

Activation of Dry Charged Batteries

Dry charged batteries need to be activated correctly to ensure a long and reliable service life. The information below outlines the steps which must be followed in the activation process.

1. Ensure you are wearing correct PPE equipment. Inspect the battery for any physical damage. Keep sparks and flames away from the battery at all times.
2. Where applicable, remove the stickers from the top of the vent caps. This exposes a small hole and will allow the battery to 'breathe' freely when in service.
3. Remove vent caps, fill each cell to the correct level with approved battery grade electrolyte.
4. Allow electrolyte to saturate plates and separators for a minimum of 30 minutes. Add electrolyte to the cells if required. The electrolyte will bubble and temperature of the battery will increase as it activates. Do not begin charging if the battery temperature exceeds 45°C - you must wait until it falls below 45°C before proceeding. **See note below regarding temperature monitoring.**
5. Check the battery polarity with a voltmeter for correct polarity.
6. Place the battery on charge at a rate of C/20 (e.g. 100Ah÷20=5A). If the charger in use has adjustable voltage, refer to the voltage table on the last page for the correct temperature compensated charge and float voltage.
7. If the battery temperature remains below 45°C and does not gas in the first 60 minutes of charging, you can increase the charge rate to C/10 (e.g. 100Ah÷10=10A) if required. If the battery temperature exceeds 45°C, or if the cells begin to gas vigorously, stop charging and allow the battery to rest 1-2 hours before charging again.
8. Continue charging until the electrolyte in the cells is within .005 points of the specific gravity (Sg) of the filling electrolyte (e.g. 1.270 or greater if fill electrolyte was 1.275)
9. Add or remove electrolyte as necessary to achieve the correct level in each cell. This completes the battery activation process. Going forward, the battery should now only be topped up with distilled water.
10. Replace vent caps and remove any spillage of electrolyte. If necessary clean battery with water and wipe dry with a cotton cloth or paper towel. **Do not use a synthetic or microfibre cloth to clean the battery as the static electricity generated can cause a spark.**

Temperature Monitoring

A quick and easy way to check the battery temperature is to use an infrared (non-contact) thermometer. Most branches should have one of these as they were used for COVID temperature monitoring. Infrared thermometers are available from tool stores or Jaycar Electronics for around \$50. If you do not have a thermometer available, the battery should feel no warmer than body temperature before charging.

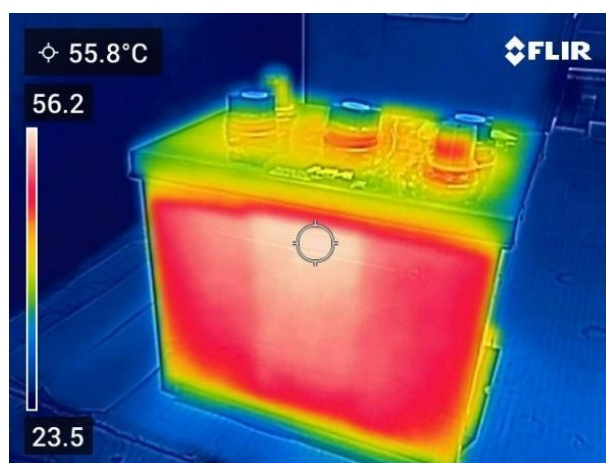
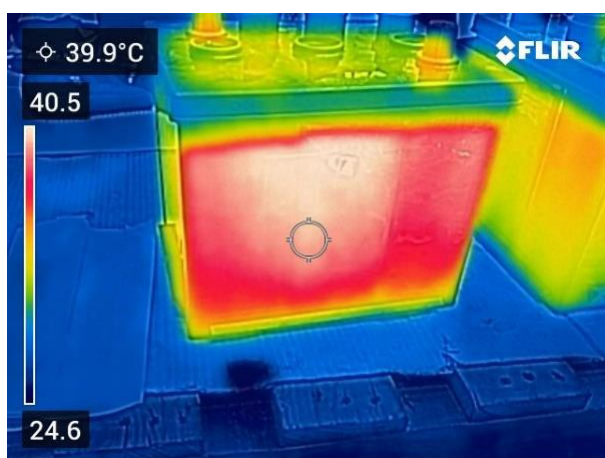
The shelf life of a dry charge battery will vary, but may be kept for several years under ideal conditions. Store in a cool dry area. The positive plate has an unlimited shelf life. The negative plate will revert to lead oxide when in the presence of moisture and oxygen. If this should happen, the battery is not ruined however activation will take considerably longer.

Before installing a battery, the contact surfaces of the battery post and terminal must be cleaned with a wire brush.

A Real World Example

The activation of dry charged batteries is not a process which cannot be rushed. To help illustrate the process, 2 x N12D (105Ah) batteries were activated at the Doveton Branch. The ambient temperature at the time of filling was approx. 22°C. Infrared images were taken to show the temperature profile during activation.

This first image (below left) was taken at 11:00am, which was 30 minutes after the batteries had been filled. The maximum temperature recorded was 40.5°C.



The second image (above right) was taken at 12:30pm. This is now two hours after the batteries were filled. The maximum temperature recorded had increased to just over 56°C.

The peak ambient temperature in the afternoon was 30°C. It took until 3:45pm (more than 5 hours) before the batteries were cool enough to begin charging. The two batteries were connected in series and charged at 4A using a 12V multistage charger. They continued to cool down until charging was stopped at 5:30pm. Charging resumed the following morning.

Charge & Float Voltage for Lead Acid Batteries

Flooded		0°C	10°C	20°C	25°C	30°C	40°C
2V	Charge	2.63	2.55	2.53	2.50	2.48	2.41
	Float	2.38	2.30	2.28	2.25	2.23	2.16
6V	Charge	7.89	7.65	7.59	7.50	7.44	7.23
	Float	7.14	6.90	6.84	6.75	6.69	6.48
12V	Charge	15.78	15.30	15.18	15.00	14.88	14.46
	Float	14.28	13.80	13.68	13.50	13.38	12.96
24V	Charge	31.56	30.60	30.36	30.00	29.76	28.92
	Float	28.56	27.60	27.36	27.00	26.76	25.92
48V	Charge	63.12	61.20	60.72	60.00	59.52	57.84
	Float	57.12	55.20	54.72	54.00	53.52	51.84

AGM		0°C	10°C	20°C	25°C	30°C	40°C
2V	Charge	2.55	2.51	2.48	2.45	2.42	2.39
	Float	2.40	2.36	2.32	2.30	2.28	2.24
6V	Charge	7.65	7.53	7.42	7.35	7.27	7.17
	Float	7.20	7.08	6.97	6.90	6.84	6.72
12V	Charge	15.30	15.06	14.84	14.70	14.55	14.34
	Float	14.40	14.16	13.94	13.80	13.68	13.44
24V	Charge	30.60	30.12	29.69	29.40	29.10	28.68
	Float	28.80	28.32	27.89	27.60	27.36	26.88
48V	Charge	61.20	60.24	59.38	58.80	58.20	57.36
	Float	57.60	56.64	55.78	55.20	54.62	53.76