

Ni-Cd batteries Installation and operating instructions

For cells delivered before May 2012, use the Installation and operating instructions N° VTX4.1 April 2008

Important recommendations

- Never allow an exposed flame or spark near the batteries, particularly while charging.
- 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 measures for protection against electric shocks.
- Discharge any possible static electricity from clothing and/ or tools by touching an earthconnected part "ground" before working on the battery.

1. Receiving the shipment

Do not overturn the package. Check the packages and cells for transport damage.

The battery is shipped filled and charged, and is ready for immediate use.

2. Storage

Store the battery indoors in a dry, clean and cool location (0°C to +30°C/+ 32°F to + 86°F) and well ventilated space on open shelves.

Storage of a filled battery at temperatures above +30°C (+86°F) can result in loss of capacity.

This can be as much as 5% per 10°C (18°F) above +30°C (+86°F) per year.

Do not store in direct sunlight or expose to excessive heat.

Vantex batteries are supplied filled with electrolyte and charged, **they can be stored in this condition for maximum 24 months from date of shipment.**

Never drain the electrolyte from the cells.

Store without opening the boxes.

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 the ambient temperature is between +10°C to +30°C (+ 50°F to + 86°F).

3.2. Ventilation

During the last part of charging, the battery is emitting gases (oxygen and hydrogen mixture).

At normal float charge, the gas evolution is very small but some ventilation is necessary.

Note that special regulations for ventilation may be valid in your area depending on the application.

3.3. Mounting

Verify that cells are correctly interconnected with the appropriate polarity. The battery connection to load should be with nickel-plated cable lugs.

Recommended torques for terminal bolts are:

- M 6 = 11 ± 1,1 N.m (97.4 ± 9.8 lbf.in)
- M 8 = 20 ± 2 N.m (177.0 ± 17.7 lbf.in)
- M 10 = 30 ± 3 N.m (265.0 ± 26.6 lbf.in)

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

3.4. Electrolyte

When checking the electrolyte levels, a fluctuation in level between cells is not abnormal and is due to the different amounts of gas held in the separators of each cell. There is normally no need to adjust the electrolyte level except if the level is 30 mm below the minimum level mark due to spillage during transport. The cells have to be topped-up with E22 electrolyte.

Do not top-up prior to initial charge.

After commissioning, when the level is stabilized, it should be not less than 5 mm below the maximum level mark

4. Commissioning

Verify that the ventilation is adequate during this operation.

A good commissioning is important. Charge at constant current is preferable. If the current limit is lower than indicated in the table A, charge for a proportionally longer time.

■ Cells stored up to 6 months:

A commissioning charge is normally not required and the cells are ready for immediate use but the full performance will be available only after a long periode of charging in service (see section 7.3 charge acceptance of Technical manual).

VTX

Vantex Ni-Cd batteries New generation Type VTX 1 L and VTX 1 M

■ Cells stored more than 6 months and up to 2 years:

A commissioning charge is necessary:

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

- Constant current charge:

20 h at 0.1 C₅ A recommended (see Table A).

Notice: At the end of charge, the cell voltage will reach about 1.75 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 24 h after current limited to 0.1 C₅ A (see the current in Table A).

If these methods are not available, then charging may be carried out at lower voltages, 1.50 V/ cell for 36 hours minimum.

• Commissioning at ambient temperature above + 30°C (+ 50°F)

- Only Constant current charge:

20 h at 0.1 C₅ recommended.

The electrolyte temperature 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 electrolyte temperature drops below + 40°C (+ 104°F).

Note: When full battery performance is required for capacity test purposes, the battery has to be charged in accordance with IEC62259 section 7 (7.1 & 7.2).

5. Charging in service

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

■ Two level charge:

- float level: 1.42 ± 0.01 V/cell
- high rate (boost) level: 1.45 ± 0.01 V/cell

■ Single level charge:

1.42 ± 0.01 V/cell

To have the full maintenance-free feature in term of topping-up for high temperature, the correction factor to apply is -2.0 mV/°C (-1.12 mV/°F) starting from an ambient temperature of 20°C (68°F). For other conditions, see section 7.2 Temperature compensation of Technical Manual.

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Table A:

Cell type	Capacity C ₅ Ah (Ah)	Charging current 0.1 C ₅ A (A)	Cell connection bolt per pole	Cell type	Capacity C ₅ Ah (Ah)	Charging current 0.1 C ₅ A (A)	Cell connection bolt per pole
VTX 1 L 15	15	1.5	M 6	VTX 1 M 8	8	0.8	M 6
VTX 1 L 30	30	3.0	M 6	VTX 1 M 16	16	1.6	M 6
VTX 1 L 47	47	4.7	M 6	VTX 1 M 24	24	2.4	M 6
VTX 1 L 62	62	6.2	M 6	VTX 1 M 32	32	3.2	M 6
VTX 1 L 75	75	7.5	2 x M 6	VTX 1 M 40	40	4.0	M 6
VTX 1 L 95	95	9.5	M 8	VTX 1 M 48	48	4.8	M 6
VTX 1 L 110	110	11.0	2 x M 6	VTX 1 M 65	65	6.5	2 x M 6
VTX 1 L 140	140	14.0	M 10	VTX 1 M 75	75	7.5	M 8
VTX 1 L 185	185	18.5	M 10	VTX 1 M 100	100	10.0	M 8
VTX 1 L 235	235	23.5	M 10	VTX 1 M 125	125	12.5	M 10
VTX 1 L 280	280	28.0	M 10	VTX 1 M 150	150	15.0	M 10
VTX 1 L 325	325	32.5	2 x M 10	VTX 1 M 170	170	17.0	M 10
VTX 1 L 375	375	37.5	2 x M 10	VTX 1 M 195	195	19.5	M 10
VTX 1 L 420	420	42.0	2 x M 10	VTX 1 M 220	220	22.0	M 10
VTX 1 L 470	470	47.0	2 x M 10	VTX 1 M 245	245	24.5	2 x M 10
VTX 1 L 515	515	51.5	2 x M 10	VTX 1 M 270	270	27.0	2 x M 10
VTX 1 L 560	560	56.0	2 x M 10	VTX 1 M 295	295	29.5	2 x M 10
VTX 1 L 610	610	61.0	3 x M 10	VTX 1 M 320	320	32.0	2 x M 10
VTX 1 L 650	650	65.0	3 x M 10	VTX 1 M 345	345	34.5	2 x M 10
VTX 1 L 700	700	70.0	3 x M 10	VTX 1 M 370	370	37.0	2 x M 10
VTX 1 L 750	750	75.0	3 x M 10	VTX 1 M 395	395	39.5	2 x M 10
VTX 1 L 800	800	80.0	3 x M 10	VTX 1 M 420	420	42.0	2 x M 10
VTX 1 L 840	840	84.0	3 x M 10	VTX 1 M 445	445	44.5	2 x M 10
VTX 1 L 890	890	89.0	4 x M 10	VTX 1 M 490	490	49.0	3 x M 10
VTX 1 L 940	940	94.0	4 x M 10	VTX 1 M 540	540	54.0	3 x M 10
VTX 1 L 980	980	98.0	4 x M 10	VTX 1 M 590	590	59.0	3 x M 10
VTX 1 L 1030	1030	103.0	4 x M 10	VTX 1 M 640	640	64.0	3 x M 10
VTX 1 L 1120	1120	112.0	4 x M 10	VTX 1 M 690	690	69.0	4 x M 10
VTX 1 L 1220	1220	122.0	5 x M 10	VTX 1 M 740	740	74.0	4 x M 10
VTX 1 L 1300	1300	130.0	5 x M 10	VTX 1 M 785	785	78.5	4 x M 10
VTX 1 L 1400	1400	140.0	5 x M 10	VTX 1 M 835	835	83.5	4 x M 10
VTX 1 L 1500	1500	150.0	6 x M 10	VTX 1 M 885	885	88.5	4 x M 10
VTX 1 L 1600	1600	160.0	6 x M 10	VTX 1 M 935	935	93.5	5 x M 10
VTX 1 L 1700	1700	170.0	6 x M 10	VTX 1 M 985	985	98.5	5 x M 10
				VTX 1 M 1030	1030	103.0	5 x M 10
				VTX 1 M 1130	1130	113.0	6 x M 10
				VTX 1 M 1230	1230	123.0	6 x M 10
				VTX 1 M 1330	1330	133.0	6 x M 10

6. Periodic Maintenance

Vantex is maintenance-free battery under the recommended operating conditions, from -20°C (+4°F) to +40°C (+104°F) at 1.42V/cell, with temperature compensation and requires only preventive maintenance.

As a periodic maintenance, the following is recommended:

- Keep the battery clean using only water. Do not use a wire brush or solvents of any kind.
- Check the charging voltage. In parallel operation, it is of great importance that the recommended charging voltage remains unchanged. The charging voltage should be checked at least once yearly. If a cell float voltage is found below 1.35V, high rate charge is recommended to apply to the cell concerned.
- Check visually the electrolyte level. Never let the level fall below the minimum level mark. Use only distilled or de-ionized water to top-up.

Topping up of the Vantex battery **shall be carried out when battery is fully charged.**

Note: *There is no need to check the electrolyte density periodically. Interpretation of density measurements is difficult and could be misleading.*

- Check every two years that all connection are tight.
- The connectors and terminal bolts should be corrosion-protected by coating with a thin layer of anticorrosion oil.
- High water consumption is usually caused by improper voltage setting of the charger.

7. Environment

To protect the environment all used batteries must be recycled.

Contact your local Alcad representative for information.

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