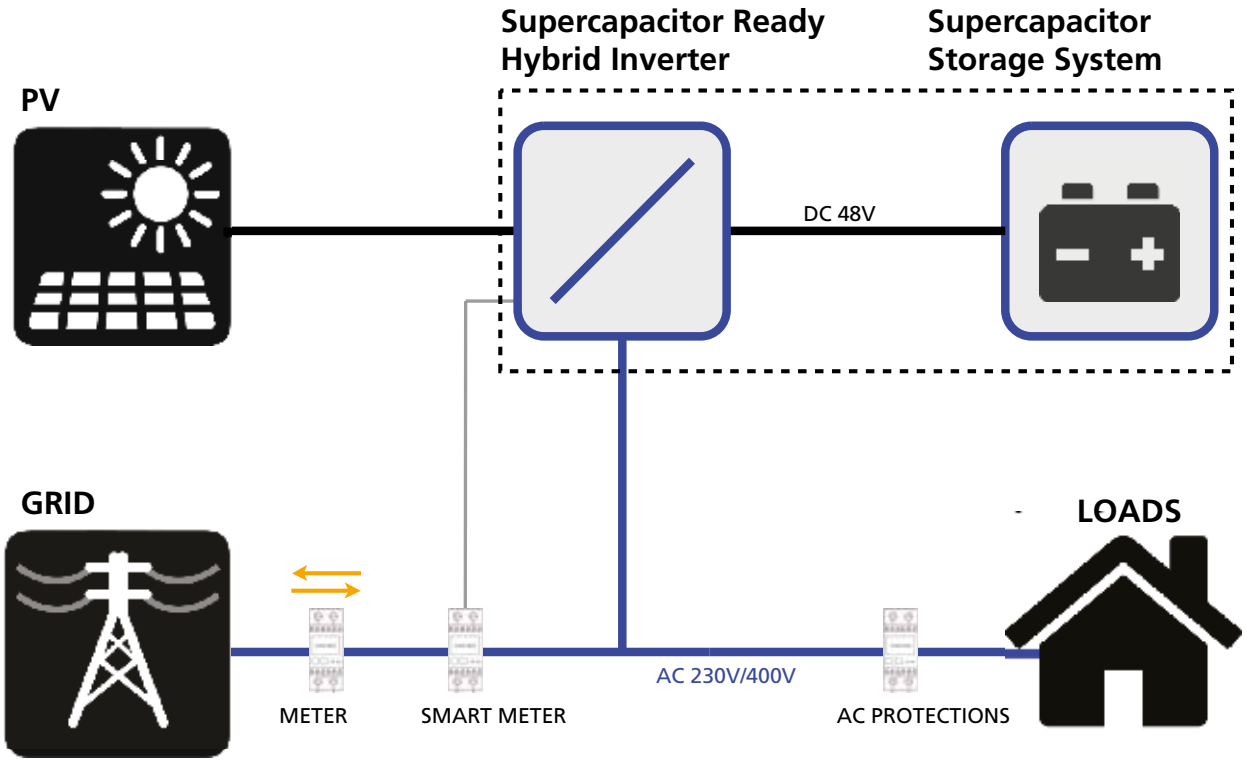
CE

UFLEX® SOLUTIONS - SELF-CONSUMPTION AND ENERGY STORAGE SYSTEMS FOR GRID CONNECTIONS

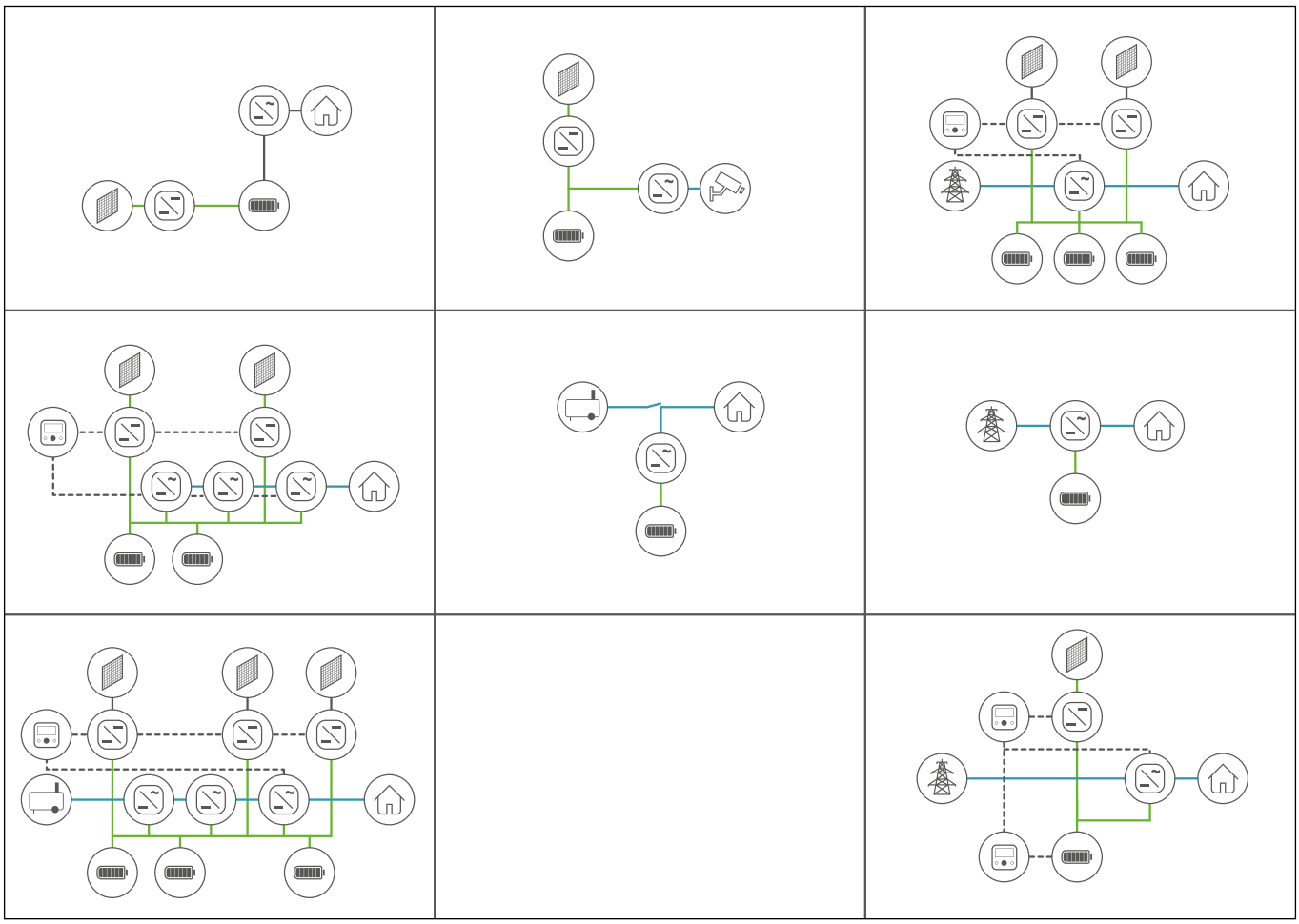
UFLEX SUPERCAPACITOR READY STORAGE SYSTEMS: A CHOICE OF CONFIGURABILITY AND HIGH PERFORMANCE

- **Configurable PV System**: wide range of PV system configuration possibilities
- **Supercapacitor Ready**: high performance storage based on modular supercapacitor elements
- **Privileged Loads Management**: power supply of loads even in case of grid failure
- **Remote Monitoring**: connectivity for the use of the control and monitoring portal free of charge.
- Maintains constant control of the variations in the flows of Energy produced and consumed.
- It acts in real time on the energy exchange between the storage system and the connection point, withdrawing or introducing energy in the most appropriate way in order to guarantee the lowest possible energy exchange with the grid both in withdrawal and in introduction.
- In its standard configuration it supplies the loads exploiting as much as possible the surplus energy produced by the PV system and stored by the system during the day.

STORAGE GRID CONNECTED SOLUTIONS



HYBRID STAND-ALONE SOLUTIONS



OFF-GRID PV SOLUTIONS WITH STORAGE

Suggested to realize of PV systems in contexts where there isn't the AC network or is not stable.

OFF-GRID SINGLE-PHASE AND STANDARD / WITH AC BACK-UP

	FROM	TO
PV Plant [kWp]	1	100
Inverter Power [kVA]	1	90
Lead Storage [useful kWh]	1	70
Supercapacitor [useful kWh]	1	>150

OFF-GRID THREE-PHASE AND STANDARD / WITH AC BACK-UP

	FROM	TO
PV Plant [kWp]	3	150
Inverter Power [kVA]	9	180
Lead Storage [useful kWh]	1	70
Supercapacitor [useful kWh]	7	>150

OFF-GRID PV SOLUTIONS WITH DC OUTPUT 12-24-48 V

POWER SUPPLY OF IMPORTANT DC LOADS

	FROM	TO
PV Plant [kWp]	500	3000
Power Supply [kWh/gg]	0,6	7
LiFePo Storage [useful kWh]	0,5	7,5
Lead Storage [useful kWh]	0,5	7,5
Supercapacitor [useful kWh]	1	14

PV APPLICATION ON VEHICLES

Suggested to realize small PV systems on vehicles like campers, boats, ambulances, etc., in order to charge the service and start-up batteries in the absence of the grid, even if the vehicle is stationary.

	FROM	TO
PV Plant [kWp]	100	800
Power Supply [kWh/gg]	0,2	2
LiFePo Storage [useful kWh]	0,5	2,5
Lead Storage [useful kWh]	0,5	2,5
Supercapacitor [useful kWh]	0,5	3,5

PV SOLUTIONS INSTALLED ON POLE FOR SPECIAL APPLICATIONS

These solutions allow to realize mini PV systems mounted on poles to provide the power and the management of small loads in remote areas or where you cannot or you don't want to connect the application to the grid.

	FROM	TO
PV Plant [kWp]	10	320
Power Supply [WH/gg]**	20	800
LiFePo Storage [useful kWh]	0,05	2
Supercapacitor [useful kWh]	0,5	2
Lead Battery Pack [useful kWh]	0,05	1,5

*** values subject to the installation area*

PV LIGHTING FOR ROADS, PARKS, GARDENS, ETC.

The use of LED lighting and light flow regulation techniques allow continuous operation throughout the year. Remote monitoring and management of the solution can also be included.

VIDEO SURVEILLANCE SYSTEMS

The use of outdoor cameras with routers and /or low-power access points of the latest generation allows you to create video surveillance services very efficient and performing even in places where there is no electricity.

MANAGEMENT AND MONITORING OF REMOTE SENSORS AND ACTUATORS

The field of application is very wide and needs met ranging from small sensors and /or low-power actuators to more complex management systems: environmental monitoring, irrigation distribution systems, water conduit, etc

MINI-GRID

Suggested to realize PV systems in contexts where there isn't an AC network a great energy production is required. They allow to share productions points distributed along the AC network.

	FROM	TO
PV Plant [kWp]	30	300
Inverter Power [kVA]	9	300
LiFePo Storage [useful kWh]	20	320
Lead Storage [useful kWh]	20	100
Supercapacitor [useful kWh]	7	21

UFLEX® - MONO AND POLY-CRYSTALLINE PV MODULES

Uflex® uses top quality materials to factory build reliable and long lasting poly-crystalline PV Modules.

Uflex® prime quality main components are: high efficiency cells, reflection-free and power transmitting glasses, anodized aluminium frames. Back positioned mounting holes for easy of installation.

The Quality Management System is certified in compliance with **ISO 9001:2008** standards.

Solar Modules manufactured by Uflex® are certified in accordance with **IEC61215** and **CE** standards
Standards: **EN 61730-1:2007+A1:2012+A2:2013+A11:2014; EN 61730-2:2007+A1:2012**

Product warranty: 12 years
Performance warranty: 30 years linear

MONO-CRYSTALLINE PV MODULES

Model	Part No.	Pmax(I) Watt	Vmp(II) Volt	Imp(III) Amp	Voc(IV) Volt	Isc(V) Amp	Dimensions mm (")	Weight kg (lbs)
UFX005MM	21387Y	5	18.31	0.28	22.43	0.30	245x190x17 (9.6x7.5x0.7)	0,7 (1.5)
UFX100MM	69578AB	100	18.30	5.47	22.42	5.76	1015x668x30 (40x26.3x1.2)	7,7 (17)
UFX140MM	21865J	140	19.00	7.37	23.28	7.76	1250x668x30 (49.2x26.3x1.2)	9,5 (20.9)
UFX180MM	22908FA	180	19.47	9.25	23.85	9.74	1485x668x30 (58.5x26.3x1.2)	11 (24.2)

POLY-CRYSTALLINE PV MODULES

Model	Part No.	Pmax(I) Watt	Vmp(II) Volt	Imp(III) Amp	Voc(IV) Volt	Isc(V) Amp	Dimensions mm (")	Weight kg (lbs)
UFX010PM	69572MA	10	18.37	0.55	22.50	0.58	245x350x17 (9.6x13.8x0.7)	1,2 (2.6)
UFX020PM	69573PA	20	18.87	1.09	22.55	1.23	440x350x25 (17.3x13.8x1)	2 (4.4)
UFX040PM	69574SA	40	18.33	2.19	22.45	2.31	425x668x25 (16.7x26.3x1)	3,1 (6.8)
UFX060PM	69576WA	60	19.25	3.12	23.58	3.29	545x668x25 (21.4x26.3x1)	4 (8.8)
UFX080PM	69577YA	80	18.30	4.38	22.42	4.61	780x668x30 (30.7x26.3x1.2)	6,1 (13.4)
UFX100PM	69578AA	100	18.20	5.50	22.30	5.79	1015x668x30 (40x26.3x1.2)	8 (17.6)
UFX160PM	21742SA	160	18.34	8.73	22.47	9.19	1485x668x30 (58.5x26.3x1.2)	11 (24.2)
UFX285PM	23532RA	285	32.03	8.90	39.24	9.37	1650x992x35 (65x39x1.4)	18,4 (40.6)

EURENER® - POLY-CRYSTALLINE AND MONO-CRYSTALLINE PV MODULES

- Electroluminescence tested (EL-Test)
- IP67 + 1 m cable
- High transmissivity and high resistance glass
- Frame with high mechanical resistance and inner tube
- Recyclable and environmentally friendly materials

- **Certified:** IEC 61215:2005; IEC 61730-1:2004 / IEC 61730-2:2004; Front load (snow) 5.400 Pa; Rear load (wind) 2.400 Pa; Fire Resistance Certified / Class 1 (UNI 9177); MCS (R.U); EEE016-20130528-001 (France); WEEE conformity in Germany; ETL Listed Mark (USA-Canada); PID Resistance (only poly-crystalline pv modules)

MEPV375HC

MEPV400UP

MEPV410HC

MEPV450HC

MODEL	MEPV375HC	MEPV400UP	MEPV410HC	MEPV450HC
Part No.	24951T	24950R	24852R	21840S
Nominal power, Pmpp	375W	400W	410W	450W
Tolerance, Pmpp	0/+5W	0/+5W	0/+5W	±1W
Module area	1,82 m^2	1,79 m^2	1,92 m^2	2,2 m^2
Module efficiency	20,60%	22,30%	21,33%	20,45%
Isc	9,23A	12,05A	12,40A	11,6A
Voc	39,18V	42,10V	41,60V	49,44V
Impp	8,76A	11,09A	11,85A	10,85A
Vmpp	32,22V	36,10V	34,60V	41,47V
Maximum voltage	1000 - 1500V	1500V	1500V	1000-1500V
α Isc	0,04% / °C	0,046% / °C	0,04% / °C	0,046% / °C
β Voc	-0,29% / °C	-0,246% / °C	-0,25% / °C	-0,276% / °C
γ Pmax	-0,37% / °C	-0,290% / °C	-0,34% / °C	-0,381% / °C
Temperature range	-40°C / +85°C	-40°C / +85°C	-40°C / +85°C	-40°C / +85°C
NOCT	42°C ± 2°C	43°C ± 2°C	43°C ± 2°C	42°C ± 2°C
Dimensions mm (") HxWxD	1755x1038x35 (69.1x40.8x1.4)	1727x1039x30 (68x40.9x1.2)	1754x1096x30 (69x43.1x1.2)	2108x1048x35 (83x41.3x1.4)
Weight kg (lbs)	19,2 (42.3)	20 (44.1)	21 (46.3)	25 (55.1)

XUNZEL™ - SEMI-FLEXIBLE SOLAR PANELS

The Xunzel™ solar panels are very thin (3 mm – 0,12”), light and bendable up to 30°. Thanks to the innovative All-Back-Contact Technology, these solar panels supply higher power than conventional PV modules of same size. By adopting the Back-Contact technique, the wafer can be coated with flexible materials and finally forms the high efficiency flexible solar panel.
These panels offer high performances also early in the morning, late in the evening and even on cloudy days. They effectively absorb different wavelengths of light to generate more electricity. Furthermore, the hotter it gets, the better is their performance compared to competitor efficiency.
Designed for boat and RVs applications, for off-grid solutions (telecom, ups-backup energy, street lighting, etc.)

FEATURES

- Easy to install. Reasy to connect. Stainless steel rings (dia. 10 mm)
- Secure and easy wiring. Includes 3 m pre-assembled solar cable
- Completely waterproof and weatherproof junction box (IP65)
- **Design**: high quality, reliability and performance. Crystalline silicon cell panels wuth patented All-Back-Contact Technology. Very thin, light and bendable up to 30°
- **Endurance**: High quality UV resistant materials ensure a long life
- **Electrical Connection**: Junction box mounted at the front side for protection against corrosion. The Xunzel™ solar panels are delivered with pre-assembled cables for a quick and safe installation

Model	Part No.	Pmax Watt	Vmp Volt	Imp Amp	Voc Volt	Isc Amp	Dimensions mm (”)	Weight kg (lbs)
HD 50W	23364W	50W	17.36	2.88	20.8	3.11	600x500x3 (23.6x19.7x0.12)	1 (2.2)
HD 110W	23365Y	110W	18.56	5.97	21.9	6.32	1155x560x3 (45.5x22.1x0.12)	2,5 (5.51)

WAAREE® - MARINE PV SOLAR MODULES

WAAREE® One with the Sun

WLW-50W FEATURES

- Ultra-Light weight
- Easy and quick to install. Simple peel and stick
- Improves electrical redundancy and continuity
- Reduce reflectivity and increased light trapping
- Providing excellent wind and seismic resistance
- Module size, shape and colour customizable
- Superior low light & low sun angle performance

WM-110-FX-24L

WM-110-FX-24L FEATURES

- Ultra-Light weight
- Higher open circuit voltage
- Easy and quick to install
- Built in crack tolerance
- Maintain module integrity and power maintenance
- Superior low light & low sun angle performance

WLW-50W

MODEL	WLW-50W	WM-110-FX-24L
Part No.	23005R	23051Y
Rated Power (P max) in Watt	50	110
Number of cell in series	36	24
Max peak voltage (Vmp) (Volt) 18.6	12.89	
Max peak current (Imp) (Amp)	2.70	8.54
Open circuit voltage (Voc) (Volt)	22.3	15.5
Short circuit current (Isc) (Amp)	2.90	8.81
Max system voltage (V DC)	600	100 V (IEC)/600 V (UL)
Max series fuse rating (Amp)	10	15
Power tolerance (%)	+3	+3
Operating temperature	-40°C to 85°C	-40°C to 85°C
Dimensions mm HxWxD (“)	610x690x20 (24x27.2x0.8)	2030x373x21 (80x14.7x0.82)
Weight kg (lbs)	1.5±0.5 (3.3±1.1)	3.5±0.5 (7.7±1.1)

SUNWARE® - MARINE PV SOLAR MODULES

Sunware solar modules, without glass, are functionally reliable, robust, light-weight, weather-proof and sea-water resistant: therefore they have been specially designed for marine applications on board.

The innovative manufacturing process, make them particularly suitable to be installed on the deck of the boat, avoiding vibrations and the negative effects of high temperature.
Self-cleaning and safe to step-on, SUNWARE modules are easy to bend and can therefore adhere to the deck (maximum bending 3%, i.e. bending of 3 cm per 1 m long module).

Each module is supplied complete with stainless steel back-plate, a sea-water proof and UV resistant cable (3 m long – red/blue 2x1.5 mmq).

SW-20xxx
cable outlet on the front,
no ventilation required

SW-40xxx
cable output on the back,
front side completely flat

Model	Part No.	Max. Power	No. of Cells	Nominal Voltage	Imax	Isc	Dimensions HxWxD mm (")	Weight kg (lbs)
SW-20143 **SW-40143**	22112L 600100A	15 Wp	40	12 V	0.71 A	0.76 A	468x243x6 (18.4x9.6x0.2)	0,8 (1.8)
SW-20144 **SW-40144**	22113N 600101C	22 Wp	40	12 V	1.03 A	1.11 A	643x273x6 (25.3x10.7x0.2)	1,2 (2.6)
SW-20145 **SW-40145**	22114R 600102E	30 Wp	40	12 V	1.4 A	1.51 A	807x273x6 (31.8x10.7x0.2)	1,6 (3.5)
SW-20146 **SW-40146**	22115T 600103G	42 Wp	40	12 V	1.996 A	2.12 A	1154x273x6 (45.4x10.7x0.2)	2,2 (4.8)
SW-20163 **SW-40163**	21010X 600104J	30 Wp	38	12 V	1.48 A	1.59 A	426x481x6 (16.7x18.9x0.2)	1,4 (3.1)
SW-20164 **SW-40164**	21735V 600105L	42 Wp	39	12 V	2.01 A	2.12 A	599x481x6 (23.6x18.9x0.2)	2 (4.4)
SW-20165 **SW-40165**	21296V 600106N	60 Wp	39	12 V	2.87 A	3.1 A	772x481x6 (30.4x18.9x0.2)	2,6 (5.7)
SW-20166 **SW-40166**	22116V 600107R	80 Wp	39	12 V	3.84 A	4.1 A	1119x481x6 (44x18.9x0.2)	3,6 (8)
SW-20185 **SW-40185**	21364K 600109V	110 Wp	35	12 V	5.87 A	6.34 A	1012x689x6 (39.8x27.1x0.2)	4,7 (10.4)

ACCESSORIES

MID CLIPS AND SIDE CLIPS
- Part No. 64098H (2 clips)
- Part No. 64099K (4 clips)

PLUGS, SOCKETS AND CONNECTORS
- **Male Socket:** Part No. - 64100R
- **Female Socket:** Part No. - 64101T
- **Plug:** Part No. - 64102V
- **Bulkhead kit:** Part No. - 64104Z
- **Bulkhead Connector:** Part No. - 64103X

RENUSOL® - PV MOUNTING SYSTEM FOR FLAT ROOFS

CONSOLE PLUS™ - PV MOUNTING SYSTEM

- Suitable for flat roofs with max 5° slope. No drilling and no damage on roof
- PV panels dimensions: 1550-24000 mm
- Inclination: 15°
- Suitable for areas with wind load up to 4 and snow load of up to 3 (DIN 1055 compliant)
- Also suitable for ground installations, landfills, rocky undergrounds and conversion sites
- Wind load tested and determined according to Eurocode 1 - influence on load-bearing structures EN1991-1-4:200
- 100% recycled polyethylene, chlorine-free (HDPE), sturdy, durable and weather resistant
- Complies with fire prevention measures according to DIN 4102 class B2
- Dimensions WxDxH mm (“): 1730x1100x390 (68.1x43.3x15.3)
- Weight kg (lbs): 7,9 (17.4)
- TÜV certified
- WARRANTY: 10 years

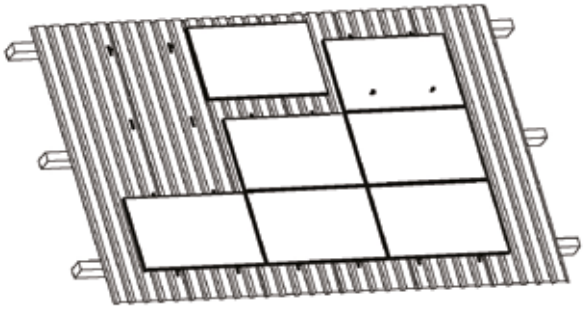
Part No. - 68717G

METASOLE™ PV MOUNTING SYSTEM MS+/MS+P

Mounting solution MetaSole™ enables fast and inexpensive installation of framed modules on roofing featuring corrugated metal sheets having a thickness between 0.40 mm and 1.00 mm.
Only four different components are required for the direct installation of the modules: a clamp base with optimised weight, two thin sheet metal screws with special coating, one end clamp, and one middle clamp.
The screw with a crowding tip makes pilot drilling unnecessary, which results in extremely short mounting time.

MS+ horizontal modules
MS+P vertical modules

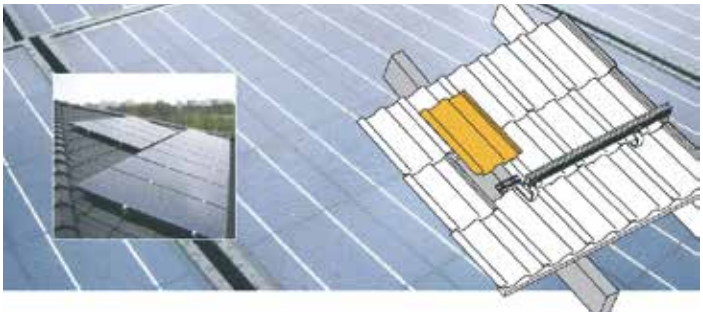
For specific system components, please contact Uflex.



SEMI-INTEGRATED PV MODULE SUPPORT FOR SLOPING ROOFS

VARIOSOLE™ MOUNTING SYSTEM

The VarioSole™ is suitable for all roofing types, framed PV modules featuring a thickness between 34 and 50 mm and, thanks to height-adjustable mounting elements, even for unlevelled roofs.
The installation of the few, partially already pre-assembled components is easy and fast. VarioSole is a rail system that is mounted on the rafters with special roof hooks. All that is usually necessary for the installation is to remove or slide up single tiles. Removing the entire roof covering is therefore not required.



POLE BRACKET FOR 10W AND 20W SOLAR PANELS
It includes bolts, screws and washers to fix the module on the structure.

21558Z - It can be installed on poles up to 40 mm diameter.
Dimensions HxWxD: 300x120x173 mm
Weight: 1 kg (2.2 lbs)

Pole bracket for 10W and 20W PV modules

Pole bracket for 100W and 180W PV modules

POLE BRACKET FOR SOLAR PANELS FROM 40W TO 180W
It includes one adjustable inclination bracket with fixing accessories. Galvanized steel structure.

21714L - Pole bracket for 40W up to 100W PV modules.
Adjustable up to 60 mm diameter.
Brackets width: 640 mm
Weight: 2,5 kg (5.5 lbs)

22194S - Pole bracket for 100W up to 180W PV modules.
Adjustable up to 90 mm diameter.
Brackets width: 640 mm
Weight: 5 kg (11 lbs)

POLE MOUNTS FOR PV MODULES FROM 100W OR HIGHER
Galvanized steel structure, **painted with polymerizing powder at 200°C, after phosphating**. Supplied with adjustable screw connection.

Structure able to support:
- 1x Uflex module from 100W or higher
- 2x Uflex modules from 80W to 180W

21184H - It can be installed on poles up to 89 mm diameter.
Spacing: 950 mm - Brackets width: 523 mm
Weight: 5 kg (11 lbs)

Pole mounts for PV modules up to 400W

POLE MOUNTS WITH BOX FOR PV SOLAR PANELS AND BATTERIES

They are designed to be functional, robust and easy to install.
Painted galvanized iron structure (20/10) for a longer durability.

- Adjustable, for poles with 102 mm of maximum diameter.
- Resistant to strong wind
- Closed battery case with ventilation slots and thermal insulation supports.
- **Note:** the support must be completed with the profile kit for the PV modules used to be mounted on the supplied 670 mm angle brackets
- Battery box internal dimensions: 380 mm

KIT BOX with pair brackets for 1 or 2 PV modules - 20658Y
Dimensions HxWxD: 600x522x410 mmm - Weight: 32 kg (70.5 lbs)

KIT BOX SMALL with pair brackets for 1 PV module - 22853G
Armature arms available:
60 mm external ø arm - 20662N
48 mm external ø arm - 22745D

KIT FOR PV MODULES

MOUNTING RAIL KIT FOR ONE SOLAR PANEL UP TO 180 W - 20743N
n° 2 mounting rails 750 mm
n° 4 end clamps
n° 4 brackets
n° 4 screws + 4 nuts/washers

MOUNTING RAIL KIT FOR ONE SOLAR PANEL OVER 180 W - 20744R
n° 2 mounting rails 1200 mm
n° 4 end clamps
n° 4 brackets
n° 4 screws + 4 nuts/washers

MOUNTING RAIL KIT FOR TWO SOLAR PANELS UP TO 180 W - 20745T
n° 2 mounting rails 1500 mm
n° 4 end clamps
n° 2 middle clamps
n° 4 brackets
n° 4 screws + 4 nuts/washers

mm 750 - 68162L
mm 1200 - 68426V
mm 1500 - 68163N
mm 3300 - 22043U

END CLAMP- 69682V

BRACKET - 66845F

MIDDLE CLAMP - 69681T

ACCESSORIES

Switchboard DC/DC 4 strings with fuses - 22814W
Switchboard DC/DC 2 strings with fuses - 23327P
Switchboard DC/DC 400-40-1 - 1 string - 400V IP68 - 23359D
Switchboard DC/DC 400-40-3 - 3 strings - 400V IP68 - 23701M
Switchboard DC/DC 400-40-6 - 6 strings - 400V IP68 - 21913T
Switchboard DC/DC 400-40-5 - 5 strings - 400V IP68 - 22032N

22814W

23327P

21913T

SOLAR CABLES AND CONNECTORS

Cavo 6 mm^2 con connettori MC4 preassemblati:

3 m cable - 68767Y
5 m cable - 69758C
10 m cable - 69759E
20 m cable - 69760N
6 mm diameter black cable - 21182D sold per meter
6 mm diameter red cable - 21183F sold per meter

MC4 male connector - 21739D
MC4 female connector - 21738B
MC3 male connector - 21741P
MC3 female connector - 21740M
2-way connector with protective seals - 23787B

FUSES AND FUSE HOLDERS

FT/FV30 - 23764N - 30 A fuse
FT/FV40 - 23765R - 40 A fuse
FT/FV50 - 23766T - 50 A fuse
FT/FV70 - 23767V - 70 A fuse
FT/FV80 - 21715N - 80 A fuse
FT/FV100 - 69106F - 100 A fuse
FT/FV200 - 69103Z - 200 A fuse
FT/FV300 - 20734M - 300 A fuse

PFH/FV10 - 21716R - Fuse holder for 80 A fuses
PFH/FV01 - 69104B - Fuse holder for 100A to 300 A fuses

24V MOUNTING KIT- 500 kWh STORAGE ENERGY

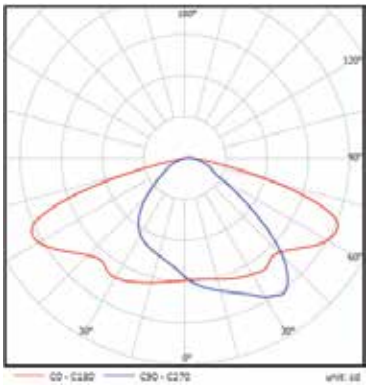
- **The kit includes - 21180Z:**
  1x mounting rail kit for 2 solar panels up to 150 W
  1x 10 m black solar cable
  1x 10 m red solar cable
  1x pole bracket for solar panel
  1x Morningstar SS-10L-24V charge controller
  2x Victron Energy 12V/38A AGM batteries
  2x 12V UFX80PM solar panels

24V MONITORING KIT - 750 KWH STORAGE ENERGY

- **The kit includes - 21181B:**
  1x mounting rail kit for 2 solar panels up to 150 W
  1x 10 m black solar cable
  1x 10 m red solar cable
  1x pole bracket for solar panel
  1x Morningstar SS-10L-24V charge controller
  2x Victron Energy 12V/60A AGM batteries
  2x 12V UFX120PM solar panels

SOLAR STREET LIGHT KIT - 68713YB

Solar streetlight for street lighting with LED lamp 30W - 4200 Lumen.
DC 12/24 Volt power supply.
Outdoor lamp (IP66) with aluminum shell.
Note: other versions are available on request



Charge controller with 10 adjustable lighting options.
The solution provides night lighting for up to 12 hours. Battery recharge time depends on installation location and installation site.
Autonomy is expandable by doubling the battery pack.

THE KIT IS COMPOSED OF:

PART No.	DESCRIPTION	QUANTITY
69583TA	UFLEX® 120W Polycrystalline module - UFX120PM cm 126x66,5x3,4	1
21674B	Victon SmartSolar MPPT 75/10 charge controller	1
66606L	12V/100Ah AGM battery	1
20658Y	UFLEX® support with box and pair brackets - Pole brackets for PV modules and batteries	1
20662N	UFLEX® arm	1
20743N	UFLEX® kit for a PV panel up to 180Wp It includes: 2 mounting rails, 4 clamps, 4 brackets, 4 screws and 4 nuts/washers	1
23183S	30W 12V 4200Lm led array	1

UFLEX® - SOLAR LED MARINE LANTERNS

Light and compact marine lanterns, equipped with ultra bright LEDs and built-in solar charging.

- **Marine applications:**
  Navigation buoys; Mooring buoys; Private docks and marinas; Input channels to ports and marinas; Lagoon vie and navigation channels; Offshore oil and gas infrastructure; Areas restricted to navigation; Booms; Buoys research institutions; Protected marine parks, perimeters in aquaculture farms, etc.

- **Land applications:**
  Bus stop signals; Emergency telephones; Camping services; Agricultural buildings etc.

M550 MODEL - Visibility up to 2-3 miles (depending on the installation area and flashing applied)

Waterproof, robust: it is not damaged by vibration or motion of the sea, is vandal-resistant and requires no maintenance. Available with 40 flashes + steady light 69945 B (optional).
It can be used also as night light signal.

Solar panel	high efficiency cells
Peak intensity (green LED)	23 cd
Available LED colours (IALA specifications)	red, green, blue, yellow, white
Polycarbonate lenses	UV-stabilized
NiMMH-AA battery	5 years expected
IP protection	IP68
Weight kg (lbs)	0.37 (0.8)

Certifications: CE EN 60945:1997, RoHS compliant.

M660 MODEL - Visibility 4 nautical miles (3,6 km) in most conditions

High performance, waterproof, resistant to sea waves, it requires no maintenance.
It can be setted when ordering: more than 256 flashes available + steady light.

Solar panel	high efficiency cells with MPPT
Peak intensity (green LED)	42 cd
Available LED colours (IALA specifications)	red, green, blue, amber, white
Polycarbonate lenses	UV-stabilized
Lithium battery	8 years expected
IP protection	IP68
Weight kg (lbs)	0,8 (1,7)

Certifications:

SCN.110.3 MODEL - Visibility more than 3 nautical miles (3,6 km) in areas of lower sunlight levels

High performance, waterproof, resistant to sea waves, it requires no maintenance.

Solar panel	1,5 W with MPPT technology
Peak intensity (green LED)	40 cd
Available LED colours (IALA specifications)	red, green, yellow, white
Lenti policarbonato	UV-stabilized
High quality Lithium-ion battery	10 years expected
IP protection	IP67
Weight kg (lbs)	4,2 (9.3)

Certifications:

MORNINGSTAR PROFESSIONAL SERIES

GENSTAR™ MPPT

- True Controller Technology Integration
- WiFi and Bluetooth Connectivity
- Powerful Load Control
- Fanless Design
- **ReadyBMS**: full communications and control with lithium batteries
- **ReadyRelay**: signaling (dry contact), advanced load control
- **ReadyShunt**: battery metering/monitoring, key metrics including SOC, energy in/out (Amp hours), current measurement for system sources and loads, and more

MODEL	GS-MPPT-60M-200V		GS-MPPT-80M-200V		GS-MPPT-100M-200V	
Part No.	25084A		25085C		25086E	
Maximum battery current	60 A		80 A		100 A	
Maximum input voltage	200 V		200 V		200 V	
Maximum input current	60 A		80 A		100 A	
Nominal operating voltage	12-24-48 VDC		12-24-48 VDC		12-24-48 VDC	
Battery voltage range	8 V - 72 V		8 V - 72 V		8 V - 72 V	
Load current	30 A		30 A		30 A	
Maximum self-consumption	< 3 Watts		< 3 Watts		< 3 Watts	
Grounding leg	Negative (Positive ground compatible with singular ground point)					
Real Time Clock (RTC)	Yes, w/ coin cell backup					
Target peak efficiency	99%		99%		99%	
Transient surge protection	4500 W/port (battery solar and load terminals)					
Nominal maximum output power	Max output	Max PV input*	Max output	Max PV input*	Max output	Max PV input*
12 Volt	800 W	1200 W	1064 W	1600 W	1330 W	2000 W
24 Volt	1600 W	2400 W	2128 W	3200 W	2660 W	4000 W
48 Volt	3200 W	4800 W	4256 W	6400 W	5320 W	8000 W
Max recommended solar PV input*	~150% of Nominal Max Output Power ("Max PV Input" Column Above)					
I/O communication interfaces	SD Card for logging, firmware updates, setpoints (unique with all 3 functions). USB-C for data, RS232/EIA-485 ports. Ethernet, WiFi, Bluetooth LE, MS-CAN					
Enclosure rating	IP20		IP20		IP20	
Storage temperature range	From -50 to 80°C		From -50 to 80°C		From -50 to 80°C	
Humidity	100% non-condensing		100% non-condensing		100% non-condensing	

* The PV array power rating may exceed the controller's Max Nominal Output Power specification. The controller will limit battery current and prevent damage. Array oversizing should be considered on a case by case basis.

MORNINGSTAR
PROFESSIONAL SERIES

TRISTAR™ MPPT 600V

The TriStar™ MPPT 600V charge controller accepts PV array or wind turbine input up to 600 Voc. It features an advanced digital signal processor and utilizes Morningstar's TrakStar MPPT™ Technology to harvest the maximum available energy from the solar array's or wind turbine's peak power point within the controller's operating range. This high speed processing technology and control methodology enable the TriStar™ MPPT 600V charge controller to sweep from the array's or wind turbine's Voc to the battery voltage faster than any competing MPPT controller on the market - in less than one tenth of a second!

The TriStar™ MPPT 600V charge controller's high voltage capability and flexible design also make several typical application scenarios possible:

- Off-grid PV systems greater than 150 Voc with long wire runs from the array to the controller
- New installation grid-tie PV systems with battery back-up
- Retrofitting string PV inverter systems to later add battery back-up without changing the PV array configuration
- Battery-based Wind systems

FEATURES

- Delivers the industry's best-in-class power efficiency
- Uses Morningstar's advanced 4-stage charging algorithm to optimize battery health
- Features extensive system networking, monitoring and communications
- Is optimized for harsh environments and equipped with extensive electronic protections
- Offers superior lightning protection
- Engineered with a robust thermal and mechanical design to deliver the highest reliability and excellent performance

MODEL	TS-MPPT-60-600V	TS-MPPT-60-600V-GDB
Part No.	68975F	68976H
Maximum battery current	60 A	60 A
Maximum input current	15 A	15 A
Nominal solar input	3200 Wp	3200 Wp
Maximum open circuit voltage	600 V	600 V
Nominal system voltage	48 VDC	48 VDC
Self-consumption	1.75 - 2.5 W	1.75 - 2.5 W
Charging algorithm	4 stage	4 stage
Dimensions cm (")	39.2 x 22.1 x 14.9 (15.4 x 8.7 x 5.9)	54.2 x 22.1 x 14.9 (21.4 x 8.7 x 5.9)
Weight kg (lbs)	9.0 (19.8)	12.8 (28.1)

MORNINGSTAR
PROFESSIONAL SERIES

TRISTAR MPPT™

Morningstar's TriStar MPPT solar controller with TrakStar Technology™ is an advanced maximum power point tracking (MPPT) battery charger for off-grid photovoltaic (PV) systems up to 3kW.

- **Maximizes the energy harvest** from the PV by rapidly finding the solar array peak power point
- **Peak efficiency** of 99%
- **Extensive Networking and Communications Capabilities:** Enables system monitoring, data logging and adjustability. Ethernet included
- Remote **Temperature Sensor** is included
- **Display:** to be ordered separately

- **Temperature range:** -40°C to +45°C
- **Max. Wire Size:** 35 mm² / 2 AWG
- **Dimensions:** 29,1x13,0x14,2 cm (11.5"x5.1"x5.6")
- **Weight:** 4,2 kg (9.3 lbs)

- **Certifications:**
  CE, ETL Listed (UL1741), cETL (CSA C22.2 No. 107.1-01), FCC Class B Part 15 Compliant, Complies with NEC U.S. National Electric Code
- **WARRANTY: 5 years**

TRISTAR MPPT™	TS-MPPT-30	TS-MPPT-45	TS-MPPT-60	TS-MPPT-60M
Part No.	69060H	67140V	67054C	23653D
Maximum charging current	30 A	45 A	60 A	60 A
PV modules maximum nominal power	400 Wp (12V) 800 Wp (24V) 1600 Wp (48V)	600 Wp (12V) 1200 Wp (24V) 2400 Wp (48V)	800 Wp (12V) 1600 Wp (24V) 3200 Wp (48V)	800 Wp (12V) 1600 Wp (24V) 3200 Wp (48V)
Maximum open circuit voltage	150 V	150 V	150 V	150 V
System voltage	12/24 or 48 VDC	12/24 or 48 VDC	12/24 or 48 VDC	12/24 or 48 VDC
Options				
TriStar Meter-2 indicator	yes	yes	yes	yes
TriStar Meter-2 remote indicator	yes	yes	yes	yes
MeterHub	yes	yes	yes	yes
EIA-485 adapter	yes	yes	yes	standard
Display and RTS	no	no	no	yes

MORNINGSTAR PROFESSIONAL SERIES

PROSTAR™ PS MPPT

The Prostar MPPT™ solar charge controller with TrakStar Technology™ is an advanced maximum power point tracking (MPPT) battery charger for off-grid photovoltaic (PV) systems up to 1100 watts. This controller allows two modules in series on a 12V battery system and two or three modules in series on a 24V battery system. Detailed battery programming options allow for advanced battery support for the latest Lithium, Nickel Cadmium, and Lead Acid battery types.

- **High reliability:** conformally coated circuit board and corrosion resistant terminals
- **Maximizes energy harvest:** using TRAKSTAR MPPT™ technology to determine and adjust to the true maximum power point as insolation changes throughout the day
- **Data logging:** detailed logging of power and load data confirms performance and helps isolate system inconsistencies
- **Automatic PV Based Lighting Control:** multi-event load control enables powerful options for PV lighting systems and settings can easily be adjusted in the field
- **Modbus communications:** Solar Industry Standard MODBUS communications protocol allows for easy programming, control, remote data access and charge synchronization with other system hardware
- **High strength:** Polycarbonate Case and extruded aluminum heatsink
- **Self diagnostic:** The ProStar MPPT continuously monitors and reports any internal hardware issues or system problems through its status LED's, optional display or communication port
- **Dimensions:** 20 x 17 x 7 cm (20 x 28 x 8.2 cm with optional box)
- **Weight:** 1,4 kg (1,8 kg with optional box)
- **Temperature range:** -40°C to +60°C

- **Certifications:** CE; RoHS; UL1741/CSA.107.1; UL 62109; IEC 62109; FCC Part- 15 class B compliant

- **Wire Box:** to reduce hazards associated with exposed wires and connections. It can be purchased separately

WIRE BOX

MODEL	PS-MPPT-25M	PS-MPPT-40M
Part No.	600110D	600111F
Max PV open circuit voltage	120 A	120 A
Max battery current	25 A	40 A
Load current rating	25 A	30 A
Nominal battery voltage	12 or 24 V	12 or 24 V
Nominal max operating power	350W (12V), 700W (24V)	550W (12V), 1100W (24V)
Self-consumption	0,6W (max 1W)	0,6W (max 1W)

MORNINGSTAR PROFESSIONAL SERIES

SUNSAVER MPPT™

Morningstar's SunSaver MPPT solar controller with TrakStar Technology™ is an advanced maximum power point tracking (MPPT) battery charger for off-grid photovoltaic (PV) systems up to 400Wp.

- **Maximizes the energy harvest** from the PV by rapidly finding the solar array peak power point
- **Use of high Voltage Modules:** Enables the use of high voltage and thin film modules for off-grid battery charging
- **Converts 24V to 12V:** allows you to use a solar power system 24V to charge a 12V battery, reducing power losses due to a long connection cable between the solar system and the battery
- **Automatic Lighting Control:** Up to four programmable timer sequences for PV lighting applications
- **Temperature range:** -40°C to +60°C
- **Max. Wire Size:** 16 mm² / 6 AWG
- **Dimensions:** 16,8 x 5,5x 7,0 cm (6.6" x 2.2" x 2.8")
- **Weight:** 0,6 kg (1.2 lbs)

- **Certifications:** CE, UL1741, CSA C22.2 No. 107.1-01 recognized component
- **WARRANTY: 5 years**

SUNSAVER MPPT™	SS-MPPT-15L
Part No.	66242Y
Maximum charging current	15 A
Nominal solar input	200 Wp (battery 12 V) - 400 Wp (battery 24 V)
Maximum open circuit voltage	75 V
System voltage	12/24 VDC
Options	
Remote indicator	yes
Temperature remote sensor	yes
MaterHub	yes
PC Meterbus adapter	yes
DIN Rail Clips	yes

MORNINGSTAR® - PWM CHARGE CONTROLLERS

MORNINGSTAR PROFESSIONAL SERIES

TRISTAR™

Morningstar's TriStar™ is a three-function controller that provides reliable solar battery charging, load control or diversion regulation.

- **Highest reliability:** Large heat sink and conservative design enables operating at full ratings to 45°C
- **More information:** 3 LEDs to o indicate status, faults and alarms. Optional meter displays extensive system and controller information, automatic self-test and reset capabilities
- **Communications capability:** RS-232 connects to a personal computer for custom settings, data logging and remote monitoring and control
- **Full adjustable:** DIP switch provides user with a choice of 7 different digital presets and custom settings via RS-232
- **Extensive Electronic Protections:** Fully protected against reverse polarity, short circuit, overcurrent, high temperature and overvoltage
- **Display:** to be ordered separately

- **Temperature range:** -40°C to +45°C
- **Largest Wire:** 35 mm² / 2 AWG
- **Dimensions:** 26,0 x 12,7 x 7,1 cm (10.2" x 5" x 2.8")
- **Weight:** 1,6 kg (3.5 lbs)

- **Certifications:** CE, ETL Listed (UL1741).
- **WARRANTY: 5 years**

PROSTAR™

Morningstar's ProStar™ is the world's leading mid-range solar controller for both professional and consumer applications.

- **Increased battery capacity and life:** PWM series battery charging. Temperature compensated charging and 3-position battery select. Remote battery voltage sense terminals
- **More information:** 3 LEDs to indicate status, faults and alarms. An optional instrument provides safety disconnection and indicates Amps, Volts, temperature, and self-diagnostics
- **Electronic Protections:** Reverse polarity, Short-circuit, Overload, High temperature disconnect, High voltage disconnect

- **Temperature range:** -40°C to +60°C
- **Largest wire:** 16 mm² / 6 AWG
- **Dimensions:** 15,3 x 10,5 x 5,5 cm (6.0" x 4.1" x 2.2")
- **Weight:** 0,34 kg (0.75 lbs)

- **Certifications:** CE
- **WARRANTY: 5 years**

TRISTAR™	TS-45	TS-60
Part No.	63888J	63889L
Rated solar, load or diversion current	45 A	60 A
System voltage	12-24-48 VDC	12-24-48 VDC
Options		
TriStar Meter-2 indicator	yes	yes
TriStar Meter-2 remote indicator	yes	yes
Temperature remote sensor	yes	yes
MeterHub	yes	yes
EIA-485 adapter	yes	yes

PROSTAR™	PS-15M	PS-30M
Part No.	62643W	61737A
Rated solar current	15 A	30 A
Rated load current*	15 A	30 A
System voltage	12/24 VDC	12/24 VDC
Options		
Digital indicator	yes	yes
Positive pole earth	no	yes
Temperature remote sensor	yes	yes

** Low voltage disconnect included on all ProStar™ controllers.*

MORNINGSTAR PROFESSIONAL SERIES

SUNSAVER™ (GEN3)

Morningstar's SunSaver™ is the world's leading small solar controller for both professional and consumer applications.

- **Increased battery life:** PWM to manage four-stage battery charging with temperature compensation. Possibility to select sealed or liquid batteries
- **Environmental protection:** Marine rated terminals/anodized case aginst marine corrosion
- **Rated for Hazardous Locations:** Specifically designed for solar power systems in the oil/gas industry. Approved for use in Class 1, Division 2, Groups A,B,C,D
- **New features:** complete electronic protections, 3 LEDs for battry chargoing status, recovery of the battery, maximum load: 15V

- **Temperature range:** -40°C to +60°C
- **Largest Wire:** 16 mm² / 6 AWG
- **Dimensions:** 15,2 x 5,5 x 3,4 cm (6.0" x 2.2" x 1.3")
- **Weight:** 0,23 kg (0.5 lbs)

- **Certifications:** CE, CE, ETL Listed (UL1741), CSA C22.2 No. 107.1-01, FCC Class B Part 15, Hazardous Locations.
- **WARRANTY: 5 years**

SUNSAVER™	SS-6L-12	SS-10-12	SS-10L-12	SS-20L-12	SS-10L-24	SS-20L-24
Part No,	61213E	61415B	61192X	61734U	61938L	20970A
Rated solar current	6,5 A	10 A	10 A	20 A	10 A	20 A
Rated load current	6 A	10 A	10 A	20 A	10 A	20 A
System voltage	12 V	12 V	12 V	12 V	24 V	24 V
*Options**						
Low voltage disconnect	yes	no	yes	yes	yes	yes
DIN Rail Clips	yes	yes	yes	yes	yes	yes

**The wire end cover is included in all SunSaver models*

SUNSAVER DUO™

Morningstar's SunSaver DUO™ is an advanced PWM two battery controller for RV's, caravans, boats and cottages.

- **Two Battery Charging:** Solar charge current is shared between the two batteries based on a user selectable priority. When one battery is fully charged, all of the charge current flows to the other battery
- **High reliable:** Epoxy encapsulation protects the controller against dust and high humidity. Electronic protections: solar short circuit, solar over current and reverse polarity
- **User adjustable:** trough a DIP switch, the user may change controller´s parameters. Further customization is possible by connecting to a computer using the PC software Morningstar

- **Temperature range:** -40°C to +45°C
- **Largest wire:** 16 mm² / 6 AWG
- **Dimensions:** 17,0 x 5,6 x 4,1 cm (6.7" x 2.2" x 1.6")
- **Weight:** 0,26 kg (0.6 lbs)

- **Certifications:** CE
- **WARRANTY: 5 years**

SUNSAVER DUO™	SSD-25RM
Part No.	66129C
Rated solar current	25 A
Rated output current*	none
Sytem voltage	12 V
Options	
Remote indicator	included
Temperature remote sensor	yes
Meterbus PC adapter	yes
DIN Rail Clips	yes

** There is no load connection on the SunSaver Duo*

MORNINGSTAR PROFESSIONAL SERIES

SUNKEEPER™

By mounting directly to the module junction box and wiring through the junction box knockout, the connection is weather-proof. This eliminates the need for an additional housing for the controller.

- **High Reliability:** Rated to 70°C to operate in high temperatures at the solar module. No need to re-rate
- **Outdoor Rated:** ETL approved for outdoor use without an additional enclosure. Rugged IP65, UV resistant case. Epoxy encapsulated printed circuit board and watertight connection to the module junction box
- **Rated for Hazardous Locations:** Specifically designed for solar power systems in the oil/gas industry. Approved for use in Class 1, Division 2, Groups A,B,C,D

- **Temperature range:** -40°C to +70°C
- **Wire terminations:** 8 fork connectors
- **Dimensions:** 9,9 x 5,1 x 1,3 cm (3.9" x 2.0" x 0.5")
- **Weight:** 0,11 kg (0.24 lbs)

- **Certifications:** CE, Hazardous Locations.
- **WARRANTY: 5 years**

SUNKEEPER™	SK-6	SK-12
Part No.	65214M	65215O
Rated solar current	6 A	12 A
Rated load current*	none	none
System voltage	12 V	12 V
Options		
Temperature remote sensor	optional (RTS)	optional (RTS)

** There is no load connection on the SunKeeper*

SUNLIGHT™

Morningstar's SunLight™ solar lighting controller combines the SunSaver design with an advanced microcontroller for automatic lighting control functions.

- **10 lighting options:** User adjustable lighting for 2 to 10 hours or overnight. The unique feature ON / OFF / ON allows you to preserve energy and still illuminate for 1 or 2 hours before dawn. The accuracy of the timer is within 2 seconds
- **Easy to install:** Test button flashes red LED to confirm correct rotary switch selection
- **Designed to be durable:** electronics encapsulated in an epoxy compound, terminals classified as marine and housing in anodized aluminum

- **Temperature range:** -40°C to +60°C
- **Largest wire:** 16 mm² / 6 AWG
- **Dimensions:** 16,8 x 5,5 x 3,4 cm (6.6" x 2.2" x 1.3")
- **Weight:** 0,26 kg (0.6 lbs)q

- **Certifications:** CE
- **WARRANTY: 5 years**

SUNLIGHT™	SL-10L-12	SL-10L-24	SL-20L-12	SL-20L-24
Part No.	61416D	61735W	61887W	63868C
Rated solar current	10 A	10 A	20 A	20 A
Rated load current*	10 A	10 A	20 A	20 A
System voltage	12 V	24 V	12 V	24 V
Options				
DIN Rail Clips	yes	yes	yes	yes

** Low voltage disconnect is inculded in all SunLight controllers*

MORNINGSTAR® - PWM CHARGE CONTROLLERS

MORNINGSTAR PROFESSIONAL SERIES

SUNGUARD™

Morningstar's SunGuard™ is the most advanced small, economical solar charge controller on the market today.

- **Highly reliable:** Epoxy encapsulation protects the controller against dust and high humidity. Rated for 25% overloads and no need to derate
- **Increases battery life:** PWM to manage with no shunt battery charging with temperature compensation. Low power consumption
- **Easy to install:** waterproof connections to the PV modules and battery
- **Temperature range:** -40°C to +60°C
- **Dimensions:** 6,4 x 5,1 x 3,8 cm (2.5" x 2.0" x 1.5")
- **Weight:** 0,09 kg (0.2 lbs)
- **Certifications:** CE, Hazardous Locations.
- **WARRANTY: 5 years**

SUNGUARD™	SG-4
Part No.	61732P
Rated solar current	4,5A
Rated load current*	none
System voltage	12V

**There is no load connection on the SunGuard*

MORNINGSTAR ESSENTIAL SERIES

SHS™

Morningstar's SHS™ controller was specifically designed to meet the needs of rural solar home systems.

- **High reliability:** The SHS™ has built-in electronic fuses that do not require replacement. Any wiring mistakes during installation will not damage the controller. The SHS™ electronics are protected with a moisture-tight coating, minimizing damage from humidity and from nesting insects
- **Easy to install:** LEDs display status information and battery level. The SHS™ controller is fully automatic and requires no adjustments or user selections
- **Automatic Lighting Control:** Automatically turns light on at dusk and turns light off at dawn
- **Temperature range:** 25°C to +50°C
- **Largest wire:** 6 mm²
- **Dimensions:** 15,1x 6,6 x 3,6 cm (5.9" x 2.6" x 1.4")
- **Weight:** 113 g (0.24 lbs)
- **Certifications:** CE, World Bank
- **WARRANTY: 5 years**

SHS™	SHS-NL-6	SHS-NL-10
Part No.	64442W	64443Y
Rated solar current	6 A	10 A
Rated load current*	6 A	10 A
System voltage	12 V	12 V
Options		
Night Light	yes	yes

** Low voltage disconnect is included on all SHS controllers*

MORNINGSTAR®
MPPT CHARGE CONTROLLERS

MORNINGSTAR
ESSENTIAL SERIES

ECOBOOST™

The EcoBoost MPPT™ solar charge controller brings Morningstar's proprietary TrakStarTechnology™ to our new line of Essentials controllers and accessories. The EcoBoost controllers automatically detect 12 or 24 V system configuration. They are highly efficient and accurate controllers designed to ensure that batteries attain a complete state of charge.
They are also sophisticated load controllers. Using this feature to manage DC power consumption protects the batteries from over discharge and helps ensure long term system reliability.

- **7 battery types:** with the possibility of customization
- **2 USB input:** to charge smartphones and tablets - 3A at 5V
- **Solar input electronic protection:** overload, short-circuit, high voltage, reverse polarity, high temperature, nighttime reverse current.
- **Load output electronic protection:** overload, short-circuit, high temperature, reverse polarity.
- **Battery electronic protection:** reverse polarity.
- **Load control:** Low Voltage Disconnect and Low Voltage Reconnect settings.
- **Lighting control:** dusk and dawn settings
- **Optional Meter:** provides access to system operational information including current and historical performance data. All EcoBoost "M" controllers include the meter

- **Operating temperature:** -40°C to +60°C
- **Tropicalization:** conformal coating, marine-rated terminals
- **Power terminals:** 2,5-16 mm^2 / 14-2AWG
- **Enclosure:** IP20
- **Dimensions:** 19,6x17,3x7,1 cm (7.7x6.8x2.8 in)
- **Weight:** 1,4 kg (3.1 lbs)

- **Certifications:** CE, TUV Listed, IEC 62109, EN 62109-1, Emissions 55014-1, Immunity 55014-2
- **WARRANTY: 2 years**

- **Accessories:** Remote Temperature Sensor (RTS), mobile phone holder (included)

MODEL	EB-MPPT-20	EB-MPPT-20M	EB-MPPT-30	EB-MPPT-30M	EB-MPPT-40	EB-MPPT-40M
Part No.	22296A	22264L	22297C	22265N	22298E	22266R
Max battery current	20 A	20 A	30 A	30 A	40 A	40 A
Load current rating	20 A	20 A	30 A	30 A	40 A	40 A
Maximum PV Open Circuit Voltage (VOC)	120 V					
Nominal battery voltage	12 or 24 V automatic sensing setting					
Max nominal operation power*						
12 V battery	300W @ 40C	300W @ 40C	400W @ 40C	400W @ 40C	560W @ 40C	560W @ 40C
24 V battery	600W @ 40C	600W @ 40C	800W @ 40C	800W @ 40C	1120W @ 40C	1120W @ 40C
Battery voltage range	10/35 V					
Self-consumption	<1.2 Watts					
Maximum combined USB charging output	3 at 5 V					

*Input power can exceed nominal maximum operating power, but controller will limit and provide its rated continuous maximum output current into batteries. This will not damage the controller.

MORNINGSTAR
ESSENTIAL SERIES

ECOPULSE™

The EcoPulse™ is a pulse width modulation (PWM) solar charge controller within Morningstar Essential Series™ of products which provides essential off-grid battery regulation functions. This controller is easy to use, and designed for residential and leisure consumer applications. Metered an non-metered versions of this product are available at 10, 20, and 30 amp charge ratings for 12 and 24V battert systems.

- **4-Stage charging:** bulk, Absorption, Float, Equalize.
- **Solar input electronic protection:** overload, short-circuit, high voltage, reverse polarity, high temperature, nighttime reverse current.
- **Load output electronic protection:** overload, short-circuit, high temperature, reverse polarity.
- **Battery electronic protection:** reverse polarity.
- **Load control:** Low Voltage Disconnect and Low Voltage Reconnect settings.
- **Lighting control:** dusk to dawn settings.
- **Optional Meter:** provides access to system operational information including current and historical performance data. All EcoBoost "M" controllers include the meter

- **Operating temperature:** -40°C to +45°C
- **Tropicalization:** conformal coating, marine-rated terminals
- **Power terminals:** 2,5-16 mm^2 / 14-6AWG
- **Enclosure:** IP20
- **Dimensions:** 15,3x10,5x5,5 cm (6x4.1x2.2 in)
- **Weight:** 0,4 kg (1 lbs)

- **Certifications:** CE
- **WARRANTY: 2 years**

- **Accessories:** Remote Temperature Sensor (RTS)

MODEL	EC-10	EC-10M	EC-20	EC-20M	EC-30	EC-30M
Part No.	21419J	21420T	21421V	21422X	21423Z	21424B
Display	No	Yes	Yes	Yes	Yes	Yes
Maximum PV open-circuit voltage	60 V	60 V	60 V	60 V	60 V	60 V
Maximum battery current	10 A	10 A	20 A	20 A	30 A	30 A
Nominal battery voltage	12/24 VDC	12/24 VDC	12/24 VDC	12/24 VDC	12/24 VDC	12/24 VDC
Battery voltage range	10/35 VDC	10/35 VDC	10/35 VDC	10/35 VDC	10/35 VDC	10/35 VDC
Self-consumption	<22mA	<40mA	<22mA	<40mA	<22mA	<40mA

MORNINGSTAR® - ACCESSORIES FOR CHARGE CONTROLLERS

TS-M-2-600V - 68979P - **TRISTAR METER-2** Digital display for TriStar MPPT 600V charge controllers

Compatibility:
TriStar
TriStar MPPT

- 2 x 6 character LCD'
- to be mounted on the controller
- displays system and controller information, legged data, bar graph metering, alarms and faults
- the information may be shown in five languages

TS-M-2 - 67055E - **TRISTAR METER-2** Digital display for TriStar charge controllers

Compatibility:
TriStar
TriStar MPPT

- 2 x 6 character LCD'
- to be mounted on the controller
- displays system and controller information, legged data, bar graph metering, alarms and faults
- the information may be shown in five languages

TS-RM-2 - 67590D - **TRISTAR REMOTE METER-2** Remote digital display for TriStar charge controllers

Compatibility:
TriStar
TriStar MPPT

- same features of TS-M-2. It includes 30 m cable for remote mounting

RD-1 - 64735M - **RELAY DRIVER** Logic module accessory for solar controllers

Compatibility:
TriStar
TriStar MPPT
All other charge controllers

- four independent relay driver outputs by reading digital data inputs
- uhigh and low alarm contacts, load control, generator start functions
- displays digital data by TriStar™ or TriStar™ MPPT
- displays battery voltage even with other charge controllers

HUB-1 - 68463B - **METERHUB** Solar controller communication hub

Compatibility:
TriStar, TriStar MPPT
TriStar Meter-2, TriStar Remote Meter-2, SunSaver MPPT, Relay Driver

- allows multiple Morningstar products to communicate over a Meterbus network (max 5 devices)
- enables multiple controllers to share a single TriStar meter and a Relay Driver
- the product electrically isolates devices that supply power to the network

RTS-1 - 64025D - **REMOTE TEMPERATURE SENSOR** measures temperature at the battery

Compatibility:
TriStar, TriStar MPPT ProStar, Sunkeeper SunSaver Duo
SunSaver MPPT

- improves battery charging thanks to very accurate temperature compensation accuratamente la temperatura della batteria
- use of the RTS is recommended whenever the temperature at the battery will be more than 5°C (9°F) different than the temperature at the controller

MSC - 68091P - **PC METERBUS ADAPTER** Converts a controller's meter port RJ-11to a standard RS-232

Compatibility:
SunSaver Duo
SunSaver MPPT

- used to connect any Morningstar controller or inverter to a PC or other equipment
- establishing a communications link enables the monitoring or logging of data from the controller or inverter as well as the customizing of any user-adjustable settings
- to be used with Morningstar devices with RJ-11 input (not RS-232)

UMC-1 - 20669D - **METERBUS ADAPTER** Converts a controller's meter port RJ-11to a standard USB 2.0

Compatibility:
SunSaver Duo
SunSaver MPPT

- used to connect any Morningstar controller or inverter to a PC or other equipment
- establishing a communications link enables the monitoring or logging of data from the controller or inverter as well as the customizing of any user-adjustable settings
- to be used with Morningstar devices with RJ-11 input (not RS-232)

EMC-1 - 20801A - **ETHERNET METERBUS CONVERTER** - Internet Data transfer device

Compatibility:
Tristar MPPT, Tristar PWM, Prostar MPPT,
Sunsaver DUO, Sunsaver MPPT, Suresine Inverter

- it adds network data funtionality to any Morningstar controller that features an exisisting MeterBus port
- adds IP based MODBUS connectivity for remote communication and control
- adds SNMP and e-mail notifications for system status changes

RSC-1 - 68471A - **EIA-485 / RS-232 ADAPTER** converts a controller RS-232 to EIA-485

Compatibility:
TriStar
TriStar MPPT
Relay driver

- allows up to 128 Morningstar products to communicate on the same communication bus and over much greater distances
- all data is transmitted in the form of MODBUS protocol

DIN-1 - 68472C - **DIN RAIL CLIPS** to install SunSaver™ family of solar charge controllers to DIN Rails

Compatibility:
SunSaver
SunLight
SunSaver Duo
SunSaver MPPT

- these rugged plastic clips have been custom made to match the mounting holes on the SunSaver controllers
- the clips also provide a mechanism to allow easy removal of the controller from the DIN rail without removing the clips

UFLEX® - ICPV MPPT INVERTER BATTERY CHARGERS

ICPV 3 kVA, 5 kVA (MPPT) and 5 kVA (double MPPT)

- Pure sine wave inverter with built-in MPPT solar charge controller
- Selectable input voltage range for home aplliances and personal computers
- Selectable charging current based on applications
- Configurable AC/Solar input priority via LCD setting
- Compatible to AC mains or generator power

- **Otional components:**
  PARALLEL KIT - 69391HA - Parallel operation with up to 9 units only for 48V/5000VA version
  CONTROL PANEL - 69390F - Remote Control Panel available
  SNMP - WEB BOX - 20010SA - Box to communicate with SNMP protocol
  ANTIDUST KIT - 23677U

ICPV MPPT 3kW-48

ICPV MPPT 5kW-48

CONTROL PANEL - 69390F

SNMP - WEB BOX - 20010SA

PARALLEL KIT - 69391HA

ANTIDUST KIT - 23677U

MODEL	ICPV MPPT 3KW-48	ICPV MPPT 5KW-48
Part No.	21545P	22889E
Rated power	3000 VA / 3000 W	5000 VA / 5000 W
Parallel capability	-	Yes, up to 9 units
Voltage	230 VAC	230 VAC
Selectable voltage range	170-280 VAC (for Personal Computers); 90-280 VAC (for Home Appliances)	
Frequency	50 Hz / 60 Hz	50 Hz / 60 Hz
AC voltage regulation (battery mode)	230 VAC ± 5%	230 VAC ± 5%
Surge power	6000 VA	10000 VA
Efficiency (peak)	90 ~ 93%	93%
Transfer time	10 ms (for Personal Computers); 20 ms (for Home Appliances)	
Waveform	Pure sine wave	Pure sine wave
Battery voltage	48 VDC	48 VDC
Maximum PV array power	3000 W	4000 W
MPPT range @ operating voltage	60 ~ 115 VDC	60 ~ 115 VDC
Solar charger type	MPPT	MPPT
Max. PV array open circuit voltage	145 VDC	145 VDC
Max. solar charge current	60 A	80 A
Max. AC charge current	10 A o 15 A (selectable)	60 A
Max. charge current	50 A	110 A
Max. efficiency	98%	-
Max. self-consumption	<35 W	<65 W
Dimensions mm (")	140x295x479 (5.5x11.6x18.6)	120x295x468 (4.7x11.6x8.4)
Weight kg (lbs)	11,5 (25.3)	13,5 (29.8)
Humidity	From 5% to 95% Relative Humidity (Non-condensing)	
Operating temperature	From 0°C to 55°C	
Antidust kit	-	optional

UFLEX® - ICPV PWM INVERTER BATTERY CHARGERS

ICPV 3 and 5 kVA (PWM)

- Selectable input voltage range for home aplliances and personal computers
- Selectable charging current based on applications
- Configurable AC/Solar input priority via LCD setting
- Compatible to mains voltage or generator power
- Battery equalization to optimize battery performance and lifecycle

- **Otional components:**
  CONTROL PANEL - 69390F - Remote Control Panel available
  SNMP - WEB BOX - 20010SA -Box to communicate with SNMP protocol

CONTROL PANEL - 69390F

SNMP - WEB BOX - 20010SA

ICPV PWM 3KW-24

ICPV PWM 5KW-48

MODEL	ICPV PWM 3KW-24	ICPV PWM 5KW-48
Part No.	21569E	22848P
Rated power	3000 VA / 3000 W	5000 VA / 5000 W
Parallel capability	No	Yes, up to 9 units with parallel kit
Voltage	230 VAC	230 VAC
Selectable voltage range	170-280 VAC (for Personal Computers); 90-280 VAC (for Home Appliances)	
Frequency	50 Hz / 60 Hz (auto sensing)	50 Hz / 60 Hz (auto sensing)
AC voltage regulation (battery mode)	230 VAC ± 5%	230 VAC ± 5%
Surge power	6000 VA	10000 VA
Efficiency (peak)	93%	93%
Transfer time	10 ms (for Personal Computers); 20 ms (for Home Appliances)	
Waveform	Pure sine wave	Pure sine wave
Battery voltage	24 VDC	48 VDC
Solar charger type	PWM	PWM
Max. PV array open circuit voltage	60 VDC	90 VDC
Max. PV array power	1200 W	2400 W
Max. self-consumption without load	<20 W	<50 W
Max. solar charge current	50 A	50 A
Max. AC charge current	30 A	60 A
Max. charge current	50 A	110 A
Dimensions mm (“)	100x272x355 (3.9x10.7x14)	155x295x455 (6.1x11.6x17.9)
Weight kg (lbs)	6,9 (15.2)	9,8 (21.6)
Humidity	From 5% to 95% Relative Humidity (Non-condensing)	
Operating temperature	From 0°C to 55°C	

UFLEX® - ICPV-EASY INVERTER BATTERY CHARGERS

ICPV-EASY

- Pure sine wave solar inverter
- Output power factor 1: 1
- Selectable high power charging current
- Wide DC imput range
- Selectable input voltage range for home aplliances and PC
- Configurable AC/Solar input priority via LCD setting
- Compatible to AC mains or generator power
- Compatible to Mains voltage or generator power
- Overload and short circuit protection
- Smart battery charger design for optimized battery performance
- Cold start function

EASY PWM 1KW-12

EASY PWM 3KW-24

EASY MPPT 3KW-24

ANTIDUST KIT - 23677U (optional)

MODEL	EASY PWM 1KW-12	EASY PWM 3KW-24	EASY MPPT 3KW-24
Part No.	21570N	21571R	21572T
Rated power	1000 VA / 1000 W	3000 VA / 3000 W	3000 VA / 3000 W
Voltage	230 VAC	230 VAC	230 VAC
Selectable voltage range	170-280 VAC (for Personal Computers); 90-280 VAC (for Home Appliances)		
Frequency	50 Hz / 60 Hz (auto sensing)		
AC voltage regulation (attery mode)	230 VAC ± 5%	230 VAC ± 5%	230 VAC ± 5%
Surge power	2000 VA	2000 VA	2000 VA
Efficiency (peak)	90 ~ 93%	90 ~ 93%	90 ~ 93%
Transfer time	10 ms (for Personal Computers); 20 ms (for Home Appliances)		
Waveform	Pure sine wave	Pure sine wave	Pure sine wave
Battery voltage	12 VDC	24 VDC	24 VDC
Solar charger type	PWM	PWM	MPPT
Max PV array open circuit voltage	55 VDC	80 VDC	145 VDC
Max PV array power	600 W	1200 W	1500 W
Max solar charge current	50 A	50 A	60 A
Max AC charge current	20 A	25 A	60 A
Max charge current	50 A	70 A	120 A
Max self-consumption without load	<25 W	<25 W	<25 W
Dimensions mm (")	88x225x320 (3.5x8.9x12.6)	100x225x334 (3.9x8.9x13.1)	100x300x440 (3.8x11.8x17.3)
Weight kg (lbs)	4,2 (9.2)	6,5 (14.3)	9,5 (20.9)
Communication interface	USB / RS232	USB / RS232	USB / RS232
Humidity	From 5% to 95% Relative Humidity (Non-condensing)		
Operating temperature	From -10°C to 50°C	From -10°C to 50°C	From -10°C to 50°C
Antidust kit	-	-	optional

ICPV EVO TWIN 6 KW

- Dual output for smart load management
- Maximum PV input current 27A
- Wide PV input voltage range 60VDC ~ 450VDC
- Customizable status LED ring with RGB lights
- Touchable button with large 4.3" colored LCD
- Built-in Wifi for mobile monitoring (Android/IOS App available)
- Data log event stored in the inverter
- Reserved communication port for BMS (RS485, CAN-BUS or RS232)
- Battery equalization extends lifecycle
- Enhanced charging power
- Built-in anti-dust kit

ICPV TWIN 6kW

MODEL	ICPV EVO TWIN 6KW
Part No.	24884E
Rated power	6000 VA / 6000 W
Voltage	230 VAC
Selectable voltage range	170-280 VAC (for Personal Computers); 90-280 VAC (for Home Appliances)
Frequency	50 Hz / 60 Hz (auto sensing)
AC voltage regulation (battery mode)	230 VAC ± 10%
Surge power	12000 VA
Efficiency (peak)	90 ~ 93%
Transfer time	15 ms (for Personal Computers); 20 ms (for Home Appliances)
Waveform	Pure sine wave
Battery voltage	48 VDC
Floating charge voltage	54 VDC
Overcharge protection	63 VDC
Solar charger type	MPPT
Max PV array power	6000 W
MPPT range @ operating voltage	60 ~ 450 VDC
Max PV array open circuit voltage	500 VDC
Max PV input current	27 A
Max solar charge current	120 A
Max AC charge current	100 A
Max charge current	120 A
Dimensions mm (")	119x313,6x457,5 (4.7x12.3x18)
Weight kg (lbs)	12 (26.4)
Communication interface	USB / RS232 / RS485 / WiFi / Dry-contact
Humiidity	From 5% to 95% Relative Humidity (Non-condensing)
Operating temperature	From -10°C to 50°C
Storage temperature	From -15°C to 60°C

ICPV MAX TWIN 8 KW

- Dual output for smart load management
- Maximum PV input current 27A
- Wide PV input voltage range 90VDC ~ 450VDC
- Status indiication with RGB lights
- Built-in Wifi for mobile monitoring (Android/IOS App available)
- Supports USB On-the-Go function
- Data log event stored in the inverter
- Reserved communication port for BMS (RS485, CAN-BUS or RS232)
- Replaceable fan design for ease of maintenance
- Selectable high power charging current
- Compatible to Utility Mains or generator input
- Built-in anti-dust kit
- Optional DC output for DC fan, LED bulb, router and so on
- Parallel operation with 6 units

ICPV MAX TWIN 8kW

MODEL	ICPV MAX TWIN 8KW
Part No.	24885G
Rated power	8000 VA / 8000 W
Voltage	230 VAC
Selectable voltage range	170-280 VAC (for Personal Computers); 90-280 VAC (for Home Appliances)
Frequency	50 Hz / 60 Hz (auto sensing)
AC voltage regulation (battery mode)	230 VAC ± 10%
Surge power	16000 VA
Efficiency (peak)	93%
Transfer time	10 ms (for Personal Computers); 20 ms (for Home Appliances)
Waveform	Pure sine wave
Battery voltage	48 VDC
Floating charge voltage	54 VDC
Overcharge protection	66 VDC
Solar charger type	MPPT
Max PV array power	8000 W (4000 W x 2)
MPPT range @ operating voltage	90 ~ 450 VDC
Max PV array open circuit voltage	500 VDC
Max PV input current	27 A x 2 (Max 40 A)
Max solar charge current	120 A
Max AC charge current	120 A
Max charge current	120 A
Dimensions mm (")	147,4x432,5x553,6 (5.8x17x21.8)
Weight kg (lbs)	18,4 (40.6)
Communication interface	USB / RS232 / RS485 / WiFi / Dry-contact
Humiidity	From 5% to 95% Relative Humidity (Non-condensing)
Operating temperature	From -10°C to 50°C
Storage temperature	From -15°C to 60°C

NEXT 3

The next3 is the new powerful player for off-grid, on-grid and hybrid installations. A 3 phase 16 kW inverter-charger with 2 built-in solar high voltage MPPT inputs with 8 + 8 KW.

- **All-in-one with solar built-in**: the next3 incorporates 2 high voltage MPPT inputs of last generation for a 16 KW integrated solar power. The solar and transfer modules are optional.
- **AC flex**: the unique AC flex interface can be configured as a second source or an extra controlled load.
- **Full interactive grid inverter**: including an AC source with double disconnection relay with the grid. This input complies with the new grid-tied regulations in the UE and other regions.
- **All battery technology ready**: the next3 is compatible with almost every 48V battery technology. An integrated CAN-BMS interface ensures a plug and play solution with communicating lithium batteries.
- **New improved smart boost function**: the Smart Boost2 function helps adapting to the source limitations with the battery in the most versatile way, facilitating for example phase balancing or peak-shaving.
- **A unique solution for distributed electrification**: innovative modular hardware combination, up to 3 units in parallel. And for the first time it is also possible to combine multi-unit and multi-battery systems using an external transfer, allowing even different battery technologies, and increasing the versatility with a centralized management.
- **Next interface, the new gate to the next ecosystem using nextOS**: with the inverter-charger, we have developed a new comprehensive interface. One single and central user interface per complete system. The next interface is the new gate to the next ecosystem using nextOS, an intuitive smart platform to configure, control and analyse your system. Making life easier for both professional installers and final users.
- **Standard coating, IP30**: the electronic elements come with standard coating and IP30 for a high hardware reliability.
- **Compact for an easy installation**: the installation and wiring have never been easier with only one device replacing up to 6 in a typical installation.
- **Power Flow Dispatcher, the brain of the whole system**: system oriented, the new power flow dispatcher centralizes the power management of the complete system integrally.

MODEL	NEXT 3
Part No.	25087G
Continuous power @25°C	15000 VA
Power 30 min. @25°C	16000 VA
Power 5 sec. 25°C with solar / inverter / 1-phase	30000 / 24000 / 10000 VA
Nominal output frequency	50/60 Hz (±0.02%)
Nominal battery voltage (Input range)	48 Vdc
Battery voltage range	38 – 68 Vdc
Maximum PV open voltage (Voc)	900 Vdc
Maximum solar power recommended (@STC)	2 x 12000 W
Dimensions HxWxD mm (")	320x450x760 (12.6x17.7x29.9)
Weight kg (lbs)	58 (127.9)

VARIOSTRING VS-70

The VarioString VS-70 is a MPPT 70A solar charge controller. It is recommended for PV capacities up to 4.2kWp, and charges the battery with a maximum current of 70A. The solar modules are connected in series to form one single string (up to 600V) connected to the VS-70, all this without special tools and with reusable connectors

VARIOSTRING VS-120

The VarioString VS-120 is a MPPT 120A/48V solar charge controller. Fully isolated dual MPPT inputs up to 600V (Voc) (2x3.5kWp) or up to 900V (Voc) (7kWp) with MPPT inputs in series.

VS-70

VS-120

- **Reduces Balance of System costs**: eliminates expensive wiring for parallel strings, saving wires, connectors, junction boxes, fuses, space, time etc
- **Safe, simple and trouble free connection**: with SUNCLIX™ (Phoenix Contact "tool free") PV connector
- **Fully protected** against wrong wiring
- **Simplified safety rules** by full isolation between PV and battery and between MPPT inputs
- **MPPT efficiency >99%**: fast precise best in class tracking algorithm. World champion for efficiency in isolated converter with **>98% conversion efficiency**
- Low self-consumption: **< 1,2W in night mode**
- **4 step charger** fully programmable for longer battery life
- Optimal usage in a **Xcom-LAN** or **Xcom-GSM**
- **Certifications:** EMC 2004/108/CE – LV 2006/95/CE – RoHs 2002/95/CE – IEC/EN 62109-1:2010 – IEC/EN 61000-6- 3:11 - IEC/EN 61000-6-12005
- **Warranty**: 5 years

MODEL	VarioString VS-70	VarioString VS-120			
Part No.	20436D	69907T			
Electrical characteristics PV array side		MPPT 1	MPPT 2	1+2 parall.	1+2 serie
Max. solar power recommended	4200 Wp	3500 Wp	3500 Wp	7000 Wp	7000 Wp
Maximum current (Isc)	13 A	13 A	13 A	26 A	26 A
Max. open circuit voltage (Voc)	200 V to 600 V	600 V	600 V	600 V	900 V
Maximum output current	70 A	120 A			
Nominal battery voltage	48 V	48 V			
Operating temperature	-20°C ÷ +55°C	-20°C ÷ +55°C			
IP protection	IP 54	IP 20			
Dimensions mm (")	120 x 220 x 350 (4.7 x 8.7 x 13.8)	133 x 322 x 466 (5.2 x 12.7 x 18.3)			
Weight kg (lbs)	5,5 (12.1)	7,5 (16.5)			

STUDER® - MPPT CHARGE CONTROLLERS

VARIOTRACK™

Variotrack™ solar charge controller automatically charges the batteries in an optimal way with all the available solar power using its algorithm for Maximum Power Point Tracking (MPPT).

- **Maximize the energy generated** from solar panels through maximum power point tracking
- **High** conversion **efficiency**: 98% charge
- **Increased battery life** 4-steps
- **Rugged and durable:** designed to perform in harsh environmental conditions (IP54)
- **Can be installed** up to 15 Variotrack™ in parallel
- **Low consumption:** ON< 5W, standby < 1W (in night time mode)
- **Display with 6 LEDs** showing system status and current
- **Multifunctional display**,programming and datalogging with RCC-02/-03
- **Can be integrated into a *Xtender*** system with synchronized battery control
- **Easy and safe to install:** fully protected against incorrect wiring
- **Electronical protections:** reverse polarity, short circuit, overload, high temperature, overvoltage, night reverse current
- **Temperature range:** -20°C to +55°C
- **Largest wire:** 35 mm²
- **Dimensions:** 11,0 x 21,0 x 31,0 cm (4.3" x 8.3" x 12.2")
- **Weight:** 4,7 kg (10.4 lbs)
- **Certifications:** EMC 2004/108/CE - LV 2006/95/CE - RoHS 2002/95/CE
- **WARRANTY: 10 years (5+5)**

VARIOTRACK™	VT-40	VT-65	VT-80
Part No.	21854D	68477N	68390A
Maximum battery current	40 A	65 A	80 A
Max. PV modules (@STC) nominal input	625 Wp (batt. 12V) 1250 Wp (batt. 24V) 2500 Wp (batt. 48V)	1000 Wp (batt. 12V) 2000 Wp (batt. 24V) 4000 Wp (batt. 48V)	1250 Wp (batt. 12V) 2500 Wp (batt. 24V) 5000 Wp (batt. 48V)
Max. open circuit voltage	75 V (batt. 12V) 150 V (batt. 24/48V)	75 V (batt. 12V) 150 V (batt. 24/48V)	75 V (batt. 12V) 150 V (batt. 24/48V)
System voltage	12/24 or 48 VDC	12/24 or 48 VDC	12/24 or 48 VDC

STUDER® - INVERTER/BATTERY CHARGER

COMPACT™

The ***Compact™*** series includes devices with a power level ranging from 1.1kVA to 4kVA that allow for optimal use of available energy, either as an off-grid inverter, battery charger or solar charge controller. This range of robust products ready to be used offers an excellent price/efficiency ratio. For 12, 24, or 48V battery banks.

- **All in one:** they combine 3 functions: performing standalone inverter, powerful battery charger and ultra-fast transfer system. All in a robust casing.
- **Ready to use:** they are shipped with battery cables already assembled, reducing the system installation

- **Operating temperature:** -20°C to +55°C
- **Certifications:** EMC 2004/108/CE - LV 2006/95/CE - ISO 9001:2008 / 14001:2004
- **Warranty: 5 years**

COMPACT™	XPC+1400-12	XPC+2200-24	XPC+2200-48	C 1600-12	C 2600-24	C 4000-48
Part No.	23494K	23495M	23496P	23497S	23498U	23499W
Power P30	1400 VA	2200 VA	2200 VA	1600 VA	2600 VA	4000 VA
Continuous power	1100 VA	1600 A	1600 A	1300 VA	2300 VA	3500 VA
Battery charger	45 A	37 A	20 A	55 A	55 A	50 A
Switching current	16 A / 1.4 kVA	16 A / 2.2 kVA	16 A / 2.2 kVA	16 A / 1.6 kVA	16 A / 2.6 kVA	16 A / 4.0 kVA

SERIE XTENDER™

XTender™ series provides an unmatched freedom of use due to its many functions. In a basic application, it offers a total package: the functions of inverter, battery charger, transfer system and assistance to the source. These functions can be combined and controlled in a totally automatic way for exceptional ease and optimal management of available energy.

- **Smart-Boost function**: allows you to add the inverter power to another source, eg. a generator, another inverter or the grid to increase the available power
- **Multi-function contacts:** can be programmed to provide many additional features. Can be programmed as time switch
- **Programmable auxiliary contacts** for interconnection with existing systems and implementation of functions
- **Possibility to connect** up to 9 XTender™ in parallel, both to increase the available power, and to create a three-phase source
- **Automatic reduction** of peak loads with the distribution of the available power
- **Adjustable** stand-by
- **Multistage programmable** battery charger with PFC
- **DSP:** control using digital signal processors
- **Overload** electronic protection
- **Warranty: 10 years (5+5)**

XTENDER™	XTS 900-12	XTS 1200-24	XTS 1400-48
Part No.	68493L	68494N	68495R
Power P30	900 VA	1200 VA	1400 VA
Continuous power	500 VA	650 VA	750 VA
Battery charger	35 A	25 A	12 A
Transfer relay	16 A / 0.9 kVA	16 A / 1.2 kVA	16 A / 1.4 kVA

XTENDER™	XTM 1500-12	XTM 2000-12	XTM 2400-24	XTM 2600-48	XTM 3500-24	XTM 4000-48
Part No.	68487S	68488U	68489W	68490E	68491G	68492J
Power P30	1500 VA	2000 VA	2400 VA	2600 VA	3500 VA	4000 VA
Continuous power	1500 VA	2000 VA	2000 VA	2000 VA	3000 VA	3500 VA
Battery charger	70 A	100 A	55 A	30 A	90 A	50 A
Transfer relay	50 A / 1.5 kVA	50 A / 2.0 kVA	50 A / 2.4 kVA	50 A / 2.6 kVA	50 A / 3.5 kVA	50 A / 4.0 kVA

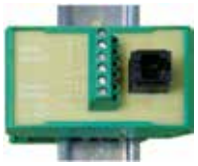
XTENDER™	XTH 3000-12	XTH 5000-24	XTH 6000-48	XTH 8000-48
Part No.	68479T	68480B	66149J	68481D
Power P30	3000 VA	5000 VA	6000 VA	8000 VA
Continuous power	2500 VA	4500 VA	5000 VA	7000 VA
Battery charger	160 A	140 A	100 A	120 A
Transfer relay	50 A / 3 kVA	50 A / 5 kVA	50 A / 6 kVA	50 A / 6 kVA

RCC-02/-03 - 66144Y/68478R - **Remote control**

- Enables the setting of the parameters as well as the display of the values measured
- By an SD card, it is possible to log the system data and to save and restore the parameters of the system
- Supplied with 2 m cbale
- Available for wall mounting (model RCC-02) or flush mount (model RCC-03)

BTS-01 - 66150T - **Battery temperature sensor**

- Allows the automatic compensation of the adjustable thresholds of the battery voltage
- Supplied with 5 m cable



RCM-10 - 68497V - **Remote ON/OFF** CONTROL

- Remotely control the input to XTS system functions
- Supplied with 5 m cable
- For mounting on DIN rail

BSP 500/1200 - 68498X/68499Z - **Control to monitor battery charging status**

- It is connected to the BUS communication of the XTS systems
- Displays the recorded data and controls the 2 auxiliary contacts of the XTS systems
- Supplied with 5 m cable

Xcom-232i - 68500E - **Communication module between XTS systems and SCADA control**

- RS-232 input and 2 m of RJ45 cable

Xcom-LAN - 20515Z - **Xcom-GSM** - 20733K - **Xcom-CAN** - 23492F - **Xcom-485i** - 23493H

- **Communication set Xcom-LAN** - The set includes one Xcom-232i, one Ethernet port and al necessary accessories.
- **Communication set Xcom-GSM** - The set includes one Xcom-232i, one cellular modem and all necessary accessories. The sim card is not provided. GPRS/3G network.
- **Communication set Xcom-CAN** - Allows communication between BMS, lithium battery management systems, and Xtender / VarioTrack / VarioString family products.
- **Modbus RTU Gateway Xcom-485i** - Allows a Studer Xtender/Vario system to interact with a third-party device using Modbus RTU over RS-485.

ARM-02 - 68503L - **Support module to mount XTS systems on DIN RAIL**

- Supplied with 2 auxiliary contacts controlled by XTS systems

EFC-01 - 68504N - **External cooling module (IP54)**

- This accessory increases the XTS system power
- To be installed directly on XTS casing and it can be mounted in any time even after installation

CAB-RJ45-8-xx - 68505R - **Communication cable between XTS systems and accessories**

- Available length: 2, 5, 10, 20, 50 m
- Other length are available on request

AJ SERIES

The AJ range consists of sine wave inverters that convert a battery's DC voltage into AC voltage, which can be used by all electrical appliances.

- **Digital control by microprocessor**, ensures high performance. The toroidal transformer and MOS power stage allow maximum efficiency
- **Steady output voltage:** 230 V +/- 5%, 50 Hz +/- 0,05%
- Available on request version with built-in charge controller
- **Protection against**: short circuit, reverse polarity, overload, overheat and overcurrent
- **Automatic disconnect** with alarm in case of low battery
- **IP 30** (IP 20 for AJ 2100-12 and AJ 2400-24)
- High reliability, silent, complete with connecting cables
- CE certified
- **WARRANTY: 5 years**

MODEL	AJ 200			AJ 400			AJ 800		AJ 2000	
	275-12	350-24	400-48	500-12	600-24	700-48	1000-12	1300-24	2100-12	2400-24
Part No.	61845D	61847H	62979G	61849M	61851Y	62980R	61853C	61855G	62981T	62983X
Nominal voltage (V)	12	24	48	12	24	48	12	24	12	24
Voltage range (V)	10.5-16	21-32	42-64	10.5-16	21-32	42-64	10.5-16	21-32	10.5-16	21-32
Continuous power (VA)	200	300	300	400	500	500	800	1000	2000	2400
Power for 30 min – P30- (VA)	275	350	400	500	600	700	1000	1300	2100	2400
Peak power for 5 s (VA)	450	650	1000	1000	1200	1400	2200	2800	5000	5200
Efficiency	93%	94%	94%	93%	94%	94%	93%	94%	92%	94%
Stanby current draw (W)	0.3*	0.5*	1.1*	0.4	0.6	1.5	0.7	1.2	0.7	1.2
No load current draw (W)	2.4	3.5	5.2	4.6	7.2	12	10	13	16	16
Polarity inversion protection	60A	40A	25A	60A	40A	25A	125A	100A	No	150A
Dimensions mm (")	142x163x84 (5.6x6.4x3.3)			142x240x84 (5.6x9.4x3.3)			142x428x84 (5.6x16.8x3.3)		273x399x117 (10.7x15.7x4.6)	
Weight kg (lbs)	2.4 (5.3)		2.6 (5.7)	4.5 (9.9)			8.5 (18.7)		19 (41.9)	18 (39.7)
Charge controller (option S)	10 A			15 A			25 A		30 A	

*Only version with built-in charge controller

On demand: JT8 remote control with 10 m. cable, alarm and AJ 800 and AJ 2000 display.

SMARTSOLAR MPPT 75/10 - 75/15 - 100/15 - 100/20 - 100/30 - 100/50 - 150/35CHARGE CONTROLLERS

- **Ultra-fast Maximum Power Point Tracking (MPPT)**: improve energy harvest by up to 30% compared to PWM charge controllers and by up to 10 % compared to slower MPPT controllers
- **Load output**: Over-discharge of the battery can be prevented by connecting all loads to the load output. The load output will disconnect the load when the battery has been discharged to a preset voltage
- **BatteryLife:** intelligent battery management. The BatteryLife algorithm will monitor the state of charge of the battery and, if needed, day by day slightly increase the load disconnect level (i. e. disconnect the load earlier) until the harvested solar energy is sufficient to recharge the battery to nearly the full 100%
- **Resin encapsulated electronics**
- **Day/night timing and light dimming option**
- **Outstanding conversion efficiency**: Maximum efficiency exceeds 98%.
- **Advanced Maximum Power Point Detection in case of partial shading conditions**
- **Flexible charge algorithm**: Fully programmable charge algorithm, and eight preprogrammed algorithms, selectable with a rotary switch
- **Extensive electronic protection**: Over-temperature protection and power derating when temperature is high. PV short circuit and PV reverse polarity protection. PV reverse current protection
- **Warranty**: 5 years

MODEL	75/10	75/15	100/15	100/20	100/30	100/50	150/35	150/45
Part No.	21674B	21675D	22401U	23016W	21678K	21679M	21680W	21867N
Battery voltage	12V/24V			12V/24V/48V	12V/24V		12V/24V/48V	12V/24V/48V
Maximum output current	10 A	15 A		20 A	30 A	50 A	35 A	45 A
Maximum PV power	135W /12V) 270W (24V)	200W (12V) 400W (24V)		290W (12V) 580W (24V) 1160W (48V)	440W (12V) 880W (24V)	700W (12V) 1400W (24V)	500W (12V) 1000W (24V) 2000W (48V)	650W (12V) 1300W (24V) 2600W (48V)
Maximum PV open circuit voltage	75 V		100 V				150 V	150 V
Maximum efficiency	98%							
Self-consumption - load on	19mA (12V) 16mA (24V)				30mA (12V) 20mA (24 V)		20mA (12V) 15mA (24V) 10mA (48V)	
Low voltage load disconnect	11,1V/22,2V o 11,8/23,6V o algorithm BatteryLife				-			
Load voltage load reconnect	13,1V/2613,1V/26,2V o 14V/28V o algorithm BatteryLife				-			
Operating temp.	-30°C ÷ +60°C							
Protection class	IP43 (electronic components) - IP22 (connections)							
Dimensions mm (“)	100x113x40 (3.9x4.5x1.6)		100x113x50 (3.9x4.5x2)	100x113x60 (3.9x4.5x2.4)	130x186x70 (5.1x7.3x2.8)			
Weighto kg (lbs)	0,5 (1.1)		0,6 (1.3)	0,65 (1.4)	1,3 (2.9)		1,25 (2.8)	

SMARTSOLAR TR & MC4 CHARGE CONTROLLERS: 150/45 - 150/60 - 150/70 - 150/85 - 150/100

- **Ultra-fast Maximum Power Point Tracking (MPPT)**: improve energy harvest by up to 30% compared to PWM charge controllers and by up to 10 % compared to slower MPPT controllers
- **Advanced Maximum Power Point Detection in case of partial shading conditions**
- **Outstanding conversion efficiency**: Maximum efficiency exceeds 98%.
- **Flexible charge algorithm**: Fully programmable charge algorithm, and eight preprogrammed algorithms, selectable with a rotary switch
- **Extensive electronic protection**: Over-temperature protection and power derating when temperature is high. PV short circuit and PV reverse polarity protection. PV reverse current protection
- **Internal temperature sensor**
- **Real-time data display options**: Apple and Android smartphones, tablets and other devices and GX devices.l
- **Bluetooth smart built-in, dongle not needed**
- **VE.Direct and VE.CAN**: For a wired data connection
- **Remote on-off**: To connect for example to a VE.BUS BMS
- **Programmable relay**
- **Pluggable LCD display (optional)**
- **Warranty**: 5 years

TR

MC4

SmartSolar pluggable display - 21162X (optional)

MODEL	150/45	150/60	150/70	150/85	150/100
Part No. TR	22311T	22254H	22314Z	-	-
Part No. MC4	22312V	22313X	22315B	-	-
Part No. TR VE.CAN	-	-	23157R	23255R	23138L
Part NO. MC4 VE.CAN	-	-	-	23837P	23512J
Battery voltage	12V/24V/48V auto detect				
Maximum output current	45 A	60 A	70 A	85 A	100 A
Maximum PV power	650W (12V) 1300W (24V) 2600W (48V)	860W (12V) 1720W (24V) 3440W (48V)	1000W (12V) 2000W (24V) 4000W (48V)	1200W (12V) 2400W (24V) 4900W (48V)	1450W (12V) 2900W (24V) 5800W (48V)
Maximum PV open circuit voltage	150V absolute max. coldest conditions 145V start-up and operating max.		150V absolute max. coldest conditions 145V start-up and operating max.		
Maximum efficiency	98%			99%	
Self-consumption	Less than 35mA @ 12V / 20 mA @ 48V				
Operating temperature	-30°C ÷ +60°C				
Protection class	IP43 (electronic components) - IP22 (connections)				
Dimensions TR mm (“)	216x295x103 (8.5x11.6x4.1)				
Dimensions MC4 mm (“)	246x295x103 (9.7x11.6x4.1)				
Weight kg (lbs)	4,5 (9.9)				

SMARTSOLAR TR & MC4 CHARGE CONTROLLERS: 250/60 - 250/70 - 250/85 - 250/100

- **Ultra-fast Maximum Power Point Tracking (MPPT)**: improve energy harvest by up to 30% compared to PWM charge controllers and by up to 10 % compared to slower MPPT controllers
- **Advanced Maximum Power Point Detection in case of partial shading conditions**
- **Outstanding conversion efficiency**: Maximum efficiency exceeds 98%.
- **Flexible charge algorithm**: Fully programmable charge algorithm, and eight preprogrammed algorithms, selectable with a rotary switch
- **Extensive electronic protection**: Over-temperature protection and power derating when temperature is high. PV short circuit and PV reverse polarity protection. PV reverse current protection
- **Internal temperature sensor**
- **Real-time data display options**: Apple and Android smartphones, tablets and other devices. ColorControl panel
- **Bluetooth smart built-in, dongle not needed**: The wireless solution to set-up and monitor the controller
- **VE.Direct and VE.CAN**: For a wired data connection
- **Remote on-off**: To connect for example to a VE.BUS BMS
- **Programmable relay**
- **Pluggable LCD display (optional)**
- **Warranty**: 5 years

TR

MC4

SmartSolar pluggable display - 21162X (optional)

MODEL	250/60	250/70	250/85	250/100
Part No. TR	22316D	22318H	-	-
Part No. MC4	22317F	22319K	-	-
Part No. TR VE.CAN	-	23256T	23257V	23258X
Part No. MC4 VE.CAN	-	-	23838S	21384S
Battery voltage	12V/24V/48V auto detect			
Maximum output current	60 A	70 A	85 A	100 A
Maximum PV power	860W (12V) 1720W (24V) 3440W (48V)	1000W (12V) 2000W (24V) 4000W (48V)	1200W (12V) 2400W (24V) 4900W (48V)	1450W (12V) 2900W (24V) 5800W (48V)
Maximum PV open circuit voltage	250V absolute maximum coldest conditions 245V start-up and operating maximum		250V absolute maximum coldest conditions 245V start-up and operating maximum	
Maximum efficiency	98%		99%	
Self-consumption	Less than 35mA @ 12V / 20 mA @ 48V			
Operating temperature	-30°C ÷ +60°C			
Protection class	IP43 (electronic components) - IP22 (connections)			
Dimensions TR mm (“)	216x295x103 (8.5x11.6x4.1)			
Dimensions MC4 mm (“)	246x295x103 (9.7x11.6x4.1)			
Weight kg (lbs)	4,5 (9.9)			

VICTRON ENERGY® - MPPT CHARGE CONTROLLERS

RS 450/100 AND RS 450/200 SMARTSOLAR CHARGE CONTROLLERS

- **Ultra-fast Maximum Power Point Tracking (MPPT) Solar Charge Controller**: the MPPT RS SmartSolar is a 48V Solar charge controller with up to 450VDC PV input and either 100A, or 200A output. It is used in on-grid and off-grid solar applications where maximum battery charging power is required.
- **Multiple independent MPPT tracking inputs**: with multiple MPPT trackers, you can optimize your solar panel design for maximum performance for your specific location.
- **Isolated PV connections for additional safety**: full galvanic isolation between PV and battery connections provide additional overall system safety.
- **Wide MPPT voltage range**: 80 – 450 VDC PV operating range, with a 120VDC PV startup voltage.
- **Light weight, efficient and quiet**: thanks to high frequency technology and a new design this powerful charger weighs only 7.9 kg for the 100A model. In addition to this it has an excellent efficiency, low standby power, and a very quiet operation.
- **Display and Bluetooth**: the display reads battery, and controller parameters. The parameters can be accessed with a smartphone or other Bluetooth enabled device. In addition, Bluetooth can be used to set up the system and to change settings with VictronConnect.
- **PV Isolation resistance monitoring for peace of mind at higher voltages**: the MPPT RS continuously monitors the PV array and can detect if there are faults that reduce the isolation of the panels to unsafe levels.
- **VE.Can and VE.Direct port**: for connection to a GX device for system monitoring, data logging, and remote firmware updates. VE.Can allows for up to 25 units to be connected together in parallel and synchronize their charging.
- **I/O connections**: programmable Relay, temperature sensor, auxiliary, digital input and voltage sensor connections. The remote input can accept the Victron smallBMS, and other BMS with allow-to-charge signal.

SmartSolar RS 450/100

SmartSolar RS 450/200

MODEL	RS 450/100	RS 450/200
Part No.	23617Z	21974P
Battery voltage	48 V	48 V
Rated charge current	100 A	200 A
Maximum charge power	5,8 kW at 57,6 V	11,5 kW a 57,6 V
Maximum efficiency	96%	96%
Self-consumption	15 mA	15 mA
Operating temperature	from -40 to +60°C (fan assisted cooling)	from -40 to +60°C (fan assisted cooling)
Protection class	IP21	IP21
Dimensions mm (“)	440x313x126 (17.3x12.3x4.9)	487x434x146 (19.2x17.1x5.7)
Weight kg (lbs)	7,9 (17.4)	13,7 (30.2)

BLUESOLAR PWM CHARGE CONTROLLER-LCD & USB 12/24V & 48V

- **Liquid crystal display:** for status monitoring and set-up
- **Load output:** over-discharge of the battery can be prevented by connecting all loads to the load output.
  The load output will disconnect the load when the battery has been discharged to a pre-set voltage.
  Some loads (especially inverters) can best be connected directly to the battery, and the inverter remote control connected to the load output.
  A special interface cable may be needed, please see the manual.
  The connect and disconnect voltages are adjustable.
- **Day/night timing of the load output:** this option allows for a pre-set ON-time after dusk.
- **Programmable battery charge algorithm:** preprogrammed algorithms for AGM, GEL, Flooded or LiFePO4 batteries (with internal BMS only)
- **Two 5 Volt USB outputs:** maximum current (both outputs combined) 2A

BlueSolar DUO LCD USB 12/24V-20A

MODEL	12/24-5	12/24-10	12/24-20	12/24-20 DUO	12/24-30	48-10	48/20	48/30
Part No.	23676S	22976Z	22979F	23709E	22980P	23131W	23682L	23683N
Battery voltage	12/24V with automatic system voltage detection					48V		
Rated charge current	5A	10A	20A		30A	10A	20A	30A
Automatic load disconnect	Yes			10,5V/21V	Yes			
Max. PV voltage	28V / 55V (1)					100V (1)		
Self-consumption	<10mA							
Load output	Manual control + low voltage disconnect +timer (DUO version: 2 ports USB 5V/2A)							
Protection	Battery reverse polarity (fuse) - Output short circuit - Over temperature							
Overload protection	Shut down after 60 s in case of 130% load							
	Shut down after 5 s in case of 160% load							
	Short circuit: immediate shut down							
Grounding	Common positive			Common negative	Common positive			
Operating temperature range	-35 to +60°C (full load)			-35 to +55°C (full load)	-35 to +60°C (full load)			
Humidity	Max 95% (non-condensing)							
Dimensions HxWxD mm (“)	96x169x36 (3.8x6.7x1.4)			101x184x47 (4x7.4x1.8)				
Weight kg (lbs)	0,15 (0.33)			0,3 (0.7)				

(1) For 12V use 36 cell solar panels
For 24V use 72 cell solar panels or 2x 36 cell in series
For 48V use 2x 72 cell solar panels or 4x 36 cell in series

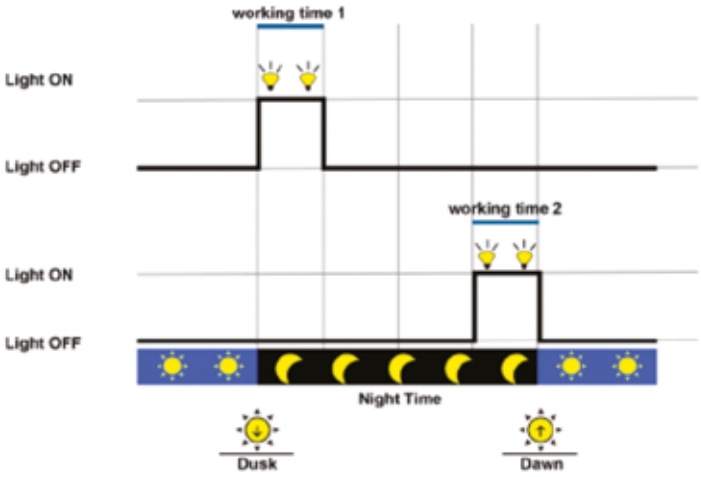
- **Programmable**: The BlueSolar PWM-Pro series is ready for use with its default settings. It also is fully programmable with help of the dedicated BlueSolar Pro Remote Panel.

BLUE SOLAR PWM AND PWM-PRO CHARGE CONTROLLERS

- Low cost PWM controller
- Lighting control function, fully programmable with the **Remote Panel** (optional) - 69450 X
- Three stage battery charging (bulk, absorption, float), fully programmable with the Remote Panel (optional)
- Integrated battery monitor function (Remote Panel needed to display state of charge)
- Load output with low voltage disconnect and manual control (default setting)
- **Optional external temperature sensor** - 69898 V
- **BlueSolar PWM Pro to USB interface cable** - 60101 SA
- Load output protected against over load and short circuit
- Protected against reverse polarity connection of the solar panels and/or battery
- Protection category: IP30
- Certifications: IEC62103-1, EN61000-6-1, EN 61000-6-3, ISO 7637-2
- **Warranty**: 5 years

BlueSolar PWM-Pro10A

BlueSolar Pro Remote Panel (optional) - 69450 X



MODEL	PWM-PRO 12/24-10	PWM-PRO 12/24-20	PWM-PRO 12/24-30
Part No.	69446G	69368N	69452B
Voltage	12 V 24 V	12 V 24 V	12 V 24 V
Rated load current	10 A 10 A	20 A 20 A	30 A 30 A
Maximum solar voltage	28 V 55 V	28 V 55 V	28 V 55 V
Self consumption	<10mA	<10mA	<10mA
Low voltage load disconnect	11,1V / 22,2V	11,1V / 22,2V	11,1V / 22,2V
Low voltage load reconnect	12,6V / 25,2V	12,6V / 25,2V	12,6V / 25,2V
Operating temperature	-20 to + 50°C	-20 to + 50°C	-20 to + 50°C
Dimensions mm (“)	70 x 138 x 37 (2.8 x 5.4 x 1.5)	82 x 160 x 48 (3.2 x 6.2 x 1.8)	100 x 200 x 57 (3.9 x 7.9 x 2.2)
Weight kg (lbs)	0,13 (0.3)	0,3 (0.7)	0,5 (1.1)

BLUE POWER SMART CHARGER IP22

With up to 94% efficiency, these chargers generate up to four times less heat when compared to the industry standard. And once the battery is fully charged, power consumption reduces to 0,5 Watt, some five to ten times better than the industry standard.
Bluetooth built-in function for smartphone monitoring

Standard features

Adaptive 6-stage charge algorithm: test-bulk–absorption-recondition–float–storage. Storage Mode: less maintenance and aging when the battery is not in use. Also charges Li-ion batteries. NIGHT and LOW setting: the output current is reduced to max. 25% of the nominal output and the charger will be totally noiseless. Protected against overheating. Eleven LEDs for Status indication.
Warranty: 5 years

BLUE SMART IP 22

MODEL	PART No.	INPUT VOLTAGE RANGE	CHARGE VOLTAGE ABSORPTION	CHARGE CURRENT	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs)
12/15 IP22 (1)	21661S	180-265V AC / 45-65 Hz	Variable*	15A	235x108x65 (9.2x4.2x2.6)	1,4 (3.1)
12/15 IP22 (3)	21662U	180-265V AC / 45-65 Hz	Variable*	15A	235x108x65 (9.2x4.2x2.6)	1,4 (3.1)
12/20 IP22 (1)	21663W	180-265V AC / 45-65 Hz	Variable*	20A	235x108x65 (9.2x4.2x2.6)	1,4 (3.1)
12/20 IP22 (3)	21664Y	180-265V AC / 45-65 Hz	Variable*	20A	235x108x65 (9.2x4.2x2.6)	1,4 (3.1)
12/30 IP22 (1)	21665A	180-265V AC / 45-65 Hz	Variable*	30A	235x108x65 (9.2x4.2x2.6)	1,4 (3.1)
12/30 IP22 (3)	21553N	180-265V AC / 45-65 Hz	Variable*	30A	235x108x65 (9.2x4.2x2.6)	1,4 (3.1)
24/8 IP22 (1)	22135Z	180-265V AC / 45-65 Hz	Variable*	8A	235x108x65 (9.2x4.2x2.6)	1,4 (3.1)
24/12 IP22 (1)	23129K	180-265V AC / 45-65 Hz	Variable*	12A	235x108x65 (9.2x4.2x2.6)	1,4 (3.1)
24/16 IP22 (1)	22219F	180-265V AC / 45-65 Hz	Variable*	16A	235x108x65 (9.2x4.2x2.6)	1,4 (3.1)
24/16 IP22 (3)	22258S	180-265V AC / 45-65 Hz	Variable*	16A	235x108x65 (9.2x4.2x2.6)	1,4 (3.1)

*** Absorption:** 12V Normal 14,4V, High 14,6V, Li-ion 14,2V – 24V Normal 28,8V, High 29,2V, Li-ion 28,4V
Float: 12V Normal 13,8V, High 13,8V, Li-ion 13,35V – 24V Normal 27,6V, High 27,6V, Li-ion 26,7V
Storage: 12V Normal 13,2V, High 13,8V, Li-ion n.d. – 24V Normal 26,4V, High 26,4V, Li-ion: n.d

BLUE SMART PORTABLE BATTERY CHARGER IP65 WITH DC CONNECTOR

- Water, dust and chemical resistant
- Seven step smart charge algorithm
- Recovery of fully discharged "dead" batteries
- Automatic power supply function
- Automatic compensation for high or low temperature
- Several other battery life enchancing features
- Li-ion battery mode
- Bluetooth built-in function for smartphone monitoring
- **Warranty**: 5 years

BLUE SMART IP 65

MODEL	PART No.	INPUT VOLTAGE RANGE	CHARGE VOLTAGE ABSORPTION	CHARGE CURRENT	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs)
12/4 IP65	21654V	180-265V AC / 45-65 Hz	14,4V DC	4A	47x95x190 (1.8x3.7x7.5)	0,9 (2.0)
12/5 IP65	21655X	180-265V AC / 45-65 Hz	14,4V DC	5A	47x95x190 (1.8x3.7x7.5)	0,9 (2.0)
12/7 IP65	21656Z	180-265V AC / 45-65 Hz	14,4V DC	7A	47x95x190 (1.8x3.7x7.5)	0,9 (2.0)
12/10 IP65	21657B	180-265V AC / 45-65 Hz	14,4V DC	10A	60x105x190 (2.4x4.1x7.5)	0,9 (2.0)
12/15 IP65	21658D	180-265V AC / 45-65 Hz	14,4V DC	15A	60x105x190 (2.4x4.1x7.5)	0,9 (2.0)
12/25 IP65	23053C	180-265V AC / 45-65 Hz	14,4V DC	25 A	75x140x240 (2.9x5.5x9.4)	1.9 (4.2)
24/5 IP65	21659F	180-265V AC / 45-65 Hz	28,8V DC	5A	47x95x190 (1.8x3.7x7.5)	0,9 (2.0)
24/8 IP65	21660P	180-265V AC / 45-65 Hz	28,8V DC	8A	60x105x190 (2.4x4.1x7.5)	0,9 (2.0)
24/13 IP65	23054E	180-265V AC / 45-65 Hz	28,8V DC	13A	75x140x240 (2.9x5.5x9.4)	1,9 (4.2)

ACCESSORIES

M6 eyelet connector with fuse - 69856C
2 m extension cable - 69857E
12V cigarette lighter plug with fuse - 69858G
Connect clamps with fuse - 69859J

BLUE SMART BATTERY CHARGERS - WATERPROOF - IP 67

- Power supply range : 180-265 VAC
- Completely encapsulated body. Water, oil or dirt will not damage the Blue Power IP67 charger. The casing is made of cast aluminium and the electronics are moulded in resin.
- Top level efficiency: with 92% efficiency or better, these chargers waste three to four times less heat
- Adaptive 4-stage charge algorithm: bulk – absorption – float – storage. The Blue Smart charger features a microprocessor controlled 'adaptive' battery management. This feature will automatically optimise the charging process relative to the way the battery is being used.
- Bluetooth built-in function for smartphone monitoring
- **Warranty**: 5 years

BLUE SMART IP 67

MODEL	PART No.	INPUT VOLTAGE RANGE	CHARGE VOLTAGE	CHARGE CURRENT	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs)
12/7 IP67	21544M	180-265V AC / 45-65 Hz	14,4V DC	7A	85x211x60 (3.4x8.3x2.4)	1,8 (4)
12/13 IP67	21378X	180-265V AC / 45-65 Hz	14,4V DC	13A	85x211x60 (3.4x8.3x2.4)	1,8 (4)
12/17 IP67	21667E	180-265V AC / 45-65 Hz	14,4V DC	17A	99x219x65 (3.9x8.6x2.6)	2,4 (5.3)
12/25 IP67	21668G	180-265V AC / 45-65 Hz	14,4V DC	25A	99x219x65 (3.9x8.6x2.6)	2,4 (5.3)
12/25 IP67 (1+SI)	21669J	180-265V AC / 45-65 Hz	14,4V DC	25A	99x219x65 (3.9x8.6x2.6)	2,4 (5.3)
24/5 IP67	21670T	180-265V AC / 45-65 Hz	28,8V DC	5A	85x211x60 (3.4x8.3x2.4)	1,8 (4)
24/8 IP67	21671V	180-265V AC / 45-65 Hz	28,8V DC	8A	99x219x65 (3.9x8.6x2.6)	2,4 (5.3)
24/12 IP67	21672X	180-265V AC / 45-65 Hz	28,8V DC	12A	99x219x65 (3.9x8.6x2.6)	2,4 (5.3)
24/12 IP67 (1+SI)	21673Z	180-265V AC / 45-65 Hz	28,8V DC	12A	99x219x65 (3.9x8.6x2.6)	2,4 (5.3)

The models with suffix (1+Si) feature a second current limited output which is always powered as long as 180 - 265 VAC is present on the input. This output can for example be used to prevent starting of a vehicle before unplugging the battery charger (start interrupt function).

victron energy
BLUE POWER

PHOENIX SMART IP43 BATTERY CHARGERS

Bluetooth Smart enabled
Any Bluetooth enabled smart phone, tablet or other device can be used to monitor, to change settings and to update the charger when new software features become available.
Phoenix Smart (1+1): two outputs to charge 2 battery banks
The second output, limited to approximately 3A and with a slightly lower output voltage, is intended to top up a starter battery.
Phoenix Smart (3): three full current outputs to charge 3 battery banks
Each output can supply the full rated output current. But the total of the 3 outputs combined can never exceed the current rating of the charger.
Automatic voltage compensation
The charger compensates for voltage drop over the DC cabling by slightly increasing output voltage when the DC current increases.
Adaptive 5-stage charge algorithm: bulk, absorption, recondition, float, storage
The Phoenix Smart Charger features our well-known 'adaptive' battery management system that can be preset to suit different types of batteries. The 'adaptive' feature will automatically optimise the charge process relative to the way the battery is being used.
The right amount of charge: variable absorption time
When only shallow discharges occur (a yacht connected to shore power for example) the absorption time is kept short in order to prevent overcharging of the battery. After a deep discharge the absorption time is automatically increased to make sure that the battery will be fully charged.
Also charges Li-ion (LiFePO4) batteries
Charger on-off control can be implemented by connecting a relay or open collector optocoupler output from a Li-ion BMS to the remote on-off port. Alternatively full control of voltage and current can be achieved with Bluetooth.
Fully programmable charge algorithm
The charge algorithm can be programmed with help of Bluetooth or the VE.Direct interface. Three preprogrammed algorithms can be selected with the mode button.
Remote on-off
The remote on/off consists of two terminals: Remote H and Remote L. A remote on/off switch or relay contact can be connected between H and L. Alternatively, terminal H can be pulled high, or terminal L can be pulled low.
VE.Direct interface
For a wired data connection to a Color Control panel, PC or other devices.
Programmable relay
Can be programmed using the VE.Direct interface or a Bluetooth enabled device to trip on an alarm or other events.

PHOENIX SMART IP43 (1+1)

PHOENIX SMART IP43 (3)

2m CA cable with CEE 7/7 option.
To be ordered separately - 23069U

MODEL	PART No.	INPUT VOLTAGE	FREQUENCY	CHARGE VOLTAGE	CHARGE CURRENT	DIMENSIONS HxWxD mm (")	WEIGHT kg (lbs)
12/30 (1+1)	23886D	230 VCA	45-65 Hz	14,4 V	30/50 A	180x249x100 (7.1x9.8x4)	3,5 (7.7)
12/30 (3)	23063F	230 VCA	45-65 Hz	14,4 V	30/50 A	180x249x100 (7.1x9.8x4)	3,5 (7.7)
12/50 (1+1)	23064H	230 VCA	45-65 Hz	14,4 V	30/50 A	180x249x100 (7.1x9.8x4)	3,5 (7.7)
12/50 (3)	23880R	230 VCA	45-65 Hz	14,4 V	30/50 A	180x249x100 (7.1x9.8x4)	3,5 (7.7)
24/16 (1+1)	23065K	230 VCA	45-65 Hz	28,8 V	16/25 A	180x249x100 (7.1x9.8x4)	3,5 (7.7)
24/16 (3)	23066M	230 VCA	45-65 Hz	28,8 V	16/25 A	180x249x100 (7.1x9.8x4)	3,5 (7.7)
24/25 (1+1)	23067P	230 VCA	45-65 Hz	28,8 V	16/25 A	180x249x100 (7.1x9.8x4)	3,5 (7.7)
24/25 (3)	23068S	230 VCA	45-65 Hz	28,8 V	16/25 A	180x249x100 (7.1x9.8x4)	3,5 (7.7)

CENTAUR BATTERY CHARGERS: analogic control

Centaur battery chargers have automatic three stage IUoUo charging. All models are designed to operate all over the world without any adjustment needed on input voltage range or frequency. They have three isolated outputs to simultaneously charge 3 battery banks. Each output is capable to supply the full rated current.

Standard features

Aluminium epoxy powder coated case with drip shield, circuit board protection with an acrylic coating, built-in temperature sensors, forced cooling, protection against output short circuit and over temperature, analog ammeter, DIP switch for selection of charge/float voltage for flooded lead-acid, gel or AGM batteries, Europe CE certification and U.S.A. UL certification. Temperature range: -20 + 60° C
Warranty: 5 years

CENTAUR

MOD.	Part No.	INPUT VOLTAGE RANGE	CHARGE VOLT ABSORPTION	CHARGE CURRENT(1)	Ah BATTERIES	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs)
12/20	64886K	90-265V AC / 45-65 Hz	14.3 VDC	20 A	80 /200	355 x 215 x 110 (14.0 x 8.5 x 4.3)	3,8 (8.4)
12/30	64887M	90-265V AC / 45-65 Hz	14.3 VDC	30 A	120/300	355 x 215 x 110 (14.0 x 8.5 x 4.3)	3,8 (8.4)
12/40	64888P	90-265V AC / 45-65 Hz	14.3 VDC	40 A	160/400	426 x 239 x 135 (16.8 x 9.4 x 5.3)	5 (11)
12/50	64889S	90-265V AC / 45-65 Hz	14.3 VDC	50 A	200/500	426 x 239 x 135 (16.8 x 9.4 x 5.3)	5 (11)
12/60	64890A	90-265V AC / 45-65 Hz	14.3 VDC	60 A	240/600	426 x 239 x 135 (16.8 x 9.4 x 5.3)	5 (11)
12/80	64891C	90-265V AC / 45-65 Hz	14.3 VDC	80 A	320/800	505 x 255 x 130 (19.9 x 10.0 x 5.2)	12 (26.4)
12/100	64892E	90-265V AC / 45-65 Hz	14.3 VDC	100 A	400/1000	505 x 255 x 130 (19.9 x 10.0 x 5.2)	12 (26.4)
24/16	64894J	90-265V AC / 45-65 Hz	28.5 VDC	16 A	45/150	355 x 215 x 110 (14.0 x 8.5 x 4.3)	3,8 (8.4)
24/30	64895L	90-265V AC / 45-65 Hz	28.5 VDC	30 A	120/300	426 x 239 x 135 (16.8 x 9.4 x 5.3)	5 (11)
24/40	64896N	90-265V AC / 45-65 Hz	28.5 VDC	40 A	160/400	505 x 255 x 130 (19.9 x 10.0 x 5.2)	12 (26.4)
24/60	64897R	90-265V AC / 45-65 Hz	28.5 VDC	60 A	240/600	505 x 255 x 130 (19.9 x 10.0 x 5.2)	12 (26.4)

(1) 100 % output up to 40°C, 80% nominal output at 50°C and 60% of nominal at 60°C

SKYLLA BATTERY CHARGERS - microprocessor control

Skylla battery chargers have automatic three stage IUoUo charging. They are designed for use on battery banks with 24V DC / 48V DC. They have two outputs, two full charge output and one output limited to 4 A.

Standard features
Aluminium epoxy powder coated case with drip shield, circuit board protection with an acrylic coating, built-in temperature sensors, forced cooling, protection against output short circuit and over temperature, battery temperature sensor, compensation on cable voltage drop, feeder function.
Warranty: 5 years

SKYLLA

SKYLLA GMDSS BATTERY CHARGERS

Power supply: The Skylla TG has proven itself to be an excellent battery charger and power supply for GMDSS applications. However, when using a standard Skylla charger, additional equipment is needed to perform the monitoring and alarm functions required for GMDSS.
No adjustments needed: The whole system is 'click and go': the panels are pre-programmed for GMDSS functionality. A simple, intuitive menu allows changing of settings if required.
Battery time to go: The Skylla GMDSS charger has a built-in battery controller. The capacity of the battery is fully monitored so the panel can even indicate the 'time to go' in case of a power supply black out.
Warranty: 5 years

SKYLLA GMDSS

MOD.	Part No.	INPUT VOLTAGE RANGE	CHARGE VOLTAGE (Absorption)	CHARGE CURRENT(1)	Ah BATTERIES	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs)
TG 24/30	64904J	185-265V AC / 45-65 Hz	28.5 VDC	30 A + 4 A	150/300	365 x 250 x 147 (14.4 x 9.9 x 5.8)	5,5 (12.1)
TG 24/30 GMDSS	66036V	185-265V AC / 45-65 Hz	28.5 VDC	30 A + 4 A	150/300	365 x 250 x 147 (14.4 x 9.9 x 5.8)	6 (13.2)
TG 24/50	64905L	185-265V AC / 45-65 Hz	28.5 VDC	50 A + 4 A	250/500	365 x 250 x 147 (14.4 x 9.9 x 5.8)	5,5 (12.1)
TG 24/50 GMDSS	67918M	90-265V AC / 45-65 Hz	28.5 VDC	50 A + 4 A	250/500	485 x 250 x 147 (19.1 x 9.9 x 5.8)	6 (13.2)
TG 24/50 3 fasi	68895H	320-450V AC / 45-65 Hz	28.5 VDC	50 A + 4 A	250/500	365 x 250 x 257 (14.4 x 10.2 x 10.1)	13 (28.7)
TG 24/80	64906N	185-265V AC / 45-65 Hz	28.5 VDC	80 A + 4 A	400/800	365 x 250 x 257 (14.4 x 9.9 x 10.1)	10 (22)
TG 24/100	64907R	185-265V AC / 45-65 Hz	28.5 VDC	100 A + 4 A	500/1000	365 x 250 x 257 (14.4 x 9.9 x 10.1)	10 (22)
TG 24/100 3 fasi	64908T	320-450V AC / 45-65 Hz	28.5 VDC	100 A + 4 A	500/1000	515 x 260 x 265 (20.0 x 10.2 x 10.4)	23 (48)
TG 48/25	64909V	185-265V AC / 45-65 Hz	57 VDC	25 A + 4 A	125/250	365 x 250 x 147 (14.4 x 9.9 x 5.8)	5,5 (12.1)
TG 48/50	64910D	185-265V AC / 45-65 Hz	57 VDC	50 A + 4 A	250/500	365 x 250 x 257 (14.4 x 9.9 x 10.1)	10 (22)

(1) 100 % output up to 40°C, 80% nominal output at 50°C and 60% of nominal at 60°C.
OPTIONAL: Skylla control panel - 65007G

VICTRON ENERGY® - BATTERY CHARGERS

SKYLLA-IP65 BATTERY CHARGERS

- Skylla-IP65 (1+1): two outputs to charge 2 battery banks
- Skylla-IP65 (3): three full current outputs to charge 3 battery banks
- IP65 protection
- LCD display
- CAN bus (NMEA2000) interface
- Synchronised parallel operation
- The right amount of charge for a lead-acid battery: variable absorption time
- Preventing damage due to excessive gassing: the BatterySafe mode
- Less maintenance and aging when the battery is not in use: the Storage mode
- To increase battery life: temperature compensation
- Battery voltage sense
- Use as a power supply
- Li-Ion (LiFePO4) ready
- **Warranty**: 5 years

SKYLLA-IP65

MODEL	PART No.	INPUT VOLTAGE RANGE	CHARGE VOLTAGE	Ah BATTERIES	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs)
12/70 IP65 (1+1)	23776W	180-265V AC / 45-65 Hz	14.4V	350-700 Ah	401x265x151 (16x10.5x6)	6 (14)
12/70 IP65 (3)	23777Y	180-265V AC / 45-65 Hz	14.4V	350-700 Ah	401x265x151 (16x10.5x6)	6 (14)
24/35 IP65 (1+1)	23778A	180-265V AC / 45-65 Hz	28.8V	150-350 Ah	401x265x151 (16x10.5x6)	6 (14)
24/35 IP65 (3)	23779C	180-265V AC / 45-65 Hz	28.8V	150-350 Ah	401x265x151 (16x10.5x6)	6 (14)

SKYLLA-I BATTERY CHARGERS - MICROPROCESSOR CONTROL

- Synchronised parallel operation
- The right amount of charge for a lead-acid battery: variable absorption time
- Preventing damage due to excessive gassing: the BatterySafe mode
- Less maintenance and aging when the battery is not in use: the Storage mode
- To increase battery life: temperature compensation
- Battery voltage sense

- Power supply range : 180-265 VAC and 180-350 VDC
- This particular version has all the features of excellence present in the Skylla family and it adds other interesting features such as **The Predisposition** to charge Li-Ion (LiFePO4) and the Synchronised parallel operation via CANbus interface
- The Skylla-I chargers, as the other Skylla units, are suitable for AC and DC (AC-DC and DC-DC operation), and as a power source due to the perfect stabilization of the output voltage
- **Warranty**: 5 years

SKYLLA-i

MODEL	PART No.	INPUT VOLTAGE RANGE	CHARGE VOLTAGE	Ah BATTERIES	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs)
i 24/80 (1+1)	68896K	180-265V AC / 45-65 Hz	28.8V	400-800 Ah	402x250x140 (15.8x9.9x5.5)	8,0 (17.6)
i 24/80 (3)	68897M	180-265V AC / 45-65 Hz	28.8V	400-800 Ah	402x250x140 (15.8x9.9x5.5)	8,0 (17.6)
i 24/100 (1+1)	68898P	180-265V AC / 45-65 Hz	28.8V	500-1000Ah	402x250x140 (15.8x9.9x5.5)	8,0 (17.6)
i 24/100 (3)	68899S	180-265V AC / 45-65 Hz	28.8V	500-1000Ah	402x250x140 (15.8x9.9x5.5)	8,0 (17.6)

- (1+1) two outputs.
- (3) three full current outputs.

PHOENIX INVERTER

Developed for professional duty, **Phoenix** pure sine inverters are suitable for the widest range of applications.
The design criteria have been to produce a true sine wave inverter with optimised efficiency without compromise in performance. Employing hybrid HF technology, the result is a top quality product with compact dimensions, light in weight and capable of supplying power, problem-free, to any load. A unique feature of the **SinusMax** technology is very high start-up power. Phoenix inverters, in fact, are well suited to power up difficult loads such as: refrigeration compressors, electric motors and similar applications. Conventional high frequency technology does not offer such extreme performance.

CE

PHOENIX INVERTER up to 1200 VA

Standard features

Aluminium epoxy powder coated case with drip shield, circuit board protection with an acrylic coating, forced cooling with temperature sensors, remote connector, battery cables (1.5 m), output short circuit protection, over temperature protection.
Warranty: 5 years

CE

MODEL	PART No.	INPUT VOLTAGE RANGE DC	CONT. OUTPUT POWER - VA[1]	PEAK POWER-W		MAX. EFFIC. %	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs)
12/250 VE. Direct	20404P	9,2 – 17,0	250	400	OUTPUT: 230V AC ± 2% - 50 Hz ± 2%	87	86x165x260 (3.4x6.5x10.2)	2,4 (5.3)
12/375 VE. Direct	20405S	9,2 – 17,0	375	700		89	86x165x260 (3.4x6.5x10.2)	3,0 (6.6)
12/500 VE. Direct	20809T	9,2 – 17,0	500	900		90	86x172x275 (3.4x6.8x10.8)	3,9 (8.6)
12/800 VE. Direct	21549Y	9,2 – 17,0	800	1600		91	105x216x305 (4.2x8.5x11.9)	5,5 (12.1)
12/1200 VE. Direct	22852E	9,2 – 17,0	1200	2200		91	117x232x327 (4.6x9.1x12.9)	7,4 (16.3)
24/250 VE. Direct	20406U	18,4 – 34,0	250	350		88	86x165x260 (3.4x6.5x10.2)	2,4 (5.3)
24/375 VE. Direct	20407W	18,4 – 34,0	375	700		89	86x165x260 (3.4x6.5x10.2)	3,0 (6.6)
24/500 VE. Direct	20810B	18,4 – 34,0	500	900		90	86x172x275 (3.4x6.8x10.8)	3,9 (8.6)
24/800 VE. Direct	21550G	18,4 – 34,0	800	1500		90	105x216x305 (4.2x8.5x11.9)	5,5 (12.1)
24/1200 VE. Direct	21802H	18,4 – 34,0	1200	2200		91	117x232x327 (4.6x9.1x12.9)	7,4 (16.3)
48/250 VE. Direct	20408Y	36,8 – 62,0	250	400		88	86x165x260 (3.4x6.5x10.2)	2,4 (5.3)
48/375 VE. Direct	20409A	36,8 – 62,0	375	700		90	86x165x260 (3.5x6.5x10.2)	3,0 (6.6)
48/500 VE. Direct	20811D	36,8 – 62,0	500	900		91	86x172x275 (3.4x6.8x10.8)	3,9 (8.6)
48/800 VE. Direct	21551J	36,8 – 62,0	800	1500		91	105x216x305 (4.2x8.5x11.9)	5,5 (12.1)
48/1200 VE. Direct	22310R	36,8 – 62,0	1200	2200		92	117x232x327 (4.6x9.1x12.9)	7,4 (16.3)

(1) Continuous output power at 25° C

PHOENIX INVERTERS 1200 VA - 5000 VA

Developed for professional duty, the Phoenix range of inverters is suitable for the widest range of applications. The design criteria have been to produce a true sine wave inverter with optimized efficiency but without compromise in performance. A unique feature of the SinusMax technology is very high start-up power. Conventional high frequency technology does not offer such extreme performance. Phoenix nverters, however, are well suited to power up difficult loads such as refrigeration compressors, electric motors and similar appliances.
Up to 6 units inverters can operate in parallel to achieve higher power output. Six 24/5000 units, for example, will provide 24kW / 30kVA output power. Operation in 3-phase configuration is also possible.

To transfer the load to another AC source: the automatic transfer switch.
If an automatic transfer switch is required we recommend using the MultiPlus inverter/charger instead. The switch is included in these products and the charger function of the MultiPlus can be disabled. Computers and other electronic equipment will continue to operate without disruption because the MultiPlus features a very short switchover time (less than 20 milliseconds).

Computer interface: All models have a RS-485 port. All you need to connect to your PC is our MK2 interface (see under accessories). This interface takes care of galvanic isolation between the inverter and the computer, and converts from RS-485 to RS-232.
Warranty: 5 years

PHOENIX 1200 VA

CE

Standard features

Aluminum epoxy powder coated case with drip shield, circuit board protection with an acrylic coating, forced cooling with temperature sensors, protection against: output short circuit, overload, low battery voltage, reverse polarity, reverse voltage on output, input voltage ripple, high temperature.
Relay multifunction.

MODEL	PART No.	INPUT VOLTAGE RANGE V DC	CONT OUTPUT POWER VA(1)	PEAK POWER W	OUTPUT: 230V AC ± 2% - 50 Hz ± 2%	MAX. EFFIC %	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs)
C12/1200	64918W	9,5 – 17,0	1200	2400		92	375x214x110 (14.7x8.4x4.3)	10 (22)
C12/1600	64919Y	9,5 – 17,0	1600	3000		92	375x214x110 (14.7x8.4x4.3)	10 (22)
C12/2000	66407E	9,5 – 17,0	2000	4000		92	520x255x125 (20.5x10.0x4.9)	13 (28.6)
12/3000	66037X	9,5 – 17,0	3000	6000		93	362x258x218 (14.2x10.1x8.6)	18 (39.7)
C24/1200	64921J	19,0 – 33,0	1200	2400		94	375x214x110 (14.7x8.4x4.3)	10 (22)
C24/1600	64922L	19,0 – 33,0	1600	3000		94	375x214x110 (14.7x8.4x4.3)	10 (22)
C24/2000	66408G	19,0 – 33,0	2000	4000		92	520x255x125 (20.5x10.0x4.9)	13 (28.6)
24/3000	64923N	19,0 – 33,0	3000	6000		94	362x258x218 (14.2x10.1x8.6)	18 (39.7)
24/5000	66244C	19,0 – 33,0	5000	10.000		94	444x328x240 (17.5x12.9x9.4)	28 (61.7)
48/3000	64926V	38,0 – 66,0	3000	6000		95	362x258x218 (14.2x10.1x8.6)	18 (39.7)
48/5000	67257T	38,0 – 66,0	5000	10.000		95	444x328x240 (17.5x12.9x9.4)	28 (61.7)

(1) Continuous output power at 25°C
All models are suitable for parallel (max 6 parallel units) and 3-phase operation
OPTIONAL: control panel Phoenix CC Inverter – 65006 E

PHOENIX INVERTERS Smart

Bluetooth built-in: fully configurable with a tablet or smartphone

- Low battery voltage alarm
- Low battery voltage cut-off and restart levels
- Dynamic cut-off: load dependent cut-off level
- Output voltage: 210 - 245V
- Frequency: 50 Hz or 60 Hz
- ECO mode on/off and ECO mode sense level
- Alarm relay

Monitoring: in- and output voltage, load and alarms

VE.Direct communication port: the VE.Direct port can be connected to a computer (VE.Direct to USB interface cable needed) to configure and monitor the same parameters.

Proven reliability: the full bridge plus toroidal transformer topology has proven its reliability over many years. The inverters are short circuit proof and protected against overheating, whether due to overload or high ambient temperature.

High start-up power: needed to start loads such as power converters for LED lamps, halogen lamps or electric tools.

ECO mode: when in ECO mode, the inverter will switch to standby when the load decreases below a preset value. Once in standby the inverter will switch on for a short period every 2,5 seconds (adjustable). If the load exceeds the preset level, the inverter will remain on.

Remote on/off: a remote on/off switch or relay contact can be connected to a two pole connector. Alternatively, the H terminal (left) of the two pole connector can be switched to battery plus, or the L terminal (right) of the two pole connector can be switched to battery minus (or the chassis of a vehicle, for example).

To transfer the load to another AC source, the automatic transfer switch: for our low power inverters we recommend our Filax Automatic Transfer Switch. The Filax features a very short switchover time (less than 20 milliseconds) so that computers and other electronic equipment will continue to operate without disruption. Alternatively use a MultiPlus with built-in transfer switch.

PHOENIX Smart

MODEL	PART No.	INPUT VOLTAGE RANGE V DC	CONT OUTPUT POWER VA[1]	PEAK POWER VA	OUTPUT: 230V AC ± 2% - 50 - 60 Hz ± 0,1%	MAX. EFFIC %	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs))
Smart 12/1600	22825B	9,3 – 17	1600	3000		92	485x219x125 (19.1x8.6x4.9)	12 (26.5)
Smart 12/2000	22826D	9,3 – 17	2000	4000		92	485x219x125 (19.1x8.6x4.9)	13 (28.6)
Smart 12/3000	23059R	9,3 – 17	3000	6000		93	533x285x150 (21x11.2x5.9)	19 (41.9)
Smart 24/1600	22827F	18,6 – 34	1600	3000		94	485x219x125 (19.1x8.6x4.9)	12 (26.5)
Smart 24/2000	22828H	18,6 – 34	2000	4000		94	485x219x125 (19.1x8.6x4.9)	13 (28.6)
Smart 24/3000	23060Z	18,6 – 34	3000	6000		94	485x285x150 (19.1x11.2x5.9)	19 (41.9)
Smart 24/5000	23758U	18,6 – 34	5000	10000		95	595x295x160 (23.4x11.6x6.3)	29 (63.9)
Smart 48/1600	22829K	37,2 – 68	1600	3000		94	485x219x125 (19.1x8.6x4.9)	12 (26.5)
Smart 48/2000	22830U	37,2 – 68	2000	4000		94	485x219x125 (19.1x8.6x4.9)	13 (28.6)
Smart 48/3000	23148P	37,2 – 68	3000	6000		95	485x285x150 (19.1x11.2x5.9)	19 (41.9)
Smart 48/5000	21878U	37,2 – 68	5000	10000		96	555x295x160 (21.8x11.6x6.3)	28 (61.7)
Smart RS 48/6000	23687X	38 – 64	6000	12000		95	425x440x125 (16.7x17.3x4.9)	11 (24.2)

(1) Continuous output power at 25°C

IVICTRON ENERGY® - NVERTER AND INVERTER/BATTERY CHARGERS

victron energy
BLUE POWER

MULTI RS SOLAR 48/6000 & INVERTER RS SMART SOLAR 48/6000

- **Hybrid Inverter/Charger**: the Multi RS Solar 48/6000 is a 48 V 6 kVA Inverter/Charger with 450 VDC 4 kWp PV input.
- **Combination of an inverter, AC charger, and Solar MPPT**: the inverter produces a perfect sine wave, and able to supply high powered appliances. It is also bi-directional, charging the battery when excess solar power or AC supply is available, or converting from the battery when it is needed.
- **Wide MPPT voltage range**: 80 – 450 VDC, with a 120 VDC PV startup voltage.
- **Light weight, efficient and quiet**: thanks to high frequency technology and a new design this powerful inverter weighs only 11 kg. In addition to this it has an excellent efficiency, low standby power, and a very quiet operation.
- **Display, Bluetooth and VictronConnect app**: the display reads battery, inverter and solar parameters. The same parameters can be accessed with a smartphone or other Bluetooth enabled device, using the VictronConnect app.
- **Extendable PV capacity, both AC-coupled and DC-coupled**: the integrated 4 kWp PV capacity can be extended by adding Solar Chargers to the system, for example our Smart Solar Charger range, including the Smart Solar RS models. When connected in a VE.Can network, all battery charging will operate synchronously and coordinated. Alternatively, the PV capacity can be extended by installing PV Inverters, of which the output power will be automatically controlled by the integrated Frequency Shift Power Control.
- **Communication ports**: VE.Can connection to a GX device for system monitoring, data logging, and remote firmware updates. VE.Direct connection to a GlobalLink 520 for remote data monitoring.
- **I/O Connections**: programmable Relay, temperature sensor and voltage sensor connections. The remote input can also be configured to accept the Victron smallBMS.

MULTI RS SOLAR 48/6000

INVERTER RS SMART SOLAR 48/6000

MODEL	MULTI RS SOLAR 48/6000	INVERTER RS SMART SOLAR 48/6000
Part No.	24920F	23687X
DC Input voltage range	38-62V	38-62V
Output	230V AC ± 2%	230V AC ± 2%
Frequency	50 Hz ± 0,1%	50 Hz ± 0,1%
Continuous output power at 25°C	4800 W	4800 W
Continuous output power at 40°C	4500 W	4500 W
Continuous output power at 65°C	3000 W	3000 W
Peak powwer	9000 W	9000 W
Maximum efficiency	95%	95%
Zero load power	20 W	20 W
Operating temperature	from -40 to +65°C	from -40 to +65°C
Communication ports	VE.Direct e VE.Can	VE.Direct e VE.Can
Dimensions HxWxD mm (")	425x440x125 (16.7x17.3x4.9)	425x440x125 (16.7x17.3x4.9)
Weight kg (lbs)	11 (24.2)	11 (24.2)

victron energy
BLUE POWER

MULTIPLUS

The MultiPlus is a powerful true sine wave inverter, a sophisticated battery charger that features adaptive charge technology, and a high-speed AC transfer switch in a single compact enclosure.
The MultiPlus is compatible with Lithium-ion batteries (see more in the related documentation).

Warranty: 5 years

MULTI

MULTIPLUS COMPACT

MULTIPLUS

Double AC outputs
The main output features a no-break function: when the shore power or the genset power fails, the MultiPlus takes charge of the active loads without discontinuity. The second output is active only when an AC source is connected. The loads that may discharge the batteries, like the boiler, shall be connected to the second output.

Parallel operation and three-phase configuration
The MultiPlus are able to be installed in parallel up to 6 units. In addition to parallel connection, three units of the same model can be configured for three-phase output: up to 6 sets of three units can be parallel connected for a total output of 75KW /90kVA and a current of 2000A.

Power Control
The MultiPlus is a very powerful battery charger, drawing high currents from the genset or from the shore power (up to 10A per 5kVA Multi at 230 VAC). In order to avoid any generator or shore overload, a current limit can be set through the Multi Control Panel; this way the Multiplus will charge the battery with the current not used from the others AC loads on board.

Power Assist
In the event that the onboard load exceeds the available shore power, the inverter function works in parallel with the shore connection to boost the total energy available and avoid overload. This works just the same with a generator.

Warranty: 5 years
Four stage adaptive charger and dual battery charging

System configuration
After installation, the MultiPlus is ready to work. If settings have to be changed, this can be done with the DIP switch setting procedure. Even parallel and 3-phase operation can be programmed with DIP switches. The accessory USB-MK3 can be used as well for any setting modification via PC and VE.BUS configure tools software.

VICTRON ENERGY® - MULTI-FUNCTION INVERTER/BATTERY CHARGERS

MODEL	PART No.	INPUT VOLTAGE RANGE	CONT. OUTPUT POWER (1)	OUTPUT	BATTERY CHARGE INPUT VOLTAGE RANGE	BATTERY CHARGE CHARGE CURRENT	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs)
12/500/20-16	20813H	9,5 – 17 V	500	230V AC ± 2% 50 Hz ± 2%	187-265 V AC / 45-55 Hz	20 A + 1 A	311x182x100 (12.2x7.2x3.9)	4,4 (9.7)
12/800/35-16	21623H	9,5 – 17 V	800			35 A + 1 A	360x240x100 (14.2x9.5x3.9)	6,4 (14.1)
12/1200/50-16	21711E	9,5 – 17 V	1200			50 A + 1A	406x250x100 (16x9.8x3.9)	8,2 (18.1)
12/1600/70-16	23061B	9,5 – 17 V	1600			70 A + 1A	470x265x120 (18.5x10.4x4.7)	10,2 (22.5)
12/2000/80-32	21869T	9,5 – 17 V	2000			80 A + 4 A	520x255x125 (20.5x10x4.9)	13 (28.7)
12/3000/120-16	69362A	9,5 – 17 V	3000			120 A + 4 A	362x258x218 (14.2x10.1x8.6)	18 (39.7)
12/3000/120-50	69363C	9,5 – 17 V	3000			120 A + 4 A	362x258x218 (14.2x10.1x8.6)	18 (39.7)
C12/800/35-16	69358K	9,5 – 17 V	800			35 A + 4 A	375x214x110 (14.7x8.4x4.3)	10 (22)
C12/1200/50-16	69359M	9,5 – 17 V	1200			50 A + 4 A	375x214x110 (14.7x8.4x4.3)	10 (22)
C12/1600/70-16	69360W	9,5 – 17 V	1600			70 A + 4 A	375x214x110 (14.7x8.4x4.3)	10 (22)
C12/2000/80-30	69361Y	9,5 – 17 V	2000			80 A + 4 A	520x255x125 (20.5x10x4.9)	13 (28.7)
24/500/10-16	21554R	19 – 33 V	500			10 A + 1 A	311x182x100 (12.2x7.2x3.9)	4,4 (9.7)
24/800/16-16	21624K	19 – 33 V	800			16 A + 1 A	360x240x100 (14.2x9.5x3.9)	6,4 (14.1)
24/1200/25-16	21712G	19 – 33 V	1200			25 A + 1 A	406x250x100 (16x9.8x3.9)	8,2 (18.1)
24/1600/40-16	23062D	19 – 33 V	1600			40 A + 4 A	470x265x120 (18.5x10.4x4.7)	10,2 (22.5)
24/2000/50-32	21870B	19 – 33 V	2000			50 A + 4 A	520x255x125 (20.5x10x4.9)	13 (28.7)
24/3000/70-16	69366J	19 – 33 V	3000			70 A + 4 A	362x258x218 (14.2x10.1x8.6)	18 (39.7)
24/3000/70-50	69178H	19 – 33 V	3000			70 A + 4 A	362x258x218 (14.2x10.1x8.6)	18 (39.7)
24/5000/120-100	69367L	19 – 33 V	5000			120 A + 4 A	444x328x240 (17.5x12.8x9.4)	30 (66.1)
C24/800/16-16	69364E	19 – 33 V	800			16 A + 4 A	375x214x110 (14.7x8.4x4.3)	10 (22)
C24/1200/25-16	69876J	19 – 33 V	1200			25 A + 4 A	375x214x110 (14.7x8.4x4.3)	10 (22)
C24/1600/40-16	69365G	19 – 33 V	1600			40 A + 4 A	375x214x110 (14.7x8.4x4.3)	10 (22)
C24/2000/50-30	69189N	19 – 33 V	2000			50 A + 4 A	520x255x125 (20.5x10x4.9)	13 (28.7)
48/500/6-16	21555T	9,5 – 17 V	500			6 A	311x182x100 (12.2x7.2x3.9)	4,4 (9.7)
48/800/8-16	21541F	19 – 33 V	800			8 A	360x240x100 (14.2x9.5x3.9)	6,4 (14.1)
48/1200/13-16	22259U	38 - 66 V	1200			13 A	406x250x100 (16x9.8x3.9)	8,2 (18.1)
48/1600/20-16	23158T	38 – 66 V	1600			20 A	470x265x120 (18.5x10.4x4.7)	10,2 (22.5)
48/3000/35-16	69449N	38 - 66 V	3000			35 A	362x258x218 (14.2x10.1x8.6)	18 (39.7)
48/3000/35-50	69157Z	38 – 66 V	3000			35 A	362x258x218 (14.2x10.1x8.6)	18 (39.7)
48/5000/70-100	69175B	38 – 66 V	5000			70 A	444x328x240 (17.5x12.8x9.4)	30 (66.1)

(1) Continuous output power at 25°C. **Color Control GX** - 68999 W is available to monitor and manage system functions.

MULTIPLUS-II

- A MultiPlus, plus ESS (Energy Storage System) functionality
- PowerControl e PowerAssist - Boosting the capacity of the grid or a generator
- Solar energy: AC power available even during a grid failure
- Two AC outputs
- Virtually unlimited power thanks to parallel and three phase operation
- On-site system configuring, monitoring and control
- Remote configuring and monitoring

MULTIPLUS-II

MULTIPLUS-II GX

MULTIPLUS-II GX

A MultiPlus-II with LCD and GX functionality: the MultiPlus-II GX integrates a MultiPlus-II inverter/charger and a GX device with a 2 x 16 character display.
Display and Wi-Fi: the display reads battery, inverter and solar charge controller parameters. The same parameters can be accessed with a smartphone or other Wi-Fi enabled device.
GX Device
The integrated GX device includes:

- A BMS-Can interface. This can be used to connect to a compatible CAN-bus managed battery. Note that this not a VE.Can compatible port.
- A USB port.
- A Ethernet port.
- A VE.Direct port.

Applications: the MultiPlus-II GX is intended for applications where additional interfacing with other products and/or remote monitoring is required, such as on-grid or off-grid energy storage systems and certain mobile applications.
Parallel and three phase operation: only one GX unit is needed in case of Parallel and three phase operation.

MODEL	PART No.	INPUT VOLTAGE RANGE	CONT. OUTPUT POWER (1)	OUTPUT	BATTERY CHARGE INPUT VOLTAGE RANGE	BATTERY CHARGE CHARGE CURRENT	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs)
12/3000/120-32	21871D	9,5 – 17 V	3000	230V AC ± 2% / 50 Hz ± 0,1%	187-265 V AC / 45-65 Hz	32 A	546x275x147 (21.5x10.8x5.8)	19 (41.9)
24/3000/70-32	23276Z	19 – 33 V	3000			32 A	499x268x141 (19.6x10.5x5.5)	19 (41.9)
24/3000/70-32 GX	21855F	19 – 33 V	3000			32 A	506x275x147 (19.9x10.8x5.8)	19 (41.9)
24/5000/120-50	21872F	19 – 33 V	5000			50 A	565x328x141 (22.2x12.9x5.5)	30 (66.1)
48/3000/35-32	22831W	38 – 66 V	3000			32 A	499x268x141 (19.6x10.5x5.5)	19 (41.9)
48/3000/35-32 GX	23040T	38 – 66 V	3000			32 A	506x275x147 (19.9x10.8x5.8)	19 (41.9)
48/5000/70-50	22832Y	38 – 66 V	5000			50 A	560x320x141 (22x12.6x5.5)	30 (66.1)
48/5000/70-50 GX	23259Z	38 – 66 V	5000			50 A	565x323x148 (22.2x12.7x5.9)	30 (66.1)
48/8000/110-100/100	21874K	38 – 66 V	8000			110 A	642x363x206 (25.3x14.3x8.1)	42 (92.6)
48/10000/140-100/100	21875M	38 – 66 V	10000			140 A	677x363x206 (26.6x14.3x8.1)	49 (108)
48/15000/200-100	25088J	38 – 66 V	15000			200 A	810x405x217 (31.9x15.9x8.5)	80 (176.4)

(1) Continuous output power at 25°C.

VICTRON ENERGY® - MULTI-FUNCTION INVERTER/BATTERY CHARGERS

victron energy
BLUE POWER

QUATTRO

Two AC inputs with integrated transfer switch
The Quattro can be connected to two independent AC sources, for example shore-side power and a generator, or two generators: the Quattro will automatically connect to the active source.

Two AC outputs
The main output has no-break functionality. In the event of a grid failure, or shore or generator power being disconnected, the Quattro takes over the supply to the connected loads. This happens so fast (less then 20 milliseconds) that computers and other electronic equipment will continue to operate without disruption. The second output is live only when AC source is available. Loads that should discharge the battery, like a water heater for example can be connected to this output.

Virtually unlimited power thanks to parallel operation
Up to 10 Quattro's can operate in parallel. Ten units 24/5000/120, for example, will provide 40kW / 50kVA output power and 1200 Amp charging capacity.

Three phase capability
Three units can be configured for three-phase output and up to 6 sets of three units can be parallel connected to provide 75kW / 90kVA inverter power and more then 2000 Amp charging capacity.

Power Control - Dealing with limited generator, shore-side or grid power
The Quattro is a very powerful battery charger. It will therefore draw a lot of current from the generator or shore-side supply (16A per Quattro at 230 VAC). A current limit can be set for both AC inputs. The Quattro will then take account of the other AC loads and use whatever is spare for charging, thus preventing the generator or shore supply from being overloaded.

Power Assist – Boosting shore or generator power
Where peak power is so often required only for a limited period, the Quattro makes sure that insufficient shore or generator power is immediately compensated for by power from the battery. When the load reduces, the spare power is used to recharge the battery. With this feature, problems related to insufficient shore or generator power are solved once and for all. Air conditioning, an electric hob, a washing machine, a dish washer, a 16A shore connection, or even less then16A, will not limit you in any way.
Warranty: 5 years

QUATTRO 24-5000

QUATTRO 48-15000

MODEL	PART No.	INPUT VOLTAGE RANGE	CONT. OUTPUT POWER (1)		BATTERY CHARGE INPUT VOLTAGE RANGE	BATTERY CHARGE CHARGE CURRENT	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs)
12/3000/120-50-50	69355D	9,5 - 17	3000	OUTPUT: 230V AC ± 2%	14.4V DC (absorption) 13.8V DC (float)	120A + 4A	362x258x218 (14.3x10.1x8.6)	19,0 (41.8)
12/5000/220-100-100	67437V	19 - 33	5000		14.4V DC (absorption) 13.8V DC (float)	220A + 4A	470x350x280 (18.5x13.8x11)	34,0 (74.9)
24/3000/70-50-50	69356F	19 - 33	3000		28.8V DC (absorption) 27.6V DC (float)	70A + 4A	362x258x218 (14.3x10.1x8.6)	19,0 (41.8)
24/5000/120-100-100	66097S	19 - 33	5000		28.8V DC (absorption) 27.6V DC (float)	120A + 4A	444x328x240 (17.4x12.9x9.4)	30.0 (66.1)
24/8000/200-100-100	67338T	19 - 33	8000		57,6V DC (absorption) 55,2V DC (float)	110A + 4A	470x350x280 (18.5x13.8x11)	41,0 (90.4)
48/5000/70-100-100	68847W	38 - 66	5000		57.6 VDC (absorption) 55.2 VDC (float)	70 A	444 x 328 x 240 (17.4 x 12.9 x 9.4)	30,0 (66.1)
48/8000/110-100-100	69456K	38 - 66	8000		57.6 VDC (absorption) 55.2 VDC (float)	110 A	470 x 350 x 280 (18.5 x 13.8 x 11)	41,0 (90.4)
48/10000/140-100-100	68973B	38 - 66	10000		57.6 VDC (absorption) 55.2 VDC (float)	140 A	470 x 350 x 280 (18.5 x 13.8 x 11)	45,0 (99.2)
48/15000/200-100-100	20812F	38 - 66	15000		57.6 VDC (absorption) 55.2 VDC (float)	210 A	570 x 480 x 330 (22.4 x 18.9 x 13)	72,0 (158.7)

(1) Continuous output power at 25°C

QUATTRO-II

- A Quattro, plus ESS (Energy Storage System) functionality
- PowerControl and PowerAssist - Boosting the capacity of the grid or a generator
- Solar energy: AC power available even during a grid failure
- Two AC Outputs
- Parallel and three phase operation
- On-site system configuring, monitoring and control
- Remote configuring and monitoring
- **Warranty**: 5 years

MODEL	QUATTRO II 24/5000/120-50	QUATTRO II 48/5000/70-50
Part No.	25082W	25083Y
DC input voltage range	19-33V	38-66V
Output voltage	230V AC ± 2%	230V AC ± 2%
Frequency	50 Hz ± 0,1%	50 Hz ± 0,1%
Cont. output power at 25°C	4000 W	4000 W
Cont. output power at 40°C	3700 W	3700 W
Cont. output power at 65°C	3000 W	3000 W
Max. apparent feed-in power	5000 VA	5000 VA
Peak power	9000 W	9000 W
Maximum efficiency	96%	96%
Charge voltage absorption	28,8 / 57,6 V	28,8 / 57,6 V
Charge voltage float	27,6 / 55,2 V	27,6 / 55,2 V
Storage mode	26,4 / 52,8 V	26,4 / 52,8 V
Max. battery charge current	120 A	70 A
Protection category	IP22	IP22
Dimensions HxWxD mm (“)	560x328x148 (22x12.9x5.8)	560x328x148 (22x12.9x5.8)
Weight kg (lbs)	30 (66.1)	30 (66.1)

VICTRON ENERGY® - MULTI-FUNCTION INVERTER/BATTERY CHARGERS

EASY SOLAR

The EasySolar combines a MPPT solar charge controller , an inverter/charger and AC distribution in one enclosure.

- The product is easy to install, with a minimum of wiring
- Three models are available: 12, 24 and 48V with 1600, 3000 or 5000 VA inverter. The batteries can be charged with solar power (BlueSolar MPPT) and/or with AC power (inverter/charger) from the utility grid or a genset
- Several software programs (Assistants) are available to configure the system for various grid interactive or stand-alone applications.
- Unique **PowerAssist©** technology protects the utility or generator supply from being overloaded
- **Warranty**: 5 years

EASYSOLAR

EASYSOLAR	PART No.	CHARGE CONTROLLER	DIMENSIONS mm (") HxWxD	WEIGHT kg (lbs)
12/1600/70-16	69502P	1x MPPT 100/50	745x214x110 (29.3x8.4x4.3)	12 (26.5)
24/1600/40-16	69503S	1x MPPT 100/50	745x214x110 (29.3x8.4x4.3)	12 (26.5)

EASYSOLAR-II GX

The all-in-one solar power solution
The Victron EasySolar-II GX integrates the following elements:
- A MultiPlus-II inverter/charger
- A SmartSolar MPPT -Tr solar charge controller
- A GX device with a 2 x 16-character display.

These elements come prewired together inside a single unit. This greatly simplifies most installations, saving time and money.
Display and Wi-Fi: The display reads battery, inverter and solar charge controller parameters. The same parameters can be accessed with a smartphone or other Wi-Fi enabled device. In addition, Wi-Fi can be used to set up the system and to change settings.
Solar charge controller included: the DC output of the SmartSolar MPPT is parallel wired with the DC connection of the MultiPlus-II inverter/charger. The on/off mechanism of the MultiPlus-II also controls the SmartSolar MPPT.
GX device includes:
- A BMS-Can interface. This can be used to connect to a compatible CAN-bus managed battery. Note that this not a VE.Can compatible port.
- A USB port
- An Ethernet port
- A VE.Direct port

The GX device controls the MultiPlus-II and the SmartSolar MPPT with respectively a VE.Bus and a VE.Direct connection.

EASYSOLAR-II GX

EASYSOLAR	PART No.	CHARGE CONTROLLER	DIMENSIONS mm (") HxWxD	WEIGHT kg (lbs)
24/3000/70-32 II GX	21876P	MPPT 250/70 GX	499x268x237 (19.6x10.5x9.3)	26 (57.3)
48/3000/35-32 II GX	23139N	MPPT 250/70 GX	499x268x237 (19.6x10.5x9.3)	26 (57.3)
48/5000/70-50 II GX	21877S	MPPT 250/100 GX	877x328x241 (34.5x12.9x9.5)	48 (105.8)

VICTRON ENERGY® - DC-DC CONVERTERS

Orion converters provide the optimum supply voltage.
Warranty: 5 years

NON ISOLATED RESIN ENCAPSULATED - IP67 ORION CONVERTERS

Completely encapsulated: waterproof, shockproof and ignition protected
Water, oil or dirt will not damage the Orion IP67 DC-DC Converter. The casing is made of cast aluminium and the electronics are moulded in resin.
Thanks to the cables of 1.8 meters in length, intermediate cable interconnections to increase length even more will in most cases not be needed. This is an important reliability increasing feature in an area were IP67 protection grade is needed. With 15 to 40 Volts input range, a stable output is ensured during surges or sags due to other equipment connected to same battery. Protected against overheating, it can be used in a hot environment such as a machine room.

ORION IP67 24/12 -10 -20

MODEL	PART No.	INPUT VOLTAGE RANGE	OUTPUT VOLTAGE - VDC	MAX OUTPUT CURRENT	TEMPERATURE CONTROL	DIMENSIONS HxWxD mm (")	WEIGHT kg (lbs)
Orion IP67 12/24-50	23080F	10-15	24	50	no	340x127x63 (13.4x5x2.5)	3 (6.6)
Orion IP67 24/12-5	69893J	15-40	12	5	no	25x43x20 (1.0x1.7x0.8)	0,1 (0.2)
Orion IP67 24/12-10	69894L	15-40	12	10	no	74x74x32 (2.9x2.9x1.3)	0,4 (0.8)
Orion IP67 24/12-20	69895N	15-40	12	20	no	74x74x32 (2.9x2.9x1.3)	0,45 (1)
Orion IP67 24/12-100	23081H	18-35	12	100	no	265x127x63 (10.4x5x2.5)	2,15 (4.7)

NON ISOLATED ORION CONVERTERS

Remote on-off connector: the remote on-off eliminates the need for a high current switch in the input wiring. The remote on-off can be operated with a low power switch or by the engine run/stop switch.
All models with adjustable output can also be used as a battery charger: for example to charge a 12 Volt starter or accessory battery in an otherwise 24V system.
All models with adjustable output can be paralleled to increase output current: up to five units can be connected in parallel.
Easy to install: delivery includes four Insulated Fastons Female Crimp 6.3 mm (eight Fastons in case of the Orion 24/12-40).

ORION DC-DC 24/12-40

MODEL	PART No.	INPUT VOLTAGE RANGE	OUTPUT VOLTAGE - VDC	MAX OUTPUT CURRENT	TEMPERATURE CONTROL	DIMENSIONS HxWxD mm (")	WEIGHT kg (lbs)
Orion 12/24-8	68126G	9-18	24	20	no	45x90x115 (1.8x3.5x4.5)	0,3 (0.7)
Orion 12/24-10*	64956E	9-18	20-30	20	no	45x90x125 (1.8x3.5x4.9)	0,4 (0.8)
Orion 12/24-20*	68882Y	9-18	20-30	30	sì	65x88x195 (2.6x3.5x7.7)	0,9 (2.0)
Orion 24/12-25*	68027E	18-35	10-15	25	no	65x88x160 (2.6x3.5x6.3)	0,7 (1.55)
Orion 24/12-40	68107C	18-35	13,2	40	sì	65x88x185 (2.6x3.5x7.3)	0,85 (1.9)
Orion 24/12-70*	68222C	18-35	10-15	70	sì	65x88x195 (2.6x3.5x7.7)	0,9 (2.0)

NON ISOLATED ORION-TR CONVERTERS

High efficiency: using synchronous rectification, full load efficiency exceeds 95%.
IP43 protection: when installed with the screw terminals oriented downwards.
Screw terminals: no special tools needed for installation.

ORION-TR
DC-DC 24/12-10

MODEL	PART No.	INPUT VOLTAGE RANGE	OUTPUT VOLTAGE - VDC	MAX OUTPUT CURRENT	TEMPERATURE CONTROL	DIMENSIONS HxWxD mm (")	WEIGHT kg (lbs)
Orion-Tr 24/12-5	20391H	18-35	12.7	7	5	53x51x27 (2.1x2x1.1)	0,1 (0.2)
Orion-Tr 24/12-10	20179K	18-35	12.5	12	10	73x94x37 (2.9x3.7x1.5)	0,2 (0.44)
Orion-Tr 24/12-15	20392K	18-35	12.5	20	15	73x94x45 (2.9x3.7x1.8)	0,3 (0.7)
Orion-Tr 24/12-20	20393M	18-35	12.5	25	20	73x94x45 (2.9x3.7x1.8)	0,3 (0.7)

ISOLATED ORION-TR CONVERTERS

Adjustable output voltage: can also be used as a battery charger: for example to charge a 12 Volt starter or accessory battery in an otherwise 24V system.
All models are short circuit proof and can be paralleled to increase output current: an unlimited number of units can be connected in parallel.
High temperature protected: the output current will reduce at high ambient temperature.
IP43 protection: when installed with the screw terminals oriented downwards.
Screw terminals: no special tools needed for installation.
Input fuse (not replaceable): on 12V and 24V input models only.

ISOLATED ORION-TR DC-DC

MODEL	PART No.	INPUT VOLTAGE RANGE	OUTPUT VOLTAGE - VDC	MAX OUTPUT CURRENT	TEMPERATURE CONTROL	DIMENSIONS HxWxD mm (")	WEIGHT kg (lbs)
Orion-Tr 12/12-9	20396U	8-17	10-15	12,5	87%	100x113x47 (3.9x4.5x1.9)	0,6 (1.3)
Orion-Tr 12/12-18	21588J	8-17	10-15	25	88%	130x186x70 (5.1x7.3x2.8)	1,3 (2.9)
Orion-Tr 12/12-30	23082K	10-17	10-15	40	87%	130x186x80 (5.1x7.3x3.2)	1,8 (4)
Orion-Tr 12/24-5	20398Y	8-17	20-30	6,3	88%	100x113x47 (3.9x4.5x1.9)	0,6 (1.3)
Orion-Tr 12/24-10	21681Y	8-17	20-30	12,5	88%	130x186x70 (5.1x7.3x2.8)	1,3 (2.9)
Orion-Tr 12/24-15	22903V	10-17	20-30	25	88%	130x186x80 (5.1x7.3x3.2)	1,8 (4)
Orion-Tr 24/12-9	20399A	16-35	10-15	12,5	85%	100x113x47 (3.9x4.5x1.9)	0,6 (1.3)
Orion-Tr 24/12-20	21682A	16-35	10-15	25	88%	130x186x70 (5.1x7.3x2.8)	1,3 (2.9)
Orion-Tr 24/12-30	22823X	20-35	10-15	45	88%	130x186x80 (5.1x7.3x3.2)	1,8 (4)
Orion-Tr 24/24-5	20073T	16-35	20-30	6,3	87%	100x113x47 (3.9x4.5x1.9)	0,6 (1.3)
Orion-Tr 24/24-12	20976N	16-35	20-30	15	88%	130x186x70 (5.1x7.3x2.8)	1,3 (2.9)
Orion-Tr 24/24-17	64968M	20-35	20-30	25	89%	130x186x70 (5.1x7.3x2.8)	1,6 (3.5)
Orion-Tr 24/48-2,5	20492P	16-35	40-60	3	88%	100x113x47 (3.9x4.5x1.9)	0,4 (1)
Orion-Tr 24/48-6	23164M	16-35	40-60	8	89%	130x186x70 (5.1x7.3x2.8)	1,3 (2.9)
Orion-Tr 24/48-8,5	23165P	20-35	40-60	15	89%	130x186x70 (5.1x7.3x2.8)	1,6 (3.5)
Orion-Tr 48/12-9	20493S	32-70	10-15	12,5	87%	100x113x47 (3.9x4.5x1.9)	0,4 (1)
Orion-Tr 48/12-20	21379Z	32-70	10-15	25	87%	130x186x70 (5.1x7.3x2.8)	1,3 (2.9)
Orion-Tr 48/12-30	22106S	20-35	10-15	45	88%	130x186x80 (5.1x7.3x3.2)	1,8 (4)
Orion-Tr 48/24-5	20494U	32-70	20-30	6,3	86%	100x113x47 (3.9x4.5x1.9)	0,4 (1)
Orion-Tr 48/24-12	21579H	32-70	20-30	15	89%	130x186x70 (5.1x7.3x2.8)	1,3 (2.9)
Orion-Tr 48/24-16	22351F	40-70	20-30	25	89%	130x186x70 (5.1x7.3x2.8)	1,6 (3.5)
Orion-Tr 48/48-2,5	20495W	32-70	40-60	3	89%	100x113x47 (3.9x4.5x1.9)	0,4 (1)
Orion-Tr 48/48-6	23166S	32-70	40-60	8	89%	130x186x70 (5.1x7.3x2.8)	1,3 (2.9)
Orion-Tr 48/48-8	23167V	40-70	40-60	15	89%	130x186x70 (5.1x7.3x2.8)	1,6 (3.5)

ISOLATED ORION 110V

ORION 110V ISOLATED

MODEL	PART No.	INPUT VOLTAGE RANGE	OUTPUT VOLTAGE RANGE	DIMENSIONS HxWxD mm (")	WEIGHT kg (lbs)
110/12-30	23286C	110V (60 – 140V)	12,5 V	82x132x190 (3,2x5,2x7,5)	1,4 (3.1)
110/24-15	21520X	110V (60 – 140V)	24 V	82x132x190 (3,2x5,2x7,5)	1,4 (3.1)

ISOLATED ORION-TR SMART CC SERIES CHARGER CONVERTERS

Bluetooth Smart enabled
Any Bluetooth enabled smart phone, tablet or other device can be used to monitor, to change settings and to update the charger when new software features become available.
Fully programmablee
- Battery charge algorithm (configurable) or fixed output.
- Smart alternator compatibility: engine running detection mechanism.

Remote on-off
A remote on/off switch or relay contact can be connected to a two-pole connector. Alternatively, the H terminal (right) of the two-pole connector can be switched to battery plus, or the L terminal (left) of the two pole connector can be switched to battery minus

ORION-TR SMART 12/12-30

MODEL	PART No.	INPUT VOLTAGE RANGE	OUTPUT VOLTAGE - VDC	MAX OUTPUT CURRENT	TEMPERATURE CONTROL	DIMENSIONS HxWxD mm (")	WEIGHT kg (lbs)
12/12-18 (220W)	23260H	8-17	12.2	25	18	130x186x70 (5.1x7.3x2.7)	1,3 (3)
12/24-10 (240W)	23261K	8-17	24.2	15	10	130x186x70 (5.1x7.3x2.7)	1,3 (3)
24/12-20 (240W)	23262M	16-35	12.2	25	20	130x186x70 (5.1x7.3x2.7)	1,3 (3)
24/24-12 (280W)	23263P	16-35	24.2	15	12	130x186x70 (5.1x7.3x2.7)	1,3 (3)
12/12-30 (360W)	23149S	10-17	12.2	40	30	130x186x80 (5.1x7.3x3.1)	1,8 (4)
12/24-15 (360W)	23151C	10-17	24.2	25	15	130x186x80 (5.1x7.3x3.1)	1,8 (4)
24/12-30 (360W)	23162H	20-35	12.2	45	30	130x186x80 (5.1x7.3x3.1)	1,8 (4)
24/24-17 (400W)	23155L	20-35	24.2	25	17	130x186x70 (5.1x7.3x2.7)	1,6 (3.5)

NON ISOLATED ORION-TR SMART CC SERIES CHARGER CONVERTERS

Bluetooth Smart enabled
Any Bluetooth enabled smart phone, tablet or other device can be used to monitor, to change settings and to update the charger when new software features become available.
Fully programmable
- Battery charge algorithm (configurable) or fixed output.
- Smart alternator compatibility: engine running detection mechanism..

Remote on-off
A remote on/off switch or relay contact can be connected to a two-pole connector. Alternatively, the H terminal (right) of the two-pole connector can be switched to battery plus, or the L terminal (left) of the two pole connector can be switched to battery minus

ORION-TR SMART 12/24-15

MODEL	PART No.	INPUT VOLTAGE RANGE	OUTPUT VOLTAGE - VDC	MAX OUTPUT CURRENT	TEMPERATURE CONTROL	DIMENSIONS HxWxD mm (")	WEIGHT kg (lbs)
12/12-30 (360W)	23150A	10-17	12.2	40	30	130x186x70 (5.1x7.3x2.7)	1,8 (4)
12/24-15 (360W)	23152E	10-17	24.2	25	15	130x186x70 (5.1x7.3x2.7)	1,8 (4)
24/12-30 (360W)	23525U	20-35	12.2	45	30	130x186x70 (5.1x7.3x2.7)	1,8 (4)
24/24-17 (400W)	23156N	20-35	24.2	25	17	130x186x70 (5.1x7.3x2.7)	1,6 (3.5)

VICTRON ENERGY® - BATTERY ISOLATORS

Battery isolators allow simultaneous charging of two or more batteries from one alternators, without connecting the batteries together. Discharging the accessory battery, for example, will not result in discharging the starter battery.

ARGO – DIODE BATTERY ISOLATORS

The Argo battery isolators feature a low voltage drops thanks to the use of Schottky diodes: at low current the voltage drop is approximately 0,3V and at the rated output approximately 0,45V. All models are fitted with a compensation diode that can be used to slightly increase the output voltage of the alternator. This compensates for the voltage drop over the diodes in the isolator.
Warranty: 5 years

ARGO

Alternator energize input

Some alternators need DC voltage on the B+ output to start charging. Obviously, DC will be present when the alternator is directly connected to a battery.
Inserting a Diode or FET splitter will however prevent any return voltage/current from the batteries to the B+, and the alternator will not start. The new diode isolators have a special current limited energize input that will power the B+ when the engine run/stop switch is closed.

MODEL	PART No.	MAX CHARGE CURRENT	ALTERNATOR MAX CURRENT	No. of BATTERIES	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs)
80-2AC	67435R	80 A	80 A	2	60 x 120 x 90 (2.4 x 4.7 x 3.5)	0.6 (1.3)
100-3AC	64984K	100 A	100 A	3	60 x 120 x 115 (2.4 x 4.7 x 4.5)	0.8 (1.8)
120-2AC	64985M	120 A	120 A	2	60 x 120 x 115 (2.4 x 4.7 x 4.5)	0.8 (1.8)
140-3AC	64986P	140 A	140 A	3	60 x 120 x 150 (2.4 x 4.7 x 6.0)	1.1 (2.4)
160-2AC	64987S	160 A	160 A	2	60 x 120 x 150 (2.4 x 4.7 x 6.0)	1.1 (2.4)
180-3AC	64988U	180 A	180 A	3	60 x 120 x 200 (2.4 x 4.7 x 7.9)	1.5 (3.3)

ARGO FET BATTERY ISOLATORS: NO VOLTAGE LOSS

Differently from diode battery isolators, FET isolators have virtually no voltage loss. Voltage drop is less then 0,02 Volt at low current and averages 0,1 Volt at higher currents.
When using ARGO FET battery isolators, there is no need to also increase the output voltage of the alternator. Care should be taken however to keep cable lengths short and of sufficient cross section.
Warranty: 5 years

Alternator energize input

The new ARGO FET isolators have a special current limited energize input that will power the B+ when the engine run/stop switch is closed.

ARGO FET

MODEL	PART No.	MAX CHARGE CURRENT	ALTERNATOR MAX CURRENT	No. of BATTERIES	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs)
1002-FET	64989W	100 A	100 A	2	65 x 120 x 200 (2.6 x 4.7 x 7.9)	1.4 (3.1)
1003-FET	64990E	100 A	100 A	3	65 x 120 x 200 (2.6 x 4.7 x 7.9)	1.4 (3.1)
2002-FET	64991G	200 A	200 A	2	65 x 120 x 200 (2.6 x 4.7 x 7.9)	1.4 (3.1)
2003-FET	64992J	200 A	200 A	3	65 x 120 x 200 (2.6 x 4.7 x 7.9)	1.4 (3.1)

BATTERY MONITORS

The BMV monitors feature an advanced microprocessor control system combined with high resolution measuring system for battery voltage and charge/discharge current. It can display: voltage, charge/discharge current, state of charge of the battery (in Ah or %), remaining charge. Standard with connection cables and shunt.
Warranty: 5 years

Mounting hole: 52 mm (2")

BMV 700 - 69112A – monitoring 1 battery 9-90 VDC
BMV 702 - 69151L – monitoring 2 batteries 9-90 VDC
BMV 702 BLACK - 69159D – monitoring 2 batteries 9-90 VDC
BMV 712 Smart - 21396Z – monitoring 2 batteries - Bluetooth included
Temperature Sensor - 69160M – Temperature sensor for BMV 702
Temp QUA - 21594D – Temperature sensor for QUA/PMP/Venus GX

SBS-3M - 22267T – Wireless battery voltage and temperature sensor for SmartSolar MPPT charge controllers. Distance up to 3 m.
SBS-10M - 23018A – Wireless battery voltage and temperature sensor for SmartSolar MPPT charge controllers. Distance from 3 to 10 m.

SS-500A - 23352N– Smart Shunt for battery monitoring via Bluetooth / Victron Connect directly on the phone

BMV 712 Smart

Smart Battery Sense

Smart Shunt 500A

WALL MOUNT

WM BMV-MPPT

WM BMV-CC

WM CC

WM BMV-MPPT - 20489B - Wall mount enclosure for BMV or MPPT Control
WM BMV-CC - 20490K - Wall mount enclosure for BMV and Color Control GX
WM CC - 20491M - Wall mount enclosure for Color Control GX

CONNECTION ACCESSORIES

VE.Direct to USB interface - 69934W
Interface MK3-USB (VE.Bus to USB) - 21329H
VE.Direct Bluetooth Smart dongle - 69545E
VE.Bus Smart dongle - 22845H

69934W

21329H

69545E

22845H

VICTRON ENERGY® - REMOTE CONTROL PANELS AND CONNECTION CABLES

DMC - Digital Multi Control GX

PHOENIX CC

CONTROL PANELS

MODEL	PART No.	DESCRIPTION
DMC 200/200	66717W	Digital Multi Control 200/200
DMC 200/200 GX	67920Y	Digital Multi Control 200/200 GX
Phoenix CC Charger	65006E	Phoenix Charger Control panel
Phoenix Inverter	66202K	Phoenix Inverter Control panel
Skylla-i	68885E	Skylla-i Control GX panel
Skylla CC	65007G	Skylla Control panel
CW	65008J	On-Off Skylla switch
Battery Alarm GX	65009L	Battery alarm panel
Wifi Module Simple	69536H	CCGX and VGX Wifi Module Simple
Wifi Long Range	69537K	CCGX and VGX Wifi Long Range Module

ACCESSORIES AND CABLE CONNECTIONS

MODEL	PART No.	DESCRIPTION
MK2-USB	67082H	Interface for Phoenix battery charger only
RS485-USB - 1,8	20416X	RS485-USB 1,8 m cable (Meter to CCGX)
RS485-USB - 5	20417Z	RS48 -USB 5 m cable (Meter to CCGX)
VE.Direct Cable 0,9	20414T	VE.Direct cable - 0,9 m (CCGX to BMV70x)
VE.Direct Cable 1,8	69266E	VE.Direct cable - 1,8 m (CCGX to BMV70x)
VE.Direct Cable 5	69479Y	VE.Direct cable - 5 m (CCGX to BMV70x)
RJ45-UTP - 0,9	69718P	VE.Can, VE.Bus, VE.Net cable - 0,9 m
RJ45-UTP - 1,8	67776U	VE.Can, VE.Bus, VE.Net cable - 1,8 m
RJ45-UTP - 5	65010V	VE.Can, VE.Bus, VE.Net cable - 5 m
RJ45-UTP - 10	65011X	VE.Can, VE.Bus, VE.Net cable - 10 m
VE.CAN Term	60555 A	VE.CAN terminator pair
ON-OFF Cable	69723G	On-Off inversion cable
Pylontech Cable	23414J	Connection cable with GX products and Pilot batteries

VICTRON ENERGY® - MONITORING SYSTEMS

COLOR CONTROL GX - 68999W

The Color Control GX provides intuitive control and monitoring for all products connected to it. The list of Victron Energy® products that can be connected is endless: Inverters, Multis, Quattros, MPPT solar chargers, BMV battery monitors, Lynx Ion + Shunt and more.
Warranty: 5 years

Color Control GX

VENUS GX - 21201E

Control panel
The Venus GX provides intuitive control and monitoring for all products connected to it. The list of Victron Energy® products that can be connected is endless: Inverters, Multis, Quattros, MPPT solar chargers, BMV battery monitors, Lynx Ion + Shunt and more
Warranty: 5 years

Venus GX

CERBO GX - 23264S

System monitoring unit and 5" accessory display **GX Touch 50** - 23265U (optional) or 7" accessory display **GX Touch 70** - 21977W (optional)
Warranty: 5 years

CERBO-S GX - 25081U

For standard systems: same features as Cerbo GX without BMS-Can port.

Cerbo GX

GX Touch 50
GX Touch 70

ACCESSORIES FOR MONITORING SYSTEMS

Meter ET112 - 21324X - Single-phase energy meter - max 100A
Meter ET340 - 21586E - Three-phase Energy Meter - max 65A per phase
GX GSM - 22833A - GSM modem for GX products
GSP x GX GSM - 22834C - GSP active antenna for GX GSM
GX LTE 4G-E - 23783T - LTE-4G modem (Europe) for GX products

MODEL	COLOR CONTROL GX	VENUS GX	CERBO GX
LCD display and 7 buttons	yes	no	GX Touch 50 or 70 (optional)
Remote console	yes	yes	yes
VE.Direct	2 dedicated isolated ports	2 dedicated isolated ports	3
VE.Can	2 isolated parallel RJ45 sockets	2 isolated parallel RJ45 sockets	yes, not isolated
VE.Bus	2 isolated parallel RJ45 sockets	2 isolated parallel RJ45 sockets	2 isolated parallel RJ45 sockets
USB	2 non-isolated USB host ports	2 non-isolated USB host ports	
Ethernet	Isolated RJ45 10/100/1000MB connector except screen	Isolated RJ45 10/100/1000MB connector except screen	Isolated RJ45 10/100/1000MB connector except screen
WiFi	optional	integrated	integrated
Bluetooth Smart	no	funzione futura	sì
Slot micro SD card	SDHC cards up to max. 32GB	SDHC cards up to max. 32GB	SDHC cards up to max. 32GB
Second CAN-bus port	no	future function	no
Programmable Relay	1 x NO	1 x NO / NC	2 x NO / NC DC up to 30VDC: 6A DC up to 70VDC: 1A AC: 6A, 125VAC
Resistive tank level inputs	no	3	4
Temperature level inputs	no	2	4
Digital IO	no	funzione futura	4
Dimensions HxWxD mm (")	130x120x28 (5.1x4.7x1.1)	45x143x96 (1.8x5.6x3.8)	78x154x48 (3.1x6x1.9)
Operating temperature	from -20 to +50°C	from -20 to +50°C	from -20 to +50°C
Safety	EN 60950	EN 60950	
EMC	EN 61000-6-3, EN 55014-1, EN 61000-6-2, EN 61000-6-1, EN 55014-2	EN 61000-6-3, EN 55014-1, EN 61000-6-2, EN 61000-6-1, EN 55014-2	EN 301489-1, EN 301489-17
Automotive	E4-10R-053535	E4-10R-053535	E4-10R-053535

VICTRON ENERGY® - BATTERY COMBINERS

The Cyrix battery combiner is a microprocessor controlled heavy duty relay that automatically connects batteries in parallel when one of them has reached a preset voltage (indicating that the battery has been charged) and disconnects when the voltage decreases below float level (indicating that one or more batteries have been discharged).

No voltage loss
Cyrix battery separators are an excellent replacement for diode isolators. The main feature is that there is virtually no voltage loss so that the output voltage of alternators or battery chargers does not need to be increased.

Prioritising the starter battery
When a Ciryx senses that the starter battery has reached its connect voltage will engage, to allow for parallel charging of the other batteries.

Bidirectional voltage sensing
The Ciryx senses the voltage of both connected batteries. It will therefore also engage if for example the accessory battery has been charged by a battery charger.

Parallel connection in case of emergency
The Cyrix can also be engaged with a switch to connect manually batteries in parallel. This is especially useful in case of emergency when the starter battery is discharged or damaged.

Warranty: 5 years

CYRIX-i 12/24-400A

CYRIX-CT 12/24-120A

CYRIX-CT 12/24-230A

MODEL	PART No.	CONTINUOUS CURRENT A	PEAK CUR-RENT	CONNECT VOLTAGE V	DISCONNECT VOLTAGE	DIMENSIONS H x W x D mm (")	WEIGHT kg (lbs)
CT 12/24-120	68956B	120 A	180 A	13÷13.8 V and 26÷27.6 V	11÷12.8 V e 22÷25.7 V	46 x 46 x 80 (1.8 x 1.8 x 3.2)	0.11 (0.24)
CT 12/24-230	69357H	230 A	500 A	13÷13.8 V and 26÷27.6 V	11÷12.8 V e 22÷25.7 V	65 x 100 x 50 (2.6 x 3.9 x 2.0)	0.3 (0.66)
i 12/24-400	67064F	400 A	2000 A	13÷13.8 V and 26÷27.6 V	10,5÷12.8 V e 21÷25.6 V	78 x 102 x 110 (3.0 x 4.0 x 4.3)	0.9 (1.9)
i 24/48-400	69892G	400 A	2000 A	13÷13.8 V and 26÷27.6 V	10,5÷12.8 V e 21÷25.6 V	78 x 102 x 110 (3.0 x 4.0 x 4.3)	0.9 (1.9)

65A/100A/220A BATTERY PROTECTION

The Victron battery protection disconnects the battery from non essencial loads before it is completely discharged (which would damage the battery) or before it has insufficient power left to crank the engine.
Warranty: 5 years

BP-100A Smart

BP-65A Smart

BP-220A Smart

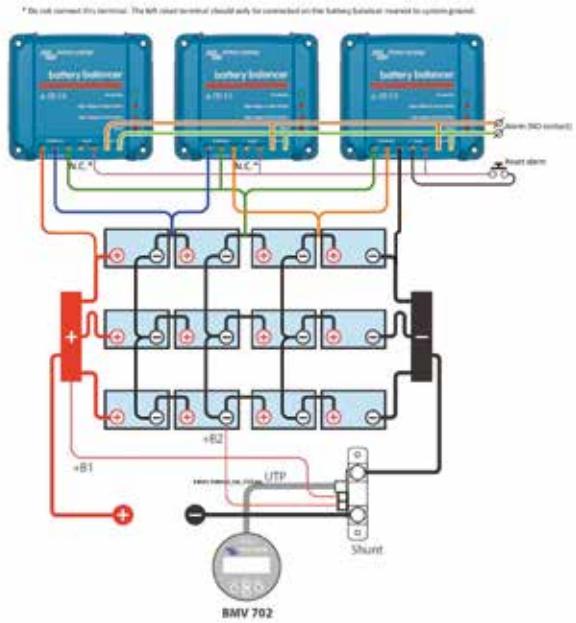
MODEL	PART No.	MAX CONTINUOUS CURRENT	PEAK CURRENT	OPERATING VOLAGE RANGE	LOAD DISCONNECT DELAY	DIMENSIONS HxWxD mm (")	WEIGHT kg (lbs)
BP-65	69853W	12/24V 65A	250A	6-35V	90 secondi	40x48x106 (1.6x1.9x4.2)	0.2 (0.5)
BP-100	69854Y	12/24V 100A	600A	6-35V	90 secondi	59x42x115 (2.4x1.7x4.6)	0.6 (1.3)
BP-220	69855A	12/24V 220A	600A	6-35V	90 secondi	62x123x120 (2.5x4.9x4.8)	0.8 (1.8)
BP48-100	20420M	100A	250A	24-64V	90 secondi	62x123x120 (2.5x4.9x4.8)	0.8 (1.8)
BP-65 Smart	22835E	12/24V 65A	250A	6-35V	90 secondi	40x48x106 (1.6x1.9x4.2)	0.2 (0.5)
BP-100 Smart	22836G	12/24V 100A	600A	6-35V	90 secondi	59x42x115 (2.4x1.7x4.6)	0.6 (1.3)
BP-220 Smart	22837J	12/24V 220A	600A	6-35V	90 secondi	62x123x120 (2.5x4.9x4.8)	0.8 (1.8)
BP48-100 Smart	22838L	100A	250A	24-70V	90 secondi	62x123x120 (2.5x4.9x4.8)	0.8 (1.8)

BATTERY BALANCER

The Battery Balancer equalizes the state of charge of two series connected 12 V batteries, or of several parallel strings of series connected batteries.
When the charge voltage of a 24 V battery system increases to more than 27 V, the Battery Balancer will turn on and compare the voltage over the two series connected batteries. The Battery Balancer will draw a current of up to 1 A from the battery (or parallel connected batteries) with the highest voltage. The resulting charge current differential will ensure that all batteries will converge to the same state of charge.
If needed, several balancers can be paralleled.
A 48 V battery bank can be balanced with three Battery Balancers.

Warranty: 5 years
IP22 protection

MODEL	BATTERY BALANCER
Part No.	69369R
Input voltage range	Up to 18V per battery, 36 V total
Turn on level	27,3 V +/- 1%
Turn off level	26,6 V +/- 1%
Stand-by current draw	0,7 mA
Max. balancing current	0,7 A (when deviation > 100mV)
Over temperature protection	Yes
Operating temperature	-30°C to +50°C
Dimensions mm (")	100x113x47 (3.94x4.45x1.85)
Weight kg (lbs)	0,4 (0.88)



Series connection

Parallel connection

SR SUPERCAPACITOR-READY

- Optimized management of self-consumption
- Certified CEI021 type A
- Easy installation
- Remote connectivity and monitoring
- Power supply of priority loads in backup
- Configurable to not feed energy into the grid
- High performance through the use of supercapacitor storage units
- 10 year warranty

MODEL	SR3000 Single-phase	SR9000 Three-phase	HSR-3K-M	HSR-6K-M
Part No.	22611F	22612H	24952V	24953X
Maximum DC input power (PV)	4000 Wp	>12000 Wp	3900 W	7800 W
Maximum DC input voltage (PV)	560 V	850 V	-	-
MPPT voltage range	120 V - 480 V	380 V - 750 V	150 V - 425 V	150 V - 425 V
Minimum MPPT Start Voltage	150 V	400 V	125 V	125 V
Max. short-circuit current for MPPT	18 A	2x 18 A	-	-
Number of MPPT trackers	1	2	2/1+1	2/1+1
Storage type	SUPERCAPCACITORS (Lead, Lithium)			
Parallelable Sirius Supercapacitors	1-8	1-8	1-8	1-8
Nominal DC voltage (storage)	48 V	48 V	-	-
Max.current DC charge/discharge (storage)	60A / 80 A	160A / 200A	70A /70A	135A / 135A
AC output voltage	230 VAC ± 15%	3/N/PE; 230/400 VAC	220/230 VAC	220/230 VAC
AC frequency	50/60 Hz (±5 Hz)	50/60 Hz (±5 Hz)	50/60 Hz	50/60 Hz
AC connection	Single-phase	Three-phase	Single-phase	Single-phase
AC output (PV + STORAGE)	3000 W	9000 W	3000 W	6000 W
Maximum AC output (storage)	6000 W (3 seconds)	12000 W (3 seconds)	3300 W	6600 W
Nominal output current (RMS)	13 A	13 A / phase	13.6 A	27.3 A
PV/BATT/GENERATOR switching time on AC	0s (separate backup output)	0s (separate backup output)	-	-
Interface and communication	Wifi 802.11 b/g/n 2.4 GHz, 2 USB 2, 1 Ethernet IP1 CAN bus, 2 RS485, 1 relay 230 V 16A, 4 analog input, 1 temperature sensor, 3 electric sensors		with BMS RS485; CAN	with BMS RS485; CAN
Electric protections	Integrated on DC/AC inputs (consult manuals)			
Dimensions LxWxD mm (“)	440x580x165 (17.3x22.8x6.5)	580x800x240 (22.8x31.5x9.4)	710x650x150 (27.9x25.6x5.9)	710x650x150 (27.9x25.6x5.9)
Weight kg (lbs)	18 (39.7)	46 (101.4)	20,5 (45.2)	20,5 (45.2)
Operating temperature	from -20°C to +50°C	from -20°C to +50°C	from -45 to 60°C	from -45 to 60°C
IP class protection	IP20	IP20	IP65	IP65
Humidity (non condensing)	from 0 to 90%	from 0 to 90%	-	-
PV-AC type	TL without transformer	TL without transformer	-	-
Warranty	10 years, extendable up to 20 years (optional)	10 years, extendable up to 20 years (optional)	5 years	5 years
Certificates	CE	CE	CE	CE
Compliance	CEI 021; EN 62109-2; EN 62109-1; EN 62040-1; DIN V VDE V 0126-1-1 (+VFR2013); VDE-AR-N 4105; EN 50438 DIN VDE V 0124-100; Synergrid C10/11 / TF3.2.1; AS4777.2; AS4777.3; NRS 097-2-1; G83; RD 1699		CEI 0-21, VDE-AR-N 4105, NRS 097, IEC 62116, IEC 61727, G99, G98, VDE 0126-1-1, RD 1699, C10-11 IEC/EN 61000-6-1/2/3/4, IEC/EN 62109-1, IEC/EN 62109-2	
Powered by	Imeon		Deye	

The solar energy is converted into current and fed into the public grid. The core of each photovoltaic system consists of efficient, reliable and high-performance inverters. To develop technologies for photovoltaic inverters, Fronius has thoroughly studied, sought innovative solutions and find answers entirely new. The result: grid-connected inverters highly functional, perfect for use with any type of solar modules.

FRONIUS PRIMO

- Single-phase inverter from 3,0kW to 8,2kW with WLAN and integrated communication package.

FRONIUS SYMO

- Three-phase inverter from 3,0kW to 20kW.

ACCESSORIES

- Accessories and components for solar systems and fastly PV systems data.

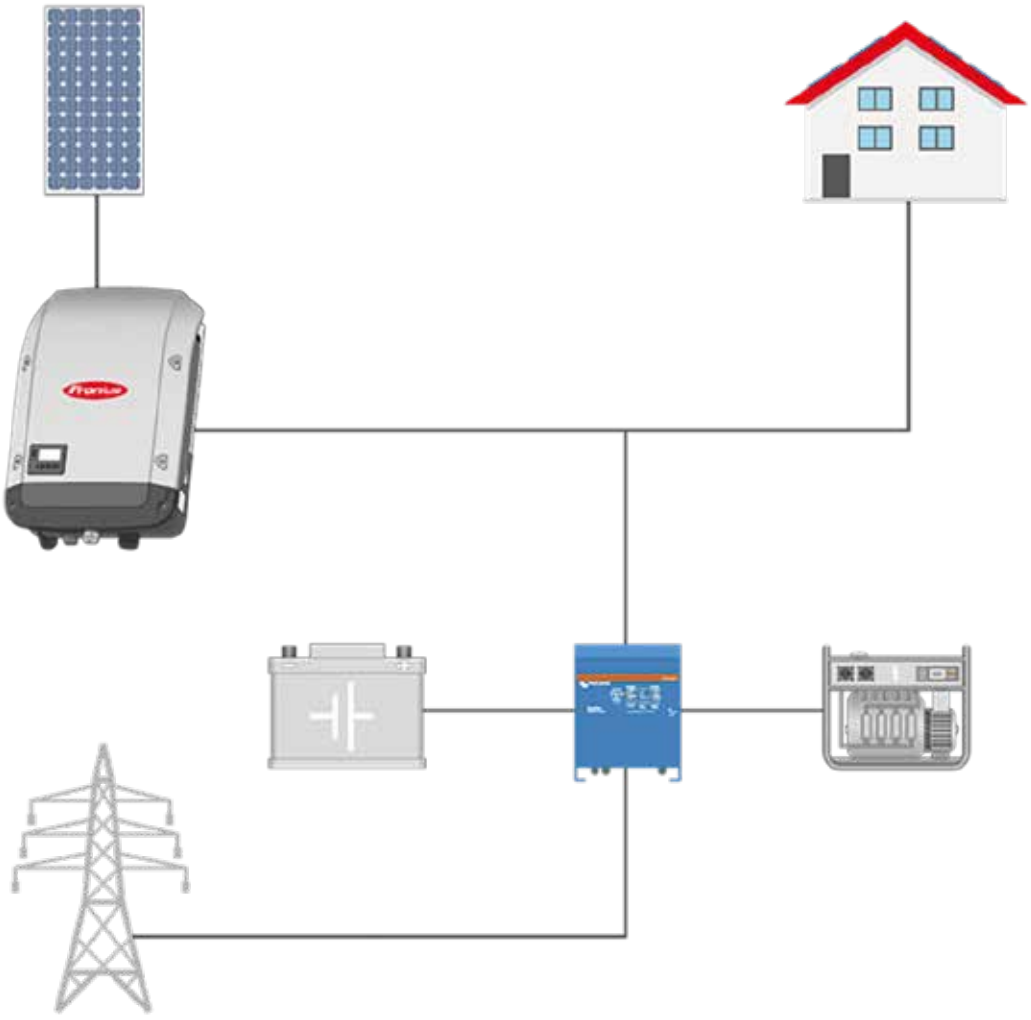
FRONIUS SOLAR.WEB APP

- Free applications to display easily and fastly PV systems data.

EXTENDED WARRANTY

- Extended warranty available: 10, 15 or 20 years.

For more information about configuration and size, please contact our Technical Service.



CL 33/50 STRING INVERTERS

CL 33/50 is the ideal solar power solution for commercial and industrial buildings and solar carports. The scalable and flexible photovoltaic architecture, combined with Schneider Electric's wide range of low voltage products, makes the CL range the right choice for commercial and industrial buildings.

OPTIMAL SYSTEM PERFORMANCE

- Input for 3 MPPT for CL 33 and 5 MPPT for CL 50
- Peak efficiency of 98.5%.
- DC/AC ratio of up to 1.3
- Integrated DC fuses and DC/AC surge protection
- Optional PID reset function

EASY TO INSTALL

- Low weight for easy installation
- Wide range of Schneider Electric low voltage products for a complete solution
- CONEXT XWPRO compatible AC coupling
- Certified CEI016 and CEI021

INSIGHT COMPATIBLE

- Setup and Configuration
- Monitoring and remote control with advanced data security
- Web and mobile apps
- Multisite management for installers and portfolio managers

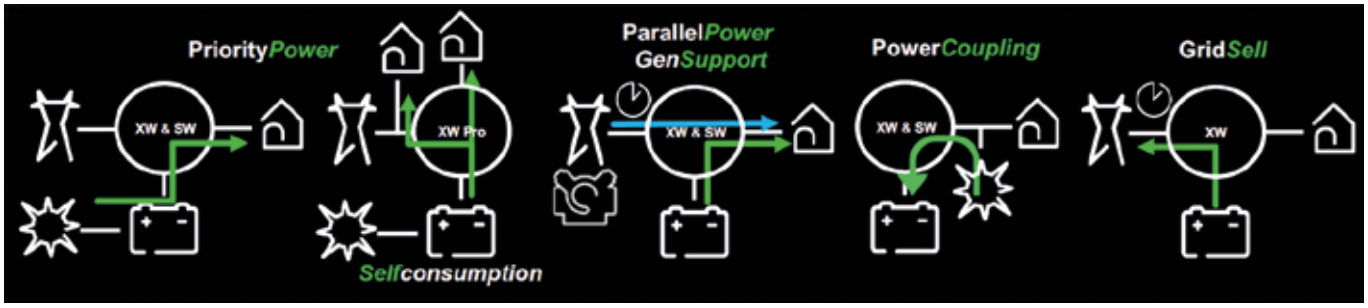
CL 33

CL 50

MODEL	CL 33	CL 50
Part No.	21891K	21892M
Maximum input PV voltage	1100 V	1100 V
Minimum input PV voltage Starting input voltage	200 V / 250 V	200 V / 250 V
MPPT voltage range	200 - 1000 V (585 V Nominal)	200 - 1000 V (585 V Nominal)
No. of independent MPPT inputs	3	5
Max. no. of PV strings per MPPT	2 (max. 30 A per MPPT)	2 (max. 30 A per MPPT)
Maximum input PV current	78 A	130 A
Rated AC output power (max)	33 kW (36,3 kVA)	50 kW (55 kVA)
Nominal AC Voltage	3/N/PE, 230/400 V	3/N/PE, 230/400 V
Rated frequency network/range	50 Hz/45 - 55 Hz, 60Hz/55 -65 Hz	50 Hz/45 - 55 Hz, 60Hz/55 -65 Hz
THD	< 3% (nominal power)	< 3% (nominal power)
Max efficiency	98,6% / 98,3%	98,7% / 98,4%
Dimensions mm (") LxWxD	702x595x310 (27,6x23,4x12,2)	782x645x310 (30.8x25.4x12,2)
Weight kg (lbs)	50 (110.2)	62 (136.7)
Isolation mode	without transformer	without transformer
Protection class	IP66	IP66
Night time energy consumption	≤2 W	≤2 W
Operating environment temp. range	From -30 to +60 °C (derating > 45 °C)	From -30 to +60 °C (derating > 45 °C)
Allowable relative humidity range	0-100% (non condensing)	0-100% (non condensing)
Communications	RS485/Optional: Wi-Fi, Ethernet	RS485/Optional: Wi-Fi, Ethernet
Warranty	5 years with registration (refer to SEsolar.com)	

SCHNEIDER ELECTRIC® - OFF-GRID AND SELF-CONSUMPTION HYBRID SOLUTIONS

Schneider® hybrid inverters manage energy conversion and battery charging, while charge controllers optimize solar energy harvesting.



XW PRO

Suitable and scalable, the XW Pro inverter/charger is the only solar energy solution with storage, back-up power, self-consumption and off-grid use for homes, small businesses and remote communities.

- Single-phase output power 8500 W (30 min) at 25 °C
- 12000 W overload for 60 sec
- Maximum output charging current 140 A
- Battery voltage rating 48 V DC
- Two AC inputs
- High speed input switch
- Configurable in three-phase clusters for max 76.5KW
- PRO version provides BMS integration
- Coupled with CL 33/50 string inverters
- Insight compatible

XW PRO 8,5 kW 230V - 23842G

XW PRO

SW

SW is a reliable inverter/charger for "off-grid" applications, backup power and self-consumption for residential and small business environments. Compatible with Insight monitoring and control platform

SW 4024 230V

- 4000 W overload for 30 min
- 7000 W overload for 5 sec
- Maximum output charging current 90 A
- Battery nominal voltage 24 VDC
- Single-phase, max 4 inverters in parallel
- AC input, with high speed switch

SW 4024 230V - 23843J

SW 4048 230V

- 4400 W overload for 30 min
- 7000 W overload for 5 sec
- Max charge output current 45 A
- Nominal battery voltage 48 V DC
- Single-phase, max 4 inverters in parallel
- AC input, with high speed switch

SW 4048 230V - 23844L

SW

Conext™ MPPT CHARGE CONTROLLERS

Conext™ MPPT charge controllers are suitable for DC-coupled systems. They allow tracking of the maximum power point of photovoltaic arrays in order to optimize solar energy harvesting and regulate battery charging.

Conext™ MPPT 60-150

- Maximum output power 3500 W (48V systems)
- 12, 24, 36, 48V nominal storage voltage
- Voc 150 V max
- Compatible with XW Pro, XW+ and SW

Conext™ MPPT 60-150 - 23845N

Connext™ 60-150

Conext™ MPPT 80-600 & Conext™ MPPT 100-600

- Maximum output power 4800W (80/600) (at 48V)
- Maximum output power 6000W (100/600) (at 48V)
- Rated storage voltage 24.48 V
- Voc 600V max
- Compatible with XW Pro, XW+ and SW
- 1-2 PV panel strings
- Insight compatible

Conext™ MPPT 80-600 - 23846R
Conext™ MPPT 100-600 - 23847T

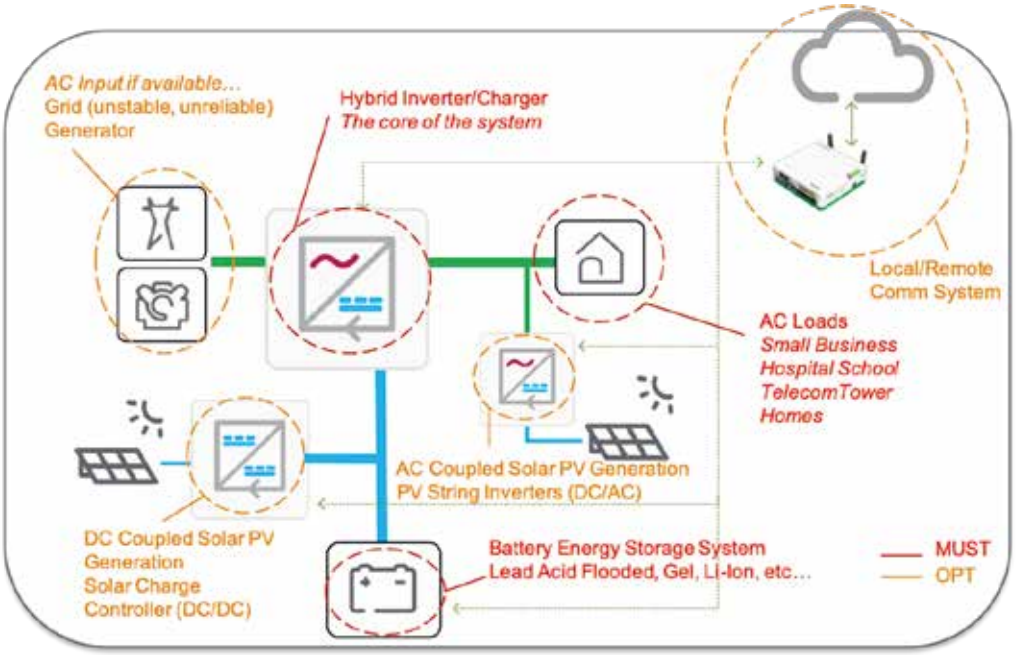
Connext™ 100-600

LOCAL AND REMOTE MONITORING

Insight is a simple and powerful energy management platform for Schneider Electric's solar and storage ecosystem for residential and commercial applications. The product offers intuitive web and mobile interfaces for owners and installers.

Insight HOME™ - 23848V - domestic monitoring
Insight FACILITY™ - 23849X - business monitoring

HYBRID SYSTEM STANDARD ARCHITECTURE



- **High power EV Charging Station**: the EV Charging Station has three phase and single-phase capabilities. It delivers maximum 22kW AC in three phase mode or 7.3kW in single phase mode.
- **Wi-Fi Communication**: Wi-Fi: 802.11 b/g/n for configuration and monitoring. The internal Wi-Fi module can be configured in Access Point mode or Station mode for both the initial setup and monitoring.
- **LCD Touch Screen**: it incorporates 4.3-inch LCD Touch Screen for monitoring and control.
- **Light Ring for fast viewing the device state**: fully programmable RGB Light Ring around charging port, to quickly determine the device state. It can be programmed from the web interface to display different light effects based on the current state (disconnected, charging, charged etc.). The objective is to help the user see the current state from a distance.
- **Two working modes available:**
  Manual Mode to configure output current
  Manual mode allows configurable output current between 6-32A. The charging power is controlled in two ways: by using the slider on the LCD touch screen or by using its web page. It allows to manually start or stop the charging process when a vehicle is connected to the charging station.
  Automatic Mode to ensure maximum PV system efficiency
  It detects when excess power is available and uses only that power to charge the vehicle.
- **Integration with GX devices**: the EV Charging Station can be configured and monitored from the GX screen devices and Remote Console.
- **Integration with VRM**: several options are available in the VRM Portal: real time reports, custom reports for configurable time periods, advanced functions such as remote firmware update.

MODEL	EV CHARGING STATION 22KW
Part No.	24949G
Input voltage range	170-265 V AC
Rated charge current	32 A / phase
Nominal power	22 kW
Current output range	6-32 A
Wifi standards	802.11 b/g/n (2.4 Ghz only)
Self-consumption	15 mA @ 230 V
Configurable max. current	10-32 A
Connector type	IEC 62196 Type 2
Operating temperarue	from -25°C to +50°C
Storage temperature	from -40 °C to +80 °C
Humidity	95%, non-condensing
Data communication	Modbus TCP over WIFI
Dimensions HxWxD mm (“)	390x300x150 (15.3x11.8x5.9)
Weight kg (lbs)	3 (6.6)

INGEREV® NEO

The INGEREV® NEO is a compact, lightweight and easy-to-install Mode 3 charging device that is ideal for charging electric vehicles both at home and in other private settings. It is available with a Type 2 socket and with an integrated Type 1 or Type 2 cable to facilitate the user during charging. It also allows power balancing according to the consumption of the rest of the system.
It has Bluetooth and its own mobile application, through which the user can configure various charger functions while being able to supervise charging, set schedules, and analyze consumption data.
The advanced NEO Pro version includes WIFI and Ethernet and, optionally, 4G and DC leak detector

FEATURES

- Wallbox suitable for outdoor installation.
- 7.4 kW and 22 kW versions.
- Mode 3 charging.
- 3, 5 and 7 meters Type 1 or Type 2 cable integrated, cable holder included.
- kWh counter.
- RGB LED status indication.
- Smartphone app.
- Access control selection (via App).
- Charging scheduling (via App).
- Wi-Fi and Ethernet available depending on model.
- DC-side leakage sensor (optional).
- Supports for ground installation available on request

INGEREV® NEO	SINGLE PHASE	SINGLE PHASE PRO	THREE PHASE PRO
Part No.	Available on request	21970FA	Available on request
AC input voltage	1ph. + N + PE 230 Vac 15%		3ph. + N + PE 400 Vac 15%
Nominal power	7.4 kW		22 kW
Frequency	50 / 60 Hz		
Nominal current	32 A		
Connector	Type 1 and 2(1) cable		Type 2(1) cable
Communication	Bluetooth 4.2	Bluetooth 4.2, Wifi, Ethernet, LTE (optional)	
HMI	Status indicator light. Smartphone app		
Stand-by consumption	<10 W		
Static power management	For single charger	For single charger and groups of interconnected chargers	
Dynamic power management	Single-phase energy counter (included)		Three-phase energy counter (included)
Cable support	Included with 5 m and 7 m cables		
Ground support pole	Single or dual (optional)		
Operating temperature	From -25 to +40 °C		
Humidity	95%		
Protection rating	IP54		
Dimensions mm (“)	365x220x105 (14.4x8.7x4.1)		
Weight kg (lbs)	3,15 (6.9)		3,7 (8.1)

BEP MARINE BATTERY SWITCH TEST PROCEDURES (UL 1107)

Continuous (1 hour) intermittent (5 minutes) and cranking (engine starting – 10 seconds). The test is to determine the maximum current the switch can handle for the stated time, without the rear terminals exceeding 100°C above the ambient temperature. The continuous and intermittent ratings are tested at 110% of specified ratings. All BEP switches are tested independently to this specification by a 3rd party laboratory.

701-KEY
- 63930 E
Spare Part
Removable
knob

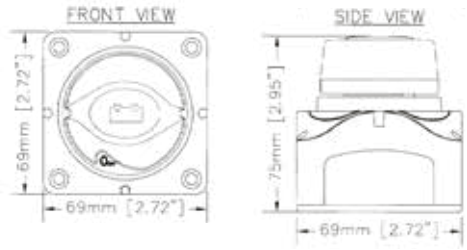
701

701 BATTERY MASTER SWITCH - 63142C

The 701 Contour Battery Master Switch offers a number of unique features. The highlights being the patented contour lock system, allowing it to be a stand alone unit, or locked together with other switches. The 701 also features a control knob which cannot be removed whilst in the On or OFF position, however can be removed by switching to an anti-clockwise 45° position. The control knob also features an interchangeable labelling system allowing a full range of applications. The 701 also features removable side plates on 4 sides for access of up to 1/0 cables. Plus a rear cover insulating the rear terminals against any short circuits ensuring the switch meets ABYC requirements. The 701 can be either surface or recess mounted by cutting a 52 mm (2 1/16") hole.

FEATURES:

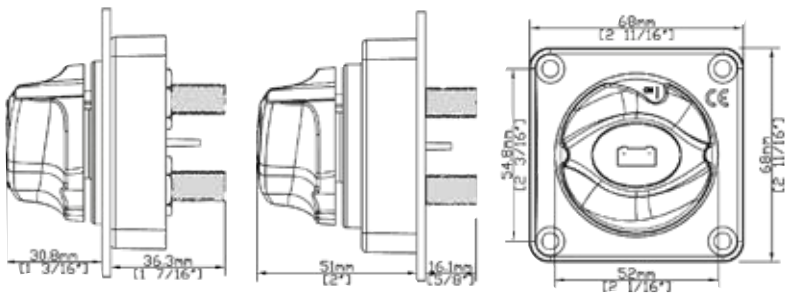
- Continuous rating: 275 Amp DC
- Intermittent rating: 455 Amp DC
- Cranking rating: 1250 Amp DC
- Voltage rating: 48V DC
- Operation: ON/OFF
- Mounting: recessed or surface
- Termination stud size: 2 x 10 mm (3/8")
- Dimensions: 69 x 69 x 75h mm (2.75 x 2.75 x 3h inches)
- Tin plated copper studs and nuts
- Ignition protected



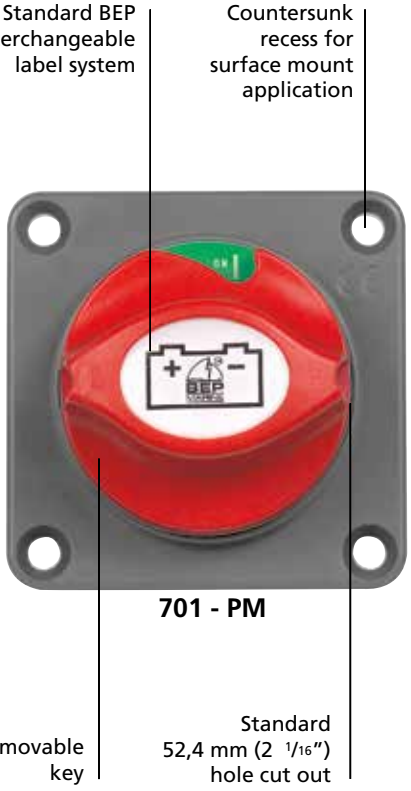
Dimensions 701

701-PM PANEL MOUNT BATTERY SWITCHES - 65494 X

Same specifications as 701 switch



Mod. 701 Dimensions



701 - PM

BEP MARINE®
BATTERY DISTRIBUTION SWITCHES

720 HEAVY DUTY BATTERY SWITCH - 63174S

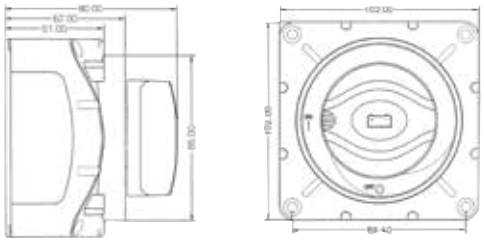
The 720 Heavy Duty Battery Switch fits into the same contour lock system as used on the battery distribution system. Rated at 600 Amp continuous and 2500 Amp cranking. It is well suited to larger vessels. As with the 701 and 720 can be recessed or surface mounted. The 720 uses the same style of self cleaning sliding contact as used in the 701. Also utilises the same label sheet as 701. Part Number 715.

FEATURES:

- Continuous rating: 600 Amp DC
- Intermittent rating: 800 Amp DC
- Cranking rating: 2500 Amp DC
- Voltage rating: 48V DC
- Operation: ON/OFF
- Mounting: recessed or surface
- Termination stud size: 2 x 12 mm (1/2")
- Dimensions: 102 x 102 x 90h mm (4 x 4 x 3.5h inches)
- Tin plated copper studs and nuts
- Ignition protected
- Available in bulk only

Recessed hole cut out 85 mm (3.3")

720



720 Dimensions

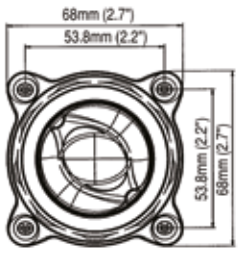
700 EASYFIT BATTERY SWITCH - 63672J

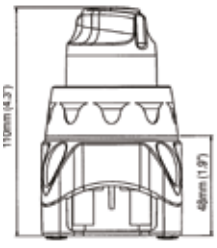
The 700 Easyfit is ideal on those installations where switches need to be recessed through varying thickness of panels. 700 Easyfit features an easily removable threaded ring allowing for panel thickness up to 19 mm (3/4"). It uses the same features as the 701 with the removable key 45° past the off position, labelled handle and a removable back cover covering exposed terminals to meet ABYC specifications. The switch can also be surface mounted offering a unique style compared to other switches available on the market. The 700 Easyfit can easily be retrofitted in place of most European post and lever type switches.

FEATURES:

- Continuous rating: 275 Amp DC
- Intermittent rating: 455 Amp DC
- Cranking rating: 1250 Amp DC
- Voltage rating: 48V DC
- Operation: ON/OFF
- Mounting: recessed or surface
- Termination stud size: 2 x 10 mm (3/8")
- Tin plated copper studs and nuts
- **700-KEY** spare Part Removable knob
- Ignition protected

700 EASYFIT





700 EASYFIT Dimensions

701-S MINI BATTERY SELECTOR SWITCH - 64387R

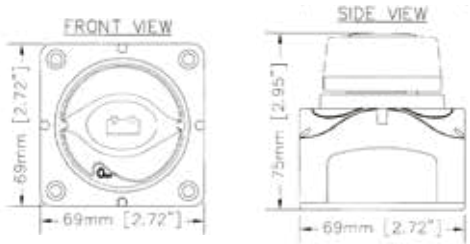
The 701-S is the most compact selector switch available on the market. Housed in the same dimensions as the 701 and includes the same removable side plates and back cover.
While BEP Marine foremost recommends isolated battery systems as outlined with our distribution clusters, the 721 offers a simple economical way of separating two batteries.
Please note this system will not separate electronics from harmful engine starting spikes.

Recessed hole
cut out 52 mm (2.1")

701-S

FEATURES:

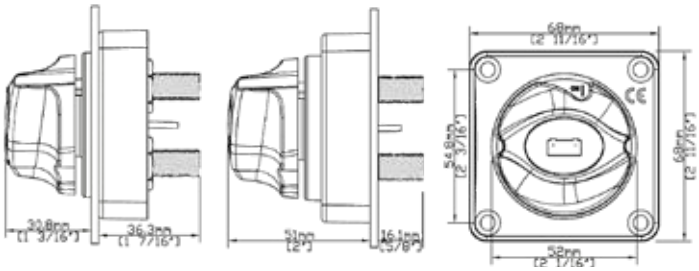
- Continuous rating: 200 Amp DC
- Intermittent rating: 300 Amp DC
- Cranking rating: 1000 Amp DC
- Voltage rating: 48V DC
- Operation: Selector 1-2-both-off
- Mounting: recessed or surface
- Termination stud size: 3 x 8 mm (5/16")
- Dimensions: 69 x 69 x 75h mm (2.75 x 2.75 x 3h inches)
- Tin plated copper studs and nuts



701-S dimensions

701S-PM PANEL MOUNT BATTERY SWITCHES - 66163C

Same specifications as 701S switch



701S-PM dimensions

Countersunk recess for surface mount application

Standard 52,4 mm (2 1/16") hole cut out

721 BATTERY SELECTOR SWITCH - 63143E

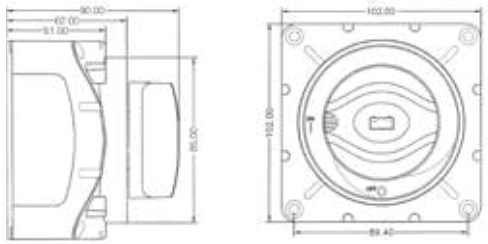
The 721 is our heavy duty selector switch, housed in the same module as the 720 and includes the same removable plates and back cover.
While BEP Marine foremost recommends isolated battery systems as outlined with our distribution clusters, the 721 offers a simple economical way of separating two batteries. **Please note this system will not separate electronics from harmful engine starting spikes.**

Recessed hole
cut out 85 mm (3.3")

721

FEATURES:

- Continuous rating: 350 Amp DC (between common and B1 or B2)
- Continuous rating: 500 Amp Dc (between common and B1 or B2)
- Intermittent rating: 500 Amp DC
- Cranking rating: 1500 Amp DC
- Voltage rating: 48V DC
- Operation: Selector – Battery 1-2-both off
- Mounting: recessed or surface
- Termination stud size: 3 x 10 mm (3/8")
- Dimensions: 102 x 102 x 90h mm (4 x 4 x 3.5h inches)
- Tin plated copper studs and nuts
- Ignition protected



721 dimensions

BEP MARINE® - REMOTE OPERATED BATTERY SWITCHES

Due to the increased loading requirements on modern boats and large increases in the cost of copper battery cable, the MD range of battery switches allows you to mount the battery switch very close to the battery, reducing cable lengths to starter motor. They are also ideal for remote isolation of bow thrusters.

THE MD RANGE OFFERS THE FOLLOWING FEATURES:

- Remote operation (easier access for battery control).
- Battery switch can be mounted alonside battery, reducing cable lengths and cable sizes to starter motor (large cost saving in copper cable).
- Reduced labour for fitting, due to shorter battery cabling.
- Manual override option to meet CE requirements.
- LED status identification for remote control switch.
- Same capacity/specification and mounting options as standard BEP battery switches.
- Utilize same interchangeable labelling system as BEP battery switches.

For the remote operation of the 701-MD and 720-MD battery switches, use the key switches 722-KS or 722-KS2 or any standard on/off switch.

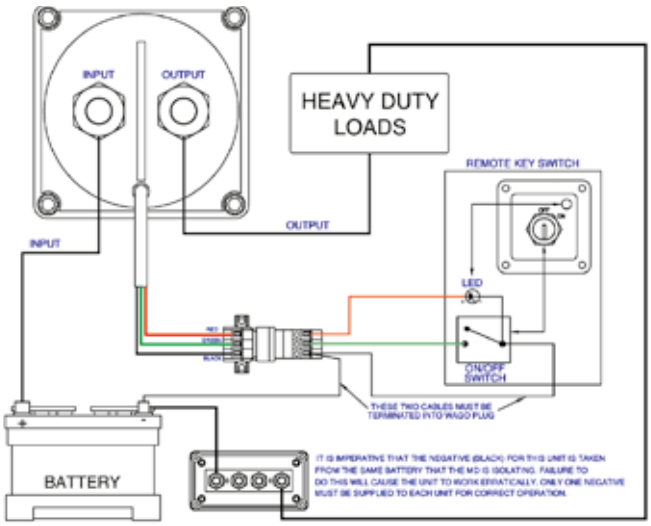
701-MD SPECIFICATIONS - 66026S

- Continuous rating: 275 Amp DC
- Intermittent rating: 455 Amp DC
- Cranking rating: 1250 Amp DC
- Voltage rating: 9,5 – 32 Volt
- Operation: On / Off
- Mounting: recessed or surface
- Ignition protected
- Stud size: 2 x 10 mm (3/8")
- Tin plated copper studs and nuts

720-MDO SPECIFICATIONS - 66027U

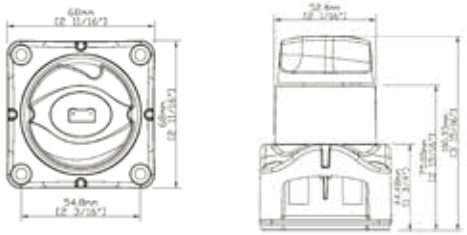
- Continuous rating: 500 Amp DC
- Intermittent rating: 700 Amp DC
- Cranking rating: 2500 Amp DC
- Voltage rating: 9,5 – 32 Volt
- Operation: On / Off
- Mounting: recessed or surface
- Ignition protected
- Stud size: 2 x 12 mm (1/2")
- Tin plated copper studs and nuts

WIRING DIAGRAM

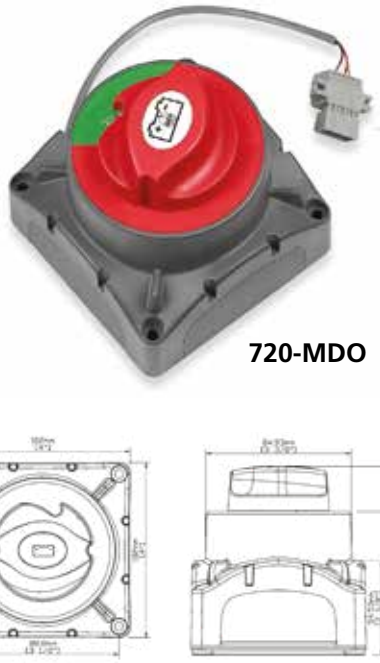


720 - MDO

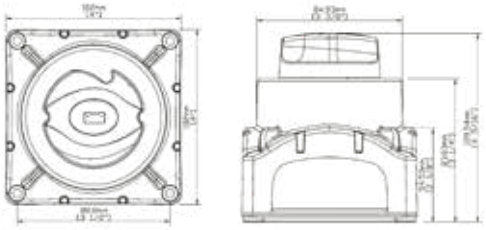
701-MD



701-MD dimensions



720-MDO



720-MDO dimensions

Optical sensor benefits (720-MDO only)

- Can be used to switch in positive or negative lines
- Low stand by current draw (7mA). Zero if aux control switch used (See instructions).
- Main contacts isolated from control circuit allowing operation via another battery source

BEP MARINE® - BATTERY DISTRIBUTION CLUSTER

715-V DUAL BATTERY CHARGING CLUSTERS

To be used on following systems:
- Single outboard dual battery bank
- Single alternator dual battery bank
- Twin alternator dual battery bank

715-V

716-SQ-140A-DVSR DUAL BATTERY CHARGING CLUSTERS

For use on charging systems up to 150A. To be used on following systems:
- Single outboard dual battery bank
- Single alternator inboard engine dual battery bank

716-SQ-140A-DVSR

715-S DUAL BATTERY CHARGING CLUSTERS

The 715-S is designed for systems with twin engines and 2 batteries. The house loads can be switched between port and starboard battery.
The selector switch can also be used to parallel the batteries when in both position.

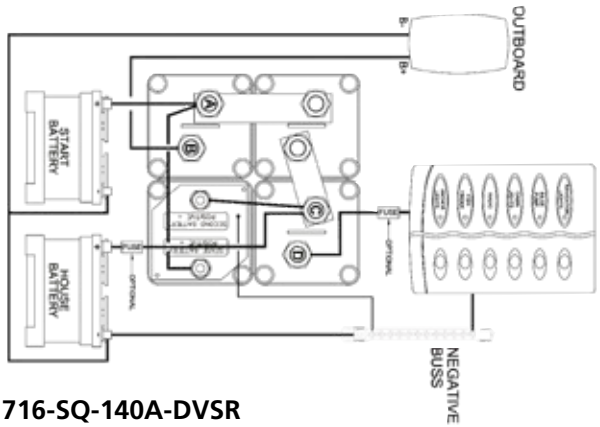
715-S

717-140A-DVSR THREE BATTERY CHARGING CLUSTERS

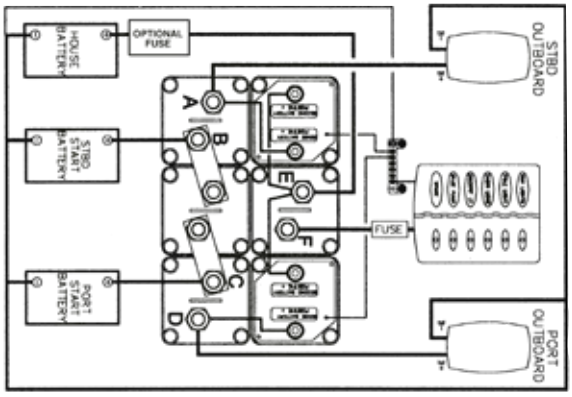
This system is designed for twin outboard installations using outboards without AUX outputs. It will allow the port engine to charge the port start battery and the house battery when the VSR is engaged. It will also allow the starboard engine to charge the starboard start battery and the house battery when the starboard VSR is engaged, giving a combined charge from two outboards into the house battery until the voltage regulators on both engines control the charge. It will also allow the house battery to be charged if steaming on one engine.

717-140A-DVSR

MODEL	PART No.	ENGINE/BATTERIES	ORIENTATION	DIMENSIONS mm (") W x H
715-V	68856X	Single inboard or outboard engine/2 banks	RECTANGULAR	207 x 69 (8.1 x 2.75)
716-SQ-140A-DVSR	68102S	Single inboard or outboard engine/2 banks	SQUARE	138 x 138 (5.4 x 5.4)
715-S	65352A	Twin inboard or outboard engine/2 banks	RECTANGULAR	138 x 69 (5.4 x 2.75)
717-140A-DVSR	68103U	Twin outboard engine/3 banks	RECTANGULAR	207 x 138 (8.1 x 5.4)
719-140A-DVSR	21368U	Three outboard engine	SQUARE	207 x 207 (8.1 x 8.1)



716-SQ-140A-DVSR

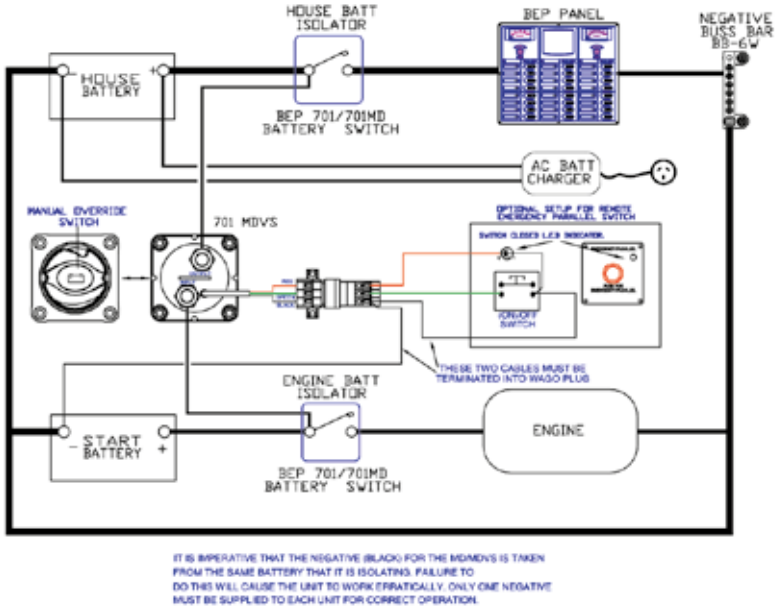


717-140A-DVSR

BEP MARINE®
DUAL BATTERY CHARGING
VOLTAGE SENSITIVE RELAYS(VSR)

REMOTE OPERATED WITH EMERGENCY PARALLEL

The VSR switch utilizes the same operation as the MD battery switches and is packed with features which complimet the MD rang



701-MDVS and 80-701-0018-00
Same specifications as 701-MD

720-MDVS and 720-MDO-EP
Same specifications as 720-MD

FEATURES:

- Dual battery sensing
- Remote emergency parallel function 701-MDVS and 720-MDVS can be operated through a momentary button on the dash which will parallel the batteries for a present time of 10 minutes. Once this 10 minutes has passed, if the voltage is up high enough for the voltage sensitive switch to operate, it twill stay engaged. If not, it will discharge.
- Engine run sensing VSR will engage when the voltage on either start or house battery reaches 13,7 Volt. If the combined battery voltage drops below 13,0 Volt and the engine is not running, after 5 seconds the contacts will open and stay open until the start or house battery voltage exceeds 13,7 Volt. If the combined battery voltage drops below 12,2 Volt and the engine is running, after 5 minutes the contacts will open and stay open until the start or house battery voltage exceeds 13,7 Volt. If voltage drops below 13,0 Volt and stays above 12,2 Volt on either start or house battery while engine is running, the VSS will stay engaged.
- Manual override option
- The VSR will cover your dual battery charging requirements and emergency parallel operation in one unit

MODEL	PART No.	VOLT	RATING	ENGAGES	DISENGAGES
701-MDVS	66416F	12V DC	275A	13.7V DC	12.2-13.00V DC
701-MDVS-24V	66418K	24V DC	275A	27.4V DC	24.4-26.00V DC
720-MDVSO	21374N	12/24V DC	500A	13.3-26.6V DC	12.7-25.4V DC
80-701-0018-00	68152H	12/24V DC	275A	Emergency parallel only	
720-MDO-EP	68346X	12/24V DC	500A	Emergency parallel only	

BEP MARINE®
DUAL BATTERY CHARGING
VOLTAGE SENSITIVE RELAY

710-140A

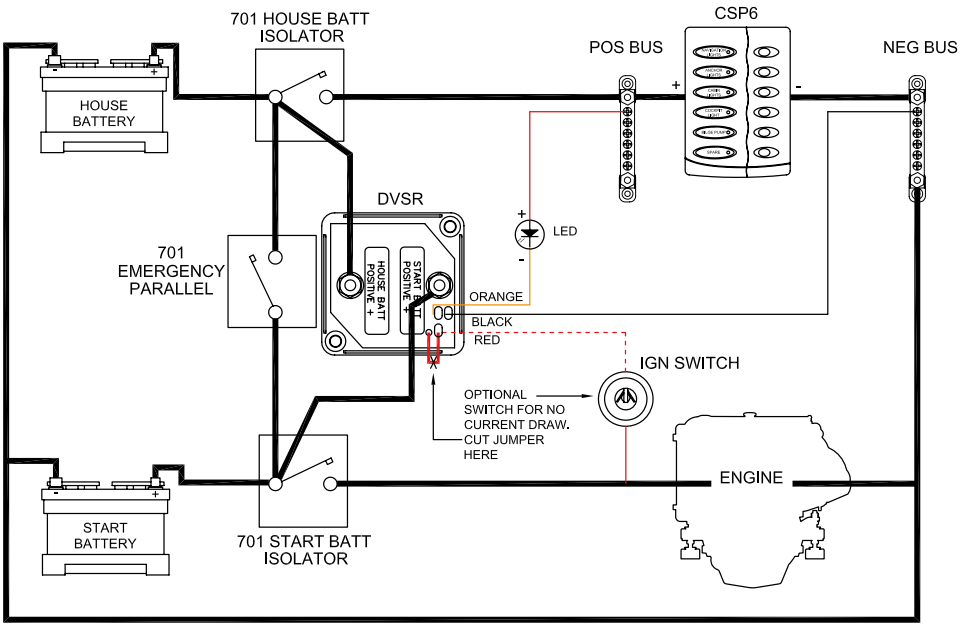
710 -140A - DIGITAL VOLTAGE SENSING RELAY (DVSR)

The Voltage Sensing Relay (VSR) allows the charging of a second battery from a single charging source. When the voltage on the start battery rises to a level indicating a 60% charge, the VSR engages allowing the 2nd battery to charge. When charging stops and voltage falls, the VSR will disengage isolating the two battery banks from each other. Dual sensing functionality enables the sensing of two battery banks allowing two way charging.

- Safely charge two or more indipendent battery banks from one charge source (alternator, battery charger….)
- Protects start batteries from becoming flattened by domestic loads
- Simple to install 3-wire connection, leaves alternator wiring intact
- No Volt drop vs. diode isolators
- Zero stand by current draw
- Multi voltage, auto selects between 12 and 24V DC operation
- Ignition protected
- Surface or panel mountable

Replace previous models 710-125A and 710-125A-DS

MODEL	PART No.	VOLT	APPLICATION	DIMENSIONS mm (“) H x W x D
710-140A	68101P	12V DC/24 VDC	For use on charging system up to: 140 Amp	69 x 69 x 50 (2.75 x 2.75 x 2)



BEP MARINE®
BATTERY DISTRIBUTION COMPONENTS

702 DISTRIBUTION STUD

The 702 Contour Distribution Stud allows terminating of heavy duty cables for 1 or more connections. Contour lock housing has removable side plates which allow for connections from all sides, utilising link bars 702SB.

702

702SB - 64393K

702SB
Secondary Bus
Fitted to distribution stud 702 allows for small wire connections without cluttering main stud. Terminal screws 4 mm (1/8").

702SB

703-300A

MODEL	PART No.	STUD SIZE	AMP	DIMENSIONS mm (")
702	63687Y	10 mm (3/8")	200A	69 x 69 x 50 (2.71 x 2.71 x 2)
703-300A	68058S	10 mm (3/8")	300A	138 x 69 x 50 (5.4 x 2.71 x 2)
703-500A	63688A	10 mm (3/8")	500A	69 x 69 x 50 (2.71 x 2.71 x 2)

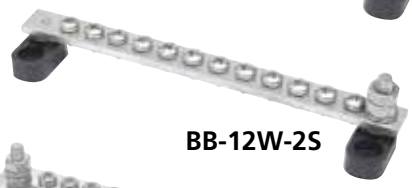
BUS BARS

Marine grade negative or positive Bus Bars are supplied as standard with all BEP AC/DC control panels

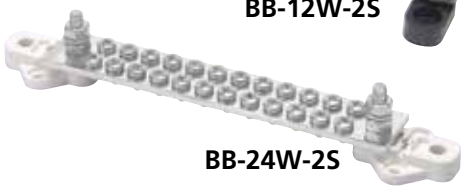
FEATURES:

- 4 mm (5/32") stainless steel screws with shakeproof washers
- 2x6 mm (1/4") input stud
- Tin plated brass
- Insulated mounting base

BB-6W-2S



BB-12W-2S



BB-24W-2S

MODEL	PART No.	OUTPUT SCREWS 4 mm (5/32")	INPUT STUDS 6 mm (1/4")	CURRENT RATING
BB-6W-2S	63690L	6	1	100A
BB-12W-2S	63691N	12	1	100A
BB-24W-2S	63692R	24	2	150A

INSULATED STUDS

FEATURES:

- 6 mm (1/4"), 8 mm (5/16") e 10 mm (3/8") tinned copper and brass studs with spring washers
- High temperature plastic insulated mounting base

IS-10MM-1
64392H

IS-10MM-1R
23904C

MODEL	IS-6MM-1	IS-6MM-1R	IS-8MM-1	IS-8MM-1R	IS-10MM-1	IS-10MM-1R	IS-6MM-2	IS-10MM-2	IS-10MM-8MM
Part No.	23517V	23518X	23124Z	23519Z	64392H	23904C	63689C	65766E	23520H
Terminals	1x6mm (1/4")	1x6mm (1/4")	1x8mm (5/16")	1x8mm (5/16")	1x10mm (3/8")	1x10mm (3/8")	2x6mm (1/4")	2x10mm (3/8")	1x10mm/1x8mm
Polarity	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Neg.	Neg.

BEP MARINE®
BATTERY DISTRIBUTION COMPONENTS

702-MFH SINGLE FUSE HOLDER

BEP Marine's new heavy duty fuse holders are an economical way of fusing heavy loads 30-80 amp. Ideal for battery charger outputs or mains feeds. 6 mm (1/4") studs receive ring terminals and cables up to 25 mm² (4 gauge). Fuse is clamped between tinned brass clamp for positive connection. Covers enclose exposed terminals to meet ABYC standards

702-MFH

MODEL	PART No.	STUD SIZE	DIMENSIONS mm (")
702-MFH	67406H	6 mm (1/4")	71 x 53 x 36 (2,8 x 2 x 1.42)

HEAVY DUTY FUSES

MODEL	PART No.	RATING	MODEL	PART No.	RATING
BFHD-30A	66132R	30 Amp	**BFHD-60A**	66135X	60 Amp
BFHD-40A	66133T	40 Amp	**BFHD-70A**	66136Z	70 Amp
BFHD-50A	66134V	50 Amp	**BFHD-80A**	66137B	80 Amp

IGNITION PROTECTED FUSES & 704-ANL FUSE HOLDER HEAVY DUTY

The 704-ANL allows fusing of heavy duty accessories between 80 Amp - 500 Amp. Mounted in contour lock mouldings with removable sides.
704-ANL - 63235K - fuse holder

ANL-FUSE

704-ANL

704-ANL

MODEL	PART No.	ANL FUSE LINKS	DIMENSIONS mm (")
IP100A	64395P	100 Amp	138 x 69 x 50 (5.4 x 2.75 x 2)
IP150A	63806D	150 Amp	138 x 69 x 50 (5.4 x 2.75 x 2)
IP200A	63807F	200 Amp	138 x 69 x 50 (5.4 x 2.75 x 2)
IP250A	63808H	250 Amp	138 x 69 x 50 (5.4 x 2.75 x 2)
IP300A	20764X	300 Amp	138 x 69 x 50 (5.4 x 2.75 x 2)
IP425A	63810U	425 Amp	138 x 69 x 50 (5.4 x 2.75 x 2)
IP500A	64407U	500 Amp	138 x 69 x 50 (5.4 x 2.75 x 2)

FUSES AND FUSE HOLDERS

FT/FV30 - 23764N - 30 A fuse
FT/FV40 - 23765R - 40 A fuse
FT/FV50 - 23766T - 50 A fuse
FT/FV70 - 23767V - 70 A fuse
FT/FV80 - 21715N - 80 A fuse
FT/FV100 - 69106F - 100 A fuse
FT/FV200 - 69103Z - 200 A fuse
FT/FV300 - 20734M - 300 A fuse
PFH/FV10 - 21716R - Fuse holder for 80 A fuses
PFH/FV01 - 69104B - Fuse holder for 100 A to 300 A fuses

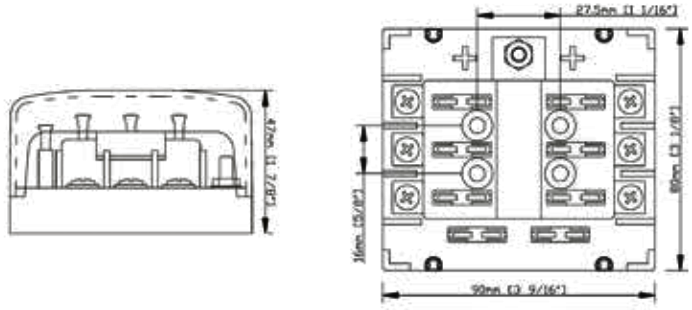
BEP MARINE®
ATC FUSE HOLDERS

ATC-6W

The BEP ATC fuse holder includes the patented contour lock system (as used in all BEP battery management products). This allows you to module as many fuse holders as you like together.
The advantage of this is that it allows you to link the inputs together, or split them apart to allow multiple power groups within one fuse holder: eg. switched supply or 24 hour supply. For the aftermarket the modular system allows you to carry one part number instead of 3 or 4. The 6W-ATC also includes a clip on cover and label positions. The lebel positions receive the same label as the 1000 series panels (ordered separately).

SPECIFICATIONS

- Maximum amperage per circuit: 30 Amp
- Maximum amperage per block: 100 Amp
- Maximum voltage: 32V DC
- Base material: polycarbonate
- Cover material: clear polycarbonate



ATC-6W Dimensions

ATC FUSE HOLDERS		
MODEL	PART No.	DESCRIPTION
ATC-6W	65569C	6 way fuseholder, screw terminals, with cover
ATC-6WQC	66017R	6 way fuseholder, quick connect, with cover

Fuse holder link
Part No. - 23006T
BB-LINK-17 mm
Ordered separately

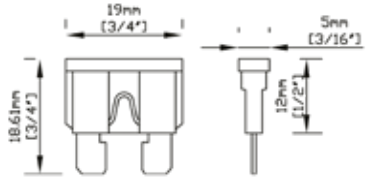
BB-LINK - 17 mm

ATC FUSES		
MODEL	PART No.	RATING
J03A	66018T	3 Amp
J05A	66019V	5 Amp
J7.5A	66020D	7.5 Amp
J10A	66021F	10 Amp
J15A	66022H	15 Amp
J20A	66023K	20 Amp
J25A	66024M	25 Amp
J30A	66025P	30 Amp

J05A

SPECIFICATIONS

- Fuses available: 3-30 Amp
- Interrupt capacity: 1000 amp DC
- Maximum voltage: 32 Volt DC



J05A Dimensions

BEP MARINE®- PRO INSTALLER EZ-MOUNT BATTERY SELECTOR SWITCHES

As easy as 1,2,3, these revolutionary battery switches allow you to wire from the front. Never has been so easy and cabling so accessible. With their shared interconnection height, Pro Installer-EZ-Mount battery switches “cluster” directly with the Pro Installer Busbar Range,resulting in the fastest, most compact installations. Optimized cable access makes installation a breeze.
Pro Installer switches set the new benchmark with outstanding ergonomics, intuitive look/feel, and are engineered from the finest materials to withstand the harsh marine environment. The outstanding performance and features of this powerful new generation battery switch appeal to both the installer and user. All ratings, footprints and features of the Pro Installer-EZ-Mount switches match the high quality of our standard switches.

FEATURES

- Continuous rating: 400 Amp DC
- Intermittent rating: 600 Amp (5 mins)
- Cranking rating: 1500 Amp (10 secs)
- Waterproof to IP66
- Tinned copper 10 mm (3/8”)studs
- Stainless steel washers/nuts
- Fiber reinforced plastics
- Same interconnection height as Pro Installer
- Removable knob allows isolation during servicing
- 3 removable sideplates for protection
- Industry standard 3.85” x 3.85” footpriny
- Dimensions mm (”): 97.8 x 97.8 (3.85 x 3.85)
- Tested to UL1107 ignition protection, CE

770-EZ-400A - 69149A - On/off master switch EZ-MOUNT

770-DP-400A - 69952Y - DOUBLE POLE, on/off master switch

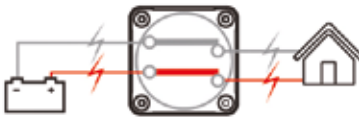
770-DP-EZ-400A - 69953A - DOUBLE POLE on/off master switch EZ-MOUNT

771-S-EZ-400A - 69150J - Selector battery switch EZ-MOUNT

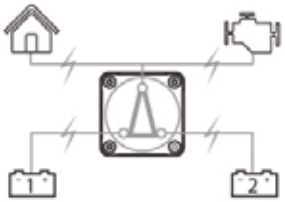
771-S-400A - 69954C - Selector battery switch

771-SFD-400A - 69955E - Selector battery selector with alternator switch disconnect

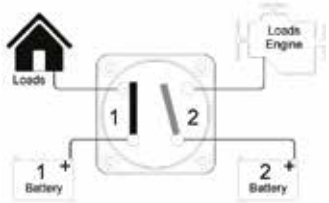
772-DBC-EZ-400A - 69889U- Dual bank control battery switch EZ-MOUNT



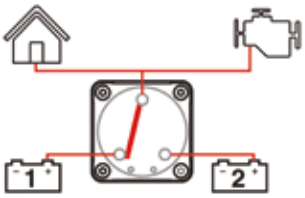
770-DP-400A - 770-DP-EZ-400A



771-S-400A - 771-S-EZ-400A



772-DBC-EZ-400A



771-SFD-400A

770-DP-EZ

771-S-EZ

772-DBC-EZ

BEP MARINE® - Z-BARS

This patent-pending, space saving buss bar range is a completely new concept for marine cable termination. Offering almost unlimited installation flexibility, the high and low level bars can be bussed together with Z-Link, or used as separate positive/negative bars.

777-BBZ18W-200

777-BBZ10W-200

FEATURES:

- Modular sizing and common interconnection height: Easily linked with other Pro Installer Busbars and Fuseholders to save installation time and space
- Clean installation—all cables can be run from one side of the Z-bar
- Innovative clear covers insulate/protect on three sides, with "snap outs" for extra cable access as required
- Label recess on cover allows fitting up to ½" width (12.7mm) printed labels
- Insert molded studs offer superior mechanical strength
- Designed for the harsh marine environment

SPECIFICATIONS:

- 4x 6mm (1/4") studs
- 10 x 4mm (5/32") terminals
- 200A maximum per bar (2x 200A)
- 50 VDC
- High temperature, fibre reinforced plastic base provides strength and chemical resistance
- Clear polycarbonate cover
- Tinned CDA102 copper conductors, stainless steel studs/screws, and nickel plated brass nuts for longevity in the marine environment
- All threads are metric
- Dimensions: 3.9" x 1.9" x 2.0" (98 x 49 x 51mm)
- Weight: 6.7 Oz (189g)

MODEL	PART No.	TERMINAL Q.TY	TERMINAL DIMENSIONS mm (")	CONNECTING STUD Q.TY	CONNECTING STUD DIMENSIONS mm (")	AMPS	DIMENSIONS mm (")
777-BBZ18W-200	68864W	18	4 (5/32)	4	6x19 (1/4x3/4)	200A	147x49x51 (5.8x1.9x2.0)
777-BBZ10W-200	68865Y	15	4 (5/32)	4	6x19 (1/4x3/4)	200A	98x49x51 (3.9x1.9x2.0)

BEP MARINE® - HEAVY-DUTY BUSBARS

Available in a broad range from 3-studs to 8-studs, Pro Installer busbars offer the installer greater flexibility to select busbars to match their load and space requirements. Compact footprints and modular designs allow for space saving and scalability. Robust construction, thicker copper conductors and additional mounting holes provide the basis for secure, reliable, electrical installations.
The covers feature snap-out side skirts providing additional cable entry as required, while the label recess provides the perfect landing for handheld-printer labels. It's easy linking to other Pro Installer products because of the common interconnection height, and the radiused busbar ends improve cable routing options for large cables.

BUSBARS

FEATURES:

- Modular sizing and common interconnection height: Easily linked with other Pro Installer Busbars and Fuseholders to save installation time and space
- Radiused bar ends allow large cable attachment at any angle between -90° and +90°, to improve installation flexibility. Generous stud lengths
- Innovative clear covers insulate/protect on three sides, with "snap outs" for extra cable access as required
- Label recess on cover allows fitting up to ½" width (12.7mm) printed labels
- Robust construction and additional mounting holes for ultimate security
- Designed for the harsh marine environment
- Plated brass nuts and stainless steel studs prevent thread galling if over-tightened

SPECIFICATIONS:

- 650A and 500A busbars 10mm (3/8") stainless steel studs
- 50 VDC
- High temperature, fibre reinforced plastic base provides strength and chemical resistance
- Clear polycarbonate cover
- Tinned CDA102 Copper conductors, stainless steel studs/screws, and nickel plated brass nuts for longevity in the marine environment
- All threads are metric

MODEL	PART No.	CONNECTING STUD Q.TY	CONNECTING STUD DIMENSIONS mm (")	AMPS	DIMENSIONS mm (")
777-BB8S-650	68860M	8	10x25 (3/8x1)	650A	249x48x66 (9.8x1.9x2.6)
777-BB5S-650	68861P	5	10x25 (3/8x1)	650A	147x48x66 (5.8x1.9x2.6)
777-BB3S-650	68862S	3	10x22 (3/8x7/8)	650A	99x48x63.6 (3.9x1.9x2.5)
777-BB4S-500	68863U	4	8x22 (5./16x7/8)	500A	99x48x63.5 (3.9x1.9x2.5)

BEP MARINE® - LINK BARS

- A range of linking bars complement the Pro Installer range of products
- High purity copper, tin plated for optimum marine electrical performance
- Fastest, most economic way of connecting for the most compact installations
- Saves space, allows clustering for the most compact installations
- Links can be doubled for higher loads

Application example

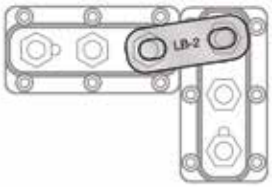
Application example

MODEL	PART No.	DESCRIPTION	LINK	MAX AMPS	DIMENSIONS mm (“)
LB-1	69318X	Link bar 31-34.7 mm	Short Link Bar 8 & 10 mm studs	650	56x25 (2.2x1.0)
LB-2	69319Z	Link bar 35.5-42.5 mm	Medium Link Bar 8 & 10 mm studs	650	69x25 (2.8x1.0)
LBJ-2	69320H	2 way joiner 46-50 mm	Long Link Bar 8 & 10 mm studs	650	74x25 (3.0x1.0)
LBZ-1	69321K	Link Z Bar to Z Bar	Joins 2 Z Bar E:E and S:S	250	49x12 (2.0x0.5)
LBZ-2	69322M	Link Z Bar to Busbar or Fuseholder	Joins Z Bar to Busbar or FuseHolder	400	53x25 (2.1x1.0)
LBJ-3	69324S	Joiner 3-way	Side to side of 3 products	525	123x25 (4.9x1.0)
LBJ-4	69325U	Joiner 4-way	Side to side of 4 products	450	172x25 (6.9x1.0)
LBJ-5	69326W	Joiner 5-way	Side to side of 5 products	400	221x25 (8.8x1.0)
LBJ-6	69327W	Joiner 6-way	Side to side of 6 products	350	270x25 (10.8x1.0)

BEP MARINE® - LINK BARS

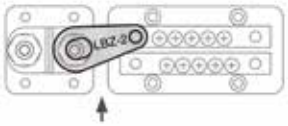
LINK BAR DIAGRAMS:

E:E End to End linking

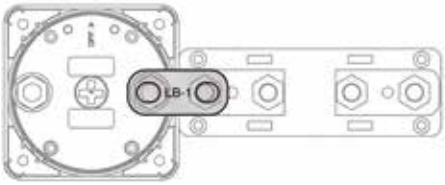


S:E Side to End linking

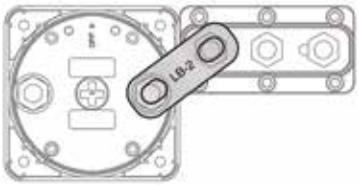
S:S Side to Side joining



Gap For small gaps between products



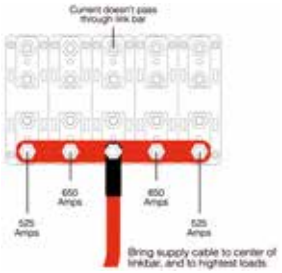
C Centerline linking



O Offset linking

FOR HIGH LOAD LINK JOINER APPLICATIONS

Links can be doubled for higher loads. Example: If 2 x 779-LBJ-5-B joiners are used in the diagram at right, quoted Amps can be doubled: maximum of 1300 Amps to the adjacent stud, or 1050 Amps to the stud 2 positions away from the feed cable.



	Heavy Duty Busbars	Z Busbars	Fuseholder 778ANL	Fuseholder ANL	Fuseholder ANL & Class T	Single insulated studs	Double insulated studs	EZ Mount battery switch On/Off
BUSBARS								
Heavy Duty Busbars	LB-1	LBZ-2	LB-1	-	LB-1 (4 Gap)	LB-2	S:E LB-1 Gap LB-1	O: LB-2 C: LB-1
Z Bars	LBZ-2	LBZ-1	LBZ-2	-	LBZ-2	-	Gap LBZ-2	LBZ-2
FUSEHOLDER								
778ANL	LB-1	LBZ-2	LB-2	-	LB-1	LB-2	S:E LB-1 Gap LB-1	O: LB-2 C: LB-1
778ANLTP	-	-	-	LB-2	-	-	-	-
778ANL2S	LB-1	LBZ-2	LB-1	-	LB-1	LB-2	S:E LB-1 Gap LB-1	O: LB-2 C: LB-1
INSULATED STUDS								
Single insulated stud	LB-2	-	LB-2	-	LB-2	LBJ-2	LB-1	LBJ-2 C: LB-2
Double insulated studs	S:E LB-1 Gap LB-1	Gap LBZ-2	S:E LB-1 Gap LB-1	- -	S:E LB-1 Gap LB-1	LB-1	S:S LBJ-2 Gap LB-1	O: LB-1 C: Gap LB-1
EZ MOUNT BATTERY SWITCHES								
EZ – ON/OFF	O: LB-2 C: LB-1	LBZ-2	LBZ-2 C: LB-1	- -	O: LB-2 C: LB-1	O: LBJ-2 C: LB-2	O: LB-1 C: Gap LB-1	LB-1
EZ – Battery studs	LB-2 (4 studs LB-1)	LBZ-2	LB-2	- -	O: LB-1 C: LB-2	LBJ-2	LB-1	-
EZ – Common studs	O: LB-2 C: LB-1	LBZ-2	O: LB-2 C: LB-1	-	O: LB-2 C: LB-1	O: LBJ-2 C: LB-2	O: LB-1 C: Gap LB-1	-

BEP MARINE® - INSULATED STUDS

The Pro Installer insulated studs are a smart choice for marine installers. Increased stainless steel stud length allows up to three large cable lugs to be connected. The clear polycarbonate cover provides insulation/protection, while the snap-out side skirts allow for additional cable entry. The power tapping plate variant provides additional termination points for small cables.

FEATURES:

- Modular sizing and common interconnection height: Easily linked with other Pro Installer Busbars and Fuseholders saving installation time and space
- Power tapping plate converts from a single stud, adding four connection points for smaller cables, while preserving access for larger cables
- Generous stud lengths allow securing of three 95mm² (3/0) cable lugs
- Innovative clear covers provide insulation/ protection, with "snap outs" for extra cable access as required
- Label recess on cover allows fitting up to ½" width (12.7mm) printed labels
- Snap out partition on double stud base provides insulation to separate studs for isolated (positive/negative) application. Snapping this partition allows easy linking of the studs
- Insert moulded studs offer superior mechanical strength
- Four mounting holes in base allow installer choice of using two, or four fastenings depending on level of securing required
- Designed for the harsh marine environment

SPECIFICATIONS:

- Note: no power passes through the stud so no amp rating is given
- 50 VDC
- High temperature, fiber reinforced plastic base provides strength and chemical resistance
- Clear poly carbonate cover
- Stainless steel studs/screws, and nickel plated brass nuts for longevity in the marine environment
- All threads are metric
- Double studs feature "snap out" insulating partition, to allow linking of studs

IST-8MM-2S

IST-8MM-1SPT

IST-8MM-1S

MODEL	PART No.	TERMINAL Q.TY	TERMINAL SIZE mm (")	CONNECTING STUD Q.TY	CONNECTING STUD SIZE mm (")	DIMENSIONS mm (")
IST-8MM-1S	68866A	4	4 (5/32)	1	8x22 (5/16x7/8)	49x49x62 (1.9x1.9x2.5)
IST-8MM-1SPT	68867C	4	4 (5/32)	1	8x22 (5/16x7/8)	49x49x62 (1.9x1.9x2.5)
IST-8MM-2S	68868E	4	4 (5/32)	2	8x22 (5/16x7/8)	49x49x62 (1.9x1.9x2.5)

BEP MARINE® - ANL FUSEHOLDERS

Providing high-capacity fusing, fast response and high interrupt ratings (ANL up to 3,000 Amps DC), these fuse holders are ideal for protecting today's demanding onboard power electronics technology including inverters and battery chargers. They also protect wiring from short circuits, for example as a main fuse to protect house circuits, protection for digital switching main feed circuits, or heavy duty loads.
ANL fuses in the following sizes/ratings are suitable:
Bussmann 35A – 750A. 8 mm (5/16") hole for stud
Littelfuse 35A-500A. 10 mm (3/8") hole for stud, fits all Pro Installer ANL fuseholders

778ANL2S

778ANL

778ANLTP

FEATURES:

- Innovative through-panel mounting version (Patent Pending) offers the user easy visual inspection of fuse state, and fast/safe access to change fuse if blown
- Modular sizing and common interconnection height: Easily linked with other Pro Installer Busbars and Fuseholders saving installation time and space
- Durable construction allows fuses to run at maximum load
- Radiused ends improve large cable routing options (can fit back-to-back lugs at any angle -90° to +90°)
- Innovative clear covers provide insulation/protection, with "snap outs" for extra cable access as required
- Fuse viewing "window" in cover aids visual inspection of fuse-state
- Label recess on cover allows fitting up to ½" width (12.7mm) printed labels
- Insert moulded studs offer superior mechanical strength
- Designed for the harsh marine environment
- All threads are metric

SPECIFICATIONS:

- Cable connection studs: Shared 8mm (5/16")
- Fuse mounting studs: 8mm (5/16"). Also allows 10mm (3/8") ANL fuses to be used
- Fuse type: ANL / ANN
- Swinging fuse style allows changing fuse without removing fastened nuts
- Amperage: 35-300A
- 50 VDC (or determined by fuse fitted)
- High temperature, fibre reinforced plastic base provides strength and chemical resistance
- Clear poly carbonate cover
- Stainless steel studs, and nickel plated brass nuts for longevity in the marine environment

MODEL	PART No.	FUSE	FUSE STUDS	CONNECTING STUD Q.TY	CONNECTING STUD SIZE mm (")	AMPS	DIMENSIONS mm (")
778ANL	68869G	Bussmann 8 mm (5/16") - Prudenz o Siba 10 mm	8 mm (5/16")	2 terminali con fusibile	8x22 (5/16x7/8)	300A	98x49x54 (3.9x1.9x2.1)
778ANLTP	68870R	Bussmann 8 mm (5/16") - Prudenz o Siba 10 mm	8 mm (5/16")	+ 2 per cavo	10x25 (3/8x1)	750A	98x49x36 (3.9x1.9x1.4)
778ANL2S	68871T	Bussmann 8 mm (5/16") - Prudenz o Siba 10 mm	8 mm (5/16")	+ 2 per cavo	10x29 (3/8x1/8)	750A	147x49x61 (5.8x1.9x2.4)

BEP MARINE® - CLASS T FUSEHOLDERS

Provide high-capacity fusing, with very fast response and very high interrupt ratings (Class-T 20,000-50,000 Amps interrupt). These fuse holders are ideal for protecting today's demanding on board power electronics technology including inverters and battery chargers. They also protect wiring from short circuits, for example as a main fuse to protect house circuits, where modern battery technologies such as Lithium Ion and AGM, are capable of producing very high short circuit currents.

FEATURES:

- Modular sizing and common interconnection height: Easily linked with other Pro Installer Busbars and Fuseholders, saving installation time and space
- Durable construction allows fuses to run at maximum load
- Radiused ends improve large cable routing options (can fit back-to-back lugs at any angle -90° to +90°)
- Innovative clear covers provide insulation/protection, with "snap outs" for extra cable access as required
- Label recess on cover allows fitting up to ½" width (12.7mm) printed labels
- Insert molded studs offer superior mechanical strength
- Designed for the harsh marine environment

CLASS T

SPECIFICATIONS:

- Cable connection studs: 10mm (3/8") studs
- Fuse mounting studs: 10mm (3/8")
- Fuse type: Class T (JLLN / TJN / A3T)
- Maximum amperage: 400A
- 50 VDC
- High temperature, fiber reinforced plastic base provides strength and chemical resistance
- Clear poly carbonate cover
- Tinned CDA102 copper conductors, stainless steel studs, and nickel plated brass nuts for longevity in the marine environment
- All threads are metric

MODEL	PART No.	FUSE	FUSE STUDS	CONNECTING STUDS Q.TY	CONNECTING STUDS SIZE mm (")	AMPS	DIMENSIONS mm (")
778T2S-400	68872V	Class T 225A-400A	10 mm (3/8")	+ 2 per cable	10x29 (3/8x1/8)	225A - 400A	147x49x61 (5.8x1.9x2.4)
778T2S-600	68873X	Class T 450A-600A	12 mm (0.47")	+ 2 per cable	10x29 (3/8x1/8)	400A - 600A	147x49x61 (5.8x1.9x2.4)

CLASS T FUSES

- Interrupt capacity: 20,000A DC
- Maximum voltage: 160V DC
- Diameter: 34 mm (1.34") - 41 mm (1.62") heavy-duty models
- Length: 70 mm (2.77") - 77 mm (3.03") heavy-duty models
- Use with: Pro Installer Class T Fuse Holders

MODEL	FT-225-B	FT-250-B	FT-300-B	FT-350-B	FT-400-B	FT-450-B	FT-500-B	FT-600-B
Part No.	23230Y	23231A	23232C	23233E	23234G	23235J	23236L	22186T
Rating	225 A	250 A	300 A	350 A	400 A	450 A	500 A	600 A
Heavy-duty	No	No	No	No	No	Yes	Yes	Yes
Q.ty	1	1	1	1	1	1	1	1

Storage systems based on supercapacitors provide a safe, efficient, and viable alternative to chemical batteries and they outperform them in many applications.

OVERCOMING THE LIMITATIONS

Power Electronics

- Advances in power electronics allowed us to deploy innovative circuits to achieve algorithm-based:
- Current balancing circuit that actively balances supercaps in series without compromising cell attributes
- Charge control circuit that allows control of rate of discharge
- Charge retention circuit that enables control of self-discharge

EFFICIENCY	High DC to DC round-trip efficiency[1]
	Nameplate capacity = usable capacity[2]
SAFETY AND DURABILITY	No risk of thermal runaway
	No heat generation during cycling
LONGEVITY	Long cycle[3] and calendar life
	No memory effect[4]
	Self-discharge, when in sleep mode, of 2% or less, per month
VERSATILITY	Wide ambient operating temperature range
	High C-rate capability without affecting cycle life or capacity
	Commercially acceptable form factor for low, medium or high voltage applications
	Modular and scalable. Economical manufacturing plant.

[1] At the supercap cell level
[2] Under normal operating conditions, no derating necessary for DOD, C-rate, temperature, capacity loss due to cycling
[3] Warranty for 10 years
[4] If left idle for an extended period and recharged, no effect on capacity or cycle life

ADVANTAGES OVER CHEMICAL STORAGE

Lower capex

- Reduced oversizing to compensate for DOD, C-rate, ambient temperature, round-trip efficiency
- Reduced safety infrastructure requirement
- Reduced disposal cost and environmental impact

Opex advantage

- Lower energy consumption during cycle life
- Lower energy consumption due to reduced parasitic loads (e.g. HVAC)
- Reduced diesel consumption & DG maintenance costs in diesel + storage deployments

LOCATION	APPLICATION
South Africa	Solar, cell tower, streetlights
Australia	Solar
Pakistan	UPS
Canada	Solar
Italy	Solar, genset, marine
Sudan	Containerized Solution - Centauri + microgrid
Kenya	Centauri + microgrid

APPLICATIONS

SOLAR WITH STORAGE

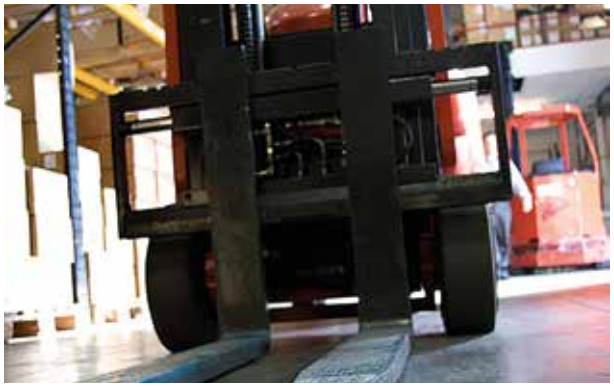
- Grid connected systems
- Stand alone systems
- Microgrid

INDUSTRIAL APPLICATIONS

- Telecommunications
- Power Quality
- UPS
- Generator set optimization

MONITORING AND CONNECTIVITY APPLICATIONS

- Video surveillance
- City Wi-Fi networks
- Off-grid lighting



MOBILITY

- Urban Electric Vehicles
- Forklifts
- House boats and recreational vehicles

SIRIUS® KILOWATT LABS® SUPERCAPACITORS

KILOWATT LABS

- Graphene supercapacitor cells
- Safest technology
- Ultra-long cycle life
- Extreme temperature
- Highest energy transfer efficiency
- Easy to install
- Rarely maintenance
- Warranty: 2 years + 8 years provided by the manufacturer

	MODEL	SIRIUS 500-12
	Part No.	21932X
PERFORMANCE SPECIFICATIONS	Voltage (Nominal)	12 VDC
	Maximum Charge Voltage	13,5 VDC
	Discharge Cut-Off Voltage	11 VDC
	Total Energy	500 Wh
	Maximum Charge Rate	40 A
	Maximum Discharge Rate	40 A
ENVIRONMENTAL SPECIFICATIONS	Cell Operating Temperature	-30°C to 80°C
	Operating Humidity	Non-Condensing
MECHANICAL SPECIFICATIONS	Dimensions WxDxH mm (")	110x110x872 (4.3x4.3x34.3)
	Weight kg (lbs)	15 (33)
	Module Casing Material	GI Powdered
	Terminal type	F05
SMART FEATURES	Alarm	Audible alarm in the event of Over/under-Voltage, Over-Current, Over Temperature
MODULE SERVICE LIFE	Projected Cycle Life	1 million cycles
	Projected Calendar Life	45 years
	Shelf Life	10 years
	Warehousing	Can be stored at any SOC without affecting cycle life
	Certifications	EN55032:2015, EN55024:2010, EN61000-4-2:2009, EN61000, EN61000:2008+A2:2010
TECHNICAL SPECIFICATIONS	Charge/Discharge Current	Under no circumstances must the charge/discharge current exceed 40 A
	Charging Voltage	Under no circumstances must the charging voltage exceed 13.5 VDC for more than 60 seconds.
	Charge Cycle	During charge cycle ensure never to exceed constant voltage of 13.5 VDC and constant current of 40 A

- Graphene supercapacitor cells
- Safest technology
- Ultra-long cycle life
- Extreme temperature
- Highest energy transfer efficiency
- Easy to install
- Rarely maintenance
- 2 years warranty

MODEL	UFSC48-3.6/100	UFSC48-5.5/100	UFSC48-7.6/100
Part No.	22133VG	24878K	24879M
Energy storage	3.6 kWh	5.5 kWh	7.6 kWh
Nominal voltage	48 VDC	48 VDC	48 VDC
Maximum charge voltage	58 VDC	58 VDC	58 VDC
Discharge cut-off voltage	37.8 VDC	37.8 VDC	37.8 VDC
ESR/AC @1KHZ 50% SOC	<15mΩ	<10mΩ	<8mΩ
Max. continuous charge current	100 A	100 A	100 A
Max. continuous discharge current	100 A	100 A	100 A
Power / energy	1.38	0.926	0.695
Round trip efficiency	95%	95%	96%
Cells self-discharge rate	2% per month	2% per month	2% per month
Project cycle life (25°C)	20000 cycles	20000 cycles	20000 cycles
Recommended depth of discharge	≤90%	≤90%	≤90%
Maximum depth of discharge	100%	100%	100%
Cooling method	Natural	Natural	Natural
Shell material	Metal and ABS plastic	Metal and ABS plastic	Metal and ABS plastic
Parallel connection	Up to 10 sets	Up to 10 sets	Up to 10 sets
Monitoring data	System voltage, current, temperature, SOC, SOH, cycle, cell's voltage	System voltage, current, temperature, SOC, SOH, cycle, cell's voltage	System voltage, current, temperature, SOC, SOH, cycle, cell's voltage

VICTRON ENERGY® - AGM SUPER CYCLE BATTERIES

The AGM Super Cycle batteries are the result of recent battery electrochemistry developments.

The paste of the positive plates is less sensitive to softening, even in case of repeated 100% discharge of the battery, and new additives to the electrolyte reduce sulfation in case of deep discharge.

Exceptional 100% depth of discharge (DoD) performance
Tests have shown that the Super Cycle battery does withstand at least three hundred 100% DoD cycles.
The tests consist of a daily discharge to 10,8V with I = 0,2C_{20}, followed by approximately two hours rest in discharged condition, and then a recharge with I = 0,2C_{20}.
The two hours rest period in discharged condition will damage most batteries within 100 cycles, but not the Super Cycle battery.
We recommend the Super Cycle battery for applications where an occasional discharge to 100% DoD, or frequent discharge to 60-80% DoD is expected
An additional advantage of the new chemistry is a slightly smaller size and less weight compared to our standard deep cycle AGM batteries.
The internal resistance is also slightly lower compared to our standard deep cycle AGM batteries.

Cycle life
≥ **300 cycles @ 100% DoD** (discharge to 10,8V with I = 0,2C_{20}, followed by approximately two hours rest in discharged condition, and then a recharge with I = 0,2C_{20})
≥ **700 cycles @ 60% DoD** (discharge during three hours with I = 0,2C_{20}, immediately followed by recharge at I = 0,2C_{20})
≥ **1000 cycles @ 40% DoD** (discharge during two hours with I =0,2C_{20}, immediately followed by recharge at I = 0,2C_{20})

SUPER CYCLE AGM	PART No.	NOMINAL VOLTAGE	Ah C_5	Ah C_{10}	Ah C_{20}	TERMINALS	DIMENSIONS mm (") WxDxH	WEIGHT kg (lbs)
12V/15Ah	21580S	12 V	13	14	15	M5	151x100x103 (5.9x3.9x4.1)	4,1 (9)
12V/25Ah	21581U	12 V	22	24	25	M5	181x77x175 (7.1x3x6.9)	7 (15.4)
12V/38Ah	21582W	12 V	34	36	38	M5	267x77x175 (10.5x3x6.9)	10 (22)
12V/60Ah	21583Y	12 V	52	56	60	M5	224x135x178 (8.8x5.3x7)	15 (33.1)
12V/100Ah	21402R	12 V	82	90	100	M6	260x168x215 (10.2x6.6x8.5)	25 (55.1)
12V/125Ah	21584A	12 V	105	114	125	M8	330x171x214 (13x6.7x8.4)	34 (75)
12V/170Ah	21403T	12 V	145	153	170	M8	336x172x280 (13.2x6.8x11)	45 (99.2)
12V/230Ah	21404V	12 V	200	210	230	M8	532x207x218 (20.9x8.1x8.6)	61 (134.5)

AGM

AGM LEAD CARBON

GEL

Deep cycle **AGM** batteries are more suitable for short-time delivery of very high currents (engine starting) than gel batteries. Life: 7 – 10 years

AGM Type	PART No.	CAPACITY	DIMENSIONS W x D x H mm (")	WEIGHT kg (lbs)
12/14	65020Y	14-12 Ah	151x98x101 (5.9x3.8x4)	4,4 (9.7)
12/22	22360G	22-19 Ah	181x77x167 (7.1x3x6.6)	5,8 (12.8)
12/38	65021A	38-33 Ah	197x165x170 (7.7x6.5x6.7)	12,5 (27.5)
12/60	65022C	60 - 55 Ah	229x138x227 (9x5.4x8.9)	18 (39.7)
12/66	65023E	66 - 60 Ah	258x166x235 (10.1x6.5x9.2)	24 (52.9)
12/90	65024G	90 - 80 Ah	350x167x183 (13.8x6.6x7.2)	27 (59.5)
12/110	65645S	110 - 100 Ah	330x171x220 (13x6.7x8.7)	32 (70.5)
12/130	65025J	130 - 120 Ah	410x176x227 (16.1x6.9x8.9)	38 (83.7)
12/165	65026L	165 - 150 Ah	485x172x240 (19.1x6.7x9.4)	47 (103.6)
12/220	65027N	220 - 200 Ah	522x238x240 (20.5x9.3x9.4)	65 (143.0)

AGM Lead carbon	PART No.	NOMINAL VOLTAGE	Ah C_5	Ah C_{10}	Ah C_{20}	TERMINALS	DIMENSIONS mm (") WxDxH	WEIGHT kg (lbs)
LC 12/106	22820R	12 V	92	100	106	M8	229x138x227 (9x5.4x8.9)	18 (39.7)
LC 12/160	22821T	12 V	138	150	160	M8	258x166x235 (10.1x6.5x9.2)	24 (52.9)

GEL Type	PART No.	CAPACITY	DIMENSIONS W x D x H mm (")	WEIGHT kg (lbs)
12/60	65028R	60 - 55 Ah	229x138x227 (9x5.4x8.9)	19 (41.9)
12/66	65029T	66 - 60 Ah	258x166x235 (10.1x6.5x9.2)	24 (52.9)
12/90	65030B	90 - 80 Ah	350x167x183 (13.8x6.6x7.2)	26 (57.3)
12/110	65646U	110 - 100 Ah	330x171x220 (13x6.7x8.7)	33 (72.7)
12/130	65031D	130 - 120 Ah	410x176x227 (16.1x6.9x8.9)	38 (83.7)
12/165	65032F	165 - 150 Ah	485x172x240 (19.1x6.7x9.4)	48 (103.6)
12/220	65033H	220 - 200 Ah	522x238x240 (20.5x9.3x9.4)	66 (143.0)
12/265	22887A	265 - 250 Ah	520x268x223 (20.4x10.5x8.8)	75 (165.3)

VICTRON ENERGY® - 12,8V & 25,6V LITHIUM SUPERPACK BATTERIES

Integrated BMS and safety switch
The SuperPack batteries are extremely easy to install, needing no additional components.
The internal switch will disconnect the battery in case of over discharge, over charge or high temperature.

Abuse proof
A lead-acid battery will fail prematurely due to sulfation:
- If it operates in deficit mode during long periods of time (i.e. if the battery is rarely, or never at all, fully charged).
- If it is left partially charged or worse, fully discharged.

A Lithium-Ion battery does not need to be fully charged. Service life even slightly improves in case of partial charge instead of a full charge. This is a major advantage of Li-ion compared to lead-acid.
The SuperPack batteries will cut-off the charge or discharge current when the maximum ratings are exceeded.

Efficient
In several applications (especially off-grid solar), energy efficiency can be of crucial importance.
The round-trip energy efficiency (discharge from 100% to 0% and back to 100% charged) of the average lead-acid battery is 80%.
The round-trip energy efficiency of a Li-ion battery is 92%.
The charge process of lead-acid batteries becomes particularly inefficient when the 80% state of charge has been reached, resulting in efficiencies of 50% or even less in solar systems where several days of reserve energy are required (battery operating in 70% to 100% charged state).
In contrast, a Li-ion battery will still achieve 90% efficiency even under shallow discharge conditions.

Can be connected in parallel
The batteries can be connected in parallel. Series connection is not allowed.
Use in upright position only.

12,8/20

12,8/60

12,8/100

12,8/200

25,6/50

MODEL	12,8/20	12,8/60	12,8/100 High current	12,8/200	25,6/50
Part No.	23097Z	22840X	21906W	22842B	23098B
Nominal voltage	12,8 V	12,8 V	12,8 V	12,8 V	25,6 V
Nominal capacity @25°C	20 Ah	60 Ah	100 Ah	200 Ah	50 Ah
Nominal capacity @0°C	16 Ah	48 Ah	80 Ah	160 Ah	40 Ah
Nominal energy @25°C	256 Wh	768 Wh	1280 Wh	2560 Wh	1280 Wh
Cycle life @80% DoD and 25°C	2500 cycles				
Max. continuous discharge current	30 A	30 A	100 A	70 A	50 A
Peak discharge current (10 sec)	80 A	80 A	150 A	100 A	100 A
Charge voltage, absorption	14,2-14,4 V	14,2-14,4 V	14,2-14,4 V	14,2-14,4 V	28,4-28,8 V
Charge voltage, float	13,5 V	13,5 V	13,5 V	13,5 V	27 V
Max. continuous charge current	15 A	30 A	100 A	70 A	50 A
Dimensions mm (") WxDxH	181x77x167 (7.1x3x6.6)	229x138x213 (9x5.4x8.4)	330x171x220 (13x6.7x8.7)	520x269x208 (20.5x10.6x8.2)	330x171x220 (13x6.7x8.7)
Weight kg (lbs)	3,5 (7.7)	9,5 (21)	14 (30.9)	31 (68.3)	14 (30.9)

VICTRON ENERGY® - LITHIUM-ION 12,8V E 25,6V

Lithium-iron-phosphate (LiFePO4 or LFP) is the safest of the mainstream li-ion battery types. The nominal voltage cell is 3,2V (lead-acid: 2V/cell). A 12,8V Li-ion battery therefore consists of 4 cells connected in series; and a 25,6V battery consists of 8 cells connected in series. They required external Victron Energy BMS control

MODEL	LFP-SMART 12,8/50	LFP-SMART 12,8/100	LFP-SMART 12,8/160	LFP-SMART 12,8/200	LFP-SMART 12,8/330	LFP-SMART 25,6/100	LFP-SMART 25,6/200
Part No.	24840H	22260C	23266W	68766W	22262G	24767A	23903A
Nominal voltage	12,8 V	12,8 V	12,8 V	12,8 V	12,8 V	25,6 V	25,6 V
Nominal capacity @25°C	550 Ah	100 Ah	160 Ah	200 Ah	330 Ah	100 Ah	200 Ah
Nominal capacity @ 0°C	40 Ah	80 Ah	130 Ah	160 Ah	260 Ah	80 Ah	160 Ah
Nominal capacity @ -20°C	25 Ah	50 Ah	80 Ah	100 Ah	160 Ah	50 Ah	100 Ah
Nominal energy @ 25°C	640 Wh	1280 Wh	2048 Wh	2560 Wh	4220 Wh	2560 Wh	5120 Wh
Maximum continuous discharge current	100 A	200 A	320 A	400 A	400 A	200 A	400 A
Recommended continuous discharge current	≤50 A	≤100 A	≤160 A	≤200 A	≤300 A	≤100 A	≤200 A
Maximum charge current	100 A	200 A	320 A	400 A	600 A	200 A	400 A
Recommended charge current	≤30 A	≤50 A	≤80 A	≤100 A	≤150 A	≤50 A	≤100 A
Power connection (threaded inserts)	M8	M8	M8	M8	M10	M8	M8
Dimensions mm (“) HxWxD	199x188x147 (7.8x7.4x5.8)	197x321x152 (7.8x12.6x6)	237x321x152 (9.3x12.6x6)	237x321x152 (9.3x12.6x6)	265x359x206 (10.4x14.1x8.1)	197x650x163 (7.7x25.6x6.4)	317x631x208 (12.5x25.8x8.2)
Weightkg (lbs)	7 (15.4)	15 (33.1)	20 (44.1)	22 (48.5)	30 (66.1)	28 (61.7)	56 (123.6)

BMS CONTROL:

BMS 12/200 - 69015C - Lithium 12V 200A battery management system
VE.BUS BMS - 69016E - Lithium battery management system
MINI BMS - 22839N - Lithium MINI battery management system

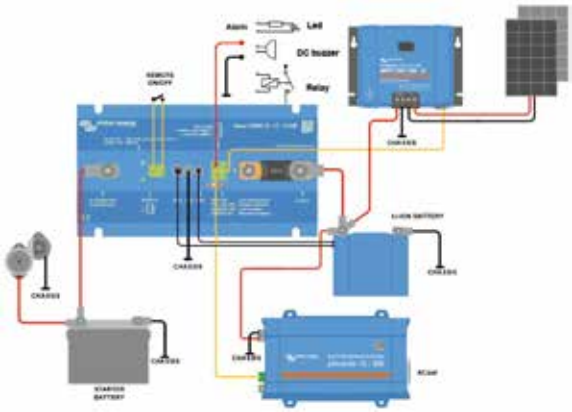
CABLES WITH M8 CIRCULAR CONNECTOR FOR LI-ION BATTERIES:

Male to female 3 pole 1 m (3.3 ft) – 68886G
Male to female 3 pole 2 m (6.6 ft) – 68887J
Male to female 3 pole 3 m (9.8 ft) – 68888L
Male to female 3 pole 5 m (16.4 ft) – 68889N

victron energy
BLUE POWER

SMART BMS CL 12/100 - 23527Y

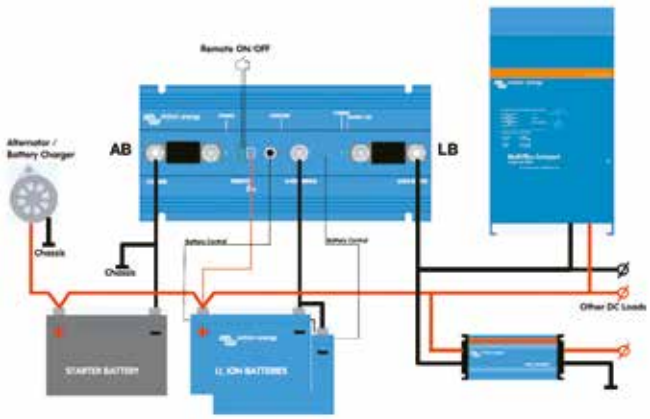
SMART BMS CL 12/100



Battery management system
The BMS connects to 12,8V Victron LiFePO4 (LFP) batteries. Up to 5 batteries may be connected in parallel. Can be used as a system on/off switch.
Alternator and battery protection
The input current is electronically limited to approximately 90% of the fuse rating. A 100A fuse, for example, will therefore limit the input current to approximately 90A.
Choosing the right fuse will:
a. Protect the LFP battery against excessive charge current (important in case of a low capacity LFP battery).
b. Protect the alternator against overload in case of a high capacity LFP battery bank (most 12V alternators will overheat and fail if running at maximum output during more than 5 minutes).
Starter battery protection
This function is similar to that of a Cyrix Battery Combiner or Argo FET Battery Isolator. Current can flow to the LFP battery only if the input voltage (= voltage on the starter battery) exceeds 13V. And current cannot flow back from the LFP battery to the starter battery, thus preventing eventual damage to the LFP battery due to excessive discharge.
Li-ion battery protection
Remote on/off input

BMS 12/200 FOR LITHIUM BATTERIES - 69015C

BMS 12/200



A 12V BMS that protects the alternator (and wiring), and supplies up to 200A in any DC load (including inverters and inverter/chargers)

Why a Battery Management System (BMS) is needed:
- A LFP cell will be damaged if the voltage over the cell falls to less than 2,5V.
- A LFP cell will be damaged if the voltage over the cell increases to more than 4,2V.
- The cells of a LFP battery do not auto-balance at the end of the charge cycle.

Alternator/battery charger input (Power Port AB) - Features
- The first function of Power Port AB is to prevent the load connected to the LFP battery from discharging the starter battery.
- Control of transients and input voltage.
- Charge current is reduced to a safe level in case of cell unbalance or over temperature.
- The input current is electronically limited to approximately 80% of the AB fuse rating. Choosing the right fuse is very important.

Load/battery charger output/input (Power Port LB) - Features
- Maximum current in both directions: 200A continuous.
- Peak discharge current electronically limited to 400A.
- Battery discharge cut-off whenever the weakest cell falls below 3V.
- Charge current is reduced to a safe level in case of cell unbalance or over temperature.

VICTRON ENERGY® - VE.BUS BMS

Protects each individual cell of a Victron lithium iron phosphate (LiFePO4 or LFP) battery

The BMS will:
- shut down or disconnect loads in case of imminent cell under voltage,
- reduce charge current in case of imminent cell overvoltage or over temperature (VE.Bus products only),
- shut down or disconnect battery chargers in case of imminent cell overvoltage or over temperature..

Protects 12 V, 24 V and 48 V systems

Operating voltage range of the BMS: 9 to 70 V DC.

Communicates with all VE.Bus products

The VE.Bus BMS connects to a MultiPlus, Quattro or Phoenix inverter with a standard RJ45 UTP cable.
- Protection grade: IP20
- Standards: EN60950; EN61000-6-3; EN55014-1 ; EN61000-6-2 ; EN61000-6-1; EN 55014-2 and EN 50498

VE.BUS BMS

VE.BUS BMS V2

MODEL	VE.BUS BMS	VE.BUS BMS V2
Part No.	69016E	25080S
Input voltage range	9-70 Vdc	9-70 Vdc
Current draw, normal operation	10 mA	10 mA
Current draw, low cell voltage	2 mA	2 mA
Operating temperature	-20 - +50°C	-20 - +50°C
Weight kg (lbs)	0,1 (0.22)	0,1 (0.22)
Dimensions HxWxD mm (“)	105x78x32 (4.1x3.1x1.3)	24x95x106 (0.9x3.7x4.2)

VICTRON ENERGY® PEAK POWER PACK

The Peak Power Pack is a complete substitute for heavy lead acid batteries in applications where high currents occur for short time. Being primarily meant for caravan movers, it is equipped with a built in charger, built-in LED light with different colours which indicates the status of the battery. If necessary, the charging is possible using the supplied adapter via a grid outlet. Charging from a solar panel is also possible.

- Battery type: lithium-ion (LiFePO4)
- Nominal voltage: 12,8 V
- Battery consumption in storage: > 6,5 Ah/year (> 0,7 mA)

PPP-20

Peak Power Pack	PPP-20	PPP-30	PPP-40
Part No.	20707J	20708L	20709N
Capacity	20 Ah	30 Ah	40 Ah
Stored energy	256 Wh	384 Wh	512 Wh
Protections	Overload / short circuit / over temperature / over discharge		
OUTPUT 1: HIGH CURRENT OUTPUT - Max. cable cross selection 16 mm² (screw terminals)			
Continuous output current	150 A (max. 200 A for 10 seconds)		
Max. input (charge) current	40 A (not protected)		
Max. input (charge) voltage	14,4 V (not protected)		
OUTPUT 2: AUXILIARY OUTPUT- Max. cable cross selection 6 mm² (screw terminals)			
Continuous output current	30 A (max. 50 A for 10 seconds)		
Max. input (charge) current	10 A (not protected)		
Max. input (charge) voltage	14,4 V (not protected)		
Dimensions mm (“)	120x170x170 (4.7x6.7x6.7)	160x170x170 (6.3x6.7x6.7)	200x170x170 (7.9x6.7x6.7)
Weight kg (lbs)	3,6 (7.9)	5,5 (12.1)	7,4 (16.3)

- **Reliable and robust**: the 48V50Ah-LV IMEON battery module is made up of the latest generation «lithium iron phosphate» cells. The 48V50Ah-LV IMEON battery is a judicious choice to restore one kWh at the best price during the entire operating life of your installation. Coupled to an IMEON brand inverter and connected to the web, the 48V50Ah-LV battery module can benefit from a guarantee of up to 10 years.
- **Maximum safety**: the 48V50Ah-LV IMEON battery integrates a BMS (battery management system) which manages the balancing of the battery cells and sends instructions to the inverter concerning the charging currents and voltages to be respected. In addition, these modules are recyclable and are made up of LiFePO4 (lithium iron phosphate) cells which ensure an optimum level of safety for users.
- **Modular design**: up to 36 battery modules IMEON 48V50Ah-LV can be installed in parallel without any additional accessories. This modularity makes it possible to create installations from 2.4 to 86.4 kWh of stored energy using the 48V50Ah-LV modules. The IMEON battery modules can be integrated into the majority of solar self-consumption, back-up or network service projects.

MODEL	MODULE 48V50AH -LV
Part No.	21975S
Total energy	2400 Wh
Capacity	50 Ah
Nominal voltage	48 V
Voltage range	45 V - 53,5 V
Nominal load/discharge current	25 A
Maximum charge/discharge current	50 A
Number of cycles at 80% discharge	6000
Parallel operation	Up to 36 modules
Dimensions WxHxD mm (“)	480x360x90 (18.9x14.2x3.5)
Weight kg (lbs)	22 (48.5)
Communication ports	CAN, RS485
Cell type	LFP (lithium iron phosphate) + BMS
Humidity	5 - 85 %
Operating temperature range	From 0°C to +50 °C
Storage temperature range	From -20°C to +60 °C
Altitude	< 4000 m
Certifications	CE / IEC62619 / UN38.3
Warranty	Up to 10 years

PYLONTECH® - BATTERIES

FEATURES

- Developed with our own LFP (lithium iron phosphate) cell to ensure the highest safety
- Self-designed BMS protects the cell in all angels such as abnormal temperature, current, voltage, SoC, SoH
- Vertical industry integration ensures more than 6000 cycles with 95% DoD
- Modular design gives the end customers the power of choice of capacity
- Compatible with most of the available Hybrid inverters
- Simple buckle fixing minimize the installation time and cost
- Backward compatibility with existing US series product
- Pre-charge function to protect ESS system from surge current
- Warranty: 10 years

MODEL	US2000C	US3000C
Part No.	21880E	22050R
Nominal voltage	48 V	48 V
Nominal capacity	2400 Wh	3552 Wh
Usable capacity	2280 Wh	3374.4 Wh
Discharge voltage	44.5 V ~ 53.5 V	44.5 V ~ 53.5 V
Charge voltage	52.5 V ~ 53.5 V	52.5 V ~ 53.5 V
Charge/discarge current recommended	25 A	37 A
Communication ports	RS485, CAN	RS485, CAN
Single string quantity	16 pcs	16 pcs
Dimensions mm (“)	442x410x89 (17.4x16.1x3.5)	442x420x132 (17.4x16.5x5.2)
Weight kg (lbs)	24 (52.9)	32 (70.5)
Operating temperature	From 0°C to +50 °C	From 0°C to +50 °C
Humidity	5%~95%	5%~95%
Altitude	< 2000 m	< 2000 m

ENERPOWER® - BATTERIES

SLC™ SERIES - 12 V AGM TECHNOLOGY

- **Applications:** SLC series batteries are suitable for use in solar power stations, control devices, alarm systems, emergency systems, emergency responders, telecommunications, UPS, operating rooms, video surveillance
- **Features:** AGM technology. They work in a wide range of temperatures, they are sealed and require no maintenance. They have a great conduct to lens discharge
- **Life:** 5 ÷ 6 years ≤ 18 Ah, 10 years > 18 Ah.

AGM

MODEL	SLC100-12A
Part No.	66606L
Nominal voltage	12 V
Nominal capacity 20h	100 Ah
Dimensions WxDxH mm (“)	330x173x220 (13x6.8x8.7)
Weight kg (lbs)	20 (63.9)

LUMINOR LEADER TECHNOLOGY

CE

- Robust ABS box shock and vibration resistant
- High performance terminals with superior conducivity
- Low internal resistance; low self-discharge
- Longer shelf life than traditional batteries
- Up to 22 Ah - 6 years of trickle charge (25°)
- From 24 Ah - 10 years of trickle charge (25°)
- Do not discharge over 80%, deep discharges damage the batteries

6 VOLT - DEEP-CYCLE AGM BATTERIES

MODEL	PART No.	VOLT	AH/20HR	TERMINALS	DIMENSIONS WxHxD mm (")	WEIGHT kg (lbs)
LDC6-220	20681T	6	220	F12-M8	260x247x180 (10.2x9.7x7.1)	30 (66.1)
LDC6-240	20680R	6	240	F12-M8	243x275x188 (9.6x10.8x7.4)	32 (70.5)
LDC6-320	60100RA	6	320	DT	295x346 x180 (11.6x13.6x7.1)	47,5 (103.9)
LDC6-400	20297S	6	400	DT	295x406x180 (11.6x16x7.1)	53 (116.8)

12 VOLT - DEEP-CYCLE AGM BATTERIES

MODEL	PART No.	VOLT	AH/20HR	TERMINALS	DIMENSIONS WxHxD mm (")	WEIGHT kg (lbs)
LDC12-9	20682V	12	8,5	F2	151x 95x65 (5.9x 3.7 x2.6)	2,55 (5.6)
LDC12-20	20683X	12	20	F13-M5	181x167x76 (7.2x6.6x3)	6,3 (13.9)
LDC12-55	20684Z	12	55	F11-M6	230x209x138 (9.1x 8.2x5.4)	17 (37.5)
LDC12-65	20685B	12	65	F11-M6	350x176x166 (13.8x6.9x6.5)	22,7 (50)
LDC12-80	20686D	12	80	F11-M6	258x208x168 (10.1x8.2x6.6)	26 (57.3)
LDC12-100	20687F	12	100	F12-M8	305x208x168 (12x8.2x6.6)	30 (66.1)
LDC12-150	20689K	12	150	F12-M8	485x240x172 (19.1x9.4x6.8)	46 (101.4)
LDC12-200	20690U	12	200	F12-M8	530x214x209 (20.9x8.4x8.2)	54 (119)
LDC12-260	20691W	12	260	F12-M8	520x220x268 (20.5x8.7x10.5)	74 (163.1)

Other models are available on demand.

START SERIES BATTERIES

The designing of the START range was born from the need to satisfy the demand of a high starting current, great reliability, Lack of servicing and high safety. The use of a recombination watertight cover with a centralized degassing system and a special flame retardant pad represents a remarkable benefit for the safety and reliability of this battery.

MODEL	PART No.	V	AH/20 H	CCA (EN)	LENGTH L mm (")	WIDTH W mm (")	TOTAL HEIGHT H mm (")	WEIGHT kg (lbs)
62R22	23102N	12	62	530	242 (9.5)	175 (6.9)	190 (7.5)	14,5 (32)
80R42	23103R	12	80	750	352 (13.9)	175 (6.9)	190 (7.5)	19,8 (43.6)
00R52	23104T	12	100	800	352 (13.9)	175 (6.9)	190 (7.5)	21,3 (47)

CYCLES SERIES BATTERIES

CYCLES range satisfies the application needs through a new designing of inner electrodes concerning alloys, grids, thickness, new elaboration of active materials and special systems of inner separation. The batteries of the CYCLES range represent the best solution as regards performance, lifetime, reliability and safety due to their strong starting power, to the high cycling resistance and a strong inclination to charge acceptance.

MODEL	PART No.	V	AH/20 H	CCA (EN)	LENGTH L mm (")	WIDTH W mm (")	TOTAL HEIGHT H mm (")	WEIGHT kg (lbs)
60A22	23105V	12	60	680	242 (9.5)	175 (6.9)	190 (7.5)	18,5 (40.8)
70A32	23106X	12	70	760	278 (10.9)	175 (6.9)	190 (7.5)	20,3 (44.7)
80A42	23107Z	12	80	800	315 (12.4)	175 (6.9)	190 (7.5)	22,9 (50.5)
00A52	23367C	12	100	850	352 (13.9)	175 (6.9)	190 (7.5)	26 (57.3)

SMART SERIES BATTERIES

The batteries of SMART series are batteries for Super Heavy Duty use. They are designed with plates (e/ electrodes) with high thickness and strenghtened structure to satisfy the need for high energies and high cyclical resistance with low-maintenance.
They are an excellent compromise among performances, long-lasting and cost, for the use on professional and pleasure boats.

MODEL	PART No.	V	AH/20 H	CCA (EN)	LENGTH L mm (")	WIDTH W mm (")	TOTAL HEIGHT H mm (")	WEIGHT kg (lbs)
62061	23109D	12	120	850	509 (20)	175 (6.9)	228 (9)	35 (77.2)
66061	23110M	12	160	950	513 (20.2)	223 (8.8)	223 (8.8)	43,8 (96.6)
72061	23111P	12	220	1200	518 (20.4)	273 (10.7)	242 (9.5)	56 (123.5)

Other models available on request.

AIR BREEZE/AIRX MARINE WIND GENERATORS

Quiet, reliable energy for sea and shore

AirBreeze/Airx Marine is trusted by sailors around the world and recommended as the best high-energy output turbine by Yachting Monthly. Its optimized electronic controls deliver energy quietly and efficiently. Extensive third party testing and certification shows more consistent output than the competition. AirBreeze/Airx Marine is part of the latest generation of AIR products – the world's best-selling wind turbines – with more than 135,000 units sold in more than 120 countries.

High performance in marine environments
We recommend AirBreeze for all small battery-charging applications in coastal areas or offshore: boats, docks and other marine uses. The AirBreeze is an ideal wind turbine for hybrid systems with solar to offset those cloudy or stormy periods. AirBreeze is built and backed by the worldwide leader in small wind.

- Improved reliability backed by a lifetime warranty
- Quiet operation
- Energy in light winds
- Lightweight; unique design is simple and easy to install
- Stop switch included
- Corrosion resistant paint tested to SAE J2334 standard
- Marine grade 0-ring seal
- Stainless steel external fasteners
- Anodized blade hub

APPLICATIONS	AIR X MARINE	AIR BREEZE
Remote homes		✔
Marine and sailboats		✔
Recreational vehicles		✔
Railroad	✔	
Telecommunications	✔	
Oil and gas	✔	
SCADA systems	✔	
Lighting systems	✔	✔
Cathodic protection	✔	
Coastal applications	✔	

AIR BREEZE	Air Breeze M1 12V	Air Breeze M2 24V	AirX Marine 12V	AirX Marine 24V
Part No.	68070F	68071H	63034Z	63035B
Energy	app. 3200 Ah/month at 5,8 m/s (11.3 knots)		30kW h/m at 5,8 m/s (13 mph)	
Rotor Diameter	1.17 m (6 in)			
Weight	5.9 kg (13 lb)			
Shipping dimensions	686 x 318 x 229 mm (27 x 12.5 x 9 in)			
Mount	48 mm (1.9 in) outer diameter			
Startup Wind Speed	3.13 m/s (7 mph)		3.58 m/s (8 mph)	
Voltage	12 or 24 V DC			
Turbine Controller	Microprocessor-based smart internal regulator			
Overspeed protection	Electronic torque control			
Survival Wind Speed	49.2 m/s (110 mph)			

AIR 30 AND AIR 40 WIND GENERATORS

Features:

- These wind generators are controlled by a microprocessor and provide high-performance and electronic protection against strong winds without mechanical friction.

- Its design and the carbon alloy blades ensure quiet operation, durability and high efficiency in several wind conditions. Their performances depends on wind speed, pole height and environment condition.

- Generator body made of die cast aluminum alloy; brushless alternator with permanent magnets.

- AIR 30 and AIR 40 are easy to install; with integrated electronic control, they are plug-and-play.

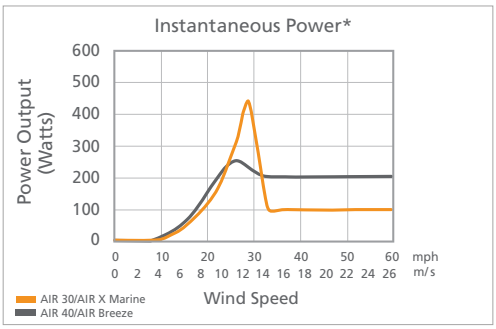
- In hybrid systems with PV panels, they provide energy all year long.

- Available on request 48V model

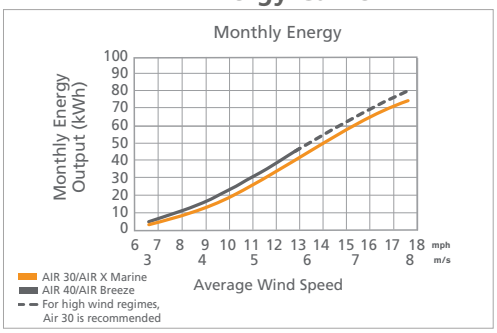
APPLICATIONS	AIR 30	AIR 40
Remote homes		✔
Recreational vehicles		✔
Railroad	✔	
Telecommunications	✔	
Oil and gas	✔	
SCADA systems	✔	
Lighting systems		✔
Cathodic protection	✔	

Model	AIR 30	AIR 40
Part No.	68072 K (12 V) - 68073M (24 V)	68074 P (12 V) - 68075S (24 V)
Energy at 5,8 m/s (13 mph)	30 kWh/month	40 kWh/month
Voltage	12/24 V DC	12/24 V DC
Start-up wind	3,58 m/s (8 mph)	3,1 m/s (7 mph)
Wind speed operating range	3,6-22 m/s (8-49 mph)	3,1-22 m/s (7-49 mph)
Optimum wind speed range	11-15 m/s (25-32 mph)	4,5-22 m/s (10-49 mph)
Survival wind speed	49,2 m/s (110 mph)	49,2 m/s (110 mph)
Rotor diameter	1,17 m (46 in)	1,17 m (46 in)
Swept area	1,07 m² (11,5 ft²)	1,07 m² (11,5 ft²)
Pipe outer diameter	48 mm (1,9 in)	48 mm (1,9 in)
Dimensions	686 x 318 x 229 mm (27 x 12,5 x 9 in)	686 x 318 x 229 mm (27 x 12,5 x 9 in)
Weight	5,9 kg (13 lb)	5,9 kg (13 lb)

AIR Power Curve



AIR Energy Curve



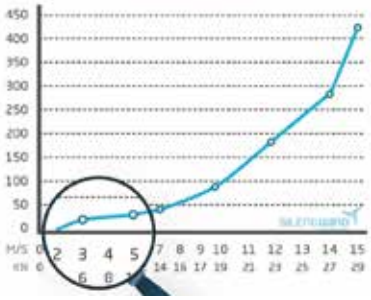
SILENTWIND® - WIND GENERATORS

SILENTIWIND PRO 12V-24V-48V – THREE BLADE GENERATORS

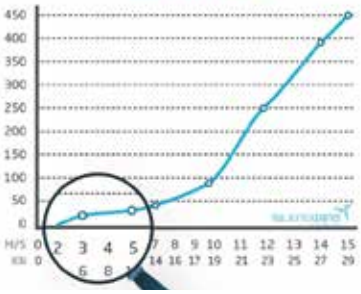
- **Features:**
  - Generator type: permanent magnet generator, 3 phase
  - Integrated electronic/manual stop switch
  - Very light: 6,8 kg only
  - Hand laminated, UV-resistant carbon blades, successfully tested according to DIN EN 61400-2 at hurricane speed 122km/h.
  - Low noise
  - Very good start-up performance due to low cogging torque at 2,2 m/s wind speed
  - **Supplied with external hybrid controller** for wind and solar energy with multi-function LCD display (for 12V and 24V models). It can be connected to photovoltaic modules.
- **Applications:** universal application for marine, land and professional systems with low, middle and high wind
- **Warranty:** 3 years
- **Certification:** DIN VDE protection class II; CE; RohS

Model	SLW-420-12	SLW-450-24	SLW-500-48
Part No.	20381EA	20382GA	20383JA
Rated voltage	12 VDC	24 VDC	48 VDC
Rated power	420 W	450 W	500 W
Rated wind speed	14,5 m/s	14,5 m/s	14,5 m/s
Start-up wind speed	2,2 m/s	2,2 m/s	2,2 m/s
Start-up charging	2,8 m/s	2,8 m/s	2,8 m/s
Rotor diameter	1,15 m	1,15 m	1,15 m
Rotor speed range	550-1700 rpm	550-1700 rpm	550-1700 rpm
Packing dimensions mm (")	780 x 400 x 210 (30.7 x 15.8 x 8.3)	780 x 400 x 210 (30.7 x 15.8 x 8.3)	780 x 400 x 210 (30.7 x 15.8 x 8.3)
Dry weight kg (lbs)	6,8 (15)	6,8 (15)	6,8 (15)

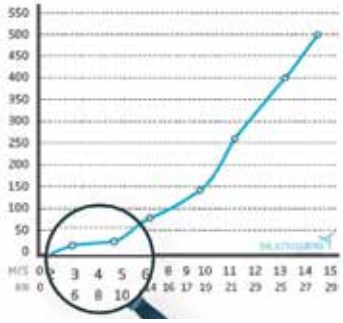
POWERCURVE 12V
BOOSTER 2V



POWERCURVE 24V
BOOSTER 4V



POWERCURVE 48V
BOOSTER 8V



WIND/SOLAR HYBRID CHARGE CONTROLLER

The LCD multifunction display shows all main operating values (W, A, V/Ah, kWh, Ah).
Battery system voltage automatically detected. Maximum power input of the solar panel: 550 Wp.

- **Bluetooth connection with dedicated App**

Part No.	20384L (12 V) - 20385N (24 V) - 20386R (48 V)
Rated battery voltage	12, 24 or 48 VDC
Max wind gen. power input	600 W /40 A (12 V) /30 A (24 V) /15 A (48 V)
Max solar mod. power input	300 W /50 VOC /20 A (12 V) /10 A (24 V) /5 A (48 V)
Display data	V, A, V/Ah, kWh, Ah
Battery type	Flooded / GEL / AGM
Dimensions mm (")	220 x 150 x 82 (8.7 x 5.9 x 3.2)
Dry weight kg (lbs)	2,8 (6.2)

THREE BLADE SPARE KIT

68485M - Three blade kit for AirBreeze™ and AirX™

POLE AND MOUNTING KIT

68689E - Reinforced pole for high wind speed
68690N - Mounting kit

SUPERWIND® - WIND GENERATOR

SILENTIWIND 350 – THREE BLADE GENERATOR

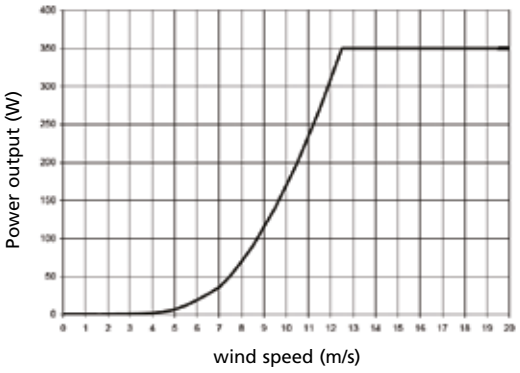
The Superwind 350 is a small wind turbine for professional use, which even under extreme conditions works autonomously and automaticly.

- **Features:**
  - Adjust the speed and power by varying the pitch of the blades
  - Carbon fiber reinforced blades
  - Alternator with permanent magnet, three-phase rectifier
  - Stop: Short circuit of the generator
  - Superwind 350 is often used in mixed wind / photovoltaic systems

- **Applications:**
  Ideal fields of application for example are navigational aids, traffic control systems, environmental monitoring stations or transmitters, but also sailing yachts, campers, summer cottages and mountain shelters.

SUPERWIND	Superwind 350 12V	Superwind 350 24V
Part No.	65726S	65727U
Max power at 12,5 m/s	350 W	350 W
Voltage	12 V DC	24 V DC
Cut-in wind speed	3,5 m/s	3,5 m/s
Cut-off wind speed	none	none
Rotor diameter	1,20 m	1,20 m
Rotor speed	500-1300 rpm	500-1300 rpm
Rotor thrust (operation)	70 N	70 N
Rotor thrust (extreme wind speed)	220 N	220 N
Dry weight kg (lbs)	11,5 (25.3)	11,5 (25.3)

Power Curve



ACCESSORIES

CRM 12V Charge controller - 65728W
CRM 24V Charge controller - 65729Y

Stop switch - 65730G

Installation Kit - 65731J

LE-v50™ and LE-v150™ WIND TURBINES

- **Features:**
  - 3 phase brushless wind turbines. The cross-ventilated 'savonious' vertical axis rotor coupled with the well proven axial flux alternator.

  - Quiet; reliable.

  - Robust design, almost indestructable: these vertical axis wind turbine are designed & proven to survive 120mph Antarctic winds.

  - Compact and lightweight, can be installed in a variety of positions with ease

  - Marine quality finish, high quality components and lasting performance

  - High efficiency due to anticipated start-up charge

  - **Charge controller included (only LE-v150™ model)**

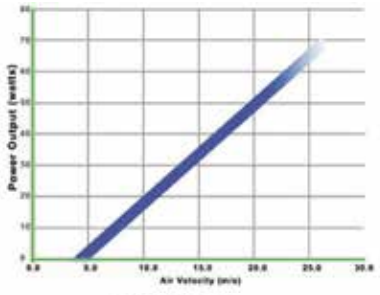
- **Applications:**
  Trickle charging for batteries installed on boats and land.
  Polar stations for monitoring air pollution.
  Buoys and marine lights. Telecom systems.
  Signaling systems that require low energy.

- **Warranty:** 2 years

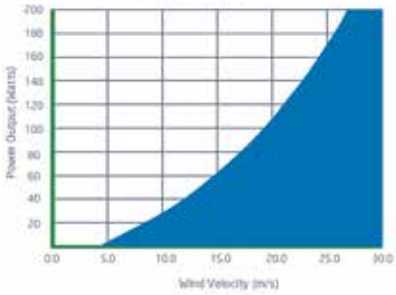
LE-v50™

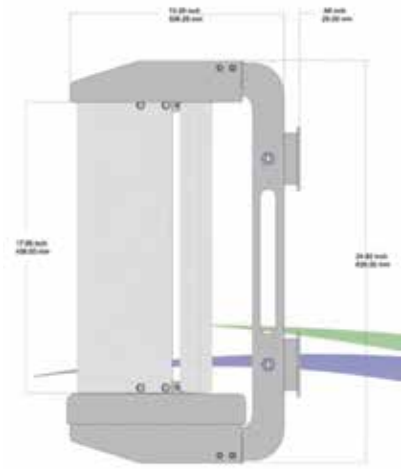
LE-v150™

Model	LE-v50	LE-v150
Part No.	68641Z (12 V) 68642B (24 V)	69771U (12 V) 69772W (24 V)
Voltage	12 or 24 V	12 or 24 V
Nominal power	11 W @ 8 m/s (15,5 knots)	24 W @ 8 m/s (17,8 knots)
Peak power	70 W	200 W
Cut-in wind speed	4 m/s (7,7 knots)	3 m/s (9 knots)
Rotor diameter	200 mm (7.92)	270 mm (10.6")
Dry weight kg (lbs)	9 (19.9)	13 (28.7)

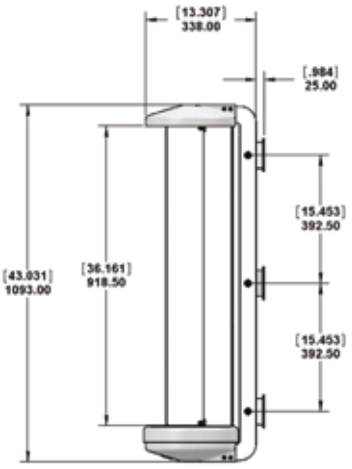


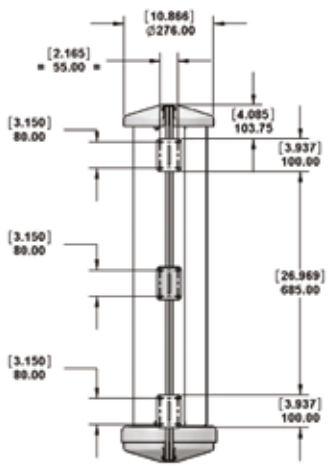
LE-v150 Power curve





LE-v50™





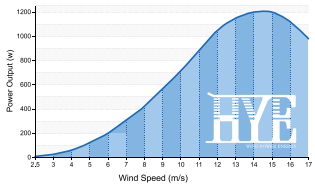
LE-v150™

HYE® - WIND GENERATORS

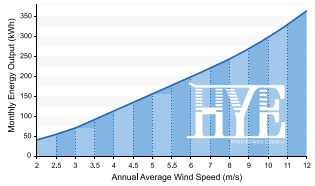
5 BLADE WIND GENERATORS HY-1000L; HY-3000L

- **Features:**
  - Equipped with electromagnetic control of the blade speed and with aerodynamic clutch of the blades. The blades are made of glass fiber reinforced
  - 3 phase brushless wind generator with permanent magnets. The wind generator body is made of aluminium alloy and rotor is stainless steel
  - Pole connection through a flange or a clamp and bolt
  - PWM electric signal or low voltage charge function
  - Available hybrid solar-wind controller for HY-1000L (24-48 VDC) and HY-3000L (48 VDC) wind generators
- **Also available:** HY-400L e HY-600L versions
- **Applications:** Stand-alone systems, solar-wind hybrid systems, etc
- **Warranty:** 3 years
- **Certifications:** ISO9001:2008; CE; RoHS; ETL

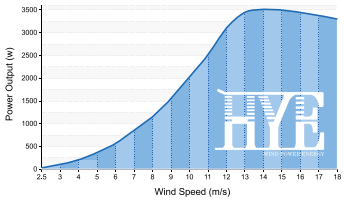
HY 1000 Wind Turbine Power Curve



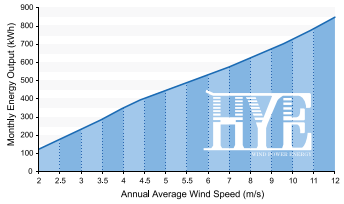
HY- 1000 Monthly Energy Output



HY- 3000 Wind Turbine Power Curve



HY- 3000 Monthly Energy Output



Model	HY-1000L	HY-3000L
Part No.	68646K	68647M
Nominal power	1000 W	3000 W
Peak power	1200 W	3500 W
Voltage	24/48 V DC	48 V DC
Start-up wind speed	2 m/s (4.5 mph)	2,5 m/s (5,6 mph)
Cut-in wind speed	3,0 m/s (6,7 mph)	3,0 m/s (6,7 mph)
Nominal wind speed	12 m/s (26.8 mph)	12 m/s (26.8 mph)
Max wind speed	50 m/s (110 mph)	60 m/s (133 mph)
Nominal rotor speed	750 rpm	700 rpm
Nominal charge current	<20 dB @ 5 m/s	<30 dB @ 5 m/s
Noisiness	<20 dB @ 5 m/s	<20 dB @ 5 m/s
Energy delivered (average month wind speed 5,5 m/s)	175 kWh/month	495 kWh/month
Temperature compensation	-40°C to +60 °C	-40°C to +60 °C
Rotor diameter	1,96 m (6.4')	3,05 m (10.0')
Area swept	3,0 m²	7,3 m²
Dry weight kg (lbs)	28 (61.7)	70 (154.3)

Also available HY-400L e HY-600L models

HYBRID CHARGE CONTROLLER FOR HY-1000L AND HY-3000L GENERATORS

Model	HY-C10-24BLS	HY-C10-48BLS	HY-C30-48BLS
Part No.	68648P	68799M	68800T
Nominal power	1000 W	1000 W	3000 W
PV nominal power	300 W	300 W	900 W
Voltage	24 V DC	48 V DC	48 V DC
Dimensions controller mm (")	90x470x220 (19.3x 8.5x8.7)	90x470x220 (19.3x 8.5x8.7)	480x370x220 (18.9x14.6x8.7)
Dimensions dump loader mm (")	-	-	580x480x220 (22.8x18.9x8.7)
Dry weight controller kg (lbs)	10 (22)	11 (24.2)	12 (26.5)
Dry weight dump loader kg (lbs)	-	-	13 (28.7)

HyLander is a hybrid power generator, capable of producing energy from alternative sources such as solar and wind.
It supplies its output directly to the users or accumulates energy to use it at a later stage, in a quiet and environmental way.

The power is the main characteristic of HyLander, as it is capable of delivering in a constant and silent way, up to 5 kVA with a peak of 10 kW only using the energy stored in the battery. In case of need, it can add extra power from the built-in generator, which intervenes to handle high power consumption, giving continuous autonomy to the system even in the absence of sun and wind.

HYLANDER

FEATURES

- Power supply 230Vac - 50HZ or 115Vac - 60Hz
- Use of environmental compatible renewable energy
- Continuous output power with genset off: 5 kVA
- Continuous output power with genset on: 10 kVA
- Pre-assembled and factory tested, ready for use unit
- Energy from sun and wind at your service 365 days a year
- Built-in backing generator and 80 l fuel tank
- Automatic Management of energy
- Remotely monitored via internet
- High capacity battery pack
- Silent running
- Easily transportable
- Designed and assembled in Italy
- All system components are CE marked

Wind turbine

PV plant

HyLander
THE PLUG AND PLAY SOLUTION

INPUT

Control Panel

AC OUT

AC OUT
230V-50Hz
110V-60Hz

CC OUT 48V
ON REQUEST 12V or 24V

HyLander is available in three configurable single-phase versions.

Upon request, Uflex also offers a three-phase solution to be combined with an external genset up to a maximum of 30 kVA and 21.3 kWh supercapacitor storage.

HYLANDER HD

MODEL	HYLANDER STD	HYLANDER HD	HYLANDER HD SUPERCAP
Part No.	69957J	22284T	23587T
Output voltage AC	230V-50Hz / 110V-60Hz	230V-50Hz / 110V-60Hz	230V-50Hz / 110V-60Hz
Output voltage DC	48V (12V and 24V optional)	48V (12V and 24V optional)	48V (12V and 24V optional)
Cont. output power 25°C	5000 VA	10000 VA	10000 VA
Peak power (5 sec.)	10000 W	20000 W	20000 W
Genset cont. output power	5000 VA	8000 VA	8000 VA
PV modules power	From 1 kWp to 5 kWP according to working area	From 1 kWp to 5 kWP according to working area	From 1 kWp to 5 kWP according to working area
Battery pack capacity	19,2 kWh	23 kWh	14,2 kWh
DOD	Programmable from 30% to 70% (factory set 50%)	Programmable from 30% to 80% (factory set 50%)	100% (*)
Usable battery capacity (50% DOD) without sun, wind or genset	9,6 kWh	13,8 kWh	14,2 kWh
Data monitoring	Display LCD: voltage, current, power, state of charge run time, load cycle, energy flow		
Monitoraggio remoto	Via internet connection	Via internet connection	
Dimensions mm (") WxHxD	1950x1020x1450 (76.8x30.2x57.1)	1950x1130x1550 (76.8x44.5x61)	1950x1130x1550 (76.8x44.5x61)
Weight kg (lbs)	around 1300 (2645.5)	around 1600 (3527.4)	around 1200 (2645)

(*) Ready for extension up to 28.4 kWh of useful capacity

APPLICATIONS

- Shelters, pastures
- Remote cottages, cabins
- Elettrification of rural areas
- Missions
- Pumping irrigation water
- Civil protection
- Schools and hospitals in not grid-connected areas
- Telecomunications
- Measumerent stations
- Natural reserves
- Not grid-connected small islands
- Forest ranger Stations
- Public events
- Military and emergency relief applications
- Mining
- Generators rental
- Appartment buildings
- Construction sites
- Prefabricated buildings and mobile camps
- Agricultural applications
- Development building areas and compound
- ...and everywhere you need energy, in a quiet, clean and inexpensive way!

ACCESSORIES

- Available for all HyLander models

Multi-crystalline solar panels

Semi-flexible solar panels

Wind generators

OPzS 2V tropicalized cell for solar storage

DC-DC converter

Supercaps

Console PV mounting system

Mounting structures

LORENTZ® - PS2-100
SOLAR WATER PUMPING SYSTEM

READY TO USE HIGH EFFICIENCY SYSTEM

PICK IT UP
a ready to go, system in a box

PLUG IT IN
no wiring to do, just plug in and go

PUMP WATER
from any source: pond, stream, well

FEATURES

- Ready-to-use, cost-effective solar powered water pumping system.
- System supplied in a 600x160x230 mm (23.6“x6.3“x9”) box for easy storage and transport.
- Submersible pump equipped with helical rotor and high efficiency brushless DC motor.
- System includes pump unit, controller, cable with motor plug and the MC4 adapter cable.
- Connection on controller: PV power, pump, no-load protection, and float switch for overflow in tanks.
- The system is generally powered by a single PV module from 180Wp to 260Wp or two PV modules from 80W-180Wp in series. Higher powers are compatible.
- Application limits: maximum 40 m head2,8 m^3/h flow rate.

TECHNICAL SPECIFICATIONS

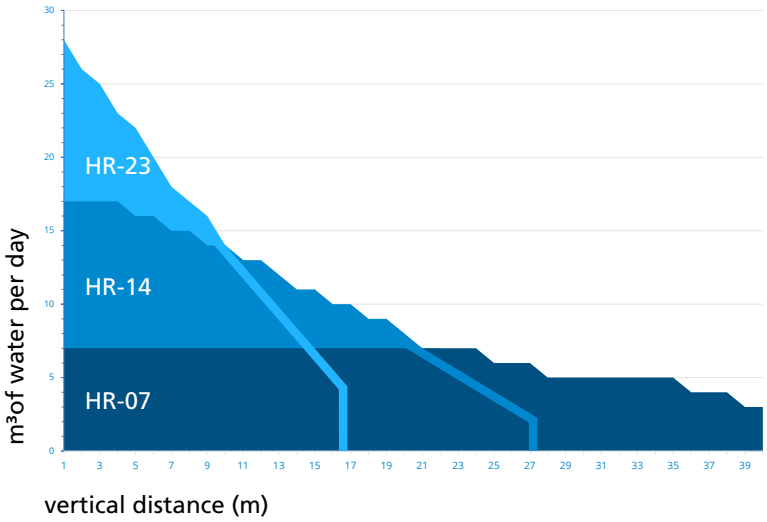
CONTROLLER	
Poower	max. 0,15 kW
Input voltage	max. 50 V
Optimum Vmp	> 34 V
Motor current	max. 6,0 A
Efficiency	max. 98%
Ambient temperature	from -40 to +50°C
Enclosure class	IP68
Dimensions mm (“) HxWxD	29x122x115 (1.1x4.8x4.5)
Weight kg (lbs)	0,7 (1.5)

MOTOR/PUMP	
Rated power	0,15 kW
Efficiency	max. 83%
Motor speed	700-2500 rpm
Insulation class	F
Enclosure class	IP68
Submersion	max. 50 m
Pump dimensions mm (“)	P 455 (17.9), ø 88 (3.5)
Pump weight kg (lbs)	5,5 (12.1)

AVAILABLE MODELS

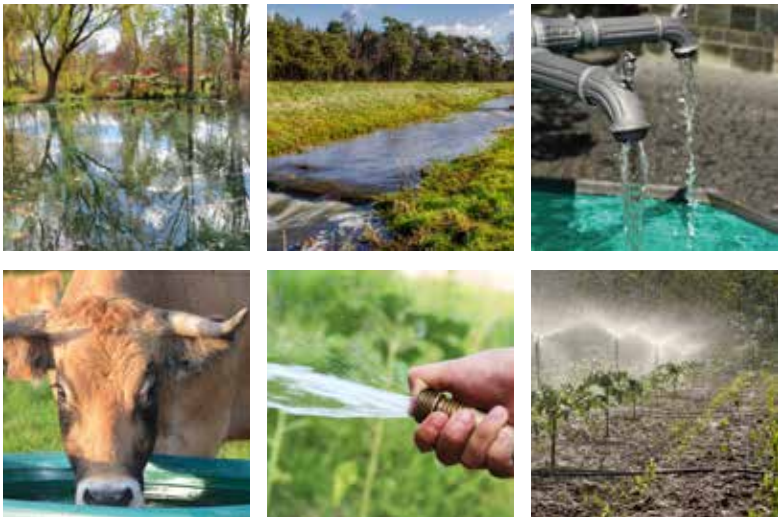
- PS2-100-075 - 23462W
- PS2-100-145 - 23463Y
- PS2-100-235 - 23464A

The chart shows the daily water that will be pumped at different vertical heads using a single 205 Wp PV module.



APPLICATIONS

With the PS2-100 system you can pump water from: wells, rivers, ponds or tanks.



PS2-100 is used to irrigate small property gardens; to supply water to livestock; to provide drinking water to homes and communities.

OPTIONAL ACCESSORIES

- They are all provided with connectors, ready to be connected to the controller or pump motor.

Probe for wells with 15 m cable - 23473B
Prevents the pump from idling

Floating probe with 10 m cable - 23472Z
Controls the overflow of a tank

15 m extension for probe - 23466E
Provided with waterproof connector

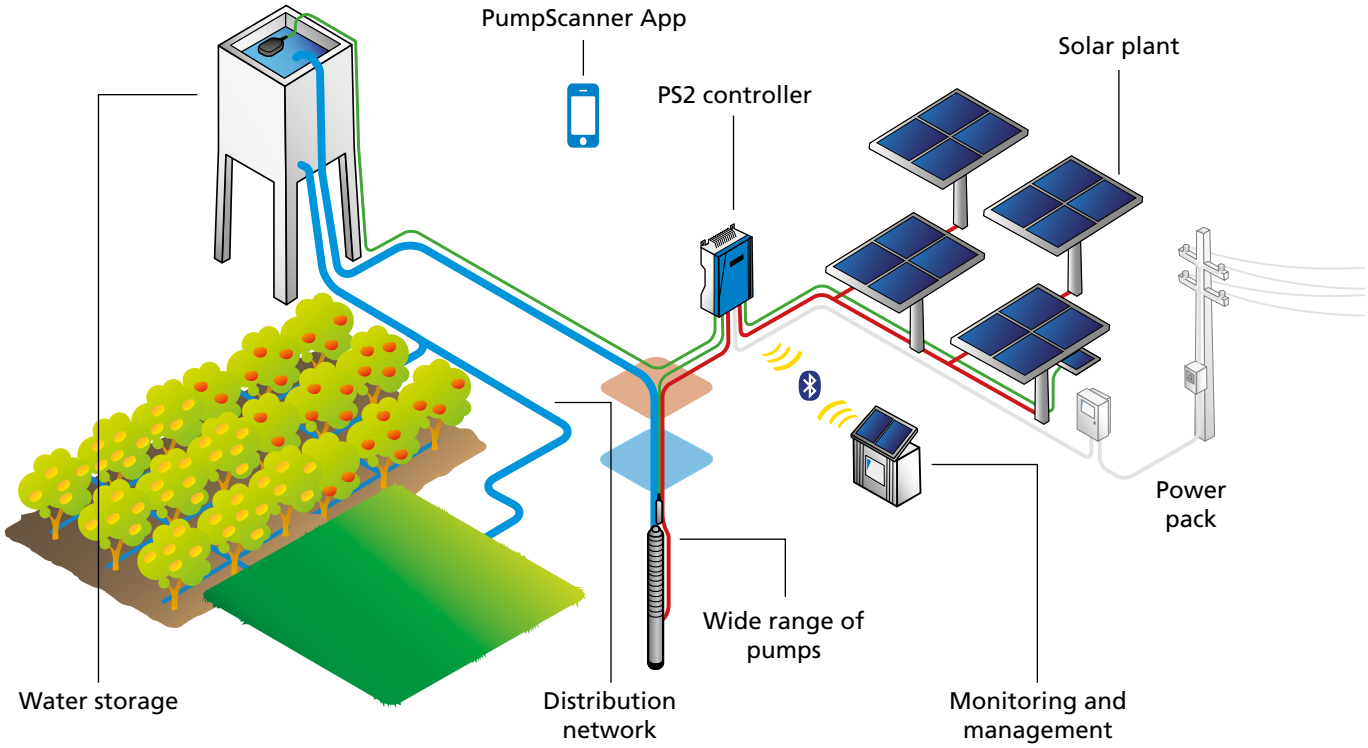
15 m extension for motor cable - 23471X
Provided with connector

SYSTEM FOR MEDIUM SIZE PLANTS




FEATURES

- Integrated solar water pumping system for small and medium size applications. Reduces operating costs, improves water safety and is environmentally sustainable.
- Solar energy is the main source of power for the PS2 system: water requirements can be met with a solar system and a water storage tank. Using an optional power pack, the PS2 can also be powered from the grid or a generator.
- Different submersible pumps are available that can pump water from depths of 450 m (1500 ft) and surface pumps for flow rates up to 60 m^3/h.
- Regardless of which pump is connected to the system, the controller manages operations and optimizes water delivery based on available power and input from various sensors.
- All PS2 systems have built-in data logging and a simple management interface. They can also be monitored and managed remotely.



PS2 COMPONENTS

Lorentz PS2 solutions combine photovoltaic-powered controllers with the corresponding motors and numerous pump versions to meet the performance requirements of the project.
Using Lorentz' own calculation tools, it is possible to develop a technical solution that is suited to the various pumping requirements.

Controller
Available from150 W to 4 kW. The controller includes the electronics to drive the ECDRIVE brushless DC motor, software for water applications, all the inputs you will ever need, data logging, plus intelligent control over the whole system to give you the most water possible.

Submersible Pumps
Available 4" helical rotor pumps and 4" to 6" submersible multistage pumps

Surface Pumps
Single or multistage surface pumps perform equally well in irrigation projects and for drinking water applications.

Pool Pumps
Two pool pump sizes available. These two systems meet the requirements of most residential and small commercial pools.

Accessories
PS2 provides a wide range of compatible probes, sensors, solar power connection equipment, racking and PV modules.

APPLICATIONS

PS2 is designed for the harshest off-grid environments. It can be used for irrigation, pumping drinking water, and livestock. Use in swimming pools keeps them crystal clear without electricity costs. Operating cost savings are achieved with PS2 systems because the system requires no toxic fuels, can be fully remotely controlled, and is designed for maximum efficiency and long life.










CONTROLLER

MODEL	PS2-150	PS2-200	PS2-600	PS2-1800	PS2-4000
Power (max)	300 W	300 W	700 W	1800 W	4000 W
Input voltage (max) DC Voc	50 V	100 V	150 V	200 V	375 V
Input current (max)	22 A	11 A	13 A	14 A	14 A
Output voltage PWM 3 phase	4-36 V	10-60 V	10-60 V	30-130 V	60-240 V
Efficiency	Max. 98%				
Ambient temperature	from -38 to +50°C (from -36 to 122°F)				
Enclosure	IP 68 (NEMA 6P) outdoor housing Pressure cast aluminum and powder coated cover Pressure cast aluminum case with integrated heat sink				

ECDRIVE MOTOR

MODEL	ECDRIVE 150	ECDRIVE 200	ECDRIVE 600	ECDRIVE 1800	ECDRIVE 4000
Power (max)	300 W	300 W	700 W	1800 W	4000 W
Input voltage	18 V	45 V	45 V	95 V	240 V
Physical	Insulation class F, Max submersion 150 m (500 ft), Enclosure class IP68 EN 1.4301/ AISI 304 stainless steel				

SUBMERSIBLE PUMPS

Motor technology	4" high efficiency ECDRIVE brushless DC motor
Speed	600 to 3300 rpm – depending on pump end
Pump ends Helical rotor	EN 1.4301/ AISI 304 cast Stainless steel stator housing Solid stainless steel rotor
Pump ends centrifugal	Multi-stage centrifugal – premium materials, EN 1.4301/ AISI 304 stainless steel

SURFACE PUMPS

Motor technology	4" high efficiency air cooled ECDRIVE brushless DC motor
Speed	600 to 3300 rpm – depending on pump end
Pump ends	Vertical multi-stage centrifugal premium materials, EN 1.4301/AISI 304 stainless steel Single stage centrifugal premium materials, cast iron body

POOL PUMPS

Motor technology	4" high efficiency air cooled ECDRIVE brushless DC motor
Speed	900 to 3300 rpm – depending on pump end
Pump ends	Single stage centrifugal premium materials

Please, contact UFLEX sales department for customized solution.

LORENTZ PS2 solar pool pumps are high-quality products designed for use in residential and commercial pools and spas. In most swimming pool applications, all filtration needs can be directly absorbed by solar energy, which means there are no electricity costs and significant environmental benefits. The LORENTZ pump uses a highly efficient and reliable brushless DC motor.

PUMPING SYSTEMS

MODEL	PS2-600 CS-17-1	PS2-1800 CS-37-1
Max. total dynamic head (TDH)	12 m	14 m
Max. flow rate	19 m^3/h	36 m^3/h
Solar operation		
Max. power voltage (Vmp)	>68 VDC	>102 VDC
Open circuit voltage (Voc)	150 VDC	200 VDC
Nominal voltage	48-72 VDC	
DC storage operation		
Nominal voltage	48 VDC	
Pumpa type	centrifugal pump	
Integrated strainer	On request	

PS2-600 CS-17-1

PS2-1800 CS-37-1

Suitable for sea water on request

FEATURES

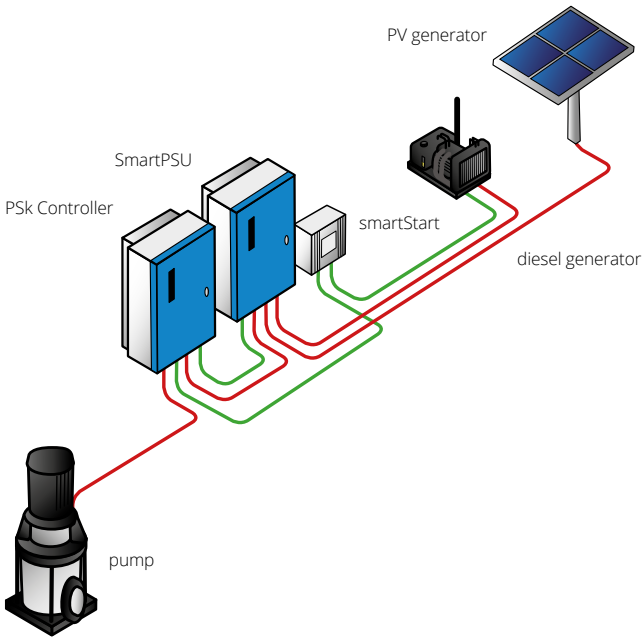
- USE in EC DRIVEDC brushless motors, designed for solar with over 90% efficiency
- Silent and powerful pumps, available in 2 versions.
- Speed controllable to match the pool size exactly.
- Fast and simple installation, direct replacement for an existing pool pump.
- High quality non corrodible materials.
- Solar direct connection.
- MPPT technology to maximise solar power.

Please, contact UFLEX sales department for customized solution.

LORENTZ® - PSK2
HYBRID WATER PUMPING SYSTEM

SYSTEM FOR LARGE SIZE PLANTS

- PSK2 and PSK3 are true hybrid water pumping systems: they automatically integrate the main solar power supply with that provided by the grid or a generator. Reduce operating costs, improve water safety and is environmentally sustainable.
- The PSK2 and PSK3 system's submersible pumps are available that can pump from 200 m (920 ft) depths, and surface pumps available for flows of up to 457 m^3/h.
- Integrated hybrid function on PSK3-7 and PSK3-15 systems



APPLICATIONS

- PSK2 and PSK3 are designed to operate off-grid in the most inhospitable and remote environments.
- PSK2 and PSK3 can supply potable water to communities of up to 400,000 people. PSK2 and PSK3 systems are used in water abstraction systems where there is a need to increase supply pressure and in water purification systems to decrease operating costs.
- By irrigating large areas of hard-to-farm land, PSK2 and PSK3 have transformed unused lands into productive farms.
- Where an industrial process uses high volumes of water then PSk2 and PSK3 can significantly reduce energy costs and provide a reliable solution to water demands.

MODEL	PSK3-7	PSK3-15	PSK2-21	PSK2-25	PSK2-40	PSK2-100
Power (max)	8 kW	10 kW	21 kW	25 kW	37 kW	90 kW
Input voltage	Optimum Vmp >575 V (max. 850 V)					
Input current	14 A	20 A	39 A	48 A	70 A	170 A
Enclosure class	IP 54 – stainless steel and powder coated outdoor housing					
Submersible pumps						
Motor technology	6" high efficiency 3-phase 380 V AC motor – 25 to 55 Hz operation					
Pump ends	Multi-stage centrifugal – premium materials, AISI 304 stainless steel					
Surface pumps						
Motor technology	High efficiency air cooled 3-phase 380 V AC motor – 25 to 55 Hz operation					
Pump ends	Vertical multi-stage centrifugal premium materials, AISI 304 stainless steel. Single stage centrifugal premium materials, cast iron body					

Please, contact UFLEX sales department for customized solution.

SUBMERSIBLE PUMP FOR DEEP WELL

These diaphragm pumps are designed to be installed in well with at least 100 mm of diameter, up to 70 m of depth.

- **Features:** Flow rate per hour: 220-230 ltres of water. The pump operates with 2 x 48 watt solar modules, absorbing 4 amps. The main features of this pump include an internal bypass which prevents idraulic overload in case of too deep submersion of the unit and dry running capability without pump damage.

Model	Pump 9300
Part No.	62473X
Voltage	24 V
Flow rate	220-230 l/h
Self-priming	up to 30 m
Max head	up to 70 m
Max absorption	4 A
Weight kg (lbs)	2,72 (6)

PUMP 9300 FLOWCHART

Total head	Flow rate	Min power PV system	Amp
6,1 m	443 l/h	58 W	1,5 A
12,2 m	432 l/h	65 W	1,7 A
18,3m	413 l/h	78 W	2,1 A
24,4 m	401 l/h	89 W	2,4 A
30,5 m	390 l/h	99 W	2,6 A
36,6 m	382 l/h	104 W	2,8 A
42,7 m	375 l/h	115 W	3,1 A
48,8 m	371 l/h	123 W	3,3 A
54,9 m	352 l/h	135 W	3,6 A
61,0 m	345 l/h	141 W	3,8 A
70,1 m	310 l/h	155 W	4,1 A

LCB PUMP CONTROLLER

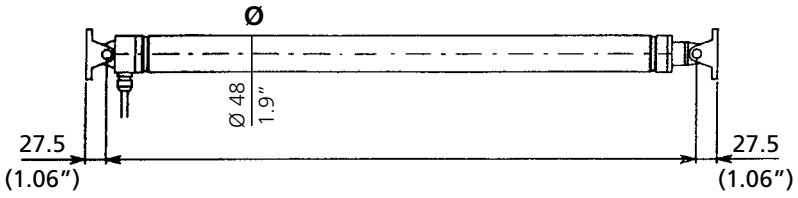
SHURflo LCB pump controllers are high quality DC power converters designed to interface between a DC (solar) pump, (e.g. SHURflo 9300 Series) and the DC power source solar panels or batteries, etc. Their main function is to maximise the daily output of water while providing protection for the pump.
When used in a solar pumping system, directly connected to solar power, it will protect the pump from over-voltage and over-current conditions and will also provide current boosting in low sunshine conditions.

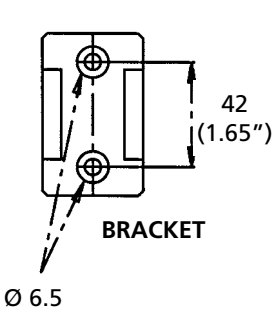
UCS® - AV SERIES ELECTRICAL HATCH LIFTERS

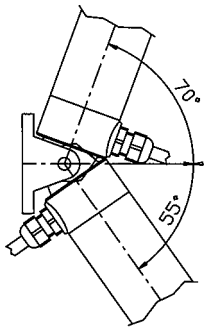
The AV hatch lifters are electromechanical products, especially designed for marine use on pleasure boats. They allow full or partial opening and closing of heavy engine hatches, peak tanks, hatch beams etc.
By activating a switch, it is possible to lift the hatch to any desired position from closed to full open; an internal self-locking mechanism will maintain the position preventing any accidental hatch closing. In case of a power failure an emergency device allows for manual opening.

TECHNICAL FEATURES

- According to the load required, the AV hatch lifter can be mounted individually, or in twin cylinder installation for heavier loads. It is also possible to install more then two AV actuators in multiple applications.
- **Maximum load for single installations: 1200N (120 kg - 265 lbs)**
- **Maximum load for dual installations: 2400N (240 kg - 529 lbs)**
- Maximum load is recommended not to be exceeded.
- Supplied with all mounting hardware.
- Stainless steel telescopic ram for manual operation in case of emergency.
- Available on request without manual emergency opening device for high performance boats.
- Circuit breaker to stop accidental overloading of the system and electronic stop at closed or full open position.
- IP 65 protection rated
- Speed: 25mm/sec no load applied, 17 mm/sec maximum load
- Current absorption in single installations: 10A at 12V, 5A at 24V
- Current absorption in dual installations: 20A at 12V, 10A at 24V
- AV 12VDC models are Ignition Protected. UL1500 - ISO8846 approved.







The rear bracket allows a 125° oscillation range of the actuator

MODEL	PART No.	VOLTS	STROKE	LENGTH A (FULL CLOSED ACTUATOR)	EXTERNAL DIA.
AV 3012	40671C	12V DC	300 mm (12")	677 mm (26.6")	48 mm (1.9")
AV 3024	40672E	24V DC	300 mm (12")	677 mm (26.6")	48 mm (1.9")
AV 4512	40582D	12V DC	450 mm (18")	827 mm (32.5")	48 mm (1.9")
AV 4524	40583F	24V DC	450 mm (18")	827 mm (32.5")	48 mm (1.9")
AV 6012	40584H	12V DC	600 mm (24")	977 mm (38.4")	48 mm (1.9")
AV 6024	40585K	24V DC	600 mm (24")	977 mm (38.4")	48 mm (1.9")

OPTIONAL COMPONENTS:

RB12 - 40738Y Relay box 12V
RB24 - 40742C Relay box 24V
It contains the relays needed for cycle revertion.

SW20 - 69116J
1 x 3 way single pole momentary switch

BR/AV - 80382I
Spare fixing bracket


SW20


RB12

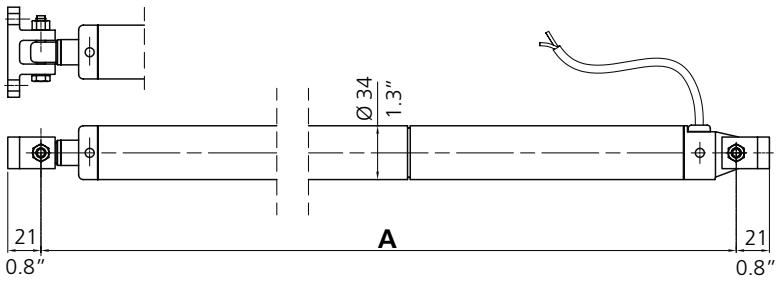
TECHNICAL FEATURES

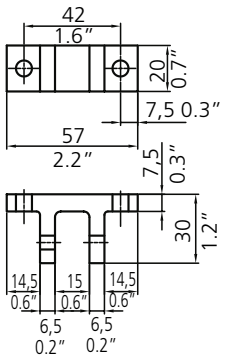
- **Single installation only**
- **Pull and push maximum load: 650N (65 kg - 144 lbs)**
- Pull and push maximum load is recommended not to be exceeded.
- Supplied with all mounting hardware.
- Aluminium ram.
- Circuit breaker to stop accidental overloading of the system and electronic stop at closed or full open position.
- IP 65 protection rated
- Speed:
  12V model:
  - 5 mm/sec no load applied
  - 4 mm/sec maximum load
  24V model:
  - 8 mm/sec no load applied
  - 6 mm/sec maximum load
- Current absorption: 2A at 12V, 1A at 24V

OPTIONAL COMPONENTS:

SW20 - 69116J
1 x 3 way single pole momentary switch

BR/UL - 35697P
Spare fixing bracket





Highest installation flexibility: 180° oscillation range

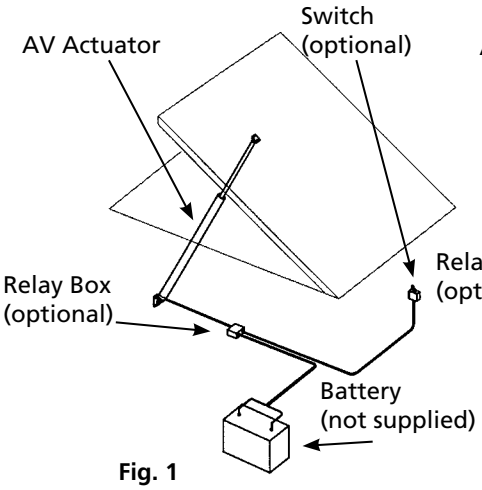


Fig. 1

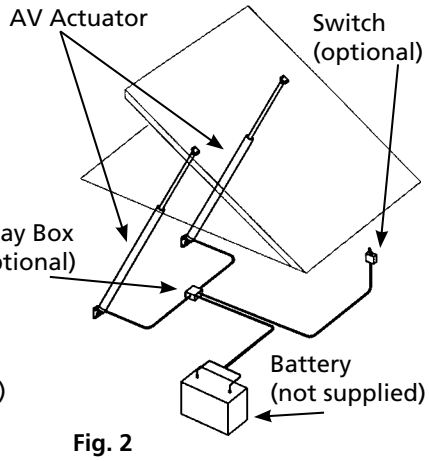


Fig. 2

MODEL	PART No.	VOLTS	STROKE	LENGTH A (FULL CLOSED ACTUATOR)	EXTERNAL DIA.
ULYSSES 1812	40924Q	12V DC	180 mm (7")	515 mm (20.3")	34 mm (1.3")
ULYSSES 1824	40926S	24V DC	180 mm (7")	515 mm (20.3")	34 mm (1.3")
ULYSSES 3012	40925R	12V DC	300 mm (12")	635 mm (25.0")	34 mm (1.3")
ULYSSES 3024	40927T	24V DC	300 mm (12")	635 mm (25.0")	34 mm (1.3")

UCS® - SMOKE VENTILATION CONTROL PANELS

A very versatile range of smoke ventilation control panels, provided of back-up batteries: they operate 24 Vdc actuators for smoke and heat extraction in case of fire, and control the automation of single or multiple windows for natural ventilation even in a multy-storey building.

The opening command for smoke extraction is controlled by smoke detectors, emergency push buttons, fire alarm systems or Building Management Systems (BMS) by "free potential – normally closed" inputs. The installation of the emergency push button (MCP - manual control point) is compulsory because, in addition to allowing manual emergency control, it also provides display of fault / emergency warnings, and can be used for easy, remote resetting.

In order to provide comfort and energy saving, the natural ventilation is granted by operating automatically the windows, according to the environmental conditions detected by the sensors. Windows can be manually controlled through push buttons or key switches in 2 different ventilation zones.

C-SV and C-SV IB control panels have been designed and tested according to the European Standard EN 12101-10 and prEN 12101-9. They have been certified as Smoke and Heat Control Systems according to the European Standard EN 12101-10:2005 + AC:2007 by IFT Rosenheim (not for C-SV 13A and C-SV IB 13A versions)

POWER

Voltage supply input	100-250 Vac, 50-60 Hz
Voltage supply output	24 Vdc (±25%)
Voltage output operation	Polarity inversione
Aux voltage output	24 Vdc
Nominal current	4 A / 8 A / 13 A / 20 A
Back up battery	2x 12 Vdc (sealed lead-acid batteries)

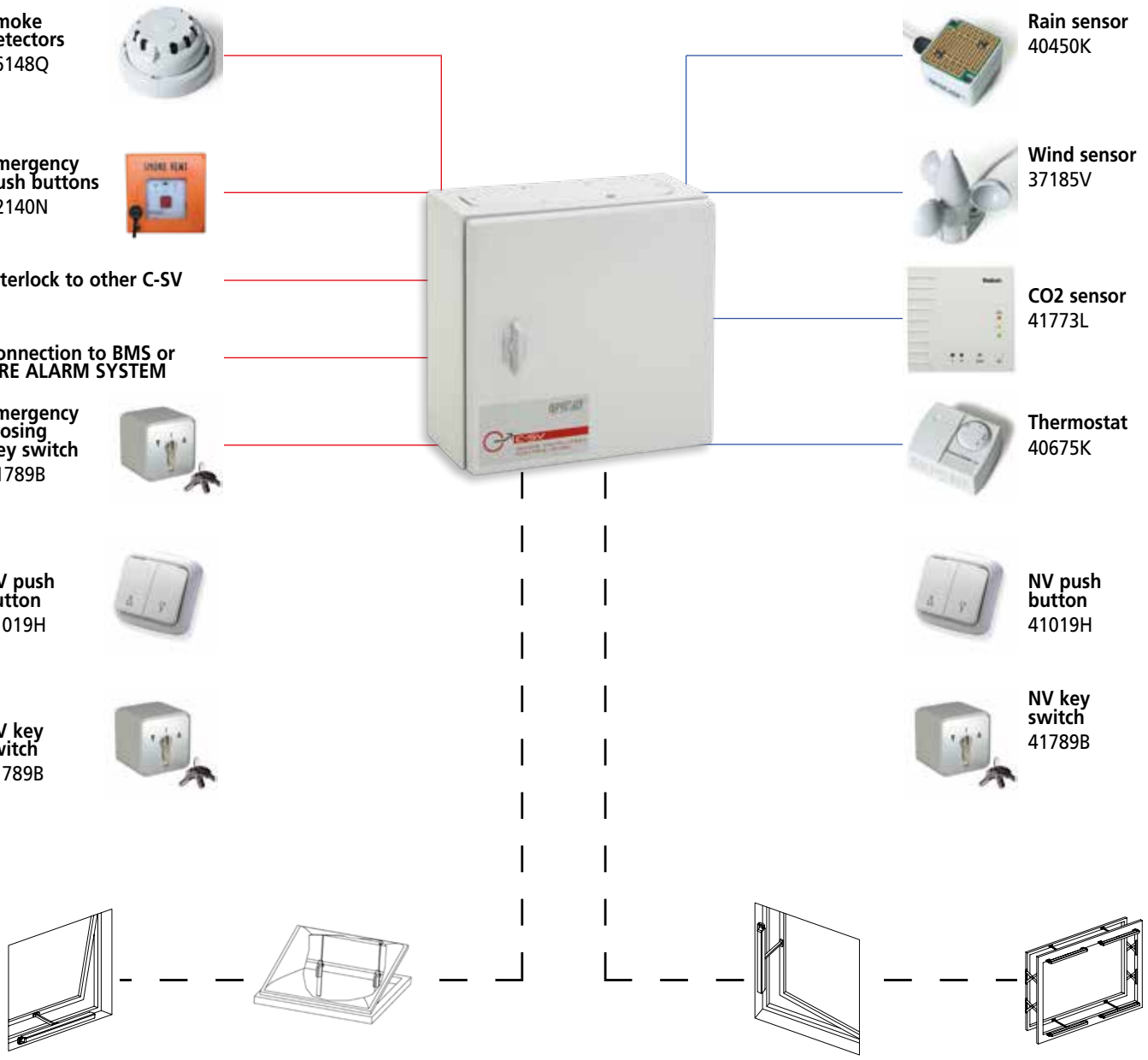
FEATURES

Smoke vent zone	1
Natural vent zone	2
Smoke/heat detector	Max 10
Emergency push button	Max 10 *(integrated push button on the front of the control panel on IB version only)*
Emergency closing button	Max 10 *(normally open contact)*
Emergency output	Clean contact *(e.g. acoustic alarm)*
Natural vent push button	External *(integrated on C-SV-IB version)*
Rain sensor	Max 1
Wind sensor	Max 1
CO2 sensor	Max 1
Thermostat	Max 1

NOTE*: the summarized values on the above table might be varied according to the final installation. For any further information please contact our sales department.*

UCS® - SMOKE VENTILATION CONTROL PANELS

ULTRAFLEX CONTROL SYSTEMS Srl



MODEL	PART No.	NOMINAL CURRENT	PUSH BUTTON	BATTERIES	DIMENSIONS mm (")
C-SV 4A	41736A	4A	Not included	Included	300x300x150 (11.8x11.8x5.9)
C-SV 8A	41737B	8A	Not included	Included	300x300x150 (11.8x11.8x5.9)
C-SV 13A	41918Z	13A	Not included	Included	400x400x150 (15.7x15.7x5.9)
C-SV 20A	41874H	20A	Not included	Included	400x400x150 (15.7x15.7x5.9)
C-SV IB 4A	41738C	4A	Integrated on the front of the control panel	Included	300x300x150 (11.8x11.8x5.9)
C-SV IB 8A	41739D	8A	Integrated on the front of the control panel	Included	300x300x150 (11.8x11.8x5.9)
C-SV IB 13A	41919A	13A	Integrated on the front of the control panel	Included	400x400x150 (15.7x15.7x5.9)
C-SV IB 20A	41875I	20A	Integrated on the front of the control panel	Included	400x400x150 (15.7x15.7x5.9)

OPTICAL SMOKE DETECTOR - 36418Q

Smoke detection by infrared light diffusion for Tyndall effect. It is certified according to the UNI EN 54 - 7/9 regulations. Alarm signal through the red led.

RESPONSE TIME	3 sec approx.
VOLTAGE SUPPLY	24 V (min. 10 V, max. 30 V)
TEMPERATURE RANGE	-10° + 80° C
DEGREE OF HUMIDITY	< 95%
MAX AIR SPEED	10 m/s
DETECTED SURFACE	40 m2

A frequent cleaning, especially in dusty environments, is recommended.

EMERGENCY PUSH BUTTON - 42140N

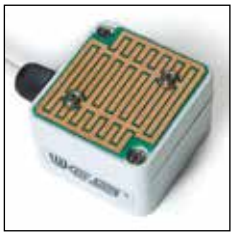
It's necessary to break the safety glass to operate the emergency button. Emergency push button allow to control by LEDs the status of the system, reset the control panels and close the window at the end of the emergency.

ACOUSTIC ALARM DEVICE - 40892C

Outward self-fed siren 24 V, stainless steel box with polycarbonate cover,
sound power 115 dB,
voltage supply 24V - 2 A,
battery 12 V, 2 Ah.
Dimensions: 236x280x99 mm

FLUSH MOUNT DOUBLE PUSH BUTTON - 41019H

Once connected to control panel allows to operate all window for natural ventilation.



RS RAIN SENSOR - 40450K

In case of rain, the rain sensor sends the signal for window automatic closing.

NV KEY SWITCH - 41789B

Once connected to control panel allows to operate all window for natural ventilation.
If properly connected to C-SV, it can be used to send an emergency closing command.

CO2 - 41773L

The CO2 sensor, if present, has the priority on the manual control. Suitable for conference and meeting rooms, offices, schools/nurseries, passive and low-energy buildings.
2 switch outputs CO2 controlled for 2 stage control, with manual and automatic mode as well as display of switching status.
3x 0–10 V outputs for CO2, temperature and relative humidity.
Compatible C-SV, IB-SV only.

WS WIND SENSOR - 37185V

It emits a variable signal according to the wind intensity and acts on the control panel as the rain sensors do.

DIAGNOSTIC KIT (CABLE + SOFTWARE) - 41853M

In the event of anomalies or installation problems, it is possible to interrogate the C-SV control panels using a special diagnostic USB cable connected to a simple computer. A dedicated software allows you to monitor in real time the operating parameters of the control panel (primary power supply, battery voltage, etc.) and to trace the origin of any faults by reading the associated error code.

TH THERMOSTAT - 40675K

The thermostat opens or closes windows when temperature settings are exceeded. Built in on/off switch.

BATTERIES FOR C-SV AND C-SV IB

40911V
Spare part for C-SV and C-SV IB control panel 4A or 8A, formed by two pieces of 12 V, 4,5 Ah batteries.

41921C
Spare part for C-SV and C-SV IB control panel 13A or 20A, formed by two pieces of 12 V, 9 Ah batteries.

UFLEX® - SALES CONDITIONS

- **Purchase orders**
  The Seller only accepts written orders sent by letter, fax or e-mail. The orders have to clearly indicate item code, description and quantity requested.
  We do not accept orders below € 150.00. Orders are processed according to availability. Back orders will be shipped at the current prices, unless different notice by the Buyer, at the earliest convenience on EX WORKS basis or together with a new order.

- **Shipments**
  Goods are delivered EX WORKS Seller's warehouse (Uflex S.r.l. – Via XXV Aprile, 45 – 16012 Busalla Genoa Italy). Unless otherwise specified by the Buyer, the cost of shipment will be invoiced. Goods always travel at the Buyer's risk.

- **Returns and claims**
  Return goods must be authorized by the Seller and shipped, **freight cost at Buyer's charge**, to Seller's warehouse (Uflex S.r.l. – Via XXV Aprile, 45 – 16012 Busalla Genoa Italy) within 30 days from purchase date. Returned items must be accompanied by a delivery note clearly indicating number and date of Selelr's delivery note / commercial invoice as well as the reason for the returning.
  In case of Buyer's request for substitution due to order mistakes, the Seller reserves the right to debit 10% of the goods value (with a minimum amount of € 10,00) for handling operations. The Buyer will be also charged accordingly at cost, should the product require further interventions.
  The Seller does not accept claims for replacements after 8 days from delivery of goods.

- **Term of payment**
  Payment terms will be established by the Seller on receipt of orders.

- **Place of jurisdiction**
  The Court of Genoa (ITALY) will have exclusive jurisdiction for any possible dispute.

CAPANNA MARGHERITA, MONTE ROSA, PIEDMONT - ITALY

MEDICAL CENTER, GUINEA

PHOTOVOLTAIC PUMPING SYSTEM, SARDINIA - ITALY

ALPINE HUT, ALTO ADIGE - ITALY

VIDEO SURVEILLANCE POLES, CAMPANIA - ITALY

FAO RADIO STATIONS, CONGO

MOUNTAIN HUT, PIEDMONT - ITALY

TOURIST RESORT, TUSCANY - ITALY

UFLEX S.r.l.

ULTRAFLEX GROUP

Via Milite Ignoto 8A
16012 Busalla (GE) - Italy
T +39 010 9620228 / 203 / 230 F +39 010 9620333
uf.energy.sales@ultraflexgroup.it
www.uflexenergia.it