

# PAG *|||*™

Professional Broadcast Equipment

## ***Powerman***

7Ah Ni-Cd Battery Packs



Instruction Manual







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## Instruction Manual

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## SECTION 1

# SAFETY

- 1.1** When used correctly, Nickel-Cadmium rechargeable batteries are a rugged, safe, clean and trouble-free method of storing power. Offering high energy densities, the cells do not deteriorate when left in a discharged state, thereby making them ideally suited to applications where reliable portable power is required. However, the user should be aware that incorrect use can present a hazard. In the interest of safety and the protection of our environment, please read and observe the following health and safety information.
- 1.2 General:** Do not put in fire or mutilate - cells may burst or release toxic material. Do not short circuit cells as this may cause burns.
- 1.3 Corrosive Electrolyte:** The electrolyte is a mixture of potassium hydroxide (KOH) and water. This can cause chemical burns to human tissue, should leakage occur. Wear protective gloves when handling all contaminated materials. In the event of contact with the skin, flood copiously with clean water. If significant amounts of KOH are involved, or if any has touched eyes, seek medical attention.
- 1.4 Accidental Short Circuiting:** Nickel-Cadmium cells can deliver power at very high rates. Powerman batteries are protected by suitable fuses at the output connectors, but severe mechanical abuse of a battery could result in damage to cells, and short circuit internal to the battery. Arcing, excessive heat and the liberation of combustible gas could result, with the potential for personal injury or ignition of adjacent flammable materials.
- 1.5 Disposal:** Do not mutilate batteries - corrosive electrolyte will be released (see 1.3 above). Do not incinerate - danger of explosion and release of toxic fumes. Do not dispose of batteries or cells in a charged condition (see 1.4 above). Expired Nickel-Cadmium batteries must be disposed of in accordance with the appropriate regulations or legislation. PAG Ltd. offer a recycling service for expired PAG batteries. These will then be properly and completely recycled. The potentially hazardous materials will be recovered and used again in the production of Nickel-Cadmium cells.

Return batteries by prior arrangement to:

PAG Ltd. 565 Kingston Road, Raynes Park, London SW20 8SA.

Tel: +44 (0)20 8543 3131, Fax: +44 (0)20 8540 4116.

Batteries must be in a discharged state and be clearly marked "FOR RECYCLING".

## SECTION 2

# SPECIFICATION

### 2.1 Model Range:

PAG Powerman batteries are available in four voltages and are fitted with XLR-4 output connectors as standard. The 12V and 13.2V Models are fitted with twin XLR-4 output sockets, wired in parallel. Note: other voltages and output connectors are also available, to special order only.

Model 9339	12V 7Ah
Model 9338	13.2V 7Ah
Model 9342	24V 7Ah
Model 9330	30V 7Ah

**2.2 Cells:** Premium grade Nickel-Cadmium sealed rechargeable cylindrical cells.

**2.3 Voltage:** 10, 11, 20 or 24 cells connected in series, nominal voltage 1.2V per cell.

**2.4 Capacity:** 7 Ampere-hours, measured at the five hour rate.

**2.5 Over Discharge Protection:** All models incorporate the PAG O.D.P. circuit which has been designed to prevent over-discharge of the Powerman battery pack, and thus extend the battery's life. An advance warning light flashes and increases in frequency before the O.D.P. circuit trips.

**2.6 Thermal Protection:** The output socket becomes isolated if cell temperature exceeds 70°C and can be reset when the temperature falls. Re-set by pressing the O.D.P. Re-set button.

**2.7 Short Circuit Protection:** The battery is protected against short circuit and excessive current loads by means of a 20mm cartridge type fuse rated T10A (anti-surge). Spare fuse supplied in additional holder. Fuses retained by means of 1/4 turn bayonet type holders.

**2.8 Output Connector:** XLR-4 connector fitted as standard output connector to all Powerman batteries. Pin connections as follows:

Pin No.	Connection
1	Negative (-)
2	No connection
3	No connection
4	Positive (+)

**2.9 Shoulder Strap:** A detachable shoulder strap is supplied which has provision for length adjustment and includes moulded shoulder pad.

**2.10 Operating Temperature Range:** 0°C to +40°C.

**2.11 Dimensions (H x W x D):**

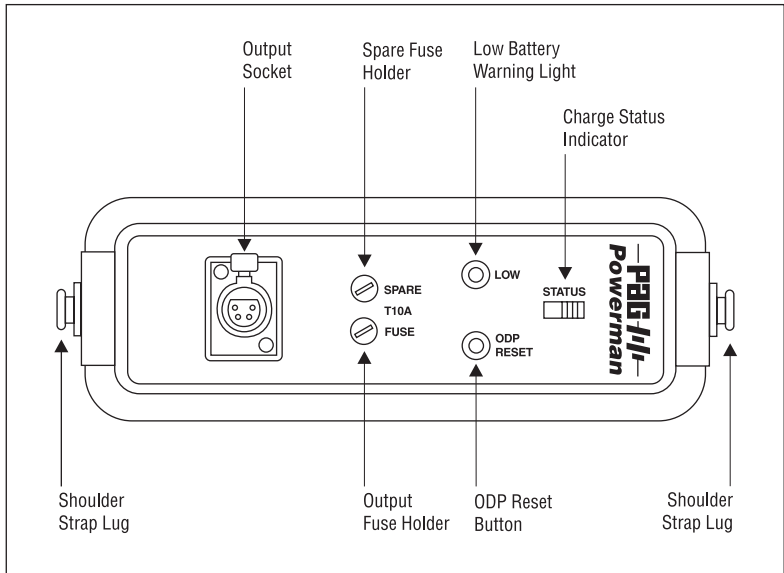
Model 9339	12V 7Ah	166 x 240 x 81mm
Model 9338	13.2V 7Ah	166 x 240 x 81mm
Model 9342	24V 7Ah	257 x 240 x 81mm
Model 9330	30V 7Ah	257 x 240 x 81mm

**2.12 Weight:**

Model 9339	12V 7Ah	4.25kg
Model 9338	13.2V 7Ah	4.5kg
Model 9342	24V 7Ah	6.3kg
Model 9330	30V 7Ah	7.3kg

## SECTION 3

# INSTRUCTIONS FOR USE



### 3.1 OPERATION OF THE O.D.P CIRCUIT

Nickel-Cadmium batteries should not be discharged too deeply. If the voltage of a Powerman battery falls below 75% of its nominal voltage cells may be damaged by voltage reversal, thus shortening the life of the battery. To guard against this, the Powerman battery is provided with an advance warning indicator backed up by an Over Discharge Protection (O.D.P.) circuit which will cut power to the output connector when the battery has reached its maximum discharge state.

Further protection is provided by a thermal cut out circuit which will isolate the output socket should cell temperature exceed 70°C.

A single button is provided to reset these two circuits and is marked O.D.P. reset.

When the battery is to be charged the O.D.P. circuit must be reset if it has been tripped.

If the temperature protection circuit has tripped due to overheating of the cells, the battery must be allowed time to cool (at least 1 hour) and the cause of the heating established before the circuit is reset.

### **3.2 CHARGING INSTRUCTIONS - GENERAL**

The battery must be charged only from constant current chargers. Constant voltage charges (as used for example for charging lead acid batteries) are not suitable for use with Nickel- Cadmium batteries, and may damage them irreparably.

When a battery has been discharged at high current rates it will become warm, and it is advisable to let it cool before recharging it.

The recommended charging temperature range is 0°C to +40°C.

It is recommended that the PAG AR Series of chargers is used exclusively to charge Powerman batteries.

### **3.3 FAST CHARGING**

No other fast-charger provides the close monitoring offered by the PAG ACS fast-charge process, which is essential to maximise the working life of the battery. The PAG 30V AR Series of fast-chargers incorporates PAG ACS, a unique microcomputer-control system that enables these chargers to fast-charge safely any reputable make of Nickel-Cadmium battery pack, whilst extending the working life. PAG AR301 (Model 9763) is a single channel charger and PAG AR304 (Model 9765) is a four channel model.

The Autoranging (AR) facility adapts the charge program to sequentially fast-charge Ni-Cd batteries within the ranges 12V to 31.2V, 1.7Ah to 10Ah. However, 30V AR Series chargers are optimised to fast-charge 24V to 30V battery packs or belts, via front XLR-4 (M) sockets. A 30V 7Ah Powerman will be fast-charged in less than two hours.

Read charger handbook before use.

Ensure that the O.D.P. cut-out is reset by pressing the reset button.

Connect the charger to the battery using the correct lead. This lead must not exceed 0.5m in length. PAG microcomputer-controlled fast-chargers will automatically terminate the charging process when the battery is fully charged. For typical charging times and full operating instructions refer to charger handbook.



## SECTION 4

# CARE & MAINTENANCE

### 4.1 STORAGE

The battery can be stored indefinitely in any state of charge (even totally discharged) without significant loss of cell life.

Maintenance charging is not required during long term storage.

Store in a cool dry place. Ideally the temperature should be from  $-20^{\circ}\text{C}$  to  $+30^{\circ}\text{C}$ . High storage temperatures (above  $+45^{\circ}\text{C}$ ) will reduce the battery's life because of unwanted chemical reactions. Excessively low storage temperatures (below  $-30^{\circ}\text{C}$ ) are also to be avoided since the electrolyte may freeze resulting in permanent cell damage.

After prolonged storage do not fast charge the battery immediately. The cells should first be re-formed and balanced by giving the battery a slow (C/10) charge for 24 hours. When the battery is subsequently put into service, 2 or 3 cycles of charge and discharge may be required to return the battery to its maximum available capacity.

The battery should be in a fully charged state before use. Even after one week in storage it is advisable to give the battery a top up charge before use.

4.2 Use only the recommended chargers.

4.3 For maximum output use within the temperature range  $0^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ . Never operate outside of the temperature range  $-20^{\circ}\text{C}$  to  $+45^{\circ}\text{C}$ .

4.4 Do not immerse the battery in water. Should this happen drain all excess water and return it immediately to the PAG Service Department for maintenance.

4.5. The battery output is protected by means of a 20mm cartridge type fuse rated T10A (antisurge). If the output is overloaded, the fuse will become open circuit and should be replaced with the spare fuse supplied AFTER THE CAUSE OF OVERLOAD HAS BEEN ESTABLISHED. This could be caused by a fault with the cables, the equipment powered by the battery the connectors or a fault internal to the battery. Never use a fuse of a higher rating than that recommended.

NOTE: The spare fuse should be replaced as soon as possible with one of the correct rating.

- 4.6** Nickel-Cadmium cells must never be replaced indiscriminately. All cells used by PAG are carefully graded and matched because battery performance is only as good as the worst cell. Fitting unmatched cells will quickly result in battery failure. In order to maintain the quality standard for which you first chose this product return to a PAG Dealer or the PAG Service Department for servicing.



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