207-901
207-913

Technical Specification

This information sheet is intended to provide additional data and technical specifications on the X-CELL Plus & Major range of 996 type batteries for the industrial or commercial user who requires a more detailed summary than that contained in our Sales Leaflet.

GENERAL

All versions of the X-CELL are intended to replace the conventional dry cell 996 type lantern battery (International equivalent :- Ever Ready 509/Ray-O-Vac 941) which is produced by a large number of manufacturers and supplied virtually world wide.

The X-CELL differs from the normal 996 type in that it can be re-used again and again - up to 3000 times - and also incorporates all the electronic circuitry to allow automatic re-charging from almost any electrical supply between 8 and 300 volts. **No external adaptors are required.** The versatility of various voltage charging options ensures a universal acceptability for the X-CELL, including field or remote applications where mains supplies are not available or are subject to interruption.

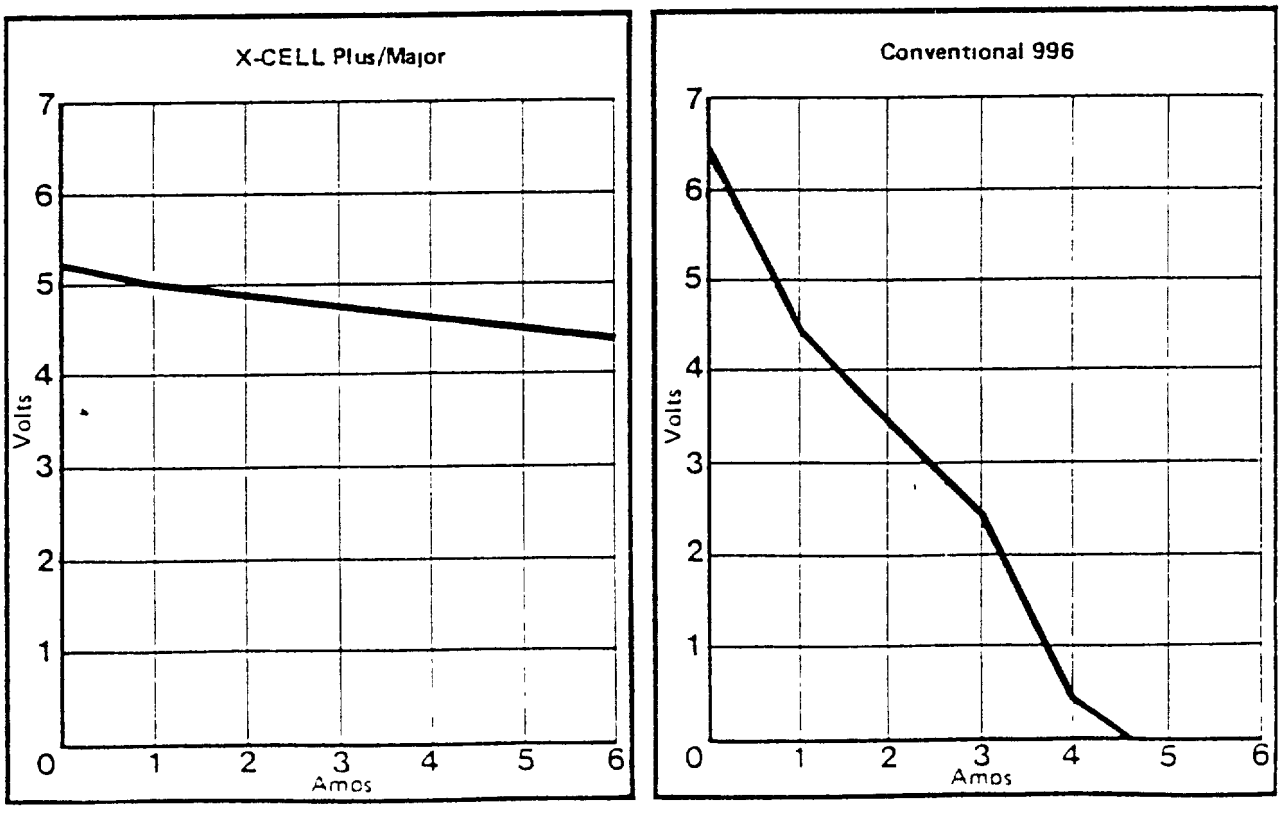
Despite these features the X-CELL is no heavier than a conventional 996 dry battery.

The X-CELL is completely maintenance free and is designed and engineered to be electronically and physically robust and tolerant to environmental extremes.

It cannot be overcharged and it can be left in a discharged state without damage. Once charged the X-CELL will remain charged for upwards of 1 year.

Its electrical performance greatly exceeds that of the conventional 996 Type in terms of voltage stability and current output. In the great majority of end uses these advantages give a noticeable improvement in the performance of equipment powered by the X-CELL (See Fig.1).

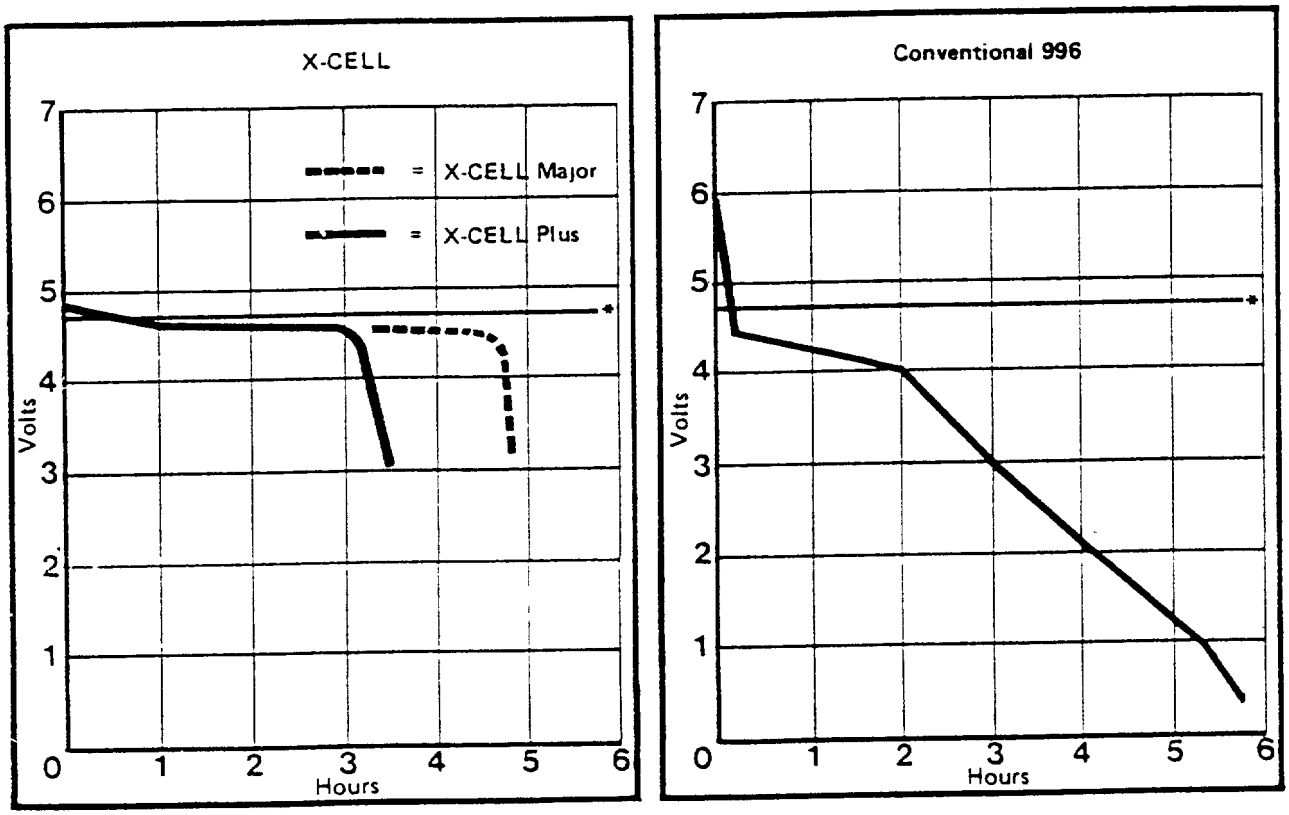
Fig. 1. Current Discharge Comparison



This feature is particularly useful in devices like high power torches including diving lamps where the superior characteristics of the X-CELL ensure that the unit operates at a maximum efficiency and light output for 95% of the discharge cycle.

In comparison the conventional 996 used in the typical handlamp offers less than 60% of its initial output for 50% of its average life. Further information on these comparisons is provided in Fig.2.

Fig. 2. Equivalent Capacity Test (Hand Lamp: 8.5A Standard Bulb)



x **Design voltage of handlamp bulbs as used in 996 powered equipment = 4.85 volts.**

The very high current output capability of the X-CELL and its low internal resistance not only ensures that the equipment powered by it gives maximum performance, but it also means that many high power requirements which were well outside the capabilities of the conventional 996 type can be provided by the X-CELL.

The maximum continuous current is a function of the internal auto-reset safety cut-out and is set at 5 amps.

However, the power source itself can provide several times this current on an intermittent basis and for special pulse applications where the duration of the current is limited, loads of up to 60 amps may be drawn. Further details are given in Note 2.

The X-CELL can be connected in series in situations where a higher voltage is required. In equipment where two or more 996 batteries are connected in parallel to give a greater capacity but the same voltage (e.g. road lamps) **only one X-CELL need be used**.

CONSTRUCTION

The X-CELL is manufactured in the United Kingdom to the highest standards by a manufacturer with Ministry of Defence and British Telecom approval.

- All components are of the finest quality and are either of U.K. or European origin.
- The case is a specially designed ABS unit combining strength with lightness.
- All external metal parts are non-ferrous to eliminate the possibility of corrosion.
- There are no moving parts or switched contacts.
- All the electronics are generously under-rated, some by as much as 600% in comparison with the most arduous conditions likely to be encountered.
- Mains isolation is via a special twin bobbin transformer to B.S. 415.
- The circuitry is completely encapsulated in a very advanced polyurethane resin system which ensures continuing mechanical and electrical integrity even in the event of damage to the case.
- The rest of the unit is foam injected to further enhance the durability of the X-CELL.
- The power source is derived from the latest technology nickel-cadmium cells as used by the military and aeronautics industry.
- The X-CELL is subjected to numerous quality and function checks during assembly to ensure consistently high performance in use.

Note 1.

X-CELLS can be continuously charged if required and are therefore suitable for use as automatic stand-by power suppliers. The Major has particular design characteristics allowing optimum performance in this function.

Note 2.

Pulse currents of up to 60 amps may be drawn from the units if required. The limiting factor on current output is the heating effect on the internal wiring. In most cases currents of up to 15 amps for a duration of not more than 10 seconds and 1:1 duty cycle will not harm the units.

All X-CELLS are fitted with an internal auto-reset current limit which prevents damage from short-circuits applied to the output terminals.

Note 3.

The capacity of the power source used in the X-CELL can be misleading when compared with other batteries such as conventional dry-cell or lead acid.

Unlike these units the X-CELL's capacity does not significantly degrade with increasing current demand. Thus in many applications the practical capacity of the X-CELL will prove significantly better than other types of battery with a nominally higher rating. At high currents this superiority can be enormous.

The only instance where the X-CELL does not significantly out-perform the conventional 996 on each discharge cycle is in low duty applications where very small currents are required on a continuous or intermittent basis. However, the overall life of the X-Cell - taking into account its ability to be recharged - is still enormously greater.

For instance, the final life of an X-CELL used in a standard road lamp, assuming 3000 recharges, is some 300,000 operating hours as opposed to only around 300 hours for a conventional 996 type. Furthermore even if left discharged the X-CELL is not damaged and **cannot** leak.

Note 4.

The number of discharge-charge cycles obtainable is related to the depth of discharge on each cycle and also the final acceptable minimum capacity of the unit. In most uses well over 1000 cycles should be obtainable and in many cases the maximum of 3000 or more.

SPECIFICATIONS

Operating & Temperature storage range		-40°C - +60°C
Charging Sources		Standard UK & Continental Model 180-280 volts AC (80-120 volts AC models available) 8-30 volts AC/DC*
		* When charged from DC voltage the X-CELL recharges regardless of connection polarity thus avoiding the chance of acccidental damage.
Charging Time. (from complete discharge)		12-14 hours maximum (Plus) 16-18 hours maximum (Major) (See Note 1.)
Output Current		5 amps continuous (See Note 2.)
Capacity	Nominal	1.2ah (Plus) 2.0ah (Major)
	Average	1.5ah (Plus) 2.2ah (Major) (See Note 3.)
Charge-discharge Cycles		600 - 3000 Normal absolute minimum 1000 (See Note 4.)
Self-Discharge		Under normal conditions at least 60% capacity is still available after 12 months.
Weight		Plus 580 gms (Black label) Major 650 gms (Dark Blue label)
Approvals		TUV/VDE; SEV; SEMKO; NEMKO; DEMKO; FEMKO

NITECH

SUSSEX, ENGLAND.

X-CELL PLUS & MAJOR RECHARGEABLE 996

MODELS AVAILABLE

Type	Discharge Time	Recharge Time	Weight	Dimensions (height x length x breadth)
Plus	3 hours*	12-14 hrs	585gms	97mm x 60mm x 60mm
Major	4.5 hours*	16-18 hrs	655gms	97mm x 60mm x 60mm

* Plus - will operate for 4 hours using Nitech 300 bulb
  Major - will operate for 8 hours using Nitech 300 bulb

ADDITIONAL DETAILS

MAXIMUM CONTINUOUS CURRENT which can be taken before current limit operates is 4-5 amps

Operating **VOLTAGE** of X-Cell Battery is 4.8 to 4.9 volts which is the design voltage of all equipment operated from ordinary 6 volt lantern batteries which are not in fact 6 volts when operating.

X-Cell batteries do not suffer from **MEMORY EFFECT**

NATO Codification - Major Battery 120v Version
Management Code : 0562
NATO Number : 6140 99 784 7839
Major Battery 240v Version
Management Code : 0562
NATO Number : 6140 99 840 0108

OTHER USES - electric fences, burglar and fire alarms, radios, road lamps, electronic instrumentation

SPECIAL APPLICATIONS - to increase voltage output X-Cell may be connected in series (battery voltage added i.e. 3 x 4.9 = 14.7). **PLEASE NOTE** that when output terminals are connected in series X-Cells may be charged through mains terminals as usual but their output terminals should be disconnected before charging through low voltage terminals. To increase capacity X-Cells may be connected in parallel. No special charging precautions are necessary in this mode.

NB - 110V batteries can be charged off 240V (Mains UK) by using an 80-140AC Adaptor.

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KEY FEATURES

X-CELL PLUS & MAJOR RECHARGEABLE 996

* The **ONLY COMPLETE** (i.e. includes charger) rechargeable replacement for 6 volt (PJ996) lantern batteries

* Two versions, **PLUS AND MAJOR** - Plus will operate standard torch for 2½-3 hours - Major for 4½-5 hours (if torch is fitted with Nitech 300 bulb these times become 4 and 8 hours respectively)

* Each X-Cell can be **RECHARGED** up to 3000 times and will pay for its initial cost 300 times over

* Supplied complete with **CHARGING LEADS** to enable direct charging from mains voltage or any vehicle voltage between 8 and 30 volts

* Not damaged by being left **DISCHARGED**

* Not damaged by being **OVERCHARGED**

* Once charged will **STAY CHARGED** for at least a year

* Output terminals protected against **SHORT CIRCUIT** by automatic resetting current limit

* Totally **MAINTENANCE** free

* Operates under all **CLIMATIC CONDITIONS** from -40° to +60°.

* **NATO CODED** and approved and used by all major organisations e.g. Ministry of Defence, British Rail, British Telecom, etc

* Each **X-CELL REPLACES** around 2½ tons of conventional batteries and removes the need to dispose of this huge amount of toxic material and also saves the resources otherwise wasted

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