Hybrid Power

ESM Module

Air cooled

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

Features

- Designed specifically for energy regeneration and power boost
- Voltage control of each cell
- Active balancing by moving energy from one cell to another
- Improved thermal management
- Forced air cooling
- Improved protection of the cells and the environment by IP65
- Control via CAN or binary signals

Applications

- (Heavy) Transportation
  - Fast energy storage hybrid driveline
  - Combination diesel-electric, fuel cell & batteries
  - Utility vehicles, trains, trams, buses, forklifts, trucks, etc.
- Maritime & Offshore
  - Dynamic energy storage vessels
  - Heavy lifting, cranes, etc.

Mechanical Data

Length x Width x Height
670 x 437 x 273 mm
Approx. 67 kg

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

Hybrid Power

Electrical Specifications

Symbol	Parameter	Description	Value	Unit
	Capacitance			
C_S	Rated capacitance		62,5	F
	Tolerance capacity		-0/+20	%
	Voltage			
U_{NOM}	Nominal voltage		120	VDC
U_{MAX}	Max. operation voltage		129,6	VDC
	Surge voltage		136,8	VDC
U_{ISO}	Isolation voltage	Test voltage 4000V	1	kVDC
	Resistance			
ESR_{DC}	Internal resistance	Min – max	9 – 23	mΩ
ESR_{AC}	Internal resistance	@25°C and 1 kHz	14	mΩ
	Environment			
T_A	Ambient temperature during operation Less than 15 minutes per 100 days a year		-20 to +40 -25 to +50	°C °C
$T_{STORAGE}$	Storage temperature range		-40 to +65	°C
	Protection class		IP65	
	Power (module)			
P_d	Rated power density	@V_r and ESR,DC_{max}	2,0	kW/kg
P_{max}		@V_{max} and ESR,AC	10,7	kW/kg
	Energy (module)			
E_{max}	Energy density	@V_{max}	4,1	kW/kg
E_{ava}	Available energy	Between V_{max} and ½ V_{max}	109	wH
	Current			
I_{AVG}	Rated continuous current		150	A
I_{PEAK}	Maximum peak current	< 5 seconds	750	A
I_{LEAK}	Leakage current	After 72 hours at 25°C	5,2	mA
	Connection			
	Power terminal	See page 6 for further information		
	Communication	See page 5 for further information		

Hybrid Power

Additional data

Symbol	Parameter	Description	Value	Unit
	Mechanical data			
	Weight		Ca. 67	Kg
	Length		670	mm
	Width		473	mm
	Height		237	mm
	Cooling			
	Recommended cooling	Forced air cooling		
	Certified tests			
	Mechanical shock and vibration	IEC 61 737		
	Electromagnetic compatibility	DIN EN 50 121-3-2:2006		
	Additional data			
	Cycles	Between V_{nom} and ½ V_{nom}@25°C	>1.000.000	cycles
	Lifetime	@V_{nom} and 25°C @V_{nom} and 65°C	10 1500	years hours
	Communication	CAN-Bus	HAN 8D-F	

Mechanical Dimensions

Air shields and mounting angles (see picture on cover sheet) are optional.

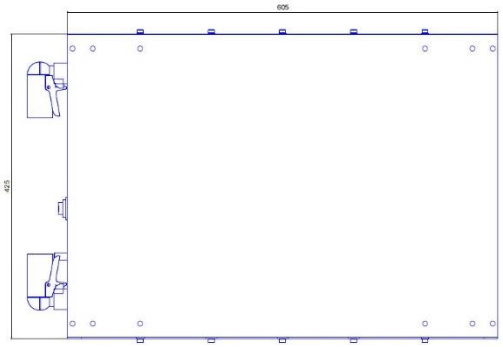


Figure 1: Top view

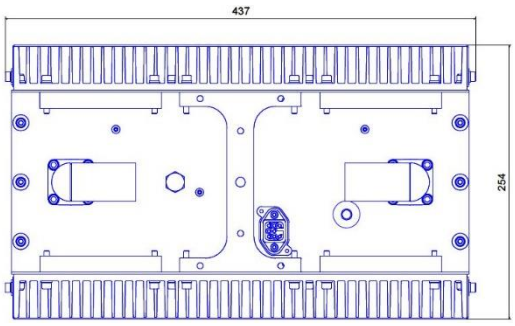


Figure 2: Front view

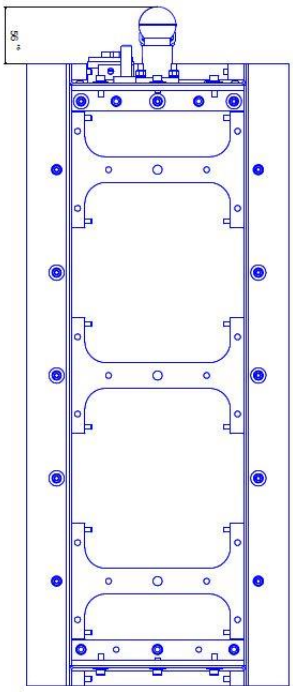


Figure 3: Side view

Connections

Communication (HAN 8D-F)

Pin	Signal	Description
1	+24V	Supplying voltage
2	0V ground	0V
3	Error message (24V-Signal)	Module status (high signal in error case), open collector output, connected via a 10 kOhm resistor at 24V
4	Temperature signal (0 – 5V)	Module temperature (see figure 6)
5	Error message module (ground)	Module status (ground) (Reference potential for pin 3+4)
6	CAN high	CAN high
7	CAN low	CAN low
8	CAN GND	CAN GND

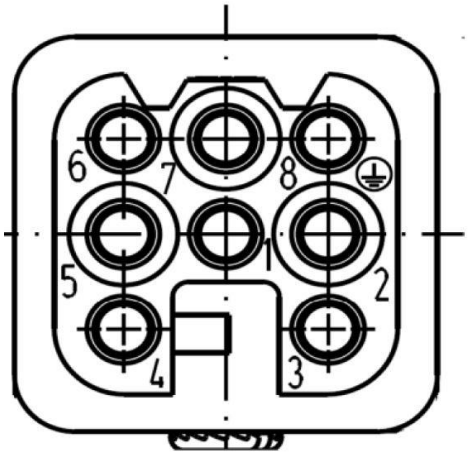


Figure 4: Pin connector HAN 8D (schematic)

Figure 5: HAN 8D connector on module

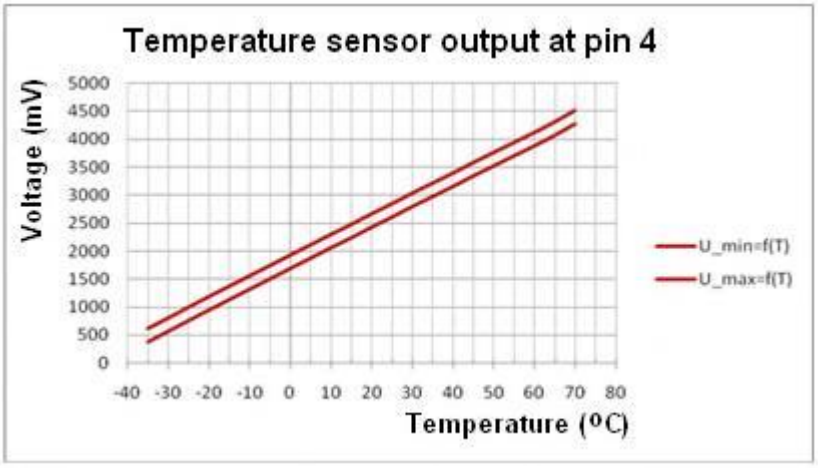
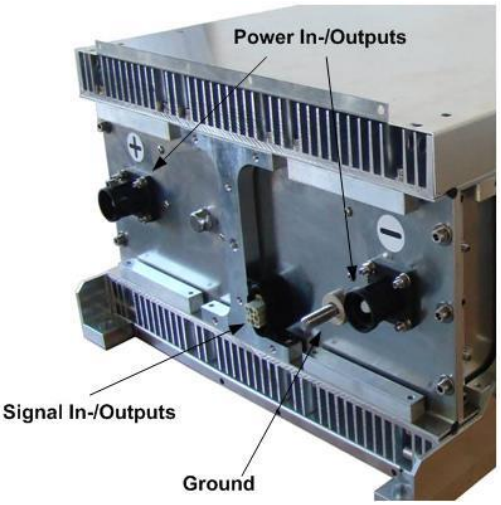


Figure 6: Temperature signal from table; pin 4

Hybrid Power

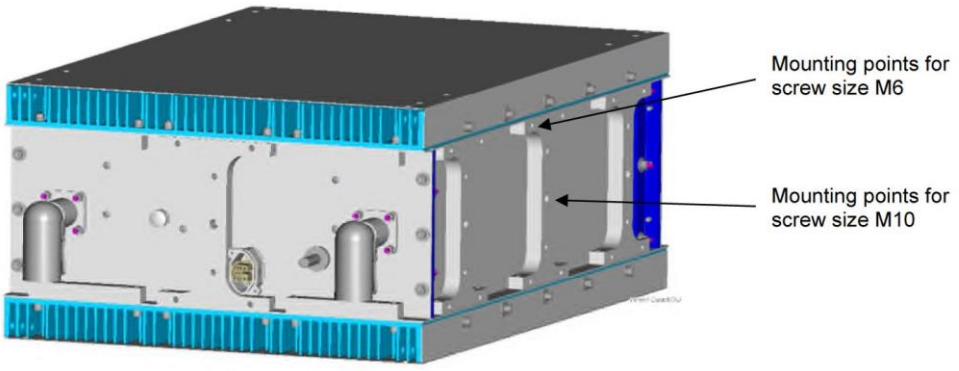
Power Terminal

Pin	Signal	Connector	Description
1	Power connector (P+)	350-205-111	
2	Power connector (P-)	350-205-112	
PE	Ground	M10 Cable Shoes	M10 (20 Nm)



Mounting & Hard Points

The way of mounting the modules is described beneath:



Mounting the module