PURSUIT OF PERFECTION

On-board power solution

PURSUIT OF PERFECTION

Company

Introduction

TBB Power aimed to offer complete on board power solution for various kinds of vehicle and boat requiring extra and reliable power supply, such as ambulance, motor homes, caravan, service vehicle, military vehicles, and yacht, sailing boat etc.

Products supplied include control panel, on board power, battery management, distribution, storage battery and semi flexi solar panel. Till 2017, we have installed our products on over 35000 vehicles and boats. TBB Power has being widely accepted as a creative and dependable partner.

To assure the high and stable quality, TBB Power has implemented ISO9001 and IAF16949 management system within the company. All products carried have passed CE and some has gained E homologation.

Company introduction

Solution provider

Complete on board power solution is our profession with a broad range of products and a highly experienced and motivated team. We are capable of offering tailored solution for various kinds of vehicle or boat.

Reliability Guaranteed

Quality and Reliability is our key promise through rigorous design, strict quality control and tens of thousands of installation worldwide.

ISO9000 IATF16949 E4 CE

Engineering Service

Along with quality products, we always work closely with our clients to come out creative solution, achieving the target with less total cost.

Global player, Local service

Tens of thousands of our systems are installed each year worldwide offering continuous power with customer satisfaction. In 2014, TBB Power GmbH was established in Dusseldorf aiming to offer better service to Europe market.

Ambulance

Boat & Yacht

Police wagon

Monitoring and Control Panel

Multiple on board monitoring and control panels were available, LED panel, LCD central panel as well as APP on smart phone. Multiple switch panels were available as well.

On board Power

We could offer complete range of on board power products including battery charger, inverter charger combination and converter charger. Intelligent battery charging curves which can always charge your battery properly avoiding undercharge or overcharge, even while driving. High performance inverter charger combination ensures a reliable and powerful on board power solution with a small installation footprint.

Battery management

Various battery management products were available, including battery monitor, charging relay and battery protection unit. For system with lithium battery, simple BMS was available as well.

Power Distribution

Both analogue and digital distribution module were available with TBB Power. With digital distribution module, many features can be achieved especially upon you are designing a complicated power solution.

Semi Flexi PV

The semi flexible solar panel integrated with glue featuring ultra light weight, higher power density and UV resistant are perfectly suitable for mobile application, such as caravan, boat as well as trucks.

Storage Battery

Multiple batteries were available for this market, including AGM deep cycle, GEL and Lithium battery.

Electrical System Provider

CCP10
–Caravan Central Panel

Especially designed for motor home and caravan, CCP10 was a control center with many distinguished features.

- Load labeled with name, easy to understand
- Extra large membrane design, easy to control
- Load status indicator
- Back light for night view
- 12 VDC Master switch
- Night mode

Dimension	170×101mm
Working voltage	10～16 V / 18～32 V
Working temp	-25~80℃
Storage temp	-35~85℃
Static power consumption	0.2 W
IP protection	IP20

Customized bezel

Water tank level indicator, designed for measurement of fresh water tank, grey water tank and black water tank.

Voltage of Starter battery

State of Charge of Service battery

Solar status

Inverter Output control

Source of power

Load control

Dussel Style

12Vdc load master switch.
One switch to control all DC appliances.

Rocky style

Combined with APP on smart phone, you can remotely monitor and control the on board water and electrical system.

Crystal

Central monitor

Usually, there are multiple panels on board belong to various electrical equipments. It is inconvenient to read and need more space for installation. Furthermore, it is very difficult and even impossible to relate one to another.

With Crystal, this is no more a harassment. It is the digital control center for complete on board power system. It enables the monitoring and controlling of all connected TBB T-bus products and can perform as the control center of on board electrical system. Optional Wifi module or Bluetooth was available for remote monitoring with smart phone.

- T-Bus design, can be connected to multiple equipments
- System monitoring
- Configuration
- Back light

Crystal - D

Crystal - A

MSP

Membrane switch panel

MSP10 **MSP2** **MSP1**

TSP

Touch switch panel

2in1

Crystal+MSP

CMP

-Caravan Master Power

CRYSTAL

MSP10

CCP10

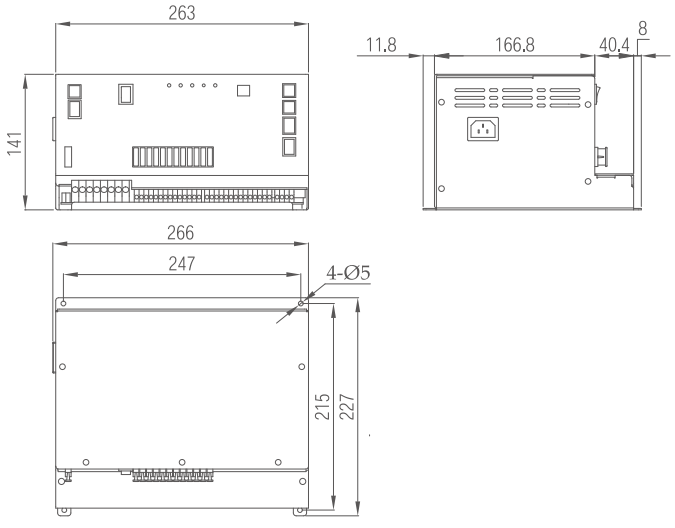
SWITCH

RSA RSB RSD

FLEXI PV

Especially designed for caravan and motor home application, CMP can perform as the power center for caravan or motor home integrated with multiple functions. Designed with concept of plug and play, it could dramatically reduce the installation time complexity.

- Smart battery charger 12V20A (30A at power supply mode)
  - Active PFC charging
  - Temperature compensated Charging
  - Voltage compensated Charging
- Float Charger for starter battery
- Solar charge controller (PWM), 25Vdc 30A
- 14 Fused DC outputs
- 3 outputs for lighting support brightness adjustment, max 2.5A each
- Battery charging relay 12V100A
- Battery Low Voltage Protection 12V 40A
- Built in Battery Switch
- Built in shunt for precise battery measurement
- Control one water pump with two tank probes
- Spring terminal
- T-bus compatible
- Optional Bluetooth



Model		CMP1225	CMP1225 - LV
Electrical Specifications			
Grid		155-265 VAC 50 / 60 Hz	90-165 VAC 50 / 60 Hz
	Power factor	0.9	
	Input surge	10 A	15 A
Battery	Starter battery	12 VDC	
	Station battery	12 VDC	
PV	Open circuit voltage	15 ~ 25 VDC	
	Max charging current	20 A	
Charging Relay		12 VDC 100 A	
Service Battery charger	Charge Algorithms	TBB premium II - 5steps	
	Rated charger output current	20 A	
	Temperature compensation	Automatic	
	Voltage compensation	Automatic	
Starter Battery charger		3 A, float charging	
Power supply mode	norminal output voltage	12.8 ± 0.2 VDC	
	rated output current	25 A	
Efficiency		90%	
Others			
Battery Disconnect	Disconnect voltage	10.5 VDC	
	Reconnect voltage	11.5 VDC	
	Battery drain after disconnection	Automatic	
Fused outputs	Numbers	11	
	Rated current	10 A x 7 ; 15 A x 4	
Protection	Short circuit on outpout	yes	
	Reverse Polarity	fuse blown	
	Overload protection	reduce output	
	Battery charger over temperature	shut down at 90 °C	
	Battery over temperature	shut down at 55 °C	
	Battery over voltage limits	shut down at 16 VDC	
Physical Specifications			
Dimensions (L*W*H)		263×141×227 mm	
Weight (kg)		5.3 kgs	
Enclosure		steel case	
Cooling		Forced cooling	
Protection category		IP20	
Approvals			
LVD		EN60335-1, EN60335-2-29	
EMC		EN55014-1, EN55014-2, EN61000-3-2, EN61000-3-3	

Energier Pro

-Inverter Charger Combination 800 VA-3 kVA

TS/VS

Temperature Sensor/
Voltage Sensor

CrystalA

RCF

Monitor with LED

AGS

Automatic Generator start

LMD

Energier Pro was especially developed for mobile and marine electrical system integrated multiple functions, including a powerful battery charger, float charger, true sine wave inverter and a high speed automatic transfer switch. Compared with separate charger and inverter, it could save a lot installation time and space.

Its distinguishing surge capability makes it capable to power most demanding appliances, such as coffee machine, vacuum cleaner, microwave and power tools etc. Meantime, with built in AEA, it can automatic allocate the power available with AC source (either grid or genset) using whatever extra for charging, thus avoiding grid or generator to be overloaded.

- Pure sine wave output with outstanding peak power
- High efficiency up to 92%
- Extremely low status consumption power
- Sophisticated TBB premium II multiple stages charging algorithm for lead acid battery
- Automatic temperature compensation charging
- Automatic voltage compensation charging
- Lithium Battery compatible
- Fully programmable with Vision monitor
- GEN mode makes it compatible with cheap generators in the market.
- Standby level adjustable
- Compatible with T-bus

Model No.	12 VDC / 24 VDC	CF0825L / CF0815M	CF1240L / CF1220M	CF1650L / CF1625M	CF2060L / CF2030M	CF3090L / CF3045M
Inverter						
Nominal Voltage	12 VDC, 24 VDC					
Cont. power @25℃ (VA)		800	1200	1600	2000	3000
Cont. power @25℃ (W)		750	1100	1300	1600	2500
Cont. power @40℃ (W)		700	1000	1200	1450	2200
Output voltage		230 / 110 VAC ± 2%				230 VAC ± 2%
Output frequency		50 / 60 Hz ± 0.1%				
Cosφ		0.9-1				
Overload Capability	>110%	15 mins				1 mins
	>125%	1 min				
	>150%	20s				
Surge		300%				
Efficiency (max)	12 VDC / 24 VDC	89% / 92%				
THD		<3%				
Bypass range	UPS mode	184-264 VAC / 88-127 VAC				184-264 VAC
	GEN mode	173-276 VAC / 67-132 VAC				173-276 VAC
	Weak Grid mode	167-264 VAC / 80-127 VAC				167-264 VAC
Zero load power		10 / 11 W	11 / 12 W	11 / 13 W	14 W	17 W
Zero load power (power save mode)		2.5 W	2.5 / 3 W	2.5 / 3 W	3.5 W	4 W
Overload and overheat protection		auto disconnect with 3 times restart attempt				
shortcut protection		auto disconnect				
Charger						
Nominal Output Voltage	12 VDC, 24 VDC					
Max Output current (A) - adjustable		25 / 15	40 / 20	50 / 25	60 / 30	90 / 45
AC Input range		195 - 264 VAC / 93.5-126.5 VAC				195 - 264 VAC
Battery types		AGM / GEL / Opzv / Flooded / LFP / Opzs				
Absorption time		variable				
Temperature compensation		-4 mV / °C / cell				
Slave Charger		3-5 A float charge				
Other Data						
Transfer time	UPS mode	15 ms				
	GEN mode	2 s				
Transfer switch		16 A			31 A	
Dry contact		Battery low				
Battery connector		M6 x 2				
AC tenminal		M3			M4	
Mechanical Data						
Enclosure		Steel with powder paint				
Dimension (mm) (max)		440x232.5x95			485x265x145	
Net Weight (KGs)		10.5	11.65	11.9	18	19.2
Cooling		Forced fan				
Protection		IP22				
Standard						
Safety		EN60950-1				
EMC						
Automotive Directive		EN61000-6-1,EN61000-6-3, EN61000-3-2, EN61000-3-3, EN55014-1, EN55014-2, EN55032, EN55024				

TRIDENT

– BS smart battery charger

Batteries will be permanently damaged by either overcharged or remaining undercharged for any period of time. TRIDENT smart battery charger will continuously deliver right charging at any circumstance with built in battery management features which will be helpful in prolonging your battery life expectancy.

Combined with up to date technology and our knowledge with batteries, Trident smart battery charger was especially designed for mobile and marine application, it was an ideal solution for your battery charging on board.

TS/VS

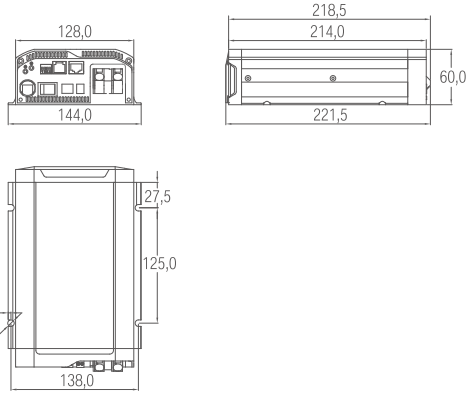
Temperature Sensor/
Voltage Sensor

CrystalB

RBS

Features

- Active PFC featuring smaller and higher efficiency, max 92%.
- With multiple isolated outputs, including slave charger for starter battery.
- Automatically work as power supply or charger.
- Sophisticated TBB premium II multiple stages charging algorithm for lead acid battery.
- Adaptive charging algorithm for multiple battery chemical including AGM, GEL, etc.
- LFP (LiFePO4) charging algorithm is available.
- Automatic temperature compensation charging
- Automatic voltage compensation charging
- Programmable with monitor
- Night mode through remote control.



Model No.	BS1215	BS1225	BS1225-3	BS2408	BS2412	BS2412-3
Electrical						
Input voltage range	165 ~ 264 VAC or 85 ~ 130 VAC					
Power Factor	0.95					
Frequency	50 / 60 Hz			50 / 60 Hz		
Output voltage range (V)	12 VDC			24 VDC		
charge current (A)	15	25	25	8	12	12
charge current (night mode) (A)	10	15	15	6	8	8
Charge current for starter battery (A)	3			1.5		
Efficiency	91%			92%		
No load power consumption (W)	≤1 w			≤1 w		
Number of outputs	1+1		2+1	1+1		2+1
charge algorithm	TBB Premium Ⅱ -5 steps					
Can be used as power supply	Yes					
Protection	Reverse polarity, Battery charger over temperature, Battery over temperature, Over load, short circuit					
Operating temp	-20 °C - - + 40 °C					
Humidity (non-condensing)	≤93%					
Enclosure						
Material & Color	Aluminum with anodized,flame proof plastic					
Battery connection	Spring terminals 16 mm² / AWG 5					
AC connection	Cable of 1.5 meter with Plug					
Protection category	IP20					
Weight	1.5 kg					
Dimensions (h*w*d)	60 x 144 x 221.5mm					
Standards						
Safety	EN60335-1,EN60335-2-29					
Emission	EN55014-1,EN55014-2,EN61000-3-2,EN61000-3-3					

NEMO series

Converter charger

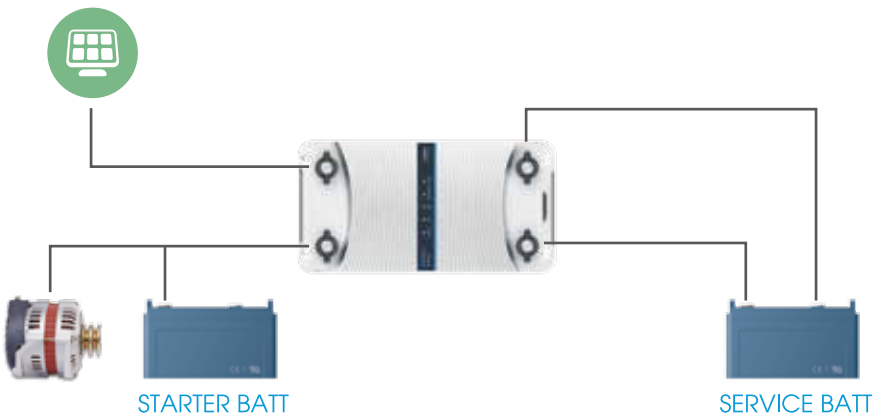
The dual input NEMO converter battery charger could draw power from smart alternator as well as solar panel, to perform a proper charging for service battery while you are driving.

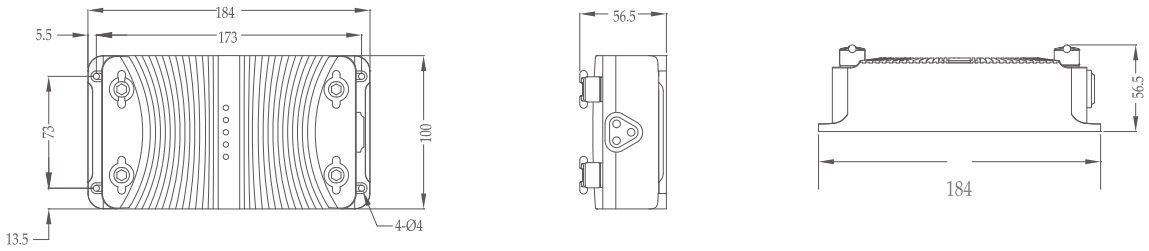
NEMO are compatible with smart ECU controlled alternator (Euro 6) which delivers a variable output when they are not needed. NEMO could maintain the charging with a stable output in this situation, to assure your battery getting a fully charging in the shortest time.

It will protect or maintain your starter battery even if engine was stopped without issue of starting problems.

Features

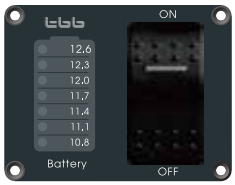
- Dual input from alternator and solar panel
- Compatible with smart alternator – Euro 6
- TBB premium II multiple stages charging algorithm for lead acid battery
- Built in automatic temperature and voltage compensated battery charging
- Multiple battery chemicals including AGM, GEL, LFP(LiFePO4) etc
- Max Power Point Tracking (MPPT) technology
- Compact and Water Proof, IP65





Model No.	DX1220	DX2410
Electrical		
Input nominal voltage	12 VDC	24 VDC
Input voltage range	11-17 VDC	22-23 VDC
Automatic activation - D+	yes	
Output nominal voltage	12 VDC	24 VDC
charge current (A)	20	10
Efficiency	91%	
Temperature compensation	yes	
Voltage compensation	yes	
Charge algorithm	TBB premium II multi stage	
Protection	Reverse polarity; Battery charger over temperature; Battery over temperature; Over load;short circuit	
Operating temp	-20 °C -- + 60 °C	
Enclosure		
Material & Color	Aluminum with anodized,flame proof plastic	
Battery connection	Spring terminals 16 mm² / AWG 5	
Protection category	IP65	
Weight	1.5 kg	
Dimensions (h*w*d)	60 mm x 144 mm x 221.5 mm	
Standards		
Safety	EN60335-1,EN60335-2-29	
Emission	EN55014-1,EN55014-2,EN61000-3-2,EN61000-3-3	

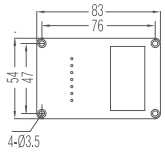
Battery Protect Unit

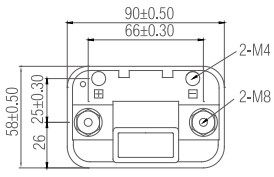


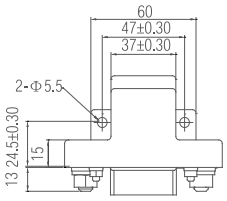
Battery Protect Unit was designed for DC loads connected on service battery. It offers an automatic protection to avoid deep discharge of service battery.

In together with a panel, it could offer precise voltage indication of service battery through a LED bar. Meantime, the battery switch could manually switch off the battery system.

- No voltage loss
- Disconnect voltage 11 VDC, engage voltage 12.6 VDC
- Available with both 12 VDC and 24 VDC models







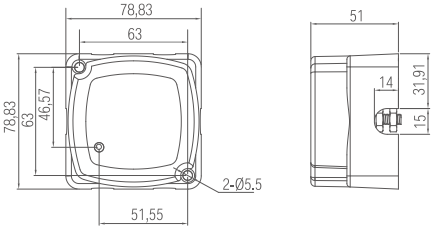
Model	BPU150
Nominal voltage	12 VDC / 24 VDC auto-detective
Nominal current	150 A
Close voltage	12.6 / 25.2 V
Open voltage	11.0 / 22.0 V
Working temperature	-40 °C ~ +80 °C
Self-consumption(open status)	< 1mA
IP level	IP54

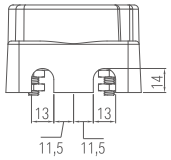
BLVP series

-Battery Low Voltage protection unit

Battery protect was designed for DC loads connected on service battery.
It offers an automatic protection to avoid deep discharge of service battery.

- No voltage loss
- Available with both 12 VDC and 24 VDC models
- Disconnect voltage 11 VDC / 22 VDC, engage voltage 12.6 VDC / 25.2 VDC





	BLVP60
Nominal voltage	12 VDC & 24 VDC
Max continuous current	60 A
Close voltage	12.6 / 25.2 V
Open voltage	11.0 / 22.0 V
Working Temperature	-40 °C ~ +80 °C

VCR

Voltage charging relay

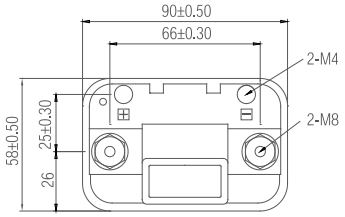
VCR offers a conveniently available source to charge the service battery, with which you can utilize the spare energy of alternator during engine running and reduce the service battery size on board. (Not suitable for Euro6 engine).

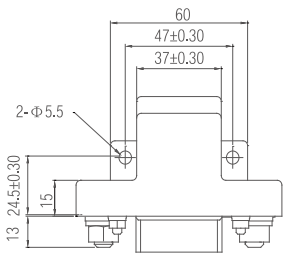
Different from a simple diode splitter, it offers management to better protect the starting battery and utilize the spare energy upon ready for use.

- No voltage loss:
  - Designed with a microprocessor controlled contactor, IRD is an ideal replacement for Diode type battery isolator.

- Prioritizing the starter battery:
  - Upon starter battery reach threshold voltage (about 13.6 V / 27.2 VDC) with preset time delay, the relay will close to charge service from alternator.
  - Upon ignition went off, it will disconnect the charging to service battery.
  - While engine running, it will disconnect the charging upon starter battery voltage drop under threshold voltage (about 12.2 VDC / 24.4 VDC) with preset time delay.

- Charging starter battery
  - Upon a shore charger was connected on service battery and voltage reach threshold voltage (about 13.6 V / 27.2 VDC) with preset time delay, the relay will close to charge starter battery in together.
- Assist start
  - In case of starter battery runs flat, through an external switch, it could manually connected two batteries together to help starting the engine.





	VCR12 / 24-120	VCR12 / 24-150	VCR12 / 24-200
Nominal voltage	12 VDC / 24 VDC auto detective		
Max continuous current	120 A	150 A	200 A
Working Temprature	-40 °C ~ +80 °C		
Protection	IP54		
Dimension (HxWxD)	65 mm x 58 mm x 90 mm		

BM series

– Battery Monitor 100 A, 200 A, 400 A

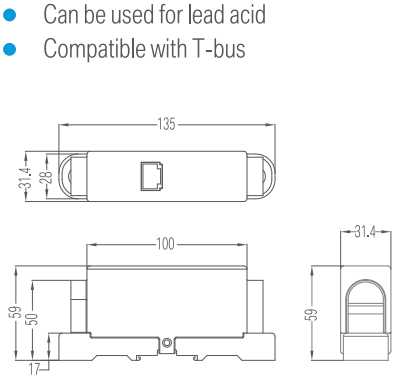
The BM series battery monitor features microprocessor controlled combined with high resolution measuring system for battery voltage and charge / discharge current. With built in software, BM can calculated consumed AH / KWH and remaining AH / KWH, and display battery voltage and battery current as well.

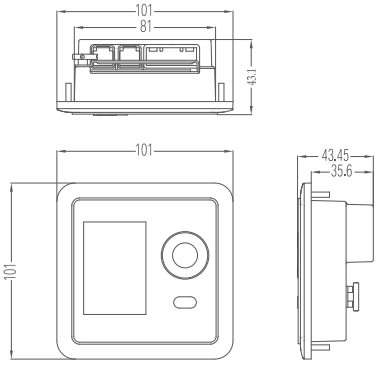
BM could record all battery activities since the first installation (max 200 records). Apart from discharging and charging, multiple other factors are considered including battery size, age ratio of battery etc. With shunt, even the smallest leakage current can be detected and recorded to guarantee the accuracy.

Compared with conventional indicating meters, small current can be measured and read exactly with this device. With this feature, latent consumers (insulation fault, wrong connections, standby unit etc) can be recognized immediately. Meantime, through additional sensor second battery voltage can be measured and displayed.

Battery low voltage protection level can be programmed and alarm cam will be sent once reaching the limit to avoid battery damage due to deep discharge. In the meantime, it can be used to drive the battery protection device to shut off the battery against further discharge.

- Battery voltage, service battery and starter battery
- Battery charging and discharging current
- Battery residual capacity in AH and %
- Programmable for protection point
- Battery voltage of starter battery
- Can be used for lead acid
- Compatible with T-bus





RY

Battery low voltage protection devices
12 V 100 A 12 V 50 A

CR

Battery low voltage protection devices 100 A, 200 A, 400 A was available for 12 VDC, 24 VDC, 48 VDC system

BML series

– Battery Monitor With BMS for Lithium

The BML series battery monitor was especially developed for lithium battery. It could calculate and display battery SOC, balance AH/KWH as well as displaying battery voltage, charge/discharge current.

Meantime, it has built in lithium battery BMS, with max 8 sensors to measure the voltage and temperature of different cells. You can program the max voltage difference, low voltage, high voltage or points as well as other parameters. External battery protection devices can be added to shut off upon protection point reached.

- Battery voltage
- Battery charging and discharging current
- Battery residual capacity in AH and %
- Built in 8 cells voltage sensor or 4 cells voltage sensor
- Programmable for protection point
- Compatible with T-bus

Model No.	BM	BM100	BM100S	BM200	BM200S	BM400	BM400S
	BML	BML1004 / BML1008	/	BML2004 / BML2008	/	BML4004 / BML4008	/
Electrial Specification							
Operation voltage range		8-33 VDC	24-70 VDC	24-70 VDC	8-33 VDC	8-33 VDC	24-70 VDC
Operation current range		≤0.15A					
Norminal battery voltage		12 V / 24 V	48 V	12 V / 24 V	4 8V	12 V / 24 V	48 V
Max measurement voltage		33 V	66 V	33 V	66 V	33 V	66 V
Efficiency		100 A	100 A	200 A	200 A	400 A	400 A
BML nominal battery voltage		12 V (4 cell) / 24 V (8 cell)					
BML max battery voltage		33 V					
Standby power consumption		<1 W					
SOC accuracy		0.05					
DOD dry contact	Qty	1					
	Capability	0.5 A / 30 VDC					
	function	Battery over voltage/low voltage protection					
Other data							
Communication		RS485					
Working temperature		-25 °C ~ 65 °C					
Dimension(LxWxH)		101*101*43.45 mm					
Weight		165 g					
IP protection		IP32					
Cooling		Self cooling					
Standards		EN55022, EN60950					

Pilot Master

-Digital distribution module

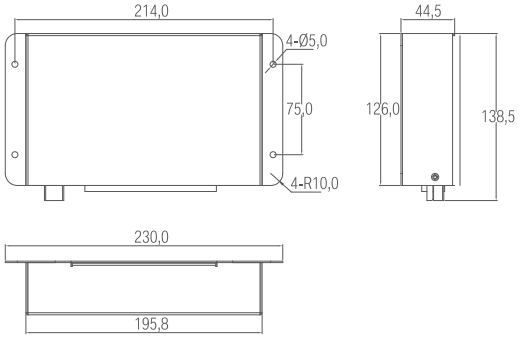
Along with more equipments were carried on board, electrical design and installation is becoming more challenging upon complicated control was desired. PILOT MASTER is a product answering this challenge.

Apart from using fewer cables, PILOT could save considerable time and cost for design and installation.
With standard system configurations, multiple control logic can be programmed without changing the wiring.

- Intelligent bus system
- Easy to install and configure
- Intelligent alarm and protection against shortcut, overload or underload
- PWM output supporting dimming of light
- Load management against multiple conditions
- 20 x outputs : Built in self protection against short cut, overload and under load. No fuse required
  - 10 x 2.5 A including 1 output supporting PWM
  - 6 x 5 A including 1 output supporting PWM
  - 4 x 9 A including 2 outputs supporting PWM
- 1 output : 12 VDC 500 mA
- 26 x inputs: dry contact, PWM, voltage or resistive sensor

Specification

- Working temperature : - 40 °C ~ 85 °C
- Rated voltage : 12 VDC or 24 VDC
- Working Voltage : 10 VDC – 16 VDC or 18 VDC – 32 VDC
- Max current : 40 A
- Protection : IP20
- Size : 210 x 130 x 45 mm



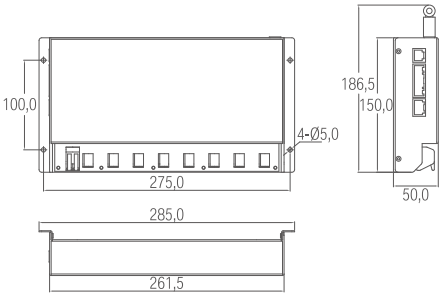
ALOT

Distribution module

ALOT is a family of analogue distribution module. Microprocessor controlled with built in fuse and relay, it can be easily used for various system.

ALOT- LCM15

- DC distribution modules
- Rated voltage : 12 VDC or 24 VDC
- Working voltage range 10 VDC -16 VDC or 18 VDC - 32 VDC
- Outputs
  - 15 x 20 A outputs with fuse
- Inputs
  - 2 x temperature input
  - 4 x voltage input (battery voltage, D+ or push button switch)
  - Can support max two MSP series switch panels
- Self consumption power max 20 mA
- RS485, T-bus compatible
- Working Temperature : - 40 °C - 85 °C
- IP20



ALOT- ACD

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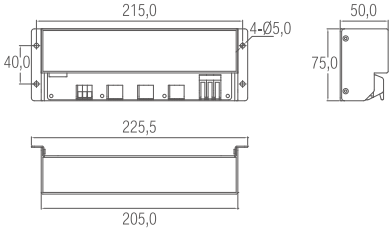


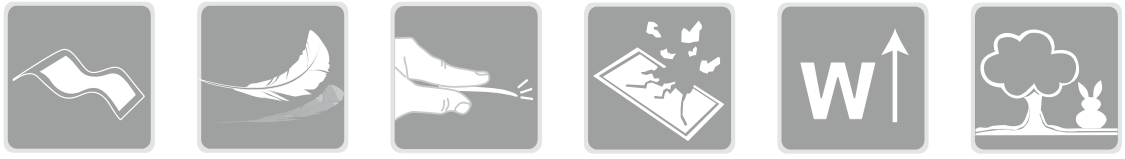
Semi Flexi Panel

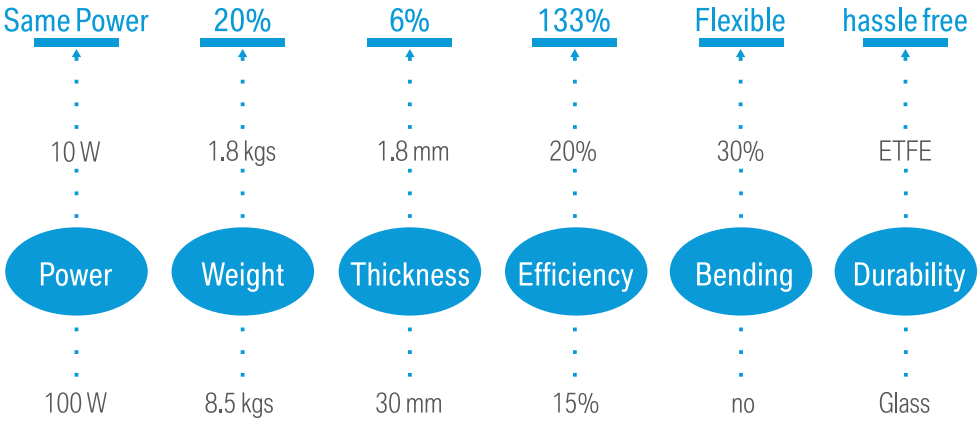
The semi flexible ultra light weight solar panels are perfectly suitable for mobile application, such as caravan, boat as well as trucks.

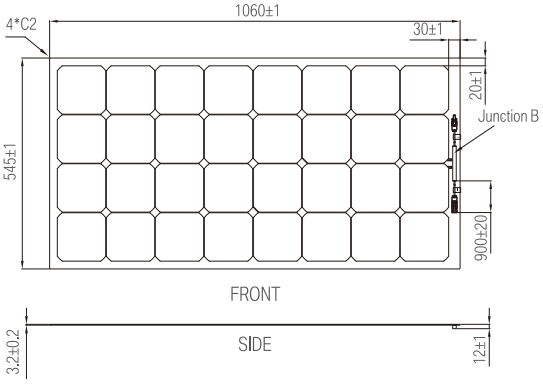
- SUNPOWER cell adopting back contact technology improving the conversion efficiency.
- Encapsulation process assured the light weight, water proof and flexibility
- ETFE surface material featuring UV resistance, guaranteed the performance in outdoor application with 20 years life span
- Integrated Butyl Tape at back, easy to apply on various surface with outstanding durability up to 20 years
- No sharp edges
- Aerodynamic

Model	SFP32	SFP36
Power	100 W	108 W
Voltage at max power	17.9 VDC	19.3 VDC
Open circuit voltage	21.4 VDC	24.1 VDC
Current at max power	5.7 A	
Short circuity curren	6.1 A	
Cell	SUNPOWER	
Cell efficiency	20%	
Module efficiency	>18%	
Operating temperature	:-40 °C - 80 °C	
Surface material	ETFE	
Junction box	IP65	
Connector	SP4	
Module cable	4 mm2	
Dimension	1060 mm x 545 mm	1190 mm x 545 mm
Thickness	3.2 mm	3.2 mm
Weight	2.2 mm	2.9 mm
Max Bending	30 degree	
Temperature coefficient	- 0.32% / ℃	
Package	single box	
Certificate	CE, RoHS	

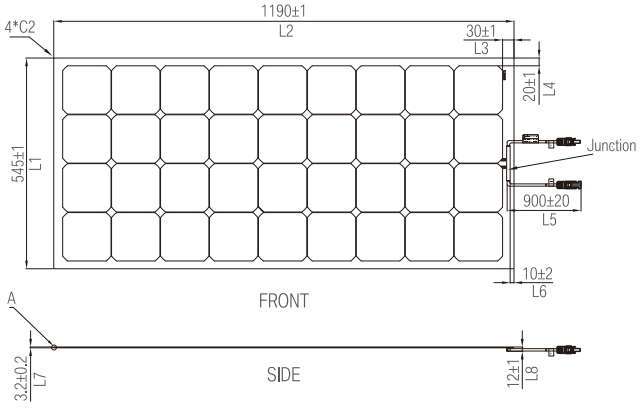
Advantage







SFP32



SFP36

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