



# **NRG 150**

User's operating manual



Made in Bulgaria

**In order to use the device for a maximum long time and without problems, as well as to be able to use all of its options, please read carefully the whole instruction manual and observe the directions in it.**

**Your NRG 150 is shipped with these parts:**

- Upper Pole Assembly – fully assembled, including upper pole stem with handle grip
- Middle pole assembly with pole lock
- lower pole - made of plastic in order to not disturb the work of the coil.
- 27 cm DD search coil
- electrical set box – made of extremely strong plastic, including 8 AA alkaline batteries or 10 rechargeable accumulators NiMH 1,2V/2800mAh.
- 220V automatic charger
- Operation user's manual

**Warranty card**

If any of these items are missing, immediately inform us or our authorized dealer where you purchased your detector.

Assembling the **NRG150** is simple and you don't need any special tools. Just mount the search coil on the lower pole assembly, connect the pole assemblies together, adjust the pole length, wrap the excess cable around the pole and plug the cable into the control unit. Finally adjust search coil angle to your preference and you are ready.

**NOTE:** Do not allow the cable to flop loosely over the search coil. Since the detector is sensitive enough to „see“ the tiny wires in the cable, a floppy cable can cause false signals as the search coil senses the moving wires.

CONTROLS:

**NRG 150** control panel:



- “**GROUND BALANCE**” – eliminates the signals of the ground mineralization.
- “**DISC**” – regulates degree of elimination of iron and unwanted objects.
- “**THRESHOLD**” – used for adjusting sound level and regulates depth of.
- “**ON / VOLUME**” – switches on the detector and adjust sound level
- “**SAT SPEED**” - (Self Adjustment Threshold) SAT Speed – adjustable rate beep on detection of metal objects.
- Button “**Auto GEB**” – turns on and off automatic ground balance.
- Button “**LIGHT**” – switch on and switch off LCD backlit.
- Jack “**Phones**” – used for head phones (one 3,5mm on the front panel, and one 6,3mm. on the bottom side of the box)

### **1. Assembling of the device:**

The bearing rod is assembled by inserting of the lower part into the upper one. Choose the desired length of the whole construction and the fixing clamp is tightened between both parts of the bearing rod. The lower part of the bearing rod is put with the opening between the ears of the coil and the plastic bolt is tightened by choosing the position of the coil to be parallel to the ground surface. The coil cable must be wind up tightly around the bearing rod and is switched to the socket of the box with electronic. Upon switching of the

cable of the coil to the socket on the box, tighten the well the metal nut of the coupling to the terminal of the box. Upon switching off, unscrew the nut completely and pull out the coupling without pulling or twisting the cable of the coil. This way, you will prevent the cable and the conductors in it from breakdown or short circuit.

The searching coil is approached to the surface of earth by paying attention to avoid presence of metals within its range.

NOTE: Detector may not work as expected indoors due to the high degree of metals used in modern construction. It is best to tune and practice outdoors to ensure stable, predictable results.

## **2. Switch on and work with NRG 150.**

1. Turn the “**ON / VOLUME**” knob to “**ON**” and adjust preference volume of sound. The display will momentarily show an opening screen which lists the software version.

2. Setting the “**THRESHOLD**” - While holding the detector a few feet above ground and away from any metal object, slowly turn the “**THRESHOLD**” knob until you hear a very slight audio tone through the speaker or headphones. This is the optimum set-point for the “**THRESHOLD**”. If the search coil is not in motion and not close to metal, the detector should be silent. A light “buzz” adjustment is recommended to insure optimum depth and maximum performance.

As “**THRESHOLD**” is in low position, as low is sensitivity. Too low of a threshold setting may cause very weak signals to not be heard. Too high of a threshold setting may cause operating instability.

3. You can work in manual or in automatic “**GROUND BALANCE**” modes:

### **- In manual ground balance mode:**

Search for and select a clear piece of ground or sand that does not contain any metallic targets. With the coil elevated at least waist high and away from any metallic target, slowly adjust the **THRESHOLD** control until a very faint audio threshold signal is heard.

Lower the search coil to within one-inch of the ground surface while listening to the threshold audio signal. If the threshold signal is high tone, the “**GROUND BALANCE**” control needs to be decreased (rotate counter clockwise). If the threshold signal is low tone, the “**GROUND BALANCE**” control needs to be increased (rotate clockwise). Keep repeating this step until threshold signal is the same within one-inch of the ground as it is in the air. Once this is accomplished, the detector is properly ground balanced.

When the ground mineralization is rejected, the detector can see deeper targets, and is less susceptible to ground interference.

While balancing the detector, you have to be sure there are no metal objects around the search coil. If it seems difficult or impossible to get little change in the steady threshold as the coil is lowered, you may be attempting to tone on top of a piece of metal. Move to a different spot on the ground and repeat balancing. Once the initial ground balance is completed, the detector is ready to be used.

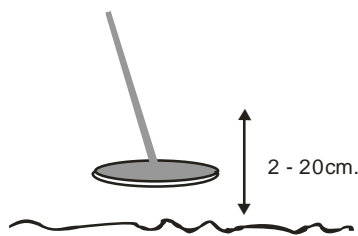


Fig. 1

A proper adjustment of the manual ground balance will enable a little more depth over automatic ground balance. However, an improper adjustment of the manual ground balance could and in all probability decrease the depth performance of the metal detector greatly.

- **In automatic ground balance mode:** push the button “**Auto GEB**” and you will hear a beep.

The „**GROUND BALANCE**” knob do not have to be turned on at that time!! If you sweep the search coil over non-ferrous metals (gold, silver, copper, bronze) a high-toned sound can be heard; and if you sweep over ferrous metals a low sound is heard. Without the ability to cancel ground mineralization, a metal detector could respond to mineralization as if it where a good target.

Always try to manual balance to the ground surface, and if it seem difficult or impossible to get little change in a steady threshold as coil is lowered, we recommend use “**Auto GEB**” regime. Use “**Auto GEB**” when you find yourself in a situation that does not allow manual „**GROUND BALANCE**” to be adjusted correctly.

The ground conditions are really bad with mineralized ground, hot rocks and iron trash, so your sweep speed must be reduced for best results.

“**Auto GEB**” is recommended when searching in wet salt sand too.

*NOTE: Under some severe mineral conditions ground balancing may not be possible. The best result you will get if searching when the soil is dry.*

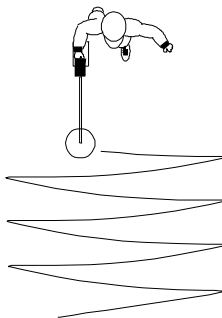


Fig.2

**NRG 150** working in dynamic regime - searching metal objects is made by moving search coil toward ground surface – fig.2 , fig.3

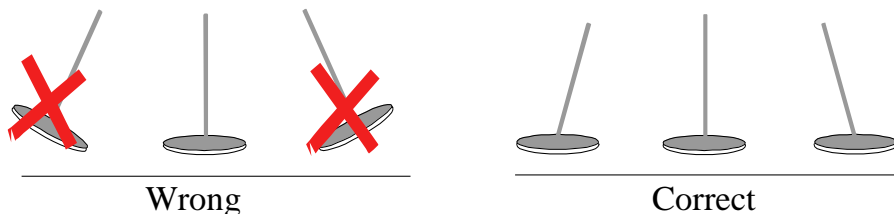


Fig.3

Start swinging the search coil in wide sweeps that overlap each other, as near to the ground surface as possible-Fig.2 The search coil should not touch the ground during your sweep. The pole length should be adjusted to allow this without having to lift the detector with your elbow or shoulder. The search coil should rest about one inch above the ground while you are standing erect. The angle of the search coil should allow the bottom to be parallel to the ground.

If you experience false signals or constant beeping or popping and you are not near common sources of electrical interference, push "**Auto GEB**" to switch on automatic balancing and/or reduce Threshold (counterclockwise) slightly and try again.

As a search coil is swept over the ground, ignore the display and concentrate on the sound the detector makes. As a search coil is passed over a metal that is likely iron trash, the sound will be low tone (245Hz). Once familiar with the sound typical iron produce, an operator may pass over such targets without consulting the display indication, and continue searching, saving more time.

As a search coil is passed over a metal that is likely good, high tone sound will be heard (700Hz). A good target typically produce a longer, more solid sound, no partial signals and mixed signals: high-low tone. Once a smooth solid signal is heard, sweep the search coil over the target several times and look at the display indication.

When a metal target is detected, probable target type will be indicated at the top of the LCD screen. The Upper Scale, where the VDI cursor is illuminated when hunting, consists of eight (8) graphical segments for more precise Target ID and discrimination.

- **First** segment indicates the metal is likely iron or steel, such a nails, steel bottle cap, or iron relic. At the same time, the sound is low tone (if not switch on **IRON MASK** mode). Dig if only iron/steel is of interest.

- **Second** segment indicates of small foils. However, some very small gold jewelry can also be indicated by this segment. You may want to dig this target in areas where small gold jewelries are suspected.

- **Third** segment indicates small gold coins, rings, medium jewelry, and small ancient coins. The most desired metal - gold, usually displayed in this segment. However, large and solid foils can be indicated by this segment too.

- **Fourth** segment indicates most likely old bronze coins, medium to larger gold jewelry or gold coins. However, aluminum pull tab can also be indicated by this segment.

- **Fifth** segment indicates medium copper or zinc coin, or large aluminum screw caps. Sometimes, a large gold rings or coins can be indicated by this segment.

- **Sixth** and **seventh** segment most often indicates small silver coins, also big bronze or copper coins.

- **Eight** segment almost always indicates high purity silver, big silver coins, but sometimes, old big bronze coins and other items of bronze without impurity. Each of the 8 segments operates independently. It can't be displayed simultaneously two or more segments.

Often when detecting very old rusty iron objects and some iron with impurities of nonferrous metal such as galvanized steel, or iron bottle caps, indication on the 1-st row jumps from the first to the last segment, and vice versa. This is always a signal that is detected magnetic object. Such items of dubious and mixed signals more accurately identified as iron, if you detect with the edge of a search coil than if you are just below the center of the coil.

Highly mineralized soils have a greater impact on the detector and thus the accuracy of VDI. In high mineralization detected signals can be changed with graphical and digital indication, than when tested in air or in low mineralized or sandy soil. Usually such places VDI is shifted to the left. For example, if one normal metal object is detected with the "sign" of the fourth or fifth segment, if buried in such mineralized ground, indication may be the second or third segment. So whenever in doubt of the display, check the detected object, and so over time you will learn to some extent to recognize what has detected metal detector!

When a metal target is detected, along with the **VDI** cursor of the first row, you can see their common **VDI** numbers (0-99), on the bottom row on the screen. "**VDI** = ".

**VDI** (Visual Discrimination Indication) is a digital indication which depends on the metal targets exact alloy, size, and shape. The reference label below the display provides a comparison of known targets and their common VDI numbers. Different metal targets may share the same VDI numbers based



on their electrical characteristics. VDI numbers from 0 to 99 are available and cover the entire range of alloys and sizes.

Whenever detection of metal objects, initially concentrate on the sound signal, so you can better determine the exact location of the object.

3. “**DISC**” knob is used to eliminate any target that you do not want the detector to audibly respond to.

If you need to eliminate more ferrous metals over the ground, the “**DISC**” control must be set in a position over “**Rings**” or “**Coins**”. If you come upon non-ferrous metals /gold, silver, copper, bronze/ a high sound can be heard; and if you come upon ferrous metal a low sound is heard. If the “**DISC**” control is in low position - “**Iron**”, every ferrous object will be signaled with high tone (like non – ferrous). If the soil is too mineralized we recommend the “**Foil**” or “**Iron**” position.

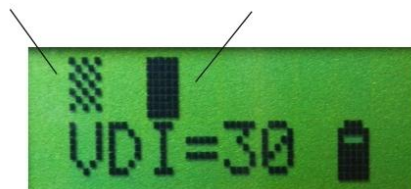
Some trash metals such as pieces of lead, tin, cannikin or pot metal will produce a good sound regardless of the **DISC** position.

#### 4. **IRON MASK** mode.

With the trigger on the hand grip in the forward position, you can switch on **IRON MASK** mode. Indication that you will see the display - the first segment will be blacked out with the symbol **IRON MASK**.

When you switch on this mode, will be disabled low tone on detection of a magnetic metal. This mode is preferable when working in areas heavily contaminated with iron trash.

*IRON MASK symbol*      *VDI cursor*



**Note:** If the potentiometer "**DISC**" is reduced to a minimum, the detector will detect ferrous (magnetic) objects with high tones, but will not display an indication of the type of metal, as it would be the first segment, and in this mode it is indicated by a symbol for **IRON MASK**. Therefore it is preferable when use mode **IRON MASK**, potentiometer "**DISC**" to be increased to at least position **FOIL** or more.

When switch off mode **IRON MASK**, i.e. return the trigger in the middle position, the detector will work again in the Two Tone mode - high tone for non-ferrous metals and low tone for ferrous metals. At the same time, will disappear and the symbol for **IRON MASK** on the first line of the display.

### **5. Searching:**

**NRG-150** can work with 2 search coils - 27 cm. and 36 cm. Large 36cm. search coils are used to detect large and bulky metal objects deeply buried to about 1.2 to 1.5 m maximum, and a small probe is used to detect and precisely locate single coin depth of about 30-40cm. or a large metal objects at depths up to 1 to 1.20 m (depending on size). Also, smaller coils can be used in bushes, bumpy and uncomfortable search location where it is impossible to use large coils.

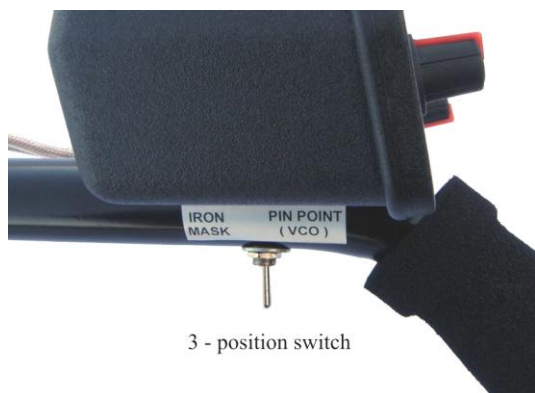
The greater the size of the search coil, the greater will be the depth of detection, but with the increase of the coil size, will be hard to detect very small metal objects. The difference in depth of detection using large coils is appreciable for large metal objects such as a large metal object is, the greater the difference in depth of detection between large and small search coils! I.e. if the difference in depth of detection of large and small coils for medium coin is 3-4cm., the difference in depth of detection as metal cup or pot of coins is about 15 cm. Therefore, the use of large coils makes sense if you look bulky items and it is important to find the best possible depth. Disadvantage of larger sensors is their size, require a flat and clean places to look. In contaminated areas with lots of scrap metal is advisable to use smaller probes.

To test for studying the characteristics of the device, you can make polygon where buried various metal objects at different depths. Also you can put to the

ground sizes metal objects. Move the search coil at different heights above them and you will learn to evaluate the size and depth of the metal object depending on the intensity and duration of the sound. After a while you will learn to recognize objects that lie just below the surface or at depth. For example, the signal from a small object located near the surface of the earth will disappear or decrease significantly if you raise the coil, while if the object is large, even the deep signal it will hardly change if you raise the coil. Also, note the duration and frequency of the sound mode when plugged PinPoint (VCO).

## 6. Pinpointing a Target

A good method for pinpointing is "X-ing" the target with the search coil. Remember that the target's response sound is always greatest when the target is directly under the center of the search coil.



To "X" a target, squeeze and hold the trigger located on the handle and sweep the search coil over the target from side to side and then from front to back until you can identify the center of the X— the spot on the ground where the target response sound is the greatest. Use loudest tone, display level indication – bars on the 1<sup>st</sup> row, to indicate targets exact center. Pinpointing a target is probably best done by "X-ing" as well. Remember that the detector will beep just as the target passes under the center of the search coil. Slowing the sweep speed down will help you pick out the center of the X, but remember that the search coil must always be moving slightly for target detection.

Another easy method is to sweep the coil from side to side across the target in very short sweeps as you slowly move forward and backward across the target. Slow down the sweep rate and shorten the sweeps until you just barely get a response at one spot. The target will be directly below the coil center at this response time – fig.4 Then turn 90 degrees and sweep the coil side to side noting the center from this new direction. "X" marks the spot that you need to dig. Where the two loudest beep intersect, is the center of the target. Release the toggle switch to the center position before continue to search

You can practice with a coin on top of the ground to become acquainted with this technique.

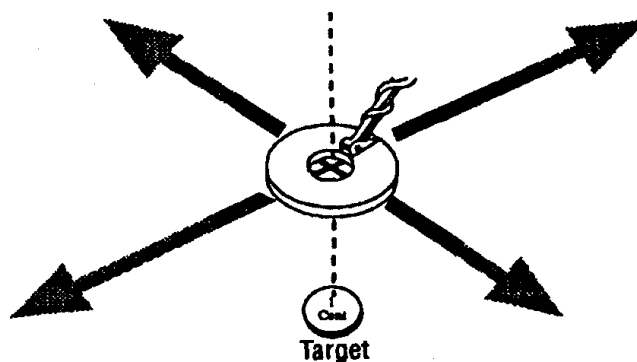


fig.4

### 7. The detection depth depends on the following:

- size, shape and location of the object in the soil. The bigger the reflecting surface of the object the deeper it is to be found;
- soil composition and mineralization level – the drier and more homogeneous the soil the easier it will be to adapt the device and for the device to detect deeper. Under stones, dry sand or in clay utensil, metals are easier to be found than in freshly dug out or damp soil.
- the longer the object has been in the soil the easier it will be to be found as a result of the good contact with the soil.
- type of detecting coil. The bigger the diameter of the coil the deeper it will be able to detect metals.
- operator's experience and skills.

You can do field tests by yourself using the device if you bury different metal objects in different depth but you should leave them **in the ground for at least 3 months**. Thus the test results will be more reliable. You should mind the soil type and the moisture composition in it. Best results are received when the soil is dry.

Freshly-buried targets will not produce the normal depth and discrimination results of targets that have been naturally lost and settled in the ground. It may take a number of years for freshly-buried targets to respond at true depths and discriminate accurately.

The best way to determine true detection depth is to use real search conditions. To reduce false signals when searching in a very trashy ground, scan only a small area at a time using slow, short overlapping sweeps.

Keep the search coil moving at a comfortable rate. If you walk too fast, you can't overlap your sweeps and you will miss a lot of ground. Also if you sweep too fast, you will lose sensitivity and miss the deep targets

## **8. Using a headphone**

You should always use a headphone whenever you search with your metal detector. Headphone is especially useful in noisy area, such as the beach and rear city area. It enhances audio perception by bringing the sound directly to your ears while masking "outside" noise interferences. You shall be amazed at how much better you can hear the detector signals with the headphone than you can with the speaker alone. Using head phones also save battery power.

To connect a headphone to the detector, insert the 3,5mm. headphone jack into the "**Phones**" on the front panel, or 6,3mm. headphone jack into the socket on the bottom of the box.

**NOTE:** The detector internal speaker will be disconnected when you connect a headphone.

## **9. Charging storage batteries and indications for their status.**

If a light “**Low battery**” appears while using the detector that means you have to stop using it and recharge the batteries as follows: put the jack of the charge device into “**CHARGE**” nest and place the device into electric net of 220V.

The charging is automatic and begins when the device is **SWITCHED OFF** and you plug the charger into the charging jack of the back panel of the device. The jack cage is “-” and the middle terminal is “+”.

Charging depending on the level of discharge of the batteries. It’s not necessary to keep eyes on charge device, because it is supplied with automatic turn off and batteries couldn’t be damaged no matter how long they will stay in the charge device. The charging continues till the moment when the batteries reach their maximum capacity When reaching their full capacity the red light on the charger will not light any more.

When they are ready pull the device out of the electric net and unplug the jack out of the “**CHARGE**”

**NOTE: Don’t unplug the charger if charge process is not finished. Always charge device's storage batteries ONLY with the paired chargers to it. Thus you will prevent damages or confusion between “+” and “-” because the use of other chargers or adaptors may lead to irretrievable damages in the batteries!**

## **10. Possible problems during exploitation of NRG 150:**

1. When switching it on you can not hear a sound, no any indication on the LCD that the device is switched on. It might indicate for:

-storage batteries are dead (usually after a long period of time). Charge the batteries with the charger. If the problem is not solved contact the service-station (office) of the company manufacturer or the local distributor.

-the accumulator block consists of 10 elements **1,2V / 2800mAh** connected in series. If just one of them is damaged the connection between them will be destroyed and practically the device will be left without power supply.

2. The working depth is significantly shallower than the normal. It might indicate for:

-storage batteries could be dead – charge the batteries with the automatic charger. If you can not solve the problem contact the service-station (office) of the company manufacturer or the local distributor.

3. During detection the device does not work stable, makes strange sounds which are not due to a metal detection. It might indicate for:

- irregular electromagnetic external interruptions.  
- problems with the aerial cable – disconnected conductor, a short circuit or bad connection in the coupling.

It is possible after continuance work and many times of switching on and off the cable's coupling to the jack box the contact between them to be destroyed. There are 2 terminals with sight holes in the jack of the back panel of the device. Put something sharp like a knife or a screwdriver in the sight holes and make them wider. Thus the coupling will fit better into the jack which will improve the contact between them. It is possible in the presence of some kind of dirty like dust or moisture to clean the terminals with cotton-wool and alcohol. If you can not solve the problem contact the service-station (office) of the company manufacturer or the local distributor.

4. The device works only with headset and when working with amplifier you can not hear a sound. Usually that happens when the headset jack is damaged. In that case contact the service-station (office) of the company manufacturer or the local distributor to change the jack.

5. Batteries charge quickly and after that during the working process they go dead quickly. Usually that happens when the batteries are really old and need replacement. Contact the service-station (office) of the company manufacturer or the local distributor for change of the storage batteries.

## **11. GUARANTEE**

The detector **NRG 150** is offered with 36 months of guarantee of electronics, labor and materials used, for harms which are not caused on purpose or irresponsibly.

The warranty does not cover rechargeable batteries!

We can upkeep your device after period of guarantee if it is necessary.

## **12. Protecting your investment**

Often detectorists are disappointed when their new detector slowly becomes less and less responsive and seems to have lost some of its original peak performance. You can help avoid this from happening to your detector by following these basic care and protection guidelines:

- ⇒ Operate your detector exactly as recommended in this Operator Instruction Manual.
- ⇒ The search coil cable is hard-wired to the search coil and protected by a strain relief. It is very important that the strain relief remains intact and should *never* be adjusted or tampered with.
- ⇒ Keep cables properly wound around the pole stems and protect them during use. Floppy, pinched, or cables that become snagged during use may short, causing erratic noises or unnecessary replacement of the search coil.
- ⇒ Sweep the search coil carefully, especially when using around rocks and building foundations. Avoid hitting the search coil against hard, solid objects and surfaces.
- ⇒ Keep your search coil slightly off of the ground during the sweep, especially when using in gravel or hard, rocky dirt.
- ⇒ Remove and clean out scuff covers periodically to avoid buildup of mineralized dirt particles which will affect performance.
- ⇒ The search coil is waterproof and can be submerged in either fresh or salt water. After the search coil is used in salt water, rinse it and the lower stem assembly well with fresh water to prevent corrosion of the metal parts.



- ⇒ The search coil is waterproof but *the electronics are not*, so always prevent any moisture or water from entering the control housing and never allow the cable connector to become submerged in water.
- ⇒ If working in or near water, or if there is a possibility of rain, use a protective weather resistant pouch or plastic bag to cover the control housing. Make sure it can "breathe" in order to ensure against condensation buildup inside.
- ⇒ After each use, clean the detector with a soft cloth to remove dust, moisture, or other contaminants.
- ⇒ When transporting the detector in a car during hot weather, store it on the floor of the passenger compartment if possible. Using a carry bag gives additional protection. In any case, never allow the detector to roll around unprotected in the trunk or back of a pickup truck.
- ⇒ Protect your detector from dust, moisture, and extreme temperatures during storage.
- ⇒ Treat your detector as you would any sensitive electronic instrument. Though ruggedly constructed and designed to withstand the demands of normal treasure hunting, proper care is essential.

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*The Manufacturer (trader) does not bear any responsibility if you use the device in violation of the law, on archeological or forbidden for search places as well as on private property without the knowledge or the permission of the owner.*

*Protect the environment and always fill back in the holes you have dugged out!*