

ReGenPro Ni-Cd batteries

Types RGP-M & RGP-L

Installation and operations instructions

Important recommendations

- **WARNING: Risk of fire, explosion, or burns. Do not disassemble, heat above 70°C, or incinerate.**
- **Never smoke while performing any operation on the battery.**
- **For protection, wear rubber gloves, long sleeves and appropriate splash goggles or face shield.**
- **The electrolyte is harmful to skin and eyes. In the event of contact with skin or eyes, wash immediately with plenty of water. If eyes are affected, flush with water, and obtain immediate medical attention.**
- **Remove all rings, watches and other items with metal parts before working on the battery.**
- **Use insulated tools.**
- **Avoid static electricity and take measurements for protection against electric shocks.**
- **Discharge any possible static electricity from clothing and/or tools by touching an earth-connected part "ground" before working on the battery.**
- **Ventilation, in accordance with the IEC 62485-2 and EN 50272-2 standard, is mandatory during commissioning and operation.**
- **Before commissioning remove vent cap using vent opener, take out the transit seal (yellow sheet) permanently and re-fix the vent cap.**

1. Receiving the shipment

Upon receipt of the goods, any transportation damage, electrolyte spillage or irregularities must be reported to the carrier and to Saft India. The battery is shipped filled and charged and is ready for immediate use. Storage of cells must not exceed the maximum storage time indicated in this document.

2. Storage

The battery must be stored in a dry indoor location, on open, well ventilated shelves away from direct sunlight between 0°C and +30°C (+32°F and 86°F).

ReGenPro batteries are supplied filled with electrolyte and charged condition. They can be stored in this condition for maximum 24 months from date of shipment in accordance with the recommendations set forth in this I&O manual. Storage of a filled battery at temperatures above +30°C (+86°F) can result in permanent change and loss of product performance, depending on the duration of the storage above the maximum recommended temperature. Never drain the electrolyte from the cells.

To ensure maximum protection of the cells always store the product in its original packaging.

3. Installation

3.1. Location

Install the battery in a dry and clean room. Avoid direct sunlight and heat. The battery will give the best performance and maximum service life when operating temperature is between +10°C to +30°C (+50°F to +86°F).

3.2. Mounting

Verify that cells are correctly interconnected with the appropriate polarity and with the connectors are correctly torque. Connections between the battery and the load shall be made with nickel plated cable lugs. Tightening torque for the terminals must be:

- M10 = 12 – 15 N m (105 - 135 lbf.in)
- M20 = 31 – 34 N m (275 - 305 lbf.in)

The connectors and terminals should be corrosion-protected by coating with a thin layer of anti-corrosion oil or DW 33 / DW 330.

3.3. Ventilation

During operation the battery emits an amount of gas mixture (oxygen and hydrogen). Ventilation inside the battery room must be adequately managed, comply with IEC 62485-2 and local regulations.

3.4. Electrolyte

As ReGenPro cells are delivered filled and charged condition, check for spillage. If spillage is noticed, the spilled cells must be refilled with TYPE-2 Electrolyte (Density 1.22 ± 0.01 kg/l) only to the same level as the other cells in the string.



RGP-M and RGP-L ranges

When checking electrolyte levels, a fluctuation in level between cells is normal. This is caused by a small difference in internal pressure in each cell. Normally there is no need to adjust the electrolyte to same visual level.

Do not top-up cells prior to an initial charge. After commissioning, when the level is stabilized, the electrolyte level should be between the maximum mark and 5mm below.

4. Commissioning

Verify that ventilation, in accordance with the IEC 62485-2 or EN 50272-2 standard, is provided during commissioning operation.

A good commissioning is important. Charge at constant current during commissioning is preferable.

After successful commissioning, the battery will be put into service and to be charged according to Section 5.

Prior and during commissioning charge, record relevant battery data like, Individual Cell Voltage, Battery Voltage, Cell Temperature and Charging current is mandatory in the commissioning report.

• Cells stored up to 6 months:

A commissioning charge is not mandatory and the cells are ready for immediate use. However, the product's full performance will only be achievable after completion of the procedures dedicated to 'Constant Current charge' under 'Cells stored more than 6 months and up to 2 years', refer to Section 4.

• Commissioning at ambient temperature between + 10°C to + 30°C (+ 50°F to + 86°F)

- Constant Current charge:

- 10 hours at 0.2 C₅ A OR
- 20 hours at 0.1 C₅ A is recommended.

Block battery Ni-Cd range

Notice: At the end of charge, the cell voltage may reach about 1.80 V, thus the charger shall be able to supply such a voltage.

When the charger maximum voltage setting is too low to supply constant current charging, divide the battery into two parts to be charged individually at constant current.

• **Constant Potential charge:**

1.55 V/Cell for a minimum of 30 hours with current limit of 0.2 C₅ A.
 If this voltage level is not available, contact Saft team for an appropriate charge procedure.

• **Commissioning at ambient temperature above +30°C (+ 86°F)**

- **Only constant current charge for:**

- 10 hours at 0.2 C₅ A OR
- 20 hours at 0.1 C₅ A is recommended

The temperature of battery container is to be monitored during charge. If the temperature exceeds + 45°C (+113°F) during charging, then it must be stopped to reduce the temperature.

The charging can be resumed when battery container temperature drops below + 40°C (+ 104°F).

Capacity Testing:

In case Capacity testing is to be performed at Site, then testing to be done in accordance with IEC 62259 section 7 (7.1 & 7.2).

5. Charging in service

The recommended charging voltages for continuous parallel operation, with occasional The recommended charging voltages for continuous parallel operation, with occasional battery discharges, are:

Two level charge:

- Float level:
1.42 ± 0.01 V/Cell with charge current limited to 0.1 C₅ A

- High rate or Boost level:
1.45 ± 0.01 V/Cell with charge current limited to 0.1 C₅ A

Single level charge:

1.42 ± 0.01 V/Cell

During normal operation of ReGenPro batteries constant voltage (CV) charging with current limit at 0.1 C₅ A is recommended. Charging with current limit 0.2 C₅ A will increase the maintenance of the battery bank and may result non-compliance of product features. To achieve maintenance-free operation (in term of water topping-up), it is necessary to control the charge input to the battery to minimize water consumption during the entire life of the battery. Temperature Compensated Voltage (TCV) is generally mandatory. The conditions to apply TCV depend on charge voltage and ambient operating temperature. 1.42V/Cell: TCV is mandatory from -20°C to +40°C (-4°F to +104°F) as mentioned in Section-7.

6. Preventive maintenance

ReGenPro is Ultra-Low Maintenance Ni-Cd battery under the recommended operating conditions, from -20°C (+4°F) to +40°C (+104°F) and requires majorly preventive maintenance as per IEEE 1106 - 2015.

Best practices include keeping the battery clean using only water. Dry the battery after cleaning.

Individual cell and total battery charge voltage must be checked and recorded once per year. Individual cells with voltages measured below 1.30 V during float charge must receive corrective action.

Under normal operating conditions the topping up requirement is minimum. Saft India recommend at least one time top up during the calendar life. In case of increased water consumption due to site conditions, the electrolyte level is visible from the outside and can be adjusted accordingly.

If visual check from the outside is not possible, a level testing tube can be used to check the electrolyte level.

Never let the level fall below the minimum level mark. Use only distilled or de-ionized water as per BIS/IS: 1069 standard to top-up. Topping up of the ReGenPro cells shall be carried out when battery is fully charged.

Changing or measuring the electrolyte specific gravity is not required.

The connectors and terminals should be corrosion-protected by coating with a thin layer of anti-corrosion oil.

To maximize the topping-up interval check the charging voltage and adjust as required.

7. Temperature Effect

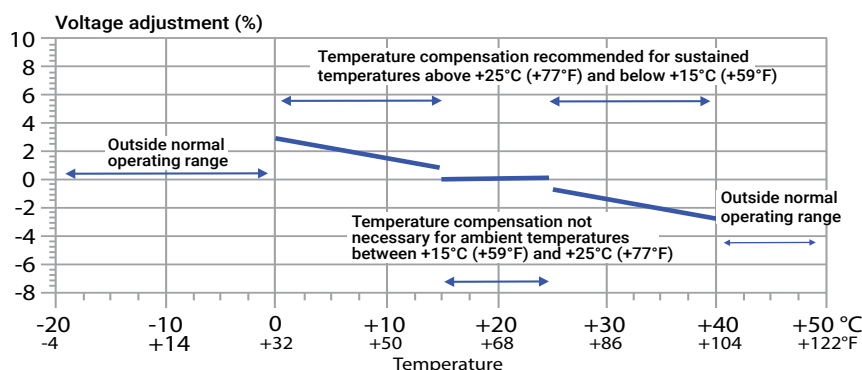
As the temperature increases the electrochemical behaviour becomes more active and so, for the same floating voltage, the current increases. As the temperature is reduced then the reverse occurs.

Increasing the current increases the water loss and reducing the current creates the risk that the cell will not be sufficiently charged.

It is important to maintain the same current through the cell, it is necessary to modify the floating voltage as the temperature changes. The change in voltage required or "Temperature Compensation" value can be derived for ReGenPro RGP-M battery as -2mV/°C/cell (-1.1 mV/°F/cell).

Temperature Compensated Voltage (TCV), is not required for an operating temperature between +15°C to +25°C. However, for an operating temperature below +15°C and above +25°C, the float voltage must be compensated or adjusted from 1.42V/cell with reference to +20°C, based on temperature compensation value.

Block battery Ni-Cd range



8. Environment

To protect the environment all used batteries must be recycled. Contact your local Saft representative for further information.

9. DO's and DON'Ts

9.1. DO's

- **Do** installation and maintenance of the battery system by trained professionals only.
- **Do** follow site safety regulation and use proper personal protective equipment, while working on battery system.
- **Do** follow safety rules and maintenance procedure as per installation and operation guidelines.
- **Do** use isolator switch between Charger to Battery and between Battery to Load.
- **Do** use torque wrench for tightening cell terminal and terminal connections at specified values.
- **Do** periodically check battery charge voltage set in the charger to ensure Ultra-Low Maintenance features.
- **Do** ensure boost charging after DI water topup.

9.2. DON'Ts

- **Do not** expose the battery in direct sunlight or heat.
- **Do not** use wire or any hard brush to clean deposits on the inter cell connectors.
- **Do not** reverse connect the power cables at terminals.
- **Do not** connect damaged cell(s) or different capacities and makes cells in one battery bank.
- **Do not** use any chemicals liquids for cleaning the cells and battery components.
- **Do not** mix hydrometer, funnel etc. used in Lead Acid battery for Ni-Cd battery maintenance.
- **Do not** connect or disconnect any cell without isolating the battery bank from system.

10. Battery Racks

Based on contract terms, if supply of Battery Rack is in scope of Saft India, ReGenPro batteries shall be supplied with Standard racks with Step/Tier configurations.

Recommendation for Battery Rack commissioning (Unless specified otherwise in contract documents).

- Racks are designed and should be fitted at site as per General Arrangement Drawing (GAD).
- Ground clearance of minimum 200 mm is recommended.
- Racks should be placed with at least 600 mm clearance on all other 5-sides for easy maintenance or service.
- Cells shall be placed as mentioned in GAD for appropriate fitment of Inter-Cell connectors & Cables.
- Even in case, rack or cabinet is not in supply scope of Saft, it is recommended to maintain these parameters wherever possible for uninterrupted operations.