Z114 HI POWER SECURITY ENERGIZER

Installation and User Manual

Edition 1, 2014

JVA Z Energizer Range Concept

Thank you for choosing our product. The JVA brand is a range of electric fencing products carefully selected from leading manufacturers around the world to meet the needs of perimeter security.

THE JVA Z RANGE ENERGIZER CONCEPT

The JVA Range of Energizers has been collaboratively designed and manufactured by an international team with over 30 years of electric fence experience earned in some of the most testing security environments in the world. It aims to provide the very best low-cost, high-voltage security energizers in the world. They are compact, integrated and fully programmable electric fence energizers with built-in alarm units and LCD *out* and *return* voltage display. They also have the option of being controlled from a remote LCD keypad.

State-of-the-art energizer design IP4 x and ABS plastic

Unique LCD display depicting fence out and return voltage

New JVA Anrdoid keypad – example of one of the many information screens. Details available from nearest Stafix branch.

Unique LCD keypad option depicting fence and alarm condition

Wall-mountable, robust energizer housing with easily detachable PCB chassis for ease of installation and repair

TWO-YEAR WARRANTY

products carry a 2-year warranty against defective components workmanship. The warranty excludes damage caused by acts of Nature such as lightning or flooding, power supply surges, rough handling, malicious action or incorrect wiring.

Please retain your invoice as proof of purchase and fill in the warranty form on page 44.

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1. INTRODUCTION

Thank you for purchasing a JVA security electric fence energizer. The growing use of non-lethal electric security fences around the world is indicative of the confidence security professionals are placing in this form of perimeter security. The reason for this popularity is simple – monitored electric security fences are effective and they reduce false alarms when compared to other technologies.

DEMARCATION The JVA electric fence around your property shows you mean business.

DEFLECTION Intruders are deflected to softer targets.

DETERRENCE The safe, powerful JVA shock is a strong deterrent to intruders.

DELAY The barrier will help delay an intruder, giving you more time to react.

DETECTION The JVA's voltage monitor warns you of any tampering with the fence.

DEPENDABLE 60 seconds a minute, 60 minutes an hour, 24 hours a day, 365 days a year, your JVA electric security fence is monitored by an alert, sober, electronic watchman.

Once every second the JVA Z114 energizer produces a very short-duration, safe, high-voltage pulse and sends it down the fence live wires. The JVA Z114 then monitors the voltage at the end of this live wire, checking that the voltage is being maintained along the entire fence line. In the event of a voltage drop caused by shorting, cutting or poor fence maintenance, the monitor will trigger an alarm, alerting you to the problem.

Designed and manufactured to meet the most stringent international safety standards, the JVA Z114 is in a class of its own when it comes to features and benefits at an affordable price.

An electric fence system which meets current safety regulations

2. FEATURES AND BENEFITS

• Australian designed and manufactured	▶	High reliability and great service
• Programmable Options	▶	Customise the energizer to unique fence conditions
• Wall-mountable, robust Enclosure with easily detachable PCB Chassis	▶	Ease of installation and repair
• Inbuilt LCD Voltage Display and Status Lights	▶	See fence conditions at a glance
• Internal 7Ah 12V Rechargeable Battery	▶	Ensure continued operation of your security electric fence in the event of a mains power failure
• Optional LCD Keypad	▶	Ease of control and display of fence voltages
• Optional PC and Internet Connections	▶	Integration with security information management systems
• Low Power Mode	▶	Detection together with reduced voltage for during the day
• Switched +12V Outputs for Siren and Strobe	▶	Local audible and visual indication alerting user to breach of security
• Earth Monitor Input	▶	Ensures that all the wires on the fence are monitored continually
• Enclosed Fence Terminals	▶	Tamper resistant and prevents accidental contact with high voltage

2.1 More Features

- Meets Safety and EMC standards (reports available on request)
- Powerful 14 joules peak output energy
- High and Low Power Mode
- Built-in Charger and space for a 12V 7.2aH Backup Battery
- Alarms on fence short or open circuit
- Control and programming via LCD Keypad
- Monitor via PC (using Perimeter Patrol software)
- Internal beeper
- AC fail, Low Battery and Bad Battery Detection
- Large number of Keypad Programmable Options
- Adjustable fence voltage level
- Can be configured as Conventional OR Bi-Polar
- Two Control Inputs which can be configured to take NO or NC contacts
- Two 12V driven Outputs (also referred to as Relays)

3. SPECIFICATIONS

Specification Name	Specification
Energizer Output Voltage	9.5kV peak no load
Peak Output Energy	14 Joules at 200 Ohms
Pulse Rate	Locked at 0.8 Hz
12v DC Power Consumption	Energizer On – 1.40A Average, 2.0A peak Energizer Off – 28mA (40mA with keypad) Not including keypad or auxiliary power
AC Power Input	16-18Vac 35W
Battery Charger Output	Float voltage 14V, 1.1A, short circuit and reverse polarity protection
Siren and Strobe Outputs	Self-resetting fuse protection, switched 12V, rated at 30W (combined)
Enclosure	IP4x ABS plastic
Size	303mm (H) x 223mm (W) x 122mm (D)
Weight – packed, no battery	3.1 kg

- There are no user-serviceable parts in this unit.
- The installer is reminded that high voltages are retained for a while after switching off, and to wait for at least 10 minutes before opening the case.
- Before working on the high voltage wiring of an electric fence, it is recommended that the energizer be turned off and an intentional short circuit be placed from the fence live wires to earth. This is a precaustion against the energizer being turned on by others while work on the fence is in progress.

4. DESCRIPTION

4.1 JVA Z114 – Exterior

4.2 Front Panel Status Lights

POWER	On whenever the unit has power
ARMED	On when the unit is armed (pulsing), will flash when in Low Voltage Mode
FENCE	Red when there is a fence alarm
GATE	On when there is a gate alarm
STATUS	The number of times the Status Light flashes indicates the status of the energizer. See the table in section 6.2 – Status Codes.

4.3 Front Panel LCD Display

The display on the JVA Z114 shows the voltage at the fence and return terminals. The left is the return and the right is the feed voltage. Arrows at the top of the display indicate that the Energizer is in Conventional Mode. When configured for Bi-Polar operation the left side is the positive Return Voltage and the right is the negative Return Voltage.

The LCD also shows the programming option and current setting when in programming Mode. This allows the programming options settings to be checked easily.

4.4 Inputs and Outputs

See Section 6.

4.5 Status Codes

See Section 6.2.

4.6 Keypad (Optional)

A keypad can be used to remotely monitor and control the Z114. It is also used to set the programmable options for installer programming options, see Section 8.

4.7 Z Series Models

Z11 Single Zone, conventional 1.5 Joule

Z13 Single Zone, conventional 2.8 Joule

Z14 Single Zone, conventional or Bi-Polar 4 Joule

Z14R Z14 with relays and IR Tamper circuit

Z18 Single Zone, conventional or Bi-Polar 8 Joule, contains relays and IR Tamper circuit

Z114 Single Zone, conventional or Bi-Polar 14 Joule

Z28 Dual Zone, conventional 8 Joule (4 Joules per zone)

ZM1 Single zone start of fence monitor with Distant Fault Detection™

ZM20 Twenty sector loop monitor

NOTE: A Z114 configured for Bi-polar may be referred to as a Z114A.

4.8 Keypad (Optional)

The Z series LCD keypad allows for easy remote control of your JVA energizer. Arming and disarming, responding to alarms or just checking the fence voltage: the LCD keypad makes this easy through a simple menu system or key sequences (shortcuts). Your security is protected by a user PIN number.

A keypad is also required to program the programmable options, see Section 7.

For information on how to control the Z114 via the keypad, see Section 8.1.1.

4.9 Internal Beeper/Keypad Beeper

Depending on the chime setting, the internal beeper and keypad beeper will sound when there is a fence alarm, a gate alarm, a door chime or a general alarm. Should the battery voltage run low, the keypad will beep 4 times before the energizer automatically enters Low Power Mode to preserve the battery.

4.10 Programmable Options

The Z114 has many programmable options. These are also known as *Setup Parameters*. To alter these options, a keypad must be used. The options are explained in Section 7.6. Each parameter has a factory set default.

4.11 Arm Input (control input 1) and Key Switch

The JVA Z series energizer can be armed (to energize the fence) by closing a contact wired into the arm input. On some Models a key switch is fitted to the right-hand side of the case for this purpose.

An external switch device, for example a remote receiver or access control keypad, can also be wired into the energizer to arm and disarm the unit.

4.12 Gate Input (control input 2)

The gate input may be wired to a gate switch to trigger an alarm when a gate is opened. Alternatively, it may be programmed as a control input for Low Power Mode. This is determined by the programmable option settings.

It is also possible to arm the gate alarm only. See Section 7.6.12 for details.

4.13 Low Power Mode

Z114 energizers can be switched into Low Power Mode. Low Power Mode may be used in situations where the fence is not required to be a deterrent but is still required to actively detect intrusion. In Low Power Mode the fence live wires operate at a much lower voltage, typically 500V peak. See Section 8.1.1 for details on using the keypad to set Low Voltage Mode.

4.14 Group Simultaneous Pulse Feature

In some installations it may be preferable to provide the ability to link multiple units into a group. When linked, the individual Z series energizers become a Group. As many as fifteen energizers can be grouped. Individual units in a Group have simultaneous high voltage output pulses and act as if they are one energizer with multiple outputs. This is designed so that no possible combination of individual outputs can be dangerous.

4.15 Remote Control Unit (Optional)

The Remote Control Unit provides the Z114 with the ability to arm or disarm the energizer via a compact key chain fob remote control. If using the remote control the siren can be used to acknowledge arming with 1 beep and disarm with 2 beeps. See Programming Option 7.6.13.

The remote controls have a range of up to 100 metres.

They come fitted with a LR27A 12V battery that will provide up to 2 years' service.

4.16 Cabling

High Voltage Cabling (Fence Feed and Returns) should be run using suitably rated cable. Double insulated electric fence "underground" cable is suitable. High Voltage Cables must never be run within the same conduit as Low Voltage Cables. A minimum distance of 30mm should be kept between High Voltage and Low Voltage Cables.

To maintain the IPx4 rating of the enclosure and to ensure moisture does not enter the enclosure via the cable entry area, a silicon sealant (neutral cure) must be used to seal all the cable passages.

4.17 Lightning Protection

Although the Z114 contains internal lightning protection elements, external lightning protection elements, such as additional external lightning protection kits, are recommended to further reduce lightning damage and thus reduce repair costs. They are available from your local dealer.

4.18 Earth Loop Monitoring

The Z114 has two fence earth terminals. If the earth monitoring facility is not required, the Earth Out and Earth Return terminals must be joined with a wire bridge. See Section 5.3 for directions on how to wire for earth loop monitoring.

4.19 Noise and Interference

The Z114 contains a microprocessor. Extreme electrical noise can upset micro-processors. The most likely cause of such noise is the high voltage output from the unit itself. In the event of erratic behaviour, check that the high voltage wiring is firmly connected to the terminals and that no sparking is seen. The Z114 is designed to self-recover from interference. Powering off (both AC and battery) should not be necessary.

4.20 PC control

A standard Windows PC may be used to control and monitor a group of Z Series Energizers. Ask your JVA distributor for a demonstration of Perimeter Patrol™ software. Z Series Energizers can be connected to a PC using either a serial data adaptor, such as the PAE223 or TCP/IP using a PAE212.

4.21 Web Server

Another alternative to remotely controlling JVA Z Series Energizers is to use the PAE225 Webserver. When suitably configured, this allows the energizer to be controlled and monitored via a web browser from any internet connected device anywhere in the world.

5. INSTALLATION

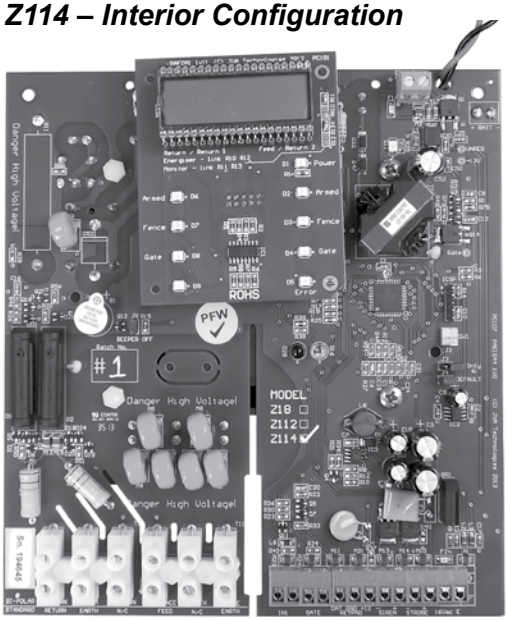
JVA recommends installation by qualified technicians.

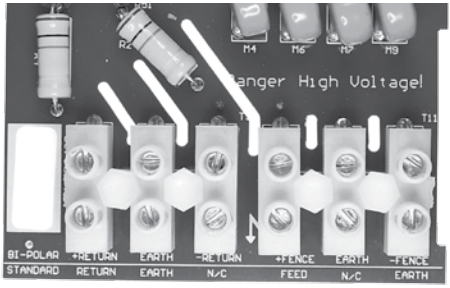
5.1 Installation Steps

1. Read the entire manual first!
2. Design and build the fence. (Beyond the scope of this manual.) Ask your distributor for help if required.
3. Decide where the JVA Z114 is to be mounted. If on an external wall it should be housed within a waterproof equipment box and definitely not in direct sunlight.
4. Remove the JVA Z114 PCB chassis from the housing by removing the 2 screws.
5. Mount the housing by using 4 screws through the rear of the box.
6. Replace the PCB chassis.
7. If using a keypad, remove the rear housing of the keypad and fix it to the wall.
8. Wire the low voltage cables to the PCB terminals*. (See Section 5.2)
9. Wire the high voltage cable to the PCB terminals*. (See Section 5.2)
10. If earth monitoring is not going to be used on the fence, connect a bridge wire from Earth Out to Earth Return.
11. Ensure that the key switch is off.
12. Fit the battery leads to the battery. The Status Light should blink twice repetitively to show mains fail, unless J3 is fitted.
13. Mount the 230 – 16V transformer and connect the 16V side to the Z114 16V input terminals. (AC is not polarity sensitive.) Do not connect a live or neutral to the earth terminal.
14. Replace the front cover.
15. Turn AC power on.
16. Arm and disarm the energizer via the keyswitch or keypad, if fitted. The Status Light should stop blinking.
17. Arm the unit.
18. Check to ensure that a short anywhere on the fence triggers the alarm.
19. Ensure that the user understands how to change the user code (PIN) and is in possession of this Installer/User Manual and the installer's contact details.

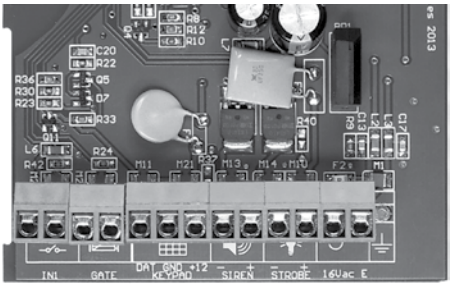
NOTE: Keep high voltage and low voltage cables at least 30mm apart. Do not run high and low voltage cables in the same conduit.

5.2 JVA Z114 – Interior Configuration



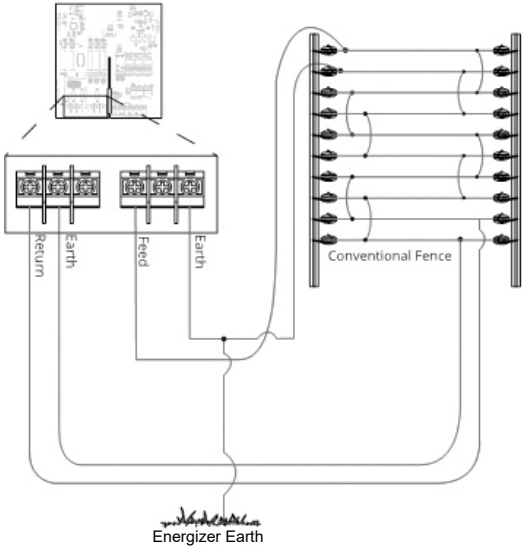


High Voltage Terminals

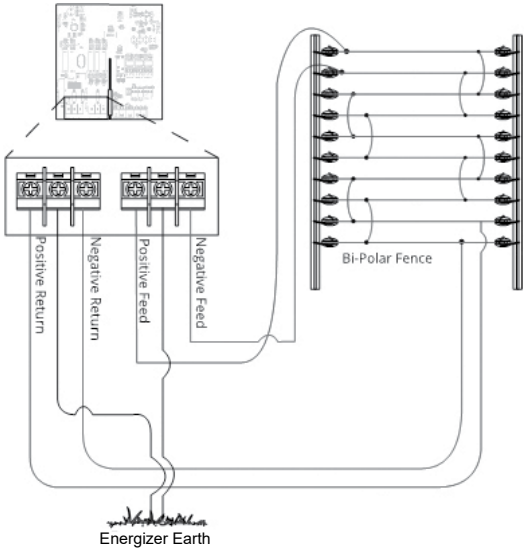


Low Voltage Terminals

5.3 Examples of Fence (High Voltage) Wiring Diagrams



Z114 Energizer configured for conventional fence operation



Z114 Energizer configured for Bi-Polar operation

5.4 Control

Your JVA Z114 security energizer has been designed for ease of operation.

Key Switch: In its simplest form, the energizer is controlled by the key switch on the side of the unit.

Keypad: The energizer can be installed in a convenient location close to the fence, while the keypad can be positioned in an easily accessible place. The systems status information, e.g. *mains power, energizer on/off, fence voltages, fence alarm, auxiliary alarm*, etc., are displayed on the keypad.

If a keypad is connected, the key switch and control input terminal may not be operational as they may have been disconnected by the installer.

If both the key switch and keypad are connected to the energizer, the last change will determine the result. For example, if the unit is armed via the keypad and then disarmed using the local key switch, it will disarm.

If in doubt consult your installer.

See section 8 for a full description of operating the Keypad.

Arming the fence using the keypad:

- Enter your PIN number (four digits long) and push the # key. (Default is 1 2 3 4)
- Make sure the red ARM light comes on.
- The keypad will beep twice to confirm that the system is armed.
- The fence will power up and if all is well (no faults) the system will be ready to deter and detect.
- If there is a fault on the fence and it cannot achieve full voltage, the LCD screen will indicate that there is a fault.
- To disarm the system, enter your PIN and press #.

5.5 Turning to Low Power Mode

To switch to Low Power Mode, enter your PIN and press *41#. In Low Power Mode the fence will still be powered and any breach will be detected, but the voltage will be much lower than normal operation. The ARM light will flash in Low Power Mode.

Enter your PIN and press *42# to switch back to Full Power Mode.

Alternatively, the unit can be switched to Low Power Mode using a switch connected to *control input 2* (gate), if it has been programmed accordingly.

5.6 When an Alarm Occurs

If the system is armed and the fence is tampered with, the Fence Light will flash and then remain on. A siren or strobe connected to the unit will turn on. If the energizer is connected to an alarm system for monitoring, an alarm signal will be sent to the alarm company monitoring the alarm system.

An alarm will also sound if the gate input is opened and the entry/exit delay time has elapsed.

5.7 To Silence the Alarm

- Enter your PIN and press #. This will silence the alarm but not disarm the system; the Armed Light will still be on. The system will be ready for the next alarm.

  *(***Note**:*The following functions have an effect on alarm timing: Siren On Time, Siren Off Time, Siren Cycles, Auto Re-arm time).*
- The siren and strobe are ready to respond again if triggered.
- To disarm the system, enter your PIN and press # again. This will also clear the fence alarm light.
- Alternatively, disarming using the key switch will reset the alarm.
- If you silence an alarm and the problem is still present when the unit is rearmed, the siren will sound again after the programmed *Off Time* has elapsed.

5.8 Changing the PIN Number

- Enter the old PIN and press *0#. This enters User Programming Mode.
- Enter your new PIN (must be 4 digits) and then #. (Repeat to confirm PIN.)
- Press *# to exit User Programming Mode.
- Make sure your new PIN works by using it to arm the energizer.
- The default PIN is 1 2 3 4.

5.9 Standby Battery

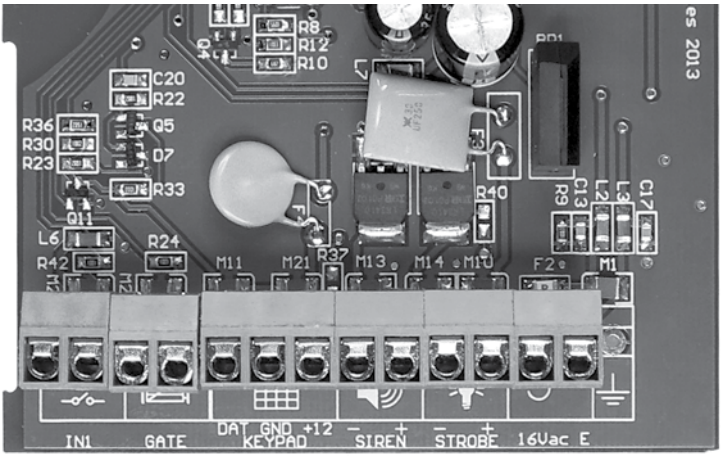
Should there be a loss of mains power, the Power Light on the keypad will go off. If the loss of power is prolonged, the battery may discharge power and become ineffective. The Power Light will start to flash indicating a battery low power problem. If the battery is fully depleted, the unit will not pulse.

If the standby battery requires replacement, the Power Light will flash and the Status Light will flash three times.

5.10 Status Light

The energizer status light indicates that the energizer requires attention. See Section 6.2.

6. TECHNICAL INFORMATION



Low Voltage Terminals

Label	Type	Description
IN1	2 Way	Energizer control input 1 (dry contact normally open) internally wired in parallel with the key switch. Can be used for a remote switch or a radio receiver. The receiver may be powered from the keypad +12V terminal.
GATE	2 Way	Energizer control input 2 (dry contact). Default function is Gate Input, Normally Closed. When the unit is armed and the gate is opened, it will trigger the Gate Alarm. Alternatively, this input can be programmed to make the energizer alternate between Low Voltage and High Voltage Mode.
KEYPAD	3 Way	Supplies power and data line for an external keypad. The +12 source on these terminals is protected with 1A self-resetting fuse.
SIREN	2 Way	Switched 12V output. Low side switched. 30W max (including Siren). A buffer relay should be used when connecting these outputs to an alarm panel.
STROBE	2 Way	Switched 12V output. Low side switched. 30W max (including Strobe). A buffer relay should be used when connecting these outputs to an alarm panel.
16Vac	3 Way	16Vac 2.5A power input plus earth. Connection of the earth is only required where local safety or wiring codes demand it. This should be connected to the cabinet or mains earth NOT the fence earth.
Batt	2 Way	12V dc or battery connection via F1 (3 Amp fuse) and flying leads.

6.1 Power Options

The Z114 has 2 sources of power, 16VAC and 12VDC (Battery). If using solar power and an external battery, connect the battery to the battery leads, not the 16Vac input.

A 24Vdc 2.5A supply can be used in place of the 16Vac supply. The correct connection is +24V to the mid AC pin, GND to the left AC pin. Due to the stored energy in a 24Vdc plug-pack, an AC Fail may take up to 5 minutes to be reported.

NOTE: Use only rechargeable batteries.

6.2 Status Codes

Status Light Number of Flashes	Interpretation	Corrective Action
1	Tamper detected	Fit the energizer lid or link J3
2	Mains supply fail	Restore mains power
3	Low battery, bad battery	Charge or replace battery
4	PCB service fault	Seek advice from your installer or distributor

Status Codes

If a minor error occurs, it will self-clear if the error condition is removed. If the mains fail or the battery runs low, it will not disarm the energizer. However, without mains power, the battery will eventually be depleted and the energizer will attempt to maintain operation by entering Low Power Mode after 4 warning beeps. If the battery charge continues to fall, the energizer will eventually stop. Once mains power has been restored and the battery has recovered, the energizer will rearm itself automatically after 4 warning beeps. A PCB fault will disarm the energizer. If an error disarms the energizer, the fence alarm will be activated.

If an error has momentarily caused the energizer to stop pulsing, this can be corrected by disarming and rearming the unit. Should the error recur return the unit for service.

6.3 Jumpers

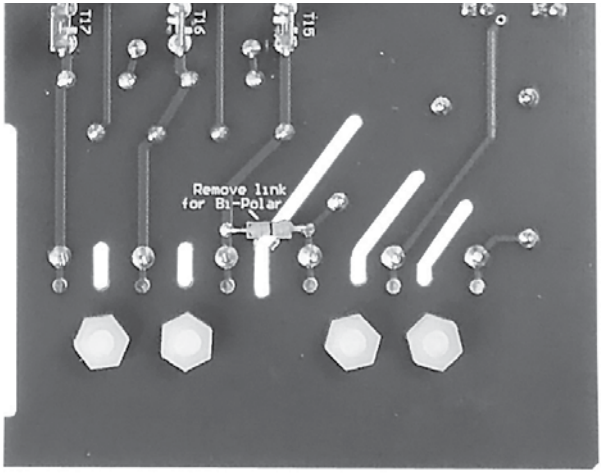
Jumper	Function	Purpose
J3	Inhibits Mains Fail Status Indication	J3 is fitted to inhibit Mains Fail Status Indication if the intention is to operate the energizer on DC only (as in solar power systems).
J4	Factory default jumper Off to return programmable options to factory defaults on power up	If the energizer needs to be defaulted to factory settings, remove all power (AC and battery) and remove the J4 jumper. Reapply the battery power and then the mains power. Reapply the J4 jumper and the energizer will be reset to default settings.

6.4 Configuring a Z114 to run in Bi-Polar Mode

By default the Z114 is configured to run in Standard Mode. This procedure explains how to modify the Z114 so that it will run in Bi-Polar Mode.

Step 1

On the back of the Z114 PCB, near the high voltage output terminals, there is a link (Pictured below) which needs to be cut. Cut the link so that it is flush with the PCB at both points where it is soldered to prevent any arcing.



Step 2

Set Fence Mode (Programming Option 15) to Bi-Polar.

Value	Function
0	Bi-Polar
1	**Conventional**

Z114 Programming Option 15

7. INSTALLATION PROGRAMMING OPTIONS

The Z114 has a non-volatile memory in which are held programming options (setup parameters). These are factory pre-set but can be field programmed using a keypad.

7.1 Programming Mode

To enter Programming Mode, enter the 6-digit installer PIN followed by *0# keys. The keypad will beep twice to indicate that the command was accepted. If the PIN was incorrect, the keypad will beep 3 times.

Pressing the # key will cycle through all the options on the LCD.

NOTE: Not all option numbers are used. The default installer PIN is 0 1 2 3 4 5.

7.2 To Exit Programming Mode

After programming, press *# to exit. If left unattended, the unit will time out and auto exit Programming Mode after approximately 5 minutes.

7.3 Changing the Installer PIN

The installer PIN may only be changed while in Programming Mode.

To enter a new installer pin, press 00 followed by the new 6-digit PIN, then the # key.

If you cannot remember your installer or user PIN, return the unit's memory to default. To do this, remove power (AC off and disconnect the battery), open the energizer, remove jumper J4 and reconnect the battery for about 10 seconds. Re-fit J4.

This will return all options to the factory set defaults.

7.4 Changing an Option

Most of the options have possible values in the range of 0 to 9.

To change any options, the unit must be in Programming Mode. Check the option number (see table below) and then the table of values for that option. Then press the option number followed by the required value. When the programming is completed, exit from Programming Mode. (See above.)

For example, to change the power level to maximum, press 019#, and the keypad will beep twice to indicate that the command was successful.

7.5 Programming Options in Brief

See Section 7.6 for more detail.

Option	Function	Description
01	Power Level	Sets the output voltage level
02	Low Power level	Sets the output power levels used in Low Power Mode
03	Fence Alarm Voltage	Sets the voltage threshold below which the fence alarm will trigger
05	Low Power Alarm Level	Sets the voltage threshold below which the fence alarm will trigger in Low Power Mode
06	Missed Pulse Count	Sets the number of pulses which may be missed before the alarm is activated
07	Battery Alarm Voltage	Sets the battery voltage threshold below which the general alarm will activate
08	Siren On Time	Sets the time that the siren (and keypad beeper) will stay on after an alarm
09	Siren Off Time	The amount of time the siren will be off for after the On Time has expired
10	Siren Cycles	The number of times the siren will sound for the On Time function above; after this many cycles the siren will automatically mute
11	Input Inversion	*Closed to arm* or *Open to arm*
12	Gate Input Function	Gate Switch Mode or Low Power Switch Mode
13	Gate Exit Delay	Time from gate switch opening to alarm
14	Chime Mode	Allows the keypad and internal beeper function to be altered
16	Binary Options	Miscellaneous options
17	Anti-Bridging	If the voltage rises OR falls quickly by more than this setting as a percentage of the average fence voltage, the alarm will occur
18	Binary Options 2	Miscellaneous options
20	Auto Re-arm Time	Sets the time which must elapse after an alarm has timed out (completed the siren cycles) before the unit will automatically re-arm, ready for the next alarm event
21-25	Relay Options	To program the relay outputs to follow certain conditions of the energizer, for enhanced monitoring purposes
26	Group ID	Allows the energizer to be set as a Master or Slave in a synchronized group – not available in all markets.

Programming Options

7.6 Programming Options in Detail

NOTE: The bold panel in each table indicates the default value.

7.6.1 Power Level (01x#)

The power level option allows the shocking power of the fence to be adjusted. For example: to change the power level to maximum, enter the following:

0 1 9 # or 0 1 0 9 #

The keypad will beep twice to indicate that the new setting has been accepted. The actual fence voltage depends on the amount of fence wire and fence conditions.

This setting may affect the average power drain and therefore backup battery time.

Value (x)	Voltage: Conventional Mode	Voltage: Bi-Polar Mode
0	5.0kV	2.5kV
1	5.5kV	2.8kV
2	6.0kV	3.0kV
3	6.5kV	3.3kV
4	7.0kV	3.5kV
5	7.5kV	3.8kV
6	8.0kV	4.0kV
7	8.5kV	4.3kV
8	**9.0kV**	**4.5kV**
9	9.5kV	4.5kV

Power Level (01x#)

NOTE: In Bi-Polar Mode the voltage on each polarity output is +/-2.5kV to +/-4.75kV i.e. half Conventional Mode voltage.

7.6.2 Low Power Level (02x#)

Same as above, but for Low Power Mode.

Value (x)	Power
0	0.5%
1	1.0%
2	1.5%
3	2.0%
4	2.5%
5	3.0%
6	**3.5%**
7	4.0%
8	4.5%
9	5.0%

Low Power Level (02x#)

7.6.3 Fence Alarm Voltage (03x#)

This option sets the voltage threshold below which the fence alarm will occur. The default Fence Alarm Voltage is 4 kV in Conventional Mode and 3 KV in Bi-Polar Mode. In Bi-Polar Mode this threshold is for both positive and negative fence wires.

Value (x)	Voltage: Conventional Mode	Voltage: Bi-Polar Mode
0	1.5kV	1.5kV
1	2.0kV	1.8kV
2	2.5kV	2.1kV
3	3.0kV	2.4kV
4	3.5kV	2.7kV
5	**4.0kV**	**3.0kV**
6	4.5kV	3.3kV
7	5.0kV	3.6kV
8	5.5kV	3.9kV
9	6.0kV	4.2kV

Fence Alarm Voltage (03x#)

7.6.4 Low Power Alarm Level (05x#)

This option sets the voltage threshold below which the fence alarm will occur. The default Fence Alarm Voltage is 500 Volts.

Value (x)	Voltage
0	300 Volts
1	**500 Volts**
2	700 Volts
3	900 Volts
4	1100 Volts

Low Power Alarm Level (05x#)

7.6.5 Missed Pulse Count (06x#)

This option enables the pulse count to be varied from the default (3). This is the number of bad or missing pulses that are counted before the alarm occurs.

NOTE: The lower this option is set, the more likely you are to get false alarms.

Value (x)	Missed Pulses
0	1
1	1
2	2
3	**3**
4	4
5	5
6	6
7	7
8	8
9	9

Missed Pulse Count (06x#)

7.6.6 Battery Alarm Voltage (07x#)

This option sets the battery voltage threshold below which the alarm will activate. The default Battery Alarm Voltage is 10.0 Volts and the unit will drop to low power at 9.0 Volts (after beeping 4 times).

If the unit enters Low Power Mode due to a flat battery, the unit will automatically return to high voltage, without warning, when the mains voltage comes back on and the battery voltage rises.

Keypad Number	Alarm	Reduce Power
0	9.0 V	8.0 V
1	9.5 V	8.5 V
2	**10.0 V**	**9.0 V**
3	10.5 V	9.5 V
4	11.0 V	10.0 V
5	11.5 V	10.5 V
6	12.0 V	11.0 V
7	12.5 V	11.5 V
8	13.0 V	12.0 V
9	13.5 V	12.5 V

Battery Alarm Voltage (07x#)

7.6.7 Siren On Time (08x#)

This option sets the duration of time that the siren will remain on after a fence alarm occurs. After this time the siren will turn off for the Siren Off Time indicated in Table 7.6.8. The siren will sound again if the alarm is still present after this Siren Off Time has passed.

The default is 3 minutes. This may be the subject of local regulations to stop an alarm causing undue disturbance to neighbours, etc.

NOTE: The Siren On Time will be cut short if the battery falls below the low battery level.

Value	Time
0	10 Seconds
1	30 Seconds
2	1 Minute
3	2 Minutes
4	**3 Minutes**
5	4 Minutes
6	5 Minutes
7	20 Minutes
8	45 Minutes
9	130 Minutes

Siren On Time (08x#)

7.6.8 Siren Off Time (09x#)

This option sets the amount of time the siren will be Off for after the Siren On Time above has expired. If an alarm is still present after this Off Time, the siren will sound again.

Value	Time
0	10 Seconds
1	1 Minute
2	2 Minute
3	**5 Minutes**
4	10 Minutes
5	20 Minutes
6	30 Minutes
7	40 Minutes
8	50 Minutes
9	60 Minutes

Siren Off Time (09x#)

7.6.9 Siren Cycles (10x#)

This option sets the maximum number of times the siren will sound for the “On Time” if the alarm continues. This may be limited by local regulations to stop an alarm causing undue disturbance to neighbours, etc.

NOTE: This is the maximum number of cycles for 1 continuous alarm. Intermittent alarm events could cause more than this number of siren soundings.

Value	Cycles
0	1
1	1
2	2
3	**3**
4	4
5	5
6	6
7	7
8	8
9	9

Siren Cycles (10x#)

7.6.10 Input Type (11x#)

The control inputs can be inverted. Unless an input is used for a Gate Switch, in which case it is always NC.

Value (x)	Input type
0	**NO Normally Open**
1	NC Normally Closed

Input Type (11x#)

7.6.11 Input 2 Function (12x#)

This option is used to set the function for the Control Input “Gate”. If set to 0, the Gate Alarm will trigger if the gate is opened for longer than the Gate Entry/Exit Delay. If set to 1, the energizer will go into Low Power Mode if this input is closed.

Value	Function
0	**Gate**
1	Low Power

Gate Input Function/ Low Power Mode (12x#)

7.6.12 Gate Entry/Exit Delay (13x#)

The gate switch must remain open for longer than the Gate Entry/Exit Delay before the Gate Alarm is triggered. If the switch closes within this time, the Gate Timer is reset to the Gate Entry/Exit Delay value.

NOTE:

1. Setting 0 was changed from 10 seconds to 0 (immediate) in firmware version 7.77.
2. From version 7.92 on, Option 18 may be used to change this to a security panel style entry/exit delay.

Value (x)	Missed Pulses
0	0 Seconds (immediate)
1	30 Seconds
2	**1 Minute**
3	2 Minutes
4	3 Minutes
5	4 Minutes
6	5 Minutes
7	6 Minutes
8	7 Minutes
9	8 Minutes

Gate Entry/Exit Delay (13x#)

7.6.13 Chime Mode (14x#)

This option allows the Energizer Internal Beeper and Keypad Beeper to be used as a Door Chime for the Gate Switch. When set to *None*, the keypad beeper is used to indicate correct keypad operation only. When set to *Door Chime* Mode, the beepers will sound when the gate switch opens, even if the energizer is disarmed.

Note: "Gate" must be selected in 7.6.11 Input 2 Function (Option 12).If set to Siren, the beepers mimic the siren function.

Value	Function
0	None
1	Door Chime
2	**Siren**
3	Fence Alarm
4	Gate beeps plus Siren

Chime Mode (14x#)

Gate Beeps plus Siren will give 2 beeps on Gate Open and 4 on Close, plus Continuous for an alarm. Beeps are on Keypad only, not Internal Beeper.

7.6.14 Binary Options (16x#)

Each option in this table can be turned on by adding the corresponding value.

For option + 1 set 16 to 01, for + 1 and +2 set 16 to 03.

Value	Function
0	**None**
+1	
+2	
+4	
+8	Active IR tamper circuit
+16	Stop slave on coms fail
+32	Do not send Alarm memory

Binary Options (16x#)

+1: Not used on the Z114

+2: Not used

+4: Not used

+8: Activate IR Tamper Circuit. J3 changes to inhibit tamper alarm rather than AC fail alarm.

+16: Stops Slaves on E-16 (Coms Fail) if the communications from the Group Master is lost.

+32: Stops the energizer sending Alarm Memory to a PC, relay PCB or Keypad. Set this to restore "Unlatched" Mode on a PAE201 relay PCB.

NOTE: +8 and +16 added in firmware code version 7.86. +32 added in code version 7.87.

7.6.15 Anti-Bridging Threshold (17x#)

Anti-Bridging has been designed to detect a section of fence being bypassed, and removed from the circuit, by an intruder bridging the feed to returns together and then cutting the live wires in between.

Setting this option to a value greater than 0 (default is 0 = off) will enable Anti-Bridging. However, this feature will not operate in Low Power Mode! While Armed, a Fence Alarm will trigger if the Fence Voltage rises OR falls quickly by more than the threshold. A slow change to the voltage will not trigger a Fence Alarm until the Voltage is less than the Fence Alarm Voltage (03x#).

The Anti-Bridging Threshold is a percentage value of the current Fence Voltage. For Example, setting option 17 to 10 (1710#) will set a 10% Anti-Bridging Threshold. At this level a fence (return) voltage normally reading 7.5kV will trigger a Fence Alarm if the voltage quickly rises to over 8.3kV or falls to less than 6.7kV.

NOTE*:*

1. Power Level (Option 1) must be set higher than the normal fence running voltage, otherwise if the load is released (fence bridged) voltage control will limit the voltage rise and the Anti-Bridging Alarm will not activate. For the above example, Option 1 must be set to 7 or greater to allow the unloaded fence to rise to 8.3kV or higher, thus triggering the Alarm.
2. A minimum of 5% was added in code firmware version 7.92.

7.6.16 Binary Options 2 (18x#)

Each option in this table can be turned on by adding the corresponding value.

For Option +1 set 18 to 01, for +1 and +2 set to 03.

+1: Enables Siren Acknowledge. The siren will chirp once for armed and twice for disarmed.
+2: Enables a home alarm style entry/exit delay for the gate input. See also Option 13.
+4: Sets the Keypad Bus Baud Rate to 4800 (default is 2400), all units in a group, PC and Keypad must be set to the same baud rate. The change will not take effect until after a reset.
+8: Sets the Keypad Bus Baud Rate to 9600 (default is 2400)

Value	Function
0	**None**
+1	Siren Codes
+2	Gate delay type
+4	4800 Baud
+8	9600 Baud
+16	
+32	

Binary Options 2 (18x#)

NOTE:

1. Z11 defaults to +1.
2. +2, +4 and +8 were added in code version 7v92.

7.6.17 Auto Re-arm Time (20x#)

This option sets the time which must elapse before another alarm will sound after the first alarm has timed out (gone completely through its cycles without being turned off).

If an event occurs (such as a low fence voltage) which triggers the siren, any other events which would otherwise trigger the siren (such as a gate alarm) will be ignored while the siren is sounding and until after the Auto Re-arm time has passed.

A setting of 0 will disable Auto Re-arm.

If this time is set to less than the Siren Off Time, the energizer may re-arm in the "Off" time and the number of Siren Cycles will be reduced.

Value	Missed Pulses
0	**0 Seconds (immediate)**
1	30 Seconds
2	1 Minutes
3	2 Minutes
4	3 Minutes
5	4 Minutes
6	5 Minutes
7	6 Minutes
8	7 Minutes
9	Disabled – Do not auto re-arm

Auto Re-Arm Time Values

7.6.18 Relay Functions

All relays can be set to any of the available functions (user assignable).

Relay 1 is (21x#)

Relay 2 is (22x#), etc.

The Modes are explained in the table opposite.

The defaults for the Z114 are:

- Relay 1 – Siren (12V switched output)
- Relay 2 – Strobe (12V switched output)
- Relay 3 – Fence 1 (**NOTE:** Relay 3 is not physically fitted to PCB)
- Relay 4 – Armed 1 (**NOTE:** Relay 4 is not physically fitted to PCB)
- Relay 5 – General (**NOTE:** Relay 5 is not physically fitted to PCB)

NOTE:

1. Optional extra relays can be retro-fitted. Contact your nearest JVA service centre for details.
2. The siren and strobe switched 12V outputs can be used to drive external buffer relays.
3. Group relay functions are operable only on the Group Master.

Value (x)	Mode
0	Fence 1
1	Fence 1 or off
2	Armed 1
3	Fence 2
4	Fence 2 or off
5	Armed 2
6	Fence Bi-Polar
7	General
8	Siren
9	Strobe
10	AC Fail
11	Low / Bad Battery
12	Tamper
13	Strobe 2
14	Gate 1 or 2
15	Siren caused by Gate 1 or 2
16	Armed in Low Power Mode
17	Group Armed Note 3
18	Group General

Relay Function Values

Function	Logic for Alarm State (opposite of normal state)
Fence x	Fence x Alarm: Zone x is Armed (Pulsing) AND the Fence Return Voltage has fallen below the Fence Alarm Voltage for more pulses than the Missed Pulse Count. Not latched.
Fence x Alarm or Disarmed	Zone x is Disarmed OR the Fence Return Voltage has fallen below the Fence Alarm Voltage for more pulses than the Missed Pulse Count. Not Latched.
Fence Bi-Polar	Energizer is Armed (Pulsing) AND the Fence Return Voltages on either Bi-Polar return line has fallen below the Fence Alarm Voltage for more pulses than the Missed Pulse Count. Not latched.
Armed x	Zone x is Armed (Pulsing)
General	AC Fail OR Tamper OR Low Battery OR Gate Alarm OR Internal Error. Latched for internal errors only.
Siren	Fence Alarm 1 OR Fence Alarm 2 OR Gate Or Tamper, will time out after the Siren Time Out time. This function is latched.
Strobe	As per Siren but does not time out, will remain On until both Zones are switched off. This function is latched.
AC Fail	Alarm on AC Fail
Battery	Alarm on Low or Bad Battery
Tamper	Alarm when tamper circuit enabled (option 16), the lid is up, and J3 is not fitted
Group Wide x	Group relay functions are the collected status of the whole group of Z energizers. Group Armed for example is set only if all energizers in the group are armed.

Relay Options Explained

7.6.19 Group Mode (26x#)

A Group must have only one Master. The other energizers in the group are Slaves. Group Voltage display energizers require each slave to have a different number. Since the Keypad Bus is common among the group one keypad can be used to program all units for all options except this Group Mode (for obvious reasons).

The procedure is:

- Connect the keypad to each unit in turn, before linking all energizers into a group.
- Set the option: one unit as master the other as slaves.

NOTE: At this time groups are limited to a master and 14 slaves.

In some markets Group Mode may not be available.

Value (x)	Mode
0	**No Group**
1	Master
2	Slave 1
3	Slave 2
4	Slave 3
5	Slave 4
6	Slave 5
7	Slave 6
etc	etc
15	Slave 14

Group Mode (26x#)

See APPENDIX A (page 36) for details on group wiring and operation.

8. JVA Z114 LCD Keypad Features

8.1 Keypad Status LEDs

The LCD Keypad has two LEDs, Power and Arm, which act as follows:

- Power: On with Mains power, flashes on low battery.
- Arm: On when the energizer is armed (pulsing), flashes when in Low Power Mode.

8.1.1 Arming/Disarming the Fence Using the Keypad

Enter your User PIN (Personal Identification Number: four digits long) and push the # key. Make sure the red ARM light comes on and the keypad beeps twice to confirm that the system is armed.

The fence will power up and if all is well (no faults) the system will be ready to deter and detect.

To disarm the system, enter your User PIN and press #.

NOTE: If there is an alarm sounding you will need to enter your PIN twice, once to silence the alarm and once more to disarm.

8.1.2 Menus

The Z series keypad has an Optional Menu-Driven Interface. The main menu is accessed by pressing the Menu (Bypass) key (bottom right). You will be asked to enter your PIN, and then press #.

Most functions are available via the menus. Use the 2 key to go up and the 8 to step down through a menu. The Enter (#) key is used to select the current line.

The menu will time out after a few minutes and return to the normal status display.

NOTE: The menu system was added in keypad firmware code version 2.10.

8.1.3 Keypad Status Display

In normal operation the keypad shows a continuous summary of the system status. For example if the system is disarmed the keypad will display “Ready to Arm”.

If the system is armed then the keypad will display the voltages for each zone in the system.

Since there can be many items to display the keypad automatically “scrolls” through all relevant detail. Each screen is shown for about 2 seconds. If you wish to hold the display at a particular point simply press the [#] key. The auto scrolling will stop for about 20 seconds.

Pressing the [#] key again will advance the display one step.

If a new trouble (AC fail, low battery, etc.) or alarm occurs, the keypad screen will jump to the relevant zone, the keypad will beep (unless toggled off) and auto scrolling will cease for about 3 minutes.

8.1.4 Changing the Keypad Messages and Address

You can change the messages and each of the zone labels.

- The Dealer Message displays when the system is on standby.
- Zone Labels displays after the [#] key is pressed during alarm memory or faults.
- The programmable Service Message is displayed during AC failure, communication failure, or low battery.

[1]	[2] Character up	[3] not used	Emergency not used
[4] ← Cursor left	[5] Next Message	[6] → Cursor right	Fire not used
[7]	[8] Character down	[9]	Panic not used
[*]	[0] Last Message	[#] Enter/Exit	Bypass not used

Keys used for changing messages

- To activate the keypad programming Mode, enter the [Installer’s Code] [*] [0] [1] [#]. Information may be entered into the keypad in the form of letters (upper and lower case), numbers (0–9), and 22 special symbols. All characters are displayed in the order: upper and lower case letters, numbers, and special symbols. The [Space] character precedes the letter A.
- To enter a Label, use the [2] key to scroll through the characters until you reach the desired character. If you scroll past the desired character, the [8] key may be used to scroll backwards. **Note:** The space character is before the A character (When A is displayed, press [8] to create a space).
- When the desired character is displayed, press the [6] key to move the cursor to the next character position. The [4] key moves the cursor to the left.

- When all characters have been entered, press the [#] key to enter the message and move to the next message position.
- Use the [0] key to move backward through the messages.

NOTE: If you move to the next message using [5] instead of the [#] key you will lose any changes you made!

To change the keypad address, scroll through the messages until the keypad displays: “Keypad address __” then change the value by pressing [2] (up) or [8] (down). Validate by pressing [#].

The message order is:

- SERVICE MESSAGE (Displayed under “System Trouble”) - Press “#”
- DEALER MESSAGE (Displayed under the standby message: “Ready to Arm”)
- ZONE NAMES
- BAUD RATE (should be left at 2400)
- KEYPAD ADDRESS ((should be left at 1)

8.2 To Exit Keypad Programming

When you have finished programming, press [*] [#].

NOTE: The keypad will also exit the programming Mode if you do not press any key within a five minute period.

To return the Keypad to default settings press the  emergency button during power up. This feature was added in keypad firmware version 1.2.

8.3 Connecting Multiple Keypads to a System

Up to three keypads may be used to remotely monitor and control the Z Series Security Energizers.

To operate correctly, each Keypad must be configured to use a unique Keypad Address. This is best achieved by connecting one keypad (at a time) to the Master Energizer and updating the Keypad Address. Once all Keypads have a different address, all can be connected to the system. A recommendation is that one Keypad is kept at Address 1.

The energizer now needs to be introduced to all of these Keypads. This is achieved by resetting the energizer using the Keypad (configured to Address 1), by pressing [USER PIN]*68#. Alternately the power can also be removed to reset the energizer. After a reset, the energizer will determine what Keypads are connected, and only these Addresses will be used in the future. This prevents unauthorized Keypads being added to the system once it is running.

If the security system is to use a PC based interface such as Perimeter Patrol, Keypad Address 2 should not be used by a keypad. The PC software uses this address to control the energizers.

8.4 Notes Regarding Keypad Configuration

Zone 1 (the Master) must be connected to the group. If it is not connected the other energizers in the group will not send status packets to the keypad. The status packets contain voltage and alarm information which the keypad displays. If Zone 1 is not connected, the keypad will report a communications failure with all the zones.

A Slave Energizer disconnected from the Group will only talk to a Keypad if it has a Keypad Address of 1. When adding/removing an energizer to/from the group, be sure to re-analyze the group using the key sequence *68#. Zone 1 (the master) must be connected to the group for this operation to work.

When re-analyzing a group ensure all energizers are disarmed. If they are not, this function will not work properly.

NOTE: If the group ID has recently been changed you may need to reset ([PIN]*68#) before the new ID's will be properly reported to the keypad.

8.5 Summary of LCD Keypad Functions

Function	Description
Arm/Disarm	[User PIN][#]
Silence an alarm (Single zone system only)	[User PIN][#]
Start Programming the Z Series Energizer	[Installer PIN][*] [0] [#]
Start Programming the Keypad	[Installer PIN][*] [0] [1] [#]
Exit Programming (any Mode)	[*] [#]
Change a User PIN, 4 Digits	[User PIN][*]0[#][New PIN]#
Change the Installer PIN, 5 Digits	[0] [0] [New Installer PIN][#] Note 1
Arm All Zones (Multi-Zone groups)	[User PIN][*][1][0][#]
Arm Zone 1 (Master)	[User PIN][*][1][1][#]
Arm Zone x, where x is any zone number up to 15	[User PIN][*][1][x][#]
Disarm All Zones	[User PIN][*][2][0][#]
Disarm Zone 1 or Master	[User PIN][*][2][1][#]
Disarm Zone x, where x is any zone number up to 15	[User PIN][*][2][x][#]
Switch to Low Power Mode (all zones)	[User PIN][*][4][1][#]
Switch to High Power Mode (all zones)	[User PIN][*][4][2][#]
Arm Gate Circuits only	[User PIN][*][4][#]
To change the Keypad Messages to English	[*][3][1][#]
To change the Keypad Messages to Spanish	[*][3][2][#] (not well supported yet)
Keypad Audible Feedback On/Off	[*] [5] [1] [#]
Keypad Alarm Beeper (Chime) On/Off	[*] [5] [3] [#]
Keypad Error Tones On/Off	[*] [5] [4] [#]
Backlight Mode On/On with keys/Off	[*] [8] [#]
Display Keypad Model	[*] [9] [#]
Re-analyse the group	[*][6][8][#]
Reset and Display Firmware Version Number	[User PIN][*][6][8][#]
Reset and return to Factory Defaults	[Installer PIN][*] [6] [8] [#]
Power Boost	[*] [9] [9] [#]
Siren Test	[*] [6] [3] [#]
Battery Test	[*] [6] [4] [#]
Clear Alarm Memory	[*] [1] [#]

NOTE:
1. Operates while in programming Mode only.

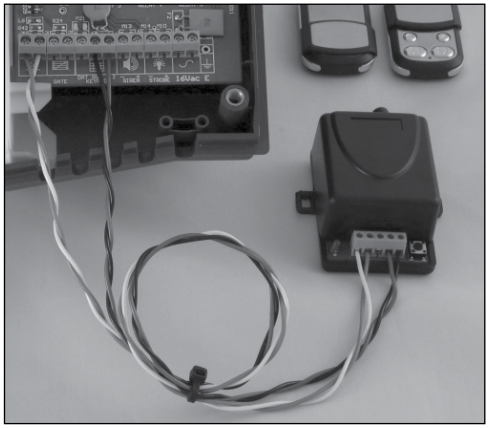
9. Remote Control Unit

The Remote Control Unit provides the Z114 with the ability to arm or disarm the energizer via a compact Key Chain Fob Remote Control.

Two Remote Controls are provided, and are uniquely coupled to the receiver using a Rolling Code Algorithm to ensure security. Should one or both remote controls lose synchronisation with the receiver, it is a simple procedure to re-associate the remotes.

The receiver controls the energizer by IN1 and receives power from the Keypad Bus. The output of the remote control receiver is a Normally Open (NO) contact.

The remote controls have a range of up to 100 metres. They come fitted with a LR27A 12V battery that will provide up to 2 years' service.



Remote Control Unit Receiver

9.1 Features

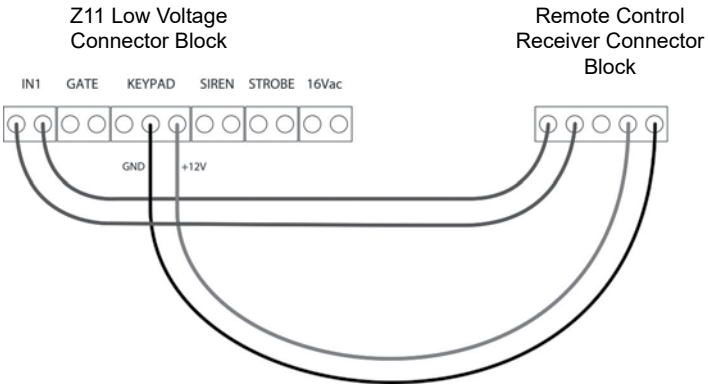
- Enables Arm/Disarm of the energizer, or a single zone, by Key Chain Fob Remote Control
- 2 Remote Controls included
- Uses Digital Rolling-Code Algorithm to uniquely and securely couple to remote controls
- Operates at 433.92MHz
- 100 metres range
- Easily connected and configured
- Wire to Keypad Bus (for power) and input (usually IN1)

9.2 Installation

The Remote control receiver unit requires 12V and 0V (GND) from the Keypad Bus, and its output is shown wired to IN1.

Mount the receiver on the right hand side of the Z114 Energizer. Connect the receiver to the energizer as indicated in the diagram below.

Keep all connections away from any high voltage wiring, specifically the Fence Feed connections coming from the left side of the energizer.



Remote Control Receiver Wiring Diagram

9.3 Operation and Configuration

The remote controls come pre-configured to work with the receiver. Simply press the LOCK key to arm the energizer. Press the UNLOCK key to disarm.

Should a remote control be lost or stolen, it is possible to disassociate the receiver with all remotes. To do this, press the button on the bottom right corner of the receiver unit and hold for approximately 10 seconds. When the red light goes off the receiver has wiped all associated remote controls from its memory.

To associate a remote control, press the button on the receiver once. The light will come on momentarily. Next, press a button on the desired remote control. The receiver light will begin flashing. Press the button on the receiver and the light will stop flashing. Test the remote control by pressing a button. The receiver light will flash, indicating it has successfully associated with the remote control. Repeat these steps for any remaining remote controls that require (re)association.

APPENDIX A
Group Simultaneous Pulse Feature

Group Simultaneous Pulse Feature

In some Industrial Installations it may be preferable to provide the ability to link multiple energizers into a group. When linked the individual Z Series Energizers become a "Group". Members of a group have simultaneous high voltage output pulses and act as is they are one energizer with multiple outputs. This is designed so that no possible combination of individual outputs can be dangerous.[1]

Group Mode Programming (26x#)

A group MUST have only 1 master. The other Energizers in the group are slaves.

If there is no Master, each Slave will electrify the fence (pulses) when Armed. However, the simultaneous pulse feature will NOT be operating.

Value (x)	Mode
0	No Group
1	Master
2	Slave 1
3	Slave 2
4	Slave 3
5	Slave 4
6	Slave 5
7	Slave 6
8	Slave 7
9	Slave 8
10	Slave 9
11	Slave 10
12	Slave 11
13	Slave 12
14	Slave 13
15	Slave 14

NOTE:

1. Do not interconnect the energizers via the keypad bus until after they are programmed.
2. If more than one keypad is used, they will need different addresses. (See 8.1.4: *Changing the keypad Messages and Address*.)
3. If Perimeter Patrol is used any keypad in the system should not have address 2. (See 8.1.4: *Changing the Keypad Messages and Address*.)

For all Energizers that will be part of a group, the procedure is as follows:

1. Make sure the key switch is turned off and IN1 is not shorted.
2. Connect the battery.
3. On the keypad, enter [Installer's code] [*] [0] [#].
4. Enter [26] followed by the required value (e.g. [1] for Master) then [#].
5. Enter [*] [#] to exit programming.
6. Connect the group using the Keypad Bus as Group Mode Linking diagram.

NOTE: At this time groups are limited to a Master and 14 Slaves (15 zones total).

[1] Patented.

Group Linking via the Keypad "Bus"

The keypad terminals on all energizers in the group are linked. Since only one energizer needs to power the keypad, 3 wires are linked from one energizer (preferably the Master) to the keypad (optional) and 2 wires to every other energizer in the group. Do not connect the live lines between energizers as this could result in some strange behaviour and possibly damage. **Note:** The connections can be a star or daisy chain or any mixture. It is possible for a PC to be added to the group using a keypad to RS232 adaptor (PAE051).

We recommend following these steps in the right order:

a. Disarm all energizers in the group. If energizers are not disarmed Step 10 may not work correctly.

b. Program the keypad address using one of the energizers.

c. Program each energizer with its required address (Master address=1, Slave 1 address=2...). Refer to note 4 below.

d. Connect any control/monitoring unit 12V, GND and Data to the Group Master.

e. Connect all the slaves Data and GND to the Group Master.

f. Connect the battery and AC power of the Group Master but do not arm.

g. Connect the battery and AC power of each slave. **Note:** Do not arm them until all the Energizers in the group are connected.

h. Wait 5 minutes for all the energizers to synchronize with the Master.

i. If there are more than one keypad or control unit, make sure they have a different ID then reset the group using keypad code: [user pin] [*] [6] [8] [#] or Perimeter Patrol "Reset All" this will allow both keypads to be recognized by all energizers in the group.

j. If using a PTE0210 keypad, enter the key sequence [*][6][8][#] to automatically re-scan the group and check what energizers are connected.

k. Arm the group using keypad [1] [2] [3] [4] [*] [1] [0] [#] or Perimeter Patrol. Make sure all energizers are activated.

NOTE:

1. Members of a group can be individually switched on and off; even the master can be turned off via input or key switch. (Note that the Z114R does not have a key switch).
2. A slave will generate a General Alarm if the Keypad Bus is broken between it and the Group Master.
3. After programming, the Keypad may be disconnected; it is not required for group operation.
4. As of energizer firmware 7v83 and keypad firmware 1v09, Z28's should have an 'empty' ID between each energizer. This means if the Z28 Master ID=1, then the ID of the first slave should be 3, not 2.

5. When connected to Perimeter Patrol, the Arm/Disarm function of a keypad is disabled. Control of these functions is through the Perimeter Patrol Interface.
6. A Keypad that is connected to a Slave Energizer that is disconnected from the Group, must have a Keypad Address set to 1. Otherwise the energizer will not respond to commands.

Group Mode Linking

APPENDIX B
RSA Legal and Safety Requirements for a Security Electric Fence

The Act of parliament regulating the electric fencing industry in the Republic of South Africa is *The Occupational Health and Safety Act 1993 (Act No. 85 of 1993). Section 12 of this Act, Electric Fences*, stipulates that the manufacturer of an electric fence energizer shall prove compliance with SANS60335-2-76. All JVA energizers have been tested and issued with a *Certificate of Compliance* by an internationally certified test laboratory to meet these requirements. (See COC Doc. on page 42.) Further, for an electric appliance to be sold legally in the Republic it requires a *Letter of Authority* issued by the National Regulator for Compulsory Standards. All JVA energizers have LOA's. (See LOA Doc. on page 43.)

In addition to the energizer having to meet stipulated legal requirements, the fence itself must be erected in accordance with the SANS 10222-3 specifications. It is the responsibility of the person installing the electric security fence to ensure that the fence erected meets these SANS 10222-3 specifications. (Copy of SANS 10222-3 is obtainable from the SABS, Tel. No. 012 428 7911. For further info www.sabs.co.za.)

Finally, any electric security fence erected, or property sold, after December 2012 requires that a *Certificate of Compliance* be issued for it by an installer registered with the national regulator.

While it is outside the scope of this manual to list all the clauses of the relevant Act and SANS documents, and bearing in mind the above mentioned regulations, below are some relevant safety requirements of the regulations.

10.1 Energizer

- The energizer shall comply with SANS 60335.76 and be installed, operated and maintained in a way that minimizes danger to persons.
- The energizer shall not exceed 8 joules under any load condition in an urban area.
- Where two or more energizers are connected to an electric fence or where electric fences are less than 2.5 meters apart the operation of the energizers shall be coordinated to be within the predetermined pulse rate and magnitude as defined by the limits of any compliant single energizer (i.e. synchronised).

10.2 Stand-alone and Wall-top electric fences

- A stand-alone electric fence shall not be installed in a public area unless the lowest live wire of the electric fence is a minimum height of 1,500mm above walking ground level or is covered by a barrier fence from the public area with a minimum height of 1,500mm.
- The minimum distance between the stand alone fence and the barrier fence shall be less than 200mm or greater than 1,000mm.
- The lowest live wire on a building element (walls etc.) shall be a minimum height of 1,500mm above walking or ground level.
- Intermediate support brackets shall be installed at a maximum of 3m apart.

10.3 Earthing

- An earth electrode shall be manufactured out of galvanised steel, copper, clad steel, or stainless steel.
- All earth electrodes shall be a minimum length of 1.2m with a minimum diameter of 10mm.
- Three earth electrodes shall be installed 1.2m apart from each other in close proximity to the energizer.
- Additional earth electrodes shall be installed at a maximum distance of 30m apart measured from the energizer. On general agricultural (rural) fences this distance can be increased to 100m.
- A distance of 2m shall be maintained between the energizer electrode and any other earthing system.

10.4 Warning Signs

- An electric fence shall be identified by prominently displaying warning signs.
- Warning signs shall be securely fixed 1.5m to 2m above ground level.
- In high density population areas warning signs shall be no more than 10 m apart.
- Warning signs shall be displayed on an access gate, or not more than 500mm on either side.

NOTE: Regulation warning signs are available from your nearest Stafix Electric Fence outlet.

10.5 Wire and Wireways

- It is illegal to electrify razor or barbed wire.
- All underground wiring shall be placed inside a sealed wireway, conduit, trunking, pipe or protective enclosure and the ends must be adequately sealed to prevent ingress of water.
- Insulated high-tension cable shall not be in the same wireway with cables or wires of telecommunication, radio or signalling circuits or with mains alternating current.

10.6 Joints

- Joints on bare conductors shall be made with ferrules or clamps and, where soldered, must be sealed with bitumen.
- The use of dissimilar metals that will cause a galvanic effect shall be minimized. Should such metals be used, any joints and fixtures shall be sealed with paint, bitumen or by soldering.

10.7 Protection

10.7.1 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.

Power line voltage	Minimum clearance
<1 000	3m
>1 000 and <33 000	4m
>33 000	5m

Fence to powerline minimum clearance

10.7.2 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 (protected against splashing water).

Figure 1
Typical constructions where the electric security fence is exposed to the public.

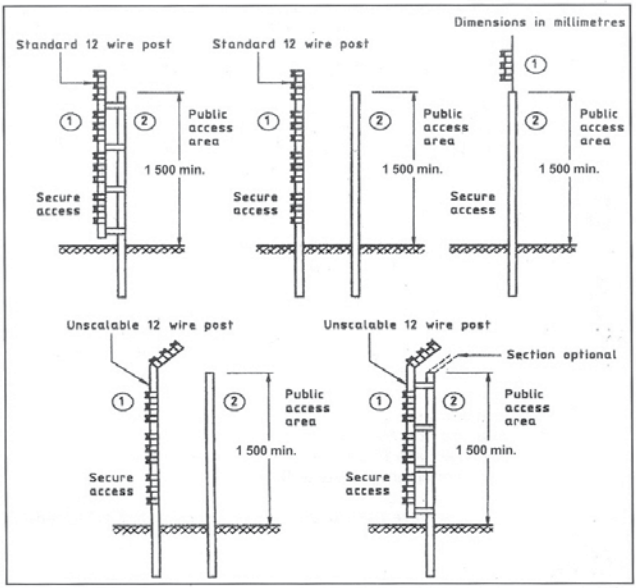
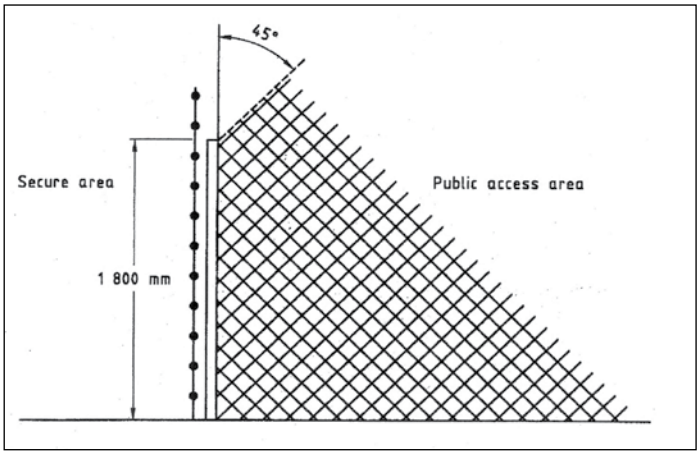


Figure 3
Prohibited zone for pulsed conductors.

Key: Electric security fence
Physical barrier
Prohibited zone



Certificate of Compliance

TEST Africa

WCT (PTY) LTD T/A T.E.S.T. *Africa*
reg #: 2000/024600/07
vat reg #: 4620192684

Room S166, Building 33
CSIR Grounds
Brummeria
Pretoria

PO Box 36335
Menlopark
Pretoria, 0102
South Africa

Tel.: (+27 12) 349 1145
Fax.: (+27 12) 3491249
E-mail: info@testafrica.co.za
Internet : http://www.testafrica.co.za

sanas
T0146

ilac-MRA

Test Report

IEC 60335-1: Household and similar electrical appliances - Safety
Part 2-76: Particular requirements for electric fence energizers

REPORT # : **WCT 14/0006**

CLIENT:	*Pakton Technologies* *PO Box 408* *Narangba, QLD* *4504, Australia*
	Attention: Alex Knight *Order #: Application Form* *Date of Order: 10-12-2013*
SAMPLE:	*PTE 1044 Electric Fence Energiser*
TEST SPESIFICATION:	*SANS 60335-2-76:2006 & IEC 60335-2-76:2002 & A1:2006* *SANS 60335-1:2011 & IEC 60335-1:2010*
SUMMARY OF RESULTS:	*Complied*
DATE STARTED:	*2014-01-06*
DATE COMPLETED:	*2014-06-05*
DATE OF ISSUE:	*2014-06-05*

TESTED: GH Holtzhausen (Technical signatory)

APPROVED: AHJ de Winnaar

NOTE:
"The South African National Accreditation System (SANAS) is a member of the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA). This Arrangement allows for the mutual recognition of technical test and calibration data by the member accreditation bodies worldwide. For more information on the Arrangement please consult www.ilac.org.

CUSTOMISED CODES

Customer Pin No. .....

Installer Pin No: .....

NRCS | national regulator for compulsory specifications

NRCS HOUSEHOLD APPLIANCES\ELECTRONIC LETTER OF AUTHORITY

APPLICANT NAME :	NDLOVU FENCING (PTY) LTD		
TRADING NAME :	STAFIX ELECTRIC FENCE AND SECURITY CENTRES		
POSTAL ADDRESS :	PO BOX 13898 CASCADES 3202	PHYSICAL ADDRESS :	219 JET PARK ROAD WITFIELD 1467
CONTACT PERSON/S :	RICKARDO PACHECO		
TEL NO :	011 3973507 / 082783449		
FAX NO :	033 472780		
E-MAIL :	ndlovu@stafix.co.za		

CUSTOMS IMPORTER CODE :	CHECKED
VAT REGISTRATION NO :	CHECKED
COMPANY REGISTRATION NO :	

TARIFF HEADING: 8543.70 REBATE CODE:

DESCRIPTION	BRAND	COUNTRY OF ORIGIN	APPLICABLE STANDARD
PTE 1044 ELECTRIC FENCE ENERGISER	JVA	AUSTRALIA ,CHINA	SANS IEC 60 335-2-76

MODEL#

Z114/Z114 (BETA)

ACCEPTED VARIATIONS

Z11/Z13/Z14/Z18/Z28 AC ADAPTOR: CHINA :CLASS III 20 mA, 12Vdc

where ! = Blank $ = Alpha # = Numeric @ = Alphanumeric * = Blank or Alphanumeric

CERTIFICATE NO :	000000087526/001	EXPIRY DATE:	04 Sep 2017
DATE OF ISSUE :	03 Sep 2014		
AUTHORIZING OFFICER :	Isaac Malapela		
DATABASE ENTRY NO :	87526	AUTHORIZED :	

This certificate is issued subject to the conditions attached overleaf

1 Dr Lategan Road Groenkloof Pretoria • Private Bag X25, Brooklyn 0075 • Tel: +27 12 428 5000 • Fax: +27 12 428 5199

"Protecting Health, Safety, the Environment and Ensuring Fair Trade"

INSTALLER DETAILS

Name .....

Phone No. .....

Date Of Installation .....

WARRANTY

All JVA products carry a **2-year warranty** against defective components and workmanship. The warranty excludes damage caused by acts of Nature such as lightning or flooding, power supply surges, rough handling, malicious actions or incorrect wiring.

Whilst every effort has been made to check that the information contained is accurate, JVA Technologies Pty Ltd will not be liable to loss or damage resulting from construction, operation or failure of any installation or system. Installation of security electric fences should be made by trained professionals with regard to the relevant local standards and workplace health and safety requirements.

Product Model purchased: ..... Serial No: .....

Customer Name: .....

Address: .....

.....

.....

Postal Code: .....

Tel. No: Cell: ..... Landline: .....

email: .....

Date purchased: ..... Invoice No: .....

Dealer Name: .....

Dealer's Stamp

Mail to your local JVA Dealer:
RSA JVA Service Department P.O. Box 13898,
Cascades 3202, Republic of South Africa • support @jva-fence.com

Z-RANGE

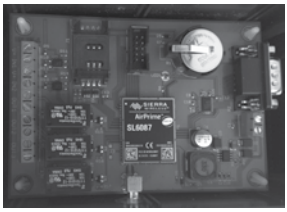
Z14 STANDARD AND BI-POLAR ENERGIZERS

Z18 STANDARD AND BI-POLAR ENERGIZERS

Z28 STANDARD 2-ZONE ENERGIZER

RANGE FEATURES INCLUDE

- ★ LCD voltage display
- ★ Powerful 4 joules per zone peak output energy
- ★ Designed to pass IEC60335.2.76 and EMC standards (reports available on request)
- ★ Wall mountable, robust enclosure with detachable PCB chassis for ease of installation and repair
- ★ Earth monitor input
- ★ Gate input
- ★ Key-switch
- ★ Keypad programmable
- ★ Lower-power mode
- ★ Entry/Exit delay from gate input trigger
- ★ Switched +12V outputs for Siren and Strobe (up to 30 Watts for 3 minutes)
- ★ Microprocessor controlled
- ★ Outputs may be wired for BiPolar fences (excluding Z28)
- ★ Multiple single-zone energizers can be wired as a group



GSM MONITORS AND CONTROLS JVA ENERGIZERS USING A CELL PHONE

WEB SERVER MONITORS AND CONTROLS ENERGIZERS VIA THE INTERNET

PERIMETER PATROL COMPLETE CONTROL SYSTEM MONITORING EVENT LOGGING

Customer Support

For assistance: If you have any questions or need further assistance, please call your nearest JVA dealer. RSA Tel. No.: 0861 782 349.

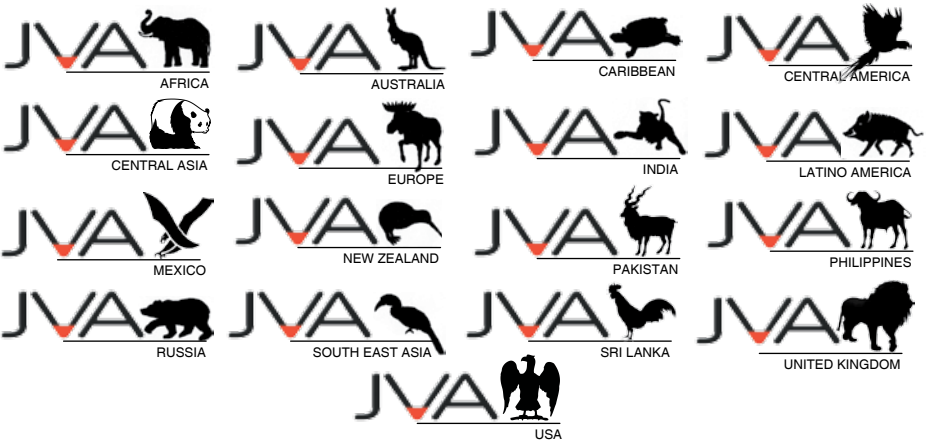
For service or repairs: If a service or repair is required, please package and label your energizer carefully and return it to your local JVA Service Centre.

For warranty repairs: Include proof of purchase, e.g. invoice.

Note: Repair centre details are displayed on the back cover of this manual.

JVA ELECTRIC FENCE SYSTEMS

JVA products are designed by JVA Technologies, Queensland, Australia and distributed to:



JVA RSA SERVICE CENTRES

Bloemfontein
36 Kolbe Lane, Oranjesig
Tel: 051 448 6695

Cape Town
Unit 15, Viking Business Park
Park Road (off Viking Way)
Epping Industria
Tel: 021 534 5056

Centurion
74 Cantonments Road, Lyttleton
Tel: 012 880 0222

Durban North
Unit B, 13 Kenneth Kaunda Road
(Old Northway)
Tel: 031 563 0274

East London
Shop 8 & 9, Paphos Park
Devereaux Avenue
Tel: 043 726 6652/60

East Rand (Jet Park)
Aerostar Business Park
219 Jet Park Road, Jet Park
Tel: 011 397 3507

George
Shop 3, 57 York Road, George
Tel: 044 874 0669/ 044 873 2958

Kimberley
29 Schmidtsdrift Road
Rhodesdene
Tel: 053 861 5631

Klerksdorp
72 Central Avenue, Flamwood
Tel: 018 468 8273

Nelspruit
Unit 4, 20 Rapid Street
Riverside Industrial Park
Tel: 013 752 7152/55

North Rand (Kya Sand)
174 Bernie Street, Randburg
Tel: 011 708 6442

Pietermaritzburg
51 Winston Road
Tel: 033 342 6722/27

Pinetown
Unit 1, 7 Suffert Street
Tel: 031 702 6351

Polokwane
9 Suez Street, Nirvana
Tel: 015 292 6273

Port Elizabeth
45 Mangold Street, Newton Park
Tel: 041 365 7178/9

Potchefstroom
35 Dr James Moroko Street
Tel: 018 297 1488

Pretoria
1185 Steve Biko Road, (977
Voortrekker Road), Wonderboom South
Tel: 012 335 4290

Rustenburg
Shop 7, Waterfall Mall
1 Howick Avenue
Tel: 014 537 2884

Somerset West
4 Broadway Centre
Urtel Crescent
Tel: 021 851 1978

Upington
Unit 2B, Industria Business Park
4 Progressus Street
Tel: 054 332 1458

Vanderbijlpark
5 Prime Business Park
Rabie Street
Tel: 016 931 0408

Vanderbijlpark Manufacturing (Pta. Wire)
18 Fairbank Street, NW7/
7 Elgar Rio, Elgar Street
Tel: 016 986 2144

Vryheid
Unit F, 153 President Street
Cnr. Hlobane Street
Tel: 034 981 0318

West Rand (Roodepoort)
599 Ontdekkers Road
Delaréy
Roodepoort
Tel: 011 472 8823

Nearest RSA branch: 0861 782349 • ***Website:*** www.jvasecurity.com • ***e-mail:*** support@jva-fence.com