Hybrid Power

Powerstart 500 B-R

- Innovative in energy storage & Power Electronics
- Custom-made solutions
- Complete solution: storage & Power Electronics
- Design and system integration

Features

- Cold temperature performance
- Improves starting performance
- Low internal resistance, high peak current
- Long life cycle
- Integrated DC/DC converter
- Integrated individual cell balancing
- Compact, rugged, fully enclosed and IP65
- Extension battery life, downsizing battery
- Built in overvoltage switch
- Approved for heavy-duty vehicles shock and vibration norms

Applications

- Diesel engine cranking & board net stabilization
  - (cold climate) transportation
  - Automotive
  - Marine
  - Industrial
  - Railway

Mechanical Data

Length x Width x Height
459 x 259 x 182 mm
Approx. 11 kg

aephybridpower.com
sales@aephybridpower.com
+31 (0)78 692 2100

Overview

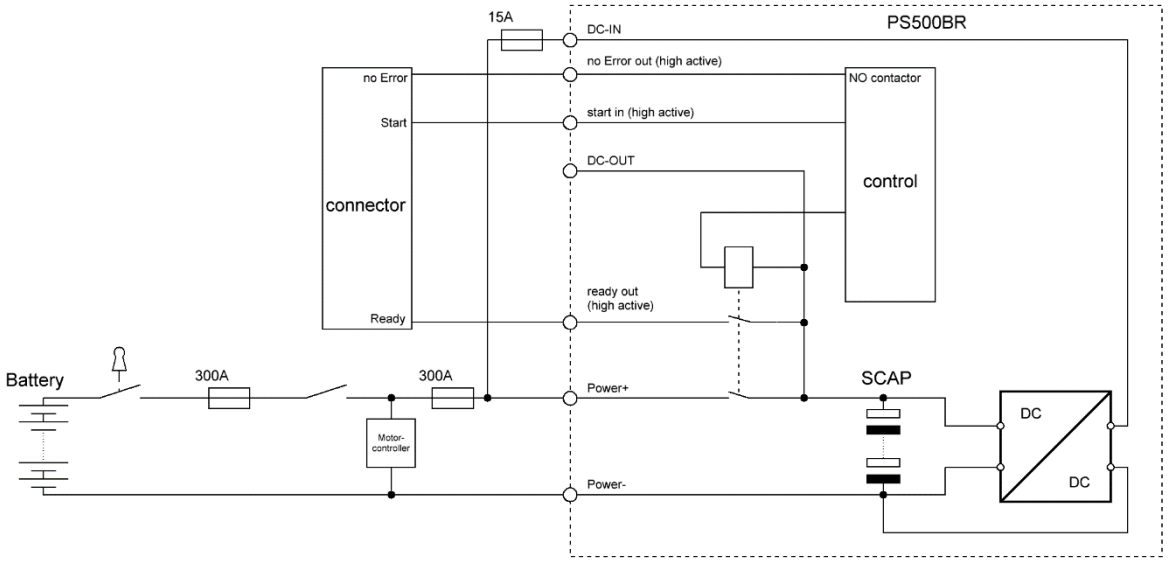


Figure 1: Block diagram of typical configuration

Global Specifications

Symbol	Parameter	Min.	Typ.	Max.	Units	Comment
T_A	Ambient air temperature	-40	-	+60[1]	°C	-
P	Peak power[2]	-	-	54	kW	-
CCA	Max. cold crank amp.	-	-	2000	A_{rms}	Power+ / t < 1
U_{nom}	Rated voltage	-	27.5	-	V DC	Power+ / DC-OUT-L
U_{TR}	Transient peak voltage	-	-	150	V DC	Exponentially decreasing to 28V within 4 s
C	Capacity	-	270	-	F	(=100kJ @ 27.5V DC)
I_L	Leakage current	-	13.2	-	mA	Per cell including balancing
	Cycle life	1.000.000	-	-	Cycles	-
	Lifetime	-	10	15	Years	-
I_{CAP}	Charge current	0.15	-	10[3]	A_{rms}	DC-IN

[1] up to 50°C three recharges 18V to 27V possible. If T ≥ 60°C charge locked. A temperature over 65°C is critical!

[2] Peak Power = $\frac{V_{max}^2}{4\ x\ ESR}$

[3] Reducing by temperature over 45°C permitted. Short transients t < 2 s are allowed.

Hybrid Power

Power inputs / outputs

I / O	Parameter	Min.	Typ.	Max.	Units	Comment
DC-IN	Input voltage	17	24	35	V_{DC}	Transients see section ''Global specifications''
	Input current	0.1[1]	-	10[1]	A_{RMS}	Short transients t < 2 s are possible
Power + [2]	Output voltage	-	U_{Cap}	-	V	Identical to cap voltages. Charge switch off voltage
Power - [2]	Output current	-	-	2000	A	T < 5 s

[1] I_{DC-IN} by CAP voltage (power+ or DC-OUT-L) with about 1 A per 1 V CAP voltage.
[2] Maximum tightening forces 10 … 15 Nm. Fix lower Nut when unscrewing!

Signal inputs / outputs

Signal	Direction Converter	Condition / Parameter	Definition
Start 1.2	Input	Input voltage start active	18…35 V^{DC}
		Input voltage start inactive	Open Collector / U < 5V
		Input current	I < 10mA @ 24 V^{DC}
Ready (for Start)	Output **Make contact**	Ready if: U_{Cap} ≥ 24V **and** DC-IN > 18V	Contact connecting to Power+
		Not ready if: U_{Cap} ≤ 23V **or** DC-IN < 18V	Contact open (I < 5 mA @ U ≤ 30 V)
		Max output current	1A / 0,5A recommended
Error	Output **Break contact**	Fault condition[3]	Contact connecting to Power+
		Normal condition[4]	Contact open (I < 5 mA @ U ≤ 30 V)
		Max. input current	1A / 0,5A recommended

[1] The start signal must be connected at all times to protect the internal DC converter!
[2] Switch start signal to Power+ or DC-OUT-L, never to another potential!
[3] Fault conditions: U_{DC-IN} < 17 V / U_{DC-IN} > 35 V / T ≥ 60 °C / cell voltage > 2.65V / cell temperature > 65 °C / error
[4] The first three seconds after power on (DC-IN) the error light is on. It is an error test signal.

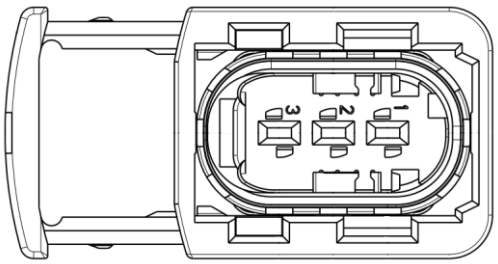
Hybrid Power

External plugs and fuses

Name	No.	Construction	Color	Width	Length	Direction for ACB	Fuse
DC-IN		Cable with flying fuse	Black	2.5mm²	0.4m	Input	15 A
Start in	1	Connector Tyco 1-1418448-1	Grey	1mm²	0.4m	Input (high active)	1.85A
Ready out	2		Blue			Output (high active)	
No Error out	3		Orange			Output (high active)	
Power + (cap)	+	Female thread M12	-	-	30 mm	Output	300A
Power – (cap)	-	Female thread M10	-	-	30 mm	GND	-

Note: Fuse at DC-IN must be installed near the module (attention: CAP potential, high short circuit current)!

Connector

Connector:	PIN	
DC-IN	-	Cable with flying fuse
Start in	1	
No Error out	2	
Ready out	3	

Connector:		Quantity	Module side Plug Part No. Pin Part No.	Quantity	Vehicle side Plug Part No. Socket Part No
Tyco		1 1 3	1-1418448-1 1670365-1	1 1 3	

Hybrid Power

Mechanical data

Length x Width x Height:	459 x 259 x 182 mm or 18 x 10 x 7 inch
Weight:	Approx. 11 kg or 24 lbs
Enclosure:	IP65

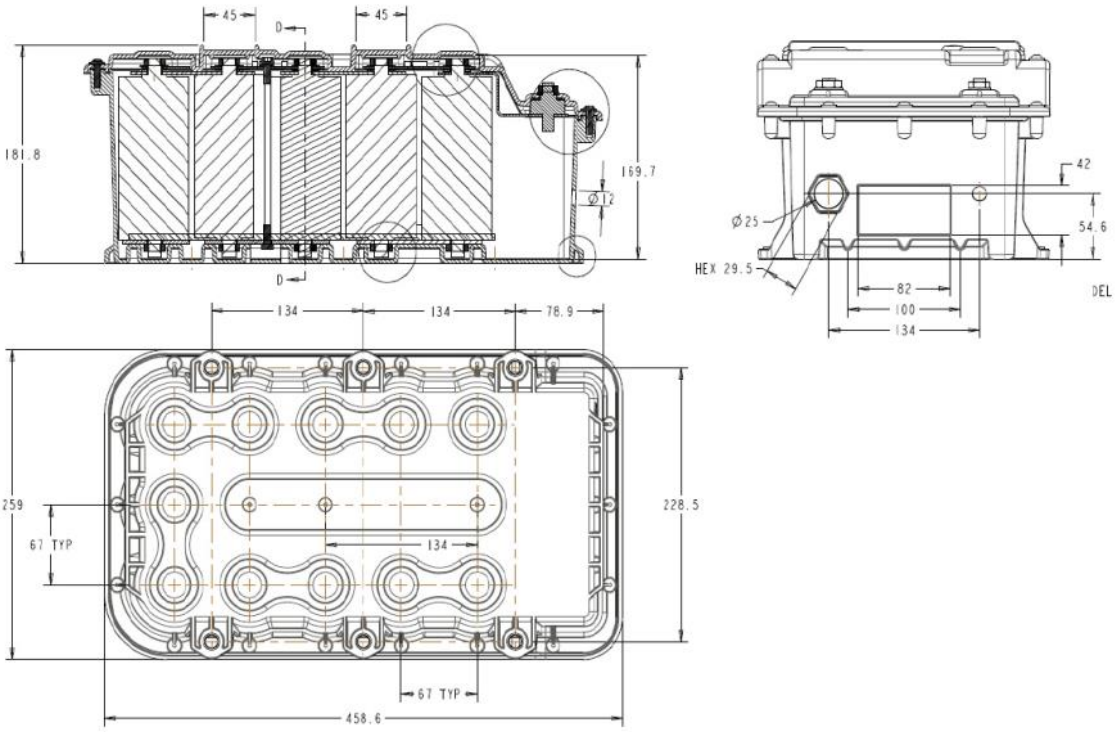


Figure 2: Dimensions

Certifying Tests

Description / Conditions	
J1455 AUG2012	Shock and Vibration according to recommended environmental practices for Electronic Equipment Design in Heavy-Duty Vehicle Applications
72/245/EEC	Radio interference (electromagnetic compatibility) of vehicles