# NCX
# Nickel-cadmium batteries
# NCX 80 - NCX 125 - NCX 160


*NCX, nickel-cadmium battery for telecom networks with extreme conditions*

## Telecom applications

The NCX battery has been designed to fulfill the demanding requirements of remote or outside telecom plants: local or access terminals, Base Transceiver Stations, Base Station Controllers, Optical Nodes Units, etc...

## Beneficial VRLA replacement

Compact and modular, NCX can adjust to most existing Valve Regulated Lead Acid (VRLA) battery compartments and is compatible with existing charging systems. With much longer life, predictable operation, less maintenance, and lower life cycle cost, NCX is a realistic and attractive alternative to troublesome VRLA batteries, particularly in extreme operating temperatures.

## Simple configuration

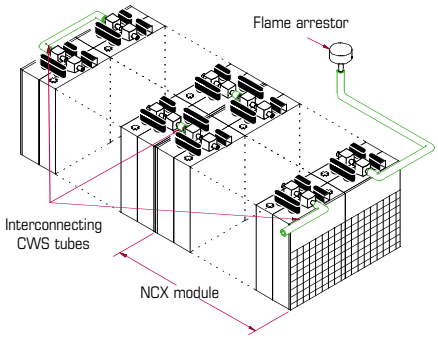
For a typical 48 V bulk power application, 38 NCX cells are recommended, with 3 to 11 cells comprising each battery module. During operation, a fixed single rate charge voltage of 1.43 V/cell is recommended, rather than temperature compensated voltage control.

## Central Watering System

Electrically interconnected NCX modules are linked by a Central Watering System (CWS). During operation, gases are channeled through the CWS and exhausted through a flame arrestor.
The CWS single inlet to fill all cells and quick disconnects facilitate a swift and safe set-up when servicing the battery.

## Reliable investment

Designed around stable components and corrosion-free chemistry, NCX makes problems like dry-out, grid corrosion, plate growth, and thermal runaway worries of the past. This stability allows for extended lifetime without frequent maintenance. At the end of the day, lower operating costs and less down time are guaranteed.




| Battery characteristics | NCX 160 | NCX 125 | NCX 80 |
|---|---|---|---|
| Volumetric energy density | 57 Wh/l | 65 Wh/l | 57 Wh/l |
| Gravimetric energy density | 36 Wh/kg | 40 Wh/kg | 36 Wh/kg |
| Charge voltage range* | 1.41 to 1.45 V/cell | 1.41 to 1.45 V/cell | 1.41 to 1.45 V/cell |
| Charging current range* | $0.1C_5$ to $0.2C_5$ | $0.1C_5$ to $0.2C_5$ | $0.1C_5$ to $0.2C_5$ |
| Case material | Polypropylene | Polypropylene | Polypropylene |
| Flammability (and OI) | UL-94 VO (28%) | UL-94 VO (28%) | UL-94 VO (28%) |
| Terminal size | M 6 x 0.75 | M 6 x 0.75 | M 6 x 0.75 |
| Life time at +25°C | ≥20 years | ≥20 years | ≥20 years |
| **Maintenance** | **NCX 160** | **NCX 125** | **NCX 80** |
| Reserve electrolyte | 230 ml | 350 ml | 230 ml |
| Watering interval at +25°C | ≥12 years | ≥12 years | ≥12 years |

*During constant voltage charge

## Applications advantages

- Fits most existing VRLA battery compartments and all charging systems
- Remote bulk power cabinets
- Controlled Environment Vaults (CEV)
- Huts
- Central Offices (CO)

## Advantages

- Very low maintenance
- Long life, even under extreme operating temperatures
- Very low Life Cycle Cost
- Flooded technology and separator design minimize thermal runaway
- Single point watering system
- All parts are readily recyclable

## Operating range

- –20°C to +40°C (–4°F to 104°F), however can survive extremes from –50°C to +70°C (–58°F to +158°F)
- Up to Zone 4 earthquake

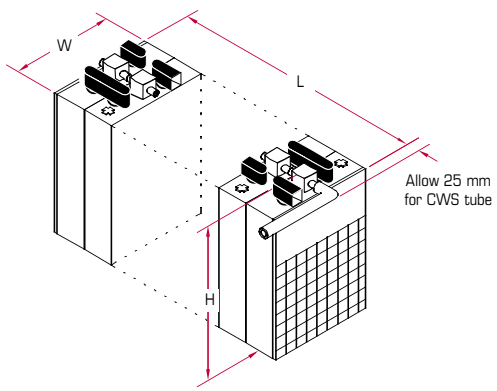
## Technology

- Sintered positive electrodes
- Plastic bonded negative electrode
- Flooded alkaline electrolyte
- Compact stack design using chemically stable separator material.

## Module physical characteristics

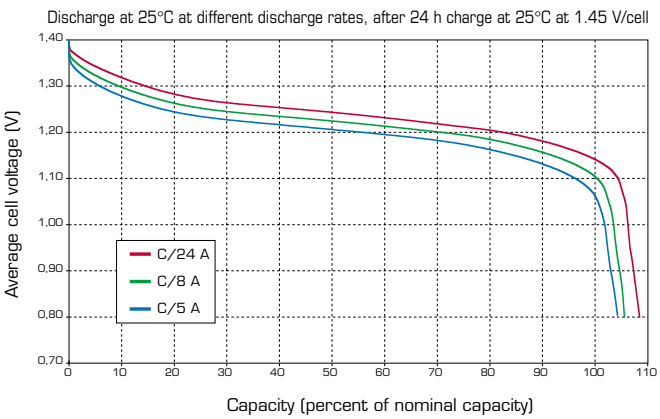
| Type | Voltage | Rated Capacity | Nominal Capacity | Maximum dimensions mm (inches) | | | | | | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | | W | | H | | | |
| | (V) | $C_5$ Ah* | $C_8$ Ah** | mm | in | mm | in | mm | in | kg | lbs. |
| **NCX 125-3** | 3.6 | 140 | 125 | 165 | 6.5 | 171 | 6.7 | 259 | 10.20 | 11.4 | 25.1 |
| **NCX 125-4** | 4.8 | 140 | 125 | 216 | 8.5 | 171 | 6.7 | 259 | 10.20 | 15.1 | 33.3 |
| **NCX 125-5** | 6.0 | 140 | 125 | 267 | 10.5 | 171 | 6.7 | 259 | 10.20 | 18.9 | 41.7 |
| **NCX 125-6** | 7.2 | 140 | 125 | 318 | 12.52 | 171 | 6.7 | 259 | 10.20 | 22.7 | 50.0 |
| **NCX 125-7** | 8.4 | 140 | 125 | 369 | 14.53 | 171 | 6.7 | 259 | 10.20 | 26.5 | 58.4 |
| **NCX 125-8** | 9.6 | 140 | 125 | 420 | 16.54 | 171 | 6.7 | 259 | 10.20 | 30.3 | 66.8 |
| **NCX 80-3** | 3.6 | 93 | 80 | 121 | 4.8 | 171 | 6.7 | 259 | 10.20 | 8.3 | 18.3 |
| **NCX 80-4** | 4.8 | 93 | 80 | 157 | 6.2 | 171 | 6.7 | 259 | 10.20 | 11.0 | 24.3 |
| **NCX 80-5** | 6.0 | 93 | 80 | 194 | 7.64 | 171 | 6.7 | 259 | 10.20 | 13.6 | 30.0 |
| **NCX 80-6** | 7.2 | 93 | 80 | 230 | 9.1 | 171 | 6.7 | 259 | 10.20 | 16.3 | 35.9 |
| **NCX 80-7** | 8.4 | 93 | 80 | 266 | 10.5 | 171 | 6.7 | 259 | 10.20 | 18.9 | 41.7 |
| **NCX 80-8** | 9.6 | 93 | 80 | 303 | 11.9 | 171 | 6.7 | 259 | 10.20 | 21.5 | 47.4 |
| **NCX 80-10** | 12.0 | 93 | 80 | 375 | 14.8 | 171 | 6.7 | 259 | 10.20 | 26.8 | 59.1 |
| **NCX 80-11** | 13.2 | 93 | 80 | 412 | 16.2 | 171 | 6.7 | 259 | 10.20 | 29.4 | 64.8 |
| **NCX 160-2** | 2.4 | 186 | 160 | 157 | 6.2 | 171 | 6.7 | 259 | 10.20 | 11.1 | 24.5 |
| **NCX 160-3** | 3.6 | 186 | 160 | 230 | 9.1 | 171 | 6.7 | 259 | 10.20 | 16.4 | 36.2 |
| **NCX 160-4** | 4.8 | 186 | 160 | 303 | 11.9 | 171 | 6.7 | 259 | 10.20 | 21.6 | 47.6 |

*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 1.1 V/cell

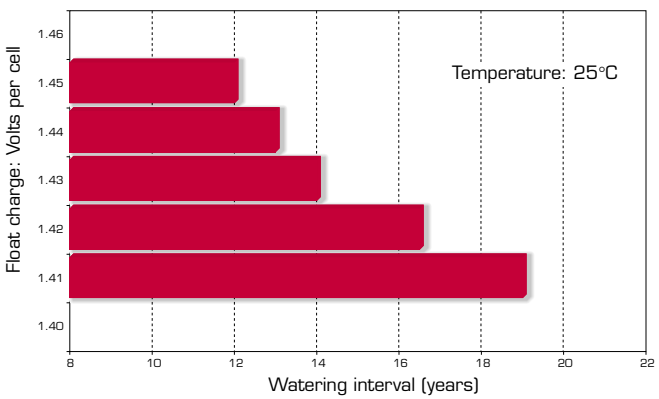



**NCX module**

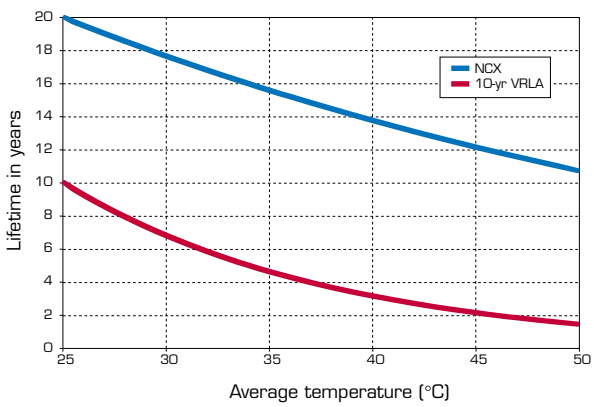
### Discharge characteristics




### Effect of $V_{float}$ on maintenance




### Effect of temperature on battery life



# Tabular discharge data for the NCX range

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

Figures are valid for a new cell that has never been put in service and has been stored less than six months.

**Final voltage: 1.00 V/cell**

| Cell type | $C_8$ (Ah) * | Hours | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 | 10 | 24 |
| NCX 80 | 80 | 55.1 | 36.4 | 25.2 | 19.1 | 15.6 | 10.2 | 8.3 | 3.5 |
| NCX 125 | 125 | 86.1 | 56.9 | 39.3 | 29.8 | 24.4 | 16.0 | 12.9 | 5.4 |
| NCX 160 | 160 | 110.1 | 72.8 | 50.3 | 38.2 | 31.3 | 20.4 | 16.5 | 7.0 |

**Final voltage: 1.05 V/cell**

| Cell type | $C_8$ (Ah) * | Hours | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 | 10 | 24 |
| NCX 80 | 80 | 46.2 | 32.9 | 24.9 | 19.1 | 15.6 | 10.1 | 8.2 | 3.5 |
| NCX 125 | 125 | 72.2 | 51.4 | 38.9 | 29.8 | 24.4 | 15.8 | 12.8 | 5.4 |
| NCX 160 | 160 | 92.4 | 65.7 | 49.7 | 38.2 | 31.3 | 20.2 | 16.3 | 7.0 |

**Final voltage: 1.10 V/cell**

| Cell type | $C_8$ (Ah) * | Hours | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 | 10 | 24 |
| NCX 80 | 80 | 39.1 | 27.5 | 22.5 | 18.2 | 15.1 | 10.0 | 8.1 | 3.4 |
| NCX 125 | 125 | 61.1 | 43.0 | 35.2 | 28.5 | 23.6 | 15.6 | 12.6 | 5.4 |
| NCX 160 | 160 | 78.1 | 55.1 | 45.0 | 36.4 | 30.2 | 20.0 | 16.2 | 6.9 |

**Final voltage: 1.14 V/cell**

| Cell type | $C_8$ (Ah) * | Hours | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 | 10 | 24 |
| NCX 80 | 80 | 30.2 | 24.0 | 18.9 | 16.0 | 13.7 | 9.2 | 7.6 | 3.3 |
| NCX 125 | 125 | 47.2 | 37.5 | 29.6 | 25.0 | 21.4 | 14.4 | 11.9 | 5.2 |
| NCX 160 | 160 | 60.4 | 48.0 | 37.9 | 32.0 | 27.4 | 18.4 | 15.3 | 6.7 |

* 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 $C_8$ A.

# Tabular discharge data for the NCX range

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

Figures are valid for a new cell that has never been put in service and has been stored less than six months.

**Final voltage: 1.00 V/cell**

| Cell type | $C_8$ (Ah) * | Hours | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 | 10 | 24 |
| NCX 80 | 80 | 59.5 | 39.7 | 28.4 | 22.2 | 18.3 | 12.1 | 9.8 | 4.2 |
| NCX 125 | 125 | 92.9 | 62.0 | 44.4 | 34.7 | 28.6 | 18.8 | 15.4 | 6.6 |
| NCX 160 | 160 | 118.9 | 79.4 | 56.8 | 44.4 | 36.6 | 24.1 | 19.7 | 8.5 |

**Final voltage: 1.05 V/cell**

| Cell type | $C_8$ (Ah) * | Hours | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 | 10 | 24 |
| NCX 80 | 80 | 50.3 | 36.1 | 28.1 | 22.2 | 18.3 | 11.9 | 9.7 | 4.2 |
| NCX 125 | 125 | 78.7 | 56.5 | 43.8 | 34.7 | 28.6 | 18.6 | 15.2 | 6.6 |
| NCX 160 | 160 | 100.7 | 72.3 | 56.1 | 44.4 | 36.6 | 23.8 | 19.4 | 8.5 |

**Final voltage: 1.10 V/cell**

| Cell type | $C_8$ (Ah) * | Hours | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 | 10 | 24 |
| NCX 80 | 80 | 44.1 | 31.1 | 25.9 | 21.3 | 17.7 | 11.8 | 9.6 | 4.2 |
| NCX 125 | 125 | 68.9 | 48.6 | 40.4 | 33.3 | 27.6 | 18.4 | 15.0 | 6.6 |
| NCX 160 | 160 | 88.1 | 62.2 | 51.7 | 42.6 | 35.3 | 23.6 | 19.2 | 8.4 |

**Final voltage: 1.14 V/cell**

| Cell type | $C_8$ (Ah) * | Hours | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 | 10 | 24 |
| NCX 80 | 80 | 34.7 | 27.6 | 22.1 | 18.7 | 16.1 | 11.0 | 9.2 | 4.1 |
| NCX 125 | 125 | 54.2 | 43.1 | 34.6 | 29.2 | 25.1 | 17.1 | 14.3 | 6.4 |
| NCX 160 | 160 | 69.3 | 55.1 | 44.3 | 37.4 | 32.1 | 21.9 | 18.3 | 8.1 |

* 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 $C_8$ A.

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