

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



Vaccine Cold Chain

Our compressor and control electronic solutions are officially certified by WHO to support global access to vaccines.

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-, S-, and G-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 CO₂, prevent risks of wasting vaccine, and are suitable for transportation in remote areas where ambient conditions are severe.



Blood



Vaccines



PLASMA



DNA



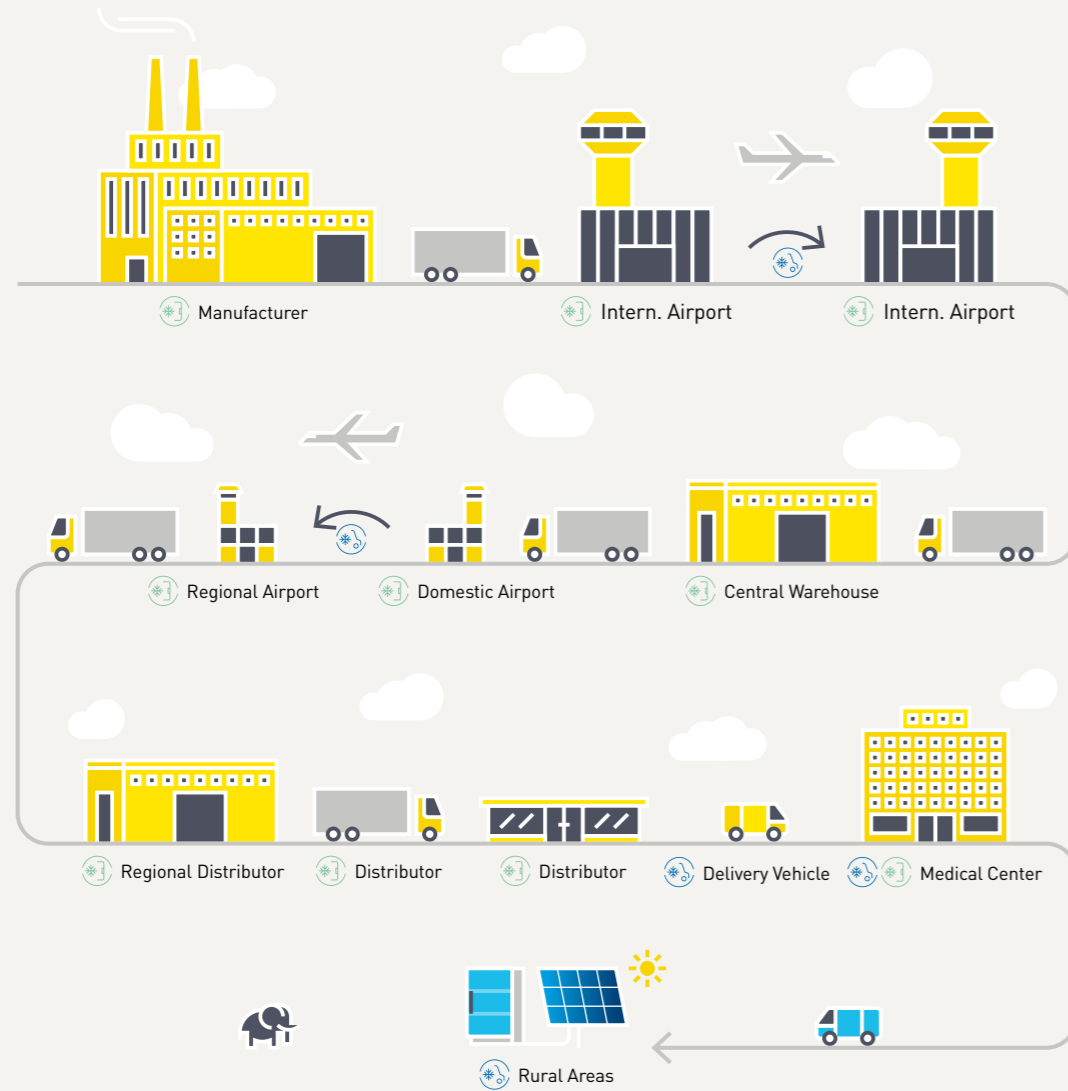
FLAMMABLE
CHEMICALS



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 biomedical 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
- Pharmaceuticals +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

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)													
	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-P BD-T 	BD35F	BD50K	BD100CN											
	BD35K	BD80F	BD220CL				MP2UVULTM				MP2UVULTM			
	BD50F	BD80CN	BD250GH.2											
			BD350GH											
KL-Series 														
			KLF4.0CN_ KLF5.6CN_ KLF7.7CND											
N-Series incl. NLV 														
				NLE10CN	NLV12.6CN									
S-Series incl. SLVE 														
G-Series 														
														MG26UDULTM*

¹ Compressors for low temperature stage | * Compressor under evaluation

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 [cm ³]	Voltage/Frequency (Mains)	Refrigerant	Application	Status
BD35F	2.00	12/24V DC, 10-45V DC Solar 100-240V AC 50/60Hz	R134a	LBP/MBP/HBP	available
BD50F	2.50	12/24VDC, 100-240V AC 50/60Hz	R134a	LBP/MBP/HBP	available
BD80F	3.00	12/24V DC	R134a	LBP	available
BD250GH.2	2.50	12/24V DC	R134a	LBP/MBP/HBP	available
BD350GH	5.08	12V DC 24V DC	R134a	LBP/MBP/HBP	available
BD220CL	3.86	12V DC	R404A/R507	LBP	available
BD35K	3.00	12/24 V DC, 10-45 V DC Solar 100-240V AC 50/60 Hz	R600a	LBP/MBP/HBP	available
BD50K	3.00	12/24 V DC	R600a	LBP/MBP/HBP	available
BD80CN	2.00	12/24V DC, 10-45V DC Solar 100-240V AC 50/60Hz	R290	LBP/MBP	available
BD100CN	2.00	12/24V DC	R290	LBP/MBP	available
NLV12.6CN	12.55	100-240V 50/60Hz 220-240V 50/60Hz	R290	LBP/MBP	available
SLVE18CN	17.69	208-240V 50/60Hz	R290	LBP/MBP	available
MP2UVULTM	2.00	12/24V DC	universal	ULT	available
MN13UVULTM	12.55	100-240V 50/60Hz 220-240V 50/60Hz	universal	ULT	available
MS18UVULTM	17.69	208-240V 50/60Hz	universal	ULT	available

Fixed-Speed Compressors

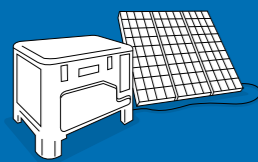
Compressor	Displacement [cm ³]	Voltage/Frequency (Mains)	Refrigerant	Application	Status
KLF4.0CND KLF4.0CNH	4.00	220-240V/50 Hz 115-127V/60 Hz	R290	LBP/MBP	available
KLF5.6CND KLF5.6CNH	5.60	220-240V/50 Hz 115-127V/60 Hz	R290	LBP/MBP	available
KLF7.7CND	7.70	220-240V/50Hz	R290	LBP/MBP	available
NLE10CN	10.09	115-127V/60Hz, 220-240V/50 Hz	R290	LBP/MBP	available
NLE12.6CNL	12.55	220-240V/50 Hz	R290	LBP	available
SCE18CNLX	17.69	115-127V/60 Hz, 220-240V/50 Hz, 208-230V/60 Hz	R290	LBP	available
SCE18CNX	17.69	220-240V/50Hz	R290	LBP/MBP	available
SCE21CNLX	20.95	115-127V/60 Hz, 220-240V/50 Hz, 208-230V/60 Hz	R290	LBP/MBP	available
MN11UHULTM	11.15	115-127V/60Hz	universal	ULT	available
MN13UDULTM	12.55	220-240V/50Hz	universal	ULT	available
MS18UHULTM	17.69	115-127V/60Hz	universal	ULT	available
MS21UDULTM	20.95	220-240V/50 Hz	universal	ULT	available



OVERVIEW OF MAIN MEDICAL EQUIPMENT

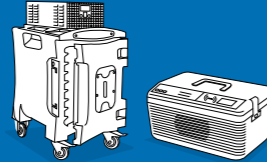


Mobile Cooling



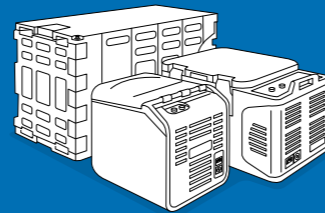
Solar Powered Medical Fridges
-40 °C to -20 °C / +2 °C to +8 °C

BD35F	BD50K
BD50F	BD80CN
BD35K	BD100CN



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

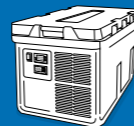
BD35F	BD50K
BD50F	BD80CN
BD80F	BD100CN
BD35K	



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

BD100CN	BD250GH.2
BD220CL	BD350GH

In DC (direct current) applications, our BD-Series compressors provide world-wide 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.

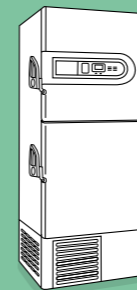


Ultra-Low Temperature Transport Boxes
-60 °C to -86 °C

MP2UVULTM (2x)

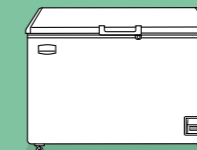


Stationary Cooling



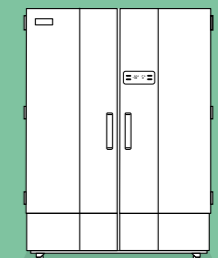
Ultra-Low Temperature Freezers
-86 °C

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



Biomedical Freezers
-60 °C

MN11UHULTM	MS21UDULTM
MN13UDULTM	MS18UHULTM
MN13UVULTM	MS18UVULTM



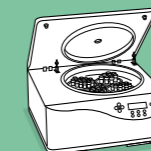
Biomedical Freezers
-40 °C / -30 °C

KLF4.0CND / CNH	KLF7.7CND
KLF5.6CND / CNH	NLV12.6CN
NLE10CN	SCE18CNL



Medical Fridges
+2 °C to +8 °C

KLF4.0CND / CNH	KLF7.7CND
KLF5.6CND / CNH	NLV12.6CN
NLE10CN	SCE18CNLX

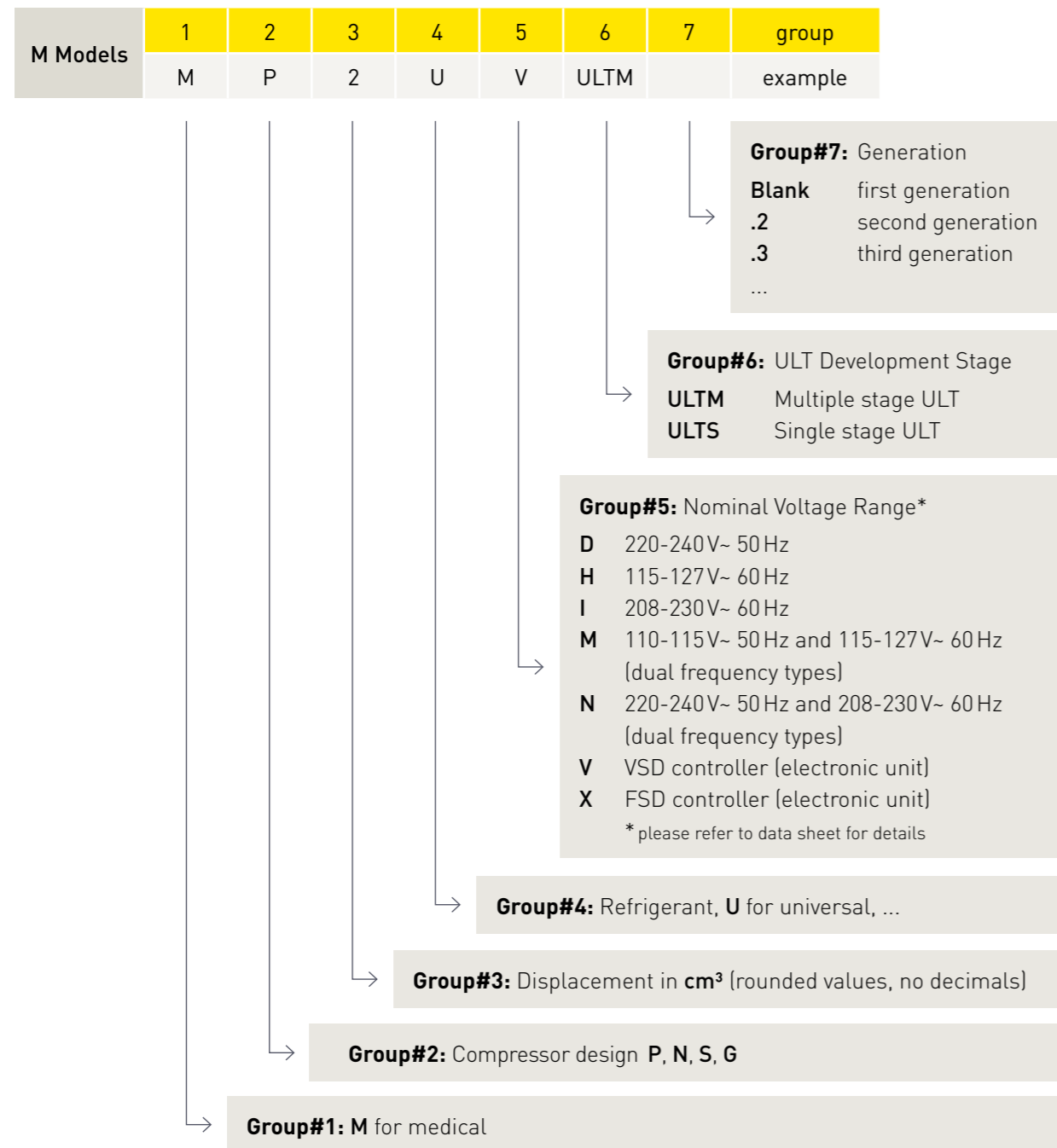


Centrifuge Coolers / Freezers
-10 °C to +40 °C

NLE10CN	NLV12.6CN
---------	-----------

In AC (alternating current) applications, our KL-, N-, S-, G-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 °C 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



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

Better customer experience

- Smooth and efficient cabinet validation and verification

Robustness

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

Technical support

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

VDE, CCC, and UL compliance

- Compatibility approval for refrigerants e.g. R170 and others upon request



benefits of Electronically Controlled compressors in Medical Appliances

Energy savings

- 30% average less energy consumption

Implementation / Customizing

- Electronics easy customizable, including implementation support

Perfect temperature control and stability

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

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

Longer life-time

- Significantly lower starting current peaks
- Multiple electronic compressor protection

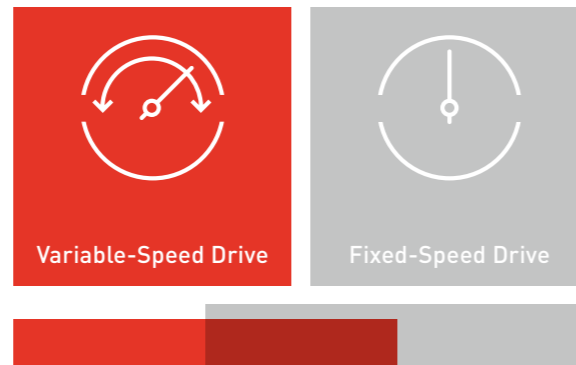
Global reach

- Supporting full global voltage range
- Optimized for low-grid areas

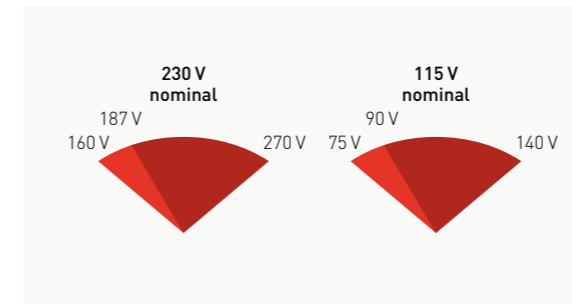
BENEFITS OF ELECTRONICALLY CONTROLLED COMPRESSORS IN DETAIL

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.

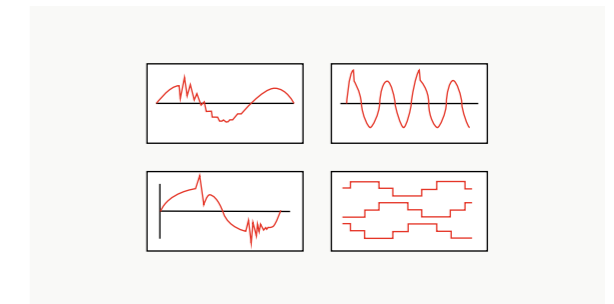


Extended Voltage Range



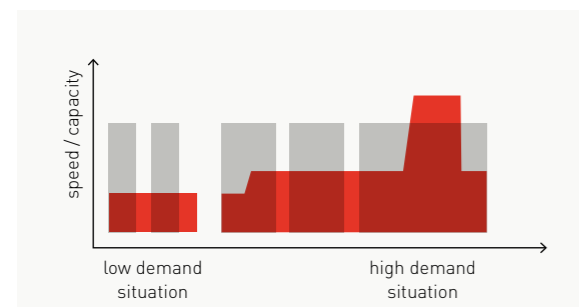
Start and run reliably in low-grid areas

Multiple Compressor Protection



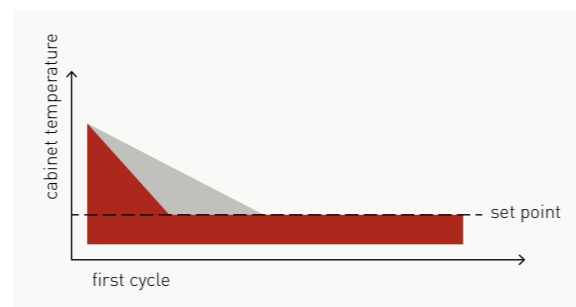
Longer system life-time

Right Cooling Capacity Every Time



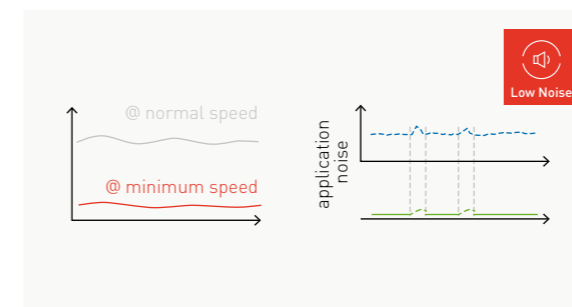
Avg. -30% energy consumption

Fast Pull-Down and Half-Reload



Better preservation of goods

Lowest Noise and Vibration



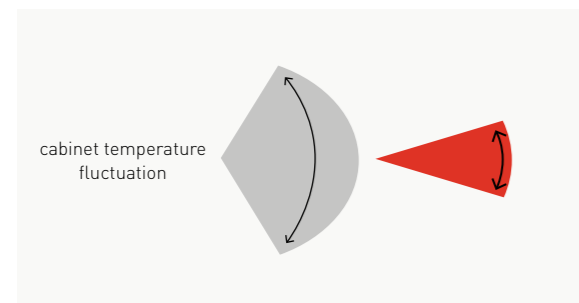
More pleasant ambient

Wide Dynamic Speed Range



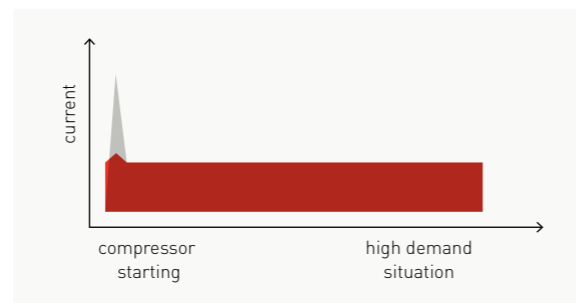
Logistic cost reduction

Exact Temperature Control



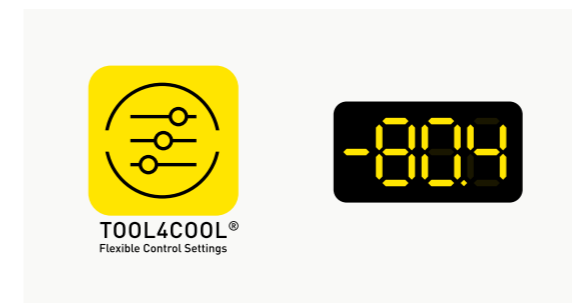
No valuable vaccine waste

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

SECOP

12

international partner for advanced developments

33

laboratories located in Austria, Germany, Slovakia, China, US, and Turkey

160

R&D engineers and technicians

440

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



Stationary Cooling



Mobile Cooling



Medical Cooling



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

Secop accepts no responsibility for possible errors in catalogs, brochures, and other printed material. Secop reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary to specifications already agreed. All trademarks in this material are the property of the respective companies. Secop and the Secop logotype are trademarks of Secop GmbH. All rights reserved.

Produced by Secop | December 2023

DES.B.050.04.02