SPL+ Ni-Cd battery Trackside power when it matters most





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Trackside power that's always there



Reliability, continuity and safety

Signaling and communication are complex and critical parts of a railroad's operating system. Reliability is paramount to guarantee the safe movements of trains and to provide effective control of trains and traffic at grade crossings. This means ensuring a highly reliable power supply for trackside signals, flashers, switches, remote monitoring and control, communications and other equipment.

Stationary batteries, housed in trackside bungalows and cabinets, play a vital role in ensuring continuity of suppling power to these critical signaling and communication operations including Positive Train Control and Communications Based Train Control systems. Batteries are also used to meet peak electricity demand and to provide backup power to all systems in case of an emergency.

SPL+ Ni-Cd (nickel-cadmium) batteries are optimized for the specific requirements of railroad trackside power. They are extremely reliable, require minimal maintenance, and cost less over their lifetime than comparable batteries.

Your trusted partner for rail battery applications

Saft has over 100 years experience in delivering well-proven Ni-Cd battery solutions optimized to ensure the total security and availability of multiple applications.

Saft products and components are designed and manufactured to the very highest quality standards. SPL is operating in ten of thousands of locations accross North America, from Alaska to the Panama canal.

Saft's comprehensive global service provides expert support throughout every stage of your battery's life from initial concept through volume supply, installation and training to end-of-life recycling.



Reliability wherever you need it



Built for today's trackside equipment

Today's trackside systems are increasingly all electronic: cabinets full of relays have been largely replaced by microprocessors and electronic circuitry along with relays, to support and operate the entire signal system.

Battery backup systems ensure continuity of power supply to these systems in the event of failure of the normal mains power supply. In railroad applications, this is vital to maintain the safe operation of trains, for good traffic control at crossings and to ensure the integrity of information about safety and control and for system management.

These trackside battery systems must be able to operate across a wide range of temperatures. They must offer a good, predictable lifetime, even at high temperatures, good low temperature performance and minimal maintenance requirements, without risk of sudden failures.

The stationary batteries must be capable of receiving their charge from the mains supply (continuous or intermittent) or from small solar panels or wind generators.

SPL+ Ni-Cd batteries help ensure complete system reliability and security by offering several advantages:

- lifetime in excess of 20 years
- infrequent and straightforward maintenance needs
- longer lifetime at higher operating temperature than lead acid batteries, together with superior low-temperature performance
- little or no need for replacement, due to long lifetime and reliability
- performance optimized for the duty cycle (cycling ability is well within the requirements of trackside applications)
- low Total Cost of Ownership, thanks to high reliability and low operating costs.

Over the lifetime of our trackside systems, it's clear that nickel-cadmium batteries offer far superior performance and optimized operational costs than equivalent lead acid types.



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SPL+ Ni-Cd battery - Trackside power when it matters most

Performance where it matters



Field-proven, robust nickel-cadmium pocket plate construction provides extremely reliable solutions for demanding railroad applications

SPL+ Ni-Cd batteries offer reliability even in the most demanding conditions:

- 20-plus year lifetime
- excellent electrical performance
- high resistance to electrical and mechanical abuse
- no "sudden-death", thermal runaway and cell dry-out as seen with VRLA batteries
- thousands of charge-discharge cycles while retaining excellent electrical performance, dependant on Depth Of Discharge (DOD).

SPL+ batteries are able to perform in harsh conditions and remote areas

The temperature in an outdoor battery cabinet can be up to + 10°C (+ 18°F) or higher than the outside air. While high temperatures reduce the life of all batteries, SPL+ batteries cope better than the alternatives.

SPL+ batteries operate in ambient temperatures ranging from – 30°C (– 22°F) to + 40°C (+ 104°F), and are able to withstand extremes of – 40°C (– 40°F) to + 55°C (+ 131°F).

SPL+ batteries are able to operate with renewable energy sources.

SPL+ batteries offer ultra-low operating maintenance needs

Trackside batteries can be hundreds of miles from the nearest maintenance depot, and the cost of frequent inspection and maintenance visits over the battery's life can easily outweigh the purchase price. SPL+ Ni-Cd batteries reduce maintenance needs dramatically compared with lead acid designs:

- the high level of gas recombination is beyond the requirements of IEC 62259 (recombination level higher than 90 percent) and reduces water consumption and gas emissions
- one topping up interval during the entire battery life at + 20°C (+ 68°F) or + 40°C (+ 104°F)
- fast and simple charging within a narrow window for minimal downtime and maximum availability.

SPL+ batteries outperform lead acid batteries at low temperatures



Percentage (%) of C5 rated capacity

4



SPL+ batteries simplify handling and installation

Saft SPL+ batteries make transportation, installation and operation fast and easy:

- batteries are only delivered filled with electrolyte and in electrically charged condition
- batteries may be stored for up to two years in normal conditions, and in some circumstances also at higher temperatures
- cell containers are polypropylene with visible electrolyte levels and are equipped with flame arresting flip top vents
- design eliminates need for special handling equipment.







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Proven performance and reliability

Dimensions

Cell type	Capacity C ₅ Ah	Hei	ight*	Wi	idth	Ler	ngth	Approx.	. weight	Internal resistance	Terminal	
	05711	mm	in	mm	in	mm	in	Kg	lb	m0hm**	bolt per pole	
SPL+80	80	349	13,74	192	7,56	68	2,68	6,8	15,0	1,94	M10	
SPL+100	100	349	13,74	192	7,56	68	2,68	6,8	15,0	1,55	M10	
SPL+130	130	349	13,74	192	7,56	68	2,68	7,5	16,5	1,19	M10	
SPL+165	165	349	13,74	192	7,56	93	3,66	9,8	21,6	0,94	M10	
SPL+200	200	349	13,74	192	7,56	93	3,66	10,4	22,9	0,78	M10	
SPL+250	250	405	15,94	192	7,56	101	3,98	12,4	27,3	0,66	M10	
SPL+290	290	405	15,94	192	7,56	130	5,12	16,0	35,3	0,57	2xM10	
SPL+340	340	405	15,94	192	7,56	130	5,12	16,7	36,8	0,49	2xM10	
SPL+380	380	400	15,75	195	7,68	146	5,75	18,4	40,6	0,43	2xM10	
SPL+420	420	400	15,75	195	7,68	159	6,26	19,8	43,7	0,39	2xM10	
SPL+470	470	400	15,75	195	7,68	171	6,73	21,8	48,1	0,35	2xM10	
SPL+510	510	400	15,75	195	7,68	183	7,20	23,5	51,8	0,32	2xM10	

*Height including IP2 terminal cover - ** Rigid connector included

Charge voltages

- Two level charge: High level: 1.45 ± 0.01 V/cell Float level: 1.42 ± 0.01 V/cell
- Single level charge: 1.42 ± 0.01 V/cell

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

Electrical characteristics

- Certified IEC 62259 Secondary cells and batteries containing alkaline or other non-acid electrolytes – Nickel-cadmium prismatic secondary single cells with partial gas recombination. SPL+ 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 standard.

Quality

- ISO 9001 and ISO 14001.
- Saft world-class continuous program.

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 electrochemical core.
- REACH The Saft Group has adopted internal procedures to ensure conformity with the European REACH (Registration, Evaluation, Authorization and Restriction of Chemical Substances) regulations.











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Performance data - All trackside applications

Performance after prolonged float charge of fully charged cells

Available Amperes at + 20°C ± 5°C (+ 68°F± 9°F)

Cell type	C ₅ Ah				Hours						Seconds						
Cett type		10	8	5	3	2	1,5	1	30	20	15	10	5	1	30	5	1
SPL+80	80	8,88	11,0	16,7	26,9	36,6	44,7	54,5	62,2	69,3	68,1	74,7	80,1	90,8	96,4	110	124
SPL+100	100	11,1	13,7	20,8	33,7	45,8	55,9	68,1	77,7	86,6	85,1	93,4	100	114	120	137	155
SPL+130	130	14,4	17,9	27,1	43,8	59,6	72,6	88,6	101	113	111	121	130	148	157	178	201
SPL+165	165	18,3	22,7	34,4	55,5	75,6	92,2	112	128	143	140	154	165	187	199	227	255
SPL+200	200	22,2	27,5	41,7	67,3	91,6	112	136	155	173	170	187	200	227	241	275	309
SPL+250	250	27,7	34,4	52,1	84,2	115	140	170	194	216	213	233	250	284	301	343	386
SPL+290	290	32,2	39,9	60,4	97,6	133	162	198	225	251	247	271	290	329	349	398	448
SPL+340	340	37,7	46,7	70,8	114	156	190	232	264	294	289	318	340	386	410	467	525
SPL+380	380	42,2	52,2	79,1	128	174	212	259	295	329	323	355	380	431	458	522	587
SPL+420	420	46,6	57,7	87,5	141	192	235	286	327	364	358	392	420	477	506	577	649
SPL+470	470	52,1	64,6	97,9	158	215	263	320	365	407	400	439	470	534	566	645	726
SPL+510	510	56,6	70,1	106	172	234	285	348	396	442	434	476	510	579	615	700	788

Available Amperes at + 20°C ± 5°C (+ 68°F± 9°F)

Final voltage: 1.05 V/cell

Final voltage: 1.10 V/cell

Final voltage: 1.00 V/cell

Cell type	С ₅				Hours						Min	Seconds					
Cett type	Aĥ	10	8	5	3	2	1,5	1	30	20	15	10	5	1	30	5	1
SPL+80	80	8,43	10,4	16,5	24,5	32,1	38,0	43,8	51,3	56,4	57,5	59,6	65,7	77,9	81,9	95,6	106
SPL+100	100	10,5	13,0	20,6	30,6	40,1	47,5	54,8	64,1	70,5	71,9	74,4	82,1	97,4	102	119	132
SPL+130	130	13,7	16,9	26,8	39,7	52,1	61,8	71,2	83,3	91,6	93,5	96,8	107	127	133	155	172
SPL+165	165	17,4	21,5	34,0	50,4	66,2	78,5	90,4	106	116	119	123	135	161	169	197	218
SPL+200	200	21,1	26,0	41,2	61,1	80,2	95,1	110	128	141	144	149	164	195	205	239	264
SPL+250	250	26,3	32,5	51,4	76,4	100	119	137	160	176	180	186	205	243	256	299	330
SPL+290	290	30,5	37,7	59,7	88,6	116	138	159	186	204	209	216	238	282	297	346	383
SPL+340	340	35,8	44,3	70,0	104	136	162	186	218	240	245	253	279	331	348	406	449
SPL+380	380	40,0	49,5	78,2	116	152	181	208	243	268	273	283	312	370	389	454	502
SPL+420	420	44,2	54,7	86,4	128	168	200	230	269	296	302	313	345	409	430	502	555
SPL+470	470	59,5	61,2	96,7	144	189	223	258	301	331	338	350	386	458	481	561	621
SPL+510	510	53,7	66,4	105	156	205	242	279	327	359	367	380	419	497	522	609	674

Available Amperes at + 20°C ± 5°C (+ 68°F± 9°F)

Hours Minutes 10 1,5 30 20 8 15 10 5 5 3 2 1 7,95 9,86 28,4 41.3 46,1 47,1 52.3 14.4 21.3 35.9 43.4 61.9 66,3 72,0 80.6 31.6 9,94 12,3 18,0 35,6 39,5 44,9 54,2 57,6 65,4 77,4 82,9 101 26,6 51,6 58,9 90,0 12,9 16,0 23,4 34,6 46,2 51,4 58,4 67,1 70,5 74,8 76,6 85,0 101 108 117 131 16,4 20,3 29,7 44,0 58,7 65,2 74,1 85,2 89,5 95,0 97,2 108 128 137 149 166 19,9 24,6 36,0 53,3 71,1 79,0 89,8 103 108 115 118 131 155 166 180 202 24.9 30.8 45.0 66,6 88.9 98.8 129 136 144 147 164 193 207 225 252 112 28,8 35,7 52,2 77,2 103 115 130 150 157 167 171 190 224 240 261 292 33,8 90,6 134 176 222 282 343 41,9 61,2 121 153 184 196 200 263 306

206

228

255

276

219

242

271

294

224

247

277

300

249

275

307

334

294

325

364

395

315

348

390

423

Available Amperes at + 20°C ± 5°C (+ 68°F± 9°F)

37,8

41.8

46,7

50,7

46,8

51.7

57,9

62,8

68,4

75.7

84,7

91,9

101

112

125

136

135

149

167

181

150

166

186

201

171

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211

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196

217

243

263

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Cell type	C ₅				Hours						Min	Seconds					
	Aĥ	10	8	5	3	2	1,5	1	30	20	15	10	5	1	30	5	1
SPL+80	80	7,38	9,23	12,4	18,3	22,9	23,6	26,3	28,2	31,0	32,5	33,8	38,9	46,9	50,7	58,6	66,2
SPL+100	100	9,22	11,5	15,5	22,9	28,7	29,6	32,9	35,3	38,8	40,6	42,2	48,6	58,6	63,3	73,3	82,7
SPL+130	130	12,0	15,0	20,1	29,8	37,3	38,4	42,8	45,8	50,5	52,7	54,9	63,2	76,1	82,3	95,3	108
SPL+165	165	15,2	19,0	25,6	37,8	47,3	48,8	54,3	58,2	64,0	66,9	69,7	80,2	96,6	104,5	121	136
SPL+200	200	18,4	23,1	31,0	45,8	57,4	59,1	65,8	70,5	77,6	81,1	84,4	97,2	117	126,7	147	165
SPL+250	250	23,0	28,9	38,7	57,2	71,7	73,9	82,2	88,1	97,0	101	106	121	146	158,3	183	207
SPL+290	290	26,7	33,7	44,9	66,4	83,2	85,7	95,4	102	113	118	122	141	170	184	213	240
SPL+340	340	31,3	39,2	52,7	77,8	97,5	100	112	120	132	138	144	165	199	215	249	281
SPL+380	380	35,0	43,9	58,9	87,0	109	112	125	134	147	154	160	185	223	241	279	314
SPL+420	420	38,7	48,5	65,1	96,2	120	124	138	148	163	170	177	204	246	266	308	347
SPL+470	470	43,3	54,2	72,8	108	135	139	155	166	182	191	198	228	275	298	345	389
SPL+510	510	47,0	58,9	79,0	117	146	151	168	180	198	207	215	248	299	323	374	422

Final voltage: 1.14 V/cell

342

378

423

459

383

423

474

514

Cell type

SPL+80

SPL+100 SPL+130 SPL+165

SPL+290 SPL+340

SPL+380

SPL+420 SPL+470

SPL+510

80

100

130

165

200

250

290

340

380

420

470

510

Saft is committed to the highest standards of environmental stewardship

As part of its environmental commitment, Saft gives priority to recycled raw materials over virgin raw materials, reduces its manufacturing plants' air and water releases year after year, minimizes water usage, reduces fossil energy consumption and associated CO₂ emissions, and ensures that its customers have recycling solutions for their spent batteries.

Regarding industrial nickel-based batteries, Saft has had partnerships for many years with collection companies in most EU and North American countries. This collection network receives and dispatches our customers' batteries at the end of their lives to fully approved recycling facilities, in compliance with the laws governing trans-boundary waste shipments. This collection network meets the requirements of the EU batteries directive. A list of our collection points is available on our web site.

In other countries, Saft assists users of its batteries in finding environmentally sound recycling solutions. Please contact your sales representative for further information.





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