Industrial Batteries Australia

FORKLIFT BATTERY MANUAL

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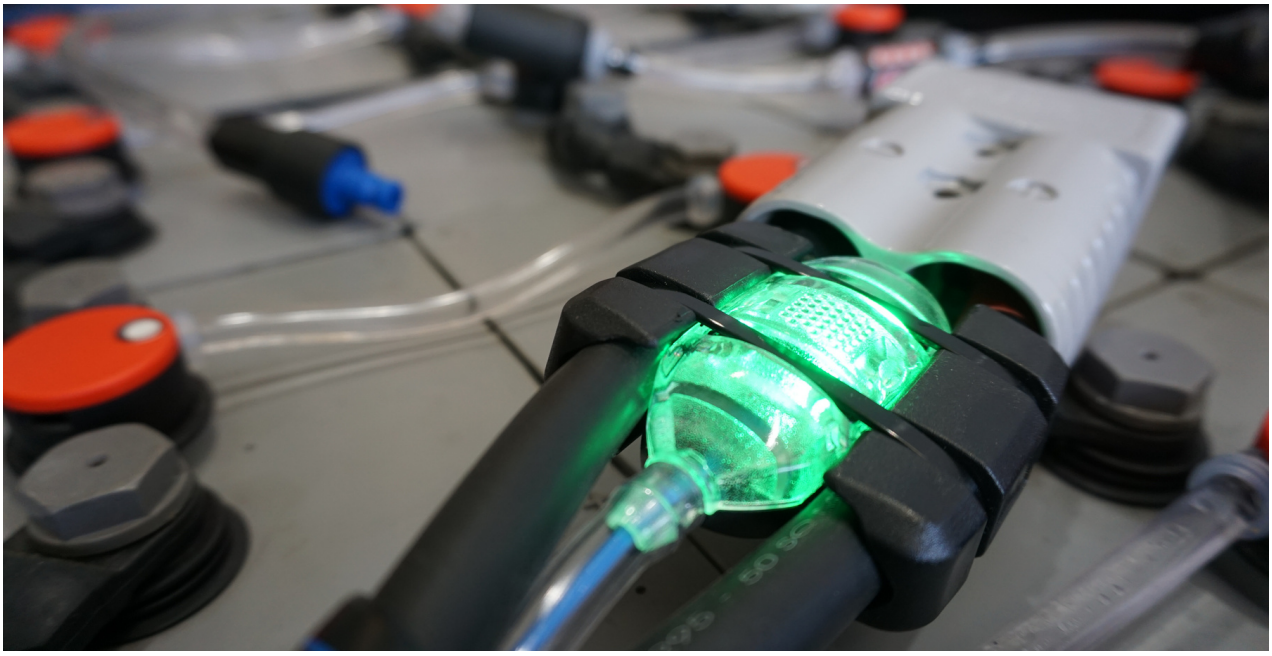

Introduction

Thank you for choosing a quality Forklift Battery from INDUSTRIAL BATTERIES AUSTRALIA.

The battery must also be correctly maintained and used in accordance with this Instruction Manual and the recorded data made available to Industrial Batteries Australia upon request.

Upon receipt of your forklift battery, please ensure you read these instructions prior to use.

Note: Ensure safety, maintenance and operating procedures are understood prior to battery handling.

The IBA range of forklift batteries are rated in accordance with AS 2402-1994. Your new battery may require 10 full cycles before the rated capacity achieved.

Contents

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1 Read Before First Use

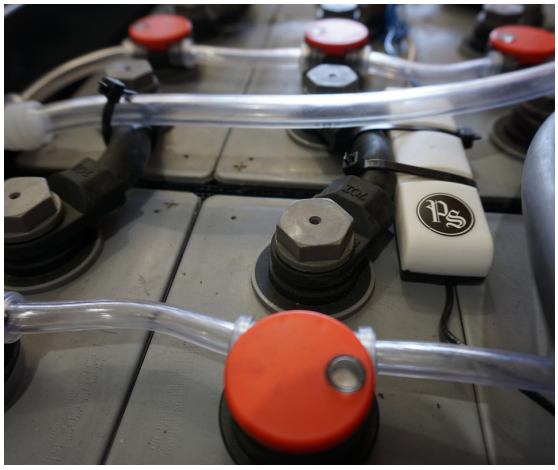
The battery should be inspected to ensure it is in perfect physical condition.

The charger cables must be connected to ensure a good contact, taking care that the polarity is correct. Otherwise the battery, vehicle or charger could be damaged.

The specified torque loading for the post screws of the charger cables and connectors is: 20 + 1 Nm

The level of the electrolyte must be checked. If it is below the pole bridge it must first be topped up to this height with clean or purified water.

The battery is then charged as in item 2.2.



2 Safety Precautions

Safety requirements according to AS2149

- Ignoring the operation instructions, repair with non-original parts or using additives for the electrolyte will render the warranty void.
- Repairs should only be performed by a qualified Industrial Batteries Australia technician.
- Maintenance should only be performed by suitably trained personnel.
- The battery electrolyte contains sulphuric acid. In the event of acid contact with skin, eyes, or clothing flush with water immediately. If swallowed, do not induce vomiting. Drink a glass of water and seek medical attention immediately.
- When handling acid, always wear rubber gloves with eye goggles or a face shield. Do not tilt battery. If mixing electrolyte, always add acid to water, not water to acid. If sulphuric acid or electrolyte is spilled, neutralise with a spill kit or soda ash and water.
- Batteries may contain explosive gases. Combustible gases are produced during the charging process. Only charge in a well ventilated area. Keep the area free of all flames and sparks. Display warning signs clearly nearby. Do not pull out the charging plugs during charging as this may cause sparks.
- Batteries store electricity which can spark or shock.
- Never use a metal container when topping up a battery's electrolyte.
- Never drop or place spanners or other metal objects on top of batteries.
- Ensure any static electricity has dissipated before carrying out work or repairs on the battery.
- Keep vent caps secured tightly and level.
- Batteries are heavy. Pay careful attention to lifting and handling heavy batteries. Use lifting equipment wherever possible. Do not tilt the battery.

Observe operating instructions and affix close within sight of the battery! Work on batteries under instructions of skilled personnel!

Smoking prohibited! Do not expose battery to open flame glowing fire or sparks as explosion & fire hazard exists!

Explosion and fire hazard, avoid short circuits! Caution! Metal parts of the battery cells are always live, do not place items or tools on the battery!

When working on batteries wear protective glasses and clothing!

Acid splashes in the eyes or on the skin must be washed out or off with plenty of water.Then see a doctor immediately. Acid on clothing should be washed out with water!

Observe operating instructions and affix close within sight of the battery! Work on batteries under instructions of skilled personnel!

Monobolic batteries/cells are very heavy! Ensure secure installation! Only use suitable transport equipment!

Dangerous voltage!

Spent batteries must be collected separately and recycled

3 Operation

Discharging

Be sure that all breather holes are not sealed or covered.

Electrical connections must only be made or broken in the open circuit condition to avoid sparks and explosion risks. To achieve the optimum life for the battery, operating discharges of more than 80% of the rated capacity should be avoided (deep discharge). Discharged batteries must be recharged immediately and must not be left discharged. This also applies to partially discharged batteries

Charging

Only direct current must be used for charging. Only connect the battery assigned to a charger, suitable for the size of battery, in order to avoid overloading of the electric cables and contacts, unacceptable gassing and the escape of electrolyte from the cells.

If the charger was not purchased together with the battery it is best to have its suitability checked by the charger manufacturers service department.

When charging, proper provision must be made for venting of the charging gases, accordingly to AS2402.1.2. Battery container lids and the covers of battery compartments must be opened or removed.

The vent plugs should stay on the cells and remain closed. With the charger switched off connect up the battery, ensuring that the polarity is correct. (positive to positive, negative to negative).

Now switch on the charger. When charging the temperature of the electrolyte rises by about 10°C, so charging should only begin if the electrolyte temperature is below 45°C.

The electrolyte temperature of batteries should be at least + 10°C before charging otherwise a full charge will not be achieved.

A charge is finished when the specific gravity of the electrolyte and the battery voltage have remained constant for two hours.

Equalising Charge

Equalising charges are used to safeguard the life of the battery and to maintain its capacity. They are necessary after deep discharges, repeated incomplete recharges and once a week in case of charges to an IU characteristic curve. Equalising charges are carried out following normal charging. The charging current must not exceed 5 A/100 Ah of rated capacity (end of charge- see point 2.2). The temperature may not exceed 55°C!

The Forklift Battery is the "heart" of your Electric Forklift – you need the very best Battery care and maintenance to ensure long term and sustained power for your Electric Forklift.

Temperature

An electrolyte temperature of 30°C is specified as the rated temperature. Higher temperatures shorten the life of the battery, lower temperatures reduce the capacity available. 55°C is the upper temperature limit and is not acceptable as an operating temperature.

Electrolyte

The rated specific gravity (S. G.) of the electrolyte is related to a temperature of 30°C and the nominal electrolyte level in the cell in fully charged condition. Higher temperatures reduce the specified gravity of the electrolyte, lower temperatures increase it. The temperature correction factor is - 0.0007 kg/l per °C, e.g. an electrolyte specific gravity of 1.28 kg/l at 45°C corresponds to an S.G. of 1.29 kg/l at 30°C.

4 Maintenance

Daily

Charge the battery after every discharge. At the end of charge the electrolyte level should be checked and if necessary topped up to the specified level with clean or purified water. The electrolyte level must not fall below pole bridge.

Water refilling system

Optional water refilling system built on batteries is used to automatically maintain the nominal electrolyte levels. The battery should
be topped up at the completion of a full charge with water and the conductance below 30µS/cm. The battery should be connected to the filling system at least once a week. In multiple shift and warm ambient temperature operations, it may be necessary to have shorter-daily topping up intervals. In winter, batteries fitted with Automaticsystem should only be charged or refilled in a room temperature above 0°C.

For proper water pressure and optimal system operation, the water tank must be located from 2 to 6 m above the upper edge of the battery (0,2 to 0,6 bar). The top up process takes a few minutes and can vary according to the battery range. The valve in each cell allows the flow of water into cell and the float closes the valve when the correct water level has been reached. A flow indicator built into the water supply pipe to the battery monitors the filling process. During filling the water flow causes the flow indicator to turn.

When all the plugs are closed the indicator shows, that the filling pro-cess is complete, the water supply to the battery should be turned off.

Weekly

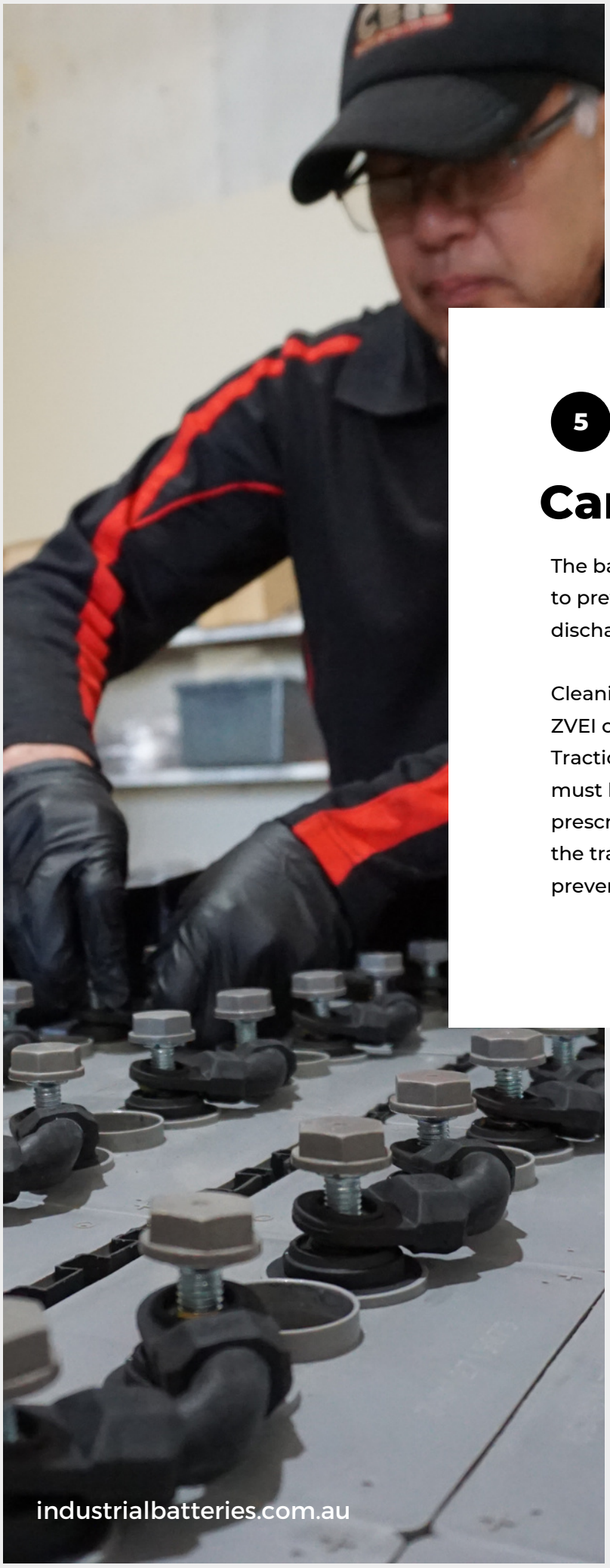
Visual inspection after recharging for signs of dirt and mechanical damage(point 4). If the battery is charged regularly with a IU characteristic curve an equalising charge must be carried out (see point 2.3).

Monthly

At the end of the charge the voltages of all cells or bloc batteries should be measured with the charger switched on and recorded. After charging has ended the specific gravity and the temperature of the electrolyte in all cells should be measured and recorded.

If significant changes from earlier measurements or differences between the cells or bloc batteries are found further testing and maintenance by the service department should be requested.

Regularly clean integrated water filter!
The system installed by the producer should not be modified in any way.



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Care of Battery

The battery should always be kept clean and dry to prevent tracking currents to avoid self discharging and explosion risks.

Cleaning must be done in accordance with the ZVEI code of practice “The Cleaning of Vehicle Traction batteries”. Any liquid in the battery tray must be extracted and disposed of in the prescribed manner. Damage to the insulation of the tray should be repaired after cleaning to prevent tray corrosion.

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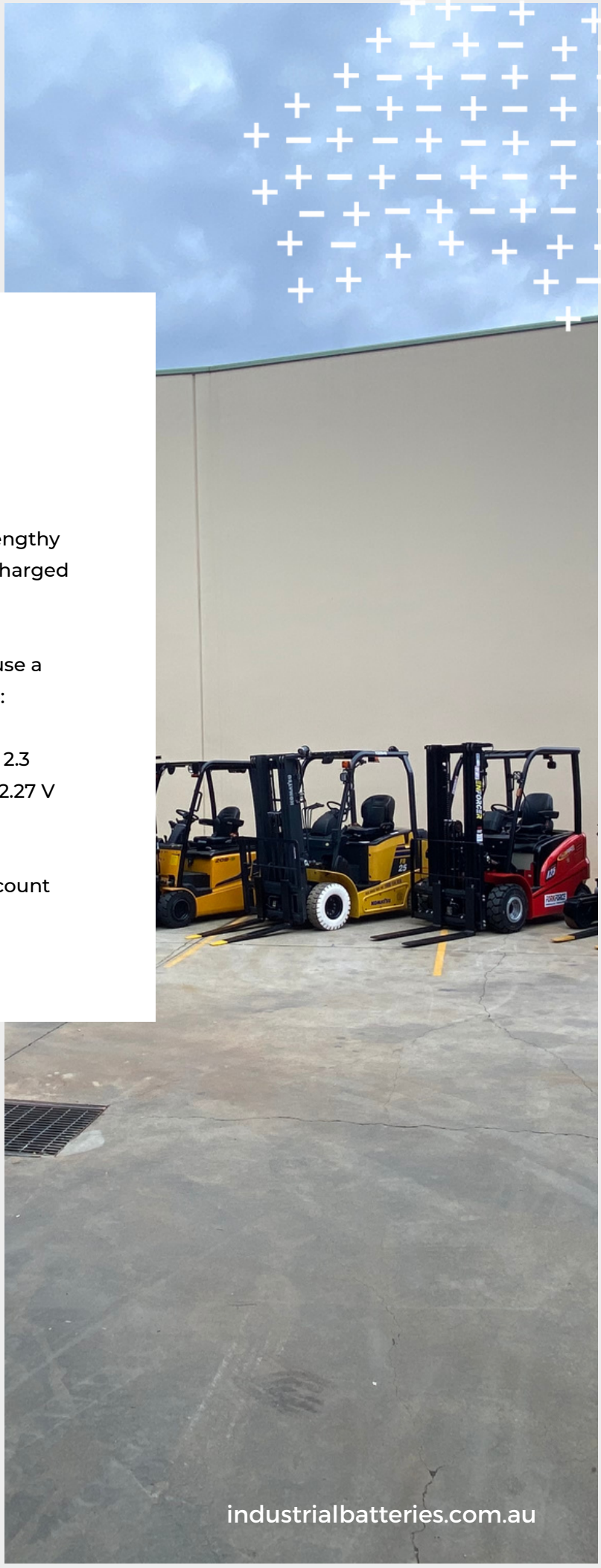
Storage

If batteries are taken out of service for a lengthy period they should be stored in the fully charged condition in a dry, frost-free room.

To ensure the battery is always ready for use a choice of charging methods can be made:

1. A monthly equalising charge as in point 2.3
2. Float charging at a charging voltage of 2.27 V x the number of cells.

The storage time should be taken into account when considering the life of the battery.



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Electrolyte circulation system

This optional system is recommended for heavy duty use, short charge times, boost or opportunity charging and in high ambient temperatures. The system reduces water consumption, working temperatures and a charge factor, prevents the stratification of the electrolyte and reduces charging time.

The principle of the electrolyte circulation system is based on pumping of air into the each battery cell which creates a circulating air stream inside the cell box.

The charge plug with integrated air supply automatically supplies air to the battery pipe system after connecting to the charger designed for electrolyte circulation.

For optimised operation the pump should supply pressure around 0,2 bar and air flow 60 litres/cell,hour. Before initial operation of battery with electrolyte circulation system make a visual examination of the electrolyte surfaces of all cells for movement and rising air bubbles during running the air pump.

At least once a year, the pump air filter must be changed. In work areas with high level of air pollution, the filter should be checked and replaced more frequently to assure proper air circulation.

Notes:

FORKLIFT BATTERY + CHARGER CARE

DO

- Top up battery ONCE weekly with clean water, always AFTER charging
- Keep sparks, flames and other ignition sources away at all times
- Ensure the Charger is turned off prior to disconnecting the battery
- Be sure battery charging is carried out in a well ventilated area
- Check battery leads and plugs regularly
- It is best to charge your battery at night. This allows suitable cool down period after charging.

Your forklift battery is the fuel tank of your electric forklift. Proper maintenance and procedures will ensure many years of trouble free usage and maximise battery life expectancy

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FORKLIFT BATTERY + CHARGER CARE

DON'T

- Do not opportunity charge the battery (ie. During daytime breaks) except when using our specialised IBA Smart Opportunity / Rapid / Fast Charger range.
- Do not fill battery with water prior to charging
- Do not remove battery from the charger without first turning the charger off.
- Do not excessively charge your battery. Optimum battery time is when battery is at 25% SOC
- Do not over-discharge your battery
- Do not attempt to repair your forklift battery. Call an authorised repairer

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MAINTENANCE LOG

Month..... Year.....

Weekly pilot cell reading

Before Charge		After Charge		
Density	Temperature	Density	Temperature	Water (L)
week 1				
week 2				
week 3				
week 4				
week 5				

MAINTENANCE LOG

Monthly full readings (after equalising)

Cell No.	Density	On Charge Volts	Cell No.	Density	On Charge Volts
1			16		
2			17		
3			18		
4			19		
5			20		
6			21		
7			22		
8			23		
9			24		
10			25		
11			26		
12			27		
13			28		
14			29		
15			30		

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National branches

NSW: 2/19 Davis Rd, Wetherill Park NSW 2164 (Head Office)

VIC branch: 8 Luisa Avenue, Dandenong South, 3175

QLD branch: Unit 1/69, Selhurst St, Coopers Plains QLD 4108

WA branch: 1/6 McDermott St, Welshpool WA 6106

SA branch: 5 George St, Wingfield SA 5013

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