

YUASA BATTERY NP, NPL, SWL, RE, EN AND UX INSTALLATION COMMISSIONING AND MAINTENANCE GUIDE



1 STORAGE

If the batteries are **not** to be installed immediately, keep them boxed and store in a cool, clean and dry place.

If the batteries are to be stored for six months or more they will need a supplementary charge prior to installation as outlined below.

2 UNPACKING AND INSPECTION

DANGER: BATTERIES ARE ELECTRICALLY LIVE AT ALL TIMES . DO NOT SHORT CURCUIT THE BATTERY TERMINALS.

Inspect the battery consignment for obvious signs of transit damage. Ensure the consignment has all items listed on the advice note or invoice, i.e. batteries, cables, shrouds etc.

Unpack each battery taking care not to drop on the terminals. Inspect each battery for physical damage such as cracks or distortion of the case and terminals.

Measure the battery open circuit terminal voltage which should be > 2.1 volts/cell (12.6 volts for a 6 cell battery). If any batteries are lower they will need a supplementary charge prior to installation.

3 SUPPLEMENTARY CHARGE

To ensure maximum service life, a supplementary charge may be required prior to installation. Apply a supplementary charge if:

- The batteries have been in storage 6 months or more.
- The battery open circuit voltage is under 2.1 volts per cell.

A supplementary charge should be applied in accordance with figures shown in the tables below.

SUPPLEMENTARY CHARGE FOR THE UX BATTERIES

STORAGE PERIOD	CHARGE VOLTAGE PER CELL	CHARGE TIME
NOT MORE THAN ONE YEAR	2.23 V/CELL	MORE THAN 3 DAYS
1 YEAR	2.28 V/CELL	2-6 DAYS
1-2 YEARS	2.28 V/CELL	3-6 DAYS

SUPPLEMENTARY CHARGE FOR THE EN BATTERIES

STORAGE PERIOD	CHARGE VOLTAGE PER CELL	CHARGE TIME
NOT MORE THAN ONE YEAR	2.26 V/CELL	MORE THAN 3 DAYS
1 YEAR	2.31 V/CELL	2-6 DAYS
1-2 YEARS	2.31 V/CELL	3-6 DAYS

SUPPLEMENTARY CHARGE FOR THE NPL AND SWL BATTERY

STORAGE PERIOD	CHARGE VOLTAGE PER CELL	CHARGE TIME
NOT MORE THAN ONE YEAR	2.275 V/CELL	MORE THAN 3 DAYS
1 YEAR	2.35 V/CELL	2-6 DAYS
1-2 YEARS	2.28 V/CELL	3-6 DAYS

After the charge period, check that the battery open circuit voltage is above 2.1 volts/cell.

4 PRE INSTALLATION CHECK LIST

DANGER: BATTERIES ARE ELECTRICALLY LIVE AT ALL TIMES. DO NOT SHORT CIRCUIT THE BATTERY TERMINALS

UNDER NO CIRCUMSTANCES SHOULD BATTERIES BE CHARGED IN A SEALED CONTAINER

The batteries in the UPS should be installed in a dry and adequately ventilated area, with an operational temperature of between 20°C and 25°C.

CAUTION: Battery operational temperature over 25°C will have a severely detrimental effect on battery service life, see tables in section 5.

INSTALLATION AND CONNECTION

A wire brush should be used on all battery terminals to remove any oxidation layers. Application of a non oxidising grease (such as Vasaline) is not necessary. However there may be some installations where there are corrosive compounds/elements nearby or in the atmosphere. In these special cases it is recommended that a non oxidising grease is used.

When fastening connectors provided to battery terminals an INSULATED SPANNER must be used.

When installing batteries remove any jewellery and watches.

When installing the batteries, free air space must be provided between each battery. The recommended distance is 10mm minimum.

Since a battery may generate ignitable gases, do not install close to any items that produce sparks.

The battery case is made from ABS resin, do not place in an atmosphere with organic solvents or adhesive material.

SINGLE STRING BATTERY CONNECTION

When multiple numbers of batteries are used, make connections as follows:

POSITIVE TERMINATION

Connect the positive terminal (+) of battery No 1 securely to the positive terminal (+) of the charge/load.

INTERCELL CONNECTIONS

Connect the negative terminal (-) of battery No 1 to the positive terminal (+) of battery No 2.

Following this procedure for each battery in sequence until the full string is connected. Note, the intercell connectors may vary in length to accommodate the battery rack or cubicle configurations.

NEGATIVE TERMINAL

Connect the negative terminal (-) of the final battery securely to the negative terminal (-) of the charger or load.

MULTIPLE STRING BATTERY CONNECTION

The connection procedure above should be followed for each of the multiple strings in this type of battery system.

Connect the positive termination cables together through a battery breaker or isolator switch.

FASTENING TERMINAL BOLTS

The following table shows the recommended torque settings for terminal nuts and bolts.

BATTERY	BOLT DIAMETER	FASTENING TORQUE (Nm)
NP17-12 NP/NPL 24-12 NP/NPL38-12 SWL750 SWL 1100	M5	2.45Nm
NP/NPL65-12 NPL130-6 SWL1850 SWL2500	M6	4.76Nm
EN RANGE NPL78-12 SWL2250	M8	6.1Nm
NPL100-12 NPL200-6	M10	16.5Nm

5 CHARGING AND COMMISSIONING

After connecting the battery system a float charge voltage needs to be applied. This voltage may be calculated from the figures in the table below (figures at 25°C).

BATTERY TYPE	CHARGE VOLTAGE PER CELL
NP/NPL/SWL	2.275 VOLTS/CELL
EN	2.26 VOLTS/CELL
UXL	2.23 VOLTS/CELL
UXH	2.275 VOLTS/CELL

FLOAT CHARGE VOLTAGE AT 25°C

This value will be high enough to compensate for the battery's self discharge and keep the battery in a fully charged condition. It should be noted that after applying the float charge voltage, full battery capacity may not be available for 24 hours. This allows for a charging and equalisation period.

EFFECT OF TEMPERATURE ON FLOAT CHARGE VOLTAGE AND BATTERY LIFE

The float charge voltage stated above relates to an operational temperature of 25°C. For other operational temperatures see the table below.

CAUTION

High operational temperature will have a severely detrimental effect on the battery life. This is also shown in the table below.

OPERATIONAL TEMPERATURE °C	CHARGE VOLTAGE PER CELL				EXPECTED BATTERY LIFE		
	RE/NP/SWL	UXL	EN	UXH	NP	NPL/RE	EN/UX
0	2.335	2.305	2.335	2.35	5 YRS	7-10 YRS	10YRS
5	2.32	2.29	2.32	2.335	5 YRS	7-10 YRS	10YRS
10	2.305	2.275	2.305	2.32	5 YRS	7-10 YRS	10YRS
15	2.29	2.26	2.29	2.305	5 YRS	7-10 YRS	10YRS
20	2.275	2.245	2.275	2.29	5 YRS	7-10 YRS	10YRS
25	2.26	2.23	2.26	2.275	5 YRS	7-10 YRS	10YRS
30	2.245	2.215	2.243	2.26	3 YRS	6-8 YRS	8YRS
35	2.23	2.2	2.23	2.245	2 YRS	4-6 YRS	6 YRS
40	2.215	2.185	2.215	2.23	1 YRS	3 YRS	4 YRS
45	2.2	2.17	2.2	2.215	<1YRS	1-2 YRS	2 YRS

*UX denotes UXL and UXH

SETTING A CUT OFF VOLTAGE

Towards the end of a battery discharge the voltage will begin to fall below its nominal value. To prevent deep discharge the battery system a cut off voltage needs to be set. A recommended cut off voltage is 1.7 volts/cell.

CAUTION

The minimum cut off voltage is 1.6 volts/cell to prevent possible permanent damage and reduction of service life.

6 COMMISSIONING LOG SHEETS

See appendixes 1, 2 & 3

INSPECTION AND MAINTENANCE

To prevent battery problems the inspection and maintenance procedures outlined need to be implemented. With each six month inspection, please complete the voltage log sheet provided. This will act as an historical record of the battery system and will help foresee any problem areas before they fully develop.

7 CUSTOMER SERVICE

Please contact our Stationery Battery Division or Technical Department if you have any queries concerning your battery system on telephone number 01793 645753 or visit our website – www.yuasa-battery.co.uk E-mail: enquires@yuasa-sales.co.uk

APPENDIX 1
STATIONARY BATTERY LOG SHEET



STRING No:.....On Load / Off Load / On Charge Time Interval:

C/M	V	Z	C/M	V	Z	C/M	V	Z	C/M	V	Z	C/M	V	Z
1			30			59			88			117		
2			31			60			89			118		
3			32			61			90			119		
4			33			62			91			120		
5			34			63			92			121		
6			35			64			93			122		
7			36			65			94			123		
8			37			66			95			124		
9			38			67			96			125		
10			39			68			97			126		
11			40			69			98			127		
12			41			70			99			128		
13			42			71			100			129		
14			43			72			101			130		
15			44			73			102			131		
16			45			74			103			132		
17			46			75			104			133		
18			47			76			105			134		
19			48			77			106			135		
20			49			78			107			136		
21			50			79			108			137		
22			51			80			109			138		
23			52			81			110			139		
24			53			82			111			140		
25			54			83			112			141		
26			55			84			113			142		
27			56			85			114			143		
28			57			86			115			144		
29			58			87			116			145		

Key: C/M = Cell or Monobloc
 * Delete as required
 V= Volt
 Z = Impedance

APPENDIX 1
STATIONARY BATTERY LOG SHEET



CUSTOMER REFERENCE:	
INSPECTED/TESTED BY:	DATE:
BATTERY TYPE:	CONFIG:
ORIGINAL INSTALLATION DATE:	NEXT SERVICE DATE:

COMMISSIONING / ROUTINE SERVICE DATE:*	SYSTEM LOAD	
FLOAT TEST: YES/NO*	FLOAT CURRENT:	TOTAL FLOAT V:

LOAD DETAILS:		
LOAD TEST: YES/NO*	LOAD DURATION:	INTERVAL:

Observations:-

Yuasa Battery Sales
(UK) Ltd
Hawksworth
Industrial Estate, Swindon,
Wiltshire SN2 1EG
Tel: 01793-645700
Fax: 01793-645701
Website:
www.yuasa-battery.co.uk

Registered number 1548820

Notes:-

1. This document should be kept for record purpose.
2. * *delete as required*