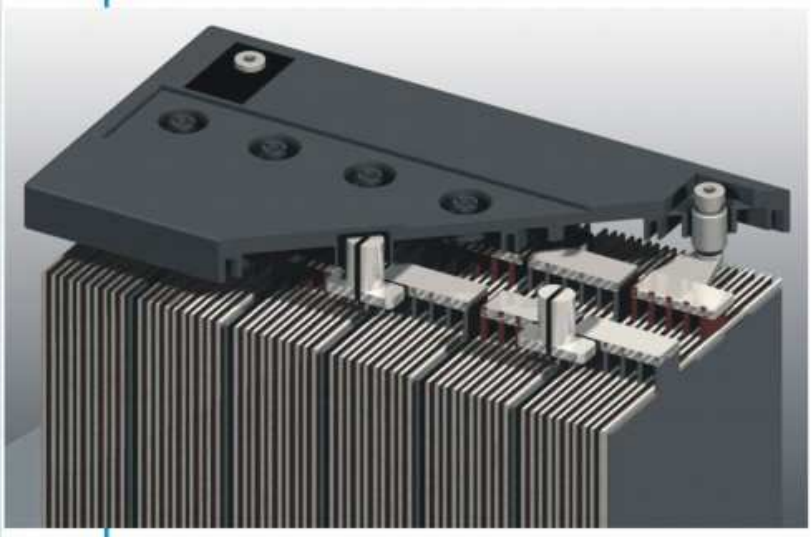
Dyno Europe AGM batteries

CONSTRUCTION - AGM battery construction is as shown in the diagram below. The positive and negative grids are cast from a calcium / tin lead alloy to reduce grid growth and corrosion. The active material is manufactured from high purity lead (99.9999%) to minimise the negative effects of impurities.
Separator is a mat of random woven acid resistant glass fibres, which acts as a sponge - soaking up and immobilising the electrolyte whilst maintaining good acid to plate contact and availability during discharge. "S wrapping" is employed to eliminate the risk of short circuits due to mossing and debris at the bottom of the cell.
The purpose of the separator is to maintain a constant distance between the positive and negative plates, thus removing the possibility of short circuits whilst allowing the active material to fully react with the electrolyte. The random weaving also results in an open structure, which offers minimal resistance to the flow of electrolyte during filling.



AGM construction with case removed and cover cut away to show internal battery parts.

ELECTROLYTE FILLING -Special production and QC systems are utilised to ensure the electrolyte saturation is optimised for each battery. The battery design and construction negates the need for electrolyte addition and the battery remains maintenance free throughout its design life.

SAFETY RELEASE VALVE- The battery will operate above atmospheric pressure under normal operating conditions, however the maximum pressure is governed by the safety release valve. Open is activated by pressures in excess of approx. 2 psi (14 Kpa), resealing at approx 1.2 psi (8.4 Kpa).

GAS RECOMBINATION - The gasses generated during normal operation of the battery are internally recombined. In fact more than 99% of the gas achieves recombination.

TERMINAL CONSTRUCTION - The contact quality between the insert terminal and the lead post is of vital importance during short duration / high Amp discharges. Elevated terminal temperatures are the result of poor contact, eventually causing seal degradation and electrolyte leaks. Haze design and assembly technique for terminal casting ensures trouble free operation for the design life of the battery.

Dyno Europe AGM batteries

AGM Vs Gel

Each battery has advantages and disadvantages, it is therefore important to choose the right battery for the application.

Advantages of AGM Batteries:

- Lower initial cost when compared to Gelled Electrolyte cells.
- Ideal for starting and stationary applications.
- Superior performancefor shorter duration / higher current discharges.
- Smaller size battery can be used for higher rate discharges.

Applications

- Float service
- Uninterruptible Power Supplies
- Medical
- Telecommunications
- Switch Gear
- Photovoltaic
- Solar
- Wind
- Control Systems
- Cellular Radio Stations
- Cathodic Protection
- Navigation Aids
- Marine equipment
- Electric Power Systems

	Capacity temperature correction Factor to be applied to Data at 20 Degrees C												
Discharge Time	-30 °C	-20 °C	-10 °C	0 °C	5 °C	10 °C	15 °C	20 °C	25 °C	30 °C	35 °C	40 °C	50 °C
5 minutes to 59 minutes	0.23	0.417	0.605	0.778	0.86	0.91	0.96	1	1.037	1.063	1.085	1.1	1.116
1 Hour to 100 Hours	0.277	0.464	0.647	0.816	0.886	0.93	0.97	1	1.028	1.05	1.063	1.07	1.078

CHEMICAL REACTION- The chemical reaction for the Discharge / Recharge process is represented by the following formula:

PbO_2 (Lead Dioxide) + $2H_2SO_4$ (Sulfuric Acid) + Pb (Sponge Lead) $\underset{\text{Charging}}{\overset{\text{Discharging}}{\rightleftharpoons}}$ $PbSO_4$ (Lead Sulphate Pos & Neg Plates) + $2H_2O$ (Water)

Under normal float charge conditions the oxygen passes through the separator from the positive to the negative plate where it reacts with the negative active material to form lead oxide.

$$2Pb + O_2 \longrightarrow 2PbO$$

In the acid conditions the lead oxide reacts with the sulfuric acid to form lead sulphate.

$$2PbO + 2H_2SO_4 \longrightarrow 2PbSO_4 + 2H_2O$$

The lead suphate formed on the negative is then reduced to lead and sulfuric acid by the evolving hydrogen.

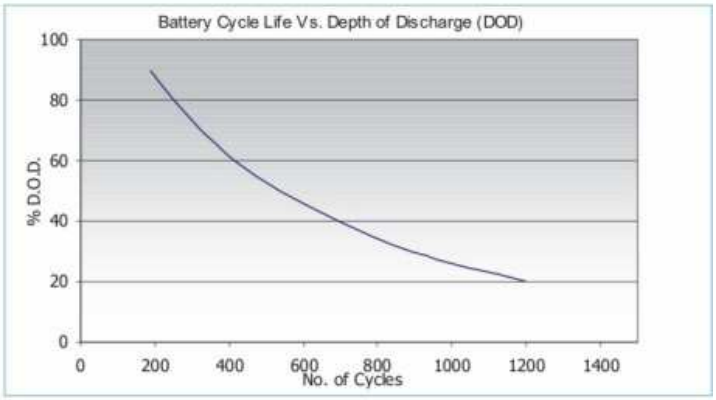
$$2PbSO_4 + 2H_2 \longrightarrow 2Pb + 2H_2SO_4$$

If the equations are resolved and like terms cancelled out on both sides of the equation the result is:

$$2H_2 + O_2 \longrightarrow 2H_2O$$

This reaction summarises what is meant by GAS RECOMBINATION. The process can never be 100% efficient, normal recombination efficiency is 95 - 99%.

Dyno Europe AGM batteries

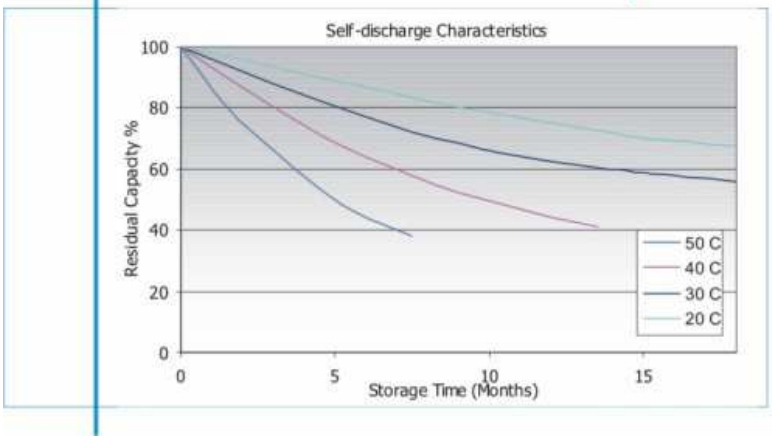


Innovative Features

- Completely maintenance free, sealed construction eliminates the need for watering
- Increased durability and deep cycle ability for heavy demand applications
- Fully tank formed plates
- Analytical Grade electrolyte
- Spill proof / leak proof
- Valve regulated Max internal pressure 2.5 psi
- Multi-position usage
- ABS Case and cover - V0 on request
- Low self discharge
- FAA and IATA approved as non-hazardous
- Built to comply with IEC 896-2, DIN 43534, BS 6290 Pt4, Eurobat.

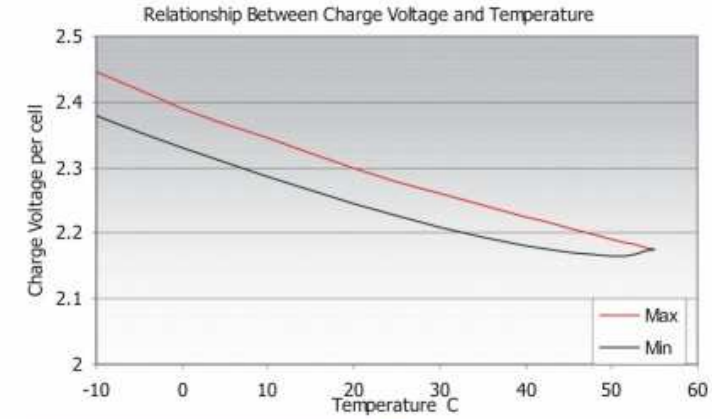
Specifications

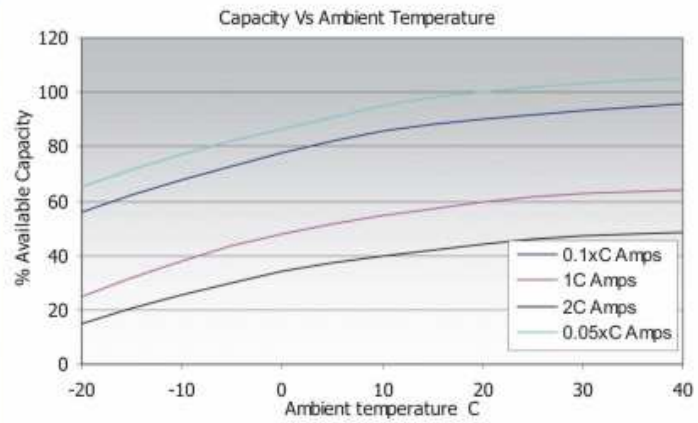
Nominal Voltage	6 & 12 Volts
Design Life	12 Years @ 20 ˚C
Operating Temperature	-10 ˚C to 45 ˚C
Grid alloy	Calcium / Tin lead alloy
Plates	Flat Pasted
Separator	Absorbant Glass Mat
Active material	Very high purity lead
Case and cover	ABS (VO on request)
Charge Voltage	Float 2.27 - 2.30 VPC @20 ˚C Cycling 2.40 @20 ˚C Max. 2.4 VPC Max ripple 3.5% Charging V
Electrolyte	Sulphuric acid Analytical grade purity
Venting Valve	EPDM Rubber 1.5 to 2 psi (10.5 - 14 KPa) release pressure. Resealing at 1 psi (7 KPa)
Terminal	Various types Epoxy sealed by extended mechanical paths
Torque setting	The recommended torque value for all types is 5-7 Nm
Cables	Insulated cables / connectors supplied on request.



Pb

Dyno Europe AGM batteries





CHARGING CHARACTERISTICS

Floating - The optimum float voltage for a battery is temperature dependant, at 15 - 24°C the recommended value is 2.27 - 2.30V. It is recommended that battery installation sites are temperature controlled, however float voltage can be increased or decreased to compensate for temperature variations. Adjustment is calculated at +/- 3 mV per degree C.

Operating Temperature	Recommended Applied Float Voltage VPC
0-9	2.33 - 2.35
10-14	2.30 - 2.33
15-19	2.27 - 2.30
20-24	2.27 - 2.30
25-29	2.25 - 2.27
30-34	2.23 - 2.25
35-40	2.21 - 2.23

The most suitable charging method for battery life and performance is the constant voltage method with a limited initial current, usually limited to a maximum of $C_{20}/4$.

Terminal Options (left to right)

- Lead Flag
- Automotive
- J Type
- Copper Flag
- J Type Adapter
- Insert

Insert are made from brass with copper, nickel and silver plating giving excellent mechanical, electrical and corrosion resistant properties.

Dyno Europe AGM batteries

Reference	Volt	C20	C5	CCA	L	W	H	Kg	Qty/pal	Layout-Term
DAB6-110	6V	112Ah	87Ah	1010A	193	168	205	16	60	A-M6
DAB6-160	6V	172Ah	142Ah	1290A	298	171	226	26	32	A-M6
DAB6-180	6V	180Ah	142Ah	1100	260	179	275	26,5	32	A-M8
DAB6-225EV	6V	241Ah	204	2570	243	188	276	33,8	32	A-M8
DAB6-200	6V	199Ah	161Ah	1600A	318	170	225	31	32	A-M8
DAB12-13	12V	14,1Ah	10,9Ah	NA	150	97	99	4	200	C-M6
DAB12-14	12V	14,1Ah	13,75Ah	NA	150	97	99	4,75	200	C-M6
DAB12-15	12V	17,8Ah	14,6Ah	265A	200	76	123	5,2	160	C-M5
DAB12-18	12V	18Ah	14,8Ah	270A	181	76	167	6,25	160	C-M5
DAB12-26	12V	26Ah	21,8Ah	300A	166	176	126	9,2	90	C-M5
DAB12-28	12V	28Ah	23,5Ah	305A	166	125	175	9,4	90	C-M5
DAB12-33	12V	33Ah	25,7Ah	320A	195	130	160	10,9	90	B-M6
DAB12-44	12V	44Ah	33Ah	350A	197	165	170	13,6	60	C-M6
DAB12-55	12V	55Ah	42,8Ah	380A	228	137	207	17,5	48	B-M6
DAB12-70J	12V	70Ah	52,4Ah	550A	350	167	179	22,1	36	C-M6
DAB12-70	12V	70Ah	53,5Ah	550A	259	168	208	21,5	36	B-M6
DAB12-80	12V	80Ah	62Ah	620A	259	168	208	23,7	36	B-M6
DAB12-90	12V	90Ah	71,8Ah	680A	305	168	208	29	36	B-M6
DAB12-100	12V	100Ah	78,1Ah	780A	305	168	208	30	36	B-M6
DAB12-110	12V	110Ah	85,7Ah	960A	332	174	213	32,2	32	B-M6
DAB12-120	12V	120Ah	95,1Ah	1020A	408	176	227	35	32	B-M6
DAB12-135	12V	135Ah	108Ah	1160A	340	173	280	39,6	24	C-M6
DAB12-150	12V	150Ah	118Ah	1300A	482	170	242	44,2	20	B-M6
DAB12-160	12V	160Ah	136Ah	1440A	530	209	214	52,2	20	E-M8
DAB12-200	12V	200Ah	161Ah	1670A	520	240	220	66	12	E-M8
DAB12-230	12V	230Ah	182Ah	1870A	521	269	203	70	12	E-M8

Dyno Europe AGM batteries

	time in minutes amps to 1,75 volts											
battery	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**60**	**90**
DAB12-15	55	39,3	30,3	25,4	21,6	18,7	16,6	14,8	13,5	12,3	10,7	8
DAB12-18	55,9	39,9	30,8	26	21,9	18,8	16,6	14,8	13,4	12,2	10,7	8
DAB12-26	85,5	66,6	53,8	45,9	38,7	34	29,6	26,3	23,4	21,1	17,6	12
DAB12-28	92,3	71,9	58,1	49,5	41,8	36,7	32	28,4	25,2	22,8	19	12,9
DAB12-33	112	81,9	62,4	51,1	42,9	37,6	3,1	29,6	26,9	24,8	21	14,7
DAB12-44	135	111	87,2	69,3	58,5	50,5	44,2	39,3	35,6	32,8	28,1	19,7
DAB12-55	165	137	107	84	69,3	59,8	52,6	47,7	43,6	40,2	34,5	24,1
DAB12-70J	195	163	131	106	89,7	77,6	69,2	63,2	58,3	54,2	46,2	32
DAB12-70	199	166	134	108	91,5	79,2	70,6	64,5	59,4	55,3	47,1	32,7
DAB12-80	208	176	147	123	104	90,5	80,8	73,5	68,5	63,7	54,8	37,6
DAB12-90	251	206	167	139	116	100	87,7	79,4	73	67,2	58,4	41,3
DAB12-100	294	236	182	151	128	110	98,4	88,2	80,5	74,4	64	44,9
DAB12-110	321	259	202	167	142	123	108	97,4	88,3	80,6	69	48,9
DAB12-120	339	276	215	179	154	135	119	108	100	91,6	78,9	56
DAB12-135	376	306	249	214	184	163	148	136	124	114	96,6	66,3
DAB12-150	389	310	259	225	197	175	156	142	129	118	101,7	70,1
DAB12-160	423	340	275	238	209	187	170	156	143	131	113,3	79,3
DAB12-200	444	366	306	268	237	213	194	179	167	156	137,9	94,7
DAB12-230	458	377	313	279	250	226	206	188	177	166	146,7	104,9
DAB6-110	328	264	206	170	145	125	110	99	90	82	70,4	49,9
DAB6-160	432	354	280	248	217	194	177	162	149	137	117,8	82,5
DAB6-200	444	366	306	268	237	213	194	179	167	156	137,9	94,7