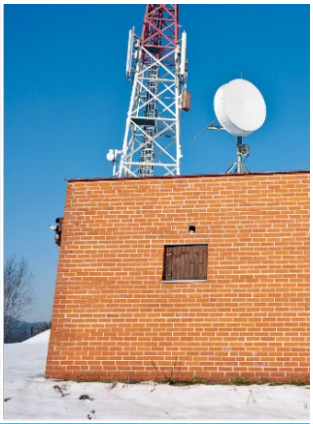
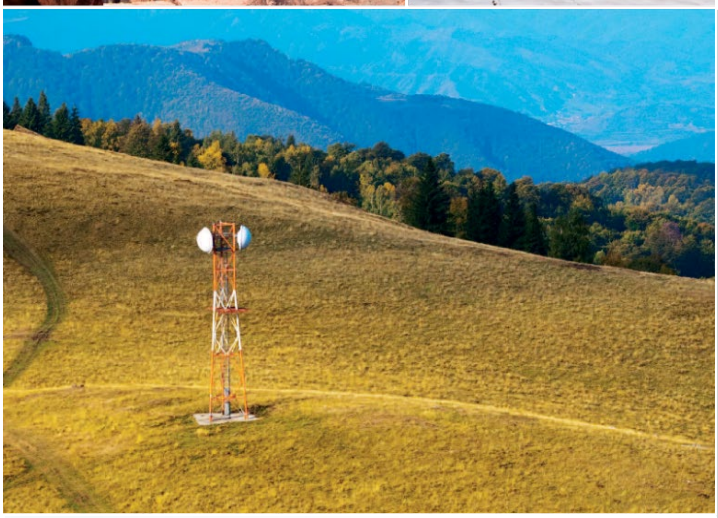
October 2020

Tel.X-*Plus* Ni-Cd Battery

The Compact, Maintenance-free Solution for Telecom Networks





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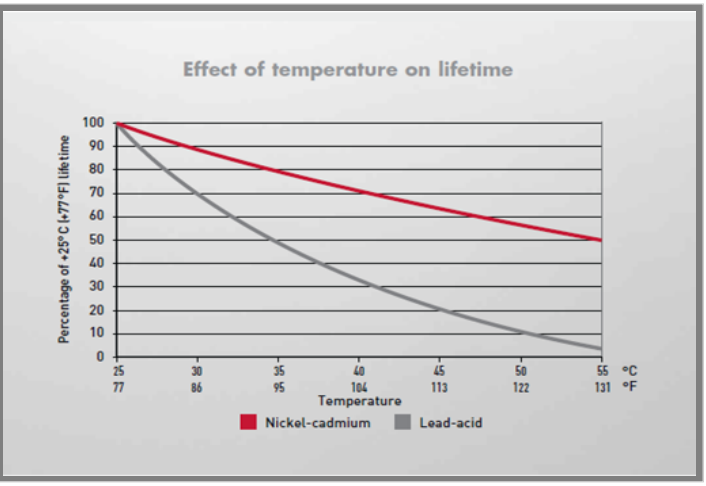
Tel.X-Plus: Delivering high-energy performance **in a compact, maintenance-free package**

Tel.X-Plus guarantees power continuity for remote and hard to access applications.

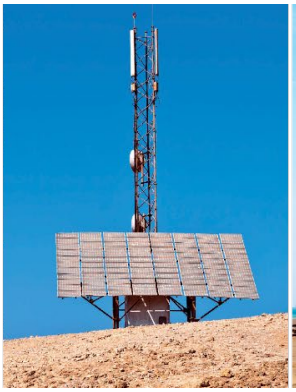
The Tel.X-Plus Ni-Cd battery delivers the optimum combination of high-energy performance and reliability. The technology-proven long life remains compact and modular, offering a maintenance-free design that ensures the lowest Total Cost of Ownership (TCO). Thanks to its outstanding energy density of up to 100Wh/l, Tel.X-Plus is the perfect direct replacement for VRLA lead-acid batteries in telecom back-up applications where limited space is available. Tel.X-Plus reduces battery weight by 30% in the same footprint.

Tel.X-Plus's powerful and robust Ni-Cd construction ensures total reliability and a long, predictable service life

The Tel.X-Plus battery has been redesigned to offer refined performance. The renowned, robust Ni-Cd construction now offers high discharge rates at both low and high temperatures without compromising service life. The Tel.X-Plus's life is less impacted by high temperatures when compared to a VRLA lead-acid battery. At +25°C (+77°F), the lifetime is 20 years. At +35°C (+95°F), the lifetime is 16 years; a reduction of 20% for a Ni-Cd battery compared to a reduction of 50% for a VRLA lead-acid battery.



Tel.X-Plus: Perfectly adapted **for battery installations in tight spaces**


Tel.X-Plus delivers exceptional reliability against unexpected outages for telecom installations where continuity and reliability of supplied power is critical. Tel.X-Plus is ideally suited for applications including remote cabinets and central offices, as well as Base Transceiver Stations (BTS) and Basic Station Controllers (BSC). Tel.X-Plus is especially suited for remote and/or decentralized locations where travel time is inconvenient and access is restricted.

Reliable backup guaranteed in extreme temperatures

Tel.X-Plus offers the ideal combination of reliability, performance, and long life over a wide range of operating temperatures.

- Utilizes robust steel nickel-plated internal construction based on unique proven Ni-Cd electrochemistry
- Eliminates the corrosion, sudden death, and thermal runaway risks associated with VRLA lead-acid batteries
- Combines superior performance with high charging efficiency
- Operates in temperatures from -20°C to +50°C (-4°F to +122°F) and tolerates -50°C to +70°C (-58°F to +158°F) for short durations (referred to as a period of less than 96 consecutive hours and a total of no more than 15 days in one year)
- Exceptional reliability removes the need for superfluous systems

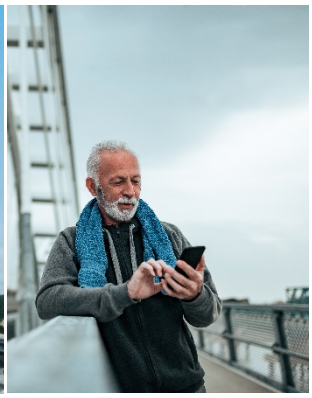
Maintenance- free, even in remote installations

Tel.X-Plus's reliable, maintenance-free design is perfectly adapted for difficult to access installations.

- Low-pressure venting system reduces water consumption to an absolute minimum
- No topping up is necessary (under operation). Water addition is possible under exceptional circumstances
- Periodic checks of charging voltage are recommended, but Tel.X-Plus requires no further attention once installed

Tel.X-Plus:

For ease of installation and operation



Tel.X-*Plus* 180 Ni-Cd Battery

Easy installation makes Tel.X-Plus a simple and direct replacement

Its compact, modular design makes Tel.X-Plus the ideal direct replacement for VRLA batteries in backup floating applications. It fits easily within the available space and is fully compatible with existing equipment.

- Highly compact design optimizes:
  - Volume: high energy density of up to 100 Wh/l
  - Weight: 30% lighter than VRLA
- Modular design suits specific capacity needs
  - 172Ah in modular block construction
  - Each module comprises 3 to 8 cells of flame-retardant material
- Layout provides easy access to front terminals
- Handles on each module ensure easy handling and installation
- Less than 20-minute installation
- Simple modular design is easy to fit in cabinets, and is well adapted to 19" and 23" racks

Designed for effortless operation

Tel.X-Plus offers the ease of operation that contributes to a long and trouble-free service life.

- Tel.X-Plus is compatible with telecom charging systems thanks to its single step 1.43VDC per cell floating voltage, with no need for temperature compensation (TCV)
- Environmental protection for terminals and connectors is provided by a protection cover (meeting IP2X level against electrical shock according to safety standard EN50272-2/IEC 62485-2)
- Front accessible connection points between adjacent blocks
- Active cooling is not required, even in harsh environments
- Tel.X-Plus batteries may be stored for up to one year without special maintenance before installation

Tel.X-Plus:

The sustainable battery solution

Designed with sustainability in mind

Tel.X-Plus is purposely designed for minimum environmental impact throughout its entire life cycle, from manufacturing to operation to recycling at end-of-life.

- The Tel.X-Plus manufacturing process is designed to minimize consumption of upstream energy
- In operation, Tel.X-Plus contributes to a significant reduction in energy consumption throughout its service life
- Highly efficient charging reduces peripheral energy consumption, including cabinet air conditioning and maintenance
- Advanced design reduces the environmental impact of waste processing

Conforms with quality, safety, and environmental standards

Meets the highest international standards, including:

Electrical and performances

- IEC 60623 compliant– Secondary cells and batteries containing alkaline or other non-acid electrolytes – vented nickel-cadmium prismatic rechargeable single cell
- Telcordia GR-3020 compliant – Nickel-cadmium batteries in the outside plant
- NFC 15-100 compliant – Low-voltage electrical installations

Safety

- EN 50272-2/IEC 62485-2 –Safety requirements for secondary batteries and battery installations – Part 2: Stationary batteries
- UL 94 VO: UL standard for flammability safety of plastic materials for parts in devices and appliances testing
- UL 1989 – Safety for standby batteries certified by Intertek
- Telcordia – GR 63 NEBS level 3 – NEBS requirements for physical protection
- Telcordia – GR 1089 NEBS level 3 – Electromagnetic compatibility and electrical safety – generic criteria for network telecommunications equipment

Quality

- ISO 9001
- Saft world class continuous program

Environment

- Fully recyclable
  RoHS – Although batteries and accumulators are not within the scope of the RoHS directive, Saft has taken voluntary measures to ensure that the substances prohibited by RoHS are not present in the battery, except for the electro-chemical core
- REACH – The Saft Group has adopted internal procedures to ensure conformity with the European REACH (Registration, Evaluation, Authorization, and Restriction of Chemical Substances) Regulation

Tel.X-Plus **Technical data**

Tel.X-Plus Physical Characteristics

Cell Type	Voltage (VDC)	Nominal Capacity (C_8Ah)*	IEC Rated Capacity (C_5Ah)**	Maximum dimensions							
				L		W		H		Weight	
				mm	in	mm	in	mm	in	kg	lbs.
TLX+ 80-3	3.6	75	76	128	5.03	105	4.13	254	10	5.7	12.6
TLX+ 80-4	4.8	75	76	168	6.62	105	4.13	254	10	7.6	16.8
TLX+ 80-5	6.0	75	76	209	8.22	105	4.13	254	10	9.5	20.9
TLX+ 80-6	7.2	75	76	249	9.82	105	4.13	254	10	11.4	25.1
TLX+ 80-7	8.4	75	76	290	11.41	105	4.13	254	10	13.3	29.3
TLX+ 80-8	9.6	75	76	330	13.01	105	4.13	254	10	15.2	33.5
TLX+ 80-9	10.8	75	76	371	14.61	105	4.13	254	10	17.1	37.7
TLX+80-10	12.0	75	76	412	16.20	105	4.13	254	10	19.0	41.9
TLX+100-3	3.6	97	98	153	6.03	105	4.13	254	10	7.2	15.9
TLX+100-4	4.8	97	98	202	7.96	105	4.13	254	10	9.6	21.2
TLX+100-5	6.0	97	98	251	9.89	105	4.13	254	10	12.0	26.5
TLX+100-6	7.2	97	98	300	11.82	105	4.13	254	10	14.4	31.7
TLX+100-7	8.4	97	98	349	13.76	105	4.13	254	10	16.8	37.0
TLX+100-8	9.6	97	98	398	15.69	105	4.13	254	10	19.2	42.3
TLX+100-9	10.8	97	98	447	17.62	105	4.13	254	10	21.6	47.6
TLX+100-10	12.0	97	98	497	19.55	105	4.13	254	10	24.0	52.9
TLX+150-3	3.6	140	147	209	8.22	105	4.13	254	10	10.5	23.1
TLX+150-4	4.8	140	147	277	10.89	105	4.13	254	10	14.0	30.9
TLX+150-5	6.0	140	147	344	13.55	105	4.13	254	10	17.5	38.6
TLX+150-6	7.2	140	147	412	16.21	105	4.13	254	10	21.0	46.3
TLX+150-7	8.4	140	147	479	18.87	105	4.13	254	10	24.5	54.0
TLX+150-8	9.6	140	147	547	21.54	105	4.13	254	10	28.0	61.8
TLX+180-3	3.6	172	180	250	9.86	105	4.13	254	10	12.6	27.8
TLX+180-4	4.8	172	180	332	13.07	105	4.13	254	10	16.8	37.0
TLX+180-5	6.0	172	180	413	16.28	105	4.13	254	10	21.0	46.3
TLX+180-6	7.2	172	180	495	19.49	105	4.13	254	10	25.2	55.6
TLX+180-7	8.4	172	180	576	22.70	105	4.13	254	10	29.4	64.8
TLX+180-8	9.6	172	180	659	25.94	105	4.13	254	10	33.6	74.0

* Obtained after a 24 hr. constant voltage float charge to 1.43VDC per cell at + 25°C (+77°F) and minimum charge current of 0.1 C_8 Amp, followed by a 8h discharge at +25°C (77+°F) down to 1.1VDC per cell

** According to IEC 60623

***This information is subject to change without notice

Battery rack assembly

Tel.X-Plus batteries can be assembled into modular and scalable systems. Available in standard 23" racks, the systems are custom fit for the overall Tel.X-Plus battery. This equipment can be also offered to resist to seismic (Telcordia GR63 Zone 4) characteristics. With such systems, Saft can provide a turnkey solution which significantly reduces the floor loading compared to VRLA.

48VDC seismic Zone 4 rack with 5 Tel.X-Plus batteries illustrated here

Tel.X-Plus Discharge Data – Amperes

Performance in **Amperes** after 24-hour constant voltage float charge to 1.43VDC per cell at +25°C (+77°F) with a minimum charge current of 0.1 C_8 Amp* down to various end of discharge voltages

End of Discharge Voltage (VDC/Cell)	Cell type	Nominal Capacity (C_8 Ah)	Discharge rate hours (Amps)											
			0.25	0.5	1	2	3	4	5	8	10	12	18	24
1.00	TLX+80	75	152.7	123.0	75.7	40.1	26.9	20.2	16.2	10.2	8.2	6.9	4.7	3.6
	TLX+100	97	196.4	158.2	97.4	51.5	34.5	26.0	20.8	13.1	10.6	8.9	6.0	4.6
	TLX+150	140	294.5	237.3	146.0	77.3	51.8	39.0	31.2	19.7	15.8	13.3	9.0	6.9
	TLX+180	172	360.0	290.0	178.0	90.0	60.0	45.1	36.2	22.8	18.5	15.6	10.7	8.3
1.05	TLX+80	75	140.0	106.9	73.8	39.4	26.5	19.9	16.0	10.1	8.1	6.8	4.6	3.5
	TLX+100	97	180.0	137.5	94.9	50.7	34.1	25.6	20.5	12.9	10.4	8.7	5.9	4.5
	TLX+150	140	270.0	206.2	142.4	76.1	51.1	38.4	30.8	19.4	15.6	13.1	8.8	6.7
	TLX+180	172	330.0	252.0	170.0	87.0	58.5	44.0	35.3	22.3	18.0	15.1	10.3	7.95
1.10	TLX+80	75	122.0	95.5	63.6	38.0	25.9	19.4	15.6	9.8	7.9	6.6	4.5	3.4
	TLX+100	97	156.8	122.7	81.8	48.9	33.3	25.0	20.0	12.6	10.1	8.5	5.7	3.4
	TLX+150	140	235.2	184.1	122.7	73.3	49.9	37.5	30.1	18.9	15.2	12.7	8.6	3.4
	TLX+180	172	287.5	225.0	155.0**	84.0	57.5	43.1	34.5	21.6	17.4	14.7	10.1	7.75
1.14	TLX+80	75	95.5	76.4	56.4	35.8	24.7	18.6	14.9	9.4	7.6	6.3	4.3	3.3
	TLX+100	97	122.7	98.2	72.5	46.0	31.8	23.9	19.2	12.1	9.7	8.1	5.5	4.2
	TLX+150	140	184.1	147.3	108.8	69.0	47.7	35.9	28.8	18.1	14.6	12.2	8.3	6.3
	TLX+180	172	225.0	180.0	130.0	80.0	55.0	41.4	33.2	20.9	16.9	14.2	9.7	7.5

* 0.1 C_8 Amp for TLX+180 equates to 17.2Amps

** Derating factor for 1-hour discharge rate at +5˚C (+41°F) to 1.1VDC/cell is 7.8%

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Tel.X-Plus Discharge Data – Watts

Performance in **Watts** after 24-hour constant voltage float charge to 1.43VDC per cell at +25°C (+77°F) with a minimum charge current of 0.1 C_8 Amp* down to various end of discharge voltages

End of Discharge Voltage (VDC/Cell)	Cell type	Nominal Capacity (C_8 Ah)	Discharge rate hours (Watts)											
			0.25	0.5	1	2	3	4	5	8	10	12	18	24
1.00	TLX+80	75	148.1	131.0	85.0	46.8	31.8	23.9	19.2	12.1	9.7	8.2	5.5	4.2
	TLX+100	97	190.4	168.4	109.4	60.2	40.9	30.8	24.7	15.6	12.5	10.5	7.1	5.4
	TLX+150	140	285.7	252.7	164.1	90.3	61.4	46.2	37.1	23.4	18.8	15.8	10.7	8.2
	TLX+180	172	349.2	308.8	198.0	104.0	70.4	53.0	42.5	26.8	21.8	18.4	12.7	9.9
1.05	TLX+80	75	142.5	115.1	83.2	46.2	31.4	23.6	19.0	11.9	9.6	8.0	5.5	4.2
	TLX+100	97	183.3	148.0	107.0	59.4	40.4	30.4	24.4	15.4	12.4	10.4	7.0	5.4
	TLX+150	140	274.9	222.0	160.6	89.1	60.7	45.6	36.6	23.1	18.6	15.6	10.6	8.1
	TLX+180	172	336.1	271.3	190.0	101.0	68.8	51.8	41.6	26.3	21.3	17.9	12.3	9.5
1.10	TLX+80	75	130.1	104.5	72.2	44.7	30.8	23.1	18.6	11.7	9.4	7.9	5.3	4.1
	TLX+100	97	167.3	134.4	92.9	57.5	39.6	29.8	23.9	15.3	12.1	10.1	6.8	4.1
	TLX+150	140	250.9	201.6	139.4	86.2	59.4	44.7	35.8	22.9	18.2	15.2	10.3	4.1
	TLX+180	172	306.7	246.4	174.0**	98.0	67.8	50.9	40.8	25.6	20.7	17.4	12.0	9.3
1.14	TLX+80	75	105.5	86.6	64.6	42.3	29.6	22.2	17.8	11.2	9.0	7.6	5.1	3.9
	TLX+100	97	135.7	111.3	83.0	54.3	38.0	28.6	22.9	14.5	11.6	9.8	6.6	5.0
	TLX+150	140	203.5	167.0	124.6	81.5	57.0	42.9	34.4	21.7	17.5	14.7	9.9	7.6
	TLX+180	172	248.8	204.1	147.0	94.0	65.2	49.0	39.4	24.8	20.1	16.9	11.7	9.0

* 0.1 C_8 Amp for TLX+180 equates to 17.2Amps

**Derating factor for 1-hour discharge rate at +5˚C (+41°F) to 1.1VDC/cell is 7.8%

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Power cable selection: The selection of power cables used within the installation of Saft Batteries is a function of:

1- Installation location: dry, damp, or wet (as defined by the NEC code)

2- Maximum ambient operating temperature

3- Maximum sustained current (amperage) applied during charge or discharge

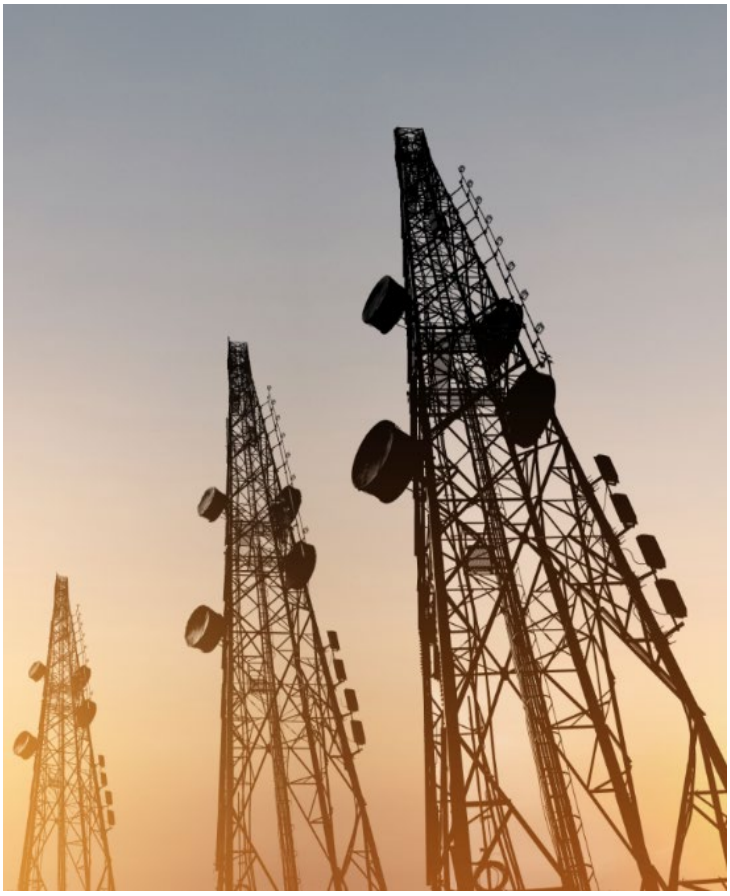
4- Follow standards mandated by the application such as GR347

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 plants' air and water releases year after year, minimizes water usage, reduces fossil energy consumption and associated CO_2 emissions, and ensures that its customers have recycling solutions for their spent batteries.

Regarding industrial batteries, Saft maintains long-standing partnerships with collection companies in most EU countries, in North America, and in other 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.

Saft has selected a recycling process for industrial lithium-ion cells with very high recycling efficiency. A list of our current collection points is available on our website. In other countries, Saft assists its battery users to find environmentally sound recycling solutions. Please contact your sales representative for further information.



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Doc No: 22010-2020-02
Edition: October 2020