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1. INTRODUCTION

The MT190 is a Circuit Breaker Finder system that operates on energized circuits, consists of a Transmitter, which plugs into the socket on the circuit you wish to isolate and a Receiver Scanner. The Transmitter sends signals along the cable to the distribution board, the operator simply runs the Receiver Scanner along the circuit breakers or fuses, and the scanner will automatically identify the correct breaker by means of a green LED and a continuous buzzer tone. An added feature is the convenient chart printed on the Transmitter that helps determine the wiring condition of the socket outlet, based on the LED lights results. Conditions indicated are Correct Wiring, Open Ground, Reverse Polarity, Open Live, Open Neutral and reverse Live and Ground. There is also a 30mA RCD test function built into the MT190 Transmitter.

2. SAFETY

WARNING: To ensure safe operation and service of the meter, follow these instructions, failure to observe these warnings can result in severe injury or death.

- Before each use, verify tester operation by testing on a known live and correctly wired receptacle and circuit.
- Do not use if the tester appears damaged in any way.
- The tester is intended for indoor use only.
- The tester is designed for use with 250V AC electrical systems, do not connect to higher voltage electrical supplies.
- Other equipment or devices attached to the circuit being tested could interfere with the tester, clear the circuit before testing.
- This tester only detects common wiring problems, always consult a qualified electrician to resolve wiring problems.
- If using accessories to connect to bare wires ensure that the circuit is not energized before inspecting, applying, or removing the transmitter.
- Exercise extreme caution around energized, bare wires, especially when working in or around an open breaker panel.
- Do not use in cardiac care areas.

Safety Symbols



WARNING

This symbol adjacent to another symbol, terminal or operating device indicates that the operator must refer to an explanation in the Operating Instructions to avoid personal injury or damage to the meter.

CAUTION

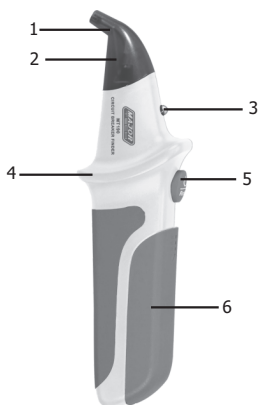
This WARNING symbol indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.

This CAUTION symbol indicates a potentially hazardous situation, which if not avoided, may result damage to the product.

3. METER DESCRIPTION

Receiver

- 1 - Scanning Head
- 2 - LED indicator, light red during auto scanning.
- 3 - Signal LED indicator, light green for correct.
- 4 - Buzzer, Bleeps to indicate auto scanning and Rapid or continuous tone to indicate correct breaker found.
- 5 - ON/OFF/RESET button , Press and hold to switch off, Press and release to switch on or reset during scanning.
- 6 - Battery cover



RECEIVER

Transmitter

- 1 - Plug
- 2 - RCD Test Button
- 3 - Receptacle LED Coding Scheme
- 4 - Receptacle LED'S Indicator
 - There is no switch for the transmitter.
 - It will automatically start the injection of the test signal upon connection to a mains supply.



TRANSMITTER

4. OPERATIONS

4.1. Transmitter

There is no switch for the transmitter. It will automatically start the injection of the test signal upon connection to a mains supply.

4.2. Receiver

The membrane switch on the receiver has 3 functions-On/Reset/Off. Push and immediately release the switch when the receiver is off-this will turn the unit on with a steady beeping and red LED Indicating that the scanning function is in progress.

Push and immediately release the switch when the receiver is on, this will reset all scanning function memories to zero, ready to start again, with a steady beeping and red LED. Always use the reset function away from the distribution board so that no signal is present during reset.

Push and hold switch down for over 1 second - this will turn the receiver off.

Note: To maximize battery life an auto-power off function is incorporated in the receiver which will turn the receiver off after three minutes of inactivity. To resume testing after this period just turn the unit on as described above. (Press and release to switch on or reset, Press and hold to switch unit off.)

4.3. Principles of Automatic Scanning

As the receiver works by comparing the strength of signal received from one breaker with another it is essential to compare like with like.

Observe the following for best results.

Do not let the scanning head wander around. To operate well the automatic scanning memory needs a consistent signal.

Keep the red scanning head at the same angle relative to the breaker or fuses for the duration of the test.

Keep the head in contact with the breaker during each sweep to ensure consistency in the proximity of the head to the breaker.

Test only the same side of each breaker during a test. Pay particular attention to this when testing a vertically hung panel which may have neighbouring breakers mounted in opposite directions.

Always reset the receiver (away from the distribution board) before changing any test condition.

4.4. Receptacle Wiring Test

1. Plug the Transmitter/Receptacle tester into the outlet.
2. The three LED's will indicate circuit condition, the diagram lists all of the conditions that the tester can detect. The LED's in this diagram represent the view from the GFCI button side of the transmitter, when viewing the other side of the transmitter the LED's will be a mirror image of those shown here.

3. The tester will not indicate the quality of the ground connection, 2 hot wires in a circuit, a combination of defects, or reversal of ground and neutral conductors.

● ● ●	CORRECT WIRING
● ● ●	HOT & GND REV, MISSING GND
● ● ●	HOT & GND REV
● ● ●	HOT & NEU REV
● ● ●	OPEN HOT
● ● ●	OPEN NEU
● ● ●	OPEN GND

4.5. Receptacle RCD Test

1. Before using the tester, press the TEST Button on the installed RCD receptacle. the RCD should trip.
 - If it does not trip, do not use the circuit and call a qualified electrician.
 - If it does trip, press the RESET Button on the receptacle.
2. Plug the Transmitter/Receptacle tester into the outlet. Verify that the wiring is correct as described above.
3. Press and hold the test button on the tester for at least 8 seconds. the indicator lights on the tester will shut off when the RCD trips.
4. If the circuit does not trip, either the RCD is operable but the wiring is incorrect, or the wiring is correct and the RCD is inoperable.

4.6. Function Check

• Function Check

Before use check that unit is functioning correctly. To do this, switch the receiver on and firstly check that the LED is red and a steady beeping tone is emitted .

If either of these functions is not present replace the battery in the receiver before proceeding. When battery power is low the green led flashing and the beeping tone will have a longer duration, then the meter will shut down quickly. The battery will have around 20% of its capacity left at this stage and will shortly require replacement. Connect the transmitter to the mains and move the scanning head over the face of the transmitter.

The frequency of the beeping should become very rapid or change to a continuous tone and the LED should turn Green when the scanning head is detecting a signal "hotspot" (this is good practice for scanning, as the indication is similar to finding the correct fuse at the board.)



(Run the scanning head over the transmitter to check the fuse Finder is operating correctly).

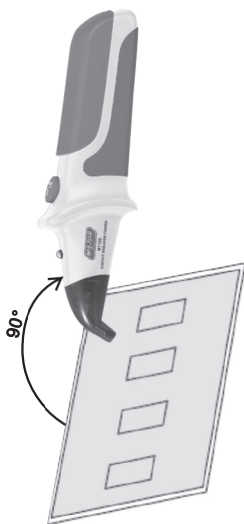
- **Advice for Best Performance**

Due to the differing designs of circuit breakers it may sometimes be unclear from the above procedure which of two breaks the strongest signal comes from, particularly if it appears to come from a boundary area between two adjacent breaker. In the event of this occurring one of the following variations should enable clear identification.

4.7. Finding the Circuit Breaker or Fuse

1. Scan the breaker on the opposite side of the switch (after resetting the receiver). The strongest signal may be found at the top of the breaker.





2. Rotate the receiver (after resetting) through 90 to set the black pips on the insert of the red scanning head to come towards being in line with the breaker. At some point a stronger signal will be found-scan at the new angle.

- **Fuse Finding Process**

1. Plug the transmitter into the socket under test and switch the socket on. The red LED on the transmitter should light.
2. Go to the consumer unit or fuse box. Turn on the receiver. A steady beeping tone will be emitted and the LED on the receiver will light red to indicate automatic scan.
3. Place the scanning head in contact with the face of the circuit breaker or fuses at a right angle to the direction of the breaker body and run the scanning head steadily along the row of circuit breakers. The frequency of the beeping will increase to a very rapid or continuous tone and the LED will turn from red to green when the receiver encounters a stronger signal



(Continue to scan slowly across the face of the circuit breakers or fuses) (Some problems occur when the receiver is getting closer to correct circuit breaker, the red LED starts flashing and there is no LED indication for long time after detecting circuit breaker. These are normal.)

Because the receiver in search and searches for weak signal, we can press the RESET key, new search for signals. And then you get the strongest signal, the red light turn off, green LED lighting and continuous tone.)

Important the first stronger signal you encounter may not be the strongest there is.

Do not stop scanning when a stronger signal is first encountered. Because the scanning technology used is comparatively, it is essential to continue scanning all of the breakers that may protect the outlet under test.

4. Repeat the scan of the row of breakers. With each sweep the receiver will automatically adjust its sensitivity and disregard weaker signals.
5. Continue scanning until the correct indication (rapid or continuous tone and LED lit green) is given only when the scanning head is over one breaker or fuse. This is the breaker protecting the circuit that the transmitter is plugged into.

6. Turn the circuit in question off and the receiver will revert to a red LED display and start steadily beeping.
7. Confirm the correct breaker has been selected by checking that the red LED on the transmitter is no longer lit.
Sometimes we have noticed a problem (mainly occurring on split distribution boards).
Some fluorescent light fitting circuits give an inconsistent amplifying effect to the detection signal resulting in a false signal. But obviously the breaker concerned will be rated considerably less than the typical rating of breaker feeding socket outlets, so it can safely be ignored.

5. SPECIFICATIONS

Function	Range
Operating Voltage	200 to 240V AC
Operating Frequency	50Hz
RCD (ELCB) Trip Rate	30mA
Power Source	9V 6LR61 (Receiver)
Size	196 x 55 x 36mm Receiver 2 x 51 x 33mm Transmitter
Weight	148g Receiver 140g Transmitter

6. MAINTENANCE

• Battery installation

The fuse finder receiver is powered by a 9V battery or equivalent.
To install a battery remove the screw and cover on the rear of the receiver enabling access to the battery compartment.

Fit the 9V Battery observing correct polarity.

Replace cover and screw.

The transmitters mains are powered and does not require a battery.
When battery power is low, the beeping tone will have a longer duration. The battery will have around 20% of its capacity at this stage and will shortly require replacement.

Remove screw and slide off cover to replace batteries.

• Cleaning

Wipe the exterior surface of the transmitter and receiver with a damp cloth or cleansing wipe. Do not use solvents. Dry thoroughly before use.



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