

# Ultima.plus

## Nickel-cadmium batteries

### STL ⊕ 38 to STL ⊕ 460

#### Telecom applications

Saft's Ultima.plus battery has been designed to fulfil the demanding requirements of remote or outside telecom plants: local or access terminals, Base Transceiver Stations, Base Station Controllers, Optical Node Units, etc...

Ultima.plus delivers long life and requires minimal maintenance, even when operating in harsh environments, with high temperatures, which rapidly expose the failures of Valve Regulated Lead Acid (VRLA) technology.

#### Intrinsic and field-proven reliability

Thanks to a 100 year established pocket plate design, coupled with Saft's innovative flooded recombination technology, Ultima.plus offers superior performance. By the use of its free electrolyte reserves and an oxygen recombination level higher than 80%. Ultima.plus completely eliminates the risk of thermal runaway, while at the same time remains virtually maintenance free.

Ultima.plus does not suffer sudden death failure. It will survive abuses, including overcharging, deep discharging, and high ripple currents, which would destroy a Valve Regulated Lead Acid battery.

#### Very low life cycle cost

Thanks to its long life, Ultima.plus reveals itself as a good investment. Very low maintenance and high reliability contribute to remarkable life cycle cost reduction. At the end of the day, lower operating costs and less down time can be expected.



#### Simple configuration

A typical 48 V telecom application needs 38 to 39 cells connected in series depending on the load voltage window. Thanks to tailored cell layouts, the Ultima.plus battery adjusts to available space. It can replace lead acid batteries without any modification of the charging equipment.

#### Ultima.plus for your application

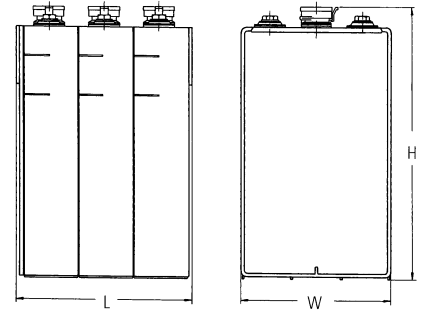
- Fully compatible with VRLA charging systems
- Cabinet or rack installations
- Huts
- Remote bulk power cabinets
- Controlled Environment Vaults (CEV)
- Central Offices (CO)

Battery characteristics	STL ⊕ 38	STL ⊕ 230	STL ⊕ 460
Volumetric energy density (Wh/l)	22.4	40.0	40.3
Gravimetric energy density (Wh/kg)	14.1	24.0	24.0
Charge voltage V/cell*	1.43 ± 0.02	1.43 ± 0.02	1.43 ± 0.02
Case material	Polypropylene	Polypropylene	Polypropylene
Flammability (and OI)	UL-94 V0 (28%)	UL-94 V0 (28%)	UL-94 V0 (28%)
Terminal Size	M 6 x 1	M 10 x 1	M 10 x 2
Life time at +25°C	≥ 20 years	≥ 20 years	≥ 20 years
Watering interval at +25°C	5 years	5 years	5 years

\* at +25°C

## Advantages

- Very low maintenance. Once every 5 years in the operating temperature range.
- Long life and high reliability, even under extreme operating temperatures
- Very low Life Cycle Cost
- Cells with partial gas recombination
- Flooded technology and separator design minimizes thermal runaway
- All parts are readily recyclable
- Equipped with nylon handles for easy installation
- Central water filling system available as an option for Ultima.plus cell types 155 Ah to 460 Ah



## Physical characteristics

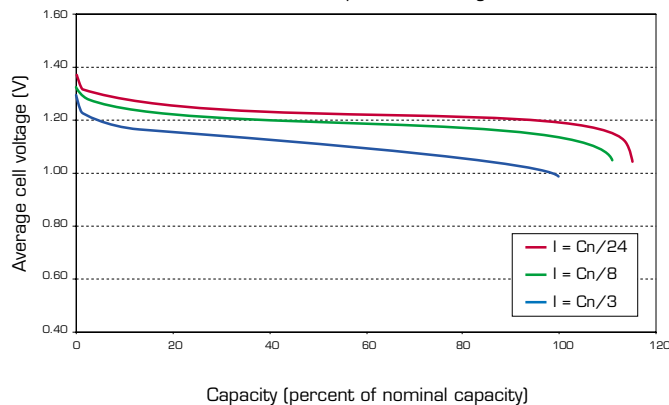
Cell type	Rated Capacity C <sub>5</sub> Ah*	Nominal Capacity C <sub>8</sub> Ah**	Maximum block of cells dimensions in mm (inches)																Weight per cell kg   lbs		Terminal Size				
			W		H		L		L		L		L		L		L								
			mm	in	mm	in	1 cell		2 cells		3 cells		4 cells		5 cells		6 cells		8 cells			10 cells			
STL⊕ 38	43	38	195	7.7	405	15.9			57	2.2	82	3.2	107	4.2	131	5.2	156	6.1	206	8.1	255	10.0	3.2	7.1	M 6 x 1
STL⊕ 77	85	77	195	7.7	405	15.9			79	3.1	115	4.5	151	5.9	186	7.3	222	8.7	294	11.6	365	14.4	4.9	10.8	M 8 x 1
STL⊕ 115	128	115	195	7.7	405	15.9			103	4.1	151	5.9	199	7.8	246	9.7	294	11.6	390	15.4			6.7	14.8	M 10 x 1
STL⊕ 155	171	155	195	7.7	405	15.9			127	5.0	187	7.4	247	9.7	306	12.0	366	14.4					8.4	18.5	M 10 x 1
STL⊕ 190	213	190	195	7.7	405	15.9			153	6.0	226	8.9	298	11.7	371	14.6							9.9	21.8	M 10 x 1
STL⊕ 230	256	230	195	7.7	405	15.9			177	7.0	262	10.3											11.5	25.4	M 10 x 1
STL⊕ 270	300	270	195	7.7	405	15.9			222	8.7	330	13.0											15.1	33.3	M 10 x 2
STL⊕ 305	341	305	195	7.7	405	15.9			246	9.7	366	14.4											16.8	37.0	M 10 x 2
STL⊕ 345	384	345	195	7.7	405	15.9	140	5.5	272	10.7													18.3	40.3	M 10 x 2
STL⊕ 385	427	385	195	7.7	405	15.9	153	6.0	298	11.7													19.8	43.7	M 10 x 2
STL⊕ 460	512	460	195	7.7	405	15.9	177	7.0	347	13.7													23.0	50.7	M 10 x 2

\* according to IEC 60623

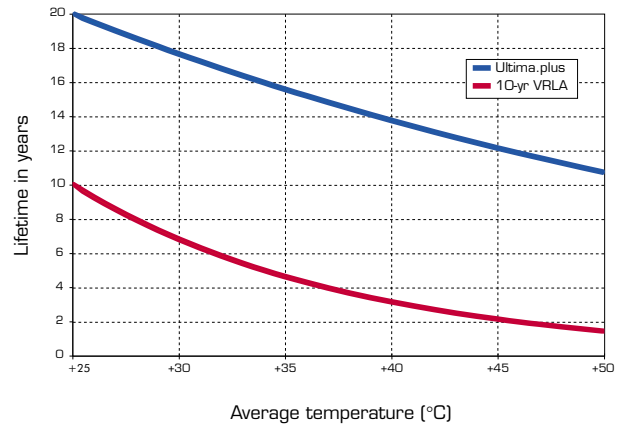
\*\* Obtained after a constant voltage charge of 1.45 V/cell 24 h, +25°C followed by a discharge 8 h, +25°C down to 1.10 V/cell Available charge current : 0.15 C<sub>8</sub>A

## Discharge characteristics

Typical discharge characteristics at +25°C at different discharge rates after a long period in floating



## Effect of temperature on battery life



## Operating range

- Typical 0 to +40°C (+32°F to +104°F), however can survive extremes from -50°C to +70°C (-58°F to +158°F)
- Up to Zone 4 earthquake

## Technology

- Pocket plate positive electrodes
- Pocket plate negative electrodes
- Flooded alkaline electrolyte
- Compact stack design using chemically stable separator material

## Tabular discharge data for the Ultima.plus range

Performance table in **Ampere** after a constant voltage charge of 1.45 V/cell for 24 h at +20°C to +25°C (+68°F to +77°F)

Final voltage: 1.00 V/cell

Cell type	C <sub>8</sub> (Ah) *	Hours							
		1	2	3	4	5	8	10	24
STL⊕ 38	38	24.5	16.8	11.9	9.14	7.40	4.87	3.91	1.65
STL⊕ 77	77	48.5	33.2	23.5	18.1	14.6	9.63	7.74	3.26
STL⊕ 115	115	73.0	49.9	35.4	27.2	22.0	14.5	11.6	4.91
STL⊕ 155	155	97.5	66.7	47.3	36.3	29.4	19.4	15.6	6.56
STL⊕ 190	190	121	83.1	58.9	45.3	36.6	24.1	19.4	8.17
STL⊕ 230	230	146	99.8	70.8	54.4	44.0	29.0	23.3	9.81
STL⊕ 270	270	171	117	83.0	63.8	51.6	34.0	27.3	11.5
STL⊕ 305	305	194	133	94.3	72.5	58.7	38.6	31.0	13.1
STL⊕ 345	345	219	150	106	81.6	66.0	43.5	34.9	14.7
STL⊕ 385	385	243	167	118	90.7	73.4	48.4	38.9	16.4
STL⊕ 460	460	292	200	142	109	88.1	58.0	46.6	19.6

Final voltage: 1.05 V/cell

Cell type	C <sub>8</sub> (Ah) *	Hours							
		1	2	3	4	5	8	10	24
STL⊕ 38	38	20.2	15.1	11.5	9.03	7.40	4.87	3.91	1.65
STL⊕ 77	77	40.0	29.8	22.7	17.9	14.6	9.63	7.74	3.26
STL⊕ 115	115	60.2	44.8	34.1	26.9	22.0	14.5	11.6	4.91
STL⊕ 155	155	80.4	59.9	45.6	35.9	29.4	19.4	15.6	6.56
STL⊕ 190	190	100	74.6	56.8	44.7	36.6	24.1	19.4	8.17
STL⊕ 230	230	120	89.6	68.3	53.8	44.0	29.0	23.3	9.81
STL⊕ 270	270	141	105	80.0	63.0	51.6	34.0	27.3	11.5
STL⊕ 305	305	160	119	90.9	71.6	58.7	38.6	31.0	13.1
STL⊕ 345	345	180	134	102	80.6	66.0	43.5	34.9	14.7
STL⊕ 385	385	201	149	114	89.7	73.4	48.4	38.9	16.4
STL⊕ 460	460	241	179	137	108	88.1	58.0	46.6	19.6

Final voltage: 1.10 V/cell

Cell type	C <sub>8</sub> (Ah) *	Hours							
		1	2	3	4	5	8	10	24
STL⊕ 38	38	15.9	12.5	10.3	8.82	7.31	4.75	3.87	1.65
STL⊕ 77	77	31.5	24.7	20.4	17.4	14.5	9.63	7.65	3.26
STL⊕ 115	115	47.4	37.1	30.7	26.2	21.8	14.4	11.5	4.91
STL⊕ 155	155	63.3	49.6	41.0	35.1	29.1	19.4	15.4	6.56
STL⊕ 190	190	78.8	61.8	51.1	43.7	36.2	23.8	19.2	8.17
STL⊕ 230	230	94.7	74.2	61.4	52.5	43.5	28.8	23.0	9.81
STL⊕ 270	270	111	87.0	72.0	61.5	51.0	33.8	27.0	11.5
STL⊕ 305	305	126	98.9	81.8	69.9	58.0	38.1	30.7	13.1
STL⊕ 345	345	142	111	92.2	78.7	65.3	43.1	34.6	14.7
STL⊕ 385	385	158	124	102	87.5	72.6	48.1	38.4	16.4
STL⊕ 460	460	189	148	123	105	87.0	57.5	46.1	19.6

Final voltage: 1.14 V/cell

Cell type	C <sub>8</sub> (Ah) *	Hours							
		1	2	3	4	5	8	10	24
STL⊕ 38	38	12.9	10.3	8.60	7.31	6.54	4.62	3.78	1.65
STL⊕ 77	77	25.5	20.4	17.0	14.5	12.9	9.14	7.48	3.26
STL⊕ 115	115	38.4	30.7	25.6	21.8	19.5	13.8	11.3	4.91
STL⊕ 155	155	51.3	41.0	34.2	29.1	26.0	18.4	15.0	6.56
STL⊕ 190	190	63.9	51.1	42.6	36.2	32.4	22.9	18.7	8.17
STL⊕ 230	230	76.8	61.4	51.2	43.5	38.9	27.5	22.5	9.81
STL⊕ 270	270	90.0	72.0	60.0	51.0	45.6	32.3	26.4	11.5
STL⊕ 305	305	102	81.8	68.2	58.0	51.8	36.7	30.0	13.1
STL⊕ 345	345	115	92.2	76.8	65.3	58.4	41.3	33.8	14.7
STL⊕ 385	385	128	102	85.4	72.6	64.9	45.9	37.6	16.4
STL⊕ 460	460	154	123	102	87.0	77.8	55.0	45.1	19.6

\* Nominal capacity is obtained after a constant voltage charge (I-U) of 1.45 V/cell (24 h at +25°C/+77°F) followed by a discharge (at the discharge rate corresponding to 8 h autonomy) down to 1.1 V/cell. Available charge current 0.15 C<sub>8</sub> A.

# Tabular discharge data for the Ultima.plus range

Performance table in **Watt** after a constant voltage charge of 1.45 V/cell for 24 h at +20°C to +25°C (+68°F to +77°F)

Final voltage: 1.00 V/cell

Cell type	C <sub>8</sub> (Ah) *	Hours							
		1	2	3	4	5	8	10	24
STL⊕ 38	38	26.1	18.2	13.3	10.5	8.58	5.80	4.66	2.01
STL⊕ 77	77	51.6	35.9	26.2	20.7	17.0	11.5	9.22	3.98
STL⊕ 115	115	77.6	54.1	39.5	31.1	25.5	17.3	13.9	5.99
STL⊕ 155	155	104	72.3	52.8	41.6	34.1	23.0	18.5	8.00
STL⊕ 190	190	129	90.0	65.8	51.8	42.5	28.7	23.1	9.96
STL⊕ 230	230	155	108	79.0	62.2	51.1	34.5	27.8	12.0
STL⊕ 270	270	182	127	92.6	72.9	59.9	40.4	32.5	14.0
STL⊕ 305	305	207	144	105	82.9	68.0	46.0	37.0	15.9
STL⊕ 345	345	233	162	119	93.4	76.6	51.8	41.7	18.0
STL⊕ 385	385	259	181	132	104	85.2	57.5	46.3	20.0
STL⊕ 460	460	311	216	158	124	102	69.0	55.5	23.9

Final voltage: 1.05 V/cell

Cell type	C <sub>8</sub> (Ah) *	Hours							
		1	2	3	4	5	8	10	24
STL⊕ 38	38	22.1	16.6	12.9	10.4	8.59	5.80	4.66	2.01
STL⊕ 77	77	43.6	32.8	25.6	20.6	17.0	11.5	9.22	3.98
STL⊕ 115	115	65.7	49.5	38.5	31.1	25.6	17.3	13.9	5.99
STL⊕ 155	155	87.8	66.1	51.4	41.5	34.2	23.0	18.5	8.00
STL⊕ 190	190	109	82.3	64.1	51.7	42.6	28.7	23.1	10.0
STL⊕ 230	230	131	98.9	77.0	62.1	51.2	34.5	27.8	12.0
STL⊕ 270	270	154	116	90.2	72.8	60.0	40.4	32.5	14.0
STL⊕ 305	305	175	132	103	82.8	68.2	46.0	37.0	15.9
STL⊕ 345	345	197	148	116	93.2	76.7	51.8	41.7	18.0
STL⊕ 385	385	219	165	128	104	85.3	57.5	46.3	20.0
STL⊕ 460	460	263	198	154	124	102	69.0	55.5	23.9

Final voltage: 1.10 V/cell

Cell type	C <sub>8</sub> (Ah) *	Hours							
		1	2	3	4	5	8	10	24
STL⊕ 38	38	18.0	14.3	11.9	10.2	8.54	5.65	4.6	2.01
STL⊕ 77	77	35.6	28.2	23.5	20.1	16.9	11.5	9.1	3.98
STL⊕ 115	115	53.6	42.5	35.4	30.3	25.4	17.1	13.7	5.99
STL⊕ 155	155	71.6	56.7	47.3	40.5	34.0	23.1	18.3	8.00
STL⊕ 190	190	89.2	70.7	58.9	50.5	42.3	28.3	22.9	9.96
STL⊕ 230	230	107	84.9	70.8	60.7	50.8	34.2	27.5	12.0
STL⊕ 270	270	126	99.5	82.9	71.1	59.6	40.2	32.2	14.0
STL⊕ 305	305	143	113	94.3	80.8	67.7	45.4	36.6	15.9
STL⊕ 345	345	161	127	106	91.0	76.2	51.3	41.2	18.0
STL⊕ 385	385	179	142	118	101	84.8	57.3	45.8	20.0
STL⊕ 460	460	214	170	142	121	102	68.4	54.9	23.9

Final voltage: 1.14 V/cell

Cell type	C <sub>8</sub> (Ah) *	Hours							
		1	2	3	4	5	8	10	24
STL⊕ 38	38	15.1	12.1	10.1	8.66	7.74	5.51	4.51	2.01
STL⊕ 77	77	29.8	24.0	20.1	17.1	15.3	10.9	8.92	3.98
STL⊕ 115	115	44.9	36.1	30.2	25.8	23.0	16.4	13.4	5.99
STL⊕ 155	155	60.0	48.3	40.4	34.4	30.8	21.9	17.9	8.00
STL⊕ 190	190	74.8	60.1	50.3	42.9	38.3	27.3	22.3	9.96
STL⊕ 230	230	89.9	72.3	60.4	51.5	46.1	32.8	26.9	12.0
STL⊕ 270	270	105	84.7	70.8	60.4	54.0	38.4	31.5	14.0
STL⊕ 305	305	120	96.2	80.5	68.6	61.4	43.7	35.8	15.9
STL⊕ 345	345	135	108	90.6	77.3	69.1	49.2	40.3	18.0
STL⊕ 385	385	150	121	101	85.9	76.8	54.7	44.8	20.0
STL⊕ 460	460	180	145	121	103	92.1	65.6	53.7	23.9

\* Nominal capacity is obtained after a constant voltage charge (I-U) of 1.45 V/cell (24 h at +25°C/+77°F) followed by a discharge (at the discharge rate corresponding to 8 h autonomy) down to 1.1 V/cell. Available charge current 0.15 C<sub>8</sub> A.

## Saft Industrial Battery Group

12, rue Sadi Carnot  
93170 Bagnole - France  
Tel: +33 1 49 93 19 18  
Fax: +33 1 49 93 19 64

www.saftbatteries.com

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