R600a | R134a | R1234yf · 12–24 V DC

THE PERFECT COOLING SOLUTION FOR AUTOMOTIVE REFRIGERATORS

SECOP

Mobile Applications

Variable-Speed Efficiency

Premium Controller

Low Noise Low Vibration

Low GWP Refrigerants

Small Footprint

→ **Compact, Efficient, and Silent Design**
The BD Nano Automotive compressors have a height of 93 mm and weigh only 1.5 kilograms, making them ideal for small car refrigerators by maximizing space for food and drinks. Their efficiency ensures low energy consumption, extended battery life, and an optimized total cost of ownership. Additionally, the compressors enhance acoustic comfort by reducing knocking noise and vibration, making them suitable for noise-sensitive applications. The BD Nano is quieter and more powerful than its predecessor, the BD Micro, which has been the benchmark in the car cooling solutions market.

→ **Proven Robustness and Low Electromagnetic Interference**
BD Nano Automotive compressors comply with the ISO16750 standard on improved transport stability. The controller provides low interference (EMI CISPR 25 class 5) and is designed for controlled emissions and protection against external sources.

→ **Produced in IATF16949-certified Plant**
BD Nano Automotive compressors are manufactured at the Secop's plant in Tianjin, China. This state-of-the-art facility has been IATF16949-certified and complies with the strict standards of the automotive industry.

→ **A Dedicated Controller for Automotive Applications**
Easy controller customization via Tool4Cool® software

Secop's BD Nano Automotive compressors, **BDN45F-A** and **BDN50K-A**, deliver premium cooling performance, high efficiency, and low noise and vibration levels in a compact design. The latest versions of the BD Nano platform feature a new electronic control unit specifically designed for automotive cooling applications, including refrigerators for passenger cars – both electric and internal combustion – trucks, and buses.

BD Nano Automotive compressors are controlled by a next-generation electronic control unit (ECU), offering users a wide range of electronic interface functions. The ECU can be configured via an easy-to-deploy Modbus interface with industry-standard LIN hardware. Designed as a universal, user-friendly, and feature-rich compressor controller, it provides enhanced functionality through Secop's free Tool4Cool® software, enabling even more customized programming.

Key features include a wide-range DC power input, extended operating envelopes, full battery protection, integrated and configurable electronic thermostat functionality, variable speed control, adjustable speed suppression to prevent cabinet resonances, and easily optimized parameters for a sustainable cooling solution.

The extreme compact BD Nano (40% shorter, 67% lighter in comparison – controller included) provides the same cooling capacity as much bigger BD35F/50F/35K/50K compressors yet with unrivaled efficiency.

General	BDN45F-A	BDN50K-A
Refrigerant	R134a, R1234yf	R600a
Compressor (1.37 kg)	109Z0445	109Z0465
Electronic unit (0.14 kg)	101N2720	101N2720

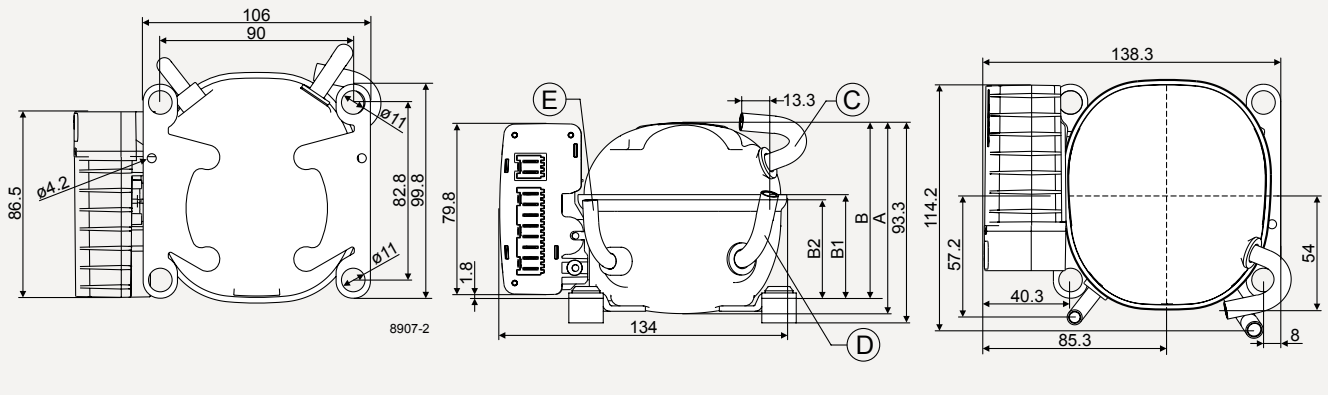
Application		
Application		LBP/MBP
Evaporating temperature	°C	-30 to 5
Voltage range	VDC	8.5–17 / 19–34
Speed range	rpm	2300–4500

Performance Data ASHRAE LBP		R1234yf				R600a			
Speed	rpm	2300	3000	4000	4500	2300	3000	4000	4500
Cooling capacity	W	30.5	40.3	56.3	64.5	31.6	43.9	60.2	68.1
Power consumption	W	21.9	26.9	36.2	41.8	21.4	28.2	39.3	44.3
COP	W/W	1.39	1.50	1.55	1.54	1.48	1.56	1.53	1.54
Test conditions @ -23.3 °C evaporating temperature		Condensing temp.: 54.4 °C | Suction gas temp.: 32.2 °C | Ambient temp.: 32.2 °C | Liquid temp.: 32.2 °C BDN45F-A performance data measured with R1234yf (R134a values similar)							

Performance Data ASHRAE MBP		R1234yf				R600a			
Speed	rpm	2300	3000	4000	4500	2300	3000	4000	4500
Cooling capacity	W	62.1	84.4	112.0	126.5	66.7	88.9	121.7	131
Power consumption	W	33.9	42.2	56.0	64.3	35.1	43.8	61.7	67.1
COP	W/W	1.83	2.00	2.00	1.97	1.90	2.03	1.97	1.95
Test conditions @ -23.3 °C evaporating temperature		Condensing temp.: 54.4 °C | Suction gas temp.: 35 °C | Ambient temp.: 32.2 °C | Liquid temp.: 46.1 °C BDN45F-A performance data measured with R1234yf (R134a values similar)							

Dimensions			
Height	mm	A	89.0
		B / B1 / B2	82.4 / 48.7 / 45.8
Suction connector	location/I.D. mm | angle material | seal	C	6.2 | 5° Copper | Rubber plug
Process connector	location/I.D. mm | angle material | seal	D	6.2 | 77.9° Copper | Rubber plug
Discharge connector	location/I.D. mm | angle material | seal	E	5.0 | 86.9° Cu-plated steel | Rubber plug
Connector tolerance	I.D. mm		±0.09, on 5.0 +0.12/+0.20

Electronic Unit Features	
New 32-bit microcontroller STM32	Parameters accessible in SI units · quicker response times · class B software for easier CB approval
Dedicated fan converter hardware	Stable fan output voltage · no fan noise changes · perfect fan protection
LIN communication hardware	Standard transceivers · robust against ground voltage shift and EMI · Modbus protocol
Updated hardware design and components	Minimal additional EMI filtering required · state of the art components · long term availability
Improved housing design	Optimized airflow · optimized PCB position · enforced stability for protection against rough conditions
Coded connectors with RAST hook	Withstand high pull forces · prevent wrong insertion · smart grouping eases wiring



Secop GmbH · Lise-Meitner-Str. 29 · 24941 Flensburg, Germany · Tel: +49 461 4941 0 · **www.secop.com**

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