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# PULSE AR III

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Metal Detector  
(PI)

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KTS-Electronic GmbH & Co. KG  
Germany

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# 1 Introduction

Dear customer,

Congratulations on your purchase of the professionally-built metal detector PULSE AR III.

To avoid possible operational errors please read this instruction manual with due care.

We wish you much success with your new PULSE AR III and will be at your disposal, if any questions should arise.

Your KTS Electronic Team

## 2 Scope of delivery

### PULSE AR III Combi (depending on scope of delivery in set included)

- Electronic unit with integrated rechargeable high performance Li-Ion battery, leather bag with shoulder straps
- 25 cm (10") and 45 cm (18") searchcoil and telescope bar
- Cylindrical coil, 5 cm Ø
- 1 x 1 m (3.28 x 3.28 ft) search frame, 8-fold demountable (incl. cable coil and backpack)
- mobile quick-charger and additional inverter with car charger cable
- facile stereo headphones
- case
- User's manual



### 3 Electronic unit

The electronic unit is stored in a hard-wearing box. Besides the display 4 control elements are located on the front.



The menu knob can be switched to four positions:

#### **ID:**

In this search mode the discriminator comes into operation. Thereby an optical and acoustical discrimination takes place. The various metals are signaled through differing tones and conductivity values.

#### **AM (all metal mode):**

All metals are indicated acoustically and optically through the value number (without discrimination). The metals are not tested for their conductivity.

This position has the advantage, that you can detect with highest sensibility and through the value number one can evaluate the object's depth position. The lower the value number, the deeper the metal object is hidden. The object's shape can also be identified.

#### **BAT:**

Scale to control the battery condition. If display shows a value of approx. 100 the device is fully charged.

**OFF:** Inoperative

#### **RESET:**

Automatic zero balance. By pressing the RESET-button the device is aligned to the respective ground surface.

#### **FREQ.:**

Frequency setting controller – the smaller the item you are searching for, the smoother the adjustment must be.

#### **VOLUME:**

Volume control.

## LED:

The optical reference to a metal in the AM and ID mode is shown through the blue LED. The green LED indicates the frequency pulse.

## Back Side:

At the back 3 connection sockets are located:



### 1. Socket for coils

The connector for the coil is left-hand sided. The plug of the searchcoil has to be plugged into the socket. Before removing the plug, the jack must be pressed; only then it is possible to pull out the plug. The connector is compatible with all searchcoils.

### 2. Socket for charger

### 3. Headphone socket

Any commercial headphones with 6.3 mm jack can be plugged. If you use the headphones, the speaker is turned off. Matching, light-weight headphones are provided.

## 4 Search process

Please absolutely note the following:

- Avoid conducting overhead lines
- Do not use cell phone during operation
- Do not carry out measurements during thunderstorms
- Protect device from wetness and high humidity
- Only a fully charged battery guarantees a trouble-free operation.
- For the process or charging only use components provided or released by KTS GmbH & Co. KG.

To make the search more result-oriented and for this reason successful, the following facts should be kept in mind:

- Change of tone (frequency)
- Intensity of tone
- Duration of tone
- Level of value (display)

A sound modification is the first sign for the existence of a metal object. If it turns out to be a large object and if it is located near ground surface the intensity of tone will increase.. While the tone is audible, the searchcoil should be moved in the near vicinity to detect the possible shape of the metal object.

A simultaneous control of sound and indicated value leads to a better analysis of the discovered object.

### Search recommendations and hints for Reset operation

During the search process be sure that you do not carry items of metal with you. This could cause a wrong adjustment when pressing the **Reset** key and can produce false indicator effects. In addition, this can lead to a false metal discrimination. While searching be ensured, that the sound remains constant, otherwise a wrong adjustment caused by magnetic fields may occur. In this case the searchcoil is held above the ground and the display has to be observed after renewed activation of the **Reset**-button and frequency adjustment.

1. Activate the metal detector with the menu knob. Beforehand the respective searchcoil has to be cable-connected to the electronic unit.
2. Hold the searchcoil to the ground and press the **Reset**-button for a brief moment. Herewith you will attain a zero balance, which is necessary for a trouble-free search.
3. During zero balance make sure, that there are no metallic objects near the searchcoil. This could cause a wrong adjustment and produce unwanted indicator effects (as the case may be repeat the **Reset**-procedure at another, metal-free spot).

4. Initially please set the frequency to the lowest level (turn the **Freq.**-modulator counterclockwise). By means of **Audio** control the volume should be set audibly. To become acquainted with the handling of the device we generally recommend to start with the lowest frequency adjustment. With advancing experience it is expedient, to increase the frequency gradually what will have a positive effect on the search performance.

Since the function of the **Reset**-button is decisive, the key should be pressed after each modification:

1. After every activation of the metal detector.
2. After each change of searchcoils.
3. During the search, if sound becomes instable due to bad ground conditions or geomagnetism.

The change of sound is the first sign for the detection of a metal object. Before excavation, however, further details should be taken into account and your own search experience should be used for help.

The more intense the sound, the larger the object and the nearer its position to the surface. While a high search tone is audible, the searchcoil should be moved in the close surrounding to determine the shape of the metal object.

**Note:** Please be certain, that there are no metal objects in the close proximity to the metal detector during zero balance. This can produce a false calibration and unwanted indication effects.

## 5 ID Metal Discrimination

### Examples for divergent conductivity values:

- |                                |                      |
|--------------------------------|----------------------|
| ➤ light metals (e.g. aluminum) | approx. 20-50        |
| ➤ copper                       | approx. 50-80        |
| ➤ gold and precious metal      | approx. 85 and over. |

Please bear in mind that – depending on soil conditions and size and shape of the located objects – the measured values can diversify. The indicated values are guide values, which can be complemented with your own search routine.

Please take note of explanations to error signals on page 12.

**Note:** To avoid incorrect conductivity values it is absolutely necessary to repeat the adjustment of the soil balance. When pressing the Reset-button make sure, that there are no metal parts in the soil.

## 6 Installation

The assembly is easy and carried out with a few simple steps:

1. Install the telescope bar by pushing the adjustable carbon tube into the armrest.
2. Connect the telescope bar with the searchcoil and wrap the cable of the coil around the bar.
3. The electronic unit is placed in a bag; insert the plug of the searchcoil through the lower opening of the bag in the intended mounting socket.



## 7 Appropriate handling

Hold the searchcoil approx. 2 to 5 cm parallel to the soil. Due to the pulse induction method a swivelling of the searchcoil is not necessary.

Determine your own speed during the search. To search a large area without great expenditure of time we recommend a speedy pace (no jogging).

## 8 Adjustment

The metal detector PULSE AR III can be adjusted within a very short time.

1. With the menu knob you activate the metal detector. Select the desired sound volume.
2. Briefly press the **Reset**-button in order to obtain a zero balance which is necessary for a failure-free search.

## 9 Indication of metal

Your device has a sound location system. With the searchcoil's approach to a metal object the tone frequency will increase. Once the coil is positioned exactly over the object, the highest tone is reached.

This method not only helps to locate the exact spot of discovery but it also detects – based on the duration of the sound – the object's shape.

### Examples:

- A long-lasting high tone in longitudinal direction stands for a slim item (e.g. a tube),
- a high tone in any direction calls for a circular object.

During the search side noises often prove to be a disturbing factor. Therefore we recommend the use of the provided headphones, which are switched to **Mono**, so that surrounding sounds (for instance traffic or dangerous animals) can be consciously perceived.

## 10 Usage of appropriate searchcoils

According to the purpose PULSE AR III is equipped with various searchcoils.

### 25 cm searchcoil

The 25 cm (10") searchcoil is the standard coil of PULSE AR III and suitable for the search after small metal objects.



### **45 cm (18") searchcoil**

Very convenient for the search after small, medium-sized and large metal objects. Furthermore it has the benefit of a speedy uninterrupted search process.



### **Cylindrical coil:**

Through its dimensions of 5x20 cm appropriate for the search in wells, narrow excavations and underwater. At the same time it can be helpful to find micro-objects.



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

Preferably used for the deep sounding after medium-sized and large metal objects. Furthermore large areas can be scanned fast and comfortable.

During the search you should hold the search frame between 20 to 50 cm over the soil. A higher distance to the soil reduces the chance of an indication of small and medium-sized metal objects.

## Assembly of the 1 x 1 m search frame

1. Connect the pipes (8 pieces) in numerical order. Please note, that the numbers should be readable on the upper side.
2. Arrange the search frame on a flat surface and be sure, that the frame is straight.
3. Afterwards the cable has to be placed on the pipe and fixed at the corners with the provided tape. Please make sure, that cable and search frame are firmly connected to each other.



**Note:** Turn off the metal detector in case you want to change the searchcoil, then connect the selected searchcoil. Please press the Reset-button after you have started the detector again.

## 11 Rechargeable battery and charger

Through the mobile Li-Ion quick-charger the metal detector is fully charged within a very short time (approx. 90 minutes). Thanks to the connection possibility at the car cigarette lighter, this is also possible on the road.. The charged battery allows an operating time of approx. 4-8 hours.



An additional inverter module can be used to charge the battery in the car.



### Charging process:

1. Attach the battery charger to the connection socket at the backside of the electronic housing.
2. The red LED indicates the charging process. Please note, that this LED has to be active during the whole charging time.
3. The maximum charging time is 90 minutes.
4. After the charging process is completed, remove the charging cable plug. The plug should be pulled out after every charging.

**Note:** PULSE AR III is equipped with a quick-charger. To prevent damages on the rechargeable battery always pay absolute attention to the maximum charging time of 90 minutes. Stop the charging process immediately after the battery is fully charged.

Never charge the metal detector without attendance or overnight, resp. over 90 minutes, because an overcharging can induce damages (e.g. overheating), which leads to the loss of guaranty.

## 12 Error signals

In the development of PULSE AR III, special emphasis was placed on stability and interference immunity so that the search is disturbed as little as possible.

Despite the multitude of filters and modulators it is – to our regret - possible that certain soil conditions cause disturbances, which can effect your measured values.

Apart from a wrong soil balance adjustment incorrect signals can occur from following effects.

1. Ferric oxide: Through magnetic ferric oxide soils the conductance of the located metal can distorted.
2. Adverse effects lead to the fact that large iron metals are indicated as precious metal.
3. Small parts of bronze partially may be indicated as iron, the definition of the measured values therefore is only guaranteed starting from 5x5cm in dimension.
4. Because of other metal parts nearby the measured values can be falsified.
5. Strong magnetic interference fields within residential areas and in the proximity of ground cables can influence the measured values, especially during utilization of the search frame.
6. Disturbances often occur in the peripherals of radio stations.
7. Strong magnetic fields, particularly in the proximity of high voltage masts, can cause disfunctions.

## 13 Care

Your PULSE AR III is easy to clean, yet there are some aspects, which you should bear in mind, in order to receive the optimal functionality.

- Protect the electronic housing with a plastic bag in case you should get caught in the rain, fog or sandstorm.
- Always keep your equipment clean and dry and wipe off sand and dirt.

**Note:** Avoid extreme temperatures, since it is possible, that electronic elements are damaged through these circumstances.

Metal detectors produce magnetic fields in the searchcoil and can possibly be hindered in their operational capability while applied in the closer environment of certain industrial plants or electronic devices.

## 14 Legal notice

Before you start searching please note that the monument protection as well as other legal standards are relevant. KTS-Electronic GmbH & Co. KG assumes no responsibility for possible legal violations.

In case of doubts we recommend a comprehensive consultation with an attorney or national monument offices.

## 15 Warranty

According to the following conditions (see below) we remedy deficiencies free of charge, if they are evidently based on manufacturing errors or defects and are reported to us immediately after assessment of damage within **24 months** after delivery to the ultimate buyer.

Defective parts will be repaired gratuitous or will be replaced by efficient parts of our choice. KTS GmbH & Co. KG reserves the right to exchange a device by an equal valued replacement unit in case the returned product cannot be required in an appropriate budget time frame.

On-site repairs cannot be demanded. Replaced, resp. exchanged parts will merge into our property.

The guarantee claim expires in cases of improper handling, gross carelessness or when repairs, modifications, additionally installed parts or extentions are carried out from persons which are not authorized on our part to do so.

Guarantee claims will neither effect an extension of the term nor they will implement a new time limit.

Further requirements, in particular such through extraneous causes resulting damages are excluded, unless a commitment is not necessarily the case.

We therefore are not liable for any accidental, indirect or other subsequent damages of any kind, which lead to limited use, data loss, profit setbacks or operating failures.

### **After expiry of warranty**

KTS GmbH & Co. KG can agree upon a service after expiry of guarantee. In this case repairing and shipment will be charged.

## **16 Contact**

### **KTS-Electronic GmbH & Co. KG**

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