

Primary Lithium Batteries





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GP Primary Lithium Manganese Dioxide (LiMnO₂) batteries offer numerous advantages over other conventional primary battery systems. The unique features include high energy density, high voltage, excellent performance at extreme ambient temperature, wide operating temperature, superior safety design, specific crimp design for leakage proof, and low self discharge rate of less than 1% per year. Our wide product range (cylindrical and coin types) are the ideal options for user-replaceable electronic devices.

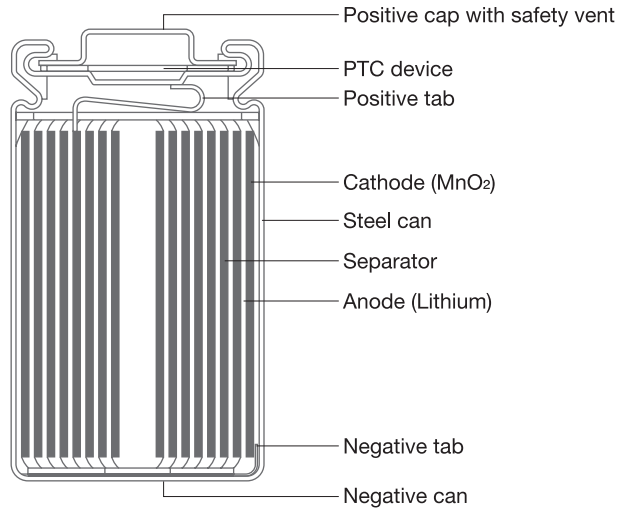
The security devices such as smoke detectors, do require highly reliable performance over an extended operation period under extreme ambient conditions. The maintenance-free GP Lithium 9V battery can last 5 times longer than the alkaline batteries, and it can provide 10-year service life in Ionisation-type Smoke Detector application! The high-power spiral cell construction of GP Lithium Cylindrical battery meets the needs of applications demanding high pulse current, or even continuous high drain discharge. GP Lithium 9V battery is the unanimous solution for smoke detectors and security professionals.

By adopting the advanced Japanese technology and fully automatic production processes, GP Primary Lithium Batteries are produced under strict and consistent quality control. As an expert in battery technology and the world's leading battery manufacturer, GP ensures our high standard of performance and quality are committed to meet the demands of the large and diversified market.

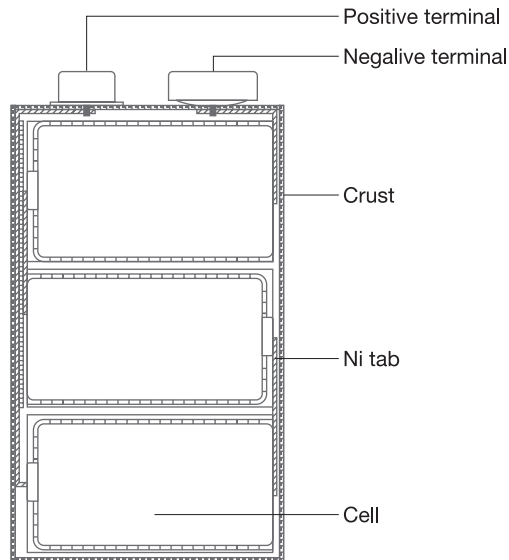


Cell Construction

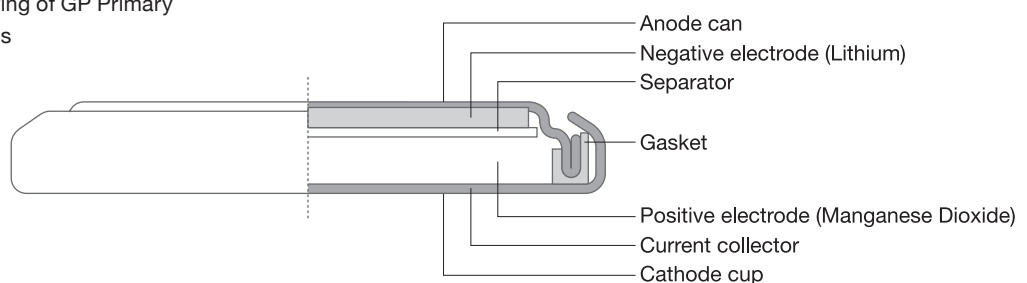
- ⊕ The spiral cell construction of GP Primary Lithium Cylindrical Batteries (e.g. GPCR-V9, GPCR123A, GPCR-V3 etc.) enlarges the facing area of the positive and negative electrodes, providing high power for high discharge current applications.
- ⊕ PTC device: A PTC (Positive Temperature Coefficient) device is installed to protect the battery from external short circuit.
- ⊕ Positive cap with safety vent : The burst-proof safety vent prevents excessive internal pressure build-up under abusive conditions.



GP Primary Lithium 9V battery (GPCR-V9) is consisted of 3 pieces of GP Primary Lithium Cylindrical Batteries (GPCR14250)



Cross sectional drawing of GP Primary Lithium Coin Batteries



Lithium 9V



Major Features

- A 10 years service life in smoke detectors
- B Up to 5 times longer lasting than ordinary alkaline batteries
- C Spiral construction results in
 - Low internal impedance
 - High discharge current
- D Design for safety
 - Built-in PTC (Positive Temperature Coefficient) to protect batteries from external short circuit
 - Burst-proof venting holes which allows safe release of the battery internal pressure
- E Leakage proof crimping technique
- F Wide operational temperature range of -40°C to +60°C with excellent discharge performance at extremely low temperatures
- G Excellent storability with low self discharge rate at less than 1% per year
- H Environmentally friendlier
 - Electrolyte contains no lithium perchlorate
- I Comply with UL and UN38.3 safety standards

Major Applications

General Applications:

Smoke detectors, security devices, medical equipment, carbon monoxide alarms, explosion gas alarms, meters (gas/electric/water), metal detectors, wireless transmitters, electronic toll collection system, etc.

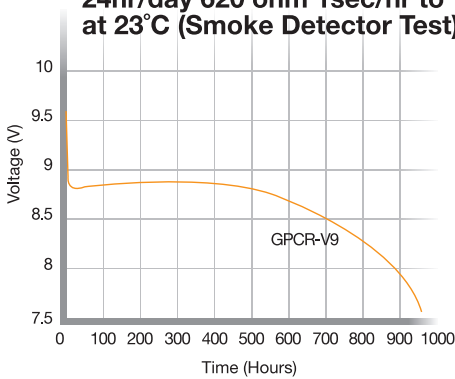
High Drain Applications:

Stun guns, military applications



Performance Characteristics

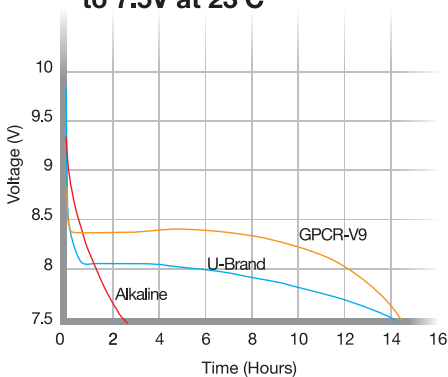
**ANSI 10K ohm background
24hr/day 620 ohm 1sec/hr to 7.5V
at 23°C (Smoke Detector Test)**



10-year Service Life in Smoke Detectors

Voltage characteristics remain stable even for a long period of discharge, greatly improving the reliability of the ionisation-type smoke detector that uses GP Lithium 9V battery (GPCR-V9). Such smoke detector is also maintenance free (battery replacement is seldom required).

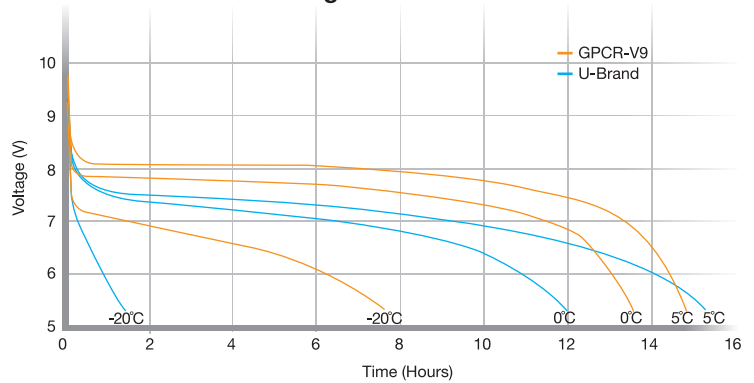
**50mA continuous discharge
to 7.5V at 23°C**



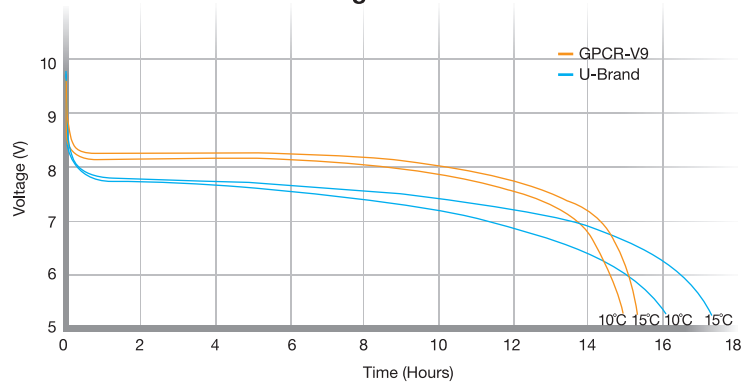
Lightweight, High Voltage and High Energy Density

GP Lithium 9V battery (GPCR-V9) lasts 5 times longer than Alkaline batteries.

50mA discharge at -20°C / 0°C / 5°C



50mA discharge at 10°C / 15°C



Excellent Temperature Characteristics

GP Lithium 9V battery (GPCR-V9) outperforms competition by demonstrating much longer operating time and stable performance over a wide temperature range of -40°C to +60°C.

Lithium Cylindrical



Major Features

- A** Spiral construction results in
 - Low internal impedance
 - High discharge current
- B** Design for safety
 - Built-in PTC (Positive Temperature Coefficient) to protect batteries from external short circuit
 - Burst-proof venting holes which allows safe release of the battery internal pressure
- C** Leakage proof crimping technique
- D** Wide operational temperature range of -40°C to $+60^{\circ}\text{C}$ with excellent discharge performance at extremely low temperatures
- E** Excellent storability with low self discharge rate at less than 1% per year
- F** Environmentally friendlier
 - Electrolyte contains no lithium perchlorate
- G** Comply with UL and UN38.3 safety standards

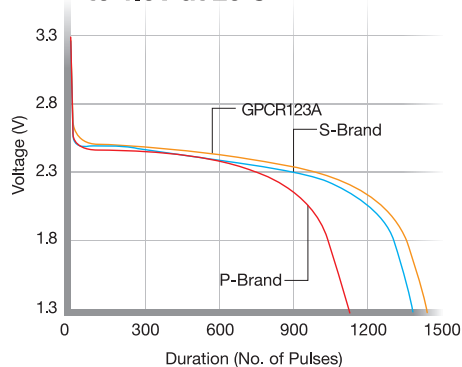
Major Applications

Cameras, flashlights, memory back-up, medical equipment, meters (gas/electric/water), photo flash, electronic guns, etc.



Performance Characteristics

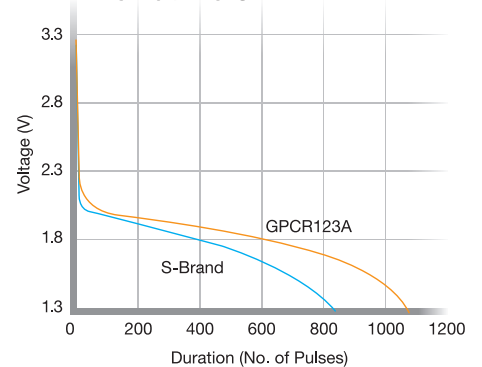
1200mA pulse discharge to 1.3V at 23°C



Excellent Pulse Discharge Performance at Room Temperature

GPCR123A shows superior high pulse discharge performance and longer duration than competitors.

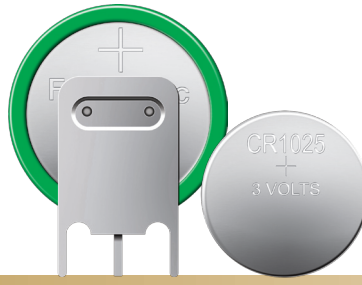
1200mA pulse discharge to 1.3V at -20°C



Outstanding Pulse Discharge Capability at -20°C

The outstanding high pulse discharge capability of GPCR123A remains strong at extremely low temperature.

Lithium Coin



Major Features

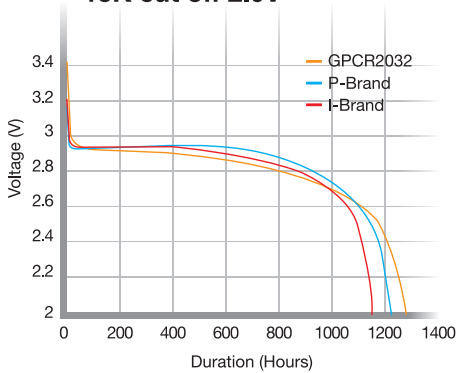
- A High volumetric energy density
- B Flat discharge voltage
- C Leakage proof crimping technique
- D Wide range of operating temperature from -10°C to $+60^{\circ}\text{C}$
- E Excellent storability with low self discharge rate at less than 1% per year
- F Comply with UL and UN38.3 safety standards

Major Applications

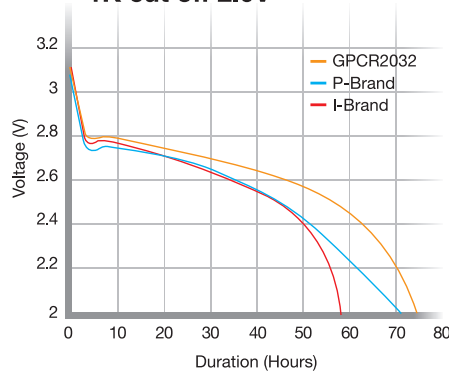
Calculators, car equipment (keyless entry), FA instruments (measuring instruments, onboard microcomputers, sensors), electronic thermometer, IC cards, IC tags, memory back-up, greeting cards, time pieces, remote control, portable games, etc.

Performance Characteristics

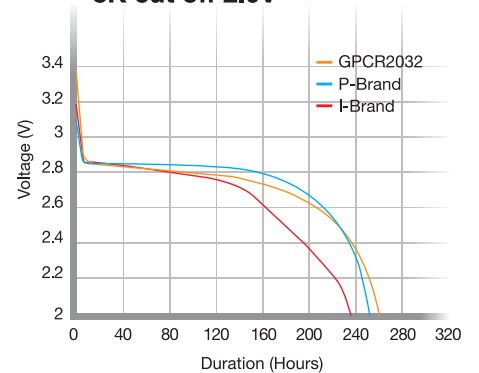
Discharge curve by loading
15K cut off 2.0V



Discharge curve by loading
1K cut off 2.0V



Discharge curve by loading
3K cut off 2.0V



GPCR2032 provides longer operating hours at different loading discharges.



Primary Lithium

Specifications

Lithium 9V

Model No.	Dimension (mm)	Voltage (V)	Weight (g)	Cross Reference			
				IEC	JIS	ANSI	Ultralife
CR-V9	26.5(L) x 17.5(W) x 48.5(H)	9.0	34	-	-	1604LC	U9VL

Operating temperature: -40°C to +60°C

Lithium Cylindrical

Model No.	Dimension (mm)		Voltage (V)	Weight (g)	Cross Reference			
	Diameter	Height			IEC	JIS	Eveready	Duracell
CR14250	14.5	25.0	3.0	9	-	-	-	-
CR14500	14.0	50.0	3.0	18	-	-	-	-
CR2	15.6	27.0	3.0	12	-	-	-	DLCR2
CR123A	16.8	34.5	3.0	17	CR17345	-	EL123AP	DL123A
CR-V3	29.0(L) x 14.5(W) x 52.0(H)		3.0	38	-	-	ELCRV3	CR-V3
CR-P2	34.8(L) x 19.5(W) x 35.8(H)		6.0	37	CR-P2	-	EL223AP	DL223A
2CR5	34.0(L) x 17.0(W) x 45.0(H)		6.0	40	2CR5	-	EL2CR5BP	DL245

Operating temperature: -40°C to +60°C

Lithium Coin

Model No.	Dimension (mm)		Voltage (V)	Weight (g)	Cross Reference			
	Diameter	Height			IEC / JIS	Eveready	Varta	Duracell
CR1/3N	11.6	10.8	3.0	2.3	CR1/3N	-	-	DL1/3N
CR1025	10.0	2.5	3.0	0.6	CR1025	ECR1025	CR1025	-
CR1216	12.5	1.6	3.0	0.6	CR1216	ECR1216	CR1216	-
CR1220	12.5	2.0	3.0	0.8	CR1220	ECR1220	CR1220	-
CR1616	16.0	1.6	3.0	1.1	CR1616	ECR1616	CR1616	-
CR1620	16.0	2.0	3.0	1.2	CR1620	ECR1620	CR1620	-
CR2016	20.0	1.6	3.0	1.7	CR2016	ECR2016	CR2016	DL2016
CR2025	20.0	2.5	3.0	2.4	CR2025	ECR2025	CR2025	DL2025
CR2032	20.0	3.2	3.0	3.2	CR2032	ECR2032	CR2032	DL2032
CR2430	24.5	3.0	3.0	4.0	CR2430	ECR2430	CR2430	DL2430
CR2450	24.5	5.0	3.0	6.6	CR2450	ECR2450	CR2450	-

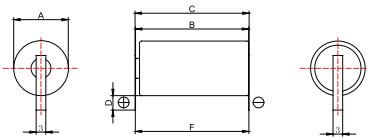
Operating temperature: -10°C to +60°C



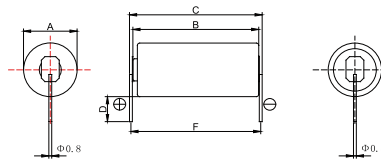
Batteries

Lithium Battery With Terminal

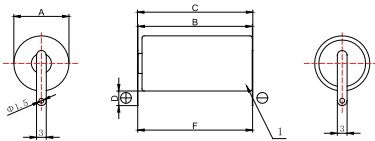
T1



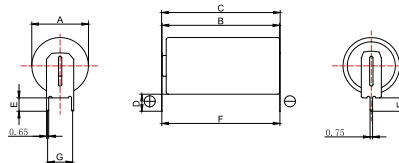
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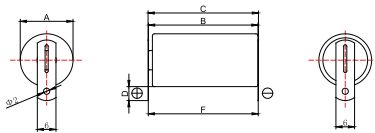
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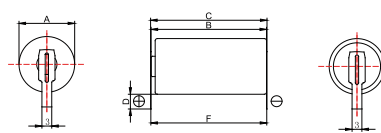
T4



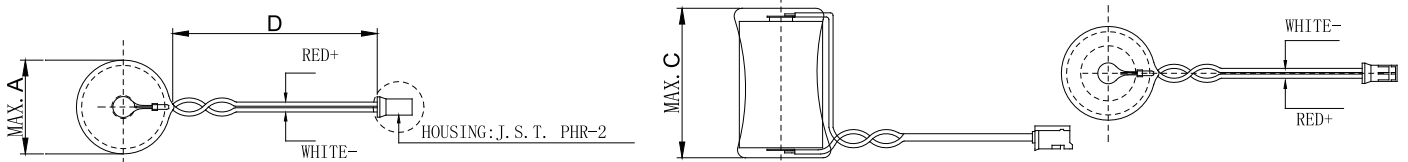
T5



T6



T7



No	Model	Capacity (mAh)	Size (mm)							Connector Description
			A	B	C	D	E	F	G	
T1	CR123A	1400	17	34	34.5	4.5		34		t:0.15 Nickel Belt
T2	CR2	800	15.6	27	29	7.2		28		φ 0.8 t:0.15 Stainless Steel
T3	CR123A	1400	17	34	34.5	3.5		34		t:0.15 Nickel Belt
T4	CR123A	1400	17	34	35	5.1	4	34	7.5	t:0.3 Stainless Steel
T5	CR123A	1400	17	34	35	3.5		34.5		t:0.3 Stainless Steel
T6	CR123A	1400	17	34	35	4.5		34.5		t:0.3 Stainless Steel
T7	CR123A	1400	18		38	40				Conector: J.S.T-PHR-2

Batteries

Precautions for Battery Handling

1. Do not charge. When this battery is charged, gas is generated inside and raises internal pressure, resulting in fire, heat generation, leakage or bursting.
2. Do not dispose of in fire, disassemble or heat in any way. It will damage the insulation materials and the safety vent resulting in fire, heat generation, leakage or bursting.
3. Insert batteries properly. Keep polarities in the correct position aligning + and - correctly for ALL batteries to avoid leakage or bursting.
4. Do not short-circuit. If the + and - come into contact with metal objects, short circuiting occurs resulting in heat generation or bursting. When carrying or storing batteries, avoid direct contact with metal objects such as bracelets or key chains by putting them in a separate bag.
5. Keep away from children. Consult a doctor IMMEDIATELY if a battery or leaked liquid is swallowed.
6. If leakage or strange smell occurs, keep batteries well away from fire to prevent ignition of leaked electrolyte.
7. Do not solder. It will damage the insulation materials resulting in fire, heat generation, leakage or bursting.
8. Do not force-discharge. When a battery is force-discharged by an external power source, the voltage drops to 0 or less (reversal voltage) and gas is generated inside the battery. This may cause fire, heat generation, leakage or bursting.
9. If leaked liquid gets into the eyes, wash IMMEDIATELY with plenty of clean water and consult a doctor.
10. Do not use different types of batteries nor new and used batteries together. Doing so can cause heat generation, leakage or bursting.
11. Do not apply strong force or handle roughly to avoid heat generation, leakage or bursting.
12. Do not use nor keep batteries in direct sunlight nor high-temperature areas. Doing so may cause heat generation, leakage or bursting.
13. Do not wash nor place batteries in water as this may cause heat generation.
14. Read the instruction manual. Take note of all precautions carefully before use. Make sure these batteries are appropriate for your equipment.
15. Storage precautions. Keep batteries away from direct sunlight, excess humidity and high temperature areas as this can cause dangerous heat generation.
16. For proper disposal and transportation follow local authority guidelines and regulations.
17. Battery shall not be punctured, crushed, disassembled, or stored beyond the maximum temperature range specified on the data sheet.
18. Do not use if there is any sign of leakage or deformation. Read the Material Safety Data Sheet (MSDS) for precautions and leakage handling directions.
19. Switch off the device immediately once the battery becomes hot, and remove the battery from the device after its temperature is cooled down to normal.
20. Only use the battery for the applications which it is designed for.
21. The warning labels must be read and all the safety precautions must be followed.
22. In case of battery fire incident refer to MSDS for control instructions.
23. While installing the battery pack in the device, ensure the pack is installed in the right position and away from the heat sources in the device, in order to avoid any damage caused to the battery pack.
24. Adopt a battery pack mechanism to prevent battery pack from being ejected, if the device is suffered from a drop of any physical impact.





**WORLDWIDE HEADQUARTERS
HONG KONG
GPI INTERNATIONAL LIMITED**

Gold Peak Building, 8/F, 30 Kwai Wing Road,
Kwai Chung, N.T., Hong Kong
Tel: (852) 2484 3333 Fax: (852) 2480 5912
E-mail address: gpil@goldpeak.com
Website: <http://www.gpbatteries.com>

SALES & MARKETING BRANCH OFFICES

ASEAN
GP BATTERY MARKETING (SINGAPORE) PTE. LIMITED
97 Pioneer Road, Singapore 839579
Tel: (65) 6559 9760 Fax: (65) 6559 9761

MALAYSIA
GP BATTERY MARKETING (MALAYSIA) SDN. BHD.
Lot 8, Jalan Pemberita U1/49,
Temasya Industrial Park,
40150 Shah Alam, Selangor Darul Ehsan, Malaysia
Tel: (60) 3 5569 3499 Fax: (60) 3 5569 3498

THAILAND
GP BATTERY MARKETING (THAILAND) CO., LIMITED
102, Soi Sukhumvit 26, Sukhumvit Road,
Klongton, Klongtoey, Bangkok 10110 Thailand
Tel: (66) 2 661 3688 Fax: (66) 2 661 3602

TAIWAN
GOLD PEAK INDUSTRIES (TAIWAN) LIMITED – TAIPEI OFFICE
8/F, NO.205, Sec. 1, Fu Xing South Road,
Taipei 10606, Taiwan R.O.C.
Tel: (886) 2 2772 9998 Fax: (886) 2 2731 4868/ 2741 0192

CHINA
HUIZHOU CHAO BA BATTERIES COMPANY LTD.
No.29, 6th Gaoxin Road,
Zhongkai Gaoxin Industrial Zone,
Huzhou City, Guangdong, China
(Postal Code: 516006)
Tel: (86) 752 2638 698 Fax: (86) 752 2638 666

HONG KONG
GP BATTERY MARKETING (H.K.) LIMITED
Unit D & E, 1/F, Kam Bun Industrial Building,
No.13-19 Kwai Wing Road,
Kwai Chung, N.T., Hong Kong
Tel: (852) 2420 0281 Fax: (852) 2494 9349

KOREA
GP BATTERY MARKETING (KOREA) LIMITED
Kunsul Hoekwan Building, 9/F, 71-2 Non Hyun-Dong,
Kang Nam-Gu, Seoul, South Korea
Tel: (82) 2 549 7188/9, 2516 3936/7
Fax: (82) 2 514 0623, 2516 0621

U.S.A.
GOLD PEAK INDUSTRIES (NORTH AMERICA), INC.
11235 West Bernardo Court, San Diego,
CA 92127-1638, U.S.A.
Tel: (1) 858 674 6099 Fax: (1) 858 674 6496/ 674 5883

CANADA
GP BATTERY MARKETING INC.
Unit 7, 7780 Woodbine Avenue, Markham,
Ontario, Canada L3R 2N7
Tel: (1) 905 474 9507 Fax: (1) 905 474 9452

LATIN AMERICA
GP BATTERY MARKETING (LATIN AMERICA) INC.
8370 NW, 66TH Street, Miami, Florida 33166, U.S.A.
Tel: (1) 305 471 7717 Fax: (1) 305 471 7718

EUROPE
GP BATTERIES EUROPE B.V.
Kortijzer 4, 5721 VE Asten,
Netherlands
Tel: (31) 493 681030 Fax: (31) 493 681039

FRANCE
GP BATTERY MARKETING FRANCE - GPBMF
ZAE du Trou Grillon - BP49,
91280 Saint Pierre du Perray - France
Tel: (33) 1 6989 6200 Fax: (33) 1 6989 6210

GERMANY
GP BATTERY MARKETING (GERMANY) GMBH
Schiebsstrasse 68, D-40549 Dusseldorf, Germany
Tel: (49) 211 522 9540 Fax: (49) 211 522 954 54

POLAND
GP BATTERY (POLAND) SP Z.O.O.
Al. Jerozolimskie 162, 02-342 Warsaw, Poland
Tel: (48) 22 500 9500 Fax: (48) 22 846 7535

U.K.
GP BATTERIES (U.K.) LIMITED
Monument View, Chelston Business Park,
Wellington, Somerset, TA21 9ND, United Kingdom
Tel: (44) 1 823 660 044 Fax: (44) 1 823 665 595

ITALY
GP BATTERY MARKETING ITALY S.R.L.
Via. Alessandro Volta 3,
20094 Assago (Mi), Italy
Tel: (39) 02 488 2512 Fax: (39) 02 488 2865

SCANDINAVIA
GPBM NORDIC AB
Grimboäsen 5, SE-417 49, Goteborg, Sweden
Tel: (46) 31 799 1600 Fax: (46) 31 799 1613

RUSSIA
AZ COMPANY
Building 4, 2-D Zaborje Str.
Mic. Dist. Vostryakovo, Domodedovo
142072 Moscow Area, Russia
Tel: (7) 495 926 50 50 Fax: (7) 495 926 50 50 ext. 201

MIDDLE EAST
GP MIDDLE EAST FZC
P.O.Box 7989, Suite No.L1-18, Saif Zone, Sharjah,
United Arab Emirates
Tel: (971) 6 5578787 Fax: (971) 6 5578777

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