Secop is the first choice for partners looking for leading-edge refrigeration solutions and a premium customer experience.

Secop delivers advanced refrigeration compressors and controls, providing customers tailored sustainable solutions for light commercial, battery-driven, and special cooling applications.

COMPRESSORS FOR MEDICAL COLD CHAIN SOLUTIONS

SECOP

Vaccine Cold Chain

Our compressor and electronic control solutions are installed in applications which are certified for WHO installations.

Biomedical Cooling Equipment

Our compressors and electronic controls precisely preserve highly valuable biomedical goods.

Stationary Cooling

Mobile Cooling

MEDICAL COOLING EQUIPMENT

Biomedical companies, laboratories, medical storage centers, hospitals, and medical facilities store, process, and transport highly sensitive substances. This includes pharmaceuticals, vaccines, cells, genes, blood, etc. The reliability of their cooling equipment is essential to ensure the quality and usability of the stored assets. Refrigerated equipment is also required to maintain very constant temperatures. Even small deviations in temperature can affect the storage life and effectiveness of the medical substances.

Our compressors and electronic controls provide the principal components required to precisely preserve highly valuable biomedical goods. These components are used in a broad range of applications and temperature levels inside the world-wide supply chain of biomedical processing, transport, and storage. Low energy consumption, in combination with Secop's commitment to natural refrigerants, provides a sustainable solution for the many different demands in temperature conditions and sizes of these medical appliances.

The compressor families of the BD-, KL-, N-, and S-Series perform on a superior level in these critical applications. This can be taken to an even higher level when combined with our premium variable-speed drive controls.

These °CCD (Cool Capacity Drive) controllers have the ability to adapt the cooling capacity and provide other benefits, including protection when used in regions that experience an unstable voltage supply.

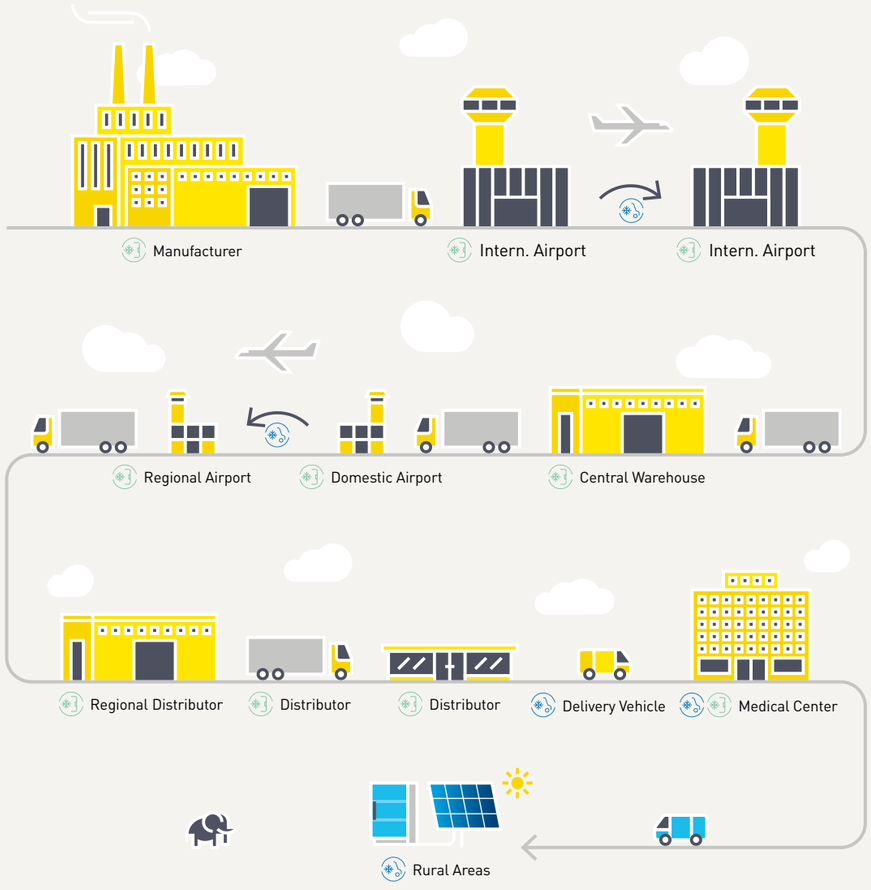
Secop has developed the technology for an ultra-low temperature cooling system. This system has been optimized for the last mile of distribution for the new generations of vaccines and offers mobile operation even in high ambient conditions such as in tropical areas.

Secop's experience in medical applications, vaccine solar freezers, and mobile solutions enables the company to develop products like the MP2UVULTM compressor, specifically designed to support battery-driven active cooling systems. Active solutions for transporting vaccines provide plenty of advantages compared to passive cooling (dry ice) transport boxes. They do not require huge quantities of dry ice, are re-usable, do not waste tons of CO_2, prevent risks of wasting vaccine, and are suitable for transportation in remote areas where ambient conditions are severe.

- Blood
- Vaccines
- Plasma
- DNA
- Flammable Chemicals
- Ultra-Low Temperatures

MEDICAL COLD CHAIN

Mobile Cooling | Stationary Cooling



The medical and vaccine cold chain requires storage and transport at different temperature levels: +2 °C to +8 °C, -20 °C down to -86 °C. Stability is key to guarantee safe product delivery up to the last mile temperature.

For biomedecial applications, there are currently no global standards as there are for vaccines. Biomedical goods, such as blood, lab probes, vaccines, cultures, test materials, chemicals, virus, bacteria, red and white blood cells, skin, bones, semen, etc. have different requirements for freezing storage or defrosting.

Our compressor and control electronic solutions are used in different applications which are officially certified by WHO (World Health Organization) to support global access to vaccines.

With the SDD (Solar Direct Drive) solution, we are able to support the distribution of vaccines in regions with a limited electricity grid, even in severe ambient conditions.
Secop's solution is the only one used in WHO certified vaccine refrigerators.

New highly effective mRNA-based vaccines for COVID-19, Ebola, and CGTs require an ultra-low storage and transportation temperature for all phases of the cold chain.

Our stationary and mobile solutions make us a reliable partner for leading companies supporting the development of a global ULT (ultra-low temperature) supply chain.

VACCINE AND BIOMEDICAL COOLING REQUIREMENTS

Vaccine Transport and Storage

- → **Conventional*:** Temperature range +2 °C to +8 °C
- → **Stringent*:** Temperature range below -70 °C

Appliances:
- → Solar Direct Drive refrigerators
- → Transport boxes and containers
- → Ultra-low temperature transport boxes
- → Ultra-low temperature stationary freezers

* According to WHO specifications published on: https://apps.who.int/immunization_standards/vaccine_quality/pqs_catalogue/

Biomaterial Storage and Medical Storage

- → Cell lines, tissue samples -80 °C
- → DNA, RNA serum -80 °C
- → Body fluid -80 °C
- → Pharmaceutics +2° to +8 °C
- → Chemicals, ingredients -60 °C
- → Virus, chemicals -80 °C

Appliances:
- → Pharmacy refrigerators
- → Medical fridges
- → Biomedical freezers
- → Laboratory freezers
- → Ultra-low temperature freezers
- → Centrifuge coolers

Blood Management

Collection, transfusion, transportation, processing and storage

- → Blood plasma (FFP) -45 °C
- → Pre-processed or processed blood, storage +2 °C to +6 °C
- → Processed blood, transport +2 °C to +10 °C

Appliances:
- → Blood bank refrigerators
- → Plasma freezers
- → Deep freezers
- → Contact shock freezer
- → Laboratory refrigerators
- → Transport boxes

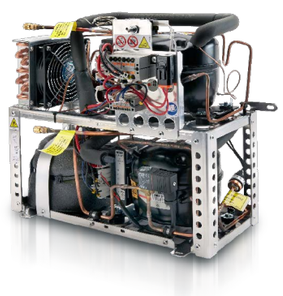
SECOP PORTFOLIO FOR MEDICAL APPLICATIONS

Compressor Series		Medical Refrigerator / Freezer +2 °C to +8 °C / -20 °C to -30 °C						BioMedical Freezer -30 °C to -60 °C				Ultra-Low Temperature Freezer[1] -60 °C to -90 °C			
		Mobile			Stationary			Mobile	Stationary			Mobile	Stationary		
		Capacity (Volume in l)						Capacity (Volume in l)				Capacity (Volume in l)			
		20–50	>50–150	>150–800	20–200	>200–500	>500–800	20–50	20–200	>200–500	>500–800	20–40	20–200	>200–500	>500–800
BD Nano		MB3CKV	MB3CKV												
BD-P		BD35F BD35K BD50F	BD50K BD80F BD80CN	BD100CN BD250GH.2				MP2UVULTM				MP2UVULTM			
KL-Series					KLF4.0CN KLF4.8CN_ KLF5.6CN_ KLF6.6CN_ KLF7.7CN_	KLF6.6CN_ KLF7.7CN_ KLF8.6CN_									
N-Series incl. **NLV**						NLE10CN	NLV12.6CN		MN11UHULTM MN13UDULTM MN13UVULTM			MN11UHULTM MN13UVULTM	MN13UDULTM		
S-Series incl. **SLVE**							SCE18CNLX SLVE18CN			MS18UVULTM			MS18UHULTM MS21UDULTM MS18UVULTM		

[1] Compressors for low temperature stage

Secop now provides a solution with several benefits such as enhanced robustness, ultra-low temperature technology, and compatibility with refrigerant ethane (R170) with its new medical compressors range. This makes them the ideal solution for hospitals, laboratories, pharmacies, research centers, universities, and the medical industry.

Single stage refrigeration systems with R290 or suitable refrigerant compositions may be used for the temperature range from -30 °C to -60 °C. When refrigerant mixtures are used, please contact Secop to verify the level of compressor overloading and warranty.



Secop recommends using 2-stage cascade systems (ULTM) for the temperature range from -60 °C to -90 °C. These have been developed for highest reliability and product safety at ultra-low temperatures.

High temperature stage:
→ Compressor using refrigerant
→ R290, R600a or R134a

Low temperature stage (ULT):
→ Compressor using refrigerant R170

TECHNICAL DATA

Variable-Speed Compressors

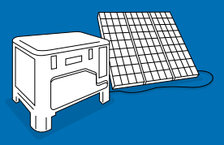
Compressor	Displacement [cm³]	Voltage / Frequency (Mains)	Refrigerant	Application	Status
MB3CKV	2.60	12/24 V DC w. SDD Module 101N3110 DC: 25–57 V, AC: 85–264 V	R600a	LBP / MBP	available
BD35F	2.00	12/24 V DC, 10-45 V DC Solar 100-240 V AC 50/60 Hz	R134a	LBP / MBP / HBP	available
BD50F	2.50	12/24 V DC, 100-240 V AC 50/60 Hz	R134a	LBP / MBP / HBP	available
BD80F	3.00	12/24 V DC	R134a	LBP	available
BD250GH.2	2.50	12/24 V DC	R134a	LBP / MBP / HBP	available
BD35K	3.00	12/24 V DC, 10-45 V DC Solar 100-240 V AC 50/60 Hz	R600a	LBP / MBP / HBP	available
BD50K	3.00	12/24 V DC	R600a	LBP / MBP / HBP	available
BD80CN	2.00	12/24 V DC, 10-45 V DC Solar 100-240 V AC 50/60 Hz	R290	LBP / MBP	available
BD100CN	2.00	12/24 V DC	R290	LBP / MBP	available
NLV12.6CN	12.55	100-240 V 50/60 Hz 220-240 V 50/60 Hz	R290	LBP / MBP	available
SLVE18CN	17.69	208-240 V 50/60 Hz	R290	LBP / MBP	available
MP2UVULTM	2.00	12/24 V DC	universal	ULT	available
MN13UVULTM	12.55	100-240 V 50/60 Hz 220-240 V 50/60 Hz	universal	ULT	available
MS18UVULTM	17.69	208-240 V 50/60 Hz	universal	ULT	available

Fixed-Speed Compressors

Compressor	Displacement [cm³]	Voltage / Frequency (Mains)	Refrigerant	Application	Status
KLF4.0CND KLF4.0CNH	4.00	220-240 V / 50 Hz 115-127 V / 60 Hz	R290	LBP / MBP	available
KLF4.8CND KLF4.8CNH	4.80	220-240 V / 50 Hz 115-127 V / 60 Hz	R290	LBP / MBP	available
KLF5.6CND KLF5.6CNH	5.60	220-240 V / 50 Hz 115-127 V / 60 Hz	R290	LBP / MBP	available
KLF6.6CND KLF6.6CNH	6.60	220-240 V / 50 Hz 115-127 V / 60 Hz	R290	LBP / MBP	available
KLF7.7CND KLF7.7CNH	7.70	220-240 V / 50 Hz 115-127 V / 60 Hz	R290	LBP / MBP	available
KLF8.6CND	8.60	220-240 V / 50 Hz	R290	LBP / MBP	available
NLE10CN	10.09	115-127 V / 60 Hz, 220-240 V / 50 Hz	R290	LBP / MBP	available
NLE12.6CNL	12.55	220-240 V / 50 Hz	R290	LBP	available
SCE18CNLX	17.69	115-127 V / 60 Hz, 220-240 V / 50 Hz, 208-230 V / 60 Hz	R290	LBP	available
SCE18CNX	17.69	220-240 V / 50 Hz	R290	LBP / MBP	available
SCE21CNLX	20.95	115-127 V / 60 Hz, 220-240 V / 50 Hz, 208-230 V / 60 Hz	R290	LBP / MBP	available
MN11UHULTM	11.15	115-127 V / 60 Hz	universal	ULT	available
MN13UDULTM	12.55	220-240 V / 50 Hz	universal	ULT	available
MS18UHULTM	17.69	115-127 V / 60 Hz	universal	ULT	available
MS21UDULTM	20.95	220-240 V / 50 Hz	universal	ULT	available

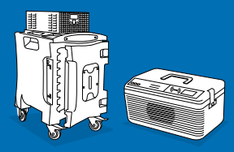
OVERVIEW OF MAIN
MEDICAL EQUIPMENT

Mobile Cooling



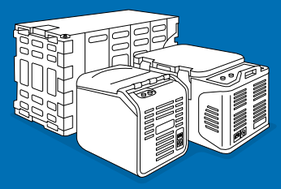
Solar Powered Medical Fridges
-40 °C to -20 °C / +2 °C to +8 °C

BD35F	MB3CKV
BD50F	BD80CN
BD35K	BD100CN
BD50K	



Medical Cooling Transport Boxes
-40 °C to -20 °C / +2 °C to +8 °C

BD35F	BD50K
BD50F	MB3CKV
BD80F	BD80CN
BD35K	BD100CN



Medical Cooling Container
-40 °C to -20 °C / +2 °C to +8 °CC

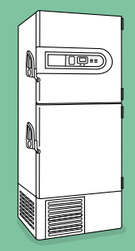
BD100CN	BD250GH.2

In DC (direct current) applications, our BD-Series compressors provide world-world safe transport of sensitive biomedical goods. Our cutting-edge controls enable cooling solutions to be directly powered by solar panels (SDD, solar direct drive) in remote areas without stable electricity grids. BD compressors are also used universally in AC / DC mode for both transport and storage. Secop's active BD compressor cooling provides significant benefits including the prevention of wasted vaccines while also not generating carbon dioxide emissions that occur with passive dry ice cooling solutions.

Ultra-Low Temperature Transport Boxes
-60 °C to -86 °C

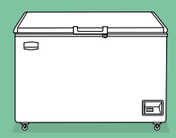
MP2UVULTM (2x)

Stationary Cooling



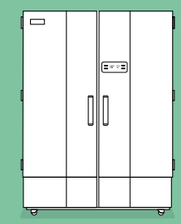
Ultra-Low Temperature Freezers
-86 °C

MN11UHULTM (2x)	MS18UVULTM (2x)
MN13UDULTM (2x)	MS21UDULTM (2x)
MN13UVULTM (2x)	MS18UHULTM (2x)



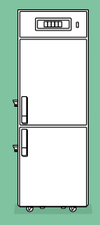
Biomedical Freezers
-60 °C

MN11UHULTM	MS21UDULTM
MN13UDULTM	MS18UHULTM
MN13UVULTM	MS18UVULTM



Biomedical Freezers
-40 °C / -30 °C

KLF4.0CN / CNH	KLF4.8CND / CNH
KLF5.6CND / CNH	KLF6.6CND / CNH
KLF7.7CND / CNH	NLE12.6CNL
MN13UVULTM	SCE18CNLX



Medical Fridges
+2 °C to +8 °C

KLF4.0CND / CNH	KLF4.8CND / CNH
KLF5.6CND / CNH	KLF6.6CND / CNH
KLF7.7CND / CNH	NLE10CN
MN13UVULTM	SCE18CNX

Centrifuge Coolers / Freezers
-10 °C to +40 °C

NLE10CN	MN13UVULTM

In AC (alternating current) applications, our KL-, N-, S-Series compressors, for stationary biomedical appliances focused on natural refrigerants, enable cooling circuits in ULT freezers to reach temperatures as low as -86 °C. The standard temperature cooling levels of +2 °C to +8 ° are used in centrifugal coolers to process and preserve all types of vaccines, blood, plasma, and other temperature-sensitive biomedical goods.

KEY TO MEDICAL COMPRESSOR TYPE DESIGNATION

M Models	1	2	3	4	5	6	7	8	group
	M	P	2		U	V	ULTM		example

Group#7: Generation
Blank first generation
.2 second generation
.3 third generation

Group#6: ULT Development Stage
ULTM Multiple stage ULT
ULTS Single stage ULT
Blank no ULT compressor

Group#5: Nominal Voltage Range*
D 220 ... 240 V~ 50 Hz
H 110 ... 127 V~ 60Hz
I 208 ... 240 V~ 60Hz
M 110 ... 115 V~ 50 Hz & 115 ... 127 V~ 60 Hz (dual frequency types)
N 220 ... 240 V~ 50 Hz & 208 ... 240 V~ 60 Hz (dual frequency types)
V VSD controller (electronic unit)
X FSD controller (electronic unit)
*please refer to data sheet for details

Group#5: Refrigerant
N R290
K R600a
F R134a and/or R513A and/or R1234yf
L R404A/R507 and/or R452A
S R170
U universal or mixture

Group#4: Application Range
L LBP
M MBP
H HBP
C LBP and MBP
G LBP and MBP and HBP
Blank ULT compressor (see also **Group#6**)

Group#3: Displacement in **cm³** (rounded values, no decimals)

Group#2: Compressor design **P, K, N, S, G, B (BD Nano), M (BD Micro)**

Group#1: M for medical

Secop's full **Key to Compressor Type Designation** can be found on **www.secop.com**

BENEFITS OF DEDICATED MEDICAL COMPRESSORS

Benefits of ULTRA-LOW TEMPERATURE Compressors in Medical Appliances

Dedicated ULT compressors
→ New compressor designation and code numbers

Robustness
→ Optimized characteristics e.g. lubrication, start/stall, liquid return, etc.

VDE, CCC, and UL compliance
→ Compatibility approval for refrigerants e.g. R170 and others upon request

Better customer experience
→ Smooth and efficient cabinet validation and verification

Technical support
→ Expert team to support customer projects and compressor analysis
→ Detail application note to support system design and optimization

Benefits of Electronically Controlled Compressors in Medical Appliances

Energy savings
→ 30 % average less energy consumption

Perfect temperature control and stability
→ Freezing compartment exact on target temperature
→ Up to 50 % faster pull-down
→ Ensuring ultra-low temperature during door openings

Longer life-time
→ Significantly lower starting current peaks
→ Multiple electronic compressor protection

Global reach
→ Supporting full global voltage range
→ Optimized for low-grid areas

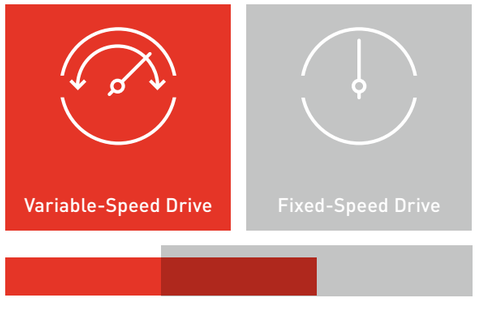
Implementation / Customizing
→ Electronics easy customizable, including implementation support

New generation of controllers will offer
→ Evaporator- and condenser-fan speed control
→ 2-speed defrost
→ Additional sensor and relay options
→ Multi-compressor control
→ IoT services
→ Preventive maintenance
→ Customized features on demand

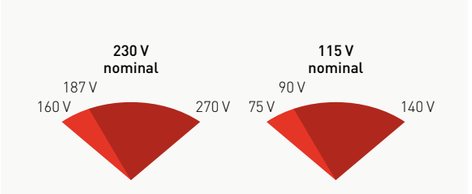
BENEFITS OF ELECTRONICALLY CONTROLLED COMPRESSORS IN DETAIL

Secop's variable-speed drive °CCD controller (Cool Capacity Drive) make it possible to adjust the refrigeration capacity of the compressor and adapt it to the desired need by controlling the motor speed.

The most important advantage of adaptable capacity is not only reduced energy consumption but also a reduced average noise level is possible.

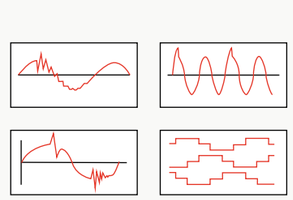


Extended Voltage Range



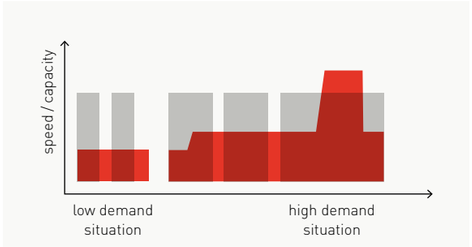
Start and run reliably in low-grid areas

Multiple Compressor Protection



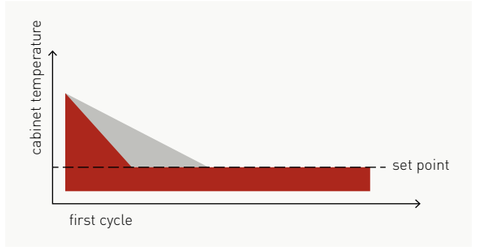
Longer system life-time

Right Cooling Capacity Every Time



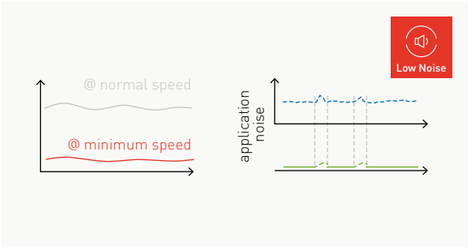
Avg. -30 % energy consumption

Fast Pull-Down and Half-Reload



Better preservation of goods

Lowest Noise and Vibration

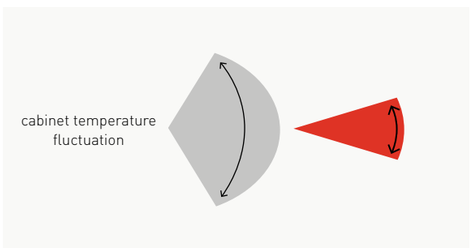


More pleasant ambient

Wide Dynamic Speed Range

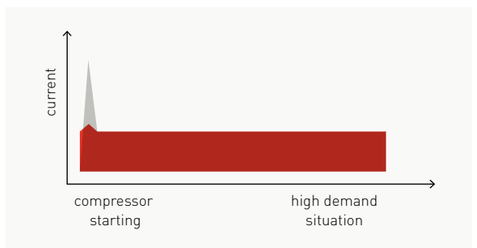
Logistic cost reduction

Exact Temperature Control



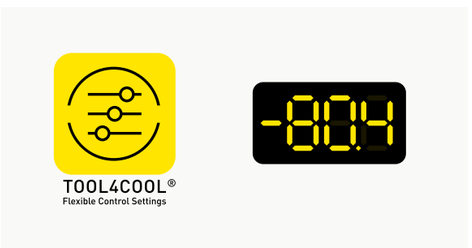
No valuable vaccine waste

No High Starting Current Peaks



Longer life-time of motors

Customization and Fast Diagnosis



Avoid vaccine loss, fast repair

Tool4Cool® software is a unique PC software tool that enables you to precisely configure your Secop variable-speed compressors to your cooling systems.

Via microprocessor-based controllers, Tool4Cool® gives you easy access to all parameters. These can be changed, monitored, downloaded, or uploaded to get the optimum performance out of your cooling system.

SECOP GROUP: AROUND THE WORLD

12
international partners for advanced developments

33
laboratories located in Germany, Slovakia, China, U.S.A., and Turkey

150+
R&D engineers and technicians

400+
patents globally

50+
countries with customer support

Secop is the expert for advanced hermetic compressor technologies and cooling solutions in commercial refrigeration. We develop high performance stationary and mobile cooling solutions for leading international commercial refrigeration manufacturers and are the first choice when it comes to leading hermetic compressors and electronic controls for refrigeration solutions for light commercial and DC-powered applications.

Secop was formerly known as Danfoss Compressors and is one of the founding fathers of modern compressor technology with years of experience that goes back to the beginning of the 1950s.

- **Flensburg:** Sales and R&D
- **Turin:** Sales
- **Atlanta:** Sales and Logistics
- **Zlaté Moravce:** R&D, Logistics, and Manufacturing
- **Tianjin:** Sales, R&D, Logistics, and Manufacturing

Stationary Cooling

Mobile Cooling

Medical Cooling

Secop GmbH · Mads-Clausen-Str. 7 · 24939 Flensburg, Germany · Tel: +49 461 4941 0 · **www.secop.com**

Produced by Secop | March 2026

DES.B.050.05.02