

# APPLICATION STUDY: BD NANO TRUCK FRIDGE

SECOOP

Date: May 2026

## SUMMARY

**Project:** Transition from a Secop BD35F to a BDN45F

**Sector:** Mobile

**Task:** Maximum efficiency for the driver's comfort



Mobile  
Cooling



## STORY

### Use case

**Compressor:** BDN45F

**Refrigerant:** R134a

**Fridge volume:** 34 l

**Power supply:** 24 V DC

**Testing laboratory:**

Secop Application Laboratory in Flensburg

### Requirements

- Faster pull down
- Better energy consumption
- Better thermal management

### Background

Refrigeration units for cab comfort (truck fridges) are essential systems powered by the vehicle's main battery (12V/24V DC), designed to keep food and drinks cooled during long-haul trips. Historically, these units have relied on the Secop BD35F compressor, which remains an industry benchmark for reliability and high performance.

### Challenges

Despite the proven excellence of the BD35F, shifting market trends have introduced new requirements:

**Need for Efficiency:** Increasing demand for extended battery life has made standard energy consumption levels insufficient

**Technical Optimization:** The primary objective is to identify a solution that drastically reduces energy consumption to meet these new sustainability and operational standards.

**Performance Maintenance:** The challenge lies in achieving this significant energy reduction without compromising the target cooling temperature.

## OUTCOME

### Solution

The answer was the integration of the Secop BD Nano compressor. This component is an evolution that offers superior performance and advantages over its predecessor. The BD Nano represents a generational leap, offering more advanced compression technology optimized for low-power operation and fast response cycles in DC applications.

Adopting the BD Nano allowed for the replacement of the system's core while maintaining mechanical and electrical compatibility with existing platforms, ensuring radically improved performance.

### Results

The BDN45F compressor demonstrated significantly enhanced performance across all key metrics when benchmarked against the BD35F.

**-46.9%**

Energy consumption at 18°C ambient temperature







**-28.57%**

Compressor run time at 18°C ambient temperature

**-7%**

Pull down time

## THE BENEFITS

 Small Footprint	 Energy Efficient	 Long Product Lifecycles	 Low Noise Low Vibration	 Premium controllers	 Variable-Speed Efficiency
Same cooling capacity as much bigger compressors	Greater energy savings and reduced TCO	Maximum robustness and reliability	Acoustic comfort for noise-sensitive applications	Enhanced connectivity and lower EMI	Optimal energy consumption and performance

## TAKE-AWAYS



### Significant Energy Savings:

Energy consumption is reduced by up to 46.9% (at 18°C ambient temperature)



### Reduced Compressor Run Time:

Operational time is cut by up to 28.57% (at 18°C ambient temperature)



### Extended Autonomy:

Provides substantially longer cooling duration when running solely on battery power, vital during breaks and rest periods



### Tool4Cool®:

Controller features intuitive interfaces and easy access to information with easy customization



### Better Temperature Stability:

The set temperature is maintained more efficiently with shorter, less demanding compressor cycles



### Faster Cooling:

It ensures that beverages inserted at ambient temperature reach the optimal setpoint quicker, significantly enhancing user experience (7% improvement in pull down time).



Learn more about the BD Nano

<https://lmy.de/HEhHk>



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### ABOUT SECOP

Secop is the expert for advanced hermetic compressor technologies and cooling solutions in commercial refrigeration.