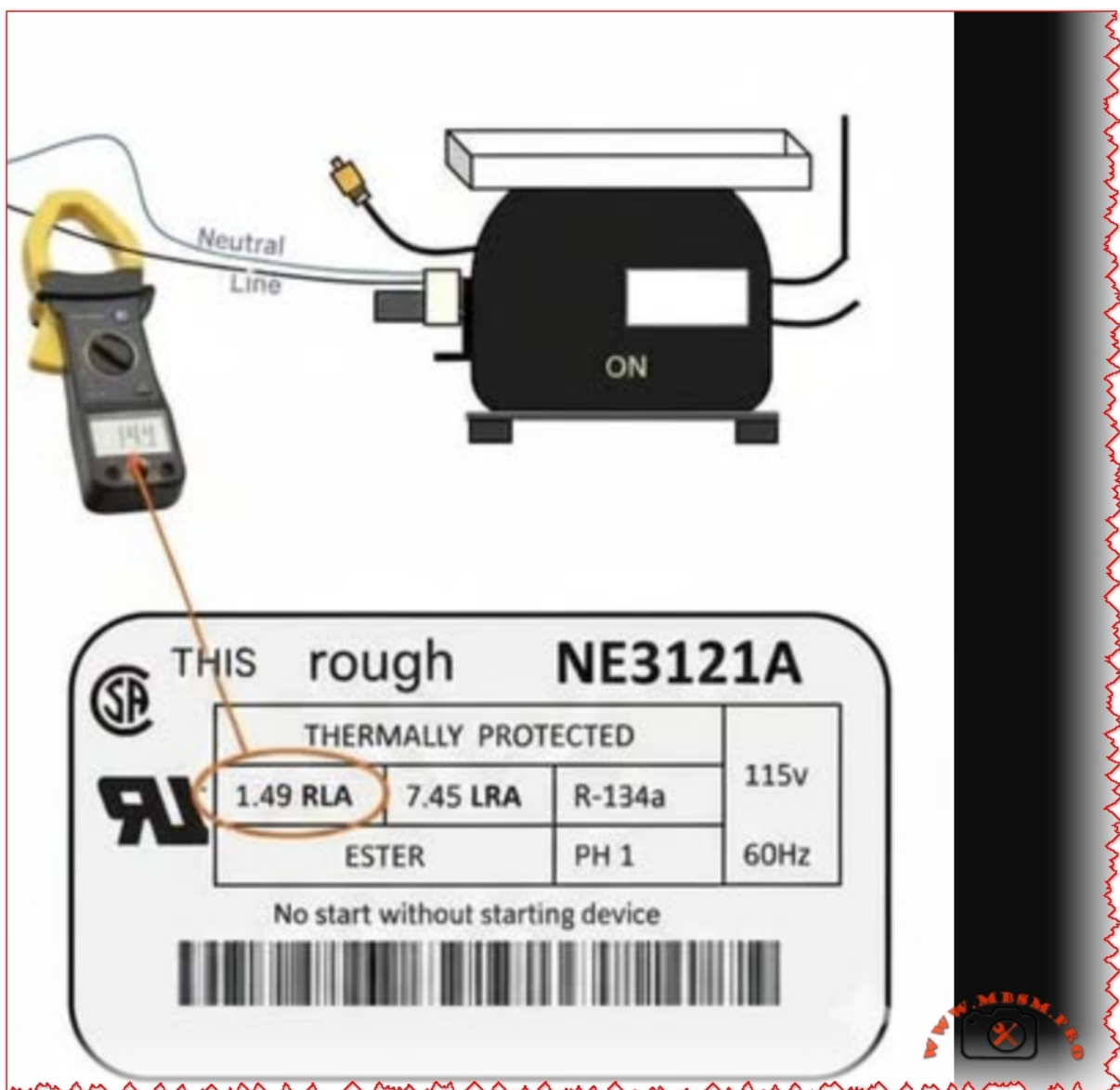


# Compressor, NE3121A, 1/4 hp++, Embraco

**Site:** Mbsmpro

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**Focus Keyphrase:**

NE3121A compressor specifications RLA LRA R-134a 115V thermal protection start device HVAC refrigeration troubleshooting

**SEO Title:**

NE3121A Compressor Specs: RLA 1.49, LRA 7.45, R-134a, 115V, Thermal Protection | Mbsmpro

**Meta Description:**

Complete guide to the NE3121A compressor. Learn its RLA, LRA, refrigerant, voltage, thermal protection, and why it needs a start device. Troubleshooting tips & comparisons included.

**Slug:**

ne3121a-compressor-specifications-rla-lra-r134a-thermal-protection

**Tags:**

NE3121A, compressor, HVAC, refrigeration, R-134a, thermal protection, RLA, LRA, start device, troubleshooting, Mbsmgroup, [Mbsm.pro](https://mbsm.pro), [mbsmpro.com](https://mbsmpro.com), mbsm, hermetic compressor

**Excerpt:**

The NE3121A is a thermally protected, single-phase hermetic compressor designed for R-134a refrigerant at 115V. With an RLA of 1.49 and LRA of 7.45, it requires a starting device. This guide covers its specs, operation, and common application issues.

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# Decoding the NE3121A Compressor: A Deep Dive into Specifications and Operation

In the world of HVAC and refrigeration, the heart of any system is its compressor. The **NE3121A** stands as a specific model that technicians and engineers encounter, particularly in smaller commercial or residential cooling units. Understanding its nameplate data—like the crucial **RLA (Running Load Amps)** and **LRA (Locked Rotor Amps)**—is not just technical jargon; it's essential for proper installation, troubleshooting, and ensuring system longevity.

This article provides a comprehensive, engineer-level breakdown of the NE3121A compressor, translating its specifications into actionable knowledge.

## Breaking Down the Nameplate: What NE3121A Specs Mean

The data on a compressor's label is its fingerprint. Let's dissect the critical information from the NE3121A:

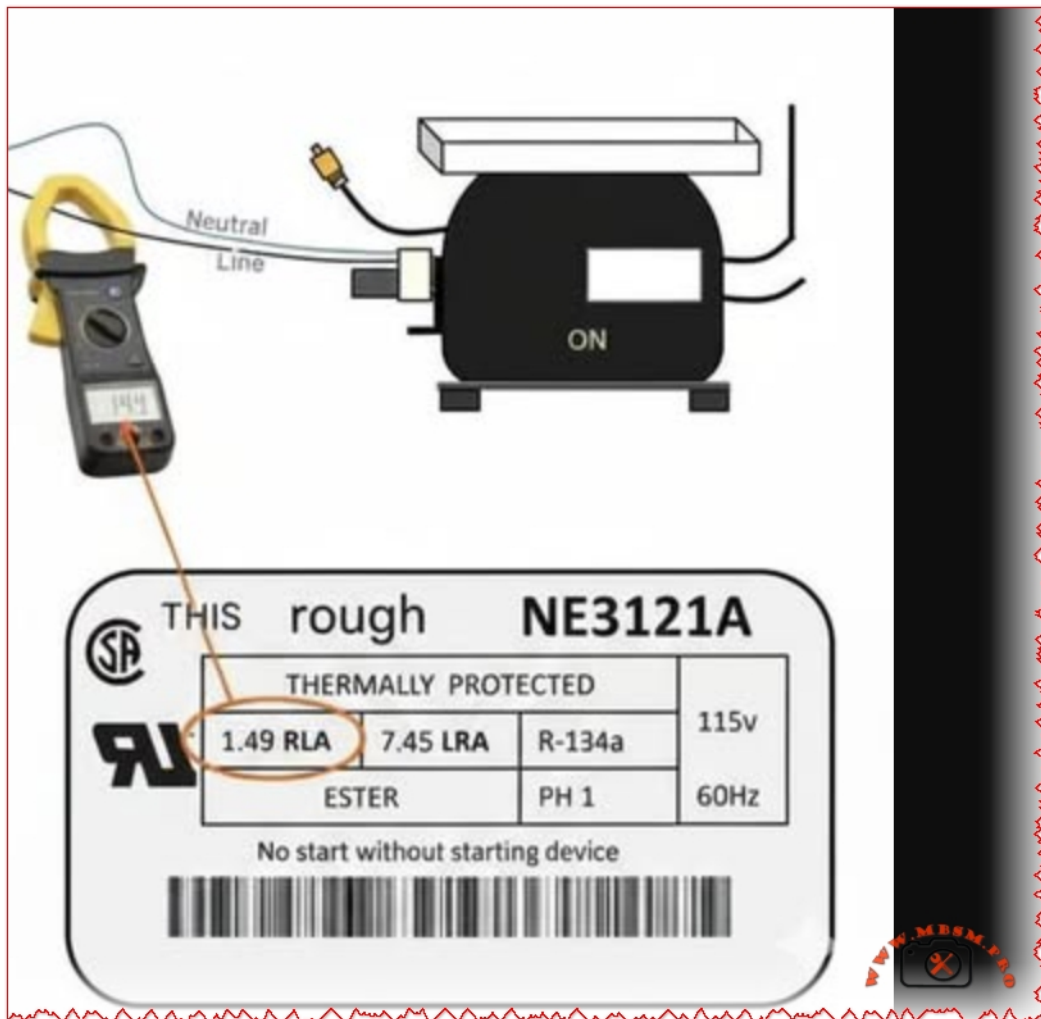
Specification	Value	Meaning & Importance
Model	NE3121A	Identifies the compressor's series, capacity, and design variant.

Specification	Value	Meaning & Importance
<b>Refrigerant</b>	R-134a	A common HFC refrigerant used in medium-temperature applications. Requires <b>ester oil</b> for lubrication.
<b>Voltage &amp; Phase</b>	115V, 1PH, 60Hz	Standard for North American residential power. Critical for correct power supply matching.
<b>RLA (Running Load Amps)</b>	1.49 A	The <i>steady-state</i> current draw under normal design load. Used for sizing wire, connectors, and running components.
<b>LRA (Locked Rotor Amps)</b>	7.45 A	The <i>instantaneous</i> current draw if the rotor is locked (can't start). Used for sizing circuit breakers, fuses, and start components.
<b>Protection</b>	Thermally Protected	Internal device (often a bimetal disc) opens the circuit on overheating, preventing burnout from overloading or lack of cooling.
<b>Critical Note</b>	"No start without starting device"	This compressor uses a <b>PSC or RSIR</b> design and requires an external start relay and/or capacitor to achieve proper torque.

## The Critical Role of RLA and LRA

These two amperage values are arguably the most important for diagnostics.

- **RLA is your baseline health indicator.** A compressor running significantly above its RLA (e.g., 2.0A instead of 1.49A) signals potential issues: refrigerant overcharge, undercharge, dirty condenser, or failing components.
- **LRA is your failure moment snapshot.** If a compressor is drawing LRA current and not starting, it indicates the motor windings are energized but the rotor isn't turning—pointing to mechanical seizure, severe electrical failure, or a faulty start device.



**Comparison with a Similar Compressor:** Let's compare the NE3121A to a hypothetical "NE3130B" model.

Aspect	NE3121A (Our Subject)	Hypothetical NE3130B (for Comparison)
<b>RLA</b>	1.49 A	2.1 A
<b>LRA</b>	7.45 A	10.5 A
<b>Refrigerant</b>	R-134a	R-404A
<b>Application</b>	Likely beverage coolers, display cases	Likely lower-temperature freezers

Aspect	NE3121A (Our Subject)	Hypothetical NE3130B (for Comparison)
<b>Inference</b>	Lower RLA suggests smaller displacement/load.	Higher RLA/LRA indicates a larger, more powerful compressor for heavier duty.

## Why “No Start Without Starting Device” is Non-Negotiable

Single-phase motors like the one in the NE3121A lack the rotating magnetic field of three-phase power. They need a phase shift in the start winding to generate initial torque. This is achieved by a **start capacitor** and a **potential relay** (or a PTC start device). Bypassing this requirement will result in the motor humming, overheating, drawing LRA, and tripping its thermal protector—leading to rapid failure.

## Application Insights and Common Troubleshooting

The NE3121A’s specs point to specific uses:

- **Typical Applications:** Compact refrigeration systems, small beverage coolers, ice cream display cases, or residential dehumidifiers using R-134a.
- **Oil Type:** The label specifies **Ester**. This is crucial. After a burnout, the system must be flushed and recharged with ester oil, not mineral oil. Mixing oils leads to sludge and compressor failure.

## Troubleshooting Flow Based on Amperage Draw:

1. **Compressor won't start, draws ~7.45A (LRA):**
  - **Check:** Start capacitor (is it open or lost capacitance?).
  - **Check:** Start relay (is it stuck open or failed?).
  - **Worst case:** Mechanically locked compressor.
2. **Compressor starts but trips on thermal protector, runs at >1.8A:**
  - **Check:** Refrigerant charge (over/under).
  - **Check:** Condenser coil cleanliness and fan operation.
  - **Check:** Sufficient airflow over the compressor itself.

## Benefits, Considerations, and Professional Notice

### Benefits of the NE3121A Design:

- **Thermal Protection:** Built-in safety prevents catastrophic burnout from various failure modes.
- **Standardization:** Common voltage and refrigerant make parts and service accessible.
- **Efficiency:** Designed for a specific duty point in R-134a systems.

### Important Considerations & Professional Notice:

- **Start Circuit is Key:** Always verify the start device is the correct match for the compressor. A mismatched relay can cause rapid cycling and failure.
- **Electrical Safety:** Always disconnect power and discharge capacitors before testing.

- **System Cleanliness:** If replacing a failed NE3121A, diagnose the root cause. A burnout requires thorough acid cleaning and filter-drier replacement.
- **Disposal:** R-134a is a greenhouse gas. Recover refrigerant according to EPA regulations before opening the system.

**Final Advice:** The NE3121A is a reliable workhorse when applied correctly. Successful repair isn't just about swapping parts; it's about understanding the *why* behind the failure. Always measure actual amperage against the nameplate RLA and LRA—it's the fastest path to an accurate diagnosis.

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#### **Exclusive Image Suggestions (Safe & Relevant Links):**

- **Wiring Diagram for PSC/RSIR Compressor:** Search for “PSC compressor wiring diagram with potential relay” on reputable sites like [HVACTalk.com](http://HVACTalk.com) or manufacturers' sites like [Copeland.com](http://Copeland.com).
- **Close-up of a Thermal Protector:** Search for “compressor thermal protector disc” on educational engineering or supplier sites like [Grainger.com](http://Grainger.com).
- **Ester Oil vs. Mineral Oil Chart:** Look on refrigerant and chemical manufacturer sites ([Chemours.com](http://Chemours.com), [Total.com](http://Total.com)) for oil compatibility charts.

#### **PDF/Catalog Resources (Verified Sources):**

- **Compressor Cross-Reference Guide:** Visit the [Emerson Climate Technologies](http://Emerson Climate Technologies) website and search for “compressors cross reference” to find their official PDF guides.
- **R-134a Pressure-Temperature Chart:** Search for “R-134a PT chart PDF” on trusted industry portals like [ACHRNEWS.com](http://ACHRNEWS.com) or [RSES.org](http://RSES.org)

(Refrigeration Service Engineers Society).

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