

PULSE 8X

HAND-HELD UNDERWATER METAL DETECTOR

OPERATION MANUAL

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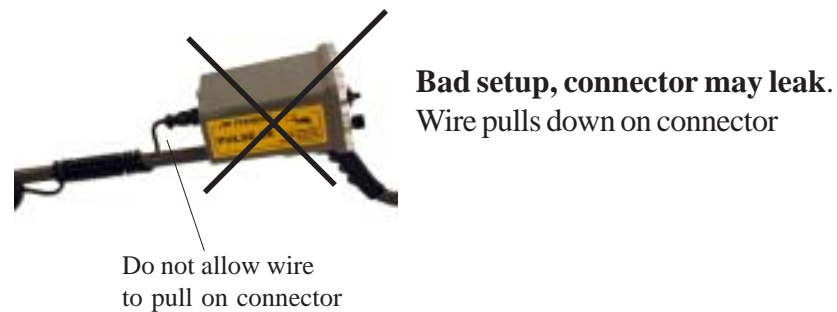
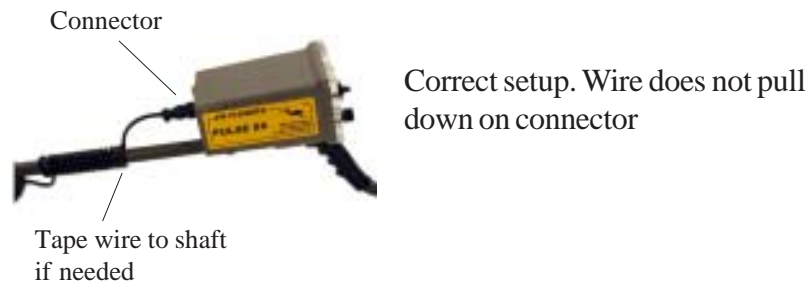
CAUTION:

Do not allow your detector to be exposed to excessive heat by leaving it in direct sunlight or inside of a closed vehicle on a hot day. Excessive heat can damage the electronics and/or destroy the detector's waterproof seals.

NOTE:

If you purchased the optional "underwater connector on coil wire", before submerging the detector be sure the O-ring is in the male half of the connector (the side mounted to the housing) and the female half of the connector is securely tightened. When properly tightened, a small detent can be felt at the end of the tightening.

When the coil wire is wrapped around the handle shaft no strain should be placed on the wire where it attaches to the connector. Sufficient slack should be left in the wire to create relief at the connector. If the wire is wrapped tight it will pull on the connector causing a leak into the connector.

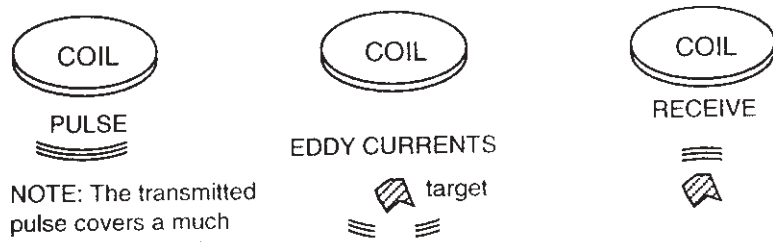


INTRODUCTION

The Pulse 8X is one of the finest hand-held metal detectors manufactured today. The Pulse 8X is used by commercial divers, US and foreign military, law enforcement and dive rescue groups worldwide.

HOW PULSE DETECTORS WORK

Pulse detectors operate by transmitting a continuous stream of high energy electromagnetic pulses (one hundred per second), from the coil. After each pulse is transmitted, the detector then “listens” using the coil as the receiving antenna.



NOTE: The transmitted pulse covers a much larger area than shown above.

Figure 1

When a transmitted pulse hits a metal object, a magnetic field is induced in the object. This causes eddy currents to flow in the metal, which in turn generates a second magnetic field. This field is picked up by the coil, amplified, and then displayed by the meter and heard in the speaker/earphone.

Almost all metals are detectable by pulse induction. Stainless steel bolts are not, but stainless steel props are (high iron content). The shape of the metal can also influence its detectability. Almost any shape of target is detectable except small loops of metal such as those used in a necklace. Larger loops, such as rings are detectable. Alloy content of rings can vary the detection range.

NOTE 2: When changing the battery, if any of the white plugs become disconnected from the electronics board, reconnect the plugs making sure that the mark on the side of the plug lines up with mark on the electronics board.

- Insert the screws and snug up. DO NOT OVER TIGHTEN.

- Make sure o-ring is visibly compressed all the way around.

Optional Cable Connector and Coils

An underwater connector on the coil wire is available. It allows the coil to be disconnected from the electronics housing. This enables field changing of different size coils. The available coils are: 5", 7.5", 10", 16", 18" with 100' of cable, 8" x 48" oval with skids and 100' of cable, and hand held 1" probe (for pushing into sand/mud). When swapping coils on the detector, be sure the o-ring is in place (in the housing side of the connector) and the locking ring is turned fully clockwise until it stops. The o-ring size is 1/2" OD x 3/32" W. If water drops are present in either side of the connector, allow it to air dry or use compressed air to dry before reassembling.

MAINTENANCE

Your Pulse 8X was designed to be maintenance free. It is constructed of corrosive resistant materials. However, as with most diving equipment, it is recommended that it be rinsed in fresh water after use and stored in a cool, dry place.

LIMITED WARRANTY

Your detector underwent constant inspection during assembly to insure many years of trouble free performance. The PULSE 8X is warranted for TWO FULL YEARS from the date of purchase. During this period, your detector will be repaired free of charge should a failure occur due to materials or workmanship. The warranty does not cover broken or cut cables, broken shafts or coils, or damage due to dropping or general misuse.

Should service be required, write or phone us explaining the nature of the problem, and we will provide shipping instructions. All repairs are made at our factory. Repairs by unauthorized persons may void the

OPTIONAL SPARE BATTERY PACK

The spare battery pack is identical to the battery pack that comes with the PULSE 8X. The Pulse 8X battery pack is made up of seven sub-C 1.2 volt NiCad batteries.

Charging Spare Battery Pack

If you use a spare battery pack it must be charged 12-14 hours by installing it in the detector (see below).

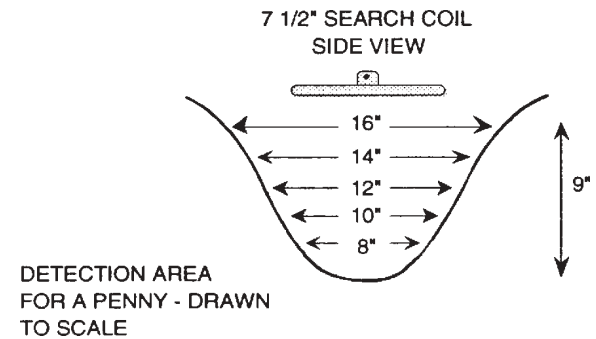
Removing the electronics for changing batteries

- Remove the six 6-32 x 5/8" stainless screws from the front faceplate.
- Pull the electronics straight out.
- Unplug the battery cable from the board and plug in the new battery (OK to reverse the plug around).
- Clean the o-ring and o-ring seat on the housing.
- Lubricate the o-ring with a silicone based grease (wiping off any excess oil)
- Position the battery under the electronics.
- Place the o-ring around the small faceplate (sm. faceplate is the small yellow faceplate behind the large clear faceplate). Carefully insert the battery and electronics into the housing.
- Holding the housing opening straight up, use two (2) playing cards to push the o-ring into the seat while applying a slight pressure against the faceplate.
- Tighten the six 6-32 x 5/8" screws into the faceplate while still applying pressure so the o-ring will remain in place.

NOTE 1: Never use glue or any adhesive to hold the o-ring in place as this may allow water to enter the housing.

DETECTION AREA

The detection area for our pulse detectors is bowl shaped and is quite large - much larger than the coil diameter.



The above illustration represents the detection area for a penny, a larger object would have a larger detection area. Due to the large detection area of the PULSE 8X, a variable sensitivity switch is provided. This enables the sensitivity to be decreased, once a target is detected, to allow easy pinpointing of the target.

Different size coils will effect the detection distance. The larger the coil the deeper the ground penetration for larger objects; but the larger coils will not detect small (coins, rings) targets as well as small coils.

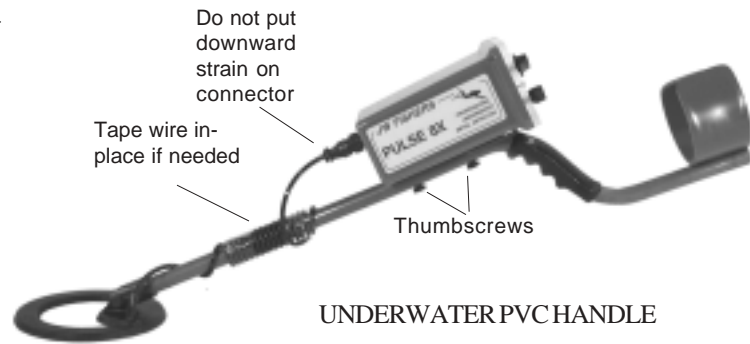
If you purchased the underwater connector option you can easily change coils in the field.

PULSE 8X DETECTION RANGES WITH 7 1/2" COIL

- SMALL RING 5 IN. (13 cm)
- NICKEL 6 IN. (15 cm)
- PENNY 9 IN. (23 cm)
- QUARTER 9 1/2 IN. (24 cm)
- 2"x2"x1/8" ALUMINUM 12 IN. (30 cm)
- 4"x4"x1/8" ALUMINUM 15 IN. (38 cm)
- 1 GALLON CAN 30 IN. (77 cm)
- LARGER TARGETS TO A MAXIMUM 6+FT. (180+cm)

ASSEMBLY FOR UNDERWATER USE

- Attach the electronics housing to the underwater PVC handle assembly using the (2) 10-32x1 1/4" thumbscrews with washers.



- Neatly wind the coil wire around the bottom part of the handle shaft.
- Attach the coil to the forked end of the shaft using the 3/8"-16 black nylon bolt and wing nut.

NOTE: If you purchased the optional "underwater connector on coil wire" (it is black hard plastic), the coil wire can be removed from the case by turning the knurled ring, on the connector, counterclockwise a half turn and pulling the connector straight out. Be sure you do not lose the O-ring which is inside the male half of the connector. The O-ring size is 3/8" ID x 1/16".

The PULSE 8X is now ready for operation in the standard underwater configuration.

NOTE: When the coil wire is wrapped around the handle shaft no strain should be placed on the wire where it attaches to the connector. Sufficient slack should be left in the wire to create relief at the connector. If the wire is wrapped right it will pull on the connector causing a leak into the connector.

lift the coil off the ground as high as possible while still detecting the target. Due to the bowl shaped detection pattern, the greatest reading will occur when the target is directly below the center of the coil.

NOTE: You may need to use LO and MED sensitivity settings for pinpointing most objects. When sensitivity settings are changed, the Zero Adjust knob must be moved to position the needle between .1 and .2.

BATTERY CHARGERS

The chargers (120vac or 12vdc) connect to the charger connector on back of the PULSE 8X housing. Charge current will be 120-130 mA. 12-14 hours charging time is required to completely recharge low batteries. The charge LED on the faceplate will illuminate while the charging is taking place (when charging from a 12v battery, the light may dim or go out as the batteries near full charge). Do not leave the charger continuously charging the batteries (for many days). This can shorten the battery life. Charged batteries will power the detector for 9-10 hours. The batteries should be completely discharged at least once a year before fully recharging; this gets rid of any "battery memory".

CHARGER OPERATING PROCEDURES

- Select charger to be used, 120vac or 12vdc.
- Wipe off charger connection on back of PULSE 8X housing.
- Attach charger connector on connector on back of housing. Do not over tighten, just snug will do.
- Turn selection switch to OFF.
- Connect input power to charger
Note: If using 12V battery as input; connect red clip to terminal (+) terminal on battery.
- Charge LED on faceplate will be illuminated while charging is taking place.
- When fully charged, the battery will provide 9-10 hours of continuous use. The battery requires 12-14 hours to fully recharge. The batteries cannot be overcharged.
- DO NOT USE ANY CHARGER OTHER THAN THE ONE PROVIDED.

OPERATION

1. After the detector has been assembled, for underwater or land use, take it outside to familiarize yourself with its operation. Position it so the coil is up off the ground, and away from all metals.
2. Turn the detector on by turning the Selection Switch to BATT CHECK position. The meter should read .8 to 1. The LEAK LED should be lit indicating the leak detection circuitry is working.
3. Turn the Selection Switch to LOW position. Use the Zero Adjust knob to tune the needle below .2 (audio stops) on the meter scale. You are ready to start detection. CAUTION - Do Not Overturn Control Knobs.
4. Locate a "clean area" of ground (no readings) and place different sizes of metal objects on the ground and practice detecting and pinpointing them.

NOTE:

If you get too close to a metal object, it causes the meter to peg full scale. The meter may remain pegged for a few seconds even after you move away from the target.

When this happens, lift the coil away from the ground (increase the distance to the target) and make another pass to pinpoint the target. The maximum meter reading will occur when the target is directly below the center of coil.

5. To get even greater sensitivity with your PULSE 8X, select MED sensitivity. Use the zero adjust knob to tune the needle between .1 and .2 on the meter scale.
6. To get maximum sensitivity, select HI. Use the Zero Adjust knob to adjust the needle between .1 and .2.
7. Due to the high sensitivity of the PULSE 8X, pinpointing the target when it is close to the surface can sometimes be difficult. When this occurs, reduce the sensitivity, using the Selection Switch, to the lowest position possible while still allowing detection of the target. Next,

OPTIONAL UNDERWATER SETUP

Remove the Electronics Housing from the Arm Rest Handle by removing the (2) 10-32 x 1 1/4" thumb screws.

The Electronics Housing can now be worn on the waist by sliding the belt through the (2) belt holders on the underside of the housing.

ASSEMBLY FOR LAND USE

Your detector comes with an aluminum land handle that was designed as a result of extensive customer feedback. The land handle is constructed of heavy-gauge aluminum with adjustable coil shaft and arm support. Both shafts adjust quickly with a small thumb screw. O-rings added to the arm support shaft eliminate play giving the handle a solid feel. The electronics housing can be worn around the waist/chest or it can be mounted on the handle shaft.

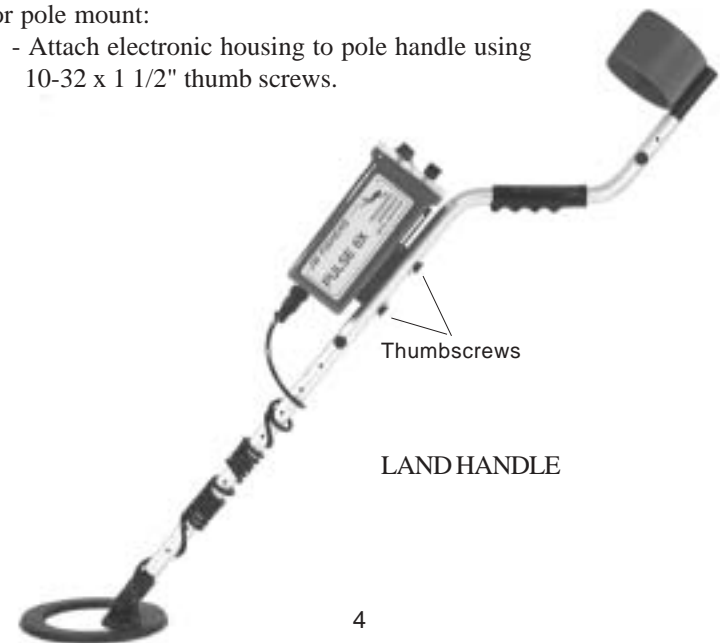
- Attach the coil to the forked end of the aluminum land handle with the 3/8 x 1 1/2" black nylon bolt and wing nut.

For belt mount:

- Slide the yellow belt through the belt holders on the underside of the electronics housing. Wear the belt around the waist or chest.

For pole mount:

- Attach electronic housing to pole handle using 10-32 x 1 1/2" thumb screws.



SWITCH, CONTROLS & CONNECTORS

Selection Switch	A five position switch is used to control the operation mode of the PULSE 8X.
Pos. 1)	OFF - All power is disconnected from the electronics. Batteries are charged in this position.
Pos. 2)	BATTERY CHECK/LED CHECK -In the battery check position the meter becomes a volt meter showing battery voltage from 0-10 volts (full scale). The detector will work with a battery reading of 8 to 10 volts. Leak detection circuitry is also tested (red LED will light) to ensure it is working.
Pos. 3,4,5)	LO/MED/HI - Three different sensitivity settings. Normal operation is in HI position with LO/MED used to pinpoint targets that give a very strong reading in the HI position.
Zero Adjust	A control knob that adjusts the position of the needle on the meter scale. With no metal near the coil, the zero adjust knob is turned clockwise until the audio just starts to sound (about .2 on meter), and then the knob is turned back slightly.
“Ear” Connector	Provides the audio output to underwater or land earphones. An audio signal will be heard with a meter reading of .2 and above. The frequency (tone) of the signal shifts with a change in the meter. The earphone can be connected to the detector in or out of water. The single underwater earphone is used by sliding it under the mask strap or into the hood, on or near the ear. An optional dual underwater headset is also available.

The stereo land headset should be kept out of water. However, the connector is waterproof and can be submerged with the detector when wading in the water. The volume of the land headset can be adjusted by a control knob on the outside of each earmuff.

An optional “dual underwater headset”, a stereo headset for underwater use, is also available.

Battery Charger

The battery charger connector is located on the back of the housing. The Selection Switch must be in the OFF position for charging to take place. It is not necessary to cover this connector when diving.

Leak LED

Illuminates if water has leaked into the electronics housing. When the Selection Switch is in the Leak LED Position, the LED is forced on for test. Actual sensing for leak occurs in the Low, Medium, and High settings.

NOTE: If the battery voltage drops to 8 volts or less (.8 on meter) the Leak LED will light, giving a false leak indication.

Charge LED

Illuminates when batteries are being charged. Full charge will occur in 12 to 14 hours. The light may go out when batteries are fully charged.

warranty.

RETURNING DETECTOR FOR REPAIR

If your detector should need service, you can write, or e-mail: JWFishers@aol.com, phone (508) 822-7330, or fax (508) 880-8949 the factory for instructions. We do not require authorization for the return equipment. If you have a problem with your detector and would like to have it checked out at the factory, simply pack the detector well and return it with a brief note describing the problem. Be sure to include your return address and telephone number on the note. When returning equipment from outside of the US, contact the factory for specific instructions regarding shipping.

