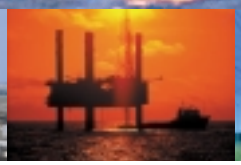
Ultima SLM Ni-Cd battery

Performance with ultra low maintenance













saft

July 2004

Ultima Ni-Cd battery

Ultra low maintenance

Developed in line with long proven nickel-cadmium technology, Ultima is an exceptionally reliable recombination pocket plate battery incorporating special technical features.

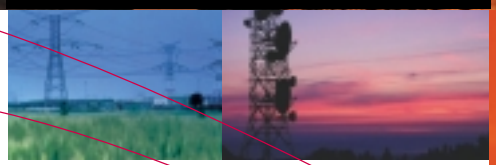
Delivering long life and requiring minimal maintenance, there is no better solution for installations where the risk of failure is unacceptable, as in

- UPS systems
- emergency lighting
- process control
- telecommunications.



The Ultima nickel-cadmium battery is eminently suitable for "remote" application such as in offshore and switching substation operations, where the system must be totally reliable and require the minimum of maintenance visits. It is also ideal for use in railroad signaling.







Ultimate safety
without compromise

No water filling
No water filling is necessary during the Ultima 20-year service life because of the controlled recombination and the valve regulated venting system (topping up is possible if required).

Valve regulated
Controlled recombination is made possible through a specific cell design and low pressure flame arresting vent. The risk of thermal runaway is eliminated by the use of free electrolyte and a recombination level of 85% to 95%, depending on floating voltage – a major advantage over VRLA batteries where starved electrolyte is often the cause of failure.

The benefits of Ni-Cd
Ni-Cd pocket plate technology eliminates all risk of sudden death during the battery's exceptionally long service life.

Ultima is resistant to electrical and physical abuse.

With fast recharging and extended storage, the unit is not only simple to install but is also environmentally safe.

Performance in temperature extremes
Ultima operates with total reliability over a wide temperature range:
0°C to +40°C (+32°F to +104°F)
and exceptionally from
–50°C to +70°C (–58°F to +158°F).

Designed to be durable
Ultima's tough cell container cradles the battery's positive nickel hydroxide and negative cadmium hydroxide plates, and alkaline electrolyte. Optimum performance is delivered without compromising structural integrity. These active materials are contained in pockets formed from double perforated steel strips. After being mechanically linked, cut to size, compressed to final plate dimensions and welded to a current carrying bus bar assembly, the heart of the nickel-cadmium cell is formed.

Guarding the environment
Saft takes seriously its responsibility to ensure manufacture, installation and operation do not harm the environment.

More than 99% of the metals contained in each nickel-cadmium battery can be recycled. At Saft's dedicated recycling centre, nickel, cadmium, steel and plastic are recovered from end-of-life batteries, ensuring maximum utilisation.

Quality built, quality tested
Ultima is manufactured in Sweden at Oskarshamn, one of Saft's many internationally accredited ISO 9001 sites. Highest quality materials and rigorous quality checking procedures ensure all relevant international standards are met including IEC 60623.







Physical properties
and block configurations

Flexibility of charging
Charging may be quickly and simply carried out by either double or single level methods

- for two level charge:
  float level: 1.42 ± 0.01 V/cell
  high level: 1.45 ± 0.01 V/cell

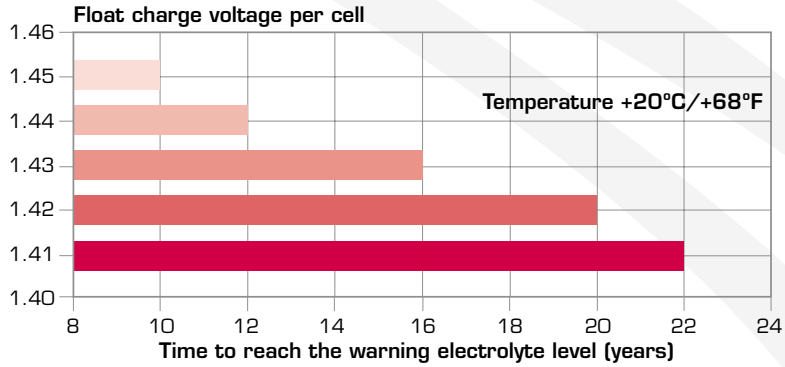
- for single level charge:
  1.42 ± 0.01 V/cell

Alternatively, a float charge of 1.42 ± 0.01 V/cell brings Ultima to up to 80% capacity after only 16 hours from a fully discharged state.

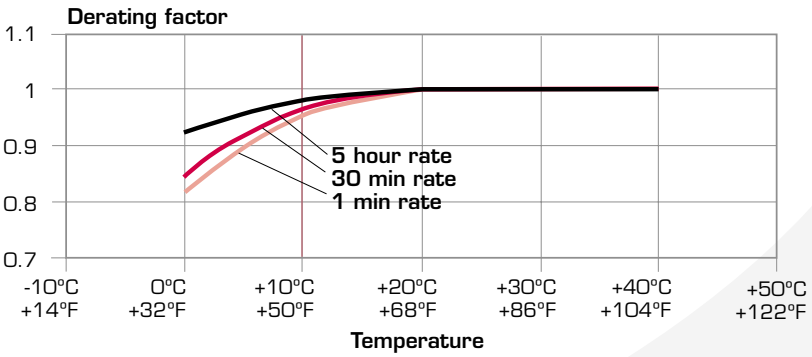


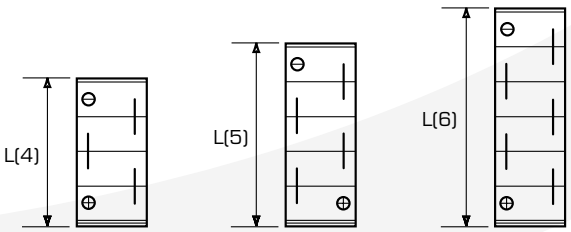
Block configuration
For serial connection of blocks on racks or on shelves, always use blocks with an even number of cells. This gives short, straight interblock connectors. When a block with an odd number of cells is necessary, it should be placed at the end of a cell row.

Effect of charging voltage on water consumption.

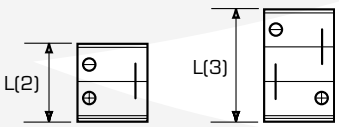


Typical cell performance variation with temperature.

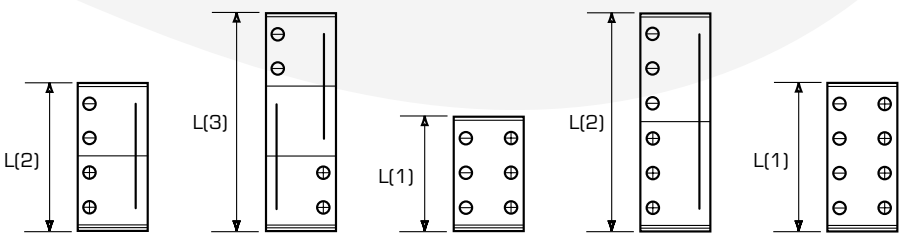




SLM 8 - SLM 48 Blocks of cells with single pole bolts.



SLM 71 - SLM 142 Blocks of cells with single pole bolts.

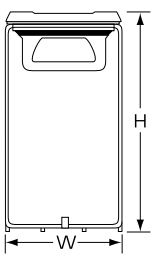


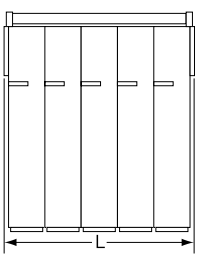
SLM 166 - SLM 476 Blocks of cells with 2 - 4 pole bolts per pole.

Engineered
for ultimate reliability



Cell type	Voltage V	Rated capacity C_5 Ah	Dimensions L mm	L in	W mm	W in	H mm	H in	Weight kg	Weight lb	Cell connect-ion bolt per pole	Electrolyte reserve per cell cc
SLM 8-4	4.8	8	133	5.2	123	4.9	270	10.6	5.5	12.1	M6	48
SLM 8-5	6	8	162	6.4	123	4.9	270	10.6	6.8	15.0	M6	48
SLM 8-6	7.2	8	191	7.5	123	4.9	270	10.6	8.1	17.9	M6	48
SLM 16-4	4.8	16	133	5.2	123	4.9	270	10.6	6.1	13.5	M6	95
SLM 16-5	6	16	162	6.4	123	4.9	270	10.6	7.6	16.8	M6	95
SLM 16-6	7.2	16	191	7.5	123	4.9	270	10.6	9.1	20.1	M6	95
SLM 24-4	4.8	24	153	6.0	123	4.9	270	10.6	7.3	16.1	M6	145
SLM 24-5	6	24	187	7.4	123	4.9	270	10.6	9.0	19.9	M6	145
SLM 24-6	7.2	24	221	8.7	123	4.9	270	10.6	10.7	23.6	M6	145
SLM 32-4	4.8	32	201	7.9	123	4.9	270	10.6	10.0	22.1	M6	190
SLM 32-5	6	32	247	9.7	123	4.9	270	10.6	12.4	27.3	M6	190
SLM 32-6	7.2	32	293	11.5	123	4.9	270	10.6	14.8	32.6	M6	190
SLM 40-4	4.8	40	249	9.8	123	4.9	270	10.6	12.3	27.1	M6	240
SLM 40-5	6	40	307	12.1	123	4.9	270	10.6	15.3	33.7	M6	240
SLM 40-6	7.2	40	365	14.4	123	4.9	270	10.6	18.3	40.3	M6	240
SLM 48-4	4.8	48	249	9.8	123	4.9	270	10.6	13.7	30.2	M6	290
SLM 48-5	6	48	307	12.1	123	4.9	270	10.6	17.0	37.5	M6	290
SLM 48-6	7.2	48	365	14.4	123	4.9	270	10.6	20.3	44.8	M6	290
SLM 71-2	2.4	71	97	3.8	195	7.7	406	16.0	10.2	22.5	M8	425
SLM 71-3	3.6	71	133	5.2	195	7.7	406	16.0	14.6	32.2	M8	425
SLM 95-2	2.4	95	112	4.4	195	7.7	406	16.0	13.3	29.3	M8	570
SLM 95-3	3.6	95	155	6.1	195	7.7	406	16.0	19.4	42.8	M8	570
SLM 119-2	2.4	119	133	5.2	195	7.7	406	16.0	15.8	34.8	M10	715
SLM 119-3	3.6	119	187	7.4	195	7.7	406	16.0	23.2	51.2	M10	715
SLM 142-2	2.4	142	145	5.7	195	7.7	406	16.0	18.5	40.8	M10	850
SLM 142-3	3.6	142	205	8.1	195	7.7	406	16.0	27.0	59.5	M10	850
SLM 166-2	2.4	166	184	7.3	195	7.7	406	16.0	22.8	50.3	2 x M8	995
SLM 166-3	3.6	166	263	10.4	195	7.7	406	16.0	33.6	74.1	2 x M8	995
SLM 190-2	2.4	190	198	7.8	195	7.7	406	16.0	25.5	56.2	2 x M8	1140
SLM 190-3	3.6	190	284	11.2	195	7.7	406	16.0	37.7	83.1	2 x M8	1140
SLM 238-2	2.4	238	241	9.5	195	7.7	406	16.0	30.5	67.3	2 x M10	1430
SLM 238-3	3.6	238	349	13.8	195	7.7	406	16.0	45.3	99.9	2 x M10	1430
SLM 285-2	2.4	285	265	10.4	195	7.7	406	16.0	33.6	74.1	2 x M10	1710
SLM 285-3	3.6	285	385	15.2	195	7.7	406	16.0	49.9	110	2 x M10	1710
SLM 357-1	1.2	357	187	7.4	195	7.7	406	16.0	23.2	51.2	3 x M10	2140
SLM 357-2	2.4	357	349	13.8	195	7.7	406	16.0	45.0	99.2	3 x M10	2140
SLM 426-1	1.2	426	205	8.1	195	7.7	406	16.0	27.0	59.5	3 x M10	2555
SLM 476-1	1.2	476	241	9.5	195	7.7	406	16.0	30.2	66.6	4 x M10	2855





Performance data

Performance after prolonged float charge of fully charged cells

Available amperes at +20°C ± 5°C (+68°F ± 9°F) **Final voltage: 1.00 V/cell**

Cell type	C_5 Ah	Hours					Minutes						Seconds			
		10	8	5	3	2	90	60	45	30	10	5	60	30	10	1
SLM 8	8	0.8	1.0	1.6	2.6	3.8	4.7	6.1	6.9	8.0	10.9	12.2	16.2	17.9	21.1	25.5
SLM 16	16	1.6	2.0	3.2	5.1	7.6	9.4	12.2	13.8	16.0	21.8	24.5	32.3	35.7	42.2	51.0
SLM 24	24	2.4	3.0	4.8	7.7	11.3	14.1	18.4	20.7	24.0	32.6	36.7	48.5	53.6	63.2	76.5
SLM 32	32	3.2	4.0	6.4	10.3	15.1	18.8	24.5	27.5	32.0	43.5	49.0	64.6	71.4	84.3	102
SLM 40	40	4.0	5.1	8.0	12.8	18.9	23.5	30.6	34.4	40.0	54.4	61.2	80.8	89.3	105	128
SLM 48	48	4.9	6.1	9.6	15.4	22.7	28.2	36.7	41.3	47.9	65.3	73.4	96.9	107	126	153
SLM 71	71	7.2	9.0	14.2	23.2	33.9	41.8	54.3	61.4	70.8	94.0	100.3	123	134	153	179
SLM 95	95	9.7	12.0	19.0	31.1	45.3	55.9	72.6	82.2	94.7	126	134	165	180	205	239
SLM 119	119	12.1	15.0	23.8	38.9	56.8	70.0	91.0	103	119	157	168	207	225	256	299
SLM 142	142	14.5	17.9	28.4	46.4	67.8	83.5	109	123	142	188	201	247	269	306	357
SLM 166	166	16.9	21.0	33.2	54.3	79.2	97.6	127	144	165	220	235	288	314	358	417
SLM 190	190	19.4	24.0	37.9	62.1	90.7	112	145	164	189	251	268	330	359	409	478
SLM 238	238	24.3	30.0	47.5	77.8	114	140	182	206	237	315	336	413	450	513	598
SLM 285	285	29.1	36.0	56.9	93.2	136	168	218	247	284	377	403	495	539	614	717
SLM 357	357	36.3	45.0	71.4	117	170	210	273	309	357	471	504	621	675	768	897
SLM 426	426	43.5	53.7	85.2	139	203	251	327	369	426	564	603	741	807	918	1071
SLM 476	476	48.6	60.0	95.0	156	228	280	364	412	474	630	672	826	900	1026	1196

Available amperes at +20°C ± 5°C (+68°F ± 9°F) **Final voltage: 1.05 V/cell**

Cell type	C_5 Ah	Hours					Minutes						Seconds			
		10	8	5	3	2	90	60	45	30	10	5	60	30	10	1
SLM 8	8	0.8	1.0	1.6	2.5	3.5	4.3	5.4	5.9	6.5	8.5	9.9	13.3	15.0	17.5	22.1
SLM 16	16	1.6	2.0	3.2	5.1	7.1	8.7	10.9	11.8	12.9	17.0	19.7	26.5	29.9	35.0	44.2
SLM 24	24	2.4	3.0	4.7	7.6	10.6	13.0	16.3	17.7	19.4	25.5	29.6	39.8	44.9	52.5	66.3
SLM 32	32	3.2	4.0	6.3	10.1	14.2	17.3	21.8	23.7	25.8	34.0	39.4	53.0	59.8	70.0	88.4
SLM 40	40	4.1	5.0	7.9	12.7	17.7	21.7	27.2	29.6	32.3	42.5	49.3	66.3	74.8	87.6	111
SLM 48	48	4.9	6.0	9.5	15.2	21.2	26.0	32.6	35.5	38.8	51.0	59.2	79.6	89.8	105	133
SLM 71	71	7.2	8.9	14.1	22.8	32.6	38.3	46.3	51.6	59.6	74.8	83.3	106	114	128	149
SLM 95	95	9.6	11.9	18.9	30.5	43.6	51.2	61.9	69.1	79.8	100	111	142	152	171	199
SLM 119	119	12.0	14.9	23.6	38.2	54.6	64.2	77.6	86.5	100	125	140	178	191	214	249
SLM 142	142	14.3	17.7	28.2	45.6	65.1	76.6	92.6	103	119	150	167	213	228	255	298
SLM 166	166	16.7	20.7	33.0	53.3	76.1	89.5	108	121	139	175	195	248	266	298	348
SLM 190	190	19.2	23.7	37.7	61.0	87.1	102	124	138	160	200	223	284	305	341	398
SLM 238	238	24.0	29.7	47.2	76.4	109	128	155	173	200	251	279	356	382	427	499
SLM 285	285	28.7	35.6	56.6	91.5	131	154	186	207	239	300	334	426	457	512	597
SLM 357	357	36.0	44.7	70.8	115	164	193	233	260	300	375	420	534	573	642	747
SLM 426	426	42.9	53.1	84.6	137	195	230	278	309	357	450	501	639	684	765	894
SLM 476	476	48.0	59.4	94.4	153	218	256	310	346	400	502	558	712	764	854	998

Performance data

Performance after prolonged float charge of fully charged cells

Available amperes at +20°C ± 5°C (+68°F ± 9°F) **Final voltage: 1.10 V/cell**

Cell type	C_5 Ah	Hours					Minutes						Seconds			
		10	8	5	3	2	90	60	45	30	10	5	60	30	10	1
SLM 8	8	0.8	1.0	1.6	2.3	3.0	3.5	4.4	4.8	5.3	6.5	7.6	10.5	11.9	14.1	17.9
SLM 16	16	1.6	2.0	3.1	4.6	5.9	7.0	8.8	9.5	10.5	13.0	15.1	21.1	23.8	28.2	35.7
SLM 24	24	2.4	3.0	4.7	6.8	8.9	10.5	13.3	14.3	15.8	19.4	22.7	31.6	35.7	42.3	53.6
SLM 32	32	3.2	4.0	6.2	9.1	11.9	14.0	17.7	19.0	21.1	25.9	30.3	42.2	47.6	56.4	71.4
SLM 40	40	4.0	5.0	7.8	11.4	14.9	17.6	22.1	23.8	26.4	32.4	37.8	52.7	59.5	70.6	89.3
SLM 48	48	4.8	6.0	9.3	13.7	17.8	21.1	26.5	28.6	31.6	38.9	45.4	63.2	71.4	84.7	107
SLM 71	71	7.1	8.8	13.8	21.5	29.0	33.5	39.2	42.7	47.2	58.3	64.6	83.3	92.7	102	111
SLM 95	95	9.5	11.8	18.4	28.8	38.9	44.8	52.4	57.2	63.1	78.0	86.4	111	124	136	149
SLM 119	119	11.9	14.7	23.1	36.0	48.7	56.1	65.6	71.6	79.1	97.7	108	140	155	171	187
SLM 142	142	14.2	17.6	27.5	43.0	58.1	67.0	78.3	85.4	94.3	117	129	167	185	204	223
SLM 166	166	16.6	20.5	32.2	50.3	67.9	78.3	91.6	100	110	136	151	195	217	238	260
SLM 190	190	19.0	23.5	36.9	57.5	77.7	89.6	105	114	126	156	173	223	248	273	298
SLM 238	238	23.8	29.5	46.2	72.1	97.3	112	131	143	158	195	217	279	311	342	373
SLM 285	285	28.5	35.3	55.3	86.3	117	134	157	171	189	234	259	334	372	409	447
SLM 357	357	35.7	44.1	69.3	108	146	168	197	215	237	293	324	420	465	513	561
SLM 426	426	42.6	52.8	82.5	129	174	201	235	256	283	351	387	501	555	612	669
SLM 476	476	47.6	59.0	92.4	144	195	224	262	286	316	390	434	558	622	684	746

Available amperes at +20°C ± 5°C (+68°F ± 9°F) **Final voltage: 1.14 V/cell**

Cell type	C_5 Ah	Hours					Minutes						Seconds			
		10	8	5	3	2	90	60	45	30	10	5	60	30	10	1
SLM 8	8	0.8	1.0	1.5	2.0	2.4	2.7	3.4	3.7	4.1	5.3	6.2	8.3	9.7	11.6	15.1
SLM 16	16	1.6	1.9	3.0	3.9	4.8	5.5	6.7	7.3	8.2	10.5	12.3	16.7	19.4	23.1	30.3
SLM 24	24	2.3	2.9	4.6	5.9	7.2	8.2	10.1	11.0	12.2	15.8	18.5	25.0	29.1	34.7	45.4
SLM 32	32	3.1	3.8	6.1	7.9	9.6	11.0	13.5	14.6	16.3	21.1	24.6	33.3	38.8	46.2	60.5
SLM 40	40	3.9	4.8	7.6	9.9	12.0	13.7	16.8	18.3	20.4	26.4	30.8	41.7	48.5	57.8	75.7
SLM 48	48	4.7	5.7	9.1	11.8	14.4	16.5	20.2	21.9	24.5	31.6	36.9	50.0	58.1	69.4	90.8
SLM 71	71	6.9	8.5	13.5	19.5	22.0	23.7	27.1	28.5	32.9	41.8	48.5	62.9	68.0	76.5	86.7
SLM 95	95	9.2	11.4	18.0	26.1	29.4	31.7	36.3	38.1	44.1	55.9	64.8	84.2	91.0	102	116
SLM 119	119	11.6	14.3	22.6	32.7	36.9	39.7	45.5	47.7	55.2	70.0	81.2	105	114	128	145
SLM 142	142	13.8	17.1	27.0	39.0	44.0	47.3	54.3	57.0	65.9	83.5	96.9	126	136	153	173
SLM 166	166	16.1	19.9	31.5	45.6	51.4	55.3	63.5	66.6	77.0	97.6	113	147	159	179	203
SLM 190	190	18.5	22.8	36.1	52.2	58.9	63.3	72.6	76.2	88.1	112	130	168	182	205	232
SLM 238	238	23.1	28.6	45.2	65.4	73.7	79.3	91.0	95.5	110	140	162	211	228	256	291
SLM 285	285	27.7	34.2	54.1	78.3	88.3	95.0	109	114	132	168	194	252	273	307	348
SLM 357	357	34.8	42.9	67.8	98.1	111	119	137	143	166	210	244	315	342	384	435
SLM 426	426	41.4	51.3	81.0	117	132	142	163	171	198	251	291	378	408	459	519
SLM 476	476	46.2	57.2	90.4	131	147	159	182	191	220	280	324	422	456	512	582

Committed to a clean environment

Saft takes seriously its responsibility to safeguard the environment.
At several sites worldwide, more than 99% of metals contained in the battery are recycled. This process safeguards valuable natural resources and is a service to customers that Saft will continue to offer for future generations.
To locate the nearest collection site, visit www.saftbatteries.com

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