Champion of HBP: Copeland KCJ513HAG-S424H

Category: Refrigeration
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The Heavyweight Champion of HBP: Copeland KCJ513HAG-S424H

In the realm of commercial refrigeration, few names carry as much weight as **Copeland**. If you are an **artisan bricoleur** repairing a large water cooler, a bottle chiller, or a specialized air conditioning unit, encountering the **KCJ513HAG-S424H** means you are dealing with a robust, high-torque machine. This isn't a small domestic compressor; it is a **1.2 HP** beast designed to move heat fast.

The **KCJ series** (Reciprocating) is legendary for its durability in high-ambient temperatures (common in Tunisia and the Middle East). Unlike rotary compressors that might struggle when the condenser gets clogged with dust, this **reciprocating connecting rod** design keeps pumping. The "HAG" suffix is your key identifier: **'H'** stands for High Temperature (HBP), and **'G'** confirms it is built for **R134a** gas.

Why 1.2 HP Matters for High Back Pressure (HBP)

This compressor is a "High Back Pressure" specialist. It is designed to operate where the evaporator temperature is relatively high (like +7.2°C for AC or water cooling).

- **Cooling Capacity:** At standard ASHRAE conditions, it delivers a massive **12,300 Btu/h** (approx 3,604 Watts).
- **Efficiency:** It uses a **CSCR (Capacitor Start Capacitor Run)** motor configuration. This means it has a start capacitor to get the heavy piston moving and a run capacitor to keep the amperage low (approx 6.5 Amps) while running.

Technical Specifications: The Data Sheet

Below is the precise data for the KCJ513HAG-S424H.

Feature	Specification
Model	**KCJ513HAG-S424H**
Brand	**Copeland (Emerson)**
Nominal HP	**1.20 HP** (approx. 1 Ton)
Displacement	**38.04 cc/rev**
Refrigerant	**R134a** (Tetrafluoroethane)
Application	**HBP** (High Back Pressure) / AC / Heat Pump
Voltage	220-230V ~ 50Hz
Cooling Capacity	**12,300 Btu/h** (@ +7.2°C Evap)
Input Power	1374 Watts

Feature	Specification
Input Current	**6.5 Amps**
Motor Circuit	**CSCR** (Capacitor Start & Run)
Start Capacitor	**80-100 µF** / 230V
Run Capacitor	**36 µF** / 440V
Oil Type	**POE** (Polyolester)
Oil Charge	890 ml
LRA (Locked Rotor)	39 A

Comparison: Copeland KCJ513HAG vs. Tecumseh & Danfoss

When this specific Copeland is unavailable, you need a backup plan. Here is how it compares to other market leaders in the 1 HP+ R134a category.

Compressor	Brand	Nominal HP	Displacement	Cooling (HBP)	Verdict
KCJ513HAG	**Copeland**	**1.2 HP**	**38.0 cc**	**12,300 Btu**	**Best for rugged, high-vibration environments.**
TAG4518Y	**Tecumseh**	1.5 HP	53.2 cc	15,000 Btu	Slightly larger; good upgrade if space permits.
CAJ4511Y	**Tecumseh**	1 HP	32.7 cc	10,500 Btu	A bit weaker; only use for smaller loads.
MT18	**Maneurop**	1.5 HP	30.2 cc	13,000 Btu	Excellent alternative, but physically larger/heavier.

> *Exploitation Note: If you replace a rotary compressor with this reciprocating model, ensure you add a liquid receiver. Reciprocating pumps are less tolerant of liquid slugging than rotaries!*

Exploitation: Installation & Troubleshooting

For the **technician**, installing the KCJ513HAG requires attention to detail:

1. **Capacitor Logic:** This unit *requires* the start capacitor to fire. If you hear a “hum” but no start, check the **potential relay (AC85001)** and the **80-100µF start capacitor**. They are the most common failure points, not the compressor itself.
2. **Oil Management:** It comes charged with **POE oil**. If you are retrofitting an old R12 system (rare these days, but possible), you must flush the lines completely. R134a + Mineral Oil = Sludge.
3. **Vibration:** This is a heavy piston compressor (~22.5 kg). Ensure the rubber grommets are fresh. If you bolt it down too tight without the rubber play, the vibration will crack the copper discharge line within weeks.
4. **Heat Management:** At 54.4°C condensing temp, this unit works hard. Ensure the condenser fan is clean and spinning at full RPM (usually 1300 RPM for these

units).



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Detailed specs for Copeland KCJ513HAG-S424H (1.2 HP, R134a). Discover cooling capacity, capacitor values (CSCR), and Tecumseh comparisons for water coolers and AC repair.
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Excerpt:
The Copeland KCJ513HAG-S424H is a powerhouse 1.2 HP compressor designed for high-demand cooling. Built for R134a applications like large water coolers and AC units, it delivers 12,300 Btu/h reliability. This guide covers its CSCR electrical setup, 38cc displacement, and how it compares to Tecumseh alternatives.
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