

ACES ENERGY

PRODUCT OVERVIEW

24V 48V 72V HFC HFP Series



HFP and HFC series in metal case

LITHIUM **LiFePO4** BATTERIES



ACES ENERGY

ACES LiFePO4 batteries with stainless steel case highlights

- Broad range of models
- Stainless steel case
- IP65 waterproof
- Rugged pole terminals
- Strong internal construction to meet high demands
- High performance Battery Management System
- Good concept to offer customized solutions

ACES LiFePO4 batteries advantages compared to lead-acid batteries

- Smaller size and 3-4 times lower weight
- Safest technology, without risk of fire or explosion
- Much higher available capacity at high load
- 6-10 times higher cycle life
- Can be charged at any moment (no memory effect)
- Long service life of about 10-15 years
- Charging efficiency about 99% versus 80% of lead-acid
- Much lower risk of deep discharge damage (protection by internal BMS)




Integrated Battery Management System (BMS)

The ACES integrated BMS functions are to protect the battery and to increase the lifetime. The smart cell balancing system will result in availability of the maximum capacity over time. The protection system will protect the battery against overcharging, overdischarging, overcurrent, overheating and short circuit. The best performance will be achieved in combination with the ACES sealed battery chargers.




Why ACES LiFePO4 batteries

- ACES LiFePO4 batteries developed in the Netherlands
- Broad range of battery models
- 3 years of warranty
- Service Center in the Netherlands
- Batteries can be repaired
- Direct customer technical support
- The batteries are qualified and tested by ACES




Technical specifications 24V HFP HFC series batteries (80...400AH)

			
Description	25.6V 80AH	25.6V 100AH	25.6V 400AH
Model name	AL24V80HFP	AL24V100HFP	AL24V400HFP
EAN / GTIN	4738471069023	AL24V100HFP	AL24V400HFP
Rated Capacity	80Ah / 2048WH	100Ah / 2560WH	400Ah / 10240WH
Discharge current (Imax)	80A	80A	200A
Peak discharge current	200A	200A	500A
Maximum charge current	40A	50A	100A
Recommended charge current	8...40A	10...50A	40...100A
Nominal Voltage	25.6V		
Operational Voltage range	22...27V		
BMS cutoff Voltage	20V		
Cycle Life 0.2C 80% DOD	3000		
Charge end voltage range	28...28.8V (Float voltage 27V)		
Charge characteristic	CC / CV		
Battery Management System	Integrated		
Serial connection	Not allowed		
Parallel connection	Up to 4 batteries		
Short circuit protection	Yes, electronic protection and fuse		
IP protection rating	IP65		
Temperature range discharge	-20°C ... +60 °C		
Temperature range charge	0°C ... +45 °C		
Temperature storage <1 month	-20°C ... +50 °C		
Temperature storage >1 month	5 °C ... +30 °C		
Connection	M8	M8	M8
Weight	18 kg	23 kg	81 kg
Dimensions (L x W x H) in mm	269 x 159 x 279	269 x 159 x 318	573 x 300 x 318
Warranty	3 years		



Technical specifications 48V HFC HFP series batteries (72...100AH)

			
Description	48V 72AH	48V 80AH	48V 100AH
Model name	AL48V72HFC	AL48V80HFP	AL48V100HFP
EAN / GTIN	4738479545574	4738474226959	4738476131657
Rated Capacity	72Ah / 3686WH	80Ah / 4096WH	100AH / 5120Wh
Discharge current (Imax)	72A	80A	100A
Peak discharge current (5 sec)	240A	240A	300A
Maximum charge current	36A	40A	50A
Recommended charge current	8...36A	8...40A	10...40A
Nominal Voltage	51.2V		
Operational Voltage range	44...54V		
BMS cutoff Voltage	40V		
Cycle Life 0.2C 80% DOD	3000		
Charge end voltage range	56...57.6V (Float voltage 54V)		
Charge characteristic	CC / CV		
Battery Management System	Integrated		
Serial connection	Not allowed		
Parallel connection	Up to 4 batteries		
Short circuit protection	Yes, electronic protection and fuse		
IP protection rating	IP65		
Temperature range discharge	-20°C ... +60 °C		
Temperature range charge	0°C ... +45 °C		
Temperature storage <1 month	-20°C ... +50 °C		
Temperature storage >1 month	5 °C ... +30 °C		
Connection	M8	M8	M8
Weight	35 kg	36 kg	44 kg
Dimensions (L x W x H) in mm	435 x 253 x 237	393 x 247 x 248	396 x 297 x 248
Warranty	3 years		

Technical specifications 48V HFC HFP series batteries (160...300AH)

			
Description	48V 160AH	48V 200AH	48V 300AH
Model name	AL48V160HFP	AL48V200HFP	AL48V300HFP
EAN / GTIN	4738478446971	4738477302087	4738472496255
Rated Capacity	160Ah / 8192WH	200Ah / 10240WH	300Ah / 15360WH
Discharge current (I _{max})	130A	150A	200A
Peak discharge current	400A	400A	500A
Maximum charge current	100A	100A	100A
Recommended charge current	20...60A	20...60A	20...100A
Nominal Voltage	51.2V		
Operational Voltage range	44...54V		
BMS cutoff Voltage	40V		
Cycle Life 0.2C 80% DOD	3000		
Charge end voltage range	56...57.6V (Float voltage 54V)		
Charge characteristic	CC / CV		
Battery Management System	Integrated		
Serial connection	Not allowed		
Parallel connection	Up to 4 batteries		
Short circuit protection	Yes, electronic protection and fuse		
IP protection rating	IP65		
Temperature range discharge	-20°C ... +60 °C		
Temperature range charge	0°C ... +45 °C		
Temperature storage <1 month	-20°C ... +50 °C		
Temperature storage >1 month	5 °C ... +30 °C		
Connection	M8	M8	M8
Weight	65 kg	81 kg	118 kg
Dimensions (L x W x H) in mm	573 x 300 x 275	573 x 300 x 318	821 x 300 x 318
Warranty	3 years		

Technical specifications 72V HFC HFP series batteries (60...100AH)

		
Description	72V 60AH	72V 100AH
Model name	AL72V60HFC	AL72V100HFP
EAN / GTIN	4738470348563	4738476404171
Rated Capacity	60Ah / 4416WH	100Ah / 7360WH
Discharge current (Imax)	60A	100A
Peak discharge current	180A	200A
Maximum charge current	30A	50A
Recommended charge current	6...30A	10...40A
Nominal Voltage	73.6V	
Operational Voltage range	64...78V	
BMS cutoff Voltage	60V	
Cycle Life 0.2C 80% DOD	3000	
Charge end voltage range	81...82.8V (Float voltage 78V)	
Charge characteristic	CC / CV	
Battery Management System	Integrated	
Serial connection	Not allowed	
Parallel connection	Up to 4 batteries	On special request
Short circuit protection	Yes, electronic protection and fuse	
IP protection rating	IP65	
Temperature range discharge	-20°C ... +60 °C	
Temperature range charge	0°C ... +45 °C	
Temperature storage <1 month	-20°C ... +50 °C	
Temperature storage >1 month	5 °C ... +30 °C	
Connection	M8	M8
Weight	40 kg	64 kg
Dimensions (L x W x H) in mm	374 x 264 x 305	416 x 372 x 262
Warranty	3 years	

Performance curves of all the batteries

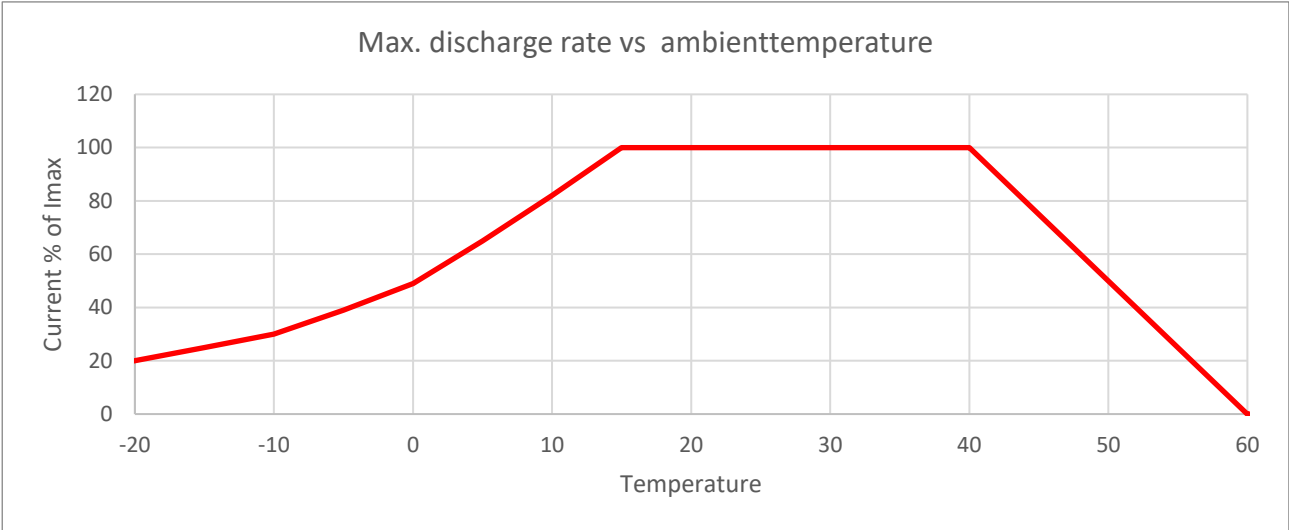


Fig. 1

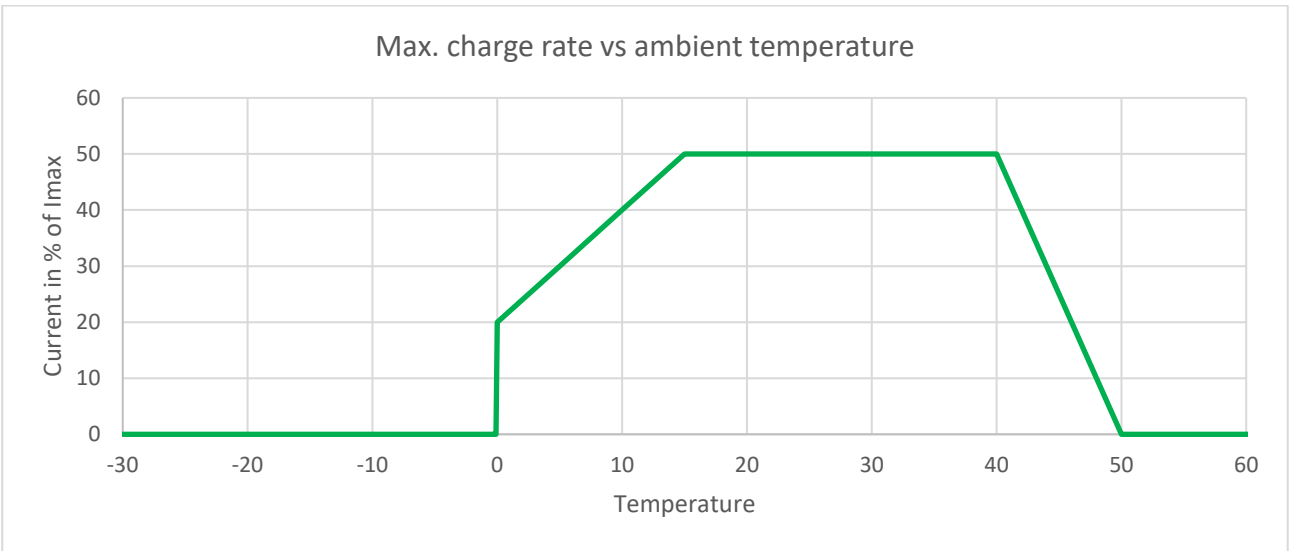


Fig. 2

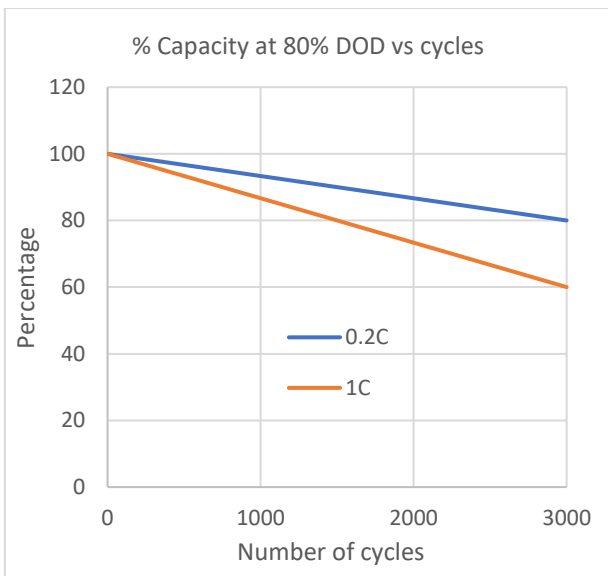


Fig. 3

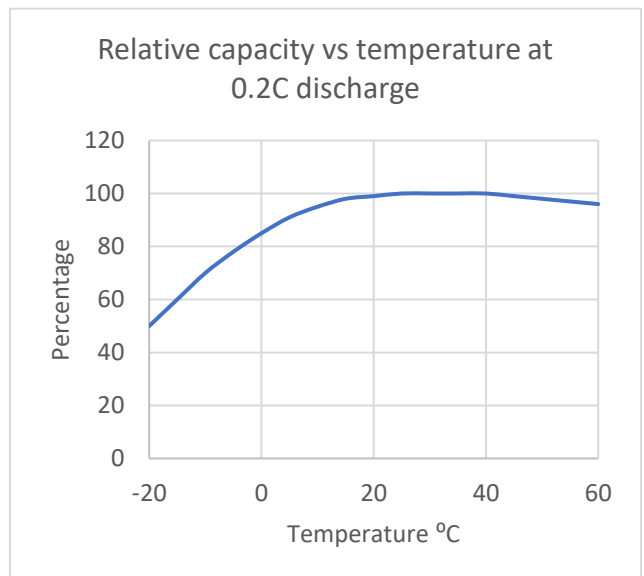


Fig. 4

Note: all values are typical values

ACES Lithium Ion batteries in comparison with Lead-acid batteries for 48V

Application 	1 x LiFePO4 ACES lithium 48V 200AH AL48V200HFP 	4 x in series VMF AGM Accu 280Ah Deep Cycle 	Benefits of ACES LiFePO4
Weight	81 kg	4 x 74 = 296kg	28% of the weight
Rated capacity C5	200AH	229AH	Rated capacity seems lower, but in use it is much higher
Life Cycles@80% DOD	3000	380	Much longer cycle life about 8 times more
Dimensions	570x297x317mm 53.7 Liter	4 pcs 521x269x224 124.7 Liter	57% less volume
Life Cycles@50% DOD	10000	750	Cycle life > 10 times
Capacity % @ 0°C	85%	76%	Best cold temp performance
Capacity @ C20 Capacity @ C5 Capacity @ C1	205AH 203AH 200AH	280AH 229AH 150AH	Almost 100% energy and power at any discharge rate
Max discharge level Usable capacity at C5 Usable capacity at C1	100% 203AH 200AH	80% 183AH 120AH	Fully useable discharge range, more AH/discharge
1 year storage cap.	90%	64%	Much lower self discharge
Short circuit prot.	yes	no	Electronic and fuse short prot.
Maintenance	None	Low	No maintenance
Charge all SOC levels	yes	no	All SOC without lifetime impact
Fast charging time	2 hours	6 hours	Can be charged 3 times faster.
Cost price incl TAX*	€ 6500	€ 1196	Higher initial cost
Cost/cycle@50% DOD and C5 discharge	€ 0,65	€ 1,59	Lowest cost per cycle

*Prices are only for reference (status January 2021)

This comparison is made for a typical application for use in a boat of about 5-6m length

ACES Lithium Ion batteries in comparison with Lead-acid batteries for 72V

Application 	2 x parallel LiFePO4 lithium 72V 60AH 	9 x in series AGM T875 Battery 8V 180Ah Deep Cycle 	Benefits of ACES LiFePO4
Weight	82 kg	4 x 74 = 296kg	28% of the weight
Rated capacity C5	120AH	180AH	Rated capacity seems lower, but in use it is much higher
Life Cycles@80% DOD Life Cycles@50% DOD	4000 10000	400 750	Much longer cycle life about 10 times more
Dimensions	374x264x305 mm 30 Liter	9 pcs 261x182x275 117 Liter	65% less volume
Left cap. at 69V (0.3C)	108AH	80AH	Voltage more constant
Capacity % @ 0°C	85%	76%	Best cold temp performance
Capacity @ C20 Capacity @ C5 Capacity @ C1	125AH 123AH 120AH	180AH 144AH 96AH	Almost 100% energy and power at any discharge rate
Max discharge level Usable capacity at C1 Usable capacity at C5	100% 120AH 123AH	80% 62AH 115AH	Fully useable discharge range, more AH/discharge
1 year storage cap.	90%	64%	Much lower self-discharge
Short circuit prot.	yes	no	Electronic and fuse short prot.
Maintenance	None	Low	No maintenance
Charge at all SOC levels	yes	no	All SOC without lifetime impact
Fast charging time	1 hour	6 hours	Can be charged 6 times faster.
Cost price incl TAX*	€ 5000	€ 2994	Higher initial cost
Cost/cycle@50% DOD and C5 discharge	€ 0,50	€ 3,99	Lowest cost per cycle

*Prices are only for reference (status January 2021)

This comparison is made for a typical application for use in a Golfcar or UTV