

interberg batteries



KPX Series

Ultra High Rate of Discharge



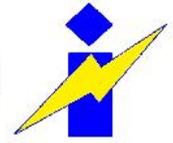
Sintered Plate NiCd Batteries Catalogue

Ed. 03/20160417





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CHARACTERISTICS of Interberg KPX Alkaline NiCd batteries:

THE MARKET'S LOWEST LIFE-CYCLE COST

DULY AND ENTIRELY RECYCLABLE

PROLONGED STORAGE CAPABILITY

EASY AND SIMPLE INSTALLATION REQUIREMENTS

Remarkable Advantages of the KPX Sintered Plate Batteries:

- **Wide Temperature Operation Range**
Interberg KPX Sintered Plate NiCd batteries can be operated in a temperature range from -40°C to +60°C.
- **Minimum and Easy Maintenance**
Interberg KPX Sintered Plate NiCd batteries require only little maintenance, while topping-up water is made at extremely long intervals.
- **Long Storage Capability**
Interberg KPX Sintered Plate NiCd batteries can be stored for many years due to their extremely low self-discharge ratio.
- **Extremely Long Service Life**
Interberg KPX Sintered Plate NiCd batteries are designed to be absolutely reliable for more than 20 years of continuous tough operation (on float charge operation)
- **Superb Resistance against Mechanical Stress and Electrical Abuses**
Interberg KPX Sintered Plate NiCd batteries are unaffected by short circuits, polarity reversal, over-discharge and over-charge. The robust mechanical construction of both cells and batteries is suitable for the operation under the toughest and roughest environmental conditions, like railway rolling stock applications
- **Safe and Reliable**
Interberg KPX Sintered Plate NiCd batteries do not emit corrosive gases

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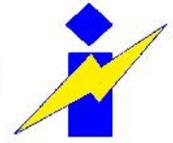


ISO 9001:08 - ISO 14001:04 - OHSAS 18001:07
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KPX Sintered Plate NiCd Batteries

Remarkable Advantages and Features of Interberg KPX Sintered Plate NiCd Batteries

- Optimized performance to suit any application requirement
- Fit in a small space
- They are lighter than conventional lead acid batteries
- Perform well even at extremely low temperatures (less than -20°C).
- No topping-up with water required for long periods (more than 2 years).
- Low ownership cost when considered over the battery's lifetime.
- Long life expectancy (greater than 20 years).
- Reliable construction (no risk of sudden death!)
- Quick-charge capacity (accepts more than 90% of charge within 5 hours).
- Can withstand extreme ambient Temperatures from $+70^{\circ}\text{C}$ to -50°C .

Conform to the following international standards:

- IEC 60623.
- UIC 854 R.
- BS 6260.
- IEC 60077.
- DIN 40771.
- NFF 64018.

Application Examples

KPX Sintered Plate Nickel-Cadmium batteries are designed to provide fail-safe emergency back-up power for lighting, air-conditioning, radio communication, door control, computing and other applications requiring medium power.

KPX Sintered Plate Nickel-Cadmium batteries are designed for diesel engine starting, emergency braking and other applications requiring high power for short durations. They have an exceptionally good performance even at very low temperatures and starting is guaranteed even at temperatures as low as -20°C .

KPX Sintered Plate Nickel-Cadmium batteries are designed to fit in space constrained locations being thus ideal for installations featuring an integral tray as in Light Rail vehicles, metros, electric multiple units (EMU), electric locomotives and high speed rail systems.

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KPX Sintered Plate NiCd Cells

KPX Ultra High Rate of Discharge Battery Cells

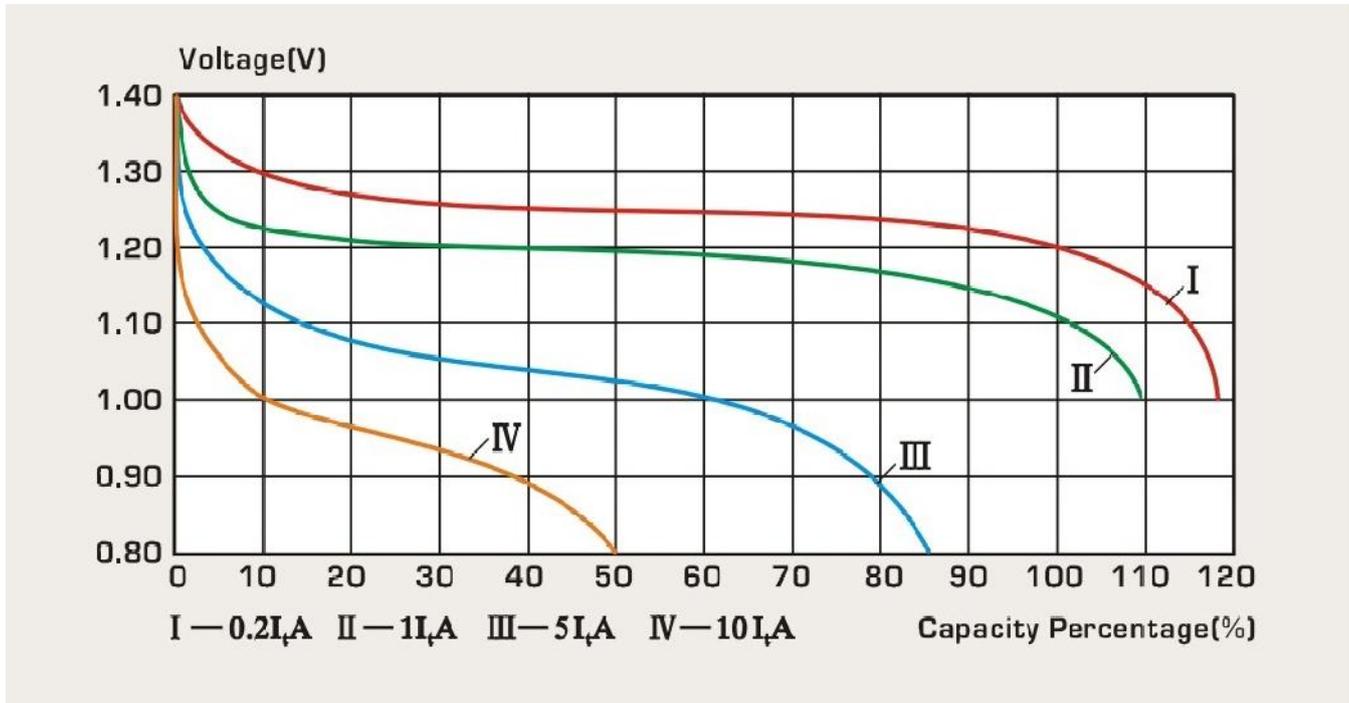
IEC-Cell Type	Interberg Cell Type Designation	Cell Voltage (V)	Capacity (Ah/5h)	Cell Length (mm)	Cell Width (mm)	Cell Height (mm)	Cell Weight (Wet) Kg	Electrolyte Volume (1.20Kg/Lit)	Cell Terminal Size	Cell Container Material
KPX-10P	XHG-0010P	1.20	10	29	81	218	1.05	0,160	M10	PA
KPX-20P	XHG-0020P	1.20	20	37	81	244	1.30	0.150	M10	AS
KPX-30P	XHG-0030P	1.20	30	37	81	244	1.50	0.200	M10	PA
KPX-40P	XHG-0040P	1.20	40	43	81	255	1.75	0.212	M10	AS
KPX-50P	XHG-0050P	1.20	50	49	81	244	2.00	0.190	M10	AS
KPX-60P	XHG-0060P	1.20	60	50	81	250	2.20	0.250	M10	PA
KPX-70P	XHG-0070P	1.20	70	70	134	285	4.40	1.000	M16	ABS
KPX-80P	XHG-0080P	1.20	80	70	134	285	4.80	1.000	M16	ABS
KPX-90P	XHG-0090P	1.20	90	70	134	285	4.80	0.950	M16	ABS
KPX-100P	XHG-0100P	1.20	100	70	134	285	5.00	0.850	M16	ABS
KPX-120P	XHG-0120P	1.20	120	70	134	285	5.00	0.800	M16	ABS
KPX-130P	XHG-0130P	1.20	130	79	40	367	7.20	1.200	M16	PP
KPX-140P	XHG-0140P	1.20	140	107	165	348	8.80	2.000	M20	PP
KPX-150P	XHG-0150P	1.20	150	79	140	367	6.95	1.100	M16	PP
KPX-160P	XHG-0160P	1.20	160	79	140	367	7.40	1.020	M16	PP
KPX-170P	XHG-0170P	1.20	170	107	165	348	9.20	1.750	M20	PP
KPX-180P	XHG-0180P	1.20	180	79	140	367	8.00	1.000	M16	PP
KPX-190P	XHG-0190P	1.20	190	107	165	348	10.00	1.700	M20	PP
KPX-200P	XHG-0200P	1.20	200	107	165	348	10.00	1.700	M20	PP
KPX-210P	XHG-0210P	1.20	210	107	165	348	10.30	1.650	M20	PP
KPX-220P	XHG-0220P	1.20	220	107	165	348	10.50	1.650	M20	PP
KPX-230P	XHG.0230P	1.20	230	107	165	348	10.60	1.600	M20	PP
KPX-240P	XHG-0240P	1.20	240	107	165	348	10.70	1.600	M20	PP
KPX-250P	XHG-0250P	1.20	250	107	165	348	10.90	1.600	M20	PP
KPX-300P	XHG-0300P	1.20	300	160	164	345	12.35	1.850	M20	PP
KPX-350P	XHG-0350P	1.20	350	160	164	345	14.45	2.150	M20	PP
KPX-375P	XHG-0375P	1.20	375	160	164	345	15.50	2.300	M20	PP

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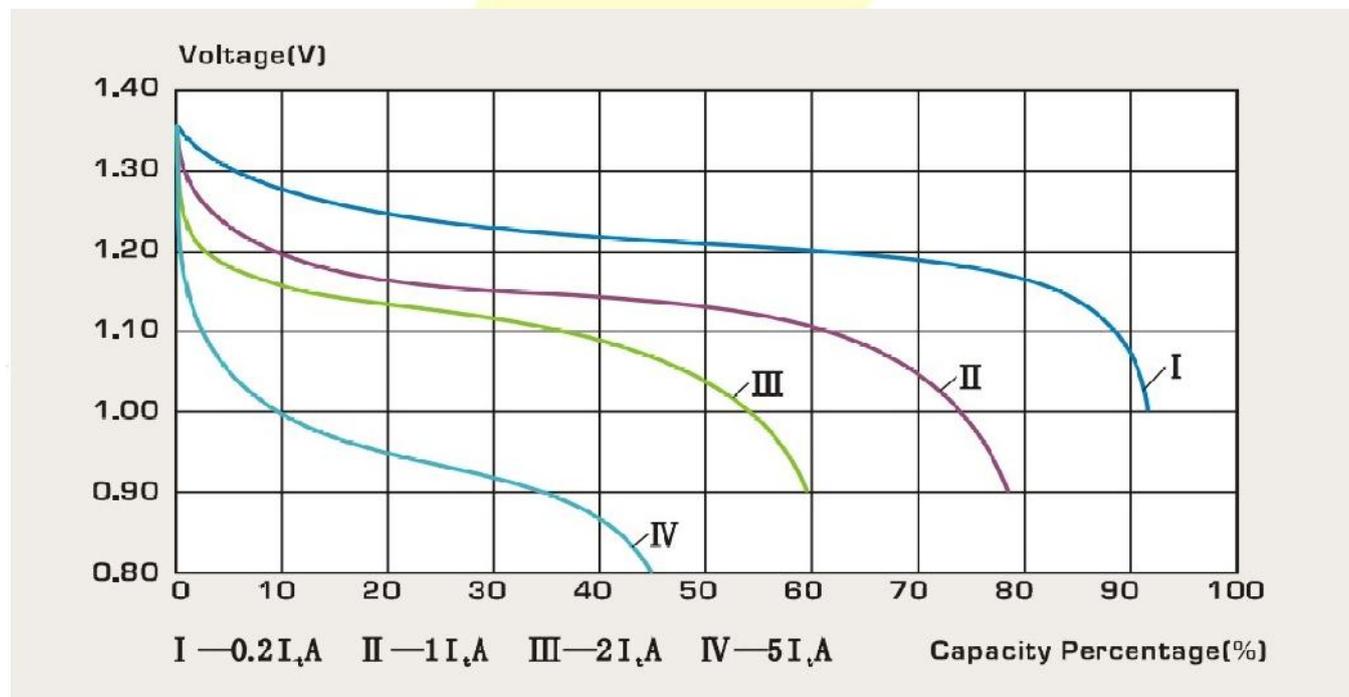


KPX Sintered Plate NiCd Cells

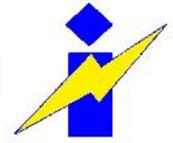
DISCHARGE CURVES at +20°C



DISCHARGE CURVES at -18°C



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KPX Sintered Plate NiCd Cells

INSTALLATION AND OPERATING INSTRUCTIONS

Safety Measures:

- Wear safety goggles and protective clothing when working with batteries
- Don't smoke or allow flames or sparks in the vicinity of a battery
- Attention: potential lethal voltages! The battery shall only be connected by trained personnel
- Avoid short-circuits! Use insulated tools only. Remove watches, rings, bracelets and other metal items before working on the battery
- If any emission accidentally contacts the skin, wash immediately and thoroughly with water
- Use special caution when connecting or adjusting battery connectors and cables. If a battery cable enters in contact with an unintended surface, arcing, fire or a possible explosion can occur.
- Do not tip the battery!

Receiving and Installation:

- All cells must be inspected for eventual transportation damage upon arrival
- Replace the transport plugs with supplied standard vent plugs. Keep the transport plugs for future use.
ATTENTION: the battery shall never be charged with the transport plugs installed!
- Mount the cells to the designated location. Verify the cell polarity for positive-to-negative connection throughout the whole battery.
- Secure the cells
- Ensure the contact surfaces of terminal posts, terminal nuts and inter-cell connecting straps are clean
- Connect the cells together. Note the recommend torque values to appropriately tight the inter-cell connectors: M10 : 18 ± 2 Nm -- M16 : 30 ± 3 Nm -- M20 : 50 ± 5 Nm
- Measure the battery voltage to ensure that individual cells are connected correctly. The total voltage value should be approximately equal to the number of cells times the measured voltage of one cell. If the measurement is less, check the individual cell's polarities again.
- Snap the supplied connector covers onto the connecting straps (flat bars).
- Connect the battery to the charger.

Commissioning:

- If the battery was delivered in discharged state, a commissioning charge will be necessary before putting the battery into service.
- The initial charge may cause the generation of a significant amount of hydrogen and oxygen. Verify that the battery room's ventilation is sufficient.
- The following methods of commissioning charge are recommended:
Constant Current Charge: at 0.2C/5 amps for 8 hours
Constant Current Charge: at 0.1C/5 amps for 14-15 hours
- Note: in case the charging voltage is higher than the charger's voltage limit, the battery should be split to allow the cells to be charged up.
- High cell voltages may be produced during the commissioning charge. If the charging voltage exceeds the system's voltage limit, perform the commissioning charge off-line from the DC system.
- Top up the electrolyte with distilled water or de-ionized water after a rest period of one hour after the commissioning charge was completed and ensure the electrolyte level reaches the maximum level marking on the cell jar. Attention: **NEVER top up before charging: the electrolyte level will raise during the charge and it may spill off the cell.**
- Clean the cells with a clean, wet cloth.

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Charging in service:

• During normal operation: Interberg KPX sintered plate cells may be charged by anyone of these methods:

• Dual Rate Charging:

Boost Charge: 1.50 ± 0.01 V/cell for a maximum of 12 hours with 0.2C/5 maximum current limit, then

Float Charge: 1.35-1.40 V/cell with 0.2C/5 maximum current limit

The boost charge should be reapplied manually or automatically after a deep discharge

• Single Rate Charging:

Float Charge: 1.39 ± 0.01 V/cell with 0.2C/5 maximum current limit

• If the temperature is outside the range of $20 \pm 10^\circ\text{C}$, it is recommended to adjust the charging voltage to compensate the temperature change. The recommended adjustment is: $-2\text{mV}/^\circ\text{C}$.

Electrolyte:

The Interberg KPX sintered plate NiCd cells are supplied either filled but electrically discharged or empty, with separate KOH flakes and LiOH powder. In the second case, follow the instructions for preparation of liquid electrolyte and first filling provided with the battery cells.

- Visually check the electrolyte levels regularly. Should they be below the mid-point between the minimum and maximum marks, top-up them with distilled or de-ionized water and make sure topping-up is only made when the battery is fully charged.
- If there is evidence that electrolyte has been ejected from vents or that there is an excessive water loss, this could indicate a charger or system malfunction and action should be taken to rectify this.

General Maintenance:

- To achieve an optimum performance it is recommended to make a "re-conditioning" maintenance every 12-18 months, discharging the battery to 1.0 V/Cell and then re-charged at 0.2C/5 rate for 7 hours twice (2 cycles in total)
- It is important to keep the batteries, racks or trays dry and clean to avoid leakage currents and corrosion
- Use damp cloth to clean the battery. Do not use solvents of any kind, but only water.
- Check float charge voltage and current often. High water loss is usually caused by high floating voltage.
- Check and correct the electrolyte level often, as described above.
- Check once a year that the connectors are tight
- It is advisable (depending on the operation condition) to measure the voltage value of each cell during the float charge. If the voltage of any of the cells is found to be 30 mV below the average cell voltage, a high rate charge should be applied.
- Do not use or store NiCd batteries in the same room with lead-acid batteries and do not use accessories, such a hydrometers, that have been used with lead-acid batteries before

Storage:

To take the battery out of service:

- Discharge the battery at 0.2C/5 rate to an end-of-discharge (cut-off) voltage of 1.0 V/cell or lower
- Replace the standard vent plugs with the transport plugs
- Clean the cells
- Store the batteries on open shelves in a clean, dry, cool and well ventilated room where the temperature is not higher than 25°C
- Before putting the batteries back to service, replace the transport plugs with the standard vent plugs. Perform the commissioning steps again as explained above and ensure that the vent plugs are always kept open during the charging process.

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