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- › [PQWT](#) /
- › [PQWT-TC150 Underground Water Well Detector Instruction Manual](#)

PQWT TC150

PQWT-TC150 Underground Water Well Detector Instruction Manual

1. INTRODUCTION

The PQWT-TC150 is a professional instrument designed for underground water detection, primarily utilized by well drillers, drilling companies, and geologists. It employs the natural electric field as an electromagnetic field work source, measuring differences in resistivity of underground rock, mineral, or groundwater. This method accurately locates the position and depth of groundwater, with a maximum detection depth of 150 meters. The instrument automatically generates curve and profile maps after data collection, aiding in the quick determination of optimal drilling locations and depths.

2. PRODUCT OVERVIEW

The PQWT-TC150 is an automatic mapping water finder, designed for ease of use and high accuracy in well finding. It features precision measurement, automated analysis, and one-click mapping capabilities.




Figure 2.1: The PQWT-TC150 main unit with accompanying electrodes and connection cables.


PQWT-TC150

AUTOMATIC MAPPING WATER FINDER


Well Finding Tools




Precision Measurement



automated analysis



One-Click Mapping



easy handling

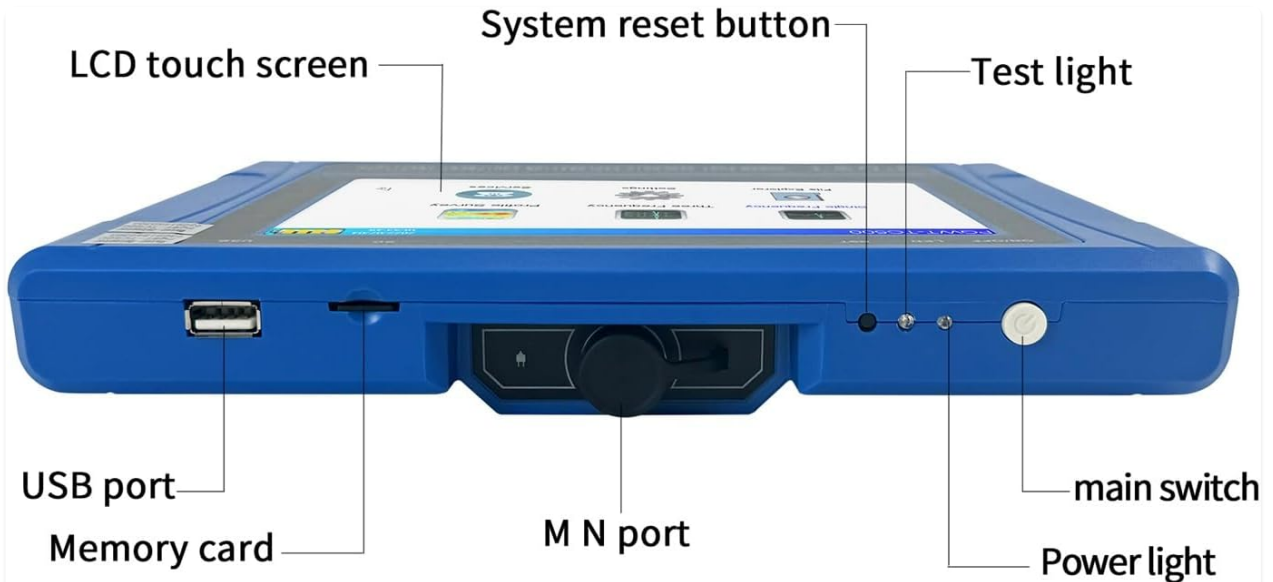
Principle: Using the natural electric field frequency selection method, the instrument automatically draws a geological structure profile and analyzes the underground water-bearing structure by collecting the changes in the underground potential difference (resistance).

Figure 2.2: The PQWT-TC150 device highlighting its automatic mapping capabilities for water finding.

3. COMPONENTS

The PQWT-TC150 kit includes the following main components:

- **Host Machine:** The main control unit with a 7-inch LCD touch screen.
- **Electrode Cable:** Used to connect the electrodes to the host machine.
- **Copper Electrode:** For ground contact during measurements.
- **Alloy Electrode Bar:** Additional electrodes for specific measurement setups.
- **USB Disk:** Contains instructions and operation videos.



Product Accessories

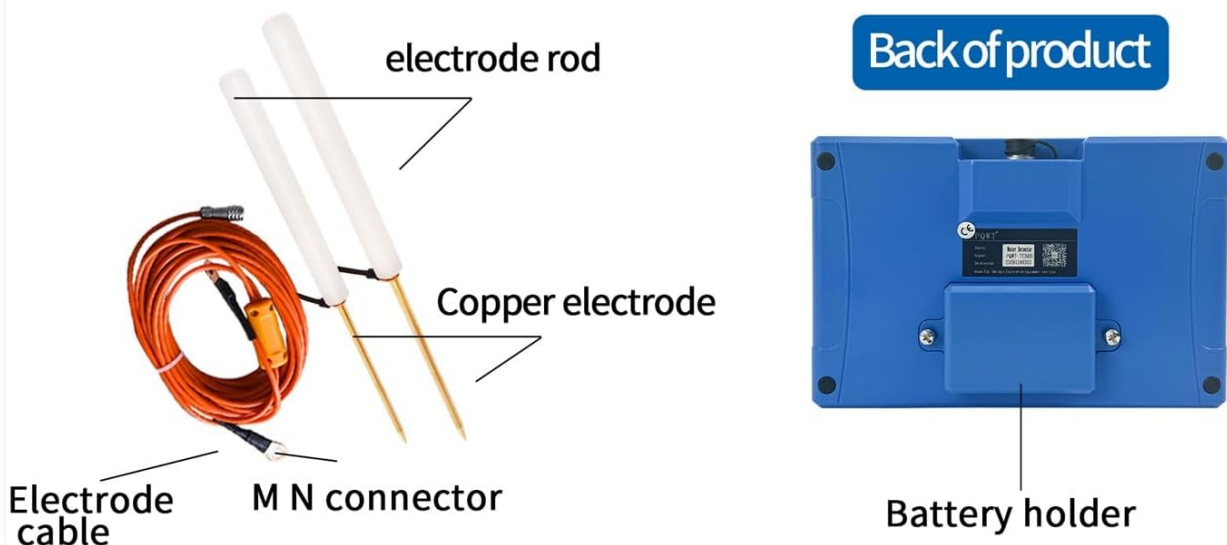


Figure 3.1: Detailed view of the PQWT-TC150 device, its ports (USB, Memory card, M N port), and included accessories like electrode cable, copper electrode, and alloy electrode bar.

Video 3.1: An overview of the PQWT-TC150, TC300, and TC500 product components, including the main unit, electrodes, and cables.

4. SETUP

Follow these steps for initial setup of your PQWT-TC150 device:

1. Wiring:

- Select a measuring tape of 50-100m.

- Lay out the tape along the intended measurement line.
- Mark the start point. Geophysical prospecting should be perpendicular to the tectonic line.
- Plug one electrode near the host machine at the 0m mark on the tape.
- Plug the other electrode at the 10m mark on the tape.

2. Power On:

- Long press the power button on the host machine to enter the startup interface.
- The display will show six options: Single Frequency, Three Frequency, Profile Survey, File Explorer, Settings, and Service.

Video 4.1: Step-by-step guide on how to set up and operate the PQWT-TC150 Underground Water Detector, including wiring and initial power-on procedures.

5. OPERATING INSTRUCTIONS

The PQWT-TC150 offers various measurement modes to suit different geological conditions and exploration needs.

5.1 Measurement Modes

- **Single Frequency:** Used for basic machine testing to ensure normal or abnormal working conditions. Recommended for dry land or stone surfaces before point measurement.
- **Three Frequency:** General testing for large areas to identify potential drilling positions. Helps in finding abnormal points of high or low value.
- **Profile Survey:** For accurate measurement and finding underground water. This method is detailed below.

5.2 Profile Survey Operation

To perform a Profile Survey measurement:

1. From the main interface, select "Profile Survey" to enter the measurement interface.
2. Before recording, ensure the two connected electrodes are placed in a crossing manner.
3. Click "Line Test" on the instrument. A green light indicates the line is normal.
4. Adopt a 10-meter electrode distance for measurement.
5. Plug the electrode near the host machine into the ground at the 0m mark on the scale.
6. Plug the electrode at the other end into the ground at the 10m mark on the scale.
7. Plug in the electrode rod to select the measuring line.
8. Click "Record" to begin data collection. The instrument will emit a reminder sound upon completion.
9. Move both electrodes forward by one meter and repeat the recording process. Continue this for all desired measurement points along the line.
10. After one measuring line is finished, the curve graph will be displayed automatically. Click "Profile" to view the profile map.
11. The picture can be zoomed in or out using the "+" or "-" buttons based on requirements.

5.3 Important Considerations

- The electrode rod should not shake during sampling.

- Avoid contact with metal objects on the ground during sampling.
- It is suggested to test over 15 points for one measuring line to ensure comprehensive data.
- It is forbidden to use the instrument in thunderstorm weather.
- Avoid regions with high-pressure lines or significant ground drops.

5.4 Data Interpretation

The instrument generates profile maps and curves to visualize underground resistivity. These maps help identify potential water sources:

- **Profile Map:** Displays horizontal measurement points and vertical detection depth. Resistivity values are color-coded (e.g., blue for low resistivity indicating water/mud, yellow for middle resistivity indicating rock, red for high resistivity indicating caves).
- **Curve:** Regular sudden changes in the curve (e.g., "V" type, "W" type, "L" type, "A" type) indicate geological structures like faults, fissures, or intersections of lithologies where water retention is likely.



Figure 5.1: An example profile map generated by the PQWT-TC150, illustrating varying resistivity levels at different depths and locations. Point 1 in the profile map corresponds to 5 meters on the tape, Point 2 to 6 meters, and so on.



Figure 5.2: An example curve graph from the PQWT-TC150, showing resistivity changes across measurement points. A 'V' shape at point 13 indicates lower resistivity, suggesting a good drilling location.

Video 5.1: Demonstration of the PQWT-TC150 in various field applications, showcasing its use for deep ground water detection for well drilling kits.

6. TECHNICAL SPECIFICATIONS

Parameter	Specification
Model	PQWT-TC150
Measuring Depth	0-150m
Measuring Frequency	Single frequency, three frequency, 33 frequency
Power Supply	Battery Model 26650*2pcs #4000mAh Rechargeable lithium battery
A/D Conversion	8-bit 1MsPS
Measuring Range	0mV-1000mV (automatically switches range)
Measurement Accuracy	0.001mV
Measurement Channel	4 channels
Unit of Measurement Data	The electric field components of different frequencies of the earth electromagnetic field ΔV_s (mv)
Channel Gain	0-500.000 times
Languages	English, French, Spanish, Arabic, Russian, Polish
Power Consumption	About 4W
Display	Industrial-grade 7-inch high-definition digital touch LCD screen
Working Hours	6-8 hours
Item Weight	13.57 pounds
Product Dimensions	17.13 x 7.09 x 15.16 inches
Temperature Range	-10~+50 Degrees Celsius

TECHNICAL PARAMETERS

Model	PQWT-TC150
Measuring depth	0-150m
Measuring frequency	Single frequency, three frequency, 33frequency
Power supply	Battery Model 26650*2pcs #4000mAh Rechargeable lithium battery
A/D conversion	8-bit 1MspS
Measuring range	0mV-1000mV The instrument automatically switches the range
Measuring accuracy	0.001 mV
Measurement channel	4 channels
Unit of measurement data	The electric field components of different frequencies of the earth electromagnetic field ΔV_s (mv)
Channel gain	0-500.000 times
Languages	English; Spanish; French, Arabic, Russian
Power consumption	About 4W
Display	Industrial-grade 7-inch high-definition digital touch LCD screen
Working hours	6-8 hours
G.W/Shipping	G.W:8KG,DHL/UPS/ Fedex to door service

Figure 6.1: A summary of the technical specifications for the PQWT-TC150 device.

7. MAINTENANCE

To ensure the longevity and optimal performance of your PQWT-TC150, follow these maintenance guidelines:

- Keep the device clean and free from dust and moisture.
- Store the instrument in its protective case when not in use.
- Regularly check the electrode cables for any signs of wear or damage. Replace if necessary.
- Ensure the rechargeable lithium battery is properly charged before each use. The average battery life is 2 years.
- Avoid exposing the device to extreme temperatures outside the recommended operating range of -10°C to +50°C.



Figure 7.1: The rechargeable battery compartment of the PQWT-TC150, housing the lithium-ion batteries.

8. TROUBLESHOOTING

If you encounter any issues with your PQWT-TC150, consider the following common troubleshooting steps:

- **No Power:** Ensure the battery is fully charged and correctly inserted. Check the main switch.
- **Measurement Errors:** Verify that all cables are securely connected and electrodes are properly inserted into the ground. Ensure no metal objects are interfering with the measurement area. Re-run the "Line Test" to check electrode connectivity.
- **Display Issues:** If the touch screen is unresponsive, try restarting the device. Ensure the screen is clean and dry.
- **Data Transfer Problems:** Check the USB cable connection and ensure the USB disk is properly recognized by your computer.

For persistent issues, refer to the detailed instructions on the provided USB disk or contact customer support.

9. WARRANTY AND SUPPORT

PQWT guarantees the quality and service of the TC150 Underground Water Well Detector. If you have any questions or require assistance, please feel free to contact customer support for expert one-on-one guidance. All instructions and operation videos are available on the USB disk included with your device.