

TECHNICAL SPECIFICATIONS

Model: ICK-250

Input Voltage: 3-phase inputs L1, L2 and L3: 440 V

AC / max. 600 V DC

DC Bus Voltage: 280–600 V DC

Charging Phase: 8.5 mA maximum per phase

Frequency: 5 to 20 kHz

Operating Environment: 0°C to 40°C at 80% RH

Protection Rating: IP40

Maximum Altitude: 2000 m (6561 ft)

Power Supply: 2 × AA alkaline batteries (LR6 – 1.5 V)

Dimensions: 119 (L) × 79 (W) × 24 (H) mm

Weight: 250 g (with standard probes).

Overload Protection: 500 V AC for 10 seconds

Measurement Category: CAT II, 600 V, Pollution Degree 2, Class 2

IEC 61010 safety standard defines four measurement categories (CAT I to CAT IV) based on the magnitude of transient impulse hazards.



 Warning: Important information, read the instructions

 Warning: Dangerous voltage

 Alternating current

 Alternating current

 Double insulation

 Compliant with European Union regulations

This guide contains instructions for safe use of the ICK-250. Refer also to the HVAC equipment manufacturer's service manual for additional safety and maintenance information.

SAFETY

Warning – Read these instructions before using your ICK-250

- These warnings identify hazardous conditions and actions that could result in injury or death
- ICK-250 is intended for use only on air conditioning and heat pump systems equipped with inverter technology. Never connect the ICK-250 to the main power supply.
- Use the device only as specified in this manual or the protection provided by the ICK-250 may be impaired.
- For proper diagnosis, tests must be performed on electrically energized parts. Such measurements must be carried out by properly trained professionals aware of the risks involved.
- Avoid any contact between the probes and other components, housing parts or metal surfaces.
- Do not disconnect circuits while they are operating. This is dangerous and may cause permanent damage to components.
- The housing is equipped with a strong magnet. Ensure the device is securely mounted before powering the system.
- Protect the ICK-250 from water, humidity and condensation.
- If the ICK-250 or connectors are damaged, they must be replaced.
- Do not use voltage levels higher than those specified
- Do not open the ICK-250 housing.
- Limit continuous use of the ICK-250 to 10 minutes. Allow a 10-minute rest period before performing another test.

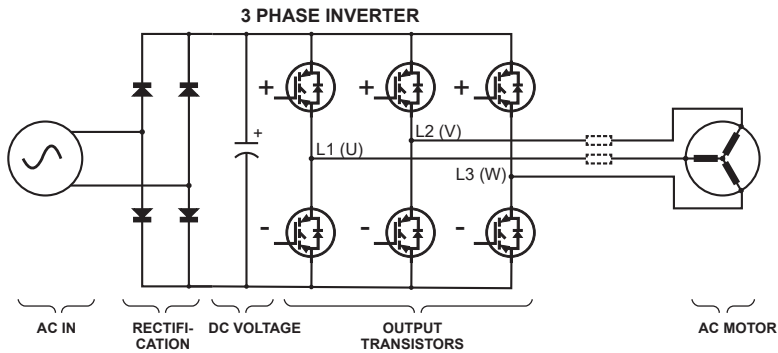
INVERTER TECHNOLOGY INFORMATION

After a test, some systems may require a reset procedure.

The inverter converts incoming AC current into DC current and then switches six transistors in sequence to produce an AC voltage at the desired frequency. The compressor operates using variable-frequency AC.

When an inverter system starts, there is typically a two- to three-minute delay before the compressor starts.

The sequence is completed once the inverter detects that no current is flowing to the compressor. In some cases, several sequences may be repeated after an additional delay.



ICK-250 OVERVIEW

The ICK-250 module is designed to diagnose the inverter board of an air conditioning or heat pump system and determine with certainty whether the board must be replaced or, by elimination, whether the problem originates from the compressor. ICK-250 detects the switching operations of the six transistors on the inverter board. A sequence during which all six transistors switch on and off alternately indicates correct operation.

BATTERY

ICK-250 remains in standby mode and automatically restarts when inverter activity is detected on inputs L1, L2 or L3, or when the MEM button is pressed.

Virtually no power is consumed in standby mode.

The battery can be tested by holding the MEM button for 4 seconds: if all six LEDs light up, the batteries are good.

Once testing is complete, clear the memory to return the ICK-250 to standby mode and preserve battery life.

OPERATION

During the test phase, ICK-250 records and displays all valid signals detected by lighting an LED and emitting an audible beep. Each valid signal is stored in memory until the next reset.

When an inverter test sequence has been completed, ICK-250 indicates that a start-up sequence has been detected by emitting a short audible signal every 4 seconds.

This continues for 18 minutes, after which the memory is cleared and the ICK-250 enters standby mode.

MEMORY

Inverter start-up sequences are often very short — only about one second.

ICK-250 stores valid signals in memory for later analysis.

Memory can be recalled at any time by briefly pressing the MEM button to display detected signals.

Six continuously lit LEDs indicate a successful test.

Memory must be cleared before each test.

MAGNETIC HOUSING

ICK-250 is equipped with a magnetic housing that allows the device to be mounted directly onto the condenser.

COMPRESSORS

Compressors can generally fail due to insulation faults in motor windings or grounding issues. It is strongly recommended to perform an insulation-to-ground test and resistance measurements between each compressor phase before reconnecting the compressor after testing.

WARNING

To avoid electric shock, injury or damage to the ICK-250, always switch off the power supply and wait 3 minutes before disconnecting connectors.

This inverter phase test must be performed with the compressor disconnected from the inverter board.

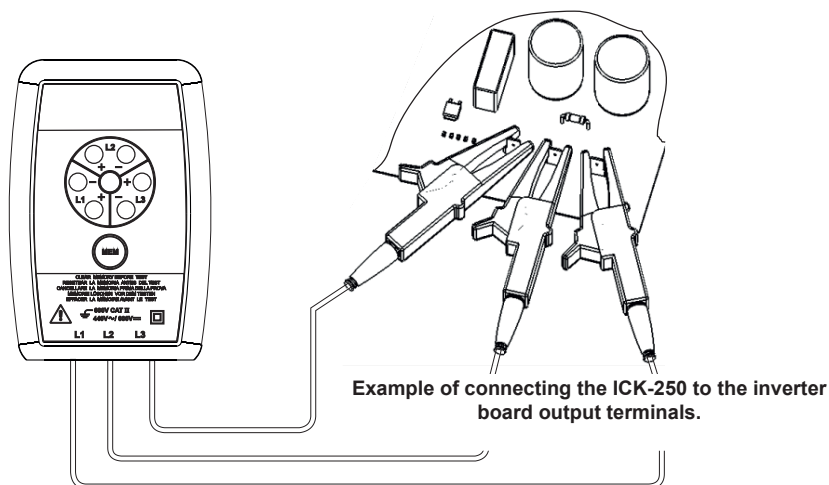
Disconnect the three compressor phases.

Connect L1, L2 and L3 of the ICK-250 to the three inverter board phases (sometimes designated U, V, W).

There are different ways to connect the ICK-250 depending on terminal type and accessibility. The technician must ensure that all connections are properly secured before powering on. Once all safe connections are established, power can be restored to the system.

STEP-BY-STEP TEST PROCEDURE

1. Press and hold the MEM button for 4 seconds to reset memory. The six LEDs will light up sequentially and then switch off, indicating test initialization.
2. After a few seconds without signal, the inverter will begin a start-up sequence during which it powers the ICK-250 (as if it were the compressor). Typically, the inverter cuts power after a few seconds if there is no compressor feedback. The ICK-250 then indicates the end of the test with a beep every 4 seconds along with all six LEDs illuminated.
3. Press the MEM button to display test results:
 - If all six LEDs flash simultaneously and brightly → the inverter board is operational
 - If one or more LEDs do not light up → the board is defective and must be replaced
 - If one or more LEDs remain constantly lit → the board is defective and must be replaced



MAINTENANCE AND CLEANING

Wipe the housing with a damp cloth and mild detergent. Do not use abrasives or solvents. Dirt or moisture in connectors may affect safe operation and device performance.

If the housing or connections are damaged, the unit must be replaced.

Check proper operation by momentarily applying 230 V between each phase until all six LEDs light up.

Battery test: hold the MEM button for 4 seconds — if all six LEDs illuminate, the batteries are good.

Use alkaline batteries only.

For long-term storage, always remove batteries to prevent leakage.

2-YEAR WARRANTY

This product has been fully tested and certified to be free from defects. Provided it is used, transported and stored professionally and according to instructions, it will provide long service life and reliable performance. If a defect occurs, first refer to the maintenance section of this manual.

If the product proves defective within 2 years due to materials or manufacturing faults, it will be repaired or replaced by the manufacturer, provided it can be clearly demonstrated that it has been used and maintained according to instructions.

No liability can be accepted under any circumstances for indirect, incidental or consequential damages or losses, including data loss, resulting from the use of this product.

This warranty does not cover batteries, damage caused by negligence, misuse, contamination, modification, accident, abnormal operating conditions or handling, including failures resulting from use outside product specifications, or normal wear of mechanical components. The warranty is void if the housing has been opened.