

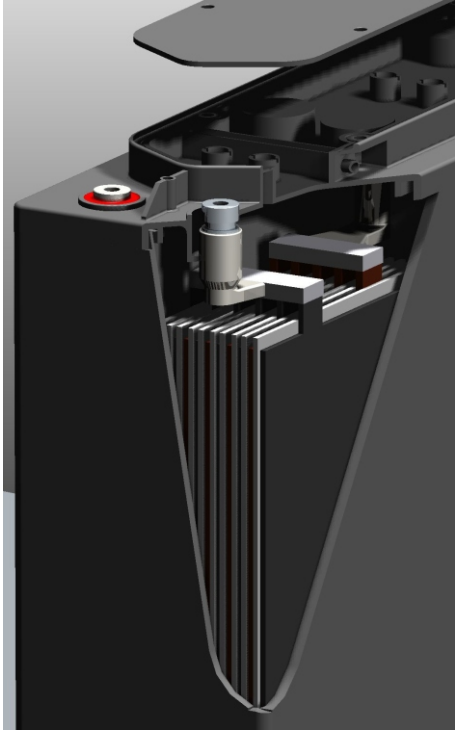


Haze Battery Company Ltd



**Sealed Lead Acid 12 Volt
Monobloc
Front Access Range - Gel & AGM**

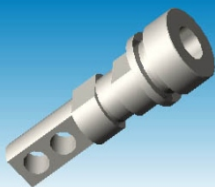
AGM Front Access



AGM Technology - AGM technology has a number of advantages over the equivalent Gel battery range, the main advantages for the Telecommunication applications are as follows:

- Increased capacity over shorter discharge times.
- Lower initial cost.
- Ideal for starting and stationary applications.
- More suitable for UPS stand-by where power outages are uncommon.
- Smaller size battery can be used for higher rate discharges.

Haze only employ "S wrapping" in our AGM construction to further reduce the possibility of short circuits due to mossing. Closely controlled plate density and thickness results in excellent consistent performance when placed in a string (series connection) Batteries are manufactured under a quality system designed to meet and exceed ISO 9002.



Front Access AGM Construction - AGM battery construction is as shown in the above diagram. 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 a high purity lead (99.9999%) to minimize the impurities, which would cause corrosion and self-discharge.

AGM battery construction is as shown in the above diagram. 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 a high purity lead (99.9999%) to minimize the impurities, which would cause corrosion and self-discharge.

The separator is mat of random woven glass fibres, they are completely acid resistant and act as a sponge soaking up and immobilizing the acid whilst keeping the acid available when it is needed during periods of battery discharge. "S Wrapping" is employed to reduce the risk of short circuit due to mossing or debris at the bottom of the cell.

The purpose of the separator is to maintain a constant distance between the positive and negative plates, totally eliminating the possibility of short circuits whilst allowing the active materials to fully react with the electrolyte. The separator also has an open construction, which offers little resistance to the flow of the electrolyte during filling.

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

Gel Front Access

Front Access Gel Construction - is as shown in the diagram. 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 a high purity lead (99.9999%) to minimize the detrimental effects of impurities, e.g. corrosion and self-discharge.

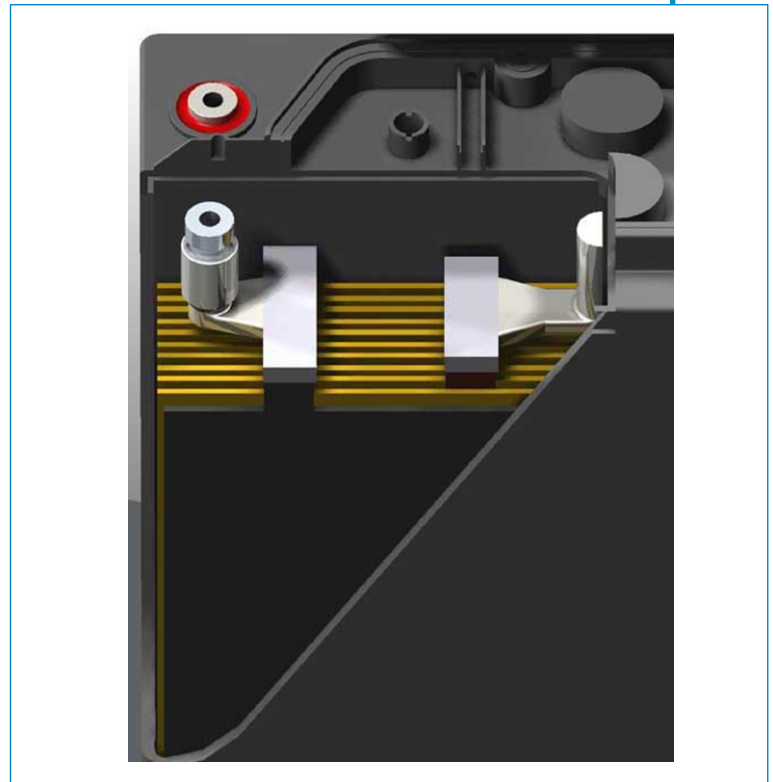
Separator is manufactured by a world leader in the field, utilizing the latest German technology. The base material is a microporous duroplastic exhibiting excellent high temperature stability and mechanical strength, resulting in very good resistance to vibration and mechanical shock. The integrity of the battery will be maintained under extreme conditions.

Typical properties are:
Acid displacement - 150ml/sqm
Pore volume - 70%
Average pore size - 0.5 μ m
Maximum pore Diameter - 1 μ m

The purpose of the separator is to maintain a constant distance between the positive and negative plates, totally eliminating the possibility of short circuits whilst allowing the active materials to fully react with the gelled electrolyte.

The separator also has an open construction, which allows little resistance to the flow of the electrolyte during filling. A thin layer (typically 0.4mm) of non-woven glass mat is an integral part of the separator and is placed against the positive plate for improved surface contact.

The purpose of the separator is to maintain a constant distance between the positive and negative plates, totally eliminating the possibility of short circuits whilst allowing the active materials to fully react with the electrolyte. The separator also has an open construction, which offers little resistance to the flow of the electrolyte during filling.



Gel Technology has a number of advantages over the equivalent AGM battery range, the main advantages for the Telecommunication applications are as follows:

- Increased durability and deep cycle ability for heavy demand applications.
- Full recovery from deep discharge, even when not charged immediately
- Suitable where mains power is unstable
- High tolerance to discharge when full charge has not been achieved
- Limiting design protects the positive plates to greatly improve cycle life
- Excellent performance over longer discharges
- Reduced self-discharge

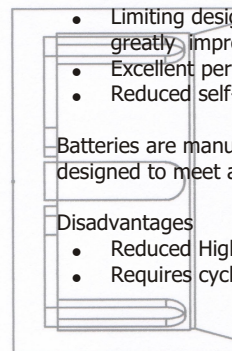
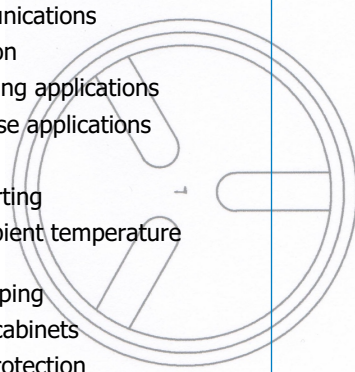
Batteries are manufactured under a quality system designed to meet and exceed ISO 9002.

Disadvantages

- Reduced High rate performance
- Requires cycling to reach full capacity

Applications

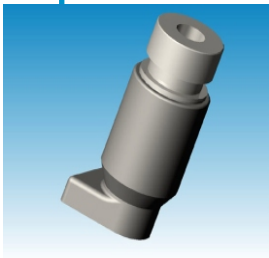
- Float service
- Residential
- Telecommunications
- Refrigeration
- Poor charging applications
- Frequent use applications
- Wind
- Engine Starting
- Higher ambient temperature applications
- Water Pumping
- Road side cabinets
- Cathodic Protection
- Boats
- General Marine
- Many other extreme applications



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.

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

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).



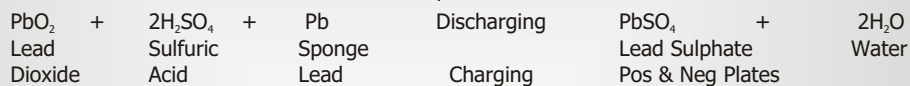
TERMINAL CONSTRUCTION - The contact quality between the insert terminal and the lead post is of vital importance during short duration / high Amp discharges. Elevated terminal temperatures are the result of poor contact, eventually causing seal degradation and electrolyte leaks. Haze design and assembly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



Haze Battery Company keenly encourages environmental awareness; PLEASE follow guidelines for the recycling /disposal of lead.

Discharge Time	Capacity temperature correction Factor to be applied to Data at 20 Degrees C								
	0 °C	5 °C	10 °C	15 °C	20 °C	25 °C	30 °C	35 °C	40 °C
5 minutes to 59 minutes	0.8	0.86	0.91	0.96	1	1.037	1.063	1.085	1.1
1 Hour to 100 Hours	0.86	0.9	0.93	0.97	1	1.028	1.05	1.063	1.07

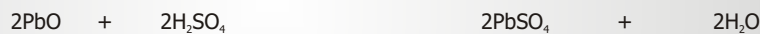
CHEMICAL REACTION- The chemical reaction for the Discharge / Recharge process is represented by the following formula:



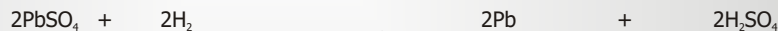
Under normal float charge conditions the oxygen passes through the separator from the positive to the negative plate where it reacts with the negative active material to form lead oxide.



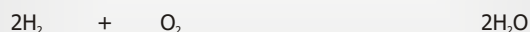
In the acid conditions the lead oxide reacts with the sulfuric acid to form lead sulphate.



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



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



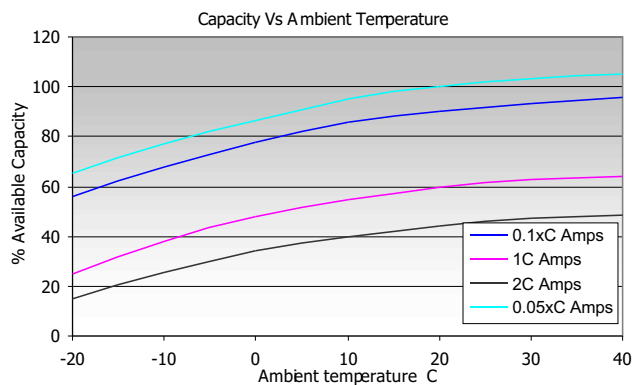
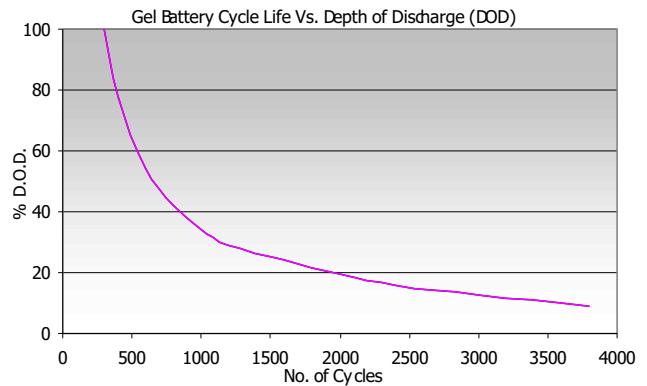
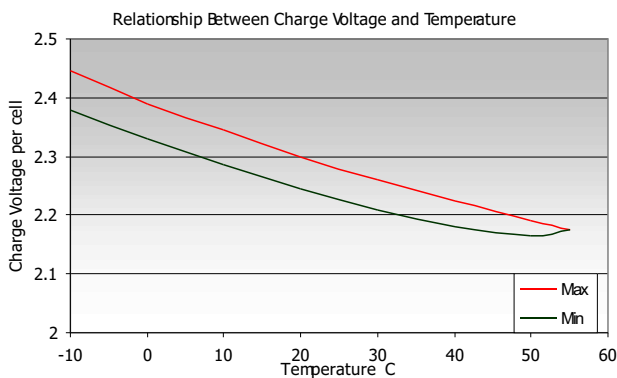
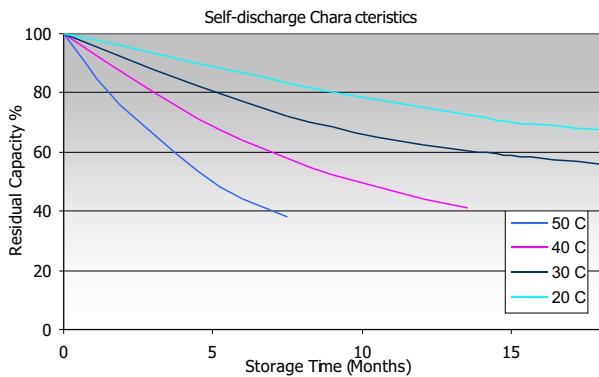
This reaction summarises what is meant by GAS RECOMBINATION. The process can never be 100% efficient, normal recombination efficiency is 95 - 99%.

Features - Designed to meet the future needs of the Tele-communications industry for - mobile, wired, access, transmission, switching, integrated power applications etc.
Resulting in the following benefits to the customer:

- Compactness
- ETSI / 19" / 23" Integration
- Modularity
- Rackable Standard component
- Long life
- Use under extreme conditions
- High power volume ratio
- Maintenance free utilising VRLA technology
- Low Installation costs
- Front Connections and terminal access
- Long Design Life - 12 years
- Rope handles on 100Ah upwards
- Central gassing system and hinged front covers on all models
- Integral flame arrestor
- Low Internal resistance
- Recyclable lead and plastics
- Designed to meet BELLCORE recommendations
- Utilising Gel technology
- Excellent Cycling ability
- Low self discharge rates

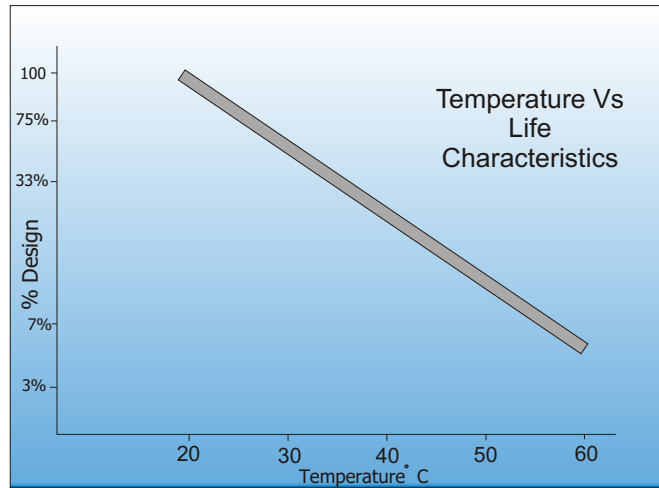
Specifications

Nominal Voltage	12 Volts
Design Life	12 Years
Operating Temperature	-20 °C to 50 °C
Grid alloy	Calcium / Tin lead alloy
Plates	Flat Pasted
Separator	Gel - Microporous Duroplastic AGM - 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 2.4 @20 °C Max. 2.4 VPC Max ripple 0.05C (A)
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	Epoxy sealed by extended mechanical paths
Torque setting	The recommended torque value is 5-7 Nm
Connectors	Supplied as standard



Battery Model	Qty Per Box	Dimensions (mm) & approx weight (kg)				Dimensions (Inches) & approx weight (Lbs)				Terminal Layout	Internal Resistance mOhms	Maximum Charge Current
		Length	Width	Height	Weight	Length	Width	Height	Weight			
HZB12-55FA	1	277	105	223	18.4	10.91	4.13	8.78	40.7	M6	4.5	15
HZB12-80FA	1	563	114	182	26.0	22.17	4.49	7.17	57.5	M6	4.4	20
HZB12-95FA	1	507	109	227	30.0	19.96	4.29	8.94	66.3	M6	4.3	25
HZB12-95FA-2	1	396	105	258	27.4	15.59	4.13	10.16	60.6	M6	3.9	25
HZB12-100FA	1	395	110	285	32.6	15.55	4.33	11.22	72.0	M6	3.5	30
HZB12-125FA	1	417	172	240	45.3	16.42	6.77	9.45	100.1	M6	3.4	35
HZB12-150FA	1	550	109	288	48.3	21.65	4.29	11.34	106.7	M6	3.2	40
HZB12-180FA	1	560	125	320	59.5	22.05	4.92	12.60	131.5	M8	3.1	45
HZY12-50FA	1	277	105	223	18.2	10.91	4.13	8.78	40.2	M6	4.5	15
HZY12-70FA	1	563	114	182	28.9	22.17	4.49	7.17	63.9	M6	4.1	20
HZY12-90FA	1	507	109	227	32.0	19.96	4.29	8.94	70.7	M6	3.7	25
HZY12-100FA	1	395	110	285	33.2	15.55	4.33	11.22	73.4	M6	3.4	30
HZY12-125FA	1	417	172	240	46.0	16.42	6.77	9.45	101.7	M6	3.3	35
HZY12-150FA	1	550	109	288	48.0	21.65	4.29	11.34	106.1	M6	3.1	40
HZY12-170FA	1	560	125	320	59.0	22.05	4.92	12.60	130.4	M8	2.9	45

The graph shows extrapolated Service Life condition for Haze batteries at different ambient temperatures. Clearly higher ambient temperatures will reduce service life.



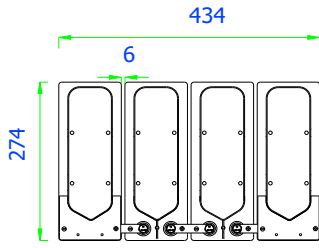
Temperature	Shelf Life
0 °C - 20 °C (32 °F - 68 °F)	12 Months
21 °C - 30 °C (69 °F - 86 °F)	9 Months
31 °C - 40 °C (87 °F - 104 °F)	5 Months
41 °C - 50 °C (105 °F - 1122 °F)	2.5 Months

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

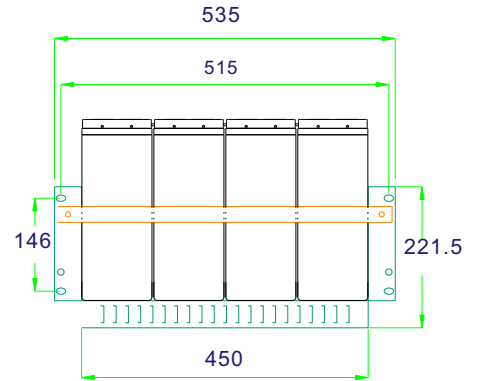
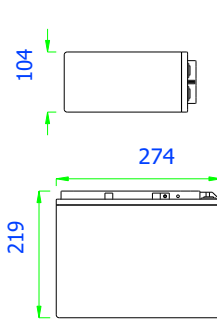
CHARGING CHARACTERISTICS

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.

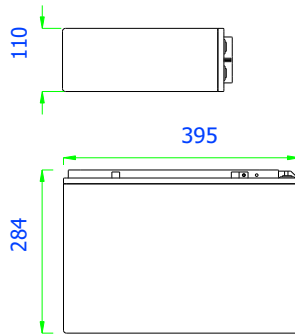
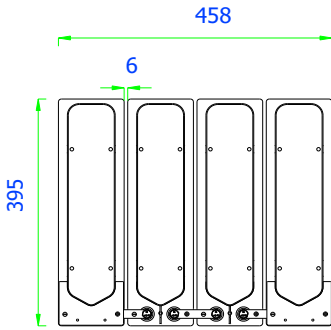
The most suitable charging method for battery life and performance is the constant voltage method with a limited initial current, usually limited to a maximum of $C_{20}/4$.



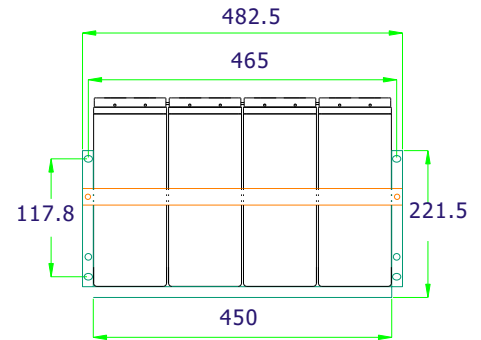
12 50 Front Access



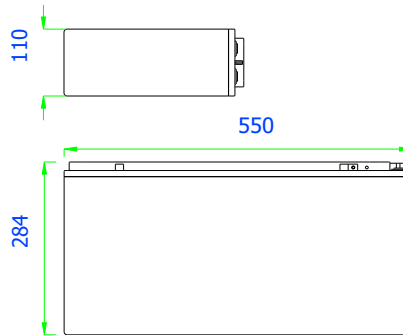
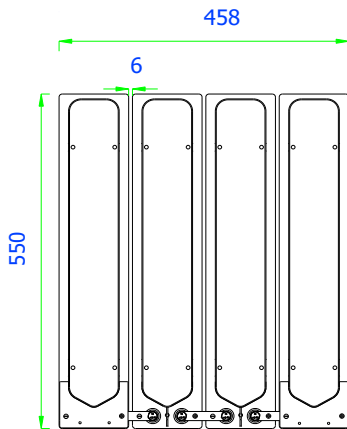
300mm Deep ETSI tray



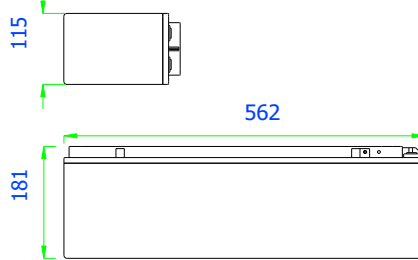
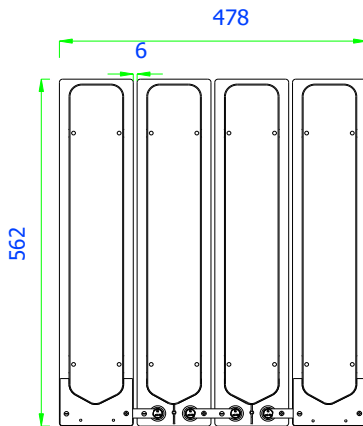
12 100 Front Access



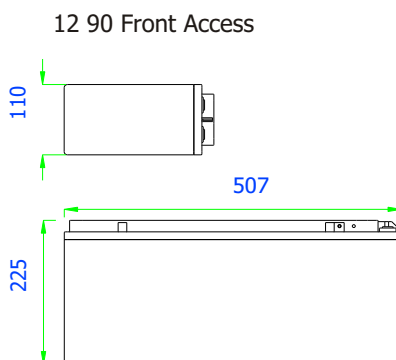
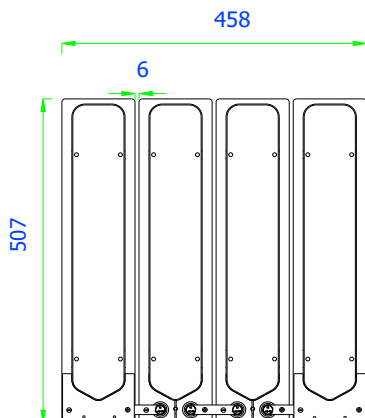
300mm deep 19 inch tray



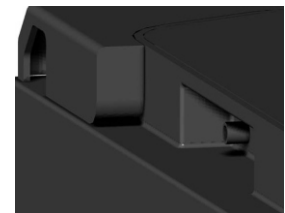
12 150 Front Access



12 70 Front Access



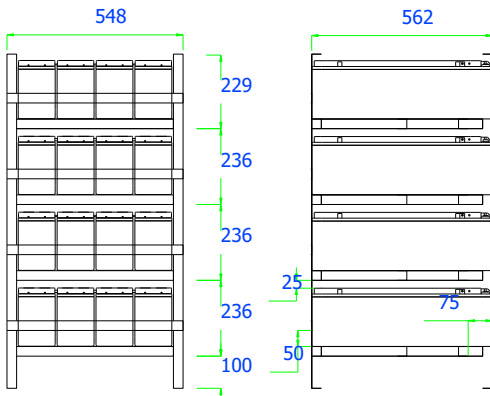
12 90 Front Access



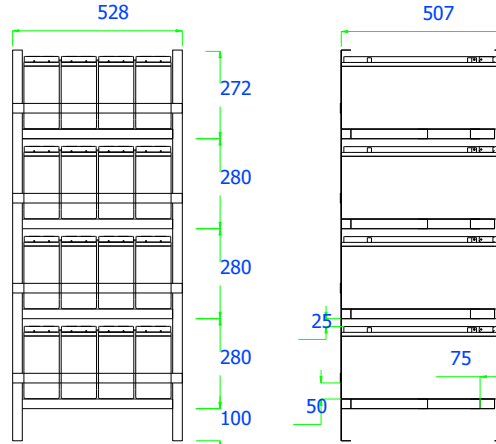
Central Gassing - Haze produce all models with an integral central gassing system. This system is a useful feature when batteries are installed in an IP66 cabinet. Sealed enclosures prevent any escaping gas from exiting, central gassing however allows a tube carrying the emissions to pass through a seal to atmosphere.



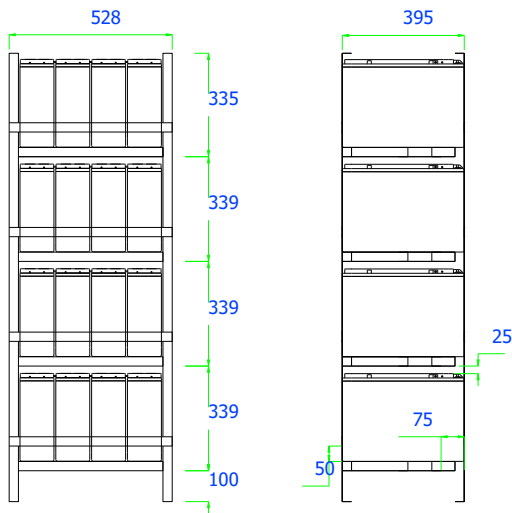
A 90 degree angle bracket can be provided for the end cell terminal connection



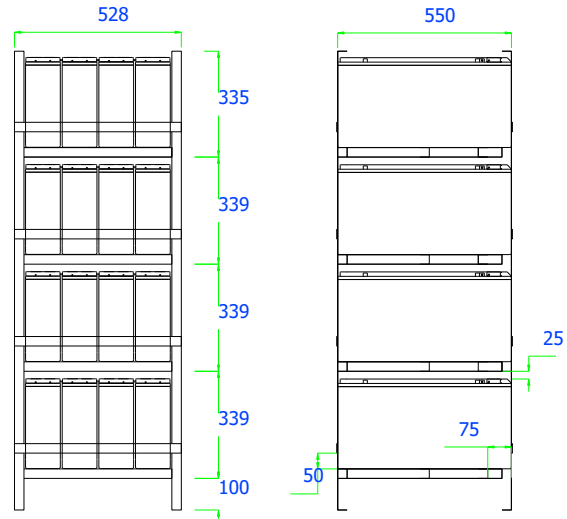
12V 70 FA



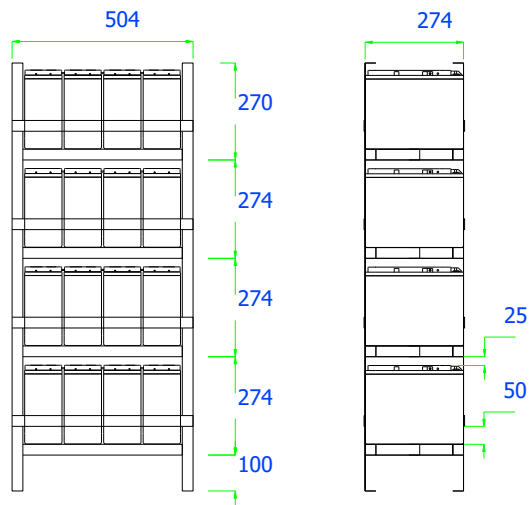
12V 90 FA



12V 100 FA



12V 150 FA



12V 50 FA

As can be seen from the rack diagrams, the Haze Front Access range are compatible with ETSI and standard 19" and 23" rack configurations, only the HZB/HZY 12 70FA can not be used in the standard ETSI and 19" formats. 300mm or 600mm deep trays can be utilised.

Other racking configurations can be tailored to meet the customers needs for a new installation or indeed to replace an existing arrangement utilising the same footprint.

The Front Access design allows racking clearances to be reduced whilst still allowing easy access for intercell connection and terminal inspectio, all resulting in time and cost savings.

With reduced space requirements the designer has the option of smaller cabinets or more power from the same foot print.



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VRLA Product Range

- 4, 6 & 12 Volt AGM 1.3 to 230AH
- 6 & 12 Volt Gel 7.5 to 230AH
- 12 Volt Front Access AGM
- 12 Volt Front Access Gel
- 2 Volt AGM & Gel 50 to 3850AH
 - EV Gel
 - EV AGM
 - Marine Gel
 - Solar