

9) **Model Number Designation** (Note - Units will be marked without the codes of a & b):

SM a b - BC dd ee - f g h - xP

SM-BC = Steed SM-BC Series

a = Input voltage code

b = AC plug type code

(Affix "S" for the Computer

Type power cord for the units with IEC-320inlet.

For example: ES,FS,GS,HS,JS etc.)

1 = 100V; **3** = 115V; **7** = 230V; **8** = 240V

E = Europe Schuko Type

F = NEMA 5-15P North America Type

G = Australia & New Zealand Type

H = U.K. Type

J = South Africa Type

U = Universal IEC-320 inlet

dd = Rated Battery Voltage (12, 24, 36 or 48 etc.)

ee = Rated Model's output current

f = **A** = Single function without battery select switch for liquid lead **A**cid battery only

G = Single function without battery select switch for dry **G**el cell battery only

D = **D**ual functions for Acid and Gel batteries with a Battery Select Switch

g = **S** = Built-in with power **S**upply and Output Function Select Switch

h = **M** = Built-in with **M**ode Override switch fixed on the front panel

R = **R**emote control box supplied for mode override switch and 3 LED indicators

xP = **x** = Number of output banks for screw terminal units. 2 = 2 banks

For example: **SM7H-BC1235-DSM** with fly output power cord

SM7E-BC1235-ASR-2P with screw terminals and has 2 Bank outputs

10) **Available Models & Specifications**

STEED SM-BC Series Model No.	Input Rating		Rated Output Voltage (VDC)	Max. Output Current (Amp)	Max. Output Power (VA)	Recommend Battery Capacity (Amp-Hour)	Cables No.	Overall Dimension			N.W. per pc (ref.) (Kgs)	Package/Ctn (Ref.)		
	ACV +/-10%	Freq. (Hz)						WD. (mm)	HT. (mm)	LG. (mm)		PCS	KGS	CBM
SM-BC1215	115 or 230V	47-63	12V	15A	220	28-150	2	173	64.5	160	2.0	8	19	0.03
SM-BC1225	115 or 230V	47-63	12V	25A	375	50-250	3	173	64.5	200	2.5	8	22.5	0.05
SM-BC1235	115 or 230V	47-63	12V	35A	525	60-350	4	173	64.5	260	3.4	6	24	0.05
SM-BC1245	115 or 230V	47-63	12V	45A	675	80-450	5	173	64.5	280	4.0	4	20.5	0.05
SM-BC2408	115 or 230V	47-63	24V	8A	220	16-80	2	173	64.5	160	2.0	8	19	0.03
SM-BC2412	115 or 230V	47-63	24V	12A	375	28-120	3	173	64.5	200	2.5	8	22.5	0.05
SM-BC2418	115 or 230V	47-63	24V	18.5A	525	40-200	4	173	64.5	260	3.4	6	24	0.05
SM-BC2425	115 or 230V	47-63	24V	25A	720	50-250	5	173	64.5	280	4.0	4	20.5	0.05
SM-BC4812	115 or 230V	47-63	48V	12A	720	28-120	5	173	64.5	280	4.0	4	20.5	0.05

• Contact Steed factory for other voltage models, such as 36V or 48V etc.

• Specifications are subject to change without notice. Contact dealer or Steed factory for detail on request

11) **Common Specifications**

Common Specifications		12V Models	24V Models	36V Models	48V Models
Max. Terminal Charge Voltage	Liquid Acid	14.80V+/-0.2V	29.50V+/-0.2V	45.00V+/-0.2V	60.30V+/-0.2V
	Dry Gel Cell	14.00V+/-0.2V	28.50V+/-0.2V	42.50V+/-0.2V	57.50V+/-0.2V
Max. Quick Charging Time		Around 10 Hour	Around 10 Hour	Around 10 Hour	Around 10 Hour
Max. Absorption Charging Time		Around 2 Hour	Around 2 Hour	Around 2 Hour	Around 2 Hour
Max. Trickle, Storage & Recharge Time		Around 20 Hour	Around 20 Hour	Around 20 Hour	Around 20 Hour

WARRANTY

Steed Magnet Products Enterprise Co., Ltd. warrant this product to be free from defects in material and workmanship for a period of 90 days from the date of purchase from our authorized dealers. Should the product require service during this period, all labor and parts used to effect repairs will be supplied free of charge.

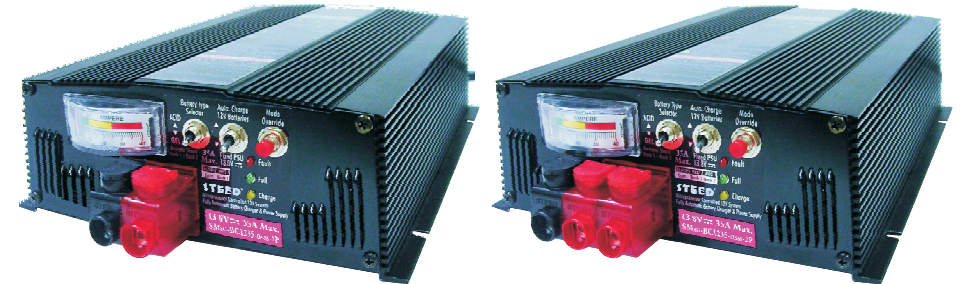
Steed Magnet Products Enterprise Co., Ltd. reserve the right to determine whether damage has been occasioned by accident, misuse, or improper installation whereby the Warranty would be void. In the event of a defect occurring during warranty period, the original purchaser may return the defect unit along with suitable proof of purchase date (i.e. receipt, credit card slip etc.) and a full description of the defect to the Dealer you purchased.

All freight charges incurred for transportation by the dealer or Steed are the purchaser's responsibility.

STEED[®] Instruction Manual

SM-BC Series (Switching Mode)

Fully Automatic Microprocessor Controlled Multi-Stages BATTERY CHARGER with POWER SUPPLY

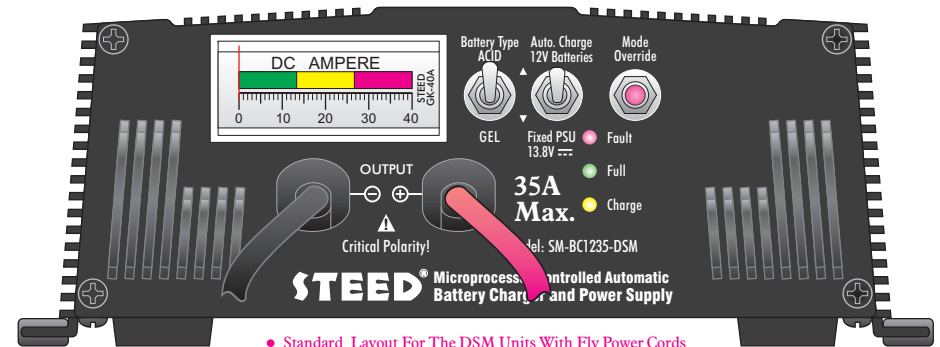


TYPE 1

- Single Output (1 Bank)
- Supplied With Steed Screw Terminals

TYPE 2

- Dual Outputs (2 Banks)
- Supplied With Steed Screw Terminals



• Standard Layout For The DSM Units With Fly Power Cords

TYPE 3

- Single Output (1 Bank)
- Supplied With Fly Power Cords

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File No. SMBC-Prime
 Issue No. Rev. B 0713

Manufactured By:
Steed Magnet Products Ent. Co., Ltd.
 in Taiwan, R.O.C.

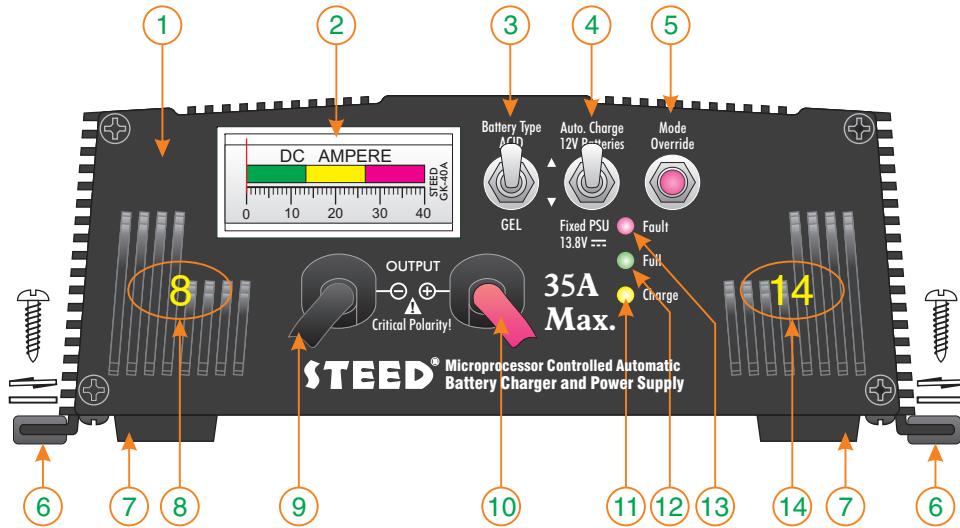
For Distributing By:
Prime-co Pte Ltd.
 in Singapore



Is Really Good, Steed Products!

Available From:
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4) Front Panel Parts Name And Functions



1. Front Panel

2. **Meter** - Displays the DC output current

3. Battery Type Selector -

- **ACID**- For charging liquid Lead Acid batteries
- **GEL** - For charging Gel cell dry batteries

4. Output Function Selector -

- **xxV Batteries** - For charging xxV batteries
- **Fixed PSU xxV** - For xxV DC Power Supply
- Other parts functions designed for charger will be then disabled temporarily when this Function Selector is put at the Fixed PSU, except the Green LED and the DC Ammeter

5. Mode Override -

Momentarily press this Button overrides charge mode direct to the Trickle mode. Press once again change to the Absorption mode and Press again change to the Quick mode and so on, in case it is detected OK for staying at that mode respectively !!

6. Rubber Spacer & Mounting Hardware -

Rubber spacers as factory provided are recommended, so as for having somewhat "elasticity" against vibration especially if it is mounted on the mobile equipments, such as Caravan, RV car or boats etc. See Mounting Assembly Instruction for detail !!

7. Plastic Feet -

Don't Remove Feet In Any Applications !!

The feet's height are so well designed, so as for able to use as a portable Desktop Charger for table protection; Or to mount anywhere else as a fixed Charging Station without the need of to remove the feet, so as for ensuring have an air gap for helping heat dissipations all the time !!

8. Left Front Ventilation Opens -

Very Important, must keep clean all openings & at least 100mm from nearby objects any time !!

9. Output Power Cord - Negative

10. Output Power Cord - Positive

11. Yellow LED - Charge

- Quick Flashes - Quick (Bulk) Charging
- Slow Flashes - Absorption (Slow) Charging

12. Green LED - Full

- On For Initial 5 Sec. - Conditioning
- Slow Flashes - Trickle Charging
- Stay On - Fully Charged and in Storage

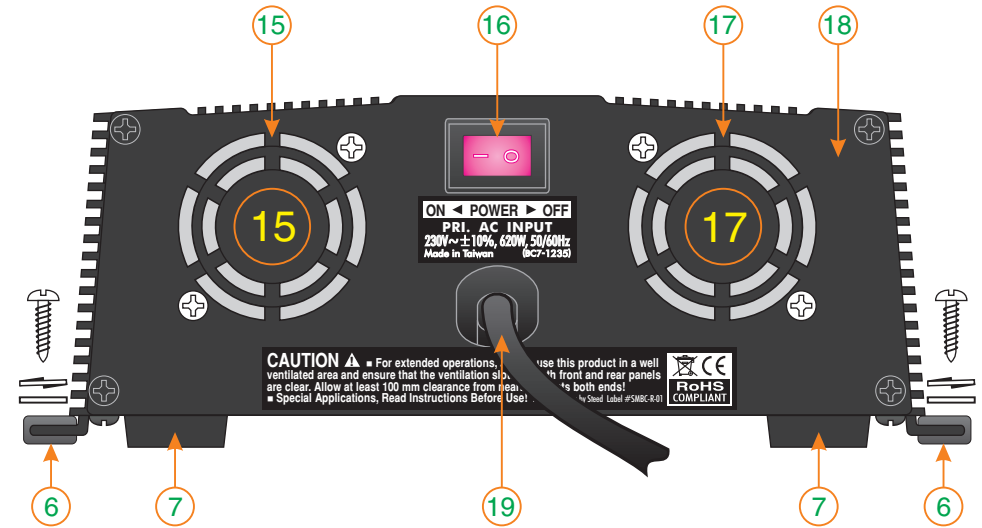
13. Red LED - Fault

- Unable to charge up for 10 Hours, Check Battery or Connections or Retry

14. Right Front Ventilation Opens -

Very Important, must keep clean all openings & at least 100mm from nearby objects any time !!

5) Rear Panel Parts Name And Functions



15. Left Rear Fan and Ventilation Opens -

Very Important, must keep clean all openings & at least 200mm from nearby objects any time !!

16. AC Power Switch

ON / OFF AC Power Switch. Put "I" for turning AC power On; and Put "O" for turning AC power "Off".

6. Rubber Spacer & Mounting Hardware -

Use rubber spacer supplied are recommended, so as for having "elasticity" against vibration especially if it is mounted on the mobile items, such as Caravan, RV car or boats etc. See Mounting Assembly Instruction below for detail.

17. Right Rear Fan and Ventilation Opens -

Very Important, must keep clean all openings & at least 200mm from nearby objects any time !!

18. Rear Panel

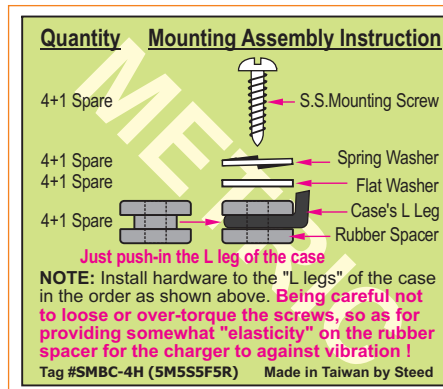
19. AC Power Cord - Critical part !!

Have the damaged cord replaced with same gauge by qualified person immediately !!

6) OPERATION

CAUTION - Read through this manual and Important Notice on the page 7 before use !!

1. Put the AC Power Switch in OFF and make sure the mains voltage are OK for your unit
2. Select the Output Function you want (Charger or Power Supply)
3. Select the Type of the Battery you want to charge (ACID or GEL) if for Charger
3. Completed Output Connections - **CAUTION !! Critical polarity !! Red is for (+), Black is for (-)**
4. Plug AC plug into AC outlet and put the AC Power Switch in On to commence charging !!
5. **Turn Off AC Switch First Before Anything When Your Battery Is Fully Charged !!** Disconnect the AC plug first before battery's !! You may have battery stayed in line if you wish.



3) FUNCTION And OPERATION INSTRUCTION - Continue

4. Output Function Select (Optional on request only)

The **Steed SM-BC** series provided an "Output Function Selector" for:

- xxV Batteries - For servicing as an Auto Charge Mode (A.C.M.) for charging batteries
- Fixed PSU xxV - For servicing as a well regulated, noise free of high quality DC power supply for powering your loads whenever AC source are available during your camping. So as for not to discharge your battery for ensuring that it has good enough power to start your car for home !! Also, for **Stopgap Battery** during it is removed for changing a new one, so as all your important data in your equipments will not lost during battery are absence !!
 - Other parts functions designed for charger will be then disabled temporarily when this Function Selector is put at the Fixed PSU except the Green LED and the DC Ampere Meter

5. Conditioning of Auto Check Function

The **Steed SM-BC** series incorporates innovative Microprocessor system where by it will be going to a quick check and conditioning for around 5 seconds, as soon as it is detected a battery is connected in the output with the signals and actions of:

- Detecting how hungry of the battery by feed it with a small currents for around 5 seconds for assigning suitable mode - You can see, how large current it used to conditioning the battery on the DC Ampere meter while, the LED is still stayed in green as the initial states of "Standby" of AC power is turned On.
- If it is detected as a hungry battery, then charger will switch to the Quick (Bulk) Charging Mode immediately !!
- Or, still staying in the "Standby" mode with green LED without delivering charging power to the output, including if it is detected no battery is connected in the output or the connections are open.

6. Phase 1 - Quick (Bulk) Charge Mode

Immediately on detecting and conditioning are checked OK, it will be switched to the Quick Charge Mode with model's max. currents to commence charging process.

- **Quick flashes the Yellow LED** indicates this Quick (Bulk) Charging is in process
- The Ammeter indicates the charging currents, from it you can see that the **Steed SM-BC** series are really delivering constant of models's max. currents for quick recovering flatted battery in a short of time than other popular chargers !!
- The max. charging time of this Quick Charge Mode is limited for 10 hours.

7. Phase 2 - Absorption (Equiposing) Charge Mode

When the battery is closed to full charge, it becomes pretty warm. The liquid type battery is even in boiling, so the charge currents must be reduced immediately, or the battery will be overcharged and even damaged.

The **Steed SM-BC** series will switch to a small current of "Absorption" (Equiposing) mode automatically when the battery is charged to close to full, so as for avoiding it being overcharged and for the chemical reactions of the battery to be equiposied all cells for best performance !!

- **Slow flashes the Yellow LED** indicates this Absorption (equiposing) mode
- The Ammeter indicates the small charging currents as well
- The max. charging time of this Absorption Charge Mode is limited for 2 hours.

2) FEATURES

1. **Latest Switching technology**, high efficiency, small size, light weight and accepts wide range of AC voltage fluctuations
2. **Steed innovative Microprocessor controlled**, 4 stages smart charging process, maximizing battery performance and extending battery life
3. **Automatic Detecting, Conditioning & Commencing Charge** if it is detected OK !!
4. **Constant Strong Bulk (Quick) Charging Mode, Shortest Charging Time !!**
5. **Automatic Switching to the Absorption (Equiposing) Mode** at the end of charge
6. **Automatic Switching to the Trickle Mode** when battery are closed to fully charged
7. **Automatic Switching to the Storage Mode** when battery are fully charged
8. **Automatic Monitoring Battery Status & Recharges it to Full** during storage
9. **Automatic Thermal Detecting, Trip & Resets** for protecting from overheating
10. **No Damage Automatic Recover Short Circuit Protection !!**
11. **Automatic Recover Current Limit Against Over Currents**
12. **Reverse Battery Polarity Protection** (By DC fuse, inside case)
13. **Colorful Steed Ampere Meter** and 3 LED indicators
14. Optional **Dual Functions** for charging liquid lead acid or Gel cell dry batteries in one
15. Optional **Power Supply** for powering loads or stopgap battery when it is not in line
16. Optional **Remote Control Box** with Mode Override Switch & LED Indicators
17. Optional **Fly Power Cord or Screw Terminals** for output connections
18. Optional **Dual Outputs** with screw terminals
19. Always **Steed high quality**, compact & very good workmanship in every respects !!

3) FUNCTION And OPERATION INSTRUCTION

1. ON/OFF AC Power Switch

It is a rocker switch located at the rear panel for turning On & Off this unit.

2. AC & DC Fuses

There are two system fuses installed on the PCB inside case for safety protections. No output and no any LED is on with the AC Power Switch at ON position should deem one of fuses' trip.

- AC Fuse - Blow AC fuse indicates that service by qualified person is requested !!
- DC Fuse - The DC fuse will blow if you have the output connected to the battery in incorrect (reverse) polarity !!
- Fuse Ratings - Replacing only with the same type and rating as marked on the PCB adjacent to the fuse all fuses !!

3. Battery Type Select (Optional For Dual Function Models Only)

Due to the characteristics between liquid Lead Acid and Gel cell dry type batteries are differed, such as terminal saturation voltage etc. and so, it is requested to select for a correct charger for them.

Steed SM-BC series provides a "Battery Type Selector" for this service where by:

- **ACID** - Is for charging the liquid Lead Acid batteries
- **GEL** - Is for charging the Gel Cell of dry type batteries

STEED[®] Switching Mode SM-BC Series

Fully Automatic Microprocessor Controlled Multi-Stages BATTERY CHARGER & POWER SUPPLY

Dear Customer,

Congratulations for purchasing a most professional and high quality product of **STEED SM-BC** series of **Fully Automatic Microprocessor Controlled Multi-Stages Battery Charger & Power Supply** !!

We understand that "Instruction Manual" makes some pretty dry reading, but this manual contains many important safety instructions, as well as operation, maintenance, transportation and storage etc. information. So for your protection in use this product and identify various product functions, please refer to your product while reading through this manual and save this manual for future immediate reference.

Also, please always have this manual transferred with the product, so as for the new user(s) to be also able to obtain all important information. Thank you!

1) GENERAL DESCRIPTIONS

As you have been aware that there is a shift in the type of batteries used in the mobility aids industry. More and more people are switching from starved lead acid batteries to sealed lead calcium, gel cell of dry fitted maintenance free batteries.

These sealed dry batteries **can't** afford you to feed them with a charging current as high as the initial bulk (quick) charge continuously when they are closed to full charge. Or, it will be aging quickly and or even damaged !! Therefore, to have charger with a function of switching to a small current of "**Trickle Charge**" mode automatically at the end of charge are become very important and a "must be" requirement !!

The **Steed SM-BC** series Battery Chargers are specifically designed for meeting above requirements by utilizing the last microprocessor and switching technologies for a fully automatic detecting and charging process through an optimum of four (4) stages (*rather than popular of only 2 or 3 stages*) providing highest reliability to charge batteries quickly, safely and automatically without the need of your attendance, while maximizing battery performance and extending its life !!

So, the **Steed SM-BC** series are ideally for all battery powered products, especially for the life supporting machine of medical equipments which request higher safety and performance, such as - Ambulance, Wheel-Chairs, etc. !!

Also, for security products or golf car, caravan, boat (*with conformal coating for anti salt humidity are requested*) etc. leisure equipments which are inconvenience to attend on after it is installed, but certainly requested to ensure highest performance all the time!

The **Steed SM-BC** series are also specifically designed for providing an optional, but very useful function of Power Supply output which provide a well regulated, noise free of high quality DC power source for operating all precision electronics within model's rating. Two most practicable applications are that you could use the power supply in lieu of battery to power your loads whenever AC source are available during your camping. So as for not to discharge your battery for ensuring that it has good enough power to start your car for home !! Also, it could be used for **Stopgap Battery** during it is removed for service or changing a new one, so as all your important data in your equipments (computer etc.) will not lost during battery are absence !!

8. Phase 3 - Trickle Charge Mode

As soon as the battery is fully charged, the charging current will be reduced to pretty low indicates that your battery are fully charged successfully !!

- **Slow flashes the Green LED** indicates this Trickle Charge mode
- The Ammeter also indicates this very small trickling current
- Trickle mode may run quickly and going for a long Storage Mode for 20 hours

9. Phase 4 - Storage & Standby Monitoring Mode

As soon as the battery is fully charged, the **Steed SM-BC** series will be going for a Storage Mode and to monitor the battery status for around 20 hours.

- **Green LED Stayed On** indicates that charger is in the Storage and Standby monitoring mode
- The Ammeter are showing almost no current in this mode
- The storage along with trickle time are limited for 20 hours total

10. Auto Recharge Function

After the charger is turned off, i.e., in the Storage and Standby monitoring Mode, if the battery are still stayed on line and for any reason, it is detected that it is hungry again and could taking currents at a certain level, the **Steed SM-BC** series will be then turn on the charger for run another charging cycle from the Quick/bulk Charge mode until it is fully recharged and so on as long as the charging system are on line.

11. Fault Of Battery Performance Diagnosis

Charging time are varied depend on the battery's initial capacity. However, normally, should be completed within 8 hours. So the **Steed SM-BC** series incorporates a battery performance diagnose function for earlier warning of aged or defective battery which are of unable to charge up for 10 hours, whereby the charger will be turned off automatically and lighting a red LED marked "FAULT" to alert you.

This may be just due to that it is a large capacity battery or has been overly discharged and so, unable to charge it to full within 10 hours. So, you may retry to run 2nd. charge cycle simply by turning the AC Power Switch Off and On. If still getting Fault then may be a battery problem. Check battery performance is required.

12. Mode Override Function (Optional on Request Only)

The **Steed SM-BC** series provided a Mode Override function for you to override the Charging Mode you may wish.

Momentarily press the button overrides the charge mode direct to the Trickle mode. Press once again change to the Absorption and press again to the Quick charging mode and so on, in case it is detected OK for staying at that mode respectively !!

13. Auto Reset Thermal Protection

If for any reasons, the charger is become too warm to continue normal operation, the thermal protector built inside will shut down the output for avoiding overheating. All lights will be then extinguished to indicate this overheat trip. It will reset to service automatically when a safe temperature is restored. (*Also, see item 2 of AC & DC Fuses*).

7) IMPORTANT NOTICE

WARNING - Battery is a DC power pack contained high power and with critical polarity. Incorrect polarity could resulting "Spark" and damaging equipment. So, read instructions before installation and keep this manual for further reference !!

8) MAINTENANCE STORAGE AND MOVING

Keep original package for storage and moving. When storing, not subject to prolonged sub-zero temperatures. Extreme cold could cause the insulation of cords to stiff and crack when uncoiled.