



saft



Optimax Ni-Cd Battery

Sustainable, maintenance-free solution for backup power applications



TotalEnergies

Optimax

The ideal choice for total security and availability

Make Saft your eco-friendly battery partner for stationary applications

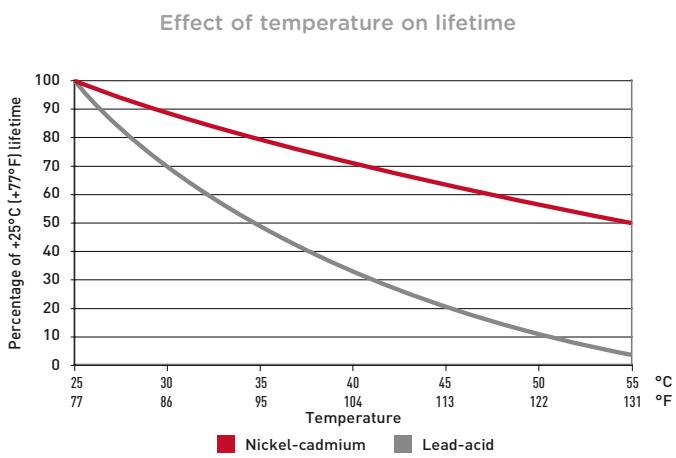


Saft has over 100 years of experience working in partnership with leading industrial customers to deliver well-proven Ni-Cd battery solutions optimized to ensure the total security and availability of stationary applications including power backup, engine starting and bulk energy storage.

Saft operates the only plant in the world that produces nickel-cadmium batteries incorporating metals that have been reclaimed on site from spent batteries, reducing their eco-footprint. The recycling of Ni-Cd batteries is a complex process that involves separating the nickel, cobalt and cadmium from the electrodes, a process perfected by Saft's plant in Oskarshamn, Sweden. This plant in Sweden is the only one in the world which combines the recycling of used batteries and the manufacturing of new ones, hence facilitating the incorporation of recycled materials into new products.

Ni-Cd batteries, the environmentally responsible choice

Saft's robust Ni-Cd technology sets the benchmark for industrial batteries operating in difficult and demanding conditions. It has established a reputation for performance, reliability, sustainability and a long, totally predictable service life – with no risk of sudden death failure. Optimax builds on this heritage by ensuring a 20-year plus service life at +25°C (+77°F). Even at +35°C (+95°F), its lifetime falls by just 20% compared with a 50% reduction for a lead-acid battery.



Optimax, The 1st Ni-Cd battery for Plug & Play replacement of lead-acid



The perfect fit to replace lead-acid batteries:

The latest generation of Optimax is the perfect fit to replace lead-acid batteries. Thanks to its 1.39 V/cell single level charge without the need for boost charge, Optimax can be charged in all commonly used DC-systems with +/- 10% voltage window. This reduces the need for dropping diodes or DC/DC converters, and as a consequence it decreases the overall cost of DC-systems.

When a fast recharge is needed, 95% State-Of-Charge (SOC) in 8h can be reached at 1.45 V/cell for maximum availability after a power failure and minimum downtime.

Optimax: The maintenance-free⁽¹⁾ battery for stationary applications

Optimax is Saft's latest development in Ni-Cd pocket plate battery technology. It combines maintenance-free⁽¹⁾ operation with total reliability to provide the ideal backup power solution for industrial installations.

Together with other key features such as its low pressure flame arresting vent, high electrical performance and chargeability, Optimax delivers an optimized TCO (Total Cost of Ownership).



⁽¹⁾ Maintenance-free means that no addition of water is necessary during the life time of the product when operating under Saft's recommended conditions.

Optimax - Delivering high performance and maintenance-free operation



Maintenance-free design reduces battery service costs

Optimax is maintenance-free thanks to a new high-tech design concept.

- Optimax never needs water to be added throughout its entire service life (under Saft's recommended operating conditions - from -20°C (-4°F) to +40°C (+104°F)).
- Maintenance is reduced to a minimum: only preventive maintenance is necessary.



- The high level of gas recombination is beyond the requirements of IEC 62259 (recombination level higher than 95%), and reduces water consumption and gas emissions.
- Optimax is equipped with a low pressure flame-arresting vent.

High performance optimizes battery life cost and reduces CO₂ footprint

Optimax offers high performance. This enables installers to specify a battery optimized for their specific application, saving on initial purchase costs.

- Optimax design enables high battery electrical performance whatever discharge time is needed.



- Commissioning is simple and easy, even up to 6 months of storage it can still be carried out using any commercially available charger.
- Wide operating temperature range means minimal need for heating or cooling, therefore reducing carbon emissions.

Good chargeability minimizes battery downtime

Optimax features fast and simple charging, within a narrow voltage window, for minimal downtime and maximum availability.

- Single or two-level charging regimes are possible:
 - Single level charge
 - 1.39 or 1.42 +/- 0.01 V/cell
 - Two level charge
- Float level:
1.39 or 1.42 +/- 0.01 V/cell
- High level: 1.45 ± 0.01 V/cell
- The fast recharge enables 95% SOC in 8h at 1.45 V/cell for maximum availability after a power failure, at +20°C (+68°F), after a constant voltage charge at 1.39 V/cell for 15 hours with an available charge current of 0.1 C5A.

Uptimax - Developed for demanding industrial installations

Uptimax: Vital support for critical systems

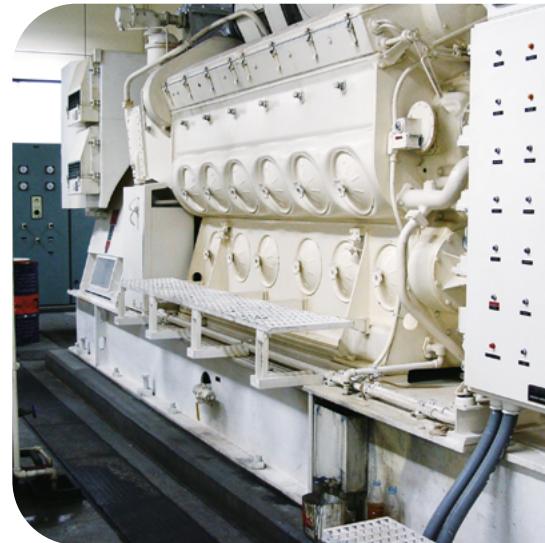
Uptimax batteries are at the heart of power backup systems throughout the oil & gas exploration and production, utility and manufacturing industries. If mains power is lost, Uptimax delivers the vital power to ensure the continuity of mission-critical loads, facilitate safe shutdown processes, bridge to standby power and safeguard computer data. Typical power backup applications include: UPS, substation, switchgear, process control systems, emergency lighting, fire alarms and security systems.

Total reliability ensures the safe operation of industrial equipment, in even the most demanding operating conditions

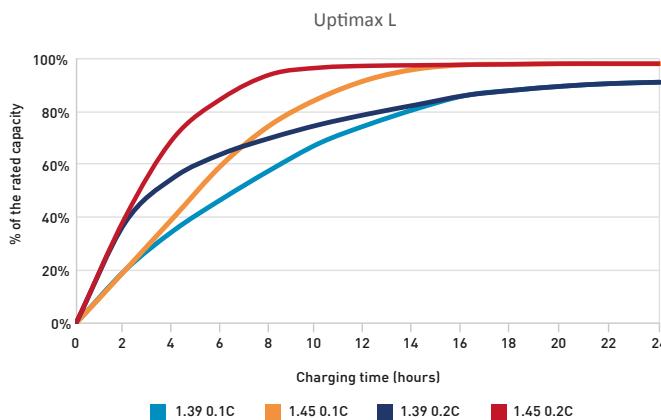
Uptimax provides complete peace of mind, whatever the application, whatever the location.

- Total reliability is based on a unique Ni-Cd electrochemistry/technology combined with the well proven Saft Nife® pocket plate design.
- It enables a long service life of over 20 years at +25°C (+77°F).
- Robust construction eliminates risk of sudden death failure.

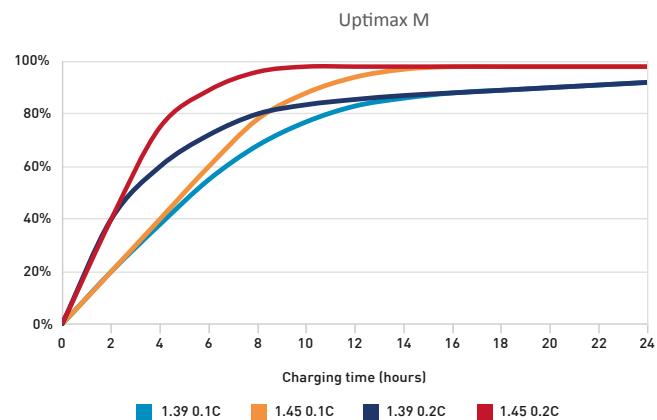
- Uptimax delivers long life and outstanding performance in temperatures up to +40°C (+104°F) and tolerates -40°C (-40°F) to +70°C (+158°F) for short durations.



Available capacity after constant voltage charge
Available charge current 0.1C5A or 0.2C5A
for L type cell



Available capacity after constant voltage charge
Available charge current 0.1C5A or 0.2C5A
for M type cell



Optimax - Modular approach based on flexible block configurations

Facilitates ease of handling, installation and operation

Optimax batteries make transportation, installation and operation fast and easy.

- Batteries are only delivered filled with electrolyte and in electrically charged condition.
- Storage for up to 2 years in normal conditions is possible.
- Design enables batteries to be assembled in blocks of up to 10 cells connected in series.
- Flexible block configuration makes the battery easy and fast to install.

Optimax construction features



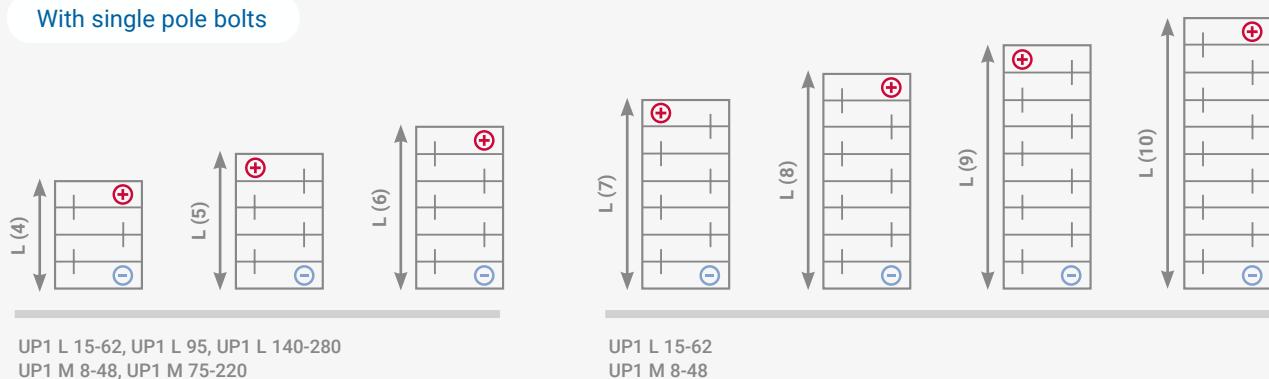
In 2022, the sustainability performance of Saft was evaluated by Ecovadis, a leading Environment and Social Responsibility rating agency. This evaluation focuses on the following matters: environment, labor and human rights, ethics as well as sustainable procurement.

Saft is ranked within the top 1% of companies involved in the manufacture of batteries and accumulators.

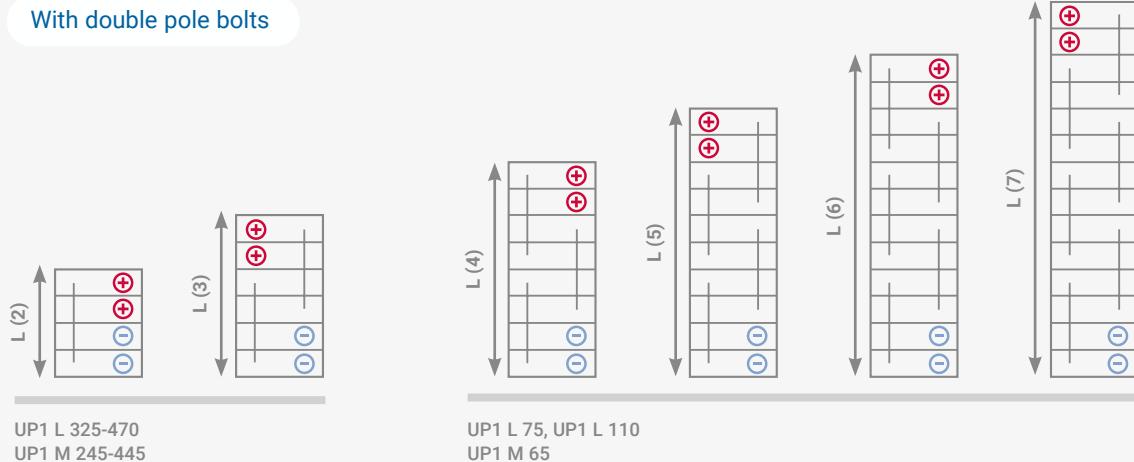
Optimax - Developed for demanding industrial installations

Flexible configuration based on cell blocks

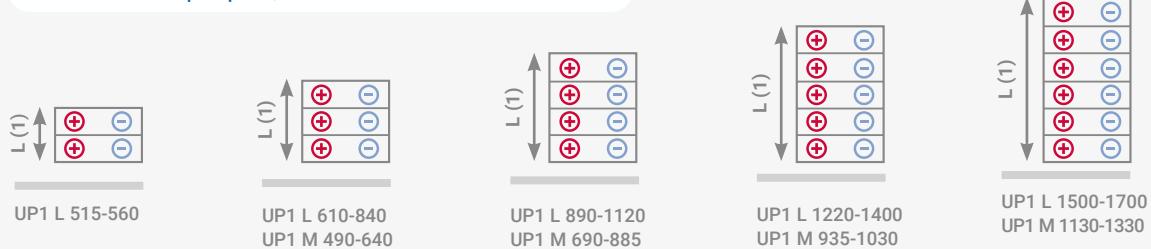
With single pole bolts



With double pole bolts



With 2-6 bolts per pole, crosswise mounted on racks



Uptimax

Easy to operate and install



Ni-Cd benefits:

► Sustainable

- Saft manufacturing process and recycling capability ensure lowest CO₂ footprint
- Saft Ni-Cd wide operating temperature range makes AC and heating redundant, hence saving energy

► Reliable

- Long operational life of over 20 years, at least 3 times longer than lead-acid batteries
- No risk of sudden death failure

► Economical

- Lowest total cost of ownership

A wide choice of capacity and performance

Uptimax cells are available in capacities from 8 – 1700 Ah in a choice of two ranges:

- UP1 L energy range, optimized for long discharge periods with a relatively low current
- UP1 M medium power range, specifically designed for mixed loads with varying current

Uptimax UP1 L

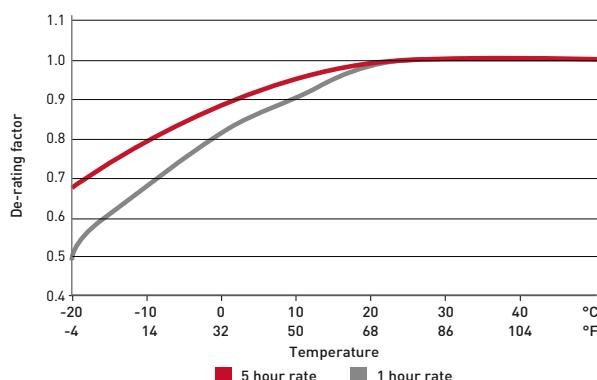
L type cell

Range of 34 cells

15 – 1700 Ah

For low rate discharges over long periods between 1 and 100 hours

Temperature de-rating factors for L type cell



Uptimax UP1 M

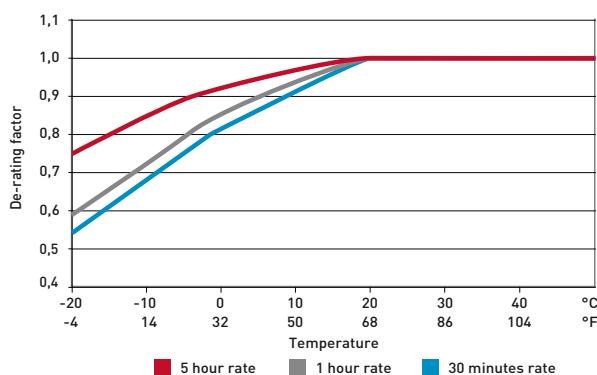
M type cell

Range of 38 cells

8 – 1330 Ah

For varied loads with low and high discharge rates, between 30 minutes and 3 hours

Temperature de-rating factors for M type cell



Optimax - Designed with the highest standards

SAFT



Optimax batteries are designed in full compliance with the highest quality, safety and environmental standards

Electrical and performances

- **Certified IEC 62259** - Secondary cells and batteries containing alkaline or other non-acid electrolytes - Nickel-cadmium prismatic secondary single cells with partial gas recombination. Optimax New Generation exceeds gas recombination requirements.
- **Certified IEC 60623** - Secondary cells and batteries containing alkaline or other non-acid electrolytes - Vented nickel-cadmium prismatic rechargeable single cells.

Safety

- **Complies with EN 50272-2/ IEC 62485-2** - Safety requirements for secondary batteries and battery installations - Part 2: Stationary batteries - The protective covers for terminals and connectors, the insulated cables are compliant with IP2 level protection against electrical shocks according to safety standards.

Quality

- ISO 9001 und ISO 14001
- Saft Excellence System

Environment & Recycling

- Fully recyclable
- **RoHS** – Although batteries and accumulators are not within the scope of the RoHS directive, Saft has taken voluntary measures to make sure that the substances forbidden by RoHS are not present in the battery, with the exception of the electro-chemical core.
- **REACH** - The Saft Group has adopted internal procedures to ensure conformity with the European REACH (Registration, Evaluation, Authorisation and Restriction of Chemical Substances) Regulation. Substances) Regulation.
- Saft operates the only plant in the world that produces nickelcadmium batteries incorporating metals that have been reclaimed on site from spent batteries, reducing their ecofootprint. The recycling of Ni-Cd batteries is a complex process that involves separating the nickel, cobalt and cadmium from the electrodes, a process perfected by Saft's plant in Oskarshamn, Sweden. This plant in Sweden is the only one in the world which combines the recycling of used batteries and the manufacturing of new ones, hence facilitating the incorporation of recycled materials into new products.

Saft offers total end to end application support

Saft's stationary battery experts can call upon a comprehensive range of skills and expertise to help our global customer specify the ideal battery solution for their particular application. Our end to end support starts at the design stage, such as advice on battery sizing, and carries customers through installation and commissioning. Saft after-sales cover support, maintenance, diagnostic services as well as end of life recycling. Saft organizes battery training seminars for consultants, engineering and maintenance departments. To ensure that our customers receive the optimum service, wherever they are in the world, Saft is continuing to expand and enhance its network of approved service stations in the Middle East, Asia and North America.

Optimax

Physical properties L range

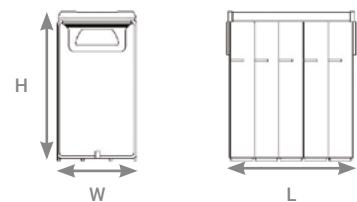
Cell Type	Capa-city	Height	Width	Lenght per block												Approx. Weight per cell	Internal Resis-tance	Bolt per pole							
				2 cells		3 cells		4 cells		5 cells		6 cells		7 cells		8 cells		9 cells							
				C, Ah	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb	mOhm				
UP1L 15	15	272	10.7	123	4.8			129	5.1	159	6.2	188	7.4	218	8.6	247	9.7	277	10.9	306	12.0	1.1	2.4	12.07	M6
UP1L 30	30	272	10.7	123	4.8			149	5.9	184	7.2	218	8.6	253	9.9	287	11.3	322	12.7	356	14.0	1.8	4.0	6.03	M6
UP1L 47	47	272	10.7	123	4.8			197	7.8	244	9.6	290	11.4	337	13.2	383	15.1	430	16.9	476	18.7	2.5	5.5	3.85	M6
UP1L 57	57	272	10.7	123	4.8			245	9.6	304	11.9	362	14.3	421	16.6	479	18.9	538	21.2	596	23.5	3.1	6.8	3.18	M6
UP1L 62	62	272	10.7	123	4.8			245	9.6	304	11.9	362	14.3	421	16.6	479	18.9	538	21.2	596	23.5	3.2	7.1	2.92	M6
UP1L 75	75	266	10.5	123	4.8			335	13.2	416	16.4	497	19.6	578	22.8							4.3	9.5	2.41	2xM6
UP1L 83	83	423	16.7	195	7.7			157	6.2	193	7.6	229	9.0									4.8	10.6	2.92	M8
UP1L 95	95	423	16.7	195	7.7			157	6.2	193	7.6	229	9.0									4.9	10.8	2.55	M8
UP1L 102	102	272	10.7	123	4.8	221	8.7	326	12.8	431	17.0	536	21.1	641	25.2	746	29.4					5.7	12.6	1.77	2xM6
UP1L 110	110	272	10.7	123	4.8	221	8.7	326	12.8	431	17.0	536	21.1	641	25.2	746	29.4					5.7	12.6	1.65	2xM6
UP1L 124	124	423	16.7	195	7.7	109	4.3	157	6.2	205	8.1	253	10.0	301	11.9							6.6	14.6	1.95	M10
UP1L 140	140	423	16.7	195	7.7	109	4.3	157	6.2	205	8.1	253	10.0	301	11.9							6.7	14.8	1.73	M10
UP1L 167	167	423	16.7	195	7.7	133	5.2	193	7.6	253	10.0	313	12.3	373	14.7							8.3	18.3	1.45	M10
UP1L 185	185	423	16.7	195	7.7	133	5.2	193	7.6	253	10.0	313	12.3	373	14.7							8.4	18.5	1.31	M10
UP1L 210	210	423	16.7	195	7.7	159	6.3	232	9.1	305	12.0	378	14.9	451	17.8							9.6	21.2	1.15	M10
UP1L 225	225	423	16.7	195	7.7	159	6.3	232	9.1	305	12.0	378	14.9	451	17.8							9.7	21.4	1.08	M10
UP1L 235	235	423	16.7	195	7.7	159	6.3	232	9.1	305	12.0	378	14.9	451	17.8							9.9	21.8	1.03	M10
UP1L 250	250	423	16.7	195	7.7	183	7.2	268	10.6	353	13.9	438	17.2	523	20.6							11.4	25.1	0.97	M10
UP1L 280	280	423	16.7	195	7.7	183	7.2	268	10.6	353	13.9	438	17.2	523	20.6							11.5	25.4	0.86	M10
UP1L 294	294	423	16.7	195	7.7	229	9.0	337	13.3												14.9	32.8	0.82	2xM10	
UP1L 325	325	423	16.7	195	7.7	229	9.0	337	13.3												15.1	33.3	0.74	2xM10	
UP1L 350	350	423	16.7	195	7.7	253	10.0	373	14.7												16.7	36.8	0.69	2xM10	
UP1L 375	375	423	16.7	195	7.7	253	10.0	373	14.7												16.8	37.0	0.65	2xM10	

Cell Type	Capa-city	Height	Width	Lenght per block						Approx. Weight per cell	Internal Resis-tance	Bolt per pole			
				1 cells		2 cells		3 cells							
				C, Ah	mm	in	mm	in	mm	in	kg	lb	mOhm		
UP1L 420	420	423	16.7	195	7.7	146	5.7	279	11.0	412	16.2	18.3	40.3	0.58	2xM10
UP1L 454	454	423	16.7	195	7.7	159	6.3	305	12.0	451	17.8	19.5	43.0	0.53	2xM10
UP1L 470	470	423	16.7	195	7.7	159	6.3	305	12.0	451	17.8	19.8	43.7	0.51	2xM10

Optimax

Physical properties L range

Cell Type	Capa- city	Height		Width		Length		Approx. Weight per cell	Internal Resis- tance	Bolt per pole
		C _s	Ah	mm	in	mm	in	kg	lb	mOhm
UP1L 500	500	423	16.7	195	7.7	171	6.7	21.2	46.7	0.48
UP1L 515	515	411	16.2	195	7.7	171	6.7	21.4	47.2	0.47
UP1L 560	560	411	16.2	195	7.7	183	7.2	23.0	50.7	0.43
UP1L 589	589	411	16.2	195	7.7	207	8.1	26.2	57.8	0.41
UP1L 610	610	411	16.2	195	7.7	207	8.1	26.5	58.4	0.40
UP1L 650	650	411	16.2	195	7.7	219	8.6	28.2	62.2	0.37
UP1L 664	664	411	16.2	195	7.7	219	8.6	28.5	62.8	0.36
UP1L 700	700	411	16.2	195	7.7	232	9.1	29.7	65.5	0.35
UP1L 725	725	411	16.2	195	7.7	243	9.6	31.2	68.8	0.33
UP1L 750	750	411	16.2	195	7.7	243	9.6	31.4	69.2	0.32
UP1L 775	775	411	16.2	195	7.7	256	10.1	32.6	71.9	0.31
UP1L 800	800	411	16.2	195	7.7	256	10.1	32.9	72.5	0.30
UP1L 840	840	411	16.2	195	7.7	268	10.6	34.5	76.1	0.29
UP1L 870	870	411	16.2	195	7.7	292	11.5	37.5	82.7	0.28
UP1L 890	890	411	16.2	195	7.7	292	11.5	38.1	84.0	0.27
UP1L 914	914	411	16.2	195	7.7	305	12.0	39.2	86.4	0.26
UP1L 940	940	411	16.2	195	7.7	305	12.0	39.6	87.3	0.26
UP1L 980	980	411	16.2	195	7.7	316	12.4	41.2	90.8	0.25
UP1L 990	990	411	16.2	195	7.7	316	12.4	41.8	92.2	0.24
UP1L 1010	1010	411	16.2	195	7.7	328	12.9	42.2	93.0	0.24
UP1L 1030	1030	411	16.2	195	7.7	328	12.9	42.9	94.6	0.23
UP1L 1080	1080	411	16.2	195	7.7	341	13.4	45.3	99.9	0.22
UP1L 1120	1120	411	16.2	195	7.7	353	13.9	46.0	101.4	0.22
UP1L 1180	1180	411	16.2	195	7.7	378	14.9	49.5	109.1	0.21
UP1L 1220	1220	411	16.2	195	7.7	388	15.3	51.3	113.1	0.20
UP1L 1260	1260	411	16.2	195	7.7	402	15.8	53.3	117.5	0.19
UP1L 1300	1300	411	16.2	195	7.7	413	16.3	54.4	119.9	0.19
UP1L 1324	1324	411	16.2	195	7.7	413	16.3	55.7	122.8	0.18
UP1L 1350	1350	411	16.2	195	7.7	426	16.8	57.1	125.9	0.18
UP1L 1400	1400	411	16.2	195	7.7	438	17.2	57.5	126.8	0.17
UP1L 1460	1460	411	16.2	195	7.7	463	18.2	61.3	135.1	0.17
UP1L 1500	1500	411	16.2	195	7.7	473	18.6	62.8	138.4	0.16
UP1L 1540	1540	411	16.2	195	7.7	487	19.2	64.5	142.2	0.16
UP1L 1570	1570	411	16.2	195	7.7	498	19.6	65.0	143.3	0.15
UP1L 1600	1600	411	16.2	195	7.7	498	19.6	65.9	145.3	0.15
UP1L 1700	1700	411	16.2	195	7.7	523	20.6	69.0	152.1	0.14



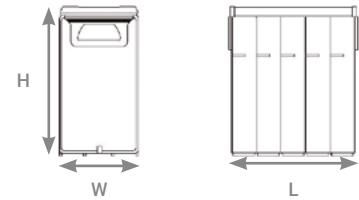
The block length and weight are determined by the number of cells in the block.
All tabulated dimensions are maximum values.

(1) Rigid connector included

Optimax

Physical properties M range

Cell Type	Capa-city	Height		Width		Lenght		Approx. Weight per cell	Internal Resistance	Bolt per pole
		C, Ah	mm	in	mm	in	mm	kg	lb	mOhm
UP1M 461	461	411	16,2	195	7,7	206	8,1	26,4	58,2	0,25
UP1M 475	475	411	16,2	195	7,7	206	8,1	27,0	59,5	0,24
UP1M 490	490	411	16,2	195	7,7	219	8,6	28,2	62,2	0,23
UP1M 502	502	411	16,2	195	7,7	232	9,1	29,5	65,0	0,23
UP1M 517	517	411	16,2	195	7,7	232	9,1	30,4	67,0	0,22
UP1M 530	530	411	16,2	195	7,7	243	9,6	31,0	68,3	0,22
UP1M 540	540	411	16,2	195	7,7	243	9,6	31,4	69,2	0,21
UP1M 553	553	411	16,2	195	7,7	244	9,6	31,6	69,7	0,21
UP1M 569	569	411	16,2	195	7,7	244	9,6	32,6	71,9	0,20
UP1M 590	590	411	16,2	195	7,7	268	10,6	34,5	76,1	0,19
UP1M 604	604	411	16,2	195	7,7	268	10,6	34,5	76,1	0,14
UP1M 620	620	411	16,2	195	7,7	268	10,6	34,9	76,9	0,18
UP1M 630	630	411	16,2	195	7,7	268	10,6	35,2	77,6	0,18
UP1M 640	640	411	16,2	195	7,7	268	10,6	35,5	78,3	0,18
UP1M 656	656	411	16,2	195	7,7	268	10,6	35,4	78,0	0,17
UP1M 675	675	411	16,2	195	7,7	268	10,6	36,0	79,4	0,17
UP1M 690	690	411	16,2	195	7,7	305	12,0	39,6	87,3	0,17
UP1M 715	715	411	16,2	195	7,7	317	12,5	41,6	91,7	0,16
UP1M 740	740	411	16,2	195	7,7	328	12,9	42,8	94,4	0,15
UP1M 752	752	411	16,2	195	7,7	341	13,4	44,2	97,4	0,15
UP1M 772	772	411	16,2	195	7,7	329	13,0	43,1	95,0	0,15
UP1M 785	785	411	16,2	195	7,7	353	13,9	46,0	101,4	0,15
UP1M 810	810	411	16,2	195	7,7	328	12,9	44,1	97,2	0,14
UP1M 835	835	411	16,2	195	7,7	341	13,4	45,9	101,2	0,14
UP1M 860	860	411	16,2	195	7,7	353	13,9	47,5	104,7	0,13
UP1M 885	885	411	16,2	195	7,7	353	13,9	48,0	105,8	0,13
UP1M 915	915	411	16,2	195	7,7	402	15,8	53,5	117,9	0,12
UP1M 935	935	411	16,2	195	7,7	413	16,3	54,4	119,9	0,12
UP1M 960	960	411	16,2	195	7,7	388	15,3	53,2	117,3	0,12
UP1M 985	985	411	16,2	195	7,7	438	17,2	57,5	126,8	0,12
UP1M 1000	1000	411	16,2	195	7,7	407	16,0	55,6	122,6	0,11
UP1M 1030	1030	411	16,2	195	7,7	413	16,3	56,4	124,3	0,11
UP1M 1080	1080	411	16,2	195	7,7	438	17,2	60,1	132,5	0,11
UP1M 1130	1130	411	16,2	195	7,7	498	19,6	65,9	145,3	0,10
UP1M 1180	1180	411	16,2	195	7,7	473	18,6	65,2	143,7	0,10
UP1M 1230	1230	411	16,2	195	7,7	492	19,4	67,6	149,0	0,09
UP1M 1250	1250	411	16,2	195	7,7	498	19,6	68,7	151,5	0,09
UP1M 1280	1280	411	16,2	195	7,7	511	20,1	70,5	155,4	0,09



The block length and weight are determined by the number of cells in the block.
All tabulated dimensions are maximum values.

(1) Rigid connector included



We energize
the world.
On land,
at sea,
in the air
and in space.

Saft has launched a sustainability initiative, Program Net Zero, consisting of 5 pillars:

1. Reducing the environmental footprint of our activities and that of our battery solutions.
2. Assisting Saft's customers in lowering their environmental footprint.
3. Using natural resources sustainably and implementing circular economy principles throughout our operations.
4. Prioritizing suppliers with strong environmental, social, and human rights records.
5. Working to always ensure compliance with environmental regulations and best practices in all locations.

Batteries facilitate the shift towards clean energy, but there is much work to do to achieve Net Zero. Therefore, Saft is committed to reducing its impact while respecting social and human rights all along the value chain.



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