Embraco NEU2178GK, compressor

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R404A, 220-240V, 50Hz, 16.8 cc, CSR, Commercial Freezer Compressor

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The Cold Heart of Commercial Freezing: Embraco NEU2178GK

If you are an **artisan bricoleur** or a refrigeration technician working on commercial island freezers or restaurant reach-ins, you have likely encountered the **Embraco NEU2178GK**. This isn't your standard domestic fridge compressor; this is a **1 HP** powerhouse designed for the heavy lifting required by **Low Back Pressure (LBP)** applications using **R404A** or **R507** refrigerant.
Known for its robust "Made in Slovakia" build, the NEU2178GK is a **CSR (Capacitor Start, Capacitor Run)** motor. This is a critical detail for technicians: unlike simpler PTCSCR compressors, this unit relies on a precise electrical box containing both a start capacitor and a run capacitor to manage its high starting torque (HST). It is the engine you choose when you need reliability in a -30°C environment.

Why the "GK" Matters

In Embraco's nomenclature, the "K" at the end (as in NEU2178G**K**) often signifies a specific motor type—in this case, one designed for **High Starting Torque**. This means it can restart even if pressures haven't fully equalized, a common scenario in busy commercial kitchens where doors are opened frequently.

Technical Specifications: The Data You Need

Here is the breakdown of the technical capabilities of this compressor.

Feature	Specification
Model	**NEU2178GK**
Brand	Embraco (Nidec)
Horsepower (HP)	**1 HP**
Displacement	**16.80 cm³ (cc)**
Refrigerant	**R404A** / R507 / R452A
Application	**LBP** (Low Back Pressure)
Voltage	220-240V ~ 50Hz
Cooling Capacity	~900 W (at -23.3°C ASHRAE)
Motor Type	**CSR** (Capacitor Start & Run)
Start Capacitor	**88 – 108 µF** / 330V
Run Capacitor	**15 µF** / 400V
Oil Type	**POE 22** (Polyolester)
Oil Charge	350 ml
Expansion Device	Capillary or TXV (Expansion Valve)

Exploitation: Installation Tips for the Artisan

Installing a 1 HP commercial compressor is different from swapping a domestic one. Here are the “golden rules” for the NEU2178GK:

1. **The Electric Box is Mandatory:** You cannot bypass the capacitor box. This motor needs the **15µF run capacitor** to maintain efficiency and keep the windings cool, and the **start capacitor** to kick the rotor into motion against high head pressure.
2. **Moisture is the Enemy:** This compressor comes filled with **POE oil**. POE is like a sponge for humidity. If you leave the plugs open for more than 15 minutes, the oil absorbs moisture that vacuum pumps cannot remove. *Keep it sealed until the last second.*
3. **Nitrogen Sweep:** Because R404A systems use POE oil, any carbon from brazing will turn into sludge and block the capillary tube immediately. Always braze with a trickle of nitrogen flowing through the pipes.
4. **R452A Compatibility:** If R404A is expensive or restricted in your area, this compressor is often compatible with **R452A**, a drop-in replacement with a lower GWP (Global Warming Potential), but always check the discharge temperature.

Comparison: Embraco NEU2178GK vs. The Competition

When you can’t find the exact Embraco model, you need a replacement. Here is how it stacks up against the heavyweights from Secop and Tecumseh.

Compressor	Brand	Approx. HP	Displacement	Verdict
NEU2178GK	**Embraco**	**1 HP**	**16.8 cc**	**Best for high-torque commercial freezers.**
SC21CL	**Secop (Danfoss)**	~7/8 – 1 HP	20.95 cc	Older design, physically larger, very reliable.
CAJ2464Z	**Tecumseh**	1.5 HP	34.4 cc	Much more powerful; usually overkill for this slot.
NT2180GK	**Embraco**	1 HP	20.4 cc	The “big brother” of the NEU series; fits if you have space.

> *Pro Tip: If replacing a Secop SC21CL with this Embraco NEU2178GK, you may need to adjust the pipework as the Embraco is slightly more compact (lower height: ~206mm vs Secop ~219mm).*

Performance Analysis: Power Consumption

One reason technicians love the **NEU series** is efficiency.

- **Current (Amps):** At typical freezer conditions (-25°C), it draws about **4.3 Amps**.
- **LRA (Locked Rotor Amps):** 21.0 A. If your clamp meter reads 21A instantly and

stays there, your compressor is mechanically seized or the start capacitor is dead.

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Excerpt: The Embraco NEU2178GK is the definitive choice for 1 HP commercial freezing applications. Featuring a robust CSR motor and 16.8cc displacement, this R404A compressor delivers high starting torque for demanding environments. This guide details the electrical requirements, installation tips, and how it compares to Secop and Tecumseh alternatives.

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