Your excellent helper in cable test!

NF-8301

CIRCUIT TRACER

User Manual

ORIGINAL AUTHENTIC
Patented products, Counterfeiting not allowed

VER : V1

Please read and understand the safety precautions before using or repairing the equipment.

Precautions

1. Only professionals can calibrate and repair the detector.
2. Before each use, the detector and the test lead wire to be used should be Inspected for damage. Please ensure that the detector and the test lead wire to be used are in good condition.
3. When using the detector, the rated voltage of the line under test cannot be greater than 400V.
4. When the transmitter is connected to a live grid, if the "ground" jack on the transmitter is connected to the protective ground and when there is leakage current in the power supply line, such leakage current and the loop current of the transmitter are combined, which may cause the leakage protection switch to trip, that is, cause the FI/RCD disconnection.

Functional Characteristics of NF-8301 Underground & Wall Cable Detector

- Detecting the path of cables, electrical lines, and water and gas pipelines buried in walls or underground;
- Detecting breaks and short circuits in cables and electrical lines buried in walls or underground;
- Locating the fuse and its circuit;
- Locating covered outlets and distribution boxes;
- Locating the direction, breakpoint and short circuit point of the electric heating line under the floor.
- AC /DC voltage/continuity/resistance/current/frequency/temperature test.

Three most common uses and wiring methods of NF-8301

1. Locating the cable route: Hold the target line with the red clip, and ground the black clip (if it is a multi-core cable, it's better to ground other cores of cable together). The receiver tracks the signal along the line to find the direction of the cable.
2. Locating the breakpoint of the cable: Use the red clip to clamp the broken cable, and ground the black clip (if it is a multi-core cable, other cores of cable must be grounded together). The receiver tracks the signal along the line. The receiver sounds before the breakpoint, and does not sound after the breakpoint.
3. Locating the short circuit point of the cable: Use the red clip and black clip respectively to clamp the short-circuited cable (if it is a multi-core cable, all other cores of cable are also clamped into the black clip). The receiver tracks the signal along the line. The receiver sounds before the short circuit point, and does not sound after the short circuit point.

CONTENTS

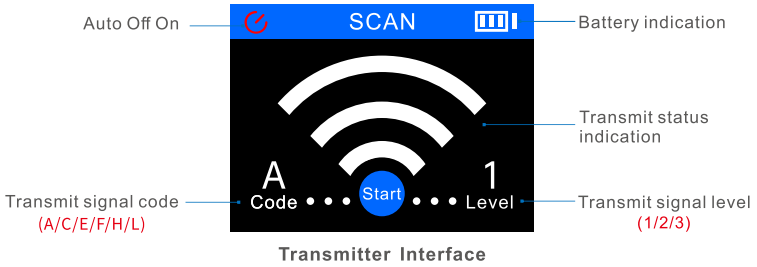
1. Keys, Screens and Accessories

NF-8301 Underground & Wall Cable Detector is an instrument that integrates cable detection and multimeter functions. Utilizing advanced integrated components and digital circuit technology, it delivers stable and reliable electrical performance. By analyzing signal variations, it can accurately locate buried cables/pipes and identify fault points.

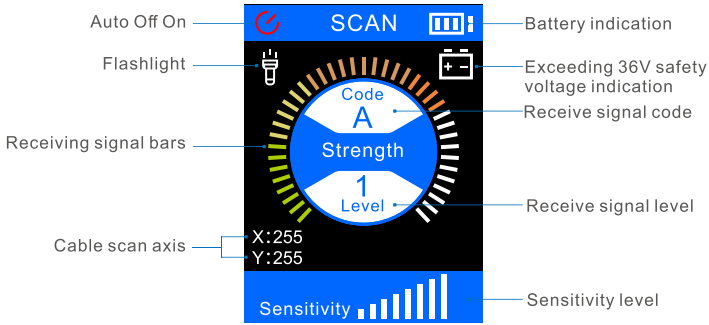
It is suitable for the construction, maintenance and repair of power cables, communication cables, electric heating lines and building pipelines.

1.1 Components and Function Description

1.2 Display Interface



Transmitter Interface



Receiver Interface

1.3 Accessories

1.The connecting wire is used to connect the transmitter to alligator clip or test pen

2. The alligator clip Is used to clamp the target cable

3. The test pen is used to touch the target cable

4. The ground rod is connected to the ground when there is no ground wire to enhance the test signal

5. Multimeter probe for multimeter testing

Notes:

1.One end of the red connecting wire is connected to the red alligator clip or red test pen, and the other end is connected to the positive electrode interface of the transmitter.

2.One end of the black connecting wire is connected to the black alligator clip or black test pen, and the other end is connected to the ground cable or ground rod to be connected to the ground.

3.The function of the alligator clip is the same as that of the test pen. Choose easy-to-operate accessories according to the construction environment.

2.Transmitter functions and use instructions

2.1 Turn on/off:

Press and hold the" ⏻ "key for two seconds to turn on/off of the instrument

2.2 Scan function:

In the main interface, press the " ◀ / ▶ " key to choose the scan icon, and press the " **OK** " key to enter the scan function interface.

Set the transmit signal level:

In the scan function interface, press the " ▶ " key to choose the transmission signal level. There are three levels in total, which can be switched cyclically during setting.

Setting the Transmitted Signal Code:

In the scan function interface, press the " ◀ " key to choose the transmission signal code. There are 6 codes, namely A/C/E/F/H/L, which can be switched cyclically during setting.

Start/Pause of Signal Transmission:

In the scan function interface, press the " **OK** " button to start or pause signal transmission

Exit Scan Mode:

In the scan interface, press the " ⮌ " key to exit the scan function interface.

2.3 Digital Multimeter Function

In the main interface, press the " ◀ / ▶ " key to choose the multimeter icon, and press the " **OK** " key to enter the multimeter function interface

Multimeter test switch:

In the multimeter function interface, press the " ◀ / ▶ "key to switch between AC voltage/DC voltage/continuity/resistance/current/frequency/temperature tests. Connect the multimeter wiring ports according to the wiring diagram at the bottom of the display interface.

Hold Data:

Press the "**OK**" button to save the multimeter test data. (For temperature test, press the "**OK**" button to switch to Fahrenheit and Celsius)

2.4 System Settings

In the main interface, press the " ◀ / ▶ " key to choose the settings icon, and press the " **OK** " key to enter the settings interface. The system settings can set the language, backlight brightness, backlight time, auto off time or view information about the machine.

Language Settings:

Press the " ◀ / ▶ " key to choose the language setting, press the "**OK**" key to switch between Chinese and English

Backlight brightness:

Press the " ◀ / ▶ " key to choose the backlight brightness, press the "**OK**" key to switch the brightness (three levels in total)

Backlight Time:

Press the " ◀ / ▶ " key to choose the backlight time, and press the "**OK**" key to switch to constant light/1min/5min/15min

Auto off:

Press the " ◀ / ▶ " key to choose auto off, press the "**OK**" key to switch to off/ 15min/30min/1h

About machine

Press the " ◀ / ▶ " key to choose About machine, and press the "**OK**" key to view the machine information.

3.Receiver functions and use instructions

3.1 Turn on/off:

Press and hold the " ⏻ " key for two seconds to turn on/off of the instrument.

3.2 Scan function

The scan function will automatically start when the machine is turned on. It can be pressed the "SCAN" button to start the scan function. The sensitivity knob can be adjusted between 5 gears. It is recommended to use high sensitivity to quickly locate the target area first, and then switch to low gear to accurately locate the target position.

3.3 NCV function

Press the "NCV" button to enter the voltage tester function. The receiver probe is close to the strong current cable. The receiver receives the signal and emits a "beeping" sound prompt. The closer the distance, the stronger the signal received and the more urgent the sound.

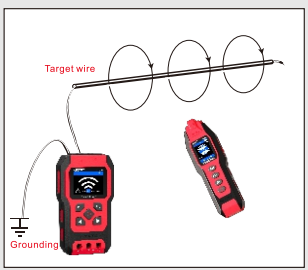
3.4 LED function

Press the " 🔦 " key to turn the light on/off without affecting the SCAN/NCV mode.

3.5 Receiver probe, directions for use:

Transmitter principle: The transmitter sends a modulated AC voltage to the cable under test → an alternating current is generated in the cable → the alternating current generates an alternating magnetic field around the cable.

Receiver principle: The receiver probe senses the signal → amplifies → digitally processes → displays on the screen and beeps to detect the direction of the cable and the fault point (such as the break point, short circuit point, etc.)



Magnetic field cables are imaginary curves used to visualize the distribution and direction of magnetic fields. They are concentric circles around the target cable.

The receiver probe is cylindrical, and the magnetic field cables pass from one end of the probe to the other end, where the induction signal is strongest.

The signal strength detected by the receiver is related to the distance between the probe and the cable, and the angle between the probe and the cable.

Figure 3.5-1

Design features:

NF-8301 is specially designed with two detection antennas, which are represented by X-axis and Y-axis on the screen.

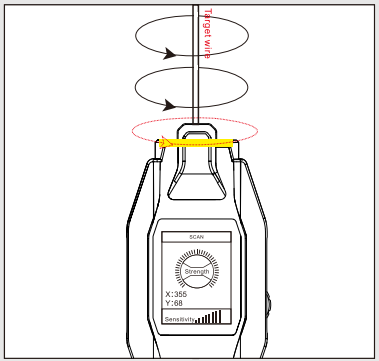
When the probe forms different angles with the target cable, the signal strength received by the X-axis and Y-axis is different.

According to the X-axis and Y-axis signal values displayed on the screen, the direction of the target cable can be determined

X-axis diagram

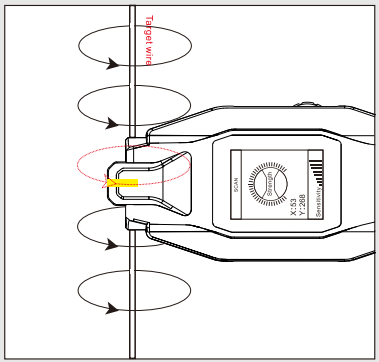
Y-axis diagram

Operational skills: How to determine the direction of the cable by the X-axis/Y-axis signal value



The device is directly above the cable.
The device is facing up.
If the X-axis signal is the strongest, it means that the cable direction at a 90-degree angle to the X-axis.

Figure 3.5-2

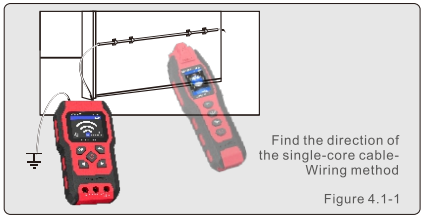


The device is directly above the cable.
The device is facing up.
If the Y-axis signal is the strongest, it means the cable direction is the same as the X-axis
.

Figure 3.5-3

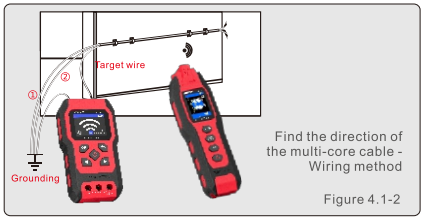
4.Wiring Method and Operation Steps

4.1 Finding the Direction of Cablin



Find the direction of the single-core cable-Wiring method

Figure 4.1-1



Find the direction of the multi-core cable - Wiring method

Figure 4.1-2

Operation Steps

Step 1: Connect the positive electrode to the target wire and ground the negative electrode (as shown in Figure 4.1-1).
If there are other cables near the target wire, ground them together, as shown in Figure 4.1-2.

Step 2: The transmitter selects the scan function and transmits the signal

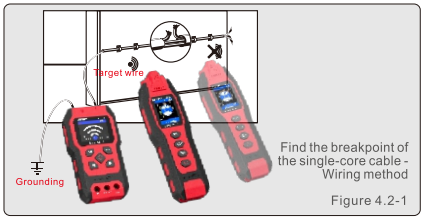
Step 3: Move the receiver probe close to the wall or ground where the target cable is located and move slowly. After the receiver receives the signal, the signal bar on the screen will jump and a "beeping" sound will be heard. The closer the distance, the stronger the signal.

Judgment Method: The path with the strongest receiver signal is the path laid by the target cable.

Operation Technique: If the signal is too strong or too weak, you can increase/decrease the transmission level of the transmitter and the sensitivity of the receiver.

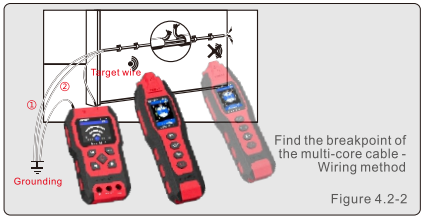
Note: The negative electrode of the instrument must be connected to the effective ground wire or the ground, otherwise the detection distance will become very short.

4.2 Locating the Breakpoint of the Cable



Find the breakpoint of the single-core cable - Wiring method

Figure 4.2-1



Find the breakpoint of the multi-core cable - Wiring method

Figure 4.2-2

Operation Steps

Step 1: Connect the positive electrode to the broken core of cable and ground the negative electrode (as shown in Figure 4.2-1).
If there are other cores of cable near the broken core of cable, ground them together, as shown in Figure 4.2-2.

Step 2: The transmitter selects the scan function and transmits the signal

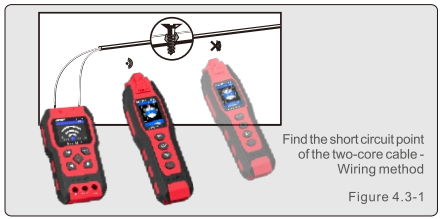
Step 3: Move the receiver probe close to the target cable and move slowly. After the receiver receives the signal, the signal bar on the screen will jump and a "beeping" sound will be heard.

Judgment Method: When the receiver probe detects a certain point along the target cable, the signal suddenly attenuates or disappears, then this point is the short-circuit point of the cable.

Operation Technique: First adjust the receiver sensitivity to the highest level to quickly locate the approximate position of the breakpoint, and then lower the sensitivity to accurately locate the fault point.

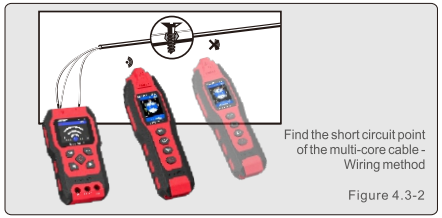
Note: The negative electrode of the instrument must be connected to the effective ground wire or the ground, otherwise the detection distance will become very short.

4.3 Locating the Short Circuit Point of the Cable



Find the short circuit point of the two-core cable - Wiring method

Figure 4.3-1



Find the short circuit point of the multi-core cable - Wiring method

Figure 4.3-2

Operation Steps

Step 1: Use the red and black clips to clamp the short-circuited core of cable respectively (as shown in Figure 4.3-1).
If there are other excess cores of cable, also connect them into the black clip (as shown in Figure 4.3-2).

Step 2: The transmitter selects the scan function and transmits the signal

Step 3: Move the receiver probe close to the target cable and move slowly. After the receiver receives the signal, the signal bar on the screen will jump and a "beeping" sound will be heard.

Judgment Method: When the receiver probe detects a certain point along the target cable, the signal suddenly attenuates or disappears, then this point is the short-circuit point of the cable.

Operation Technique: First adjust the receiver sensitivity to the highest level to quickly locate the approximate position of the breakpoint, and then lower the sensitivity to accurately locate the fault point.

Notes: 1.In the short circuit point test, the short-circuited core of cable must be known, otherwise the test is impossible.
2.The short-circuit point can be found only when the resistance of the short-circuited cable is less than 20Ω, and the short-circuit resistance can be measured by a multimeter.

5.Application Examples

5.1 Detecting the Direction of Buried Cabling

Perform the operations described in 4.1-1 above.

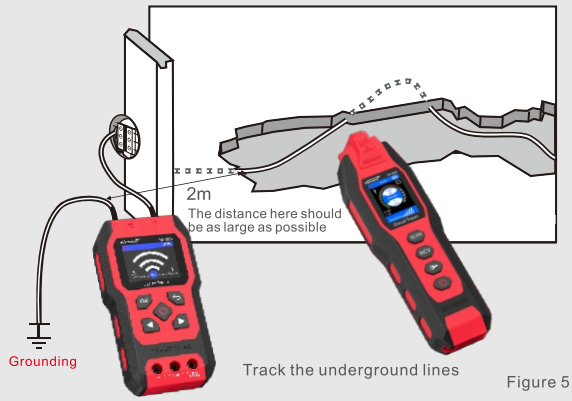


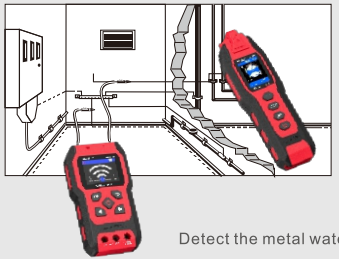
Figure 5.1

Caution

1. The distance between the grounding terminal and the line under test should be as large as possible; otherwise, the detection depth may be affected.
2. The depth of detection is greatly affected by the ground conditions (e.g. wet ground, existence of rebars, wire with metal shielding layer or metal pipe sleeve).
3. The farther away from the target cable, the weaker the signal strength and the deeper the detection depth.

5.2 Detecting the Buried Metal Water Pipe and Metal Heating Pipe

- The pipes must be made of metal (e.g. steel pipe/iron pipe);
- The pipes must not be connected to the ground wire, and there should be a large resistance between the pipe and the soil (if the resistance is too small, the detection distance will be small);
- Connect the target pipe with the positive electrode, and connect the negative electrode to the ground;
- Perform the operations described in 4.1-1 above.

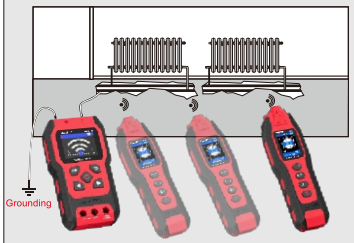


Detect the metal water pipe

Caution

1. For safety reasons, power off the electrical equipment.
2. The receiver is set with appropriate sensitivity to accurately locate the pipeline

Figure 5.2-1



Detect the metal heating pipe

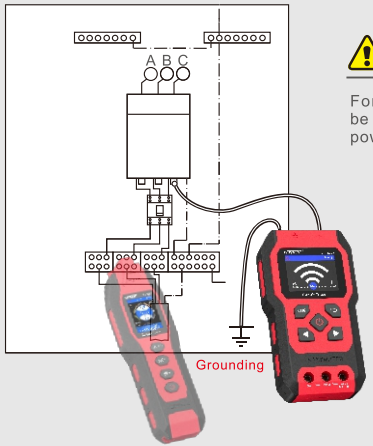
Caution

1. The distance between the grounding terminal and the line under test should be as large as possible; otherwise, the depth of detection may be affected.
2. The receiver is set with appropriate sensitivity to accurately locate the pipeline

Figure 5.2-2

5.3 Locating the User Assignment of the Three-phase Power Supply Line on the Same Floor

- Disconnect the main switch in the distribution box on this floor;
- Disconnect the neutral line in the distribution box on this floor from the neutral line on other floors;
- Connect the positive electrode of the transmitter to the three-phase line under test, and ground the negative electrode (as shown in Figure 5.3);
- Perform the operations described in 4.1-1 above;
- After setting up the transmitter, take the receiver to the air switch of the household for detection. If there is a signal, the corresponding line is found; otherwise, the corresponding line is not found.



Warning

For safety reasons, please be sure to switch off electrical power!

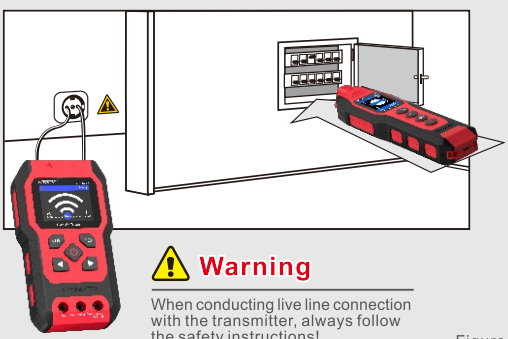
Figure 5.3

Caution

1. The grounding terminal should be fully grounded, and the grounding terminal of the transmitter should have a certain distance from the line under test, otherwise the detection effect may be affected.

5.4 Locating the Air Switch or Electric Leakage Switch Corresponding to the Socket

- Turn off all air switches or electric leakage switches in the distribution box;
- Connect the positive electrode of the transmitter to the live line of the socket, and the negative electrode to the neutral line (as shown in Figure 5.4);
- Adjust the transmitter to the appropriate signal level, and adjust the receiver sensitivity to the appropriate level.Use the receiver for detection near the air switch or the electric leakage switch. The switch with the strongest signal is the switch corresponding to the socket.



Warning

When conducting live line connection with the transmitter, always follow the safety instructions!

Figure 5.4

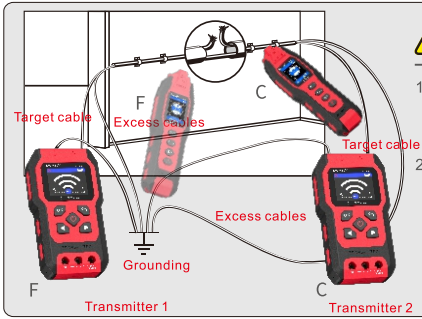
Caution

1. Because of the crosstalk effect of the signal on other lines, there may be signals on other lines, but the signals are relatively weak.
2. During detection, it's better to place the probe head of the receiver at the incoming wire of the switch for a better effect.

5.5 Locating the Breakpoint of the Cable Using Two Transmitters (More Accurate)

When there is a large number of wire harnesses, only one transmitter is used to access the signal from one end of the line to find the line breakpoint. Because of the electric field crosstalk, only rough positioning can be carried out, and it is difficult to accurately locate the fault point of the open circuit. Due to the electric field crosstalk, only rough positioning can be carried out, and it is difficult to accurately locate the fault point of the open circuit. At this time, two transmitters can be used to access signals from both ends of the line to accurately locate the fault point of the open circuit (the second transmitter needs to be purchased separately).

- The circuit must be uncharged;
- Connect the positive electrode of transmitter 1 to one end of the cable under test, and ground the negative electrode;
  Connect the positive electrode of transmitter 2 to the other end of the cable under test, and ground the negative electrode.
  Other excess cables must also be grounded (if any), as shown in Figure 5.5.
- Set the signal code of transmitter 1 to F and the signal code of transmitter 2 to C. (The signal code is not specific. Just make sure that the signal codes of transmitter 1 and transmitter 2 are not consistent.)
- Set the sensitivity of the receiver and detect signals along the path of the target cable. Observe the signal code received by the receiver. When the code changes from F to C, or from C to F, the point is the breakpoint. Here, the sensitivity of the receiver can be reduced for accurate positioning.



Caution

1. Adjust the transmitter's transmitting power level to accommodate different detection radii.
2. The receiver sensitivity can be adjusted to determine the location of the detection site.

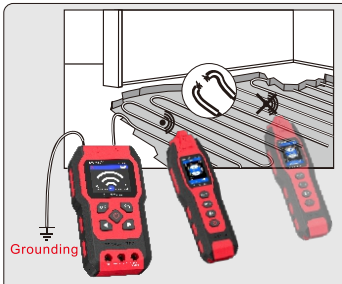
Figure 5.5

Caution

1. Ensure that the grounding terminal is well grounded.
2. The contact resistance of line interruption must be greater than 100 kilohm.

5.6 Locating the Breakpoint of the Underfloor Heating Cable

- The circuit must be uncharged;
- Connect the positive electrode of the transmitter to the underfloor heating cable and ground the negative electrode;
- The detection method is as shown in Figure 5.6. Follow the methods above to locate the breakpoint.



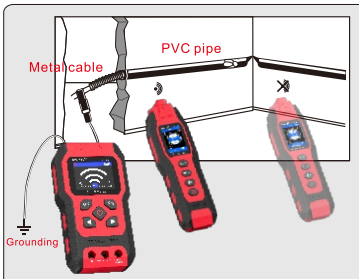
Caution

1. If the outside of the heating wire is wrapped with a shielding net, the shielding net cannot be connected with the ground wire. If necessary, disconnect the ground wire of the shielding net.
2. During the process of searching along the line, if the signal of the receiver suddenly attenuates at a certain location, it is the fault location of the line.

Figure 5.6

5.7 Locating the Breakpoint of the Underfloor Heating Cable

- The pipe must be made of non-metal material (such as PVC pipe);
- Pull a cable or metal hose through the pipe until it can no longer stretch;
- Perform the operations described in 4.1-1 above. The receiver is used for detection along the laid path. If the signal received by the receiver suddenly attenuates in a certain area, the area is the blockage point.



Caution

1. If there are other cables in the pipe, disconnect the power supply and ground them together with the negative electrode of the instrument.
2. Ensure that the grounding is good; otherwise, the detection effect may be affected.

Figure 5.7

5.8 Use Multiple Hosts to Distinguish Multiple Lines

- The circuit must be uncharged;
- The ends of the core wires must be twisted to each other for conduction;
- Connect the transmitter as shown in Figure 5.8;
- Different hosts transmit signals with different codes, and the receiver receives and recognizes the signals to distinguish different lines.

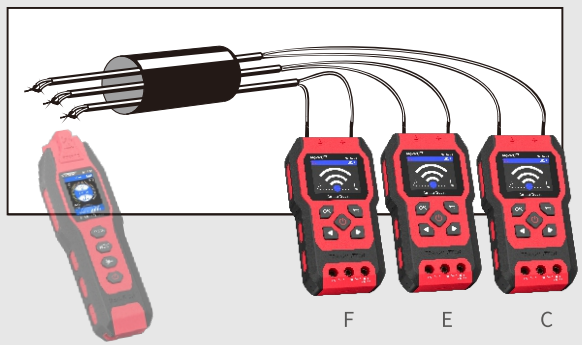


Figure 5.8

Tips

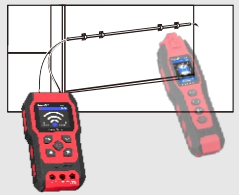
1. If necessary, multiple transmitters can be purchased to transmit signals with different codes.
2. If there is only one transmitter, conduct multiple measurements.

6.Methods to Improve the Depth of Detection

6.1 How to Improve the Detection Depth of Uncharged Lines

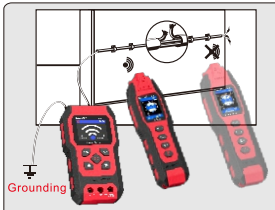
If the core wire of a multi-core cable is used as the loop (as shown in Figure 6.1-1), the detection depth is quite limited. The reason is that the feeder line and the loop are very close to each other, which causes serious distortion of the magnetic field. You can't build a magnetic field strong enough in a narrow area.

In this case, you can connect cables as shown in Figure 6.1-2 and Figure 6.1-3 to improve the detection depth.



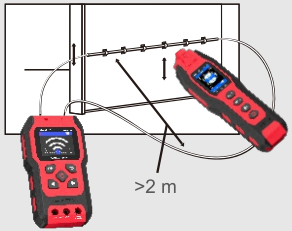
The maximum detection depth of this connection method is 0.5 meters.

Figure 6.1-1



The maximum detection depth of this connection method is 1-1.5 meters.

Figure 6.1-2



Caution

1. The distance between bthe feeder line and the loop should be at least 2 meters.

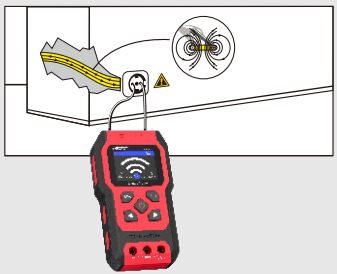
The maximum detection depth of this connection method is 2 meters.

Figure 6.1-3

6.2 How to Improve the Detection Depth of Live Lines

When the transmitter is directly connected to the phase line and neutral line, the signal is conducted on the two parallel lines (as shown in Figure 6.2-1), which will cause the signals to cancel out each other, in which case, the maximum detection depth is only 0.5 meters.

To eliminate this effect, the detection depth can be increased to 2.5 meters or more. As shown in Figure 6.2-2 , a cable tray can be used to provide a longer loop.

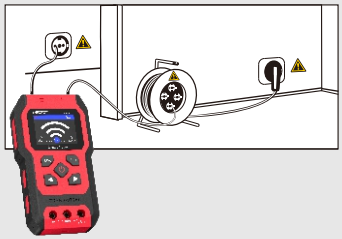


Warning

When conducting live line connection with the transmitter, always follow the safety instructions!

The maximum detection depth of this connection method is 0.5 meters.

Figure 6.2-1



Warning

When conducting live line connection with the transmitter, always follow the safety instructions!

The maximum detection depth of this connection method is 2.5 meters.

Figure 6.2-2

6.3 Factors Affecting the Depth of Detection

1. The connection method is incorrect.
2. The instrument's settings are not set to the maximum (transmitter and receiver).
3. The cable is armored or has a shielding layer.
4. The cable runs through a metal pipe.
5. The floor or soil is too wet.
6. There are rebars which are dense.

7. Maintenance and Repair

If the detector is not working properly, please check it according to the following table:

Fault	Check Item	Measures
Cannot be started	Is the battery low?	Charge with the USB cable
The transmitter cannot recognize the external voltage	Whether the contact is good?	Reconnect the cable
	Is the test pen broken?	Replace the test pen
	Is the test pen inserted in place?	Insert the test pen in place
	Is the test lead wire disconnected?	Replace the test lead wire
	Is the test lead wire inserted in place?	Insert the test lead wire in place
Power off during measurement	Is the battery low?	Charge with the USB cable
	Does the instrument shut down automatically?	Restart it
The transmitter cannot receive the signal transmitted by itself	Has the transmit key been pressed?	Retransmit the signal
	Detect if the fuse of the transmitter is disconnected?	Send it to a nearby service center

8. Accessories List

Transmitter	1 set	Receiver	1 set
Test clips (red and black)	Each 1 pcs	User Manual	1 pcs
Test pen (red and black)	Each 1 pcs	Ground rod	1 pcs
Test lead wire (red and black)	Each 1 pcs	Toolkit	1 pcs
Multimeter pen(red and black)	Each 1 pcs	Graphic carton	1 pcs

Note: The list is for reference only. The accessories actually delivered shall control.

9. Technical Parameters

Technical parameters of transmitter	Transmit signal frequency	125KHz
	Transmit signal peak	23±3V MAX
	AC Voltage	Test range:0~750V Accuracy:±0.8%+3
	DC Voltage	Test range:0~1000V Accuracy:±0.5%+3
	Diode\continuity test	Alarm when resistance is lower than 50Ω, measurable diode forward voltage drop range:0~3.3V
	Resistance measurement	0~60MΩ Accuracy:±1%+5
	Current measurement	AC measurement:0~5A Accuracy:±0.8%+3 DC measurement:0~5A Accuracy:±0.8%+3
	Frequency Measurement	Sine wave measurement range:1HZ~20MHZ (Input signal:⩾1.5Vpp) Square wave measurement range: 1HZ~5MHZ (Input signal:⩾1Vpp) triangle wave measurement range: 1HZ~1MHZ (Input signal:⩾1.2Vpp)
	Ambient temperature	Meaurement range:0-50℃, Error:±1℃, Unit:℃/℉
	Power supply	3.7V rechargeable lithium battery
	Charging Current	750mA MAX
	Working Current	500mA MAX
	Standby Current	100mA MAX
	Off Current	1uA
	Low Battery reminder	√
	Low Battery off	√

Technical parameters of receiver	Receive signal frequency	125KHz
	Sensitivity Adjustment	√
	NCV function	√
	Light function	√
	Power supply	3.7V rechargeable lithium battery
	Charging Current	750mA MAX
	Working Current	500mA MAX
	Standby Current	100mA MAX
	Off Current	1uA
	Low Battery reminder	√
	Low Battery off	√

NOYAFA® 精明鼠®

深圳市诺方舟电子有限公司

编号	201	202	301	302	303	304	305	比例:	1:1	品号:	
类目	塑胶件	五金类	镜片	PVC贴纸	不干胶贴	说明书	包装盒	单位:	mm		
选择						√		设计	LJQ	品名:	NF-8301说明书英文-V1
306	307	308	309	310	311	312	313	核准			
彩卡	吸塑	工具包	PE袋	纸箱	宣传单	合格证	打印标签	标准:	√	文件类型:	打样文件
								定制:			
制作日期		2025.07.22		样式	骑马订		印刷材质		128g铜版纸		
印刷要求		彩色		页码	28P		变更记录				
尺寸大小		140×105mm		版本	V1						