

Introduction

This guide uses the VM-550FF 1-watt and the Loc3-5Tx 5-watt transmitters to locate the pushrod cable on the Type-MX and Type-CP cable reels. The locator being used is the vLoc3-Cam receiver, but users of the full range of Vivax-Metrotech locators will also find it useful.

Transmitter Operational Controls

The VM-550FF Transmitter is a multi-frequency 1-watt transmitter. The FF and two low frequencies are not suitable for this application; only the high frequency of 83kHz, known for its effectiveness, should be used. The locate frequency is applied by direct connection or induction. For this application, the direct-connection method must be used.

VM-550FF What's in the box



1. VM-550FF Transmitter
2. Ground stake
3. Direct connection lead
4. Transmitter carry strap

VM-550FF Connection Block



1. Direct connection socket
2. Socket cover

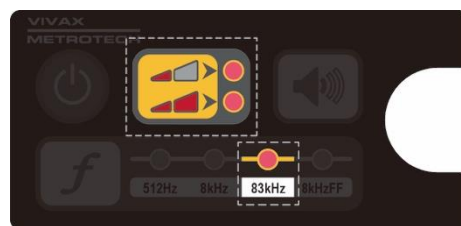
VM-550FF Overview



1. On/Off button
2. Output power select and indicator
3. Speaker volume select
4. Speaker
5. Battery housing cover
6. Connection lead socket
7. Frequency select
8. Frequency selected indicators
9. Battery cover retaining screws

VM-550FF Keypad

To locate the pushrod cable deployed in a pipe or a utility, only the 83kHz frequency and high/low power options need to be used.



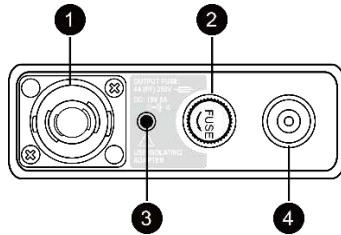
The **Loc3-5Tx Transmitter** is a multi-frequency 5-watt transmitter. When using this model transmitter, only frequencies above 65kHz should be used. The locate frequency can be applied by direct connection or induction. For this application, **the direct connection method** must be used.

Loc3-5Tx What's in the box



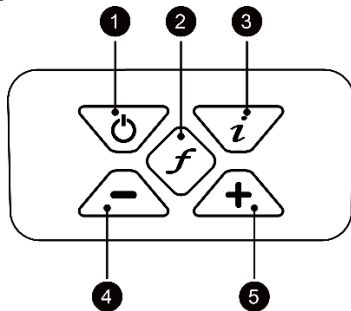
1. Loc3 series transmitter
2. Ground stake
3. Direct connection lead
4. Alkaline battery tray
5. Mini-USB lead

Loc3-5Tx Connections Block



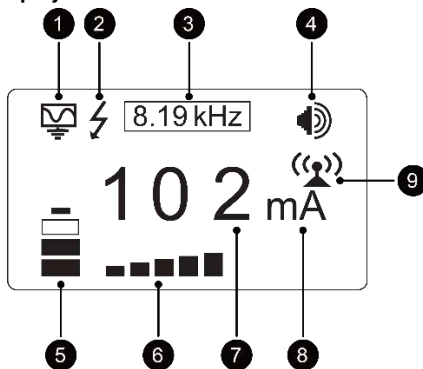
1. Connection lead socket
2. Loudspeaker
3. Fuse (1.6A/250V Fuse)
4. Battery charging socket & DC input

Loc3-5Tx Keypad



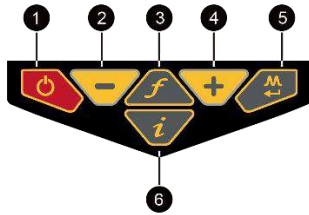
1. On/Off control
2. Frequency select
3. Information (Volume, LCD contrast, Frequency menu)
4. Output decrease (Navigate through the menu)
5. Output increase (Navigate through the menu)

Loc3-5Tx Display



1. Mode indication icon
2. High Voltage Warning (output is enabled for high voltage)
3. Frequency being transmitted
4. Loudspeaker level
5. Battery status
6. Output setting
7. Digital readout (mA, volts, ohms)
8. Units (mA, volts, ohms)
9. Tx-Link status

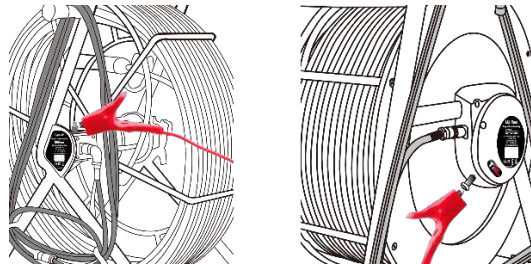
vLoc3-Cam Receiver



- | | |
|-----------------------|-------------------------|
| 1. On/Off | 4. Increase sensitivity |
| 2. Reduce sensitivity | 5. Mode select |
| 3. Select frequency | 6. Depth readings |

Active Location of the Camera Pushrod Cable

Locating the deployed pushrod cable route is possible with a transmitter, which will apply a precise locate signal to one of the pushrod cable conductors. The locating signal is applied by directly connecting the transmitter to the connection port of the Type-CP or Type-MX pushrod cable reels. The picture below shows a direct connection post to which the red transmitter lead connects. The VM-550FF is a good choice of transmitter, providing 83kHz at 1 watt of power. However, any transmitter with a high direct-connection frequency over 65kHz suits the task.



Peak Response Mode

The Line mode used to locate the pushrod cable is called Peak Response mode. Two horizontal antennas provide a "peak" or maximum signal response when over the center of the pushrod cable. The illustration below provides an example of a peak locate signal.



The left illustration shows a low bar graph in blue and a low signal strength 18.3 when approaching the pushrod cable from right to left. The center illustration shows the highest bar graph response and signal strength of 61.4 when directly over the pushrod cable. The right illustration shows a low bar graph and low signal strength of 18.3 after crossing the pushrod cable and now to the left of it.

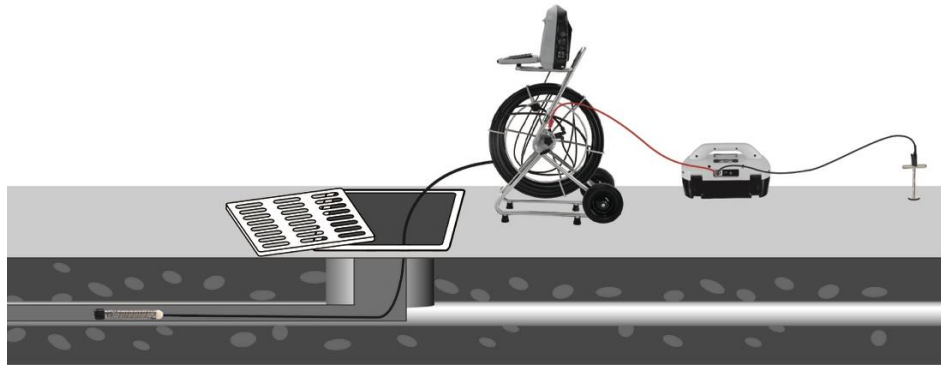
Method:

- **Applying a signal**

1. Connect the red lead to the reel's connection post.
2. Connect the black lead to a suitable ground, such as a ground stake inserted in the soil. If possible, place the ground stake at the right angle to the suspected pipe direction, as the earth lead may interfere with signals from the Pushrod cable.



Make sure the leads do not impede the operation of the turning pushrod cable cage.

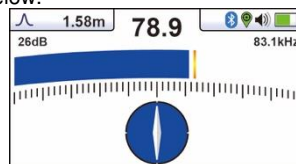


If there is no suitable area to insert the ground rod into the earth, the maintenance hole access point may have metal surrounding the hole. Making a good connection by clipping onto the surround should be possible. If the surround is rusty, use a wire brush to clean the connection point first.

- **Locating the Pushrod Cable**

(connect to the reel as described above)

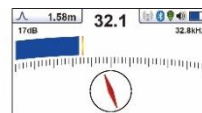
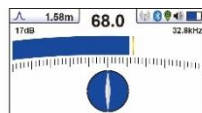
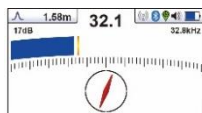
3. Use the "Mode" button to choose the Line mode. The peak icon  should be shown in the top left portion of the screen, and the screen should look similar to the illustration below.



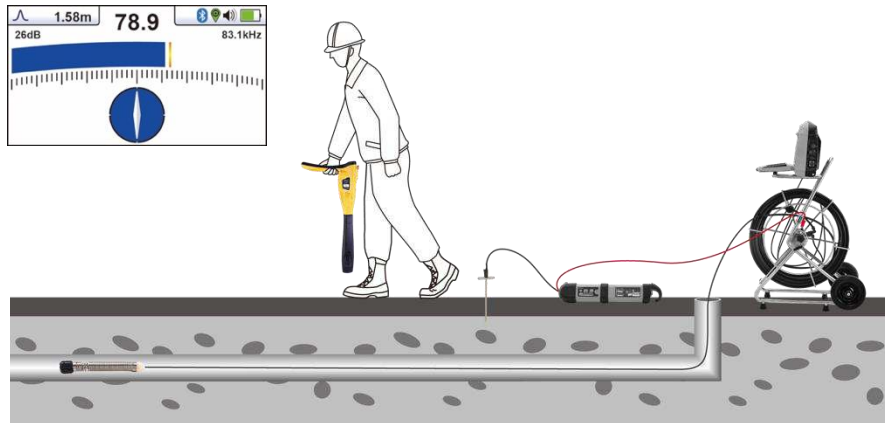
4. Use the "f" button to set the locator's frequency to that of the transmitter.



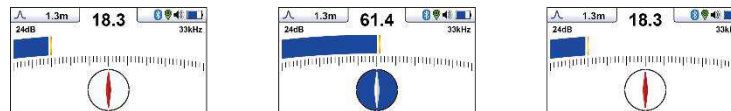
Note that the screen will now show the addition of a compass (line direction indicator). In the presence of a locate signal, the compass will align itself parallel to the pushrod cable being located. When the compass indicator is parallel to the pushrod cable the circle will be filled in blue. This ensures that the operator is aware of the direction of the pushrod cable.



5. Stand approximately 5m (6ft) from the reel and over the suspected position of the pushrod cable.



6. Hold the locator vertically and rotate it on its axis until the compass indicates Forward/Back and is filled in blue, as in the above illustration
7. Adjust the sensitivity control using the "+" and "-" keys so that the bar graph is approximately 50%.
8. Keeping the vLoc3-Cam vertical, move to the side slightly. If the bar graph increases, you are moving toward the pushrod cable. If it decreases, you are moving away from it.



Make the compass indicator in line and leave it blue.

9. Move toward the pushrod cable until a maximum "peak" signal is obtained. Reducing or increasing the sensitivity may be necessary to keep the bar graph on the scale. This is normal and should be expected. Keep the vLoc3-Cam vertical and avoid swinging as swinging may create false readings.
10. Move the locator side to side to ensure a maximum signal is detected. Use the peak level indicator to assist.



11. With the maximum signal found and the compass running forward/back, the vLoc3-Cam is now directly over and exactly across the pushrod cable.
12. The depth is also displayed in the box at the top left of the screen unless a weak signal is detected. The depth is only accurate if the locator is directly above and in line with the pushrod cable.

1.58m

13. Continue to trace the pushrod cable along the route.

As the end of the pushrod cable is reached, the signal will rapidly reduce. This is to be expected and typically will happen a meter or two (three to six) from the camera head.



At this point, the signal will start to be distorted, and the depth measurement will be affected. Check for distortion by raising the locator a known distance, such as 300mm (1ft), and check the depth changes by approximately this amount. If it doesn't, treat the results with caution.

Distortion will also occur at the reel end of the pushrod cable.

If the exact position of the camera is required, switch the sonde on at the control box and use the vloc3-Cam in the sonde mode to detect the camera head.

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