Smart VH module

Super High Energy Ni-MH battery system

ARTS Energy's smart VH module offers an ideal solution for personal electric vehicles to professional appliances i.e. for any applications where power and long autonomy are required.

Smart VH module integrate smart electronics, all in a robust plug-n-play battery design.

Features

Basic configuration: 12 V, 24 V, 36 V or 42 V(*) battery systems including:

- Built-in BMS (Battery Management System) managing charge, discharge and state of charge based on proprietary algorithm.
- LED display for fuel gauge and battery status.
- Communication and remote control possible through the BPCI® (Battery Protection and Communication Interface) bus.
- Main terminals or specific connector for charge. Energy recovery (regenerative charge) during use is possible depending on the battery status.
- End of discharge alarm before battery self disconnection.
- Auto-sleep mode and on/off key to protect the battery when unused or to prevent short circuit .
- Designed for ease of parallel assembly.
- State-of-health indicator.
- Discharge current up to 40 A.
- 2 years/500 cycles smart warranty.

Benefits

- Plug-and-play design.
- Autonomy on demand thanks to ease of parallel assembly.
- Remote on/off control HMI (Human Machine Interface) possible.
- Protection against common mishandling (high temperature, short-circuit…).
- Electrical desactivation in sleep mode.
- Compatible with a wide range of constant current power supplies (CCPS).
- Preventive maintenance thanks to state-of-health feature.
- Recyclability and respect for the environment.

(*) upon request

	VH D			VH F				
Electrical characteristics	**10S**	**20S**	**30S**	**10S**	**20S**	**30S**	**10S2P**	**20S2P**
Minimum voltage (V)	12	24	36	12	24	36	12	24
Typical capacity (Ah)	9	9	9	15	15	15	30	30
Energy (Wh)	108	216	324	180	360	540	32	720
Specific energy (Wh/kg)	51	57	58	58	64	68	64	67
Energy density (Wh/l)	83	104	113	107	126	134	126	139
Mechanical characteristics								
Height (mm)	99	159	219	129	219	309	219	395
Length (mm)	178	178	178	178	178	178	178	178
Width (mm)	73.5	73.5	73.5	73.5	73.5	73.5	73.5	73.5
Weight (kg)	2.1	3.8	5.6	3.1	5.6	8.0	5.6	10.7
Volume (dm^3)	1.3	2.1	2.9	1.7	2.9	4.0	2.9	5.2
Operating conditions								
Operating temperature range for charge and discharge (°C) - min / max	- 10 / + 40							
Extended temperature range for discharge(°C) - min / max	- 20 / + 60							
Transport and storage temperature range (°C) - min / max	+ 5 / + 25							

Typical charge time	**VH D**	**VH F**
95 % of capacity (h)	3	5
Balancing time to 100% of capacity typical use (h)	5	
Balancing time to 100% of capacity after long storage (h)	48	

Maximum discharge current	
Maximum peak current (A) - 0.1 s (0°C / + 20°C)	up to 120 / 150
Maximum peak current (A) - 1 s	up to 80
Maximum peak current (A) - 10 s	up to 60
Maximum discharge current (A) - 1 min	up to 40
Maximum one shot full discharge current (A) - continuous	up to 30 (starting at + 20°C)

ARTS ENERGY

Advanced Rechargeable Technology and Solutions

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Smart warranty

- 2 years or 500 cycles (70% depth of discharge) at + 20°C.
- Integrated memory recording the history of operating and storage conditions.
- Computer-based software to access data.

Applications

- Electric bicycles, scooters, wheelchairs and other light electric vehicles.
- Professional applications such as portable measurement equipment, medical carts, cinematography and others
- Back-up and small stationary systems

Components

- M8 male main terminals.
- Specific charge (7Amps max) and BPCI® communication connector: HIROSE 547-0085-8-MFDF6-8DP-3.5DSA.
- Charge fuse: replaceable 15 A ATO.
- Discharge fuse: replaceable 40 A ATO.
- ABS plastics.

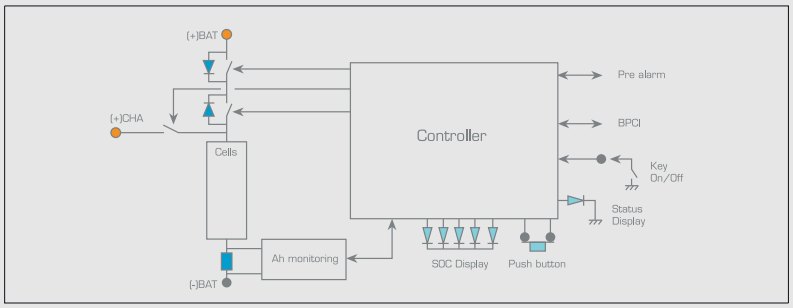
Recommendations

- Recharge up to 6 months after a full charge.
- Store at temperature from + 5 to + 25°C.
- Do not expose to water projection.
- Consult ARTS Energy for CCPS and accessories for system integration.

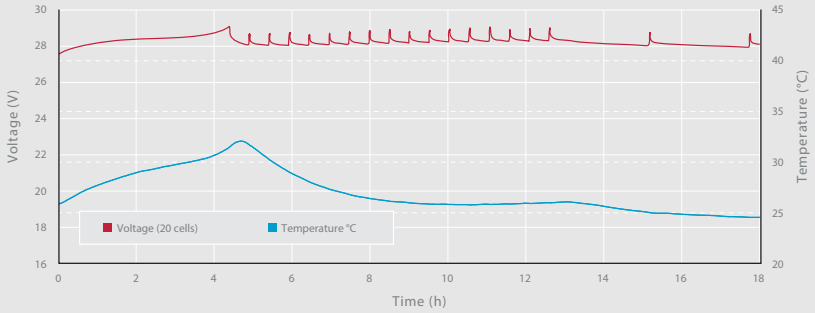
Data are given for single cells. Please consult ARTS Energy for utilization of cell outside this specification.

Data in this document are subject to change without notice and become contractual only after written confirmation by ARTS Energy.

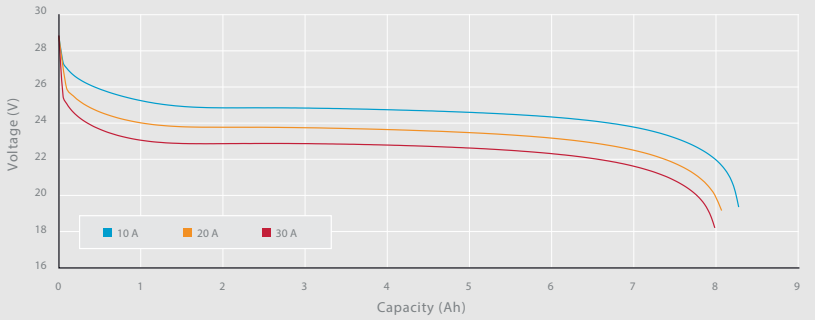
BMS overall description



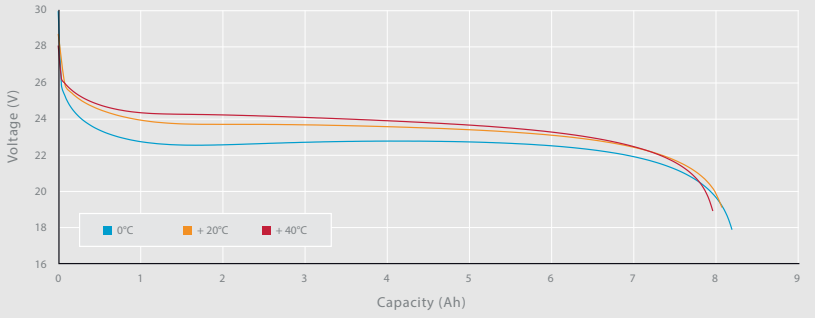
Charge at 3 A at room temperature with ARTS Energy integrated charge controller
(example for a 20S VH F module)



Discharge at room temperature at different rates after charge with ARTS Energy integrated charge controller
(example for a 20 VH D 9500 XP)



Discharge at 20 A and different temperatures after charge with ARTS Energy integrated charge controller
(example for a 20S VH D 9500 XP)



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