

Operating instructions



## **PULSE AR III**

**(Pulse induction metal detector)**



**KTS-Electronic**  
**Pulse Induction**

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## Electronic unit

The electronic unit is accommodated in a sturdy quality housing. On the front there are 4 controls and the analog display.



**MODE:** The MODE rotary button can be switched to four different positions:

**OFF:** The equipment is switched off.

**BATTERY (battery control):** In this position the equipment is switched on, simultaneously you can check the charge of the rechargeable battery. Full accu shows up as 100 on the display or more.

**ALLM. (all metal search):** In this position the metals are not examined for their conductivity - all metals are indicated without distinction acoustically and optically by the display. This position has the advantage of the highest sensitivity search, at the same time the depth of the object is found, which is represented on the display. The smaller the pointer excursion, the more deeply the metal is found. Also atop of the pointer scale, the shape of the metal can be determined.

**DISC (metal distinction):** In this position the frequency discriminator is switched on. The number of the kind of the found metal is computed and shown on the display. By the display and the indicated kind of metal number, the kind of the metal can be determined with some exercise and experience. The kind of metal number can be measured between 0 -100 depending upon kind of metal.

**VOLUME (audio gain control):** With the VOLUME rotary button the volume can be adjusted.

**FREQ.:** You can adjust the desired position with the MODE rotary button and adjust the volume. You should adjust the frequency in such a way that a slow ticking frequency becomes perceptible. A fine frequency adjustment stands for a sturdy swelling clay/tone.

**RESET:** The RESET key is an automatic null balance by push of a button. After switching on, but before beginning with the search, the RESET key should be pressed briefly. After the replacement of the coil the RESET key must be pressed, so that the new coil is adjusted. In addition the RESET key should be pressed after occurrence of a spurious signal.

**Light emitting diode:** In the DISC position the conductivity of a metal is seized. As soon as the DISC diode lights up and the pointer in a certain position, the kind of metal can be read. The conductivity value and the DISC light emitting diode are indicated until the searchcoil is removed from the metal.

## Back of the electronic unit



**Female connector for coil and battery charger:** The female connector of the coil is on the left side. The wall plug of the search coil is put simply into the female connector. Before remove the plug, the lever under the connection beech should be pressed, only then can the plug be pulled out.

The female connector is compatible with all PULSE AR III search coils.

The search coil female connector is simultaneous the female connector for the battery charger. For loading the accus, put the plug of the battery charger simply into the female connector of the coil and control the loading procedure. The red light emitting diode indicates the charge procedure. The green light emitting diode indicates the end of the charge procedure. Charging with the high-speed battery charger takes approx. 3 – 4 hours afterwards the load plug should be removed.

The wall plugs of the battery charger should be removed before storage.

**Headphone female connector:** You can use each commercial stereo headphone with a 6.3 mm jack plug. With the use of the headphone the loudspeaker is switched off. More suitably, light weight headphone is supplied with this equipment.

## The search with the 25 or 45 cm search coil



1. Slide the lower plastic tube into the middle aluminum pipe and connect these with the upper aluminum pipe.
2. Hold now the center piece, while you adjust the fixing bolt in the clockwise direction with your free hand.
3. Tape the cable of the search coil around the lower pipe and insert the plug into the fitting bush at the electronic part for this purpose. The electronic part is in a special protection bag. The plug should be inserted by the lower opening of the protection bag.
4. The search coil should be kept parallel about 2 to 5 cm over the ground.
5. After switching on and adjusting the volume and the frequency the null balance of the soil can be made by the RESET key.
6. For the soil balance adjustment you keep the coil about 5 cm over the soil (in a metal-free place) and press the RESET key for about 3 seconds. With the soil balance adjustment the influences of soil minerals in the search coil are neutralized, thus fewer incorrect signals are produced.

7. Repeat the soil balance adjustment in every new place, so that the adjustment is accomplished correctly. Particularly when the soil-layers change, e.g. at excavations, this procedure should be repeated.

## 1 x 1 m Search Coil (Big Coil)

### Assembly

The 1x1 m search framework is available in 2 different variants.

The search cable is firmly embedded in a PVC pipe (eightfold divided). In this case, the pipes must be put simply together and be carried with the two hanging belts (without metal parts) (s. illustration).

The search cable is not firmly embedded in the pipes. In this case you should plug together the PVC pipes and fasten the cables to the pipes with a tape. The advantage is in the fact that this variant can be transported more easily.



### Search with 1 x1 m Coil

The search framework consists 4 meters of special cables, which are fastened in or to the pipes. It is best suitable for the search for larger objects, which one assumes to be found in a spacious area. With the help of 2 persons, you get reach the goal earlier and more comfortable. A further advantage at this large coil is the fact that smaller disturbing metal parts are not indicated. The search coil can be carried in between 20 - 50 cm over the soil. The greater the distance to the soil, the lesser the indication of small to medium sized metal parts.

Your PULSE AR III was created in such a way that swivel no brisk of the search coil is more necessary. Keep simply the search probe flat and parallel to the soil, and determine your search speed individually.

After you switch the device on press the RESET key for a short moment and adjust the **FREQ.** in a way, that a slow ticking signal becomes audible. This signal should resemble the ticking of a second hand.

With each new adjustment press the RESET key, in order to reach a null balance.

With the rotary button **VOLUME** you adjust the desired volume.

You can select from two search methods:

**ALLM Search method:** For this method set the MODE automatic controller to the ALLM - position. With this search method all metals are indicated. By the ALLM - search method you get more performance from your equipment, however no metal distinction is possible.

**DISC search method:** Set the MODE automatic controller to the position DISC. With this search method a metal distinction takes place. As soon as the DISC - light emitting diode lights up, the pointer stops. By the height of the pointer excursion the kind of metal can be determined. Iron metals reach a value up to 60 on the scale, aluminium, lead, copper up to 30, gold reaches values of over 80.

### **Exact localization of metal objects:**

Your PULSE AR III works with the pulse induction searching system and is able to detect, without setting the search coil in motion. With approximating the search coil to a metal object, the frequency of the clay/tone is increased. As soon as the search coil is exactly over the object, the highest clay/tone is reached.

With this method the exact place of discovery of the object can be located. By the clay/tone duration the form of the object can be determined. For example, a long lasting high clay/tone stands in longitudinal direction for a narrow object, e.g. a pipe. A high clay/tone in any direction indicates a circular object.

**Note:** Please note that you do not carry metal articles with on you body when in search process. This could cause a wrong adjustment when pushing the RESET key and can produce false indicator effects whilst the search process. In addition this can cause a wrong discrimination or metal distinction.

During the search it is to be made certain that the clay/tone remains constant, otherwise a wrong adjustment by magnetic fields may occur. Especially with the search with the 1 x 1 m coil (search framework) be certain that when an instable clay/tone appears the RESET key is pressed. This must be accomplished in order to prevent unwanted interferences by geomagnetism.

Strongly magnetized soils affect large search coils (search frameworks) more than small frameworks. In the search with the large coil be certain therefore that the search coil approx. 15-50 cm (depending upon need) is kept parallel to the soil and if possible without jerky movements.



### **Important notes to the RESET key:**

The function of the RESET key is very important and should be operated after everyone of the following changes.

1. After each switching on of the metal detector
2. After each change of the mode function
3. After each conversion of the search coil
4. While the search, if the clay/tone becomes instable by bad soil conditions or geomagnetism.

### **The search procedure**

With the search and particularly before the excavation the following factors should be considered, in order to arrange the search more goal-oriented and with it more successful.

1. Change of the clay/tone (frequency)
2. Intensity of the clay/tone
3. Duration of the clay/tone
4. Pointer excursion
5. Conductivity number

The change of the clay/tone is the first sign for the detection of a metal object. Before the excavation, however different factors should be analyzed and the own search experience to the assistance be pulled.

The more intensively the clay/tone, the more largely or more near lies the metal object. While the high search clay/tone rings out, the search coil in the close environment should induced, around the approximate form of the metal object to determine .

The pointer excursion works in the all metals position exactly the same as the clay/tone. Simultaneous observing of clay/tone and pointer excursion leads to the better analysis of the find object.

After by the intensity of the clay/tone and by the pointer excursion the size of the object was determined and with the simultaneous movement of the search coil the probable form of the object, can be begun with the conductivity recognition and metal distinction.

For the identification of the metal object the DISC position should be selected, after manipulation of the RESET key and the renewed FREQ. attitude hold the search coil over the soil and observes the announcement.

Your PULSE AR III have a metal distinction. In addition the inserted microprocessor computes the conductivity of the metal object and indicates these on the similar announcement. Your PULSE AR III were developed in such a way that no swivelling of the search coil is necessary. This proves during the depth detection as particularly helpful.

For the identification of a metal object a weak clay/tone is not sufficient. So that the conductivity of the metal can be computed, it requires a signal with high intensity. As long as the search coil on the located metal object is, the conductance number is stored and indicated.

We recommend to locate first with the sensitive search mode ALLM. the finds and only if a clear acoustic signal to be heard are to the DISC mode to switch.

Hold in addition the search coil on a constant height over the soil and press the RESET key approx. 2 seconds long. Move the search coil over the located metal object then again. As far as the acoustic signal achieved its highest intensity, the DISC light emitting diode will shine and on the announcement the conductivity of the metal will indicate.

Compare the indicated conductivity number with on page 3 indicated the values, in order to determine the kind of metal of your find object.

The indicated values are approximate values, which can be completed by your own search experience in your search area.

For example a large iron sheet metal of 10 to 10 cm the value 40, for a gold sheet metal equal in size the value 50 is indicated and for a silver sheet metal the value 100 will be indicated. In change of form and size usually in addition, the indicated values change. Your own search experience will help you to identify your find more exactly.

**Note:**

**So that no wrong conductivity values are indicated, is absolutely necessary after mode a change-over a renewed soil balance attitude. With manipulation the RESET key is to be made certain therefore that no metal part is in the soil.**

## **Incorrect signals**

With the development of your PULSE AR III special value was put on stability and fail-safe characteristic, so that during the search if possible few disturbances arise. Despite the multiplicity of filters and modulators it is unfortunately impossible that certain soil conditions cause disturbances, which can affect your measured values. Incorrect signals can occur except by a wrong soil balance attitude by the following effects:

1. Ferric oxide: By magnetic ferric oxide soils the conductance of the located metal can be falsified.
2. Anomaly effects lead to the fact that large iron metals are indicated as precious metal.

3. Small articles from bronze than iron are partly indicated, an accuracy of the measured values is therefore ensured starting from 5 x 5 cm find size.
4. The measured values can be falsified, because in the proximity of the located metal object other metal parts are.
5. Strongly magnetic perturbative fields within the living range and in the proximity of ground cables can do special with use of the large search coil the measured values to affect.
6. In the proximity lying radio transmitter, often lead to disturbances, during the search.
7. Strongly magnetic fields, particularly in the proximity of high voltage masts, can cause disturbances.

## Search coils

To its PULSE AR III there are different search coils, which are suitable for certain employment of purposes in each case.

### 25 cm search coil

For the search for small articles, e.g. coins particularly the small search coil with 25 cm diameters is suitable, since it has a higher penetration depth. Besides arise fewer incorrect signals, therefore it is particularly for the search in closely settled areas advisable the small search coil to use.



### 45 cm search coil

For the search for medium sized and large metal objects the 45 cm coil is in the best way suitable, besides it offers the advantage of the brisker search.

### **Cylinder search coil**

The cylinder coil is suitable by its dimensions of 5 x 20 cm special for the search in close areas. The probe is supplied alternatively with 5 or 10 meters of cables.



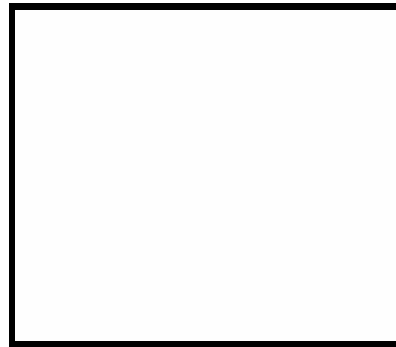
### **1 x 1 m PVC search frame**

The provided 4 m special cables are fastened alternatively in or to that 1 x 1 m PVC framework. The search framework is usually used for the depth sounding after medium sized and large metal objects. Indispensably for the search for large metal parts in larger areas. Besides small scrap iron parts become automatically filtered.



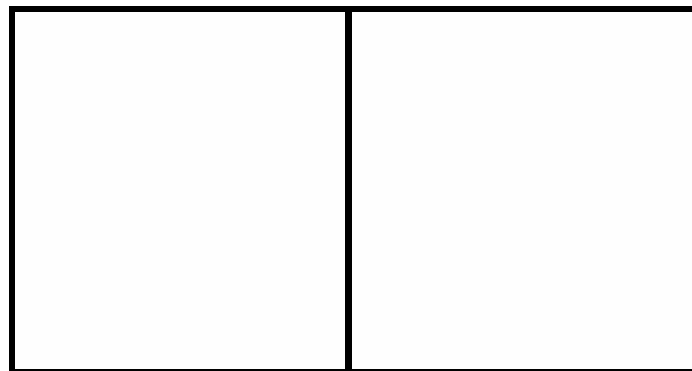
## Cable coil with 8 m extent

The cable coil is supplied without frameworks and is thus versatile usable. Owing to the pulse induction technology the 8 m cables can be developed easy to the desired search coil. By the small weight and the small dimensions is simple the cable coil to transport.



## 1 x 2 m search coil

This search coil is a compensation probe. Through e.g. high voltage masts develop strong magnetic fields, which can lead to disturbances. When using this probe disturbances are neutralized, without the search achievement is reduced.



## Accu and battery charger



The strong pulse achievement are supplied by inserted 2000 mA NIMH accu, which can be loaded with the high-speed battery charger within 3 - 4 hours fully. With a normal battery charger the loading procedure amounts to approx. 12 hours. The actual working time amounts to, depending upon coil size and use of headphones approx. 8-12 hours.

The loading procedure is indicated by the red light emitting diode and the end of the loading procedure by the green light emitting diode. After each loading procedure the lead for the battery charger should be removed.

An additionally available mobile part, makes a loading of the accus in the car possible.

## Care

Your PULSE AR III does not need much care, yet there are some points, which should consider you, to receive in order its optimal ready status.

Avoid extreme temperatures, since it is not to be excluded that electronic construction units are damaged thereby.

Invert a plastic bag over the electronics housing, as soon as you come into rains, nebulas or dust.

Always hold your equipment clean and dry and wipe you off sand and dirt.

## Reference

Metal detectors produce magnetic fields in the search coil and can in the closer environment of certain industrial plants or electronic devices, which produce a strong magnetic field in higher frequency ranges (starting from 100 MH), for disturbances cause. Your equipment is adjustable under these circumstances functionally, however no more in air so that a quiet sound becomes audible.

## Detection depth of PULSE AR III

object size	25 cm probe	45 cm probe	1 x 1 m probe	2 x 2 m probe
10 x 10 cm	65 cm	75 cm	100 cm	120 cm
25 x 25 cm	100 cm	130 cm	180 cm	230 cm
50 x 50 cm	120 cm	160 cm	250 cm	290 cm
1 x 1 m	160 cm	220 cm	320 cm	430 cm
max. search depth	220 cm	280 cm	480 cm	580 cm

all depth data in the medium air

Object: Iron

### Remark:

- With the 25 and 45 cm search coil you can also seek out smaller metal objects, e.g. coins, depending upon size up to a depth of 40 cm.
- For metal objects, which are buried during a long period in the soil, the depth achievement up to 20 % increases.
- The small search coil are in such a way conceived that perpendicularly standing metal objects in the center of the coil and horizontally lying metal objects at the edge of the coil are better sought out.

## Technical data

### Electronic unit

Dimensions: approx. 198 mm x 157 mm x 62 mm

Weight: inclusive inserted accu approx. 1100 g

Current supply: inserted NIMH Akku 12 Volt / 2 Ah

Actual working time: approx. 10 hours enterprise

Battery charger: normales battery charger (load time approx. 12 hours)

Autoload cable: external (connection at the cigarette lighter)

### 1 x 1m search coil

Dimensions: eightfold, inclusive transportation bag divides,  
approx. 60 cm length

Weight: total weight inclusive transportation bag approx. 1.2 kg

## Scope of supply

### PULSE AR III Combi



Complete width unit equipment with 3 coil, consisting of:

- Electronic unit with inserted accu, padding ash and stretcher belt
- 1 x 1 m search framework eightfold detachable inclusive carrying bag
- Battery charger
- Light Stereo headphones
- Stretcher suit-case
- German or english operating instructions
- incl. 25 cm + 45 cm + Cylinder probe and Telescopic Pole

### PULSE AR III Compact



Complete width unit equipment with 1x1 m search framework, consisting of:

- Electronic unit with inserted accu, padding ash and stretcher belt
- 1 x 1 m search framework eightfold detachable inclusive carrying bag
- Battery charger
- Light Stereo headphones
- Stretcher suit-case
- German or english operating instructions

## **Accessories**

### **Extra available accessories:**

- 25 cm diameter search coil, waterproof
- 45 cm diameter search coil, waterproof
- cylinder coil with 5-10 m cables, waterproof
- Universal cable coil with 8 m extent
- 2 x 2 m search coil
- Telescope seaweeds for 25 und 45 cm coil
- replacement accu ( 12 Volt, 2000 MA- NIMH)
- Car load cable

**With questions or notes we are to you gladly at the disposal.**