HAMMER™

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ACE RANGE MANUAL

THE *HAMMER ACE* ENERGIZER CONCEPT

The *HAMMER ACE* range of energizers is the newest and state of the art multi-function energizer to join the *HAMMER* range. This compact and easy to use energizer is controlled either by the on board keyswitch or by an optional LED or LCD keypad or by a remote keyswitch or remote control. The unit is operated by a fully programmable microprocessor.
These units big advantage in the market is the incorporation of mostly all the add-ons available to suit the needs of customers. The unit also boasts earth line monitoring as well as a simple and easy adjustable voltage and joules method, which can be done via the keypads or on the unit itself. The optional keypads are also fully programmable.

The idea behind the new *HAMMER ACE* range is to make it as user friendly as possible with simple but useful ways to set it up to your desired needs. The new Switch Mode Power Supply and 10 stage adjustable output joules are just a couple of those examples.

OPTIONAL EXTRAS

LED KEYPAD

LCD KEYPAD

REMOTE RECEIVER

THE HAMMER ACE RANGE OF ELECTRIC FENCE SECURITY ENERGIZERS CONTENTS:

ENERGIZER	ACE 100	ACE 200
FENCE ZONES	1	1
MAXIMUM OUTPUT VOLTAGE NO LOAD	9 KV	9KV
MAXIMUM ENERGY OUTPUT AT 500 OHMS	5 JOULES	8 JOULES
MAXIMUM STORED ENERGY	8 JOULES	15 JOULES
STANDBY BATTERY	7 AH	7 AH
STANDBY BATTERY TIME	12 HRS	12 HRS
FUSE TO PREVENT BATTERY SHORTING OR REVERSING	2 A	2 A
POWER CONSUMPTION	30 W MAXIMUM	30 W MAXIMUM
VISUAL POWER FAIL INDICATION	√	√
MONOTORING HV RETURN VOLTAGE	√	√
MONOTORING EARTH RETURN	√	√
DETECTION DELAY WITHOUT USING A KEYPAD	3-4 SECONDS	3-4 SECONDS
DETECTION DELAY WHEN USING A KEYPAD	1-240 SEC WHEN USING THE	1-240 SEC WHEN USING THE
AUXILIARY CONTACT ALARM MONITOR (E.G. GATE)	KEYPAD	KEYPAD
ARMED RESPONSE CONNECTION AND RELAY	√	√
REMOTE ON/OFF CONNECTION	√	√
LED ALARM INDICATION	√	√
LED BAR GRAPH VOLTAGE INDICATION	√	√
LED MAINS AND BATTERY INDICATION	√	√
SIREN DRIVER REALY	15 W 0-3 MIN/ PROGRAMMABLE WITH KEYPAD	15 W 0-3 MIN/ PROGRAMMABLE WITH KEYPAD
STROBE/FLASHING LIGHT DRIVER RELAY	15 W LATCHED TILL RESET	15 W LATCHED TILL RESET
DECREASED POWER SETTINGS VIA LINK	√	√
LCD DISPLAY	WHEN USING LCD KEYPAD	WHEN USING LCD KEYPAD

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SPECIFICATIONS

SPECIFICATIONS

SWITCH MODE POWER SUPPLY	
BUILT IN BATTERY CHARGER	13.8 V DC
MAINS POWER NEEDED	220 V AC
BUILT IN SURGE SUPPRESION	√
BUILT IN LIGHTNING PROTECTING	√
POWER ON INDICATION LED	√

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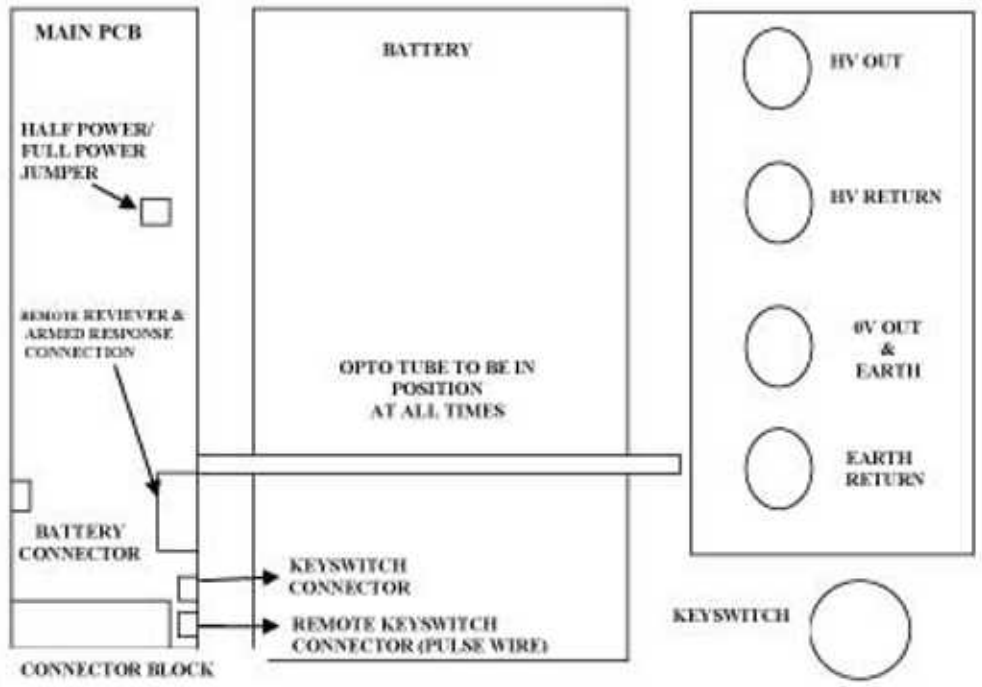
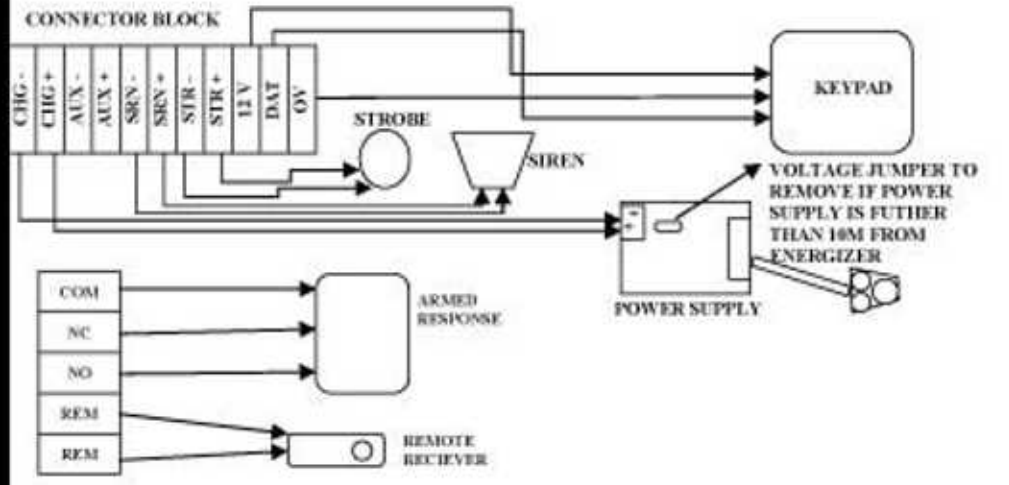
THE HAMMER ACE FEATURES:

- **MICROPROCESSOR CONTROL**
  - Gives the unit unique versatility
  - Adjustable voltage and output
  - Controlled pulsing
- **EARTH LINE MONITORING**
- **DEDICATED ARMED RESPONSE RELAY**
- **REMOTE ON/OFF CONNECTION**
- **2,5 JOULE OR 5 JOULE MOVABLE HV OUTPUT LINK ON 5 JOULE UNIT**
- **4 JOULE OR 8 JOULE MOVABLE HV OUTPUT LINK ON 8 JOULE UNIT**
  - Enables HV output control e.g. in the case of arching the output can be changed to avoid it. This can be done with or without a keypad.
- **10 LEVEL JOULE AND HV OUTPUT SETTINGS**
  - This feature is only accessible when using the optional LED or LCD keypad
- **LED KEYPAD, LCD KEYPAD, KEYSWITCH OPERATED, REMOTE ON/OFF**
- **OPTIONAL LED CODE KEYPAD**
  - Controls the energizer from a remote location up to 100m away
  - System information display by dedicated LEDs
  - Pin code user identification
  - Programmable settings
  - 10 level joule output settings
  - Multiple keypads can be used on one energizer
- **OPTIONAL LCD CODE KEYPAD**
  - Battery low settable chime
  - Controls the energizer from a remote location up to 100m away
  - System default settings
  - System information display on a lit up LCD screen
  - User friendly scroll-down set up menu
  - Pin code user identification
  - HV return read out
  - Programmable settings
  - 10 level Joule output settings
  - Multiple keypads can be used on one energizer
- **OPTIONAL REMOTE KEYSWITCH**
  - Simple on/off and reset to control the energizer from a remote location
  - System information display by dedicated LEDS
- **SWITCH MODE POWER SUPPLY**
  - Ensures that the energizer is "safe" meaning there is no 220v on the energizer itself.
  - Power-on indication LED
  - Link for increased voltage in the case where the energizer is more than 10 m away.
  - Stops all fluctuations in mains power and has built in surge suppression

FEATURES


MAIN PCB
HALF POWER/
FULL POWER
JUMPER
REMOTE REVIEVER &
ARMED RESPONSE
CONNECTION
BATTERY
CONNECTOR
CONNECTOR BLOCK
BATTERY
OPTO TUBE TO BE IN
POSITION
AT ALL TIMES
KEYSWITCH
CONNECTOR
REMOTE KEYSWITCH
CONNECTOR (PULSE WIRE)
HV OUT
HV RETURN
0V OUT
&
EARTH
EARTH
RETURN
KEYSWITCH


CONNECTOR BLOCK
CHG -
CHG +
AUX -
AUX +
SRV -
SRV +
STR -
STR +
12 V
DAT
0V
KEYPAD
STROBE
SIREN
VOLTAGE JUMPER TO
REMOVE IF POWER
SUPPLY IS FUTHER
THAN 10M FROM
ENERGIZER
POWER SUPPLY
COM
NC
NO
REM
REM
ARMED
RESPONSE
REMOTE
RECIEVER

INSTALLATION PROCEDURE:

1. MOUNTING THE ENERGIZER

There are two mounting holes at the top of the energizer and one at the bottom
Mounting the energizer is also hassle free because the cover doesn't need to be removed.

2. MOUNTING THE MAINS TRANSFORMER

There are two mounting holes on the outside of the enclosure.

3. MOUNTING THE KEYPAD

The keypad can be mounted up to a 100 m away from the energizer. The keypad has two keyhole mounting holes at the back. The cable between the keypad and the energizer must be a 0.5mm **FOIL SCREEN CABLE**. The shield must be wired into the OV terminal on the energizer side but not on the keypad side. Up to six keypads can be connected up in parallel.
One keypad must be configured as the master keypad by inserting the jumper on the two pins at the back of the keypad. If there is a communication problem between the keypad and the energizer 3 LED's on the LED keypad will flash in the bottom row (One on the left , one in the middle and one to the right) and on the LCD keypad it will read ***SYSTEM FAULT***. On the energizer the comms LED will not be on. Pressing the reset button on the back can reset the keypad.

4.TESTING THE ENERGIZER

Connect up the 12 V battery connector on PC board, which was left disconnected by the factory for transport. The mains/battery LED at the energizer should be on as well as the LED on the power supply. Place a wire link between the black OV terminals and the HV out and HV return terminals individually. Turn the energizer on by turning the key or when using a keypad type in 22220 (Refer to keypad operation section 4). The energizer will start pulsing and all the LED s on the bar graph of the energizer should pulse (When using a LED keypad all the LEDs on the bar graph should pulse and when using a LCD keypad it should indicate a return voltage of more than 7 KV)

5.TESTING THE SIREN ETC

Refer to the diagram on page 7 and 8

6.CONNECTING THE FENCE

Ensure the energizer is switched off and not pulsing. Connect the fence high voltage feed and return cables to the two red high voltage terminals on the right as indicated. Connect the fence OV (earth) feed and return cable to the two black terminals on the left, if earth line monitoring is being used. (Refer to the diagram on page) In the case where earth line monitoring is not being used then do not remove the wire link between the two black terminals and connect the earth wire on either black terminal. The energizer earth must be grounded as close possible to the energizer by means of three earth spikes 1.2 m long, driven into the ground in a crow foot layout as proposed by new governing law. Furthermore earth spikes along the fence at distances of 30m apart are recommended.

N.B. Fence droppers or mild steel bar, which will rust, are not sufficiently effective to provide acceptable earthing.

7.TESTING THE FENCE

Turn the energizer on. The bar graph on the energizer and on the LED keypad, if you are using one, should pulse fully, meaning all the bar graph LEDs should turn on. If you are using a LCD keypad the return voltage displayed should be more than 7 KV and the bar graph on the energizer should pulse all the way. If the bar graph LEDs do not illuminate, only a couple light up, the return voltage on the LCD keypad display is low or zero or the fence alarm triggers - there is a short on the fence or an open circuit on the fence. Once you have cleared the fence and there is full bar graph on the energizer and LED keypad. On the LCD keypad you should have a healthy return voltage of more than 7 KV. Short the fence at various points to trigger the alarm. If the alarm does not trigger reset the fence alarm delay time or increase the alarm trigger voltage.

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KEYPAD OPERATION:

The keypad allows the user to have complete secure control of the energizer on a neat, small keypad at a location of up to 100m from the energizer such as a bedroom, without having to have the large energizer box and ticking noise in the room. The energizer can be installed in a garage or location close to the fence while the keypad can be positioned at an easily accessible place.

1. LED KEYPAD

1.1 FUNCTION

The specific system information e.g. mains power, energizer on/off, fence alarm, auxiliary alarm, fence voltage etc. are displayed by dedicated LED s on the keypad. PIN code user identification on the keypad prevents unauthorized operation. All operations must be preceded by entering a valid user PIN code. There are 3 different 4-digit PIN codes. When the correct code is entered the buzzer will emit 3 long beeps. If the code is incorrect it will emit 2 short beeps.

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1.2 LED DISPLAY

LED DISPLAY - TOP ROW

LED STATUS	LED 1	LED2	LED3	LED4
ON	Mains power good, battery power good	Energizer Armed	Fence Alarm Active	Aux Alarm Active
OFF	Mains power off, Battery low	Energizer Disarmed	Fence Alarm deactivated	Aux Alarm deactivated
FLASHING	Mains power off, Battery good	LED will never Flash	Fence alarm triggered. Stops flashing when fault has been removed and system reset	Aux Alarm triggered. Stops flashing when fault has been removed or reset.

LED DISPLAY - BOTTOM ROW

LED 1-7	Fence voltage bar graph, each LED represents 1000 V. i.e. If 1-6 were illuminated it indicates that there is in excess 7000 V at the end of the fence.

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1.3 PIN CODE LEVELS FOR LED KEYPAD

SUB MENU	VALUE	DESCRIPTION	DEFAULT
01	NEW PIN L1	CHANGE PIN CODE LEVEL 1. ENTER NEW NUMBER TWICE. 4 DIGITS	1111
02	NEW PIN L2	CHANGE PIN CODE LEVEL 2. ENTER NEW NUMBER TWICE. 4 DIGITS	2222
03	NEW PIN L3	CHANGE PIN CODE LEVEL 3. ENTER NEW NUMBER TWICE. 4 DIGITS	3333
04	0-9	FENCE ALARM VOLTAGE TRIGGER LEVEL (x1000V). 1 DIGIT	2
05	001-240	AUXILARY ALARM TRIGER DELAY IN SECONDS. 3 DIGITS.	001
06	001-240	FENCE ALARM TRIGGER DELAY IN SECONDS. 3 DIGITS.	004
07	001-240	SIREN TIME OUT IN SECONDS. 3 DIGITS.	180
08	0-9	JOULE OUTPUT VAIRABLE SETTINGS. 1 DIGIT.	9

Examples of PIN code settings

- Example 1- To change PIN code level 1
  - Enter PIN level 3 (default 3333)- keypad will beep once
  - Enter 01- keypad will beep once
  - Enter new four digit PIN- keypad will beep once
  - Enter new four digit PIN again- Keypad will beep two long beeps if accepted.
  - If the two entries do not match or the number is already in use the keypad will give four short beeps.
  - Keypad returns to normal

- Example 2- To change Auxiliary alarm delay to 30 seconds
  - Enter PIN level 3 (default 3333) –keypad will beep once
  - Enter 05- Keypad will beep once
  - Enter 030- Keypad will beep twice
  - Keypad will return to normal

2. LCD KEYPAD

1.1 FUNCTION

The specific system information e.g. mains power, energizer on/off, fence alarm, auxiliary alarm, fence voltage etc. are displayed on the LCD screen. PIN code user identification on the keypad prevents unauthorized operation. All operations must be preceded by entering a valid user PIN code. There are 3 different 4-digit PIN codes. When the correct code is entered the buzzer will emit 3 long beeps. If the code is incorrect it will emit 2 short beeps. When entering the setup of the keypad the energizer has to be turned off. To enter the setup it is 3333.

1.2 LCD DISPLAY

LCD READ OUT	DESCRIPTION
ENERGIZER OFF	THE UNIT IS TURNED OFF
SYSTEM ON FENCE + AUX. ARMED	ENERGIZER ARMED AND NO ALARMS ARE BYPASSED
SYSTEM ON AUX ONLY ARMED	ENERGIZER ARMED AND FENCE ALARM IS BYPASSED
SYSTEM ON FENCE ONLY ARMED	ENERGIZER ARMED AND AUX ALARM IS BYPASSED
SYSTEM ON ALL ALARMS OFF	ENERGIZER ARMED BUT ALL ALARMS ARE BYPASSED
FENCE ALARM	FENCE ALARM TRIGGERED
AUX ALARM	AUX ALARM TRIGGERED
SYSTEM FAULT	KEYPAD NOT CONNECTED PROPERLY. CHECK CONNECTION
MAINS FAIL	WILL FLASH EVERY 10 SEC. WITH CHIME BUZZER WHEN THE MAINS FAILED. (CHIME CAN BE SWITCHED OFF)

1.3 PIN CODE LEVELS

SUB MENU	VALUE	DESCRIPTION	DEFAULT
01	YES/NO	DEFAULT ENERGIZER SETTINGS	
02	0-3min	AUXILARY ALARM TRIGER DELAY	5 sec
03	0-3min	FENCE ALARM TRIGGER DELAY	3 sec
04	0-3min	SIREN TIME OUT	
05	600V-5600V	FENCE ALARM VOLTAGE TRIGGER LEVEL	2200V
06	2.4J - 5.1J	OUTPUT JOULES	5.1J
07	NEW PIN L1	CHANGE PIN CODE LEVEL 1. ENTER NEW NUMBER TWICE. 4 DIGITS	1111
08	NEW PIN L2	CHANGE PIN CODE LEVEL 2. ENTER NEW NUMBER TWICE. 4 DIGITS	2222
09	NEW PIN L3	CHANGE PIN CODE LEVEL 3. ENTER NEW NUMBER TWICE. 4 DIGITS	3333
10	On/Off	TURNING THE CHIME ON OR OFF FOR MAINS FAIL	ON

3. PIN CODE LEVELS

PIN code user identification on the keypad prevents unauthorized operations. All operations must be preceded by entering a valid user PIN code. There are 3-different 4 digit PIN codes. When the correct code is entered the buzzer will emit two long beeps. If the code is incorrect it will emit four short beeps.

- **PIN code level 1** (default **1111**- low level user code)
  - To reset the energizer enter the four digit code (1111)
  - The system cannot be turned off with this code.

This code is ideal to give to staff members or guards. If the alarm is activated, the person entering this code will only be able to reset the alarm. However the energizer will not switch off so the fence will stay active. As soon as the alarm is triggered, the signal will be sent and the siren and strobe will be activated- if they are connected. The person using this code, in resetting the alarm, will switch the siren and strobe off, thereby preventing further noise pollution.

- **PIN code level 2** (default **2222**- owner code)
  - To turn the system on, enter the four digit code (2222) plus one of the following digits:
    - 0 - Nothing bypassed (Full operation)
    - 1 - Fence alarm bypassed (Energizer function only)
    - 2 - Auxiliary alarm bypassed
    - 3 - Fence and auxiliary alarm bypassed
  - To reset the alarm enter the four digit code (2222)
  - To switch the system off enter the four digit code (2222)

This code gives the user full control over normal operation of the unit.

- **PIN code level 3** (default **3333**- installer/programming code)

NB - To enter the set up the energizer must be switched off
This code is used to enter the programming menu. The user is able to make the changes to the PIN codes in level 1 and 2 and change the default factory settings of the energizer to suite the fence conditions. Any and all changes are stored in memory so a loss of power will not affect changes made.

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S.A. STANDARD REQUIREMENTS FOR ELECTRIC FENCES

The *HAMMER* energizers has been extensively tested and certified in accordance with international standards. *HAMMER* does not take responsibility for the erection standards of the fence. It is the responsibility of the erector to consult and comply with the S.A. Standards and Code of Practice for the installation and erection of electric security fences. For the user's convenience we include the S.A. Standard Requirements here but the installer also needs to consult SA Standards The construction of electric fences and SABS 1063, 0142, SABS IEC 60335-2-76. These are available from the S.A. Bureau of Standards.

1. DEFINITION

Physical barrier

- A barrier of height not less than 1.5 m and intended to prevent inadvertent contact of persons with the conductors of the electric fence.
- NOTE: Physical barriers are typically constructed from vertical sheeting, rigid vertical bars, rigid mesh or rods of chain wire mesh.

Public access area

- Any area where persons are protected from inadvertent contact with pulsed conductors by a physical barrier (see above)

Pulsed conductors

- Conductors that are subject to high voltage pulses by the energizer

Secure area

- An area where a person is not separated by a physical barrier (see above) from pulsed conductors (see above) below 1.5m

2. INSTALLATION, OPERATION AND MAINTANANCE

- Electric security fences and their ancillary equipment shall be installed, operated and maintained in a way that minimizes danger to persons and reduces the risk of people receiving an electrical shock unless they attempt to penetrate the physical barrier, or are unauthorized to be ion a secure area.

- A space of 2.5m shall be maintained between uninsulated electric fence conductors or uninsulated connecting leads that are supplied from different energizers. This space can be less where the conductors or connecting leads are covered by insulating sleeving, or consists of insulated cables that are rated to at least 10 KV.

- The requirements above do not apply in the case where the separately energized conductors are separated by a physical barrier that has no openings greater than 50mm.

- A vertical separation of not less than 2m shall be maintained between pulsed conductors fed from different energizers.

- Mains supply wiring shall not be installed in the same conduit as signalling leads associated with the electric security fence installation, but shall be installed in accordance with the requirement given in SABS 0142.
  N.B. Fence HT leads must under no circumstances be rooted in the same conduit as any other wiring

3. WARNING SIGNS

- Electric security fences shall be identified by prominently placed warning signs that shall be legible from the secure area and from the public area.

- Each side of the electric security fence will have at least one warning sign.

- A warning sign shall be placed:
  - At each gate
  - At each access point
  - At intervals not exceeding 10m
  - Adjacent to each sign with regards to chemical hazards, for emergency services information.

4. GATES

- Gates in electric security fences shall be capable of being opened without the person operating the gate being shocked.

5. EARTHING

- Where an electric security fence passes below bare power line conductors, the highest metallic element shall be effectively earthed from a distance of not less than 5m on either side of the crossing point.
- The distance between any electric fence earth electrode and other earth systems shall not be less than 10m, except when the earth system is associated with a graded earth mat. The earth electrode shall comply with SABS 1063. Amendment 1, Deco 2000 1.
- All exposed conductive parts of the physical barrier shall be effectively earthed.

6. PROTECTION

- All ancillary equipment connected to the fence circuit shall be designed to provide a degree of isolation between a fence circuit and the supply mains equivalent to that specified for the energizer.
- Protection from weather shall be provided for the ancillary equipment unless the equipment is certified by the manufacturer as being suitable for use outdoors, and is of a type with a minimum degree of protection IPX4 (protection against splashing water)

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WARRANTY

ALL ***HAMMER*** PRODUCTS CARRY A ONE YEAR WARRANTY AGAINTS DEFECTIVE COMPONENTS AND WORKMANSHIP. THIS WARRANTY EXCLUDES DAMAGE CAUSED BY ACTS OF NATURE SUCH AS LIGHTNING OR FLOODING, POWER SURGES, ROUGH HANDELING OR MALICIOUS ACTS. IN ORDER FOR A PRODUCT TO FALL UNDER WARRANTY, THE PRODUCT MUST BE RETURNED TO THE HAMMER FACTORY IN THE ORIGINAL STATE IT WAS MUNUFACTUERED IN.

PRODUCT PURCHASED: .....
SERIAL NUMBER: .....
DATE PURCHASED: .....
INVOICE NUMBER: .....
CUSTOMER NAME: .....
TEL NO.: .....