電池規格 BATTERY SPECIFICATIONS

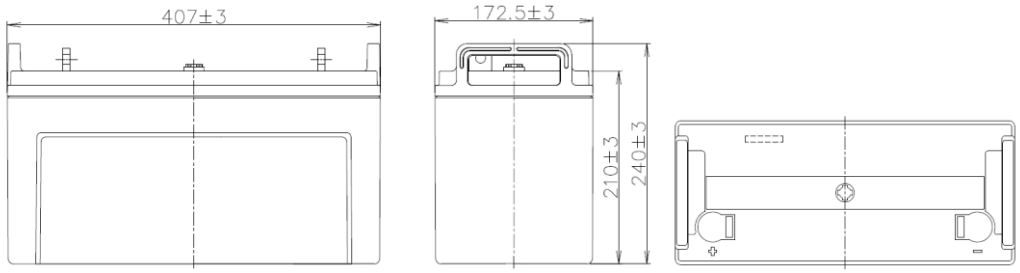
閥調式鉛酸蓄電池 Valve Regulated Lead Acid (VRLA) Rechargeable Battery

1. 型式 Model：NPL100-12

2. 額定電壓 / 容量 Nominal Voltage / Capacity：12V / 100AH（20 HR）

3. 諸元 Mechanical Spec：

尺寸 Measurements	長 Length	407±3mm
	寬 Width	172.5±3mm
	槽高 Case height	210±3mm
	總高 Overall height	240±3mm
端子 Terminal	螺絲式 Bolt （M10） 鎖緊轉矩 Tightening torque 14.7~19.6Nm（150~200kgf · cm）	
重量 Weight	約 About 37 kg	
ABS難燃等級 ABS Flame class	NPL-100-12	難燃等級UL94HB Flame class UL94HB
	NPL100-12 FR	難燃ABS， 難燃等級UL94V0 Flame Retardant ABS , Flame class UL94V0



4. 構造 Construction：

蓄電池係由陽極板、陰極板、電槽、蓋、隔離板、電解液等組成,並設有陽、陰極板引出端子。

密閉構造機能為蓄電池產生之氣体由陰極板吸收且不必補水。

This battery is composed of positive plates, negative plates, separators, container, lid, electrolyte etc., and is equipped with positive and negative polarity terminals.

Any emitted gas from the battery is minimized with the negative plate gas recombinant method, thus requiring no topping up of electrolyte.

5. 外觀 External appearance：

不得有漏液、污垢、裂痕、變形等現象。
Battery shall be without acid leakage, conspicuous stain, scar or deformation.

6. 性能 Performance：

6-1 性能測試溫度：25±2℃ (特別指定不在此限)
6.1 Temperature of tested battery shall be 25±2℃, if not specified.

6-2 放電容量 Discharge capacity：（此數值為最小值This value is the minimum）

PERFORMANCE DATA AT 25℃(77℉) - Amperes and Watts															
TIME / F.V.		5M	10M	15M	20M	30M	45M	1H	2H	3H	4H	5H	8H	10H	20H
10.80V	W	3100	2500	2112	1761	1340	1002	809	445	309	247	210	133	110	59.9
	A	281	223	185	153	116	86	69.9	37.7	25.8	20.7	17.6	11.1	9.22	4.95
10.50V	W	3500	2700	2210	1830	1383	1028	825	451	311	249	211	134	111	60.1
	A	325	243	194	160	120	89	71.2	38.2	26.1	20.9	17.7	11.2	9.30	5.00
10.20V	W	3750	3000	2332	1908	1425	1047	831	454	313	250	213	135	112	60.5
	A	355	275	207	168	124	90	71.6	38.4	26.2	20.9	17.8	11.3	9.32	5.00
10.02V	W	3855	3027	2343	1916	1429	1049	832	455	314	251	214	135.8	113	60.8
	A	369	282	210	170	125	91	71.7	38.5	26.3	21.0	17.9	11.3	9.37	5.03
9.60V	W	4140	3100	2374	1936	1440	1054	833	459	318	254	216	138	114	61.7
	A	405	300	217	174	128	92	72.0	38.8	26.6	21.3	18.1	11.4	9.49	5.10

蓄電池交貨時，經完全充電〔電壓14.4V/只（MAX. 0.25C_{20}）充電16hr〕後，1天內測試時仍須視電池充電狀態，必要時須延長充電時間。

The battery capacity at the time of delivery, within 1 day after being charged at 14.4V（MAX. 0.25C_{20}）for 16hr.
Charge period may need to be extended, as it is dependent on the state of the charge of the battery.

6-3 開路電壓 Open circuit voltage：

在完全充飽電的狀態，開路電壓大約13V。
Open circuit voltage will be around 13 V at fully charged condition. It is dependent on the state of the charge of the battery.

6-4 內部電阻 Internal resistance：

完全充電後以AC橋式(1KHz)測試約3.6mΩ。
Give a full charge to the battery, and measure with AC bridge (1KHz), about 3.6mΩ.

6-5 最大放電電流 Maximum discharge current：

放電電流 Discharge current	放電時間 Discharge time
300 A	1分以下Minutes below
600 A	5秒以下Seconds below

6-6 充電 Charging：

充電方式 Method	電壓設定 Given Voltage	充電最大電流 Maximum charging Current	說　　明 Special condition(S)
浮動充電 Float Charging	13.65V±0.15V	0.25C_{20}（A）	當環境溫度上升時，充電電壓必須降低避免造成過充電。因此建議以-3mV/℃/cell（25℃基準值）做溫度校正補償。 As the average ambient temperature rises, charging voltage should be reduced to prevent overcharge. Accordingly, the recommended compensation factor is -3mV/℃/cell at 25℃ of standard centre point.
循環充電 Cyclic Charging	14.4V~15.0V	0.25C_{20}（A）	當環境溫度上升時，充電電壓必須降低避免造成過充電。因此建議以-4mV/℃/cell（25℃基準值）做溫度校正補償。 注意：為了避免造成電池過量的充電，導致電池的故障損壞，這種充電方式必須適當的終止電池充電時間。 As the average ambient temperature rises, charging voltage should be reduced to prevent overcharge. Accordingly, the recommended compensation factor is -4mV/℃/cell at 25℃ of standard centre point. Caution：This needs to be terminated with appropriate charging period in order to avoid excess over charging that can result in the damage of the batteries.

6-7 使用溫度範圍 Permissible temperature range：

狀態 Conditions	溫度範圍 Temperature range
放電 Discharging	-15℃～45℃
充電 Charging	-15℃～45℃
放置 Storage	-15℃～45℃

6-8 放置期限 Storage period without charge：

溫度狀況 Storage temperature	容許放置期限 Max. storage period
Temp.≦25℃	6 個月 months
25＜ Temp. ≦30℃	4 個月 months
30＜ Temp. ≦35℃	3 個月 months
35＜ Temp. ≦40℃	2 個月 months

6-9 期待浮充壽命 Expected float use life：

測試條件：

以13.65±0.15V定電壓持續充電,每3個月後以0.25C_{20}（A）放電至10.2V終止電壓。

在環境溫度25±2℃，7年內電池容量維持在2Hr以上。

期待壽命會因溫度的升高而變得更短。

Test condition：

Charge at 13.65±0.15V continuously and discharge at 0.25C_{20}（A）to FV 10.2V every 3 months.
Battery capacity maintains more than 2Hr during 7 years, at 25±2℃.
Expected life will become shorter accordingly with rise in the temperature.

6-10 期待循環壽命 Expected Cyclic life：

50%放電測試條件：

在環境溫度25±2℃，以0.25C（A）放電2小時。再以定電壓14.4～14.7V/只充電（充電電氣量=放電電氣量量的105～110%），期待循環壽命約400Cycle（放電末電壓應達10.2V以上）。

期待壽命會因溫度的升高而變得更短。

50% DOD test condition：（at 25±2℃）

Discharge at 0.25C（A）for 2 hours. Constant voltage charge at 14.4～14.7V / battery（Charge amount（AH）=105～110% of discharge amount（AH））.

Expected cycle life about 400 cycle（Final discharge voltage over 10.2V）.
Expected life will become shorter accordingly with rise in the temperature.

6-11 機械強度 Mechanical strength：

6-11-1 耐振動性能：

振 幅：4 mm

頻 率：16.7 Hz任意方向連續60分鐘振動後,目視檢查電池不得有漏液、異常現象,測定電壓應達12V以上。

6-11-2 耐衝擊性：

在厚約10mm以上之硬木板上測試,由20cm高處落下(方向任意,但端子部除外)一次後,目視檢查不得漏液、異常現象,測定電壓應達12V以上。

6-11-1 Anti-vibration performance：

Vibrate the battery in any directions for 60 consecutive minutes with 4 mm amplitude and 16.7 Hz per minute. Read the voltage and make visual inspection. Battery shall show no extreme damage or no electrolyte leakage and should read nominal 12V or more.

6-11-2 Anti-impact performance：

Drop it from a 20cm height onto a 10mm thick solid wooden block in any directions except terminal portions. Read the voltage and make visual inspection. Battery shall show no extreme damage or no electrolyte leakage and should read nominal 12V or more.

7. 安裝條件Installation Conditions：

蓄電池的收納容器不得為密封構造，收納容器請務必設置通往外部的通氣孔。 若在金屬製的收納容器內使用蓄電池，則為了避免蓄電池因電槽（外殼）破裂而產生漏液，導致收納容器或固定架與蓄電池之間形成漏電迴路，請在兩者之間配置具耐熱、耐酸性且不會因固定時的應力而造成破損的絕緣片或絕緣匣，或者將蓄電池裝入絕緣袋中。 上述絕緣物請使用不會在表面附著油脂類、或由絕緣物內部滲出有機物之絕緣物。 蓄電池請勿與含有可塑劑的乙烯絕緣帶、絕緣片或溶劑、油脂等接觸。
Storage container for rechargeable battery must not be of sealed and air tight construction; the container must be equipped with appropriate ventilation system，such as ventilation holes leading to the outside and so on. The following applies to using a rechargeable battery inside a metallic storage box: to prevent the rechargeable battery from leaking fluid due to a breakage in the electrolytic cell, thus forming a leak circuit between the battery and the storage box (or fixed frame), install between these two items a heat and acid resistant insulating sheet (or tray) that will not be damaged by periodic stress. Alternatively, place the rechargeable battery inside an insulating bag but not to be sealed. For the above described insulation material, do not use any material that can be stained with grease, or that can have organic substance oozing out of itself. Do not allow the rechargeable battery to come into contact with vinyl tape containing plasticizer, insulation sheet, solvent, or grease.

8. 注意 Caution：

請避免不同種類、容量、新舊電池串聯，或並聯組數超過三組以上，或循環使用。
Use different kinds, capacity, new and old production of battery to series connection, or parallel connection more than three groups, or cycle use, please avoid.

9. 變更履歷Modification record：

版次 Revision	日 期 Date	變 更 內 容 Modification content
2	2011.12.12	增訂6.10 期待循環壽命。 Revision 6.10 Expected Cyclic life.
3	2014.02.20	修訂6-2 放電容量。 Revision 6-2 Discharge capacity. 修訂6-5 最大放電電流。 Revision 6-5 Maximum discharge current. 修訂6-7使用溫度範圍 Revision 6-7 Permissible temperature range.
4	2015.12.28	修訂1. 型式 ：NPL100-12N FR→NPL100-12 FR。 Revision Model：NPL100-12N FR→NPL100-12 FR.
5	2018.09.25	修訂6-4 內部電阻 Revision 6-4 Internal resistance.
6	2026.02.13	修訂1. 型式 ：NPL100-12 FR→NPL100-12 。 Revision Model：NPL100-12 FR→NPL100-12 修訂3 諸元 Revision 3 Mechanical Spec：