ULTRA

BATTERIES

Specification Guide

www.ultrabatteries.co.nz

LIFELINE ...the heart of your system ® | PULSARIVER | OPTIMA BATTERIES The Ultimate Power Source™ | ODYSSEY THE EXTREME BATTERY | Deka | MOTOBATT WITH GIGAFLEX™ TECHNOLOGY | SYNERGY POWER SOLUTIONS | Solution

HCB TECHNOLOGIES LIMITED

HCB Technologies Limited is the only 100% New Zealand owned and operated company trading nationally in the New Zealand wholesale battery market. Branches are located throughout the major centres, servicing customers directly or through a distributor network.

HCB Technologies core business is Automotive, Commercial, Marine and Deep Cycle Batteries with successful expansion into related ranges. These include Standby Batteries, Gelled and AGM Valve Regulated Batteries, US Manufactured Deep Cycle Batteries, Motor Cycle Batteries, Battery Chargers, Testers and Electrical Accessories.

The company philosophy is; to provide quality products, supplied with integrity, backed by excellent people and service. The vision and goal, and market point of difference, is to supply and support our customers and not compete with them.

From small beginnings in Auckland in 1988, we were known as Harbour City Batteries and established on family ownership and values. Over time, HCB Technologies has experienced steady growth to today's position as a significant player in the New Zealand battery market.
Additional branches and sales teams throughout the country have reinforced this position and expanded our service level capabilities to meet the needs of our loyal and valued customer base.

In November 2006 the company was acquired by Hellaby Holdings Ltd, a successful publicly listed New Zealand investment group with substantial automotive company ownership and industry experience. Under the operation of Hellaby, HCB Technologies has continued to expand, following the same principles the business was founded on and is recognised for.

The customer service, support and technical expertise provided by HCB Technologies is thoroughly proven in the New Zealand and Pacific markets. The company has an enviable reputation for product ranges that are well researched and tested, highly suitable and highly reliable. We aim to continue this philosophy to meet the needs of our customers, and their customers, today and in the future.

**Providing quality products,
supplied with integrity,
backed by excellent people and service.**

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ULTRA BATTERIES

Please note whilst every endeavour has been made to ensure the correctness of the products and specifications shown within this specification booklet, HCB Technologies Limited cannot accept responsibility for errors contained within. Performance ratings are supplied by the manufactures of the product. Methods of testing are up to world standards and are in line with normal battery industry procedures. Products and specifications are subject to change without notification.

Print version E15

ULTRA BATTERY RANGE
Applications and Technology Introduction

Automotive Starting

Ultra Automotive starting batteries are produced in one of the worlds largest and most sophisticated battery manufacturing facilities.

Calcium
Ultra Automotive Calcium batteries provide the benefit of very low maintenance with excellent cranking performance and proven long life.

Lead Antimony
Lead Antimony batteries are suited for most starting applications with a special emphasis on older vehicles and applications having lower peak recharge voltages.

NEW **EFB and AGM for Start/Stop**
New Ultra Automotive EFB (Enhanced Flooded Batteries) and AGM batteries have been launched to manage the demands of modern vehicles equipped with Start/Stop systems. Due to increased shutting off and subsequent engine restarting, a Start/Stop vehicle battery experiences considerable continuous discharge and recharge cyclic strain.

Commercial Starting

Ultra Commercial engine starting batteries provide the advantages of being highly maintenance free with excellent cranking performance and feature a very robust cell design, proven resistant to the vibration and cycling demands of heavy duty applications for a long life.

Calcium
Ultra Comercial Calcium batteries offer quality through reliable calcium plate design and construction. This Calcium/Calcium construction provides maintenance free batteries perfectly suited to manage the heavy electrical loads and higher charge rates of modern commercial vehicles.

Lead Antimony
The durable construction and robust plate material of Ultra Lead Antimony batteries offers proven reliablity in applications with lower voltage electrical systems or where higher electrical loads, or demanding vehicle operation, constrict available recharge time and peak recharge levels.

High Performance Starting

Ultra High Performance engine starting batteries are offered in Calcium, AGM and Silver Calcium technologies.

Calcium
Ultra High Performance Calcium batteries are designed and manufactured in the USA using the latest calcium technologies including deep pocket envelope separators and compucast grids for provide superior performance.

Heavier duty calcium plates help prevent shorts and maximise energy storage and delivery.

AGM
The High Performance AGM range is suited to late model commercial vehicles where the starting battery may be subject to cyclic loads, common in vehicles with a large number of accessories. AGM technology offers enhanced safety being non-spill, faster recharge and higher cyclic resistance.

NEW **Silver Calcium**
New Ultra High Performance Silver-Calcium Batteries offer numerous performance benefits including a semi-cyclic ability, resistance to higher temperatures, longer life, minimal self-discharge and very high CCA ratings to box size.

ULTRA BATTERY RANGE
Applications and Technology Introduction

Marine Starting

Marine grade Ultra Marine starting batteries feature heavier positive plates than automotive batteries and include vibration and cycling resistive separators.

Calcium
The Ultra Marine maintenance free range uses the latest Calcium/Calcium technology to meet the demanding requirements of marine engine starting.

Maintenance free construction reduces gas emitted from the battery, reducing corrosion around the terminals and lowering ventilation requirements and eliminates any need for adding electrolyte to the battery.

Further features include an integrated 'magic eye', offering a swift and easy assessment of the state of the battery plus dual terminals on most models for time saving installations of the battery and accessories.

Deep Cycle

Made in USA

Ultra Deep Cycle batteries are manufactured in the USA and offer reliable, proven, deep cycle performance in Flooded, Gel and AGM technologies.

Plate grids range from 2.2mm to 5mm in thickness, with glass mat separators and hot melt cell group bonding. This robust construction provides excellent cycle life and a high resistance to corrosion when subjected to top off charge and float duty charging voltages.

Deep Cycle Flooded
Ultra Deep Cycle Flooded batteries offer the highest level of performance and reliability.

The range now features 'Diamond Plate' technology paste for a higher initial capacity, faster recharge cycles plus enhanced recharge-ability. This offers lower recharge costs, especially in cold temperatures.
Fortified plate construction provides a stronger crystal network for decreased shedding of positive plates to increase cycle life.

Deep Cycle Gel
Ultra Deep Cycle Gel batteries contain electrolyte locked in a thixotropic gel, rather than conventional acid liquid, ensuring a completely sealed and maintenance free design.
Ultra Deep Cycle Gel batteries are completely spill and leak proof, highly resistant to vibration and may be installed in hard to reach locations as there is no need to check fluid levels.
By replacing traditional battery acid with gel electrolyte, there is no need for watering, eliminating the risk of damage due to possible over or under watering.

Deep Cycle AGM
The Ultra Deep Cycle AGM range provides good cold cranking performance and excellent cycle life, well suited for engine start, high current for short periods or lighting and accessory loads.
The batteries are valve regulated lead acid designs where the electrolyte is immobilised with the cells using the Absorbed Glass Mat technology. Utilising a valve in the top of each cell and advanced plate chemistry, gasses produced during use are recombined, making the batteries completely maintenance free.

AUTOMOTIVE STARTING

Ultra

CALCIUM TECHNOLOGY

Ultra Automotive Calcium technology provides the benefit of very low maintenance with excellent cranking performance and proven long life.

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	Res Cap
02U	6V	L6	STD	210	170	170	190	525	110
03U	6V	L6	STD	185	170	170	190	270	80
12N24-3U	12V	L	LUG	185	125	160	180	240	38
12N24-4U	12V	R	LUG	185	125	160	180	240	38
NEW 12N24-3HPU	12V	L	LUG	195	130	160	180	350	N/A
12N24-4HPU	12V	R	LUG	195	130	160	185	350	N/A
NS40ZU (NS40ZAU)*	12V	R	STD	185	125	200	227	330	56
NS40ZLU (NS40ZALU)*	12V	L	STD	185	125	200	230	330	56
NS40ZPPU (NS40U)*	12V	R	PP	185	125	200	230	330	56
NS40ZLPPU (NS40LU)*	12V	L	PP	185	125	200	230	330	56
NEW NS40ZLPP-BHU (NS40ZL-BHU)*	12V	L (B1)	PP	185	125	200	230	330	56
NS60AU (NS60ZAU)*	12V	R	STD	235	130	200	225	430	75
NS60ALU (NS60ZALU)*	12V	L	STD	235	130	200	225	430	75
NS60APPU (NS60U)*	12V	R	PP	235	130	200	225	430	75
NS60ALPPU (NS60LU)*	12V	L	PP	235	130	200	225	430	75
127U (N48U)*	12V	R (B3)	STD	235	175	185	210	370	65
127/11U (N50U)*	12V	R (B3)	STD	235	175	185	210	450	75
127/11FU** (N50FU)*	12V	R (NHD)	STD	225	175	185	210	450	75
156U (N49U)*	12V	L (B3)	STD	235	175	185	210	370	65
156/11U (N51U)*	12V	L (B3)	STD	235	175	185	210	450	75
156/11FU** (N51FU)*	12V	L (NHD)	D/F	225	175	185	210	450	75
50D20LU	12V	L	STD	200	170	200	225	400	78
55D23LU	12V	L (NHD)	STD	230	170	200	225	470	100
NEW 55D23L-BHU	12V	L (B1)	STD	230	175	200	225	470	100
55D23RU	12V	R	STD	230	175	200	225	470	100
34LU	12V	L	STD	260	175	185	205	580	120
34RU	12V	R	STD	260	175	185	205	580	120
58LU	12V	L	STD	230	180	160	175	430	100
58U	12V	R	STD	230	180	160	175	430	100
65/820U	12V	R (B4)	STD	290	189	185	190	780	140
75/650U	12V	R (B1)	SIDE	230	177	175	185	650	90
DIN36U	12V	L (B3)	STD	210	175	175	175	330	62
DIN44U	12V	L (B3)	STD	210	175	190	190	370	75
DIN45U	12V	L (B3)	STD	245	175	175	175	430	80
DIN55U	12V	R (B3)	STD	245	175	190	190	500	94
DIN55LU	12V	L (B3)	STD	245	175	175	175	500	94
DIN55LHU	12V	L (B3)	STD	245	175	190	190	520	94
DIN55FU	12V	L (B3)	LUG	245	175	190	190	520	94
DIN63U	12V	L (B3)	STD	280	175	175	175	580	110
DIN66U	12V	L (B3)	STD	275	175	190	190	580	110
DIN66RU	12V	R (B3)	STD	275	175	190	190	580	110
DIN75U	12V	L (B3)	STD	315	175	175	175	730	135
NEW DIN75RU	12V	L (B3)	STD	315	175	175	175	730	135
DIN85U	12V	L (B3)	STD	350	175	175	175	730	148
DIN92U	12V	L (B3)	STD	350	175	190	190	810	160
NEW DIN110U	12V	L (B3)	STD	350	175	190	190	850	170

Key: for details see page 41

* New Part Number (Old Part Number). eg **127U New (N48U) OLD**

**Terminal rotated 90°

LEAD ANTIMONY TECHNOLOGY

Lead Antimony is suited for most starting applications with an emphasis on older vehicles and applications having lower peak recharge voltages.

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	Res Cap
125U (N39U)	12	L	D/F	240	130	180	202	300	52
126U (N40MU)	12	R	STD	240	130	180	202	300	52

Key: for details see page 41

* New Part Number (Old Part Number). eg **125U New (N39U) OLD**

Introducing new Ultra Automotive EFB and AGM batteries, technology to manage the demands of modern vehicles equipped with Start/Stop systems.

Due to increased shutting off and subsequent engine restarting, a Start/Stop vehicle battery experiences considerable continuous discharge and recharge cyclic strain.

START/STOP - ENHANCED FLOODED BATTERY (EFB) TECHNOLOGY

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	Res Cap
Q85LEFBU	12	L	STD	230	175	200	225	550	110
T110LEFBU	12	L	STD	305	175	200	225	760	150

Key: for details see page 41

Ultra EFB batteries are higher performance versions of Calcium/Calcium technology batteries to meet the demands of Stop/Start systems.

EFB technology advantages include thicker calcium plates and more robust separators that allows for cycling ability. Thicker grids incorporate polyester fibre to enhance paste adhesion and provide greater cyclic resistance.

Q85LEFBU

START/STOP - AGM TECHNOLOGY

Code	Volt	Assy	Term	Length	Width	Box Height	CCA	Res Cap	A/Hr
DIN55LAGMU	12	L(B3)	STD	240	175	190	640	100	60
DIN66AGMU	12	L(B3)	STD	280	175	190	760	120	70
DIN75AGMU	12	L(B3)	STD	315	175	190	800	140	80
NEW DIN92LAGMU	12	L (B3)	STD	355	175	190	850	160	95
NEW DIN105LHAGMU	12	L(B3)	STD	395	175	190	950	180	105

Key: for details see page 41

Ultra Automotive AGM batteries are designed to manage the electrical load demands of modern vehicle Start/Stop systems.

Absorbent Glass Mat material holds battery acid like a sponge ensuring constant contact between plates and electrolytes providing added cycling ability.

DIN105HAGMU

AUXILIARY BATTERIES New Product Range

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	Res Cap
AUX14U *	12	L	SOCKET	150	90	145	145	200	12
34B17LU **	12	L	PP	170	130	210	225	280	47

Key: for details see page 41 * AGM Technology ** Calcium Technology

Ultra Auxiliary batteries are specifically designed to deliver reliable auxiliary power to critical vehicle functions such as starting assist, Drive-by-wire power backup, Brake-by-wire backup and other smart control functions.

* Optimised valve regulation and recombination efficiency is provided through an individual cell venting system. This ensures reliability while maximising cycling performance.

AUX14U

COMMERCIAL STARTING

Ultra

Calcium technology within Ultra Commercial Batteries provides the advantages of being highly maintenance free with proven cranking performance and long life.

The Ultra Commercial range is produced in one of the largest and most sophisticated battery manufacturing facilities in the world.

CALCIUM TECHNOLOGY

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	Res Cap
N617U	6	L6	STD	230	175	195	220	780	210
N621U	6	L6	STD	260	170	200	225	780	200
N625U	6	L6	STD	300	170	200	225	800	310
NS70LU	12	L	STD	255	170	200	220	580	115
NS70U	12	R	STD	255	170	200	220	580	115
NEW NS70L-BHU	12	L (B1)	STD	255	170	200	220	580	115
NS70/15U	12	R (B1)	STD	255	170	200	220	680	145
NS70L/15U	12	L (B1)	STD	255	170	200	220	680	145
N70ZZLU	12	L	STD	300	170	200	220	640	135
N70ZZU	12	R	STD	300	170	200	220	640	135
NEW N70ZL-BHU	12	L (B1)	STD	300	170	200	220	640	135
N70Z/17U	12	R (B1)	STD	300	170	200	220	730	150
N70ZL/17U	12	L (B1)	STD	300	170	200	220	730	150
N86U	12	R	STD	330	170	210	230	780	200
N87U	12	L	STD	330	170	210	230	780	200
N100LU	12	L	STD	405	170	210	235	680	165
N100U	12	R	STD	405	170	210	235	680	165
N120U	12	3R	STD	500	180	210	235	860	230
N150U	12	3R	STD	500	220	210	235	950	290
N200U	12	3R	STD	515	275	220	245	1100	400

Key: for details see page 41

The Ultra Batteries Commercial range offers the highest levels of performance and reliability across a wide range of applications from small four wheel drives to large commercial vehicles.

N70ZZU

Ultra Commercial batteries provide excellent levels of quality through reliable calcium plate design and construction.
This Calcium/Calcium construction allows for a fully maintenance free battery than can handle the heavy electrical loads and higher charge rates of modern commercial vehicles.
Ultra Commercial batteries feature a very robust cell design, highly resistant to the vibration and cycling demands of heavy duty applications.

N120U

COMMERCIAL STARTING

Ultra

Ultra Commercial batteries feature highly durable construction and plate material to meet the demands of commercial vehicles.

Lead Antimony technology is proven in applications with lower voltage electrical systems or where higher electrical loads constrict available recharge time and peak recharge levels.

LEAD ANTIMONY TECHNOLOGY

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	Res Cap
NS70ULA	12	R	STD	260	170	205	230	580	125
NS70ULLA	12	L	STD	260	170	205	230	580	125
N70ZULA	12	R	STD	300	170	200	220	650	150
N70ZULLA	12	L	STD	300	170	200	220	650	150
N86ULA	12	R	STD	345	170	205	225	730	160
N87ULA	12	L	STD	345	170	205	225	730	160
157U	12	R	STD	340	170	260	285	720	240
158U	12	L	STD	340	170	260	285	720	240
N94U	12	3L	STD	505	205	185	205	820	270
N120ULA	12	3R	STD	500	180	210	235	800	210
N150ULA	12	3R	STD	500	220	210	235	900	265
N200ULA	12	3R	STD	515	275	220	245	1100	355
DIN135DU	12	3L (NHD)	STD	515	190	195	210	910	220
DIN135U	12	3L (B3)	STD	515	175	210	210	835	220
DIN165DU *	12	3L (NHD)	STD	515	220	195	210	1100	330
DIN165U *	12	3L (B3)	STD	515	220	210	210	1100	330

Key: for details see page 41

*To be superseded by Silver Calcium see page 9

Lead Antimony technology provides high quality and low maintenance options for most common battery sizes and vehicle applications.

The low maintenance design allows users to easily check and maintain their battery. The Ultra Commercial Lead Antimony range allows for flexibility without sacrificing performance and battery life.

N120ULA

DUAL PURPOSE - LEAD ANTIMONY

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	A/Hrs
DP24/65U	12	R	D/T	275	165	200	235	550	65
DP27/80U	12	R	D/T	320	165	205	235	650	80
DP31/100U	12	R	D/T	325	170	215	235	700	100

Key: for details see page 41

DUAL PURPOSE BATTERIES ARE NOT SUITABLE FOR FULL DEEP CYCLE APPLICATIONS

The choice for applications requiring a true dual battery offering both good cranking advantages and cyclic capacity for semi-cyclic applications.

Dual purpose is a great choice where space or budget does not allow for multiple batteries, yet semi-cyclic use is required.

DP31/100U

HIGH PERFORMANCE STARTING

Ultra

Made in USA

The Ultra Batteries High Performance range is precision manufactured in the USA. Each battery features deep pocket envelope separators and compucast grids to provide superior performance.

CALCIUM TECHNOLOGY

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	Res Cap
P22/615U *	12	R (B1)	STD	205	170	185	205	560	86
P22/615LU *	12	L (B1)	STD	205	170	185	205	560	86
P24/650U	12	R (B4)	STD	275	170	205	230	675	115
P24/650LU	12	L (B4)	STD	275	170	205	230	675	115
P24/930U	12	C (B3)	STD/SIDE	275	180	180	200	850	115
P27/850U	12	R (B1)	STD	325	170	205	230	840	140
P27/850LU	12	L (B1)	STD	325	170	205	230	840	140
P148SSU	12	C	STD	330	175	220	240	730	190
P31/1125U	12	C	STD	330	175	215	235	1000	185
P31/925U	12	C	STD	330	170	215	235	950	175
P4D/1050U	12	3R (NHD)	STD	525	215	225	255	1050	290
P8D/1500U **	12	3R (B3)	STD	525	275	225	255	1425	440

Key: for details see page 41

*Not US Manufactured

** Calcium Hybrid Technology

Heavier duty calcium plates feature inside Ultra High Performance Calcium batteries to help prevent shorts and maximise energy storage and delivery.

The robust design of the High Performance range provides improved vibration resistance, suitable for use in a wide variety of heavy duty applications.

P31/1125U

AGM TECHNOLOGY

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	Res Cap
P24/750AGMU	12	R (B4)	STD/SIDE	270	180	175	200	775	120
P31/925AGMU	12	C	STD	330	170	220	240	925	190
P31/925AGMSU	12	C	S/S STUD	330	170	220	240	925	190

Key: for details see page 41

The High Performance AGM range meets the needs of late model commercial vehicles where the starting battery may be subject to cyclic loads, common in vehicles with a large number of accessories.
AGM technology offers enhanced safety being non-spill, faster recharge and higher cyclic resistance.

See pages 16 to 23 for further Performance Starting AGM batteries.

P24/750AGMU

WARNING: Over length bolts damage the battery.
Use OEM bolts for side mount terminal batteries.

DK00325
OEM bolt to suit side mount terminals (1 pair per pack) Suits:
P24/750AGMU, P24/930U & 75/650U

DK00325

HIGH PERFORMANCE STARTING

Ultra

New Ultra Silver Calcium technology, the superior choice for engine starting.

Silver-Calcium alloy grids offer the performance benefits of a semi-cyclic ability, resistance to higher temperatures, longer life, minimal self-discharge and very high CCA ratings to box size.

AUTOMOTIVE SILVER CALCIUM TECHNOLOGY

New Product Range

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	Res Cap
NS40ZLPPSCU	12	L	PP	194	126	200	225	450	70
NS40ZPPSCU	12	R	PP	194	126	200	225	450	70
NS60ALPPSCU	12	L	PP	237	127	200	225	510	75
NS60APPSCU	12	R	PP	237	127	200	225	510	75
55D23LSCU	12	L	STD	230	171	200	224	680	104
127SCU	12	R	STD	236	175	180	202	565	115
156SCU	12	L	STD	236	175	180	202	565	115
DIN55LHSCU	12	L	STD	242	175	190	190	635	110
DIN66LSCU	12	L	STD	275	175	190	190	725	130

Key: for details see page 41

COMMERCIAL SILVER CALCIUM TECHNOLOGY

New Product Range

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	Res Cap
NS70LSCU	12	L	STD	268	172	200	221	780	140
NS70SCU	12	R	STD	268	172	200	221	780	140
N70ZLSCU	12	L	STD	302	171	200	221	710	160
N70ZSCU	12	R	STD	302	171	200	221	710	160
N120SCU	12	3R	STD	513	186	205	217	1210	230
N150SCU	12	3R	STD	509	222	195	216	1270	300
N200SCU	12	3R	STD	511	276	225	235	1515	375
DIN165DSCU	12	3L	STD	509	222	195	216	1270	300
DIN165SCU	12	3L (B3)	STD	515	215	210	210	1100	220

Key: for details see page 41

Ultra Batteries High Performance Silver Calcium Technology out-performs traditional flooded, and calcium/calcium batteries under harsh operating conditions such as taxis, and hot running trucks.

- Resistance to vibration and corrosion
- Light cyclic ability
- Higher CCA to box size
- Longer storage and usage life
- Superior heat durability

NS40ZLPPSCU

The High Performance Silver Calcium range comprehensively covers most automotive and commercial vehicle applications.

Silver Calcium technology has become the preferred choice for many European vehicle manufacturers across their premium models for performance and durability.

55D23LSC

MARINE STARTING

Ultra

Marine grade Ultra Marine starting batteries features heavier positive plates than an automotive battery and includes vibration and cycling resistive separators.

Maintenance free construction reduces gas emitted from the battery, reducing corrosion around the terminals and lowering ventilation requirements.

LOW MAINTENANCE - CALCIUM TECHNOLOGY

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	MCA	Res Cap	A/Hrs
M22/370U	12	R (B3)	D/F	230	170	185	210	400	530	65	40
M22/460U	12	R (B3)	D/F	230	170	185	210	460	580	75	45
M24/520U	12	R (NHD)	STD	260	170	200	220	500	630	100	60
M24/580U	12	R (NHD)	STD	260	170	200	220	580	710	135	70
M27/660U	12	R (NHD)	STD	300	170	200	220	660	790	130	75

Key: for details see page 41

LOW MAINTENANCE

The Ultra Marine range is a premium calcium technology providing excellent coverage for most outboard motor applications.

Removable battery vent caps provide ease in checking and maintaining electrolyte levels. Heavier calcium plates ensure high levels of shock and vibration resistance, without sacrificing performance.

M24/520U

MAINTENANCE FREE - CALCIUM TECHNOLOGY

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	MCA	Res Cap	A/Hrs
MMF22/430U	12	R (B3)	D/F	230	170	185	210	430	580	75	45
MMF24/500U	12	R (B4)	D/T	260	170	200	220	500	630	100	60
MMF24/680U	12	R (B4)	D/T	260	170	200	220	680	810	137	75
MMF27/780U	12	R (B4)	D/T	300	170	200	220	780	910	160	80
MMF31/930U	12	C (NHD)	STD	330	170	215	235	930	1060	195	100

Key: for details see page 41

MAINTENANCE FREE

The Ultra Marine maintenance free range uses the latest Calcium/ Calcium technology to meet the demanding requirements of marine engine starting. The sealed, maintenance free design eliminates any need for adding electrolyte to the battery.

Features include an integrated 'magic eye', offering a swift and easy assessment of the state of the battery and dual terminals on most models for time saving installations of the battery and accessories.

MMF24/500U

MAINTENANCE FREE PERFORMANCE STARTING

The Ultra Batteries High Performance range is also suitable for marine applications.

See pages 8 & 9 for more in the performance starting High Performance range.

CM31/925U

MARINE STARTING

Ultra

ULTRA BATTERIES

Always select batteries with sufficient cranking power and reserve capacity. Consider the motor manufacturer's recommended capacity to be a minimum capacity guideline.

HONDA MARINE	Low Maintenance	Maintenance Free	High Performance
8hp to 20hp	M22/370U	MMF22/430U	P22/615U
25hp to 50hp	M22/460U	MMF24/500U	P24/650U
40hp to 60hp	M24/520U	MMF24/680U	P24/750AGMU
75hp to 90hp	M24/580U	MMF24/780U	P24/930U
115hp to 150hp	M27/660U	MMF31/930U	P31/925U
200hp to 225hp	-	MMF31/930U	P31/1125U

JOHNSON / EVINRUDE	Low Maintenance	Maintenance Free	High Performance
9.9hp to 50hp V4 Carbureted	M22/370U	MMF22/430U	P22/615U
V4 Direct-Injection & V6 Carbureted	M22/460U	MMF24/500U	P24/650U
40hp to 90hp E-TEC	M24/520U	MMF24/680U	P24/750AGMU
V6 Direct-Injection	M27/660U	MMF27/780U	P27/850U
4-Stroke 25hp to 30hp	M22/370U	MMF22/430U	P22/615U
4-Stroke 40hp to 140hp	M24/520U	MMF24/680U	P24/750AGMU
4-Stroke 150hp to 200hp E-TEC	M27/660U	MMF27/780U	P27/850U
4-Stroke 200hp to 300hp E-TEC	-	MMF31/930U	P31/1125U

MERCURY & MARINER MARINE	Low Maintenance	Maintenance Free	High Performance
6hp to 60hp	M22/370U	MMF22/430U	P22/615U
75hp to 125hp	M22/460U	MMF24/500U	P24/650U
V6 Models	M24/520U	MMF24/680U	P24/750AGMU
Optimax - All Models	M27/660U	MMF27/780U	P27/850U
4-Stroke 9.9hp to 25hp	M22/370U	MMF22/430U	P22/615U
4-Stroke 30hp to 115hp	M22/460U	MMF24/500U	P24/650U
Verado 4-Stroke 135hp to 200hp 4 Cylinder	-	-	P24/750AGMU
Verado 4-Stroke 200hp to 350hp	-	-	P24/750AGMU
Verado 4-Stroke 200hp to 300hp Pro Series	-	-	P31/925AGMU

SUZUKI MARINE	Low Maintenance	Maintenance Free	High Performance
9.9hp to 25hp	M22/370U	MMF22/430U	P22/615U
25hp to 50hp	M22/460U	MMF24/500U	P24/650U
60hp to 175hp	M24/520U	MMF24/680U	P24/750AGMU
200hp to 250hp V6	M27/660U	MMF27/780U	P27/850U
300hp V6	-	MMF31/930U	P31/1125U
225hp to 300hp	-	MMF31/930U	P24/930U

YAMAHA MOTORS	Low Maintenance	Maintenance Free	High Performance
50hp and under	M22/370U	MMF22/430U	P22/615U
20hp to 200hp Carburetor	M22/460U	MMF24/500U	P24/650U
2.6L & 3.3L HPDI	M24/520U	MMF24/680U	P24/750AGMU
4-Stroke 25hp and below	M22/370U	MMF22/430U	P22/615U
4-Stroke 30hp to 115hp	M22/460U	MMF24/500U	P24/650U
4-Stroke 150hp to250hp	M24/520U	MMF24/680U	P24/750AGMU
4-Stroke 300hp to 350hp	M27/660U	MMF27/780U	P27/850U

DEEP CYCLE

Ultra

Made in USA

Ultra Deep Cycle batteries are manufactured in the USA and offer proven performance.

Plate grids thickness ranges from 2.2mm to 5mm, with glass mat separators and hot melt cell group bonding. This robust construction provides excellent cycle life and a high resistance to corrosion when subjected to top off charge and float duty charging voltages.

FLOODED TECHNOLOGY

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	A/Hrs	Kg
12BU **	6	L6	STD	230	170	190	210	750	95	16
R208U *	6	L6	U/T	260	180	245	275	N/A	215	24
R220U *	6	L6	D/T	260	180	245	275	N/A	235	28
R245U *	6	L6	U/T	260	180	260	300	N/A	251	32
IDCJ305U	6	L6	D/T	300	180	330	360	N/A	305	42
L16/380U	6	L6	LUG	310	180	385	430	N/A	375	50
L16/420U	6	L6	LUG	310	180	385	430	N/A	420	54
8VU	8	R	U/T	260	180	245	285	N/A	170	29
MDC24/85U	12	R	D/T	275	170	205	235	500	85	19
IDC24/85U	12	L	D/T	275	170	205	235	500	85	19
MDC27/105U	12	R	D/T	320	170	205	235	575	105	22
IDC27/105U	12	R	D/T	320	170	200	230	575	105	26
MDC31/130U	12	R	D/T	330	170	220	240	650	125	27
IDC31/130U	12	R	D/T	330	170	220	240	620	130	30
R155U *	12	R	U/T	330	180	245	280	650	155	40
MDCN150/180U **	12	3R	STD	505	220	230	240	1250	180	45
IDCJ185U	12	L	D/F	395	175	340	370	N/A	190	54
MDC8D/240U	12	3R	STD	525	280	220	245	900	240	58

Key: for details see page 41

*Has 17mm S/S Stud which can be cut off

**Not US Manufactured

MDC = Marine Deep Cycle, heavy duty, designed for general marine, RV & Commercial use
IDC = Industrial Deep Cycle, extreme duty, designed for harsh use applications

Ultra Deep Cycle flooded batteries feature Diamond Plate technology paste for a higher initial capacity, faster recharge cycles plus enhanced recharge-ability. This offers lower recharge costs, especially in cold temperatures.

Fortified plate construction provides a stronger crystal network for decreased shedding of positive plates to increase cycle life.

IDC31/130U

DUAL PURPOSE - LEAD ANTIMONY TECHNOLOGY

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	A/Hrs
DP24/65U	12	R	D/T	275	165	200	235	550	65
DP27/80U	12	R	D/T	320	165	205	235	650	80
DP31/100U	12	R	D/T	325	170	215	235	700	100

Key: for details see page 41

DUAL PURPOSE BATTERIES ARE NOT SUITABLE FOR FULL DEEP CYCLE APPLICATIONS

The choice for applications requiring a true dual battery offering both good cranking advantages and cyclic capacity for semi cyclic applications.

Dual purpose is a great choice where space or budget does not allow for multiple batteries, yet semi cyclic use is required.

DP31/100U

DEEP CYCLE
Ultra

Made in USA

ULTRA BATTERIES

Made in the USA, Ultra Deep Cycle Gel batteries utilise advanced computer aided design and manufacturing techniques for superior deep cycle and engine starting performance.

GEL TECHNOLOGY

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	A/Hrs	Kg
GGC2U	6	L6	D/F	260	180	245	275	585	180	31
GU1HU	12	R	LUG	210	130	155	185	200	32	11
G22NFU	12	L	D/F	230	140	205	235	210	51	17
G24U	12	R	D/F	275	170	225	250	335	74	24
G24SU	12	R	SOCKET	260	170	205	220	335	74	23
G27U	12	R	D/F	320	170	205	235	400	88	29
G31DTU *	12	R	D/T	330	170	220	240	550	98	31
G4DU	12	3R	STD	525	215	225	255	970	183	57
G8DU	12	3R	STD	525	280	225	250	1150	225	74

Key: for details see page 41

*Has 17mm S/S Stud which can be cut off

Ultra Gel batteries feature electrolyte locked in a thixotropic gel, rather than conventional acid liquid, ensuring a completely sealed and maintenance free design.

Ultra Gel batteries are completely spill and leak proof, highly resistant to vibration and may be installed in hard to reach locations as there is no need to check fluid levels. There is no need for watering, eliminating the risk of damage due to possible over or under watering.

G4DU

DEEP CYCLE
Ultra

AGM TECHNOLOGY

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	A/Hrs	Kg
AU1HU	12	R	LUG	195	135	155	185	200	32	11
A22NFU	12	L	D/F	230	140	205	235	350	55	18
A24U	12	R	D/F	275	170	205	235	525	79	25
A27U	12	R	D/F	320	170	205	235	580	92	29
A31DTU *	12	C	D/T	330	170	220	240	800	105	32
A4DU	12	3R	STD	535	215	220	250	1110	198	60
A8DU	12	3R	STD	530	280	225	255	1450	245	75

Key: for details see page 41

*Has 17mm S/S Stud which can be cut off

Ultra Deep Cycle AGM batteries provides good cold cranking performance and excellent cycle life, well suited for engine start, high current for short periods or lighting and accessory loads.

The batteries are valve regulated lead acid designs where the electrolyte is immobilised with the cells using the Absorbed Glass Mat technology. Utilising a valve in the top of each cell and advanced plate chemistry, gasses produced during use are recombined, making the batteries completely maintenance free.

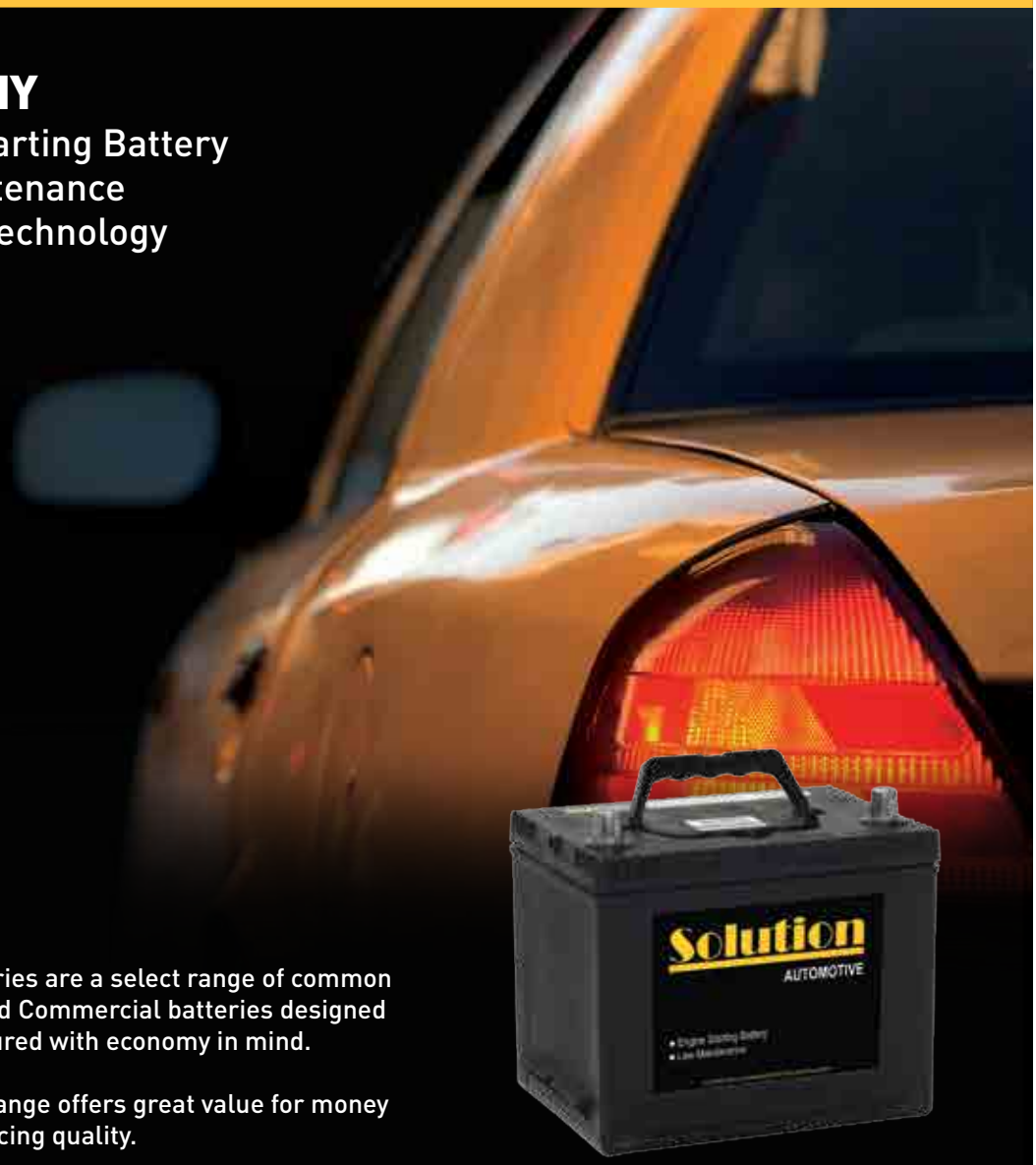
A31DTU

More AGM Deep Cycle Batteries on pages 16 to 23

Solution

ECONOMY

Engine Starting Battery
Low Maintenance
Calcium Technology



Solution batteries are a select range of common Automotive and Commercial batteries designed and manufactured with economy in mind.

The Solution range offers great value for money without sacrificing quality.

ECONOMY - CALCIUM TECHNOLOGY

Code	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	Res Cap
NS40ZLPPS *	12	L	PP	185	125	200	220	270	44
NS40ZPPS *	12	R	PP	185	125	200	220	270	44
NEW NS60ALPPS *	12	L	PP	235	125	200	220	360	60
NEW NS60APPS *	12	R	PP	235	125	200	220	360	60
NEW 55D23LS	12	L	STD	230	170	200	220	450	88
125S	12	L	D/F	235	125	180	190	250	52
126S	12	R	STD	235	125	180	200	250	52
127S	12	R	STD	225	170	185	205	350	59
156S	12	L	STD	235	175	185	205	350	59
NS70LS	12	L	STD	255	170	200	220	450	90
NS70S	12	R	STD	255	170	200	220	450	90

Key: for details see page 41

* Use PPSHIM for standard post

NS40ZLPPS

NS60APPS

55D23LS

125S

PPSHIM
Convert Pencil Post to Standard Post
1 x Positive & 1 x Negative per pack

PPSHIM


LIFELINE
...the heart of your system ®
Long lasting batteries from the AGM technology pioneers.
Accept nothing less for your fleet.
Class leading cranking amps
Rapid recharging
Ultra low self-discharge rates
Unmatched life-cycles
Reliable under harsh vibration
US NAVY SPECIFIED
Lifeline are the pioneers of fully sealed, maintenance free, AGM technology for starting and deep cycle applications.
Every battery is expertly hand built in California to demanding military specifications.
Lifeline technology offers market leading features such as a superior cell construction with a low resistance for class leading cranking amps, rapid recharging capabilities, ultra-low self-discharge rates (only 2% per month), unmatched life-cycles and a worldwide proven reliability under demanding shock and vibration loads.
LIFELINE
...the heart of your system ®
Made in USA

LIFELINE
...the heart of your system ®

New Product Range

AGM TECHNOLOGY - Starting Batteries

Code	Volt	Assy	Term	Length	Width	Box Height	CCA	MCA	A/Hrs	Kg
GPL-1400T	12	L	Socket M8	250	125	175	550	700	57	15
GPL-2400T	12	R	Socket M10 POS, M8 NEG	280	170	235	650	790	75	24
GPL-2700T	12	R	Socket M10 POS, M8 NEG	330	170	235	745	900	95	29
GPL-3100T	12	R	Socket M10 POS, M8 NEG	330	170	235	810	950	100	30

AGM TECHNOLOGY - Deep Cycle Batteries

Code	Volt	Assy	Term	Length	Width	Box Height	CCA	MCA	A/Hrs	Kg
GPL-4CT-2V	2	R	Socket M8 x4	260	180	250	2025	2500	660	30
GPL-6CT-2V	2	R	Socket M8 x4	260	180	330	2500	2750	900	41
GPL-L16T-2V	2	R	Socket M8 x2	295	175	400	3645	4552	1200	54
GPL-31T-2V	2	R	Socket M8 x2, M10 x2	330	170	230	3240	4050	630	30
GPL-4CT	6	R	Socket M8	260	180	250	760	925	220	30
GPL-6CT	6	R	Socket M8	260	180	330	925	1025	300	41
GPL-L16T	6	R	Socket M8	295	175	400	1350	1675	400	54
GPL-U1T	12	R	Socket M6	195	135	175	215	275	33	11
GPL-24T	12	R	Socket M10 POS, M8 NEG	285	170	235	550	680	80	26
GPL-27T	12	R	Socket M10 POS, M8 NEG	330	170	235	575	715	100	28
GPL-30HT	12	R	Socket M8	340	170	305	700	850	150	44
GPL-31T	12	R	Socket M10 POS, M8 NEG	330	170	235	600	750	105	29
GPL-31XT	12	R	Socket M10 POS, M8 NEG	330	170	235	650	800	125	34
GPL-4DA	12	R	STD	530	220	220	1100	1360	210	56
GPL-4DL	12	L	Blade Terminal	530	220	220	1100	1360	210	56
GPL-8DA	12	R	STD	530	275	220	1350	1675	255	71
GPL-8DL	12	R	Blade Terminal	530	275	220	1350	1675	255	71

Key: for details see page 41

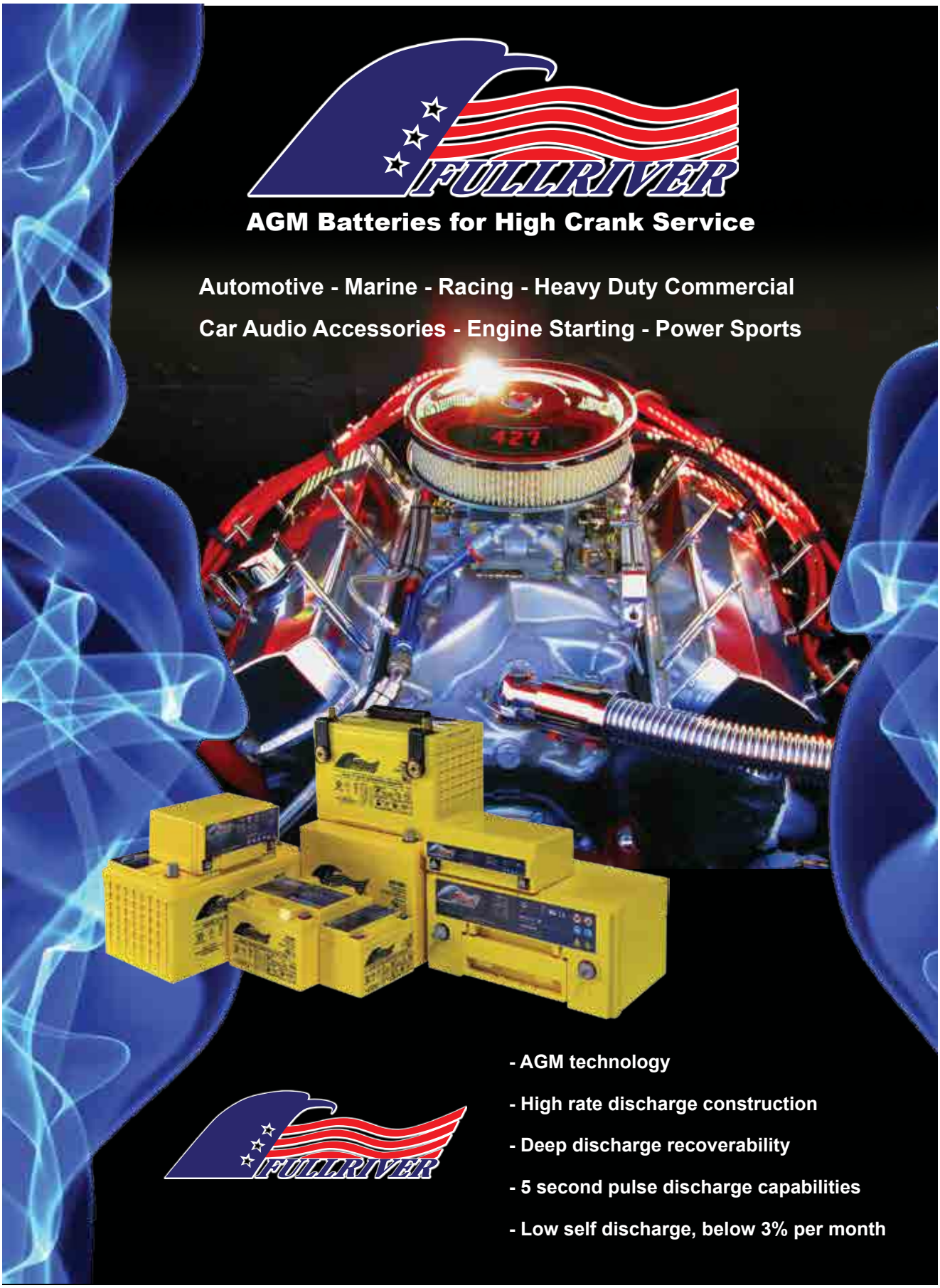
Rapid Recharge -
Lifeline batteries facilitate a significant increase in recharge rate, with amazingly high current limitations when the charging voltage is correctly regulated.

GPL-4CT

Low Self Discharge -
Lifeline technology offers a superior charge retention rate compared to flooded and gelled technologies.
Lifeline batteries self discharge around 2% per month compared to up to 10% per month for other batteries.

GPL-8DL

PERFORMANCE STARTING
Fullriver



AGM TECHNOLOGY

Code	Volt	Terminal	Length	Width	Box Height	Total Height	CCA	Res Cap	A/Hrs	Kg
HC8	12	M6	140	85	100	100	100	8	8	3
HC14A	12	M6	170	100	155	155	200	20	14	6
HC14B	12	M6	180	85	130	130	185	15	14	5
HC18	12	M6	170	100	175	175	265	26	18	7
HC20	12	M6	180	80	165	165	230	28	20	7
HC28	12	M8	165	175	125	125	410	48	28	11
HC44	12	M8	200	165	170	170	560	80	44	15
HC105	12	M8	330	170	215	220	1050	242	105	34

Key: for details see page 41

Note: Fullriver Batteries are not suitable for use in Deep Cycle applications.

The Fullriver engine starting battery range provides high cranking amp ratings from smaller box sizes, saving weight and space.

HC8

Brochure available

HC20

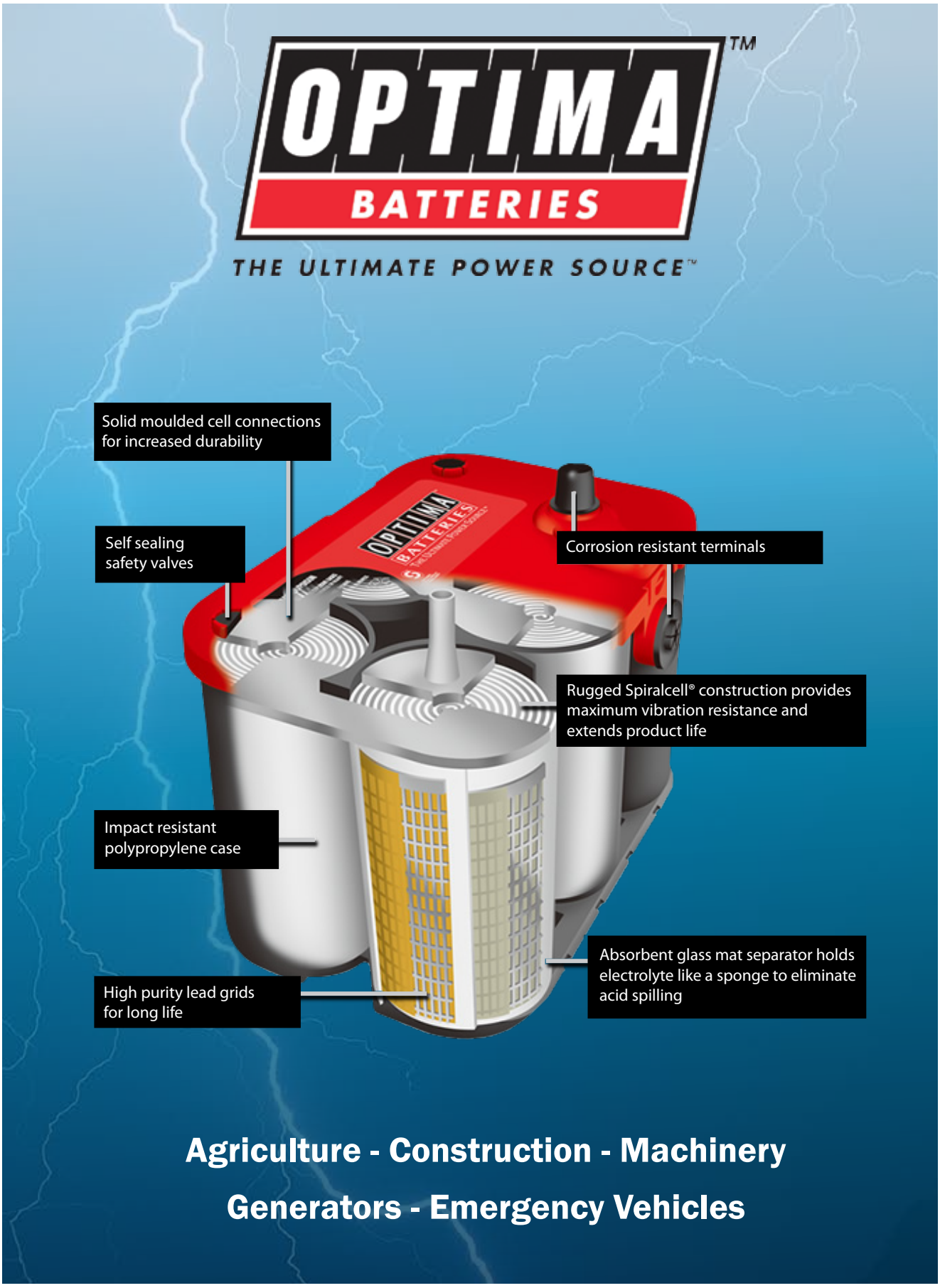
ACCESSORIES

TP07POS - M6 brass positive terminal

TP07NEG - M6 brass negative terminal

PERFORMANCE STARTING & DEEP CYCLE

Optima



AGM TECHNOLOGY

Code	Type	Volt	Assy	Term	Length	Width	Box Height	Total Height	CCA	Res Cap	A/Hrs	Kg
6V	Red Top Starting	6	C	STD	255	90	185	205	800	100	50	8
34	Red Top Starting	12	R	STD	255	175	180	200	800	100	50	17
NEW 34/78	Red Top Starting	12	R	STD/SIDE	255	175	180	200	800	110	50	17
34M	Blue Top Starting	12	R	D/T	255	175	180	200	800	100	50	17
NEW D34M	Blue Top Dual Purpose	12	R	D/T	255	175	180	200	750	120	55	20
D34	Yellow Top Deep Cycle	12	R	STD	255	175	180	200	750	120	55	19

Key: for details see page 41

OPTIMA® REDTOP® high-performance AGM batteries deliver a powerful burst of ignition power for a reliable start every time in the most demanding cranking applications.

With impressive high power delivery and extreme resistance to vibration, REDTOP® is ideal for trucks, SUVs, hot rods, street cars and other high performance applications that require a spill proof starting battery. OPTIMA's reputation as a truck or automotive battery is unsurpassed.

34/78

Installing an OPTIMA® BLUETOP® high performance AGM battery equals exceptional cranking and cycling power.

BLUETOP®'s provides outstanding vibration resistance and efficient power delivery and faster recharge time. This flexible AGM battery is ideal for those who need a sure starting, strong cranking, maintenance free power source.

BLUETOP® is also ideal for demanding marine and RV applications operating extensive electronic systems and electrical loads.

D34M

The OPTIMA® YELLOWTOP® is a high performance AGM battery with premium cranking power and impressive cycling capability, perfect for modern, accessory loaded vehicles.

YELLOWTOP® can repeatedly be brought back from deep power drains to full charge. Low internal resistance also provides more consistent power output and faster recharges.

Vehicles with winches, high demand electronics and audio systems, commercial vehicles and heavy equipment can all rely on this battery to provide ultimate starting and deep cycle power.

D34

PERFORMANCE STARTING & DEEP CYCLE

Odyssey

ODYSSEY®

THE BATTERY THAT GOES TO EXTREMES

AUTOMOTIVE
- Everyday Vehicles
- Classic & Antiques
- 4x4 & Off Road
- High Performance
- Modified Vehicles

HEAVY DUTY COMMERCIAL
- Semi Trailers
- Construction Equipment
- Farming Equipment
- Buses & RVs
- Cargo Vans
- Emergency Response

MARINE DUAL PURPOSE
- Engine Starting
- Trolling
- House Bank

POWER SPORTS
- Motorcycles
- All Terrain Vehicles
- Jet Skis
- Snowmobiles
- Ultra lights

06 PERFORMANCE STARTING & DEEP CYCLE
Odyssey

ODYSSEY THE EXTREME BATTERY

AGM TECHNOLOGY

Code	Volt	Terminal	Length	Width	Box Height	Total Height	PHCA (5 sec)	CCA	Res Cap	A/Hrs	Kg
PC310	12	SOCKET	140	85	100	100	310	100	9	8	3
PC535	12	SOCKET	170	100	155	155	535	200	21	14	5
PC545	12	SOCKET	175	85	130	130	545	185	18	13	6
PC625	12	SOCKET	170	100	175	175	625	265	27	18	6
PC680*	12	U/T	185	80	170	170	680	220	24	16	7
PC925*	12	U/T	170	180	130	130	925	380	52	28	12
PC1200*	12	U/T	200	170	170	170	1200	550	78	42	17
PC1230	12	STD/SIDE	240	175	200	200	1230	730	100	55	21
PC1400-25	12	STD	240	170	220	220	1400	820	125	65	23
PC1400-35	12	STD	240	170	220	220	1400	820	125	65	23
PC1500DT	12	STD	275	170	200	200	1500	880	135	68	22
PC1700*	12	STD	330	170	175	175	1700	875	142	68	28
PC1750-65	12	STD	300	180	190	190	1750	930	135	74	26
PC2150	12	D/T	330	170	240	240	2150	1150	205	100	35
PC2250	12	D/T	285	270	230	230	2250	1225	240	126	39

Key: for terminal details see page 41

*Can be fitted with brass automotive terminal

The combination of extreme power and performance makes ODYSSEY batteries perfect for a range of applications, including automotive, marine, commercial, racing and power sports.

ODYSSEY batteries are designed to deliver twice the overall power and three times the life of conventional batteries.

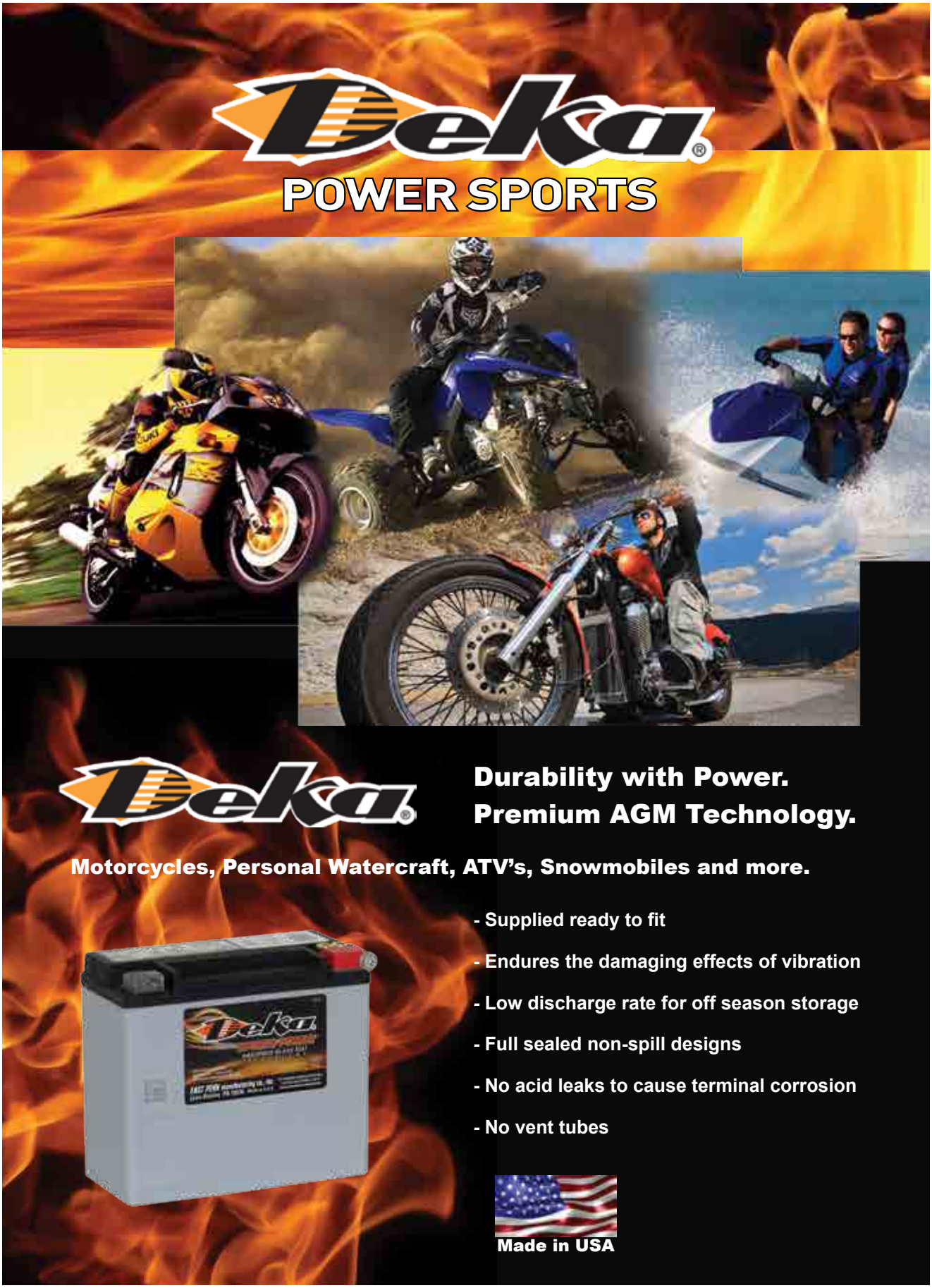
- Longer cycle life
- Longer shelf life
- Faster recharge
- Vibration resistance
- Extreme temperature tolerant
- Totally maintenance free

PC925

Brochure available

PC2150

POWER SPORTS
Deka



AGM TECHNOLOGY

Code	Volt	Length	Width	Height	CCA	Midtronics Tested CCA**	Res Cap	Foot Notes
ETX9	12	150	90	105	120	250	8	
ETX12	12	150	90	130	180	290	10	
ETX14	12	150	90	145 *	220	410	12	2 x 17mm spacers included
ETX14L	12	150	90	145 *	220	410	12	10mm bottom spacer included
ETX15	12	135	90	165	220	325	14	
ETX15L	12	135	90	165	220	325	14	
ETX16	12	175	100	155 *	325	435	19	20mm bottom spacer included
ETX16L	12	175	100	155 *	325	435	19	20mm bottom spacer included
ETX18L	12	205	90	165	340	450	20	
ETX20L	12	175	90	155	310	430	17.5	
ETX30LA	12	170	130	195 *	400	480	26	22mm bottom spacer included

* Dimensions do not include spacer

** HCB bench tested using Midtronics MDX-P300

Deka Power Sports AGM batteries are designed for reliable performance. The completely sealed spill-proof design provides season-to-season reliability, reducing the need for frequent battery replacement and ongoing maintenance.
Deka Absorbed Glass Mat (AGM) technology increases cranking power while improving rider and environmental safety.

ETX9

Key to Deka's AGM technology are highly porous micro fibre separators which completely absorb and trap the electrolyte. Moulded top and side connection terminals provide versatility, increased strength and durability.

ETX16L

- Supplied ready to fit
- Endures the damaging effects of vibration
- Low discharge rate for off season storage
- Full sealed non-spill designs
- No acid leaks to cause terminal corrosion
- No vent tubes

ETX20L

MOTORCYCLE
Motobatt

MOTOBATT

- Unique four terminal designs
- High crank ratings
- AGM technology
- Fully sealed non-spill
- Broader fitment range

AGM TECHNOLOGY

Motobatt	Volt	Number of Term	Length	Width	Height	CCA	A/Hrs	Notes
MBT6N4	6	2	70	70	95	N/A	4	
MBT6N6	6	2	95	55	110	N/A	6	
MB2.5U	12	2	80	70	105	N/A	2.5	
MB3U	12	2	100	55	110	50	3.8	
MBT4BB	12	2	115	40	90	40	2.5	
MTR4	12	2	115	50	85	45	2.5	
MBTX4U	12	2	115	70	90	70	4.7	
MB5U	12	4	120	60	130	90	7	
MB5.5U	12	4	135	60	130	90	7	
MB7U	12	2	150	65	95	100	6.5	
MBTX7U	12	2	115	70	130	115	8	
MBTZ7S	12	2	115	70	105	100	6.5	
MB7BB	12	4	150	60	130	150	9	
MBTX9U	12	4	150	90	105	160	10.5	Includes 5mm bottom spacer
MB9U	12	4	135	75	135	140	11	Includes 6mm or 21mm bottom spacer
MBT9B4	12	2	150	70	105	140	9	
MBTZ10S	12	4	150	90	95	190	8.6	
MB10U	12	4	135	90	145	175	14.5	Includes 9mm bottom spacer
MB12U	12	4	135	80	160	160	15	Includes 14mm bottom spacer
MBTX12U	12	4	150	90	130	200	14	Includes 5mm or 15mm bottom spacer
MBT12B4	12	2	150	70	130	150	11	
MBT14B4	12	2	150	70	145	175	13	
MBTX14AU	12	4	135	90	170	190	16.5	Includes 8mm bottom spacer
MBTX16U	12	4	150	90	160	250	19	
MB16U	12	4	160	90	160	240	20	
MB16A	12	2	150	90	180	200	17.5	
MB16AU	12	2	205	70	165	230	20.5	
MB18U	12	4	180	90	160	250	22.5	
MB51814	12	4	185	80	170	220	22	
MBTX20U	12	4	175	90	155	310	21	Includes 20mm bottom spacer and a 13mm side spacer (**yellow case**)
MBTX20UHD	12	4	175	90	155	310	21	Includes 20mm bottom spacer and a 13mm side spacer (**black case**)
MBTX24U	12	4	205	90	160	285	25	Includes 14mm bottom spacer
MBTX30U	12	4	165	125	175	380	32	Includes 17mm bottom spacer (**yellow case**)
MBTX30UHD	12	4	165	125	175	380	32	Includes 17mm bottom spacer (**black case**)
MBHD12H	12	2	200	130	165	390	33	

For industry code cross reference see page 37

The Motobatt 12 volt AGM battery design has revolutionised the motorcycle. HCB Technologies recommends that Motobatt is not installed into personal watercraft. Refer to Deka Power Sports batteries on page 24 for these applications.

Many Motobatt batteries incorporate **Quadflex™ Technology,** a unique four terminal design with two positives, two negatives and height spacers, permitting an almost universal fit.

All Motobatt batteries are maintenance free, non-hazardous, non-spill, charged and ready to install directly out of the box.

MB16A

STANDBY VRLA
Synergy

SYNERGY
POWER SOLUTIONS

Standby

Synergy VRLA AGM Standby

5 Year Design Life

Synergy offers an extensive range of 6v and 12v VRLA AGM technology batteries from 1.3 to 20 A/Hrs.
Extensively proven throughout New Zealand, Synergy VRLA is especially suited to the fire, security, stationary and emergency lighting markets.
For further information on Synergy AGM please contact your local representative.

VRLA - AGM TECHNOLOGY

Code	Volt	Term	Length	Width	Height	(20 hr)	(10 hr)	(5 hr)	(1 hr)	Kg
A6-1.3	6	T1	100	25	50	1.2	1.1	1	0.7	0.3
A6-3.2	6	T1	135	35	60	3.2	3	2.7	2	0.7
A6-4	6	T1	70	47	100	4	3.7	3.4	2.5	1
A6-7.2	6	T1	150	35	95	7.2	6.7	6.1	4.5	1
A6-12	6	T1	150	50	100	12	11.2	10.2	7.5	2
A12-0.8	12	E Plug	95	25	60	0.8	0.74	0.68	0.5	0.4
A12-1.2	12	T1	95	45	50	1.2	1.12	1.02	0.75	1
A12-2.3	12	T1	180	35	60	2.3	2.14	1.95	1.44	1
A12-2.9	12	T1	80	55	100	2.9	2.7	2.45	1.82	1
A12-3.2	12	T1	135	67	60	3.2	3	2.7	2	1
A12-5	12	T1	90	70	100	5.4	5	4.6	3.4	2
A12-5W	12	T2	90	70	100	6	5.6	5.1	3.8	2
A12-7	12	T1	150	65	95	7	6.5	6	4.55	2
A12-7.5	12	T2	150	65	95	7.5	6.98	6.37	4.71	2
A12-9	12	T2	150	65	95	8.5	7.91	7.22	5.3	2
A12-10W	12	T2	150	65	110	10	9.3	8.1	6.28	3
A12-12	12	T2	150	100	95	12	11.2	10.2	7.54	3
A12-18	12	T3	180	77	167	18	16.7	15.9	10.6	4
A12-20S	12	T12	180	77	167	20	18.6	17	12.6	6
A12-18	12	T3	180	80	165	18	16.9	15.9	10.6	4
A12-20S	12	T12	180	80	165	20	18.6	17.0	12.6	6

Key: for details see page 31

5 year design life in float application

- **Purpose built for standby applications**
- **Ultra long service life**
- **AGM technology**
- **Zero maintenance**

A12-0.8

The Synergy Stationary battery range is specifically designed for reliable standby backup power of applications such as emergency lighting, security and UPS through to small portable electronic equipment.

A12-18

STATIONARY - AGM TECHNOLOGY (Bulk supply option product)

Code	Volt	Term	Length	Width	Height	(20 hr)	(10 hr)	(5 hr)	(1 hr)	Kg
SA12-7	12	T1	150	65	95	7	6.5	6	4.55	2
SA12-7-Q8 **	12	T1	150	65	95	7	6.5	6	4.55	2
SA12-7-Q104 **	12	T1	150	65	95	7	6.5	6	4.55	2
SA12-7-Q504 **	12	T1	150	65	95	7	6.5	6	4.55	2

** Q in part code signifies Quantities (Q8 = Box of 8) (Q104 = 13 Boxes of 8) (Q504 = a pallet / 63 Boxes of 8)

Key: for terminal details see page 31

TELCO/UTILITY VRLA
Synergy

SYNERGY
POWER SOLUTIONS

Telco/Utility

Synergy VRLA AGM Long Life

10 Year Design Life

The Synergy AL & FT series are general purpose 12v AGM technology batteries with a 10 year design life in float charge use.
As with all Synergy batteries, the AL series are rechargeable, highly efficient, leak proof and completely maintenance free.
For further information on Synergy AGM please contact your local representative.

AGM TECHNOLOGY - Long Life

Code	Volt	Terminal	Length	Width	Height	(20 hr)	(10 hr)	(5 hr)	(1 hr)	Kg
AL12-28S	12	T12	165	175	125	29.6	28	24.3	17.2	9
AL12-33S	12	T12	195	130	155	35	32.6	29.7	22	12
AL12-45S	12	T6	200	165	170	48.1	45	39.1	27.9	14
AL12-65S	12	T6	350	165	180	69.5	65	56.5	40.3	23
AL12-75S	12	T11	260	170	210	80.2	75	65.3	46.5	23
AL12-90S	12	T6	305	170	210	96.3	90	78.3	55.8	28
AL12-100S	12	T11	330	170	220	107	100	87	62	29
AL12-120S	12	T11	405	175	210	128.4	120	104.4	74.4	32
AL12-200S	12	T11	490	240	220	214	200	174	124	61

10 year design life in float application Key: for terminal details see below

AGM TECHNOLOGY - Front Terminal

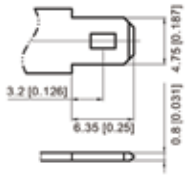
Code	Volt	Term	Length	Width	Height	(10 hr)	(8 hr)	(5 hr)	(1 hr)	Kg
FT12-55	12	T11	290	105	225	57.1	55	52	38.1	18
FT12-100	12	T13	510	110	235	103.8	100	94.5	69.2	36
FT12-150	12	T11	550	110	285	155	150	141.7	103.8	58

10 year design life in float application Key: for terminal details see below

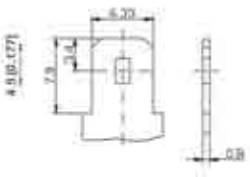
Synergy Long Life VRLA technology provides reliable, robust and flexible back up any critical electrical applications and carries a proven history supporting telecommunications, utility and power station distribution throughout New Zealand.

Terminal Configuration

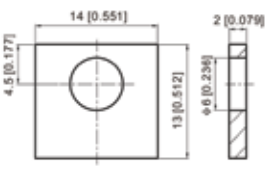
T1 Terminal
Unit: mm [inches]



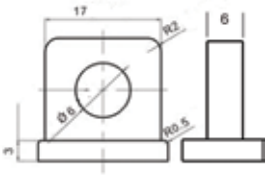
T2 Terminal
Unit: mm [inches]



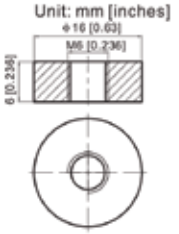
T3 Terminal
Unit: mm [inches]



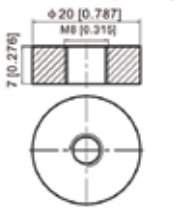
T10 Terminal
Unit: mm [inches]



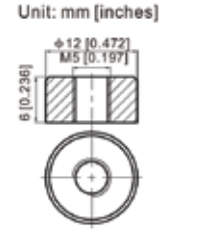
T6 Terminal
Unit: mm [inches]



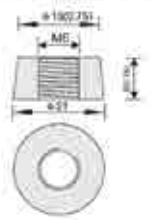
T11 Terminal
Unit: mm [inches]



T12 Terminal
Unit: mm [inches]



T13 Terminal
Unit: mm [inches]



DEEP CYCLE VRLA

Synergy

SYNERGY
POWER SOLUTIONS

Deep Cycle

Synergy VRLA AGM Deep Cycle

10 Year Design Life

The Synergy AC & G series are deep cycle batteries especially designed for cyclic use.
Heavy duty lead calcium alloy grids provide an extra margin of performance and service life on deep discharge cyclic applications.
For further information on Synergy AGM please contact your local representative.

AGM TECHNOLOGY - Deep Cycle (For Cyclic Use)

Code	Volt	Term	Length	Width	Height	(20 hr)	(10 hr)	(5 hr)	Kg
AC6-210	6	D/T	260	180	255	210	200	185	30
AC6-225	6	T11	245	190	275	245	221	198	32
AC12-18	12	T3	180	75	165	19.3	18	15.8	6
AC12-26	12	T3	165	175	130	27.8	26	22.8	9
AC12-75	12	T11	260	170	210	80.4	75	65.8	24
AC12-100	12	T11	330	170	220	107	100	87.7	30
AC12-150	12	T11	480	170	240	160	150	131	45
AC12-200	12	T11	520	240	240	214	200	175	63
AC12-250	12	T11	520	275	240	262	250	218	78

Key: for terminal details see page 31

10 year design life in float application

The Synergy Deep Cycle range offers superior, deeper discharge recovery thanks to the use of thicker and heavier plates and lower internal resistance.

Unlike other VRLA batteries, Synergy AC batteries are purpose built to handle the demanding requirements of repeated deep cycle discharge.

AC12-100

AGM & GEL TECHNOLOGY - Deep Cycle for Golf Trundlers

Code	Volt	Term	Length	Width	Height	(20 hr)	(10 hr)	(5 hr)	Kg
LCXC12-21P	12	T3	180	75	170	21	16.7	15	5
LCXC12-28P	12	T3	165	125	175	28	24	22	9
GU1H *	12	LUG	210	130	155	32	29	25	11

Key: for terminal details see page 31

* GEL Technology

GEL TECHNOLOGY

Code	Volt	Term	Length	Width	Height	(20 hr)	(10 hr)	(5 hr)	Kg
G12-30	12	T10	195	130	160	30	27	24	10
G12-40	12	T6	200	165	170	38	35.3	30.4	14
G12-50	12	T6	230	140	205	50	46.5	40	17
G12-70	12	T6	260	170	210	70	65.1	56	23
G12-80	12	T6	350	170	185	85	78	68	27

Key: for terminal details see page 31

The Synergy deep cycle range also offers cost effective AGM and Gel technology batteries for applications such as golf carts, communications, in-house power, marine & RV, caravans, motorhomes, and medical applications.

More AGM Deep Cycle Batteries on pages 13 & 16 to 23

G12-40

BATTERY CROSS REFERENCE
Ultra Automotive

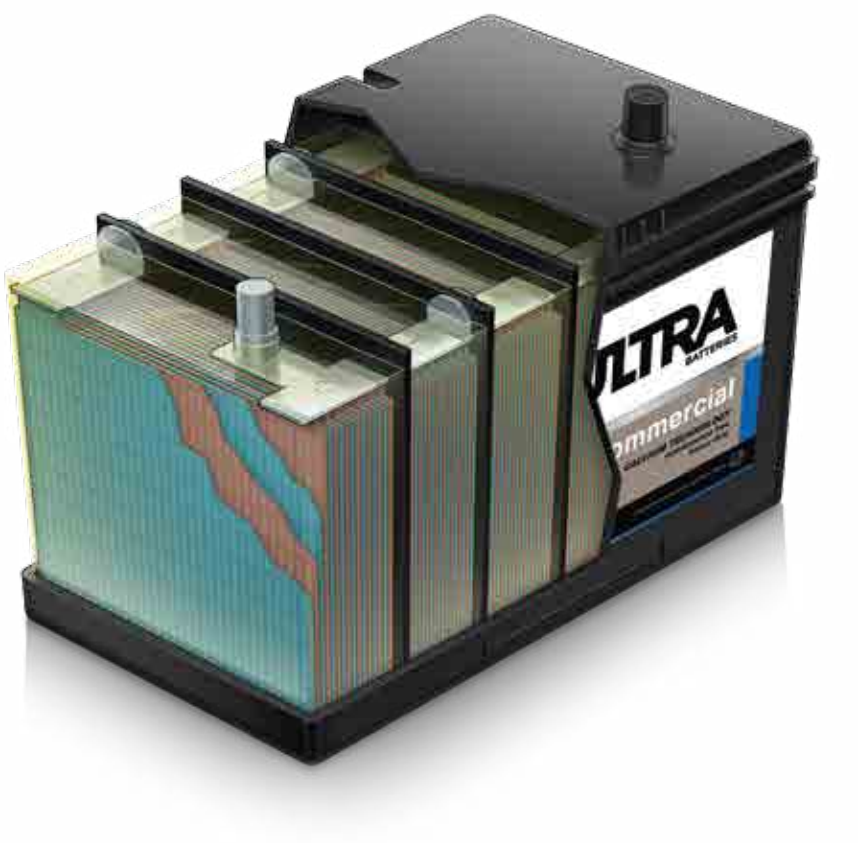
Ultra Automotive

ULTRA	HELLA ENDURANT	CENTURY	EXIDE	SUPER CHARGE	AA
NS40ZPPU (NS40LU) *	NS40ZPP	NS40ZMF	40DPMF	MF40B20DF	2123
NS40ZLPPU (NS40U) *	NS40ZLPP	NS40ZLMF	40CPMF	MF40B20L	2124
NS40ZU (NS40ZAU) *	NS40Z	NS40ZSMF	40DMF	NS40ZAL	2121
NS40ZLU (NS40ZALU) *	NS40ZL	NS40ZLSMF	40CMF	NS40ZAL	2122
NS40ZLPP-BHU (NS40ZL-BHU) *	NS40ZLPP-BH	NS40KLMF	-	-	-
NS60AU (NS60ZAU) *	NS60A	NS60SMF	X60DMF	MF55B24RS	2133
NS60ALU (NS60ZALU) *	NS60AL	NS60LSMF	X60CMF	MF55B24LS	2134
NS60APPU (NS60U) *	NS60APP	NS60MF	X60DPMF	MF55B24R	2135
NS60ALPPU (NS60LU) *	NS60ALPP	NS60LMF	X60CPMF	MF55B24L	2136
125U (N39U) *	125	41	-	MF43	2134
126U (N40MU) *	126	43	-	MF43	2133
127U (N48U) *	127	46	LM50D	NS50Z	-
127/11U (N50U) *	127/11	57mf	LM51D	NS50P	2175
127/11FU (N50FU) *	127/11F	57EFMF	54DMF	NS50P	2503
156U (N49U) *	156	47	LM50C	NS50L	-
156/11U (N51U) *	156/11	58MF	53CMF	NS50PL	2176
156/11FU (N51FU) *	156/11F	58EBMF	54CMF	NS50PL / NS50PLX	2504
N50ZU	N50Z	75D26RMF	LMN50ZZ	-	4501
N50ZLU	N50ZL	75D26LMF	LM50ZZL	-	4502
50D20LU	50D20L	50D20L	50D20LMF	MF50D20L	-
55D23RU	55D23R	55D23R	55D23DMF	N55D23R	2177
55D23LU	55D23L	55D23L	55D23CMF	N55D23L	2178
58U	58	48RMF	58DMF	MF58R	-
58LU	58L	48LMF	58CMF	MF58	2582
12N24/3U	12N24/3	12N24/3	N05	-	-
12N24/4U	12N24/4	12N24/4	N06	-	-
12N24/3HPU	12N24/3HP	-	U1LMF	MFU1	-
12N24/4HPU	12N24/4HP	-	U1RMF	MFU1R	-
02U	O2	O3	-	-	-
DIN36U	DIN36	DIN44MF	DIN44MF	MF44	-
DIN44U	DIN44	-	-	-	3372
DIN55U	DIN55	DIN53ZRMF	DIN55DMF	MF55R	3551
DIN55LU	DIN55L	DIN53ZLMF	DIN55MF	MF55	3552
DIN55FU	DIN55F	DIN55FMF	-	-	-
DIN55LHSCU	DIN55LHSC	DIN55LAGMF	-	-	
DIN45U	DIN45	-	-	-	-
DIN63U	DIN63	DIN65ZLMF	DIN66MF	MF66	-
DIN66U	DIN66	-	-	DIN66H	3662
DIN66RU	DIN66R	-	DIN70MF	-	-
DIN66LSCU	DIN66LSC	DIN66ZLAGMF	-	-	-
DIN75U	DIN75	DIN74ZLMF	DIN77MF	MF77	-
DIN85U	DIN85	DIN85ZLMF	DIN88MF	SMF85L / MF88	3882
DIN92U	DIN92	DIN88zlmf	-	MF88H	-

* New part number (Old part number)

Ultra Commercial

ULTRA	HELLA ENDURANT	CENTURY	EXIDE	SUPER CHARGE	AA
N617U	N617	08	12B	N12	6612
N621U	N621	23	115	-	-
N625U	N625	26	26B	N25	6626
NS70U	NS70	NS70	N50ZZ	NS70	-
NS70LU	NS70L	NS70L	N50ZZL	NS70L	-
NS70/15U	NS70/15	-	XN50ZZMF	-	-
NS70L/15U	NS70L/15	-	XN50ZZLMF	-	-
N70ZZU	N70Z	N70Z	N70ZZ	N70ZZ	4703
N70ZZLU	N70ZL	N70ZL	N70ZZL	N70ZZL	4704
N70Z/17U	N70Z/17	N70ZZMF	XN70ZZMF	MF80D26R	-
N70ZL/17U	N70ZL/17	N70ZZLMF	XN70ZZLMF	MF80D26L	-
N87U	148/17	87Z	86A	-	-
N86U	149/17	86Z	86b	N87LZ	-
158U	158	89	-	-	-
157U	157	89B	-	-	-
N94U	CODE 55	94	94B	N94P	-
N100U	N100	N100	N100	N100	-
N120U	N120	N120	N120	N120P	-
N150U	N150	N150	N150	N150P	-
N200U	N200	N200	N200	N200P	-
DIN135U	DIN135	DIN120L	-	-	-
DIN165U	DIN165	DIN165	-	-	-



BATTERY CROSS REFERENCE
Ultra Marine

Ultra Marine Starting

ULTRA	HELLA ENDURANT	CENTURY	EXIDE	SUPER CHARGE	AA
MMF22/430U	MMF22/430	M57MF	MSST22	MFM48	-
MMF24/500U	MMF24/500	-	-	-	-
MMF24/680U	MMF24/680	M24MF	MSST24	MFM50	-
MMF27/780U	MMF27/780	M27MF	MSST27	MFM70	-
MMF31/930U	MMF31/930	M31MF	MSST31	-	-

Ultra Dual Purpose

ULTRA	HELLA ENDURANT	CENTURY	EXIDE	SUPER CHARGE	AA
DP24/65U	DP24/65	-	MSDP24	MRV50	-
DP27/80U	DP24/80	-	MSDP27	MRV70	-
DP31/100U	DP31/100	-	MSDP31	MRV87	-

Ultra Deep Cycle

ULTRA	HELLA ENDURANT	CENTURY	EXIDE	SUPER CHARGE	AA
12BU	12B	12DC	ED1	-	-
MDC24/85U	MDC24/85	24DC	ED50	D50Z	-
MDC27/105U	MDC27/105	27DC	ED6	D70Z	-
MDC31/130U	MDC31/130	30DC	ED7	D87L	-
MDCN150/180U	MDCN150/180	N150DC	-	-	-
MDCN8D/240U	MDCN8D/240	N200DC	-	D200P	-
IDC24/85U	IDC24/85	-	DC12V80	-	-
IDC27/105U	IDC27/105	-	DC12V105	-	-
IDC31/130U	IDC31/130	-	DC12VXC	-	-
R208U	R208	-	-	-	-
R220U	R232	CY220-6	DC6V225	-	-
R245U	R245	CY245-6	DC6V245	-	-
L16/380U	L16/380	CY350-6	DC6V375	-	-
L16/450U	L16/450	-	-	-	-
8VU	8V	8VGC	DC8V150	GC2-8V	-

BATTERY CROSS REFERENCE

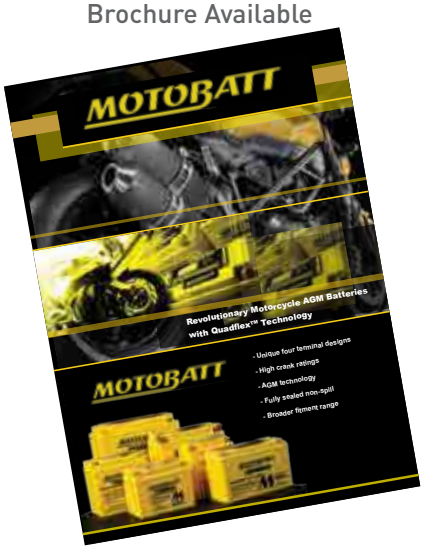
Motobatt

HCB PART #	MOTOBATT PART #	SPACER
6N4-2A	MBT6N4	
6N4-2A-3		
6N4-2A-4		
6N4-2A-5		
6N4-2A-7		
6N4-2A-8		
6N4C-1B		
6N6-1B	MBT6N6	
6N6-1D-2		
6N6-3B		
6N6-3B-1		
CB2.5L-C	MB2.5U	
CB3L-A	MB3U	
CB3L-B		
YT4B-BS	MBT4BB	
YTR4BBS	MTR4	
CB4L-B	MBTX4U	
YTX4L-BS		
12N5-3B	MB5U	
CB5L-B		
CB7C-A		10mm
12N5-4B	MB5.5U	
12N5.5-3B		
12N5.5-4A		
12N5.5-4B		
12N7B-3A		30mm
12N7B-4A		30mm
12N5.5A-3B	MBTZ7S	6mm
TYTZ7S		
YTX5L-BS		
YTX7-BS		22mm
YTZ7S		
YB7B-B	MB7BB	
YT7B-4	MB7U	
YTX7B-BS		
YTX7L-B	MBTX7U	
YTX7L-BS		
CB12B-B2	MBTX9U	22mm
YTX9-BS		
YTZ14S		5mm1

HCB PART #	MOTOBATT PART #	SPACER
12N7-3A	MB9U	
12N7-3B		
12N7-4A		
12N7-4B		
12N9-3B		6mm
12N9-4B-1		6mm
CB7-A		6mm
CB7L-B		6mm
CB9-B		6mm
CB9A-A		6mm
CB9L-A2		6mm
CB9L-B		6mm
YT9BBS	MBT9B4	
CT9B4		
CTZ10S	MBTZ10S	
YTX7A-BS		
12N10-3A	MB10U	
12N10-3B		
12N10-3B1		
12N11-3A-1		9mm
12N11-3B		9mm
CB10A-A2		9mm
CB10L-A2		
CB10L-B		
CB10L-B2		
12N12A-4A-1	MB12U	
CB12A-A		
CB12A-B		
CB12AL-A		
YTX12-BS	MBTX12U	
YTX14-BS		15mm
YTX14L-BS		15mm
YTX15L-BS		
YT12B-4	MBT12B4	
YT14B	MBT14B4	
12N14-3A	MBTX14AU	
CB14-A2		
CB14A-A1		
CB14A-A2		
CB14L-A2		
CB14L-B2		
YTX16-BS	MBTX16U	
YTX16BS-1		
YTX16L-BS		
CB16B-A1	MB16U	

HCB PART #	MOTOBATT PART #	SPACER
HYB16A-A	MB16A	
CB16AL-A2	MB16AU	
CB18-A	MB18U	
CB18L-A		
CB18L-A2		
51814	MB51814	
51913		
12N16-3B	MBTX20U	
12N16-4B		
CB16-B		
CB16-B-FM		15mm
CB16A-A		
CB16CL-B		20mm
CB16HLA-CX		
CB16L-B		
YTX20-BS		
YTX20L-BS		
12N18-3	MBTX24U	
C50-N18A-A		12mm
C50N18L-A2		
C50N18L-A-FM		
C50N-18L-A		
C60-N24L-A	MBTX30U	
C60-N24L-B		
C60N-24AL-B		
CB30CL-B		17mm
YTX30L-BS		
HD4-12	MBHD12H	

Brochure Available



INDEX BY PART NUMBER

INDEX BY PART NUMBER

INDEX BY PART NUMBER

ULTRA BATTERIES

Specification Table Key

Battery measurements (L x W x H) are taken at the extremities of the battery including hold downs and handles. Box height is to the upper mounting surface and total box height includes posts, caps or highest extremity.

Bottom hold down (BHD)

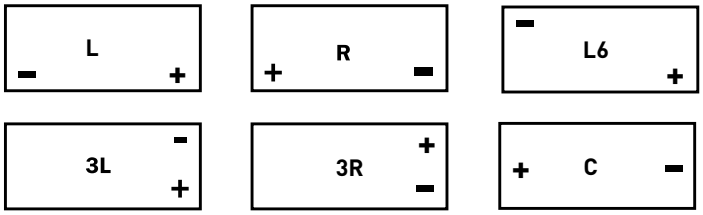
B1	2 bottom hold down 10.5mm high on long sides
B3	4 bottom hold down 10.5mm high on all four sides
B4	2 bottom hold down 19mm high on long sides
B3/B4	B4 bottom hold down available with adapter on long sides

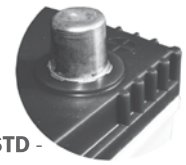
Abbreviations

A/Hrs	Ampere Hours (20 Hr Rate unless otherwise stated)
CCA	Cold Cranking Amps
D/C	Deep Cycle
MCA	Marine Cranking Amps
HCA	Hot Cranking Amps
PHCA	Pulse (5 sec) Hot Cranking Amps
Res Cap -R/C	Reserve Capacity

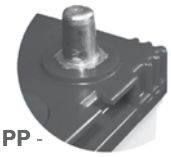
Battery Assemblies

Check for correct polarity when fitting a battery.





STD - Standard Post

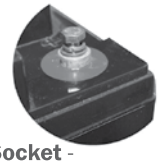


PP - Pencil Post

D/F - Dual Fit Terminal

LUG - Lug Terminal

U/T - Universal Terminal



Socket - Socket Terminal

D/T - Dual Terminal

Side - Side Terminal

Side/STD - Side Terminal & Standard Post

What do the rating and specifications signify?

CCA (Cold Cranking Amps) Internationally recognised SAE Cold Cranking Performance test. CCA Rating represents the number of amps that a new fully charge battery at - 18ºC can deliver for 30 seconds while maintaining a voltage of 1.2v per cell or more. NOTE: this is the measurement of a battery's ability to start engines.

MCA (Marine Cranking Amps) & CA (Cranking Amps) internationally recognised SAE Marine Cranking Performance test. MCA or CA Rating represents the number of amps that a new fully charged battery at 0ºC can deliver for 30 seconds while maintaining a voltage of 1.2v per cell or more. NOTE: This is the measurement of a battery's ability to start engines in a marine environment.

Res Cap (Reserve Capacity) This rating is the time in minutes that a new fully charged battery can supply a current of 25 Amps and maintain a terminal voltage above 10.5v for a 12v battery and 5.25v for a 6v battery. NOTE: This represents the approximate time that a vehicle will run with a night time electrical load should its engine charging system fail.

A/Hrs (Ampere Hours) A unit of capacity that is calculated by multiplying the current in amps that the battery can deliver for 20 hours to 10.5 volts for a 12 volt battery.

Warranty

The batteries detailed in this booklet are guaranteed against faulty workmanship or materials on the part of the battery. This warranty commences from the date of sale to the end user and is identified on the top of the individual battery block by a month and year code. This used A to L for the month (January A, February B, etc) and a number depicting the year. The length of the warranty is dependent upon the product type and is detailed on the top of each battery with a warranty label. The warranty is void through misuse, misapplication, abuse or any other factors which negatively affect the battery life. The warranty is provided by HCB Technologies Limited, New Zealand.

TECHNICAL INFORMATION
Battery Types

Introduction
Lead Acid batteries fall into two main categories, Flooded and Valve Regulated. Flooded batteries include, Low Maintenance (the most common type) and Maintenance Free. Low maintenance batteries require periodic checking and topping of the electrolyte levels in each cell. Valve regulated batteries come in the form of Gelled Electrolyte and Absorbed Glass Mat (AGM).

Marine Engine Start
To start an engine, high current delivery for a short duration is required. Typically, to start and engine, only approximately 1% of the battery capacity is used. Engine Starting batteries are constructed specifically to meet this demand. A larger number of thinner plates are used as the current output is effected by plate surface area. Plates are constructed so the acid can more easily mix with the active material that produces the current during starting.

Deep Cycle
Deep Cycle batteries are required to provide a lower level of current output for a much longer duration to a deeper level of discharge than an engine starting battery. If you were to regularly discharge an engine starting battery to 50% of its capacity (called 50% DoD – Depth of Discharge) the battery would only provide a relatively low number of discharges (cycles) before the plates would deteriorate and the battery would fail. Deep Cycle batteries are made of thicker plates with a more dense active material which resists this deterioration. Different separators are used along with the anti-vibration construction found in Ultra Marine Batteries. With these features, the battery can withstand the potentially damaging effects of continual deep discharge and recharge.

VRLA Gel Batteries
Sealed, Valve-Regulated (SVR) Gelled-electrolyte batteries offer many significant advantages over conventional "flooded" batteries. Gel batteries are spill proof and leak proof, and resist over-discharges that can shorten the life of the battery. Gel batteries have a self-discharge rate of less than 1% per month (20ºC). They provide ample cranking amperage for quick, sure starts. Their SVR design minimizes gassing, making them safe to install around people and sensitive electronic equipment. Gel batteries offer a viable alternative when you can only choose one battery. Gel batteries are maintenance free.
Charging for long life, always use a good, constant potential, voltage-regulated charger. For 12v batteries, (charge to at least 13.8v but NO MORE THAN14.6v @ 20ºC, for 6v batteries, charge to at least 6.9v butt NO MORE THAN 7.3v @ 20ºC. Do not charge in a sealed container. For Sealed Lead Acid/Synergy Gels please follow battery side label voltage information. Please note that the Gel battery charging specification has increased from previous model Gel batteries sold prior to 2012. This new information applies to batteries from 2012 onwards (13.8v to 14.1v applies to all batteries prior to 2012).

VRLA AGM Batteries
Sealed, Valve-Regulated (SVR) Absorbed Glass Mat (AGM) batteries use special absorbed electrolyte technology that is superior to flooded lead-acid batteries. Fine, highly porous micro fibre glass separators absorb the electrolyte, increasing efficiency by lowering internal resistance and boosting capacity. Lower internal resistance also means AGM batteries can be recharged faster than conventional batteries, allowing the user to put them back into operation sooner. The completely sealed, valve-regulated AGM battery minimises gas emissions and acid leakage for longer and safer battery operation. AGM batteries are also completely maintenance free. Charging: Use a quality, constant potential, voltage-regulated charger. For 12-volt AGM batteries, charge to at least 14.4 volts, but no more than 14.6 volts at 68ºF (20ºC). Do not charge in a sealed container.

Open circuit voltage vs. state of charge comparison

Charge	Silver Calcium	Flooded Calcium/Calcium	Flooded Lead Antimony	Gel	AGM
100	12.80V	12.80V	12.65V	12.70-12.80V	12.80-12.90V
75	12.65V	12.65V	12.45V	12.65V	12.60V
50	12.44V	12.44V	12.24V	12.35V	12.30V
25	12.19V	12.19V	12.06V	12.00V	12.00V
0	11.97V or less	11.97V or less	11.89V or less	11.80V	11.80V

Notes: 1/ Divide the values in half for 6v batteries
2/ Ultra Commercial Calcium/Calcium batteries have a fully charged voltage of 12.6v

The "true" O.C.V. (Open Circuit Voltage) of a battery can only be determined after the battery has been removed from the load (charge or discharge) for 24 hours.

CARE & MAINTENANCE OF DEEP CYCLE BATTERIES

- New batteries should be given a full charge before use.
- New deep cycle batteries need to be cycled several times before reaching full capacity (50-125 cycles, depending on type). Capacity will be limited during this period.
- Battery cables should be intact, and the connectors kept tight at all times. Always use insulated tools to avoid shorting battery terminals. Regular inspection is recommended.
- Vent caps should be correctly installed and tight during vehicle operation and battery charging.
- Batteries should be kept clean and free of dirt and corrosion at all times.
- Batteries should always be watered after charging unless plates are exposed before charging. If exposed, plates should be covered by approximately 3mm of electrolyte (add distilled water only). Check electrolyte level after charge. The electrolyte level should be kept 6mm below the bottom of the fill well in the cell cover.
- Water used to replenish batteries should be distilled or treated not to exceed 200 T.D.S. (total dissolved solids...parts per million). Particular care should be taken to avoid metallic contamination (iron).
- For best battery life, batteries should not be discharged below 80% of their rated capacity. Proper battery sizing will help avoid excessive discharge.
- Battery chargers should be matched to fully charge batteries in an eight hour period. Defective and unmatched chargers will damage batteries or severely reduce their performance.
- Avoid charging at temperatures above 48°C or ambient, whichever is higher.
- Deep cycle batteries need to be equalized periodically. Equalizing is an extended, low current charge performed after the normal charge cycle. This extra charge helps keep all cells in balance. Actively used batteries should be equalized once per month. Manually timed charger should have the charge time extended approximately 3 hours. Automatically controlled charger should be unplugged and reconnected after completing a charge.
- In situations where multiple batteries are connected in series, parallel or series/parallel, replacement battery(s) should be of the same size, age and usage level as the companion batteries. Do not put a new battery into a pack which has 50 or more cycles. Either replace with all new or use a good used battery(s).
- Periodic battery testing is an important preventative maintenance procedure. Hydrometer readings of each cell (fully charged) gives an indication of balance and true charge level. Imbalance could mean the need for equalizing; is often a sign of improper charging or a bad cell. Voltage checks (open circuit, charged and discharged) can locate a bad battery or weak battery. Load testing will pick out a bad battery when other methods fail. A weak battery will cause premature failure of companion batteries.
- Always use a matched charger and battery pack system. Unmatched chargers will cause potential problems.
- As batteries age, their maintenance requirements change. This means longer charging time and/or higher finish rate (higher amperage at the end of the charge). Usually older batteries need to be watered more often. And, their capacity decreases.
- Lead acid batteries should be brought up to full charge at the earliest opportunity. Avoid continuously operating batteries in a partially charged condition. This will shorten their life and reduce their capacity.
- Extreme temperatures can substantially affect battery performance and charging. Cold reduces battery capacity and retards charging. Heat increases water usage and can result in overcharging. Very high temperatures can cause "thermal run-away" which may lead to an explosion or fire. If extreme temperature is an unavoidable part of an application, consult a battery/charger specialist about ways to deal with the problem.
- Inactivity can be extremely harmful to all lead acid batteries. If seasonal use is anticipated, we recommend the following:
  - A) Completely charge the battery before storing.
  - B) Remove all electrical connections from the battery, including series/parallel connectors.
  - C) Store the battery in as cool a place as possible. However, do not store in a location which will consistently be below 0°C. Batteries will discharge when stored, the lower the temperature the lower the self discharge.
  - D) When not in use, boost every two months.

TECHNICAL INFORMATION
Deep Cycle Care & Sizing

MARINE & HOUSEBANK SIZING

General
Sizing of marine batteries is critical to the performance of electrical items on any vessel. Insufficient capacity results in systems failure, poor battery performance and shortened battery life. Excessive capacity results in unnecessary weight, cost and space usage.

To ascertain the correct battery size a simple arithmetic calculation of power usage of each electrical accessory between charging periods (usually daily) is required. From this a calculation of current each accessory uses (amps) multiplied by the duration of use (hrs) gives the ampere hour consumption of the vessel. Ampere hours is the unit of measurement of battery capacity.

It is a characteristic of lead acid batteries that regular discharges below 50% of capacity will result in a disproportionate reduction in life. When a battery is discharged, up to 85% of capacity can be restored relatively quickly. The remaining 15% required to bring the battery to full charge has to be "trickled" in at relatively low current rates resulting in a full charge time from, say, 50% depth of discharge (DoD), of around 6 to 8 hours. Therefore the best workable capacity results from a battery bank which is 2.5 to 3 times the daily consumption. It is commonly recommended that capacities should be twice daily usage but this sizing results in discharges well below 50% and a significantly shorter recharge time because a larger battery can absorb greater ampere hours before the regulating voltage control causes a tapering down of the charging current.

Remembering that a battery simply stores power it is obvious that the charging capacity coupled with the number of charging hours is equally as critical to good battery performance. Insufficient charging system output or insufficient charging time will result in system failure. If a battery is operated at low levels of charge the battery efficiency is reduced. Failure to periodically bring the battery to full charge will result in reduced battery performance possibly to the point of failure.

The Battery Sizing Calculation
Using the worksheets we have available for download at www.hcb.co.nz, list all of the electrical accessories on the boat. Include either the current draw in amps of the power usage expressed in watts. This information can be obtained from the specifications contained in the appliance instruction book or from the supplier. Take care to ensure that the true position is indicated. For example, you may have six lights on your boat but realistically only use three at any one time.

Because the battery capacity is expressed in Ampere/hours we need to convert any wattage figures into amps of load. This is simply done by dividing the watts by the system voltage. For example a 12 volt 100 watt spotlight consumes 8.5 amps. 100 divided by 12 equals 8.5.

When extending the figures into the "A/hrs/day" column, only extend the circuits which apply when the boat is at rest or when the engine is not running. For example the electric clutch on and engine driven compressor drawing eight amps would not be included as the current draw stops when the engine is turned off. However, these current demands need to be taken into account when calculating the available charging current and should be deducted from the alternator output.

Once all of the accessories have been included and their individual consumption calculated, simply add the right hand column. This will provide you with the power usage. From this the battery capacity is established. The power usage calculated should represent between 33% and 40% of the total battery capacity. Please note, whilst this is generally a "daily" figure, individuals may decide that they only wish to run their charging system once every three days. This is possible provided the calculations reflect the number of hours of usage between charges.

Alternator Sizing and Charging Times
Selection of an alternator with an output equal to the daily ampere hour load would result in a required running time of approximately 1.25 hours per day provided the charging voltage is no less than 14.4 volts and the battery capacity is at least 2.5 times the daily a/hr usage. The use of alternators which have a higher output than the daily a/hr usage will reduce engine running time but only within limits unless a larger battery capacity is fitted.

To calculate the required engine running time you can take the daily a/hr usage and divide by the alternator size and multiply by 1.2.
Example: 100 A/Hrs per day/80 amp alternator = 1.25 * 1.2 = 1.5hrs.

Additional points worth considering
As mentioned previously, charging of lead acid batteries to fully charged generally takes between 6 and 8 hours but 80% to 90% of charge can be returned in much shorter times. In practice house batteries in boats rarely become fully charged while in use on the water. If the batteries are not periodically taken to a full charged state (say every two to three months) a portion of the capacity is permanently lost. Correct maintenance practices must be followed.
The higher the battery capacity of a battery the greater the ability of the battery to absorb power. This is another reason why correct battery sizing is critical.

Alternator sizing is also very important and sized according to the desired charging time. For example a boat with a daily power consumption of 80 ampere hours, a 220 ampere hour battery and a 80 amp output alternator would require approximately 1.25 hours of charging time. Obviously batteries are not 100% efficient and typically absorb between 85% and 90% of the capacity provided by the alternator. Whilst some manufacturers make claims of superior efficiency in practice these differences have no effect. If measurements were made of this system the batteries would operate between 40% and 85% of state of charge. The final 15% of charge can only be "trickled" in and takes several hours.

Care should be taken when working around batteries, particularly when they are on charge of have recently been charged. Batteries emit explosive gases which if ignited can cause serious injury, particularly to the eyes. Safety glasses should be worn at all times when working on or around batteries.

When doing the design for a new installation, or the addition of accessories in an existing boat, it is advisable to take into account possible additions of electrical load. For example if you are considering putting a microwave oven on your boat at some stage in the future consideration to the increased load should be made. This may be in the form of allowing for an additional battery bank to be added (say in parallel to the existing one) and also alternator size wherever possible. The addition of an accessory which significantly increases the load on the batteries and charging may stress the system to such an extent that problems will arise. This could be likened to increasing your engine size by say 30% and using the same diameter propeller shaft. You may be able to do this if the original shaft was heavy enough in the first place.

Charging voltages are critical. Small differences in charging voltages (as low as 0.4 volts) can have significant effects. This easily understood when remembering that the voltage rise, which causes charging current to flow, is very low. A 50% discharged battery has a terminal voltage of around 12.2 volts. A charging voltage of 14.0 volts represents 1.8 volt rise. A charging voltage of 14.6 volts (the recommended for flooded deep cycle batteries) provides a rise of 2.4 volts. This is 33% higher than that which is provided by the lower charging voltage. Charging current is proportionally higher and charging time using the higher charging voltage is significantly reduced.

The 14.6 volt charge rate setting also induces gassing within the cells which mixes the electrolyte. Stratification of the electrolyte occurs when charging and discharging of the battery takes place. Discharge produces water which is lighter and floats to the top. Charging produces acid which is heavier and tends to sink to the bottom. Most common cause of poor battery performance is insufficient charging voltages. Lower recharge voltages often result in shortened battery life.

Deep Cycle Calculator	12 Volt System				
	No	Watts	Amps	Hrs/Day	A/Hrs/day
Saloon LED Lights	5	3	1.3	3	3.8
Cockpit LED Lights			0.0		0.0
Fwd Cabin LED Lights			0.0		0.0
Fresh Water Pump	1	50	4.2	4	16.7
VHF	1	5	0.4	0.5	0.2
Log/Depth	0	10	0.0	8	0.0
Stereo/CD	1	30	2.5	8	20.0
Fridge - Electric	1	8	0.7	24	16.0
Total Daily Ampere Hour Usage					56.6
Minimum Battery Capacity Required			Factor	2.5	141.6
			Factor	3	169.9
Circuits with Engine Running					
GPS	1	20	1.7	1	1.7
Total Running Load	1	20	1.7		1.7
Solar	1	20	1.7	6	10.0
Total Renewable Energy					10.0
Engine Running Time					
Ampere hour required			56.6		
Alternator Output			60		
Running Load			1.7		
Charging Amps Available			58.33333333		
Renewable Energy			10.0		
Charging Hrs required			**1.0**		

TECHNICAL INFORMATION
Charging & Equalisation

1. Charging – Flooded Types

a. Deep Cycle Batteries in a cycling application require a recharging voltage of 2.43 to 2.45 volts per cell. This is 14.6/14.7 volts for a 12 volt nominal installation and 29.2/29.4 volts in a 24 volt site.

b. To fully recharge the cells this charging voltage needs to be applied until the charging current tapers to approximately 3% of the total capacity of the battery. E.g. A 220amp/hr bank is considered to be fully charged when the charging current reaches 8 to 10 amps with a charging voltage of 2.43 to 2.45 volts per cell.

c. It is not necessary to fully charge the batteries after each cycle. If the batteries are working hard then a maximum discharge level of 60% (leaving 40%) for using true Industrial Deep Cycle Batteries you will still achieve a reasonable life. However this is not the recommended depth of discharge for every cycle, which is 50%, but occasional discharges to 60% is acceptable. A recharge back up to 80% to 85% after each cycle is also acceptable provided the cells are fully charged every 4 to 6 weeks. Regular very deep discharges to 80% will result in a reduced battery performance and a reduced life. Both of these systems are the result of high levels of lead sulphate, which diminish the batteries charge acceptance and cause premature positive plate failure.

d. This recharge should result in some gassing (to mix the electrolyte) and hydrometer levels should be restored to the fully charged state.

e. During partial recharge (to 80%) only a slight rise in electrolyte temperature should be detected. This would be of the order of 5 degrees Celsius. A full recharge should see a maximum temperature rise of 10 degrees Celsius.

f. Once the battery is fully charged it can be maintained by applying a charging voltage of 2.24 to 2.25 volts per cell (13.4-13.5 for 12volt and 26.8 to 27.0 for 24volt). This is called a "Float" charge. However it is worth noting that this float charge does cause some deterioration in the cells but this deterioration is often less than the damage caused by the batteries being left in an under charged state.

g. All charging voltages need to be temperature compensated. That is, as the battery temperature raises the charging voltage needs to be reduced. Most modern quality regulated chargers are temperature compensated.

h. Care should be taken when working around batteries on charge or when recently charged to levels of hydrogen and oxygen may be present which, if ignited by a mere spark, can cause a dangerous explosion. The wearing of eye protection is essential.

2. Discharging

a. Discharge levels should be as per 1. c above.

3. Equalisation Charge

a. Equalisation charges may be necessary as it is common in lead acid batteries for cell capacities to vary which results in an increasing difference between the state of charge of independent cells within the battery and a corresponding variation in SG readings.

b. Equalisation charge is a form of over charge which, when applied allows the flatter cells to catch up.

c. Effectively the charging takes the form of a current limited charge with a higher voltage setting. This results in a continuation of the charge through the battery even when some cells reach a fully charged state and their voltage rises. This allows the remaining cells to continue to receive charge.

d. Equalisation charging voltages are of the order of 2.6 to 2.7 volts per cell with the current ideally limited to 10% of the C10 rating of the cells.

e. During Equalisation charges, high levels of gas will be emitted. Ventilation of the surrounding area is essential. Eyewear protection must be worn and care to avoid sparks of flames should be taken.

HCB STANDBY BATTERY SOLUTIONS

World leading brands, proven technology, durability & technical expertise.

HCB offers specialist quality batteries and technical support from the world's most respected and experienced manufacturers to service solar, deep cycle, telecommunications, UPS, off-grid systems and more.

For further information please contact your local representative.

Deka – Valve regulated, gelled-electrolyte batteries designed to offer reliable, maintenance-free power for applications where frequent deep cycles are required and minimum maintenance is desirable.

- Compu-cast, power path grids and computer-controlled oxide
- Made in USA
- A/Hr ranges up to 2000A/Hrs @C8

FIAMM – One of Europe's oldest and most respected battery manufacturers offering a full range of products for the renewable energy and standby markets.

- 2v, 6v and 12v batteries
- Long design Life construction – Eurobat Classification
- A/Hr range up to 3000A/Hrs @ C10

Hawker – Perfect Plus & Evolution are reliable and robust positive tubular plate traction cells, ideal for large off-grid solar and standby applications.

- A/Hr range up to 1500A/Hrs @ C20
- 1500 cycles to 80% DOD
- BS & DIN Cell dimensions

Ultra Batteries Deep Cycle – Reliable, long-lasting backup power. Ideal for standby and renewable energy application where frequent deep cycles are required.

- 2v, 6v and 12v batteries
- Flooded, and VRLA AGM/Gel type constructions
- IPT Technology Options – Optimizes power capacity, cell consistency and long term reliability

Lifeline – Recognised as the premium sealed AGM battery technology leader. Designed and manufactured to military and aerospace specifications.

- 2v, 6v & 12v battery types
- 325 to 3100CCA
- 20% faster recharge than conventional flooded and gel cell batteries

US Battery – Manufacturer of world leading flooded deep cycle mono-block batteries for a variety of applications from marine and RV to renewable energy and industrial deep cycle machinery.

- 2v, 6v & 12v battery types
- Full range to 1100A/hrs
- Crystalock – advanced plate curing process to ensure superior cycle life

MERCHANDISING

BATTERY STANDS

Code	Colour	Depth	Width	Total Height	Number of Shelves
Motobatt	Yellow	240	450	1600	6
3 Teir Battery Stand	Black	370	800	1050	3

3 Teir Stand

Motobatt Stand

3 Teir Stand Header Cards

Ultra Automotive
Ultra Marine
Motobatt
Solution

Footpath Sign

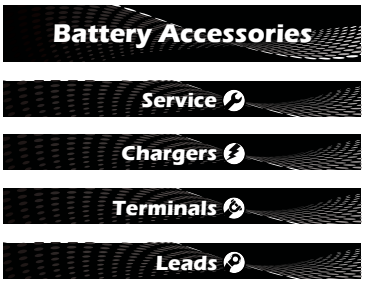
Ultra Automotive
Ultra Marine

HCB Accessories

For a complete range of battery accessories including battery chargers, cables, terminals, lugs, tools, consumables and more please see the HCB Accessories Catalogue.

HCB Merchandising

HCB branded header cards and category cards for Terminals, Chargers, Leads and Servicing will highlight the wide range of battery associated products and offers a great showroom platform to provide retail display of all battery associated accessories.



Wall Display

Plank Wall PW2400x1200 sheets, joiners, capping, shelving, single and double wall hooks are available to customise your retail display. See your HCB Accessories Catalogue for the full range.

Free Standing Display

Plank Wall PW1500X900 units are available for showroom floor areas providing double sided display. Smaller header cards, shelving, single & double wall hooks are available to customise your retail display.
See your HCB Accessories Catalogue for the full range.

ULTRA BATTERIES

Protect your environment & conserve precious resources

RECYCLE YOUR SCRAP

As a potentially hazardous product, and under legislation of the Resource Management Act, your company and HCB Technologies Ltd have a responsibility to assist in the recycling of batteries.

We recommend that your batteries are collected by a reputable metal recycler or HCB Technologies (if you are serviced by a representative). Scrap batteries will then be forwarded to an approved smelter for recycling.

HCB TECHNOLOGIES

HCB Technologies Limited Head Office
2a Mahunga Drive
Mangere Bridge

Phone: (09) 622-0033
Fax: (09) 622-0220

Email: info@hcb.co.nz

Web: www.hcb.co.nz
www.ultrabatteries.co.nz

HCB Albany
Unit 2, 10 Canaveral Drive, Albany
Phone: (09) 479-9420
Fax: (09) 479-1750

HCB Auckland
2a Mahunga Drive, Mangere Bridge
Phone: (09) 634-8634
Fax: 0800-931100

HCB Hamilton
Unit 2, 3 Maxwell Place, Te Rapa
Phone: (07) 850 5374
Fax: (07) 850 5366

HCB Palmerston North
202A Broadway Avenue, Palmerston Nth
Phone: (06) 354 5868
Fax: (06) 354 5872

HCB Wellington
Unit 4, 50 Gracefield Road, Lower Hutt
Phone: (04) 569 5260
Fax: (04) 569 3470

HCB Nelson
20 Parere Street, Nelson
Phone: (03) 546 8367
Fax: (03) 546 8361

HCB Christchurch
Unit 14, 3 Stark Drive, Wigram,
Phone: (03) 338 7155
Fax: (03) 338 2366

HCB Dunedin
30 Harrow Street, Dunedin South
Phone: (03) 477 1344
Fax: (03) 470 1698