

Uptimax Ni-Cd batteries

Type UP1 L and UP1 M

Installation & operating instructions

Safety precautions

- **WARNING: Risk of fire, explosion, or burns. Do not disassemble, heat above +70°C (+158°F), 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 measures 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 standard, is mandatory during commissioning and operation.**

1. Receiving the shipment

Do not overturn the package. Upon receipt of the goods, any transportation damage, electrolyte spillage or irregularities must be reported to the carrier and to Saft.

The battery is shipped filled and charged, ready for immediate use or filled and discharged for easier commissioning. Storage of cells must not exceed the maximum storage time indicated on the packing case.

2. Storage

Cells shall never be stored for a period exceeding 24 months from the date of manufacture.

The battery must be stored in a dry, clean and well-ventilated indoor location, away from sunlight and other UV-sources at an ambient temperature between 0°C and +30°C (+32°F and +86°F).

Storage of battery at temperatures above +30°C (+86°F) and/or above 24 months can result in permanent change and loss of product performance.

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 heat, direct sunlight and other UV-source.

The battery will give the best performance when the ambient temperature is between +10°C to +30°C (+50°F to +86°F).

3.2. Mounting

For cells with handles, both must be used when lifting and moving. To prevent electrolyte spillage, do not tip cells.

Verify that cells are correctly interconnected with the appropriate polarity and that the connectors are correctly torqued.

Connections between the battery and the load shall be made with nickel plated cable lugs. Tightening torque for the terminals must be:

- M 6 = 11 ± 1.1 N.m (97.4 ± 9.8 lbf.in)
- M 8 = 20 ± 2.0 N.m (177.0 ± 17.7 lbf.in)
- M 10 = 30 ± 3.0 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, anti-corrosion grease (NO-OX), or approved equal.

3.3. Ventilation

During operation the battery emits a gas mixture of oxygen and hydrogen.

Ventilation inside the battery room must be adequately managed, comply with IEC 62485-2 and local regulations.

To calculate the required ventilation, contact your local Saft representative or use Saft sizing tool, BaSiCs.

3.4. Electrolyte

Do not top up with deionized or distilled water prior to initial charge to avoid overfilling a cell.

When checking electrolyte levels, a fluctuation in level between cells is normal. This is caused by a small difference in internal pressure and due to the varying amounts of gas held in the separators of each cell. The level is normally at least 15 mm (5/8") above the minimum level mark (lower) and there should be no need to adjust it.

If electrolyte is ever spilled from a cell and the level is 30 mm (1.2") below the minimum level mark (lower), then refilling with E22 electrolyte is required. Contact your local Saft representative for more details.



4. Commissioning

Verify that ventilation, in accordance with the IEC 62485-2 standard, is provided during this operation.

A good commissioning is important and mandatory. After commissioning, the battery must be charged permanently according to section 5.

Prior and during commissioning charge, record all data requested in the commissioning report available on saft4u.saft.com.

It is mandatory to send the commissioning report to commissioning@saft.com to activate the warranty.

4.1. Cells delivered filled and charged stored up to 6 months

A commissioning charge is normally not required and the cells are ready for immediate use. However, the product's full performance will be achievable after 1 to 3 months of float charge in service.

If the published performance is required immediately, please refer to Section 4.2.

4.2 Cells delivered filled and charged stored for more than 6 months and up to 2 years or filled and deep discharged stored up to 2 years

Always conduct a commissioning charge before use in service.

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

Uptimax Ni-Cd batteries

4.2.1. Constant current charge

Charge for 10 h at 0.2 C₅ A (see Table A).

If the current limit is lower than indicated in the table A, extend the charge time proportionally.

Notice: At the end of charge, the cell voltage will reach about 1.80 V/cell, 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.

4.2.2. Constant potential charge

• Filled and charged/deep discharged

Charge at 1.55 V/cell for a minimum of 24 h with current limit of 0.2 C₅ A (see the current in Table A).

If this voltage level is not available, then charge at 1.50 V/cell for a minimum of 36 h with current limited to 0.2 C₅ A (see the current in Table A).

• Filled and deep discharged (option)

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

Constant voltage charge at a low voltage level:

Charge at 1.45 V/cell for a minimum of 72 h with current limit of 0.2 C₅ A (see the current in Table A).

If capacity is not needed directly it is also possible to charge 1.42 V/cell for a minimum of 1 month with current limited to 0.2 C₅ A (see the current in Table A).

4.2.3. Commissioning at ambient temperature above + 30°C (+ 86°F)

Only constant current charge.

10 h at 0.2 C₅ A recommended.

20 h at 0.1 C₅ A possible.

Notice: At the end of charge, the cell voltage will 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. It must be stopped to reduce the temperature.

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

Note: When full battery performance is required for capacity test purposes, the cells shall be charged 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 battery discharges, are:

• Single level charge:

1.39 ± 0.01 V/cell or 1.42 ± 0.01 V/cell

• Two level charge:

Float level

1.39 ± 0.01 V/cell or 1.42 ± 0.01 V/cell

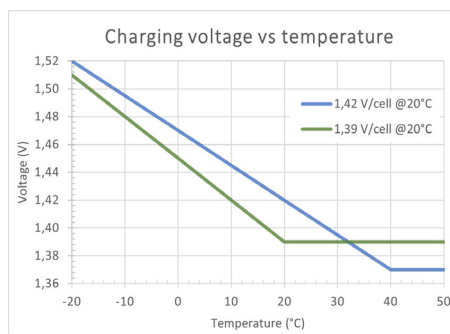
High rate (boost) level

1.45 ± 0.01 V/cell

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.

1.39 V/cell: TCV is mandatory, from -20°C to +20°C (-4°F to +68°F) increase the charge voltage by 3 mV/°C/cell (+1.7 mV/°F/cell). TCV shall not be used from +20°C to +40°C.

1.42 V/cell: TCV is mandatory, from -20°C to +20°C (-4°F to +68°F) increase the charge voltage by 2.5 mV/°C/cell (+1.4 mV/°F/cell) and from +20°C to +40°C (+68°F to +104°F) decrease the charge voltage by 2.5 mV/°C/cell (-1.4 mV/°F/cell).



6. Preventive maintenance

Uptimax is maintenance-free battery under the recommended operating conditions, from -20°C (+4°F) to +40°C (+104°F) and requires only preventive maintenance.

However, it is good practice with any system to carry out an inspection of the system once per year or at the recommended topping-up interval period to ensure that the charging system,

the battery and the ancillary electronics are all functioning correctly. Additionally, follow your standard preventative maintenance procedures.

Keep the battery clean using only water. Do not use a wire brush or solvents of any kind. Vent plugs can be rinsed in clean water if necessary.

Check the charging voltage, should be checked and recorded at least once yearly. Individual cells with voltages measured below 1.30 V/cell during float charge, high rate charge is recommended to apply to the cell concerned.

Under normal operating conditions there is no need for topping up. High water consumption is usually caused by an improper voltage setting or voltage drift that is above the recommended in service charging voltages. To maximise the topping-up interval check the charging voltage and adjust as required.

Visually check the electrolyte level. Never let the level fall below the minimum level mark. Use only distilled or deionized water to top-up. Topping up of the UPTIMAX battery shall be carried out when battery is fully charged.

Note: There is no need to check the electrolyte density. Electrolyte density measurements do not indicate state of charge or state of health.

Ensure all terminals and connectors are coated with a thin layer of anti-corrosion oil, anti-corrosion grease (NO-OX) or approved equal.

Note: All these maintenance recommendations followed the IEEE 1106 standard 'Recommended Practice for Installation, Maintenance, Testing and Replacement of Vented Nickel-Cadmium Batteries for Stationary Applications'.

We offer battery training, for more information look in our service brochure.



7. Environment

To protect the environment all used batteries must be recycled. Contact your local Saft representative for further information. However, it is good practice with any system to carry out an inspection of the system once per year or at the recommended topping-up interval period to ensure that the charging system, the battery and the ancillary electronics are all functioning correctly. Additionally, follow your standard preventative maintenance procedures.

Table A

Cell type	Capacity Charging Current			Cell connection bolt per pole
	C ₅ Ah	0,1 C ₅ A	0,2 C ₅ A	
UP1L 15	15	1.5	3.0	M6
UP1L 30	30	3.0	6.0	M6
UP1L 47	47	4.7	9.4	M6
UP1L 57	57	5.7	11.4	M6
UP1L 62	62	6.2	12.4	M6
UP1L 75	75	7.5	15.0	2xM6
UP1L 83	83	8.3	16.6	M8
UP1L 95	95	9.5	19.0	M8
UP1L 102	102	10.2	20.4	2xM6
UP1L 110	110	11.0	22.0	2xM6
UP1L 124	124	12.4	24.8	M10
UP1L 140	140	14.0	28.0	M10
UP1L 167	167	16.7	33.4	M10
UP1L 185	185	18.5	37.0	M10
UP1L 210	210	21.0	42.0	M10
UP1L 225	225	22.5	45.0	M10
UP1L 235	235	23.5	47.0	M10
UP1L 250	250	25.0	50.0	M10
UP1L 280	280	28.0	56.0	M10
UP1L 294	294	29.4	58.8	2xM10
UP1L 325	325	32.5	65.0	2xM10
UP1L 350	350	35.0	70.0	2xM10
UP1L 375	375	37.5	75.0	2xM10
UP1L 420	420	42.0	84.0	2xM10
UP1L 454	454	45.4	90.8	2xM10
UP1L 470	470	47.0	94.0	2xM10
UP1L 500	500	50.0	100.0	2xM10
UP1L 515	515	51.5	103.0	2xM10
UP1L 560	560	56.0	112.0	2xM10
UP1L 589	589	58.9	117.8	3xM10
UP1L 610	610	61.0	122.0	3xM10
UP1L 650	650	65.0	130.0	3xM10
UP1L 664	664	66.4	132.8	3xM10
UP1L 700	700	70.0	140.0	3xM10
UP1L 725	725	72.5	145.0	3xM10
UP1L 750	750	75.0	150.0	3xM10
UP1L 775	775	77.5	155.0	3xM10
UP1L 800	800	80.0	160.0	3xM10
UP1L 840	840	84.0	168.0	3xM10
UP1L 870	870	87.0	174.0	4xM10
UP1L 890	890	89.0	178.0	4xM10
UP1L 914	914	91.4	182.8	4xM10
UP1L 940	940	94.0	188.0	4xM10
UP1L 980	980	98.0	196.0	4xM10
UP1L 990	990	99.0	198.0	4xM10
UP1L 1010	1010	101.0	202.0	4xM10
UP1L 1030	1030	103.0	206.0	4xM10
UP1L 1080	1080	108.0	216.0	4xM10

Cell type	Capacity Charging Current			Cell connection bolt per pole
	C ₅ Ah	0,1 C ₅ A	0,2 C ₅ A	
UP1L 1120	1120	112.0	224.0	4xM10
UP1L 1180	1180	118.0	236.0	5xM10
UP1L 1220	1220	122.0	244.0	5xM10
UP1L 1260	1260	126.0	252.0	5xM10
UP1L 1300	1300	130.0	260.0	5xM10
UP1L 1324	1324	132.4	264.8	5xM10
UP1L 1350	1350	135.0	270.0	5xM10
UP1L 1400	1400	140.0	280.0	5xM10
UP1L 1460	1460	146.0	292.0	6xM10
UP1L 1500	1500	150.0	300.0	6xM10
UP1L 1540	1540	154.0	308.0	6xM10
UP1L 1570	1570	157.0	314.0	6xM10
UP1L 1600	1600	160.0	320.0	6xM10
UP1L 1700	1700	170.0	340.0	6xM10

UP1M 8	8	0.8	1.6	M6
UP1M 16	16	1.6	3.2	M6
UP1M 24	24	2.4	4.8	M6
UP1M 32	32	3.2	6.4	M6
UP1M 40	40	4.0	8.0	M6
UP1M 48	48	4.8	9.6	M6
UP1M 65	65	6.5	13.0	2xM6
UP1M 75	75	7.5	15.0	M8
UP1M 89	89	8.9	17.8	2xM6
UP1M 96	96	9.6	19.2	2xM6
UP1M 100	100	10.0	20.0	M8
UP1M 114	114	11.4	22.8	M10
UP1M 125	125	12.5	25.0	M10
UP1M 140	140	14.0	28.0	M10
UP1M 150	150	15.0	30.0	M10
UP1M 170	170	17.0	34.0	M10
UP1M 175	175	17.5	35.0	M10
UP1M 195	195	19.5	39.0	M10
UP1M 209	209	20.9	41.8	M10
UP1M 220	220	22.0	44.0	M10
UP1M 238	238	23.8	47.6	2xM10
UP1M 245	245	24.5	49.0	2xM10
UP1M 263	263	26.3	52.6	2xM10
UP1M 270	270	27.0	54.0	2xM10
UP1M 285	285	28.5	57.0	2xM10
UP1M 295	295	29.5	59.0	2xM10
UP1M 310	310	31.0	62.0	2xM10
UP1M 320	320	32.0	64.0	2xM10
UP1M 332	332	33.2	66.4	2xM10
UP1M 345	345	34.5	69.0	2xM10
UP1M 358	358	35.8	71.6	2xM10
UP1M 370	370	37.0	74.0	2xM10
UP1M 382	382	38.2	76.4	2xM10
UP1M 395	395	39.5	79.0	2xM10

Cell type	Capacity Charging Current			Cell connection bolt per pole
	C ₅ Ah	0,1 C ₅ A	0,2 C ₅ A	
UP1M 420	420	42.0	84.0	2xM10
UP1M 434	434	43.4	86.8	2xM10
UP1M 445	445	44.5	89.0	2xM10
UP1M 461	461	46.1	92.2	3xM10
UP1M 475	475	47.5	95.0	3xM10
UP1M 490	490	49.0	98.0	3xM10
UP1M 502	502	50.2	100.4	3xM10
UP1M 517	517	51.7	103.4	3xM10
UP1M 530	530	53.0	106.0	3xM10
UP1M 540	540	54.0	108.0	3xM10
UP1M 553	553	55.3	110.6	3xM10
UP1M 569	569	56.9	113.8	3xM10
UP1M 590	590	59.0	118.0	3xM10
UP1M 604	604	60.4	120.8	3xM10
UP1M 620	620	62.0	124.0	3xM10
UP1M 630	630	63.0	126.0	3xM10
UP1M 640	640	64.0	128.0	3xM10
UP1M 656	656	65.6	131.2	3xM10
UP1M 675	675	67.5	135.0	3xM10
UP1M 690	690	69.0	138.0	4xM10
UP1M 715	715	71.5	143.0	4xM10
UP1M 740	740	74.0	148.0	4xM10
UP1M 752	752	75.2	150.4	4xM10
UP1M 772	772	77.2	154.4	4xM10
UP1M 785	785	78.5	157.0	4xM10
UP1M 810	810	81.0	162.0	4xM10
UP1M 835	835	83.5	167.0	4xM10
UP1M 860	860	86.0	172.0	4xM10
UP1M 885	885	88.5	177.0	4xM10
UP1M 915	915	91.5	183.0	5xM10
UP1M 935	935	93.5	187.0	5xM10
UP1M 960	960	96.0	192.0	5xM10
UP1M 985	985	98.5	197.0	5xM10
UP1M 1000	1000	100.0	200.0	5xM10
UP1M 1030	1030	103.0	206.0	5xM10
UP1M 1080	1080	108.0	216.0	5xM10
UP1M 1130	1130	113.0	226.0	6xM10
UP1M 1180	1180	118.0	236.0	6xM10
UP1M 1230	1230	123.0	246.0	6xM10
UP1M 1250	1250	125.0	250.0	6xM10
UP1M 1280	1280	128.0	256.0	6xM10
UP1M 1330	1330	133.0	266.0	6xM10

