

Quick reference

# Light commercial **variable-speed** **Compressors** for AC Voltage: DLV, NLV SLV

R290 | 100-127 V, 220-240 V, 50/60 Hz





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**R290 | 220-240 V | 100-127 V | 50/60 Hz | DLV- / NLV- / SLV-Series**

Compressor	Code number	Application	CECOMAF Capacity [W] T <sub>c</sub> =55°C, T <sub>liq</sub> =55°C, T <sub>suc</sub> =32°C Evaporating temperature [°C]						CECOMAF						ASHRAE Capacity [W] T <sub>c</sub> =54.4°C, T <sub>liq</sub> =32.2°C, T <sub>suc</sub> =32.2°C Evaporating temperature [°C]					
									LBP rating point -25°C / 55°C		MBP rating point -10°C / 55°C		HBP rating point 5°C / 55°C							
			-35	-15	-5	0	10	15	Cooling capacity	COP	Cooling capacity	COP	Cooling capacity	COP	-35	-15	-5	0	10	15
									[W]	[W/W]	[W]	[W/W]	[W]	[W/W]						
DLV4.0CN 2000 rpm	102H3486	L/MBP	60	171	258	311			65	1.12	203	2.27	330	3.02	58	179	274	333		
DLV4.0CN 4500 rpm	102H3486	L/MBP	140	401	604	728			152	1.22	476	2.28	772	3.01	136	420	642	779		
DLV5.7CN 2000 rpm	102H4604	L/MBP	107	261	383	458			112	1.38	305	2.23	485	2.84	109	278	413	496		
DLV5.7CN 4500 rpm	102H4604	L/MBP	246	599	879	1052			258	1.32	700	2.13	1114	2.71	249	639	947	1138		
NLV8.0CN 2000 rpm	105H7800	L/MBP	141	365	544	652			148	1.42	431	2.35	688	3.01	150	388	584	703		
NLV8.0CN 4500 rpm	105H7800	L/MBP		795	1188	1423					941	2.29	1489	2.87		826	1252	1510		
NLV8.0CN 2000 rpm	105H7801	L/MBP	141	365	544	652			148	1.42	431	2.35	688	3.01	150	388	584	703		
NLV8.0CN 4500 rpm	105H7801	L/MBP		795	1188	1423					941	2.29	1489	2.87		826	1252	1510		
NLV10CN 2000 rpm	105H7000	L/MBP	188	472	696	830			195	1.42	555	2.29	878	2.89	203	509	758	907		
NLV10CN 4500 rpm	105H7000	L/MBP		1010	1496	1789					1188	2.20	1892	2.68		1085	1617	1941		
NLV10CN 2000 rpm	105H7001	L/MBP	188	472	696	830			195	1.42	555	2.29	878	2.89	203	509	758	907		
NLV10CN 4500 rpm	105H7001	L/MBP		1010	1496	1789					1188	2.20	1892	2.68		1085	1617	1941		
NLV12.6CN 2000 rpm	105H6355	L/MBP	242	575	846	1011			253	1.40	673	2.21	1059	2.70	246	605	897	1076		
NLV12.6CN 4500 rpm	105H6355	L/MBP		1278	1881	2248					1497	2.14	2354	2.49		1344	1995	2393		
NLV12.6CN 2000 rpm	105H6356	L/MBP	242	575	846	1011			253	1.40	673	2.21	1059	2.70	246	605	897	1076		
NLV12.6CN 4500 rpm	105H6356	L/MBP		1278	1881	2248					1497	2.14	2354	2.49		1344	1995	2393		
SLV15CNK.2 2000 rpm	104H8541	LBP	236	638					252	1.12	755	1.88			232	665				
SLV15CNK.2 4000 rpm	104H8541	LBP	460	1228					494	1.13	1435	1.86			438	1297				
SLV15CNK 2000 rpm	104H8578	LBP	236	638					252	1.10	755	1.87			232	665				
SLV15CNK 4000 rpm	104H8578	LBP	460	1228					494	1.12	1435	1.86			438	1297				

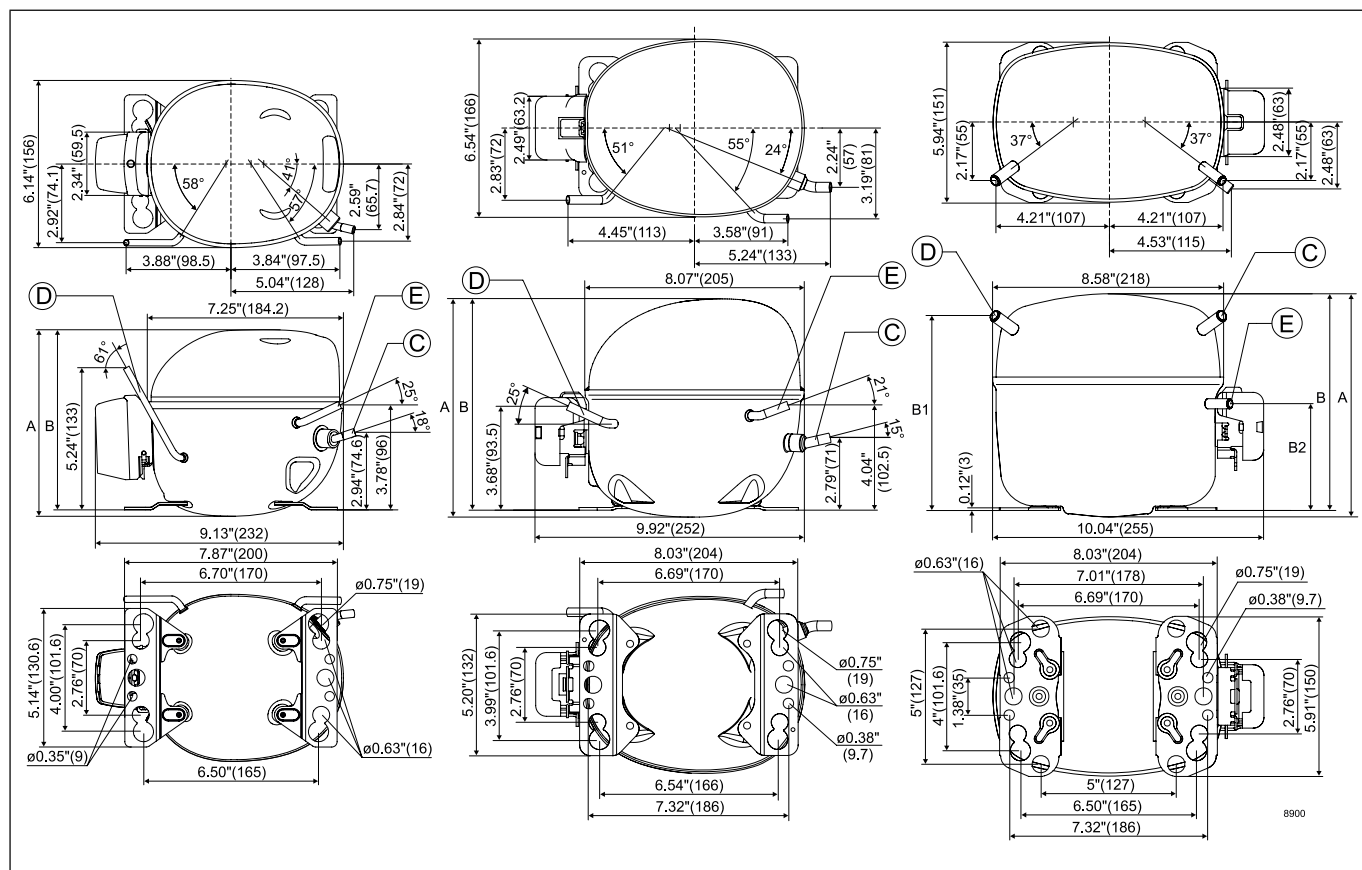
**R290 | 220-240 V | 100-127 V | 50/60 Hz | DLV- / NLV- / SLV-Series | Controllers**

Compressor	Code number	DLV	NLV	NLV	SLV	SLV
		105N4460	105N4710	105N4760	105N46xx Series	105N467x Series
		Standard	Standard, PFC	Multi Voltage, PFC	General Purpose, PFC	General Purpose, PFC
		Voltage range:	Voltage range:	Voltage range:	Voltage range:	Voltage range:
		90 - 140 V, 50/60 Hz	180 - 270 V, 50/60 Hz	90 - 270 V, 50/60 Hz	180 - 254 V, 50/60 Hz	95 - 135 V, 50/60 Hz
		Inputs:	Inputs:	Inputs:	Inputs:	Inputs:
		Thermostat, defrost, communication, frequency signal	Thermostat, defrost, communication, frequency signal	Thermostat, defrost, communication, frequency signal	Modbus, integrated temperature controller	Modbus, integrated temperature controller
DLV4.0CN	102H3486	✓				
DLV5.7CN	102H4604	✓				
NLV8.0CN	105H7800		✓	✓		
NLV8.0CN	105H7801		✓	✓		
NLV10CN	105H7000		✓	✓		
NLV10CN	105H7001		✓	✓		
NLV12.6CN	105H6355		✓	✓		
NLV12.6CN	105H6356		✓	✓		
SLV15CNK.2	104H8541				✓	
SLV15CNK	104H8578					✓

ASHRAE						Power	Displacement	Voltage and frequencies (* dual frequency type with 50/60 Hz)	Compressor cooling (refer to data sheet)	Dimensions							Application
LBP rating point -23.3°C / 54.4°C		MBP rating point -6.7°C / 54.4°C		HBP rating point 7.2°C / 54.4°C						Height [mm]		Connectors location / diameter [mm]			alt. connectors available		
Cooling capacity	COP	Cooling capacity	COP	Cooling capacity	COP					A	B	Suction C (I.D.)	Process D (I.D.)	Discharge E (I.D.)			
[W]	[W/W]	[W]	[W/W]	[W]	[W/W]	[HP]	[cm³]										
120	1.54	229	2.22	386	3.27	1/8	4.00	90-140 V, 60 Hz *	F2	175	169	8.2	6.5	6.5		1 2 3 4 6 10	
280	1.58	537	2.22	904	3.25	3/10	4.00	90-140 V, 60 Hz *	F2	175	169	8.2	6.5	6.5		1 2 3 4 6 10	
195	1.69	346	2.18	570	3.06	1/6	5.70	95-135 V, 60 Hz *	F2	175	169	8.2	6.5	6.5		1 2 3 4 6 10	
446	1.61	795	2.08	1308	2.92	2/5	5.70	95-135 V, 60 Hz *	F2	175	169	8.2	6.5	6.5		1 2 3 4 6 10	
265	1.73	489	2.26	804	3.23	1/4	7.96	90-270 V, 50 Hz *	F2	203	197	8.2	6.2	6.2	X	1 2 3 4 6 8 10	
558	1.72	1049	2.29	1731	3.14	1/2	7.96	90-270 V, 50 Hz *	F2	203	197	8.2	6.2	6.2	X	1 2 3 4 6 8 10	
265	1.73	489	2.26	804	3.23	1/4	7.96	90-270 V, 50 Hz *	F2	203	197	8.2	6.5	6.5	X	1 2 3 4 6 8 10	
558	1.72	1049	2.29	1731	3.14	1/2	7.96	90-270 V, 50 Hz *	F2	203	197	8.2	6.5	6.5	X	1 2 3 4 6 8 10	
352	1.74	636	2.20	1031	3.08	1/3	10.09	90-270 V, 50 Hz *	F2	203	197	8.2	6.2	6.2	X	1 2 3 4 6 8 10	
749	1.76	1357	2.22	2217	2.93	3/4	10.09	90-270 V, 50 Hz *	F2	203	197	8.2	6.2	6.2	X	1 2 3 4 6 8 10	
352	1.74	636	2.20	1031	3.08	1/3	10.09	90-270 V, 50 Hz *	F2	203	197	8.2	6.5	6.5	X	1 2 3 4 6 8 10	
749	1.76	1357	2.22	2217	2.93	3/4	10.09	90-270 V, 50 Hz *	F2	203	197	8.2	6.5	6.5	X	1 2 3 4 6 8 10	
422	1.68	753	2.17	1230	2.86	3/8	12.55	198-254 V, 50 Hz *	F2	203	197	8.2	6.2	6.2	X	1 2 3 4 6 8 10	
938	1.66	1675	2.05	2736	2.62	5/6	12.55	198-254 V, 50 Hz *	F2	203	197	8.2	6.2	6.2	X	1 2 3 4 6 8 10	
422	1.68	753	2.17	1230	2.86	3/8	12.55	198-254 V, 50 Hz *	F2	203	197	8.2	6.5	6.5	X	1 2 3 4 6 8 10	
938	1.66	1675	2.05	2736	2.62	5/6	12.55	198-254 V, 50 Hz *	F2	203	197	8.2	6.5	6.5	X	1 2 3 4 6 8 10	
446	1.32					2/5	15.28	180-254 V, 50 Hz *	F2	199	193	10.2	6.2	6.2		4   10	
888	1.42					5/6	15.28	180-254 V, 50 Hz *	F2	199	193	10.2	6.2	6.2		4   10	
446	1.31					2/5	15.28	95-135 V, 60 Hz *	F2	199	193	10.2	6.2	6.2		4   10	
888	1.42					5/6	15.28	95-135 V, 60 Hz *	F2	199	193	10.2	6.2	6.2		4   10	

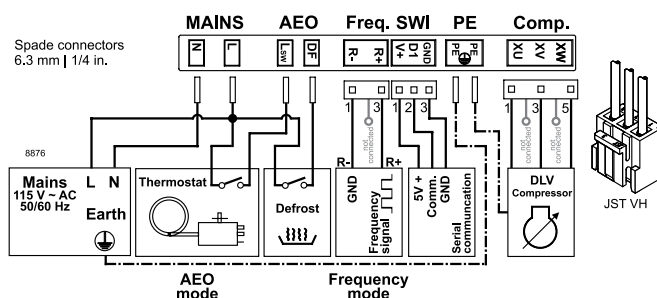
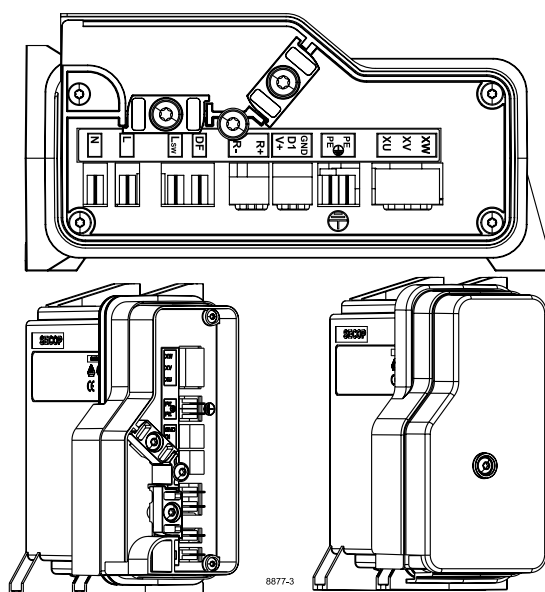
Refrigerators = 1, Freezers = 2, Beverage coolers = 3, Commercial freezers = 4, Minibars = 5, Ice cream cabinets = 6  
Water coolers = 7, Heat pumps = 8, Wine coolers = 9, Display cabinets = 10, Ice makers = 11

## DLV / NLV / SLV



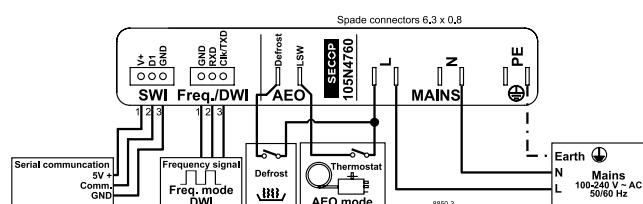
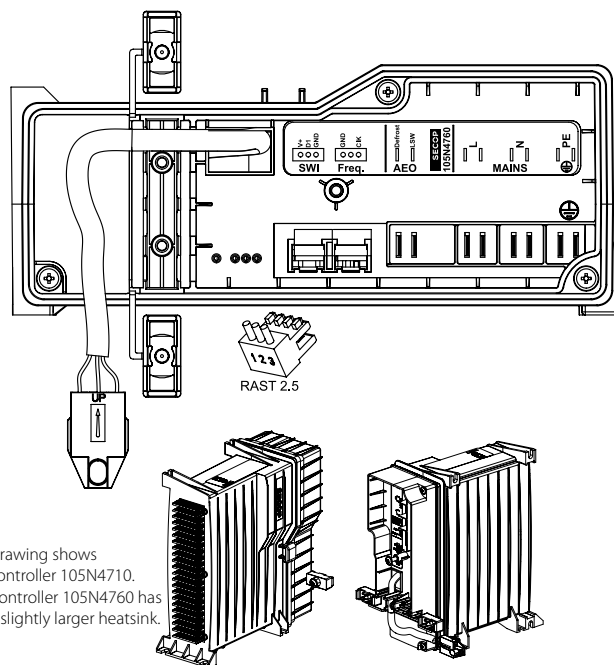
### HST - 105N44xx Series Controller for DLV compressors

DLV - electronic unit 105N4460 (100-120 V, 50/60 Hz)



### HST - 105N47xx Series Controller for NLV compressors

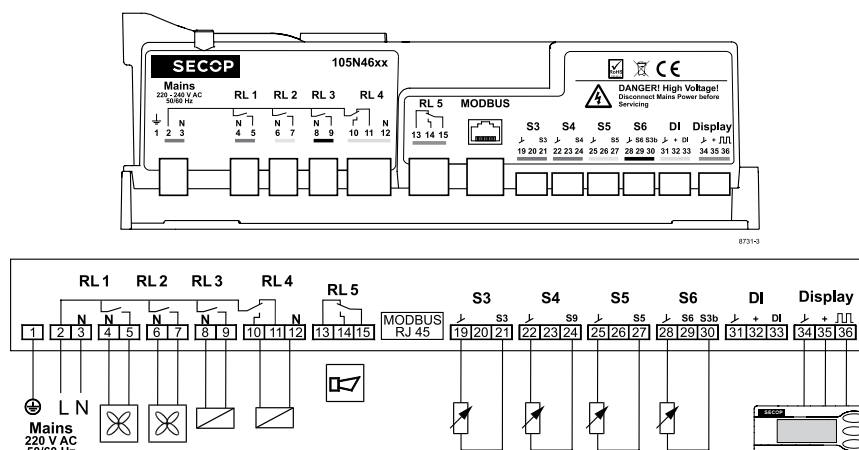
NLV - electronic unit 105N4710 (220-240 V, 50/60 Hz, with PFC)  
NLV - electronic unit 105N4760 (100-240 V, 50/60 Hz, with PFC)



PFC = power factor correction according to EN 61000-3-2:2014

**LST - 105N46xx Series Controller, 220-240 V, 50/60 Hz, with PFC for SLV compressors**

SLV

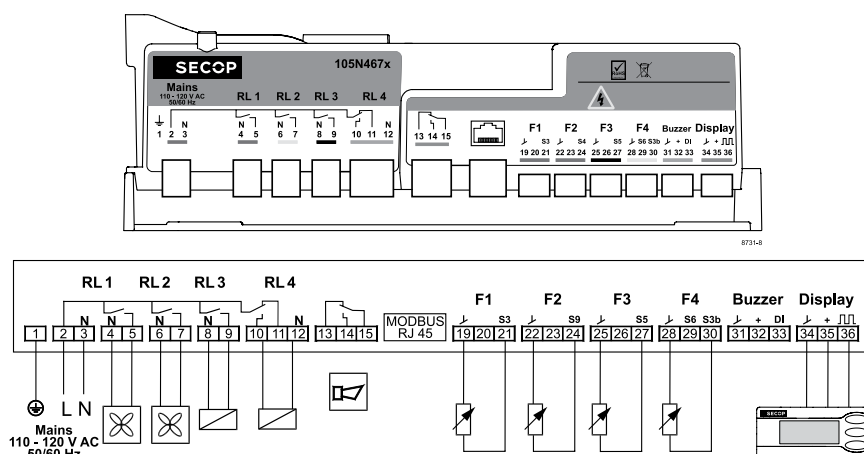


<b>Mains</b>	red
<b>RL 1</b>	blue
<b>RL 2</b>	yellow
<b>RL 3</b>	black
<b>RL 4</b>	grey
<b>RL 5</b>	green
<b>S3</b>	red
<b>S4</b>	blue
<b>S5</b>	yellow
<b>S6</b>	black
<b>DI</b>	grey
<b>Display</b>	green

PFC = power factor correction according to EN 61000-3-2:2014

**LST - 105N46xx Series Controller, 110-120 V, 50/60 Hz, with PFC for SLV compressors**

SLV



<b>Mains</b>	red
<b>RL 1</b>	blue
<b>RL 2</b>	yellow
<b>RL 3</b>	black
<b>RL 4</b>	grey
<b>-</b>	green
<b>F1</b>	red
<b>F2</b>	blue
<b>F3</b>	black
<b>F4</b>	yellow
<b>Buzzer</b>	grey
<b>Display</b>	green

upper part of label: orange

PFC = power factor correction according to EN 61000-3-2:2014

## Variable-Speed °CCD® Controllers (Electronic Units)

Full load operation is extremely rare in most cooling applications, restricted to a few days per year. That is why variable-speed control has been built into the DLV, NLV, SLV Series. This unique technology makes capacity automatically adapt to your actual requirement. The compressor runs at low speed most of the time, thus minimizing energy consumption. On top of this, system efficiency is greatly improved thanks to reduced loss when less heat is transferred via the evaporator and condenser. Overall, this equates to substantial energy savings.

Tool4Cool® is a unique PC software tool that enables you to precisely configure your Cool Capacity Drive (°CCD®) variable-speed compressors to your cooling systems.

The variable-speed compressor motors are electronically controlled. No attempt needs be made to start the compressor without a complete electronic unit, as specified in the data sheet for the compressor type in question.

The °CCD® electronic unit has a built-in overload protection as well as thermal protection. When this protection is activated, the electronic unit will protect the compressor motor as well as itself. The electronic unit will also automatically restart the compressor after a certain time.

The electronic unit provides the compressor with High Starting Torque (HST) which means pressure-equalization of the system before start is not necessary.

The compressors are equipped with permanent magnet rotors (PM motor) and three identical stator windings. The electronic unit (attached or detached) controls the PM motor. Connecting the motor to AC power, by fault, will damage the magnets and lead to drastically reduced efficiency, or even nonfunctioning.

For more information on which starting device to use on individual compressors, please refer to the actual data sheets (some compressors have limitations for either LST or HST). and to our "Operating Instructions" and "Instructions".

The compressor application must factor in power supply from an electrical circuit with the appropriate fuse or circuit breaker. In addition, the use of a GFCI (Ground Fault Circuit Interrupter) or RCD (Residual Current Device) is recommended.



### Flammable Refrigerant R290

R290 is a hydrocarbon. This refrigerant is flammable and is only allowed for use in appliances which fulfil the requirements laid down in the latest revision of EN/IEC 60335-2-24. Do not use open fire near the refrigerants R290. The refrigeration systems must be opened with a tube cutter.

In order to carry out service and repair on R290 systems the service personnel must be properly trained to be able to handle flammable refrigerants. This includes knowledge on tools, transportation of the compressor and refrigerant, and the relevant regulations and safety precautions when carrying out service and repair.

Secop compressors for the flammable refrigerants R290 are equipped with a yellow warning label as shown.



## Mounting Accessories

Mounting	Code number	Bolt / pin dimension	Comp. base hole	Type of packaging	Compressor series	Parts list
Bolt joint	118-1917	M6 metric	16 mm	Single pack for one compressor	DLV- / NLV- / SLV-	I
Bolt joint	118-1918	M6 metric	16 mm	Industrial pack in any quantity	DLV- / NLV- / SLV-	I
Bolt joint	118-1946	1/4 inch	16 mm	Single pack for one compressor	DLV- / NLV- / SLV-	II
Bolt joint	118-1949	1/4 inch	19 mm	Single pack for one compressor	all with 19 mm base holes	III
Snap-on	118-1947	Ø 7.3 mm	16 mm	Single pack for one compressor	DLV- / NLV- / SLV-	IV
Snap-on	118-1919	Ø 7.3 mm	16 mm	Industrial pack in any quantity	DLV- / NLV- / SLV-	IV

Parts list (4 pcs. per compressor needed)				Symbol drawings	
I	Sleeve Ø 8 mm x 6.4 mm x 0.8 mm	112-2052			
	Washer Ø 20 mm x Ø 6.7 mm x 1 mm	112-2053			
	Bolt M6 x 25 mm	681X1130			
	Nut M6	118-3659			
	Rubber grommet 16 mm	118-3661			
II	Sleeve Ø 8.3 mm x 6.7 mm x 0.8 mm	112-2088			
	Washer Ø 20 mm x Ø 6.7 mm x 1 mm	112-2053			
	Bolt 1/4 x 1 inch, 20 UNC	119-3002			
	Nut 1/4 inch, 20 UNC	119-3031			
	Rubber grommet 16 mm	118-3661			
III	Sleeve Ø 9.5 mm x 7.9 mm x 0.8 mm	112-2085			
	Washer Ø 20 mm x Ø 6.7 mm x 1 mm	112-2053			
	Bolt 1/4 x 1 1/4 inch, 20 UNC	119-3002			
	Nut 1/4 inch, 20 UNC	119-3031			
	Rubber grommet 19 mm	118-3666			
IV	Steel pin	118-3586			
	Washer Ø 21 x Ø 8.1 mm x 0.9 mm	118-3588			
	Clip	118-3585			
	Rubber Grommet 16 mm	118-3661			



## Why Choose Variable-Speed Compressors?

**The most important advantage of variable-speed technology is adaptable capacity which leads to high efficiency.**

Overall, a variable-speed drive compressor offers engineers far more options when it comes to building electronic systems and products. By altering the settings for each individual device built, efficiency gains can be made that both benefit a business and the customer, i.e. the initial investment might be slightly higher applying a compressor with inverter but the operating costs and therefore the total cost of ownership will be significantly lower. Especially in high priced energy markets the payback time is extremely short

### Advantages of adaptable capacity

- Improved system efficiency thanks to higher  $t_0$  and lower  $t_c$  — up to 40 % energy savings
- Dynamic speed range from 1:4
- Adjustable cooling capacity for actual system demand
- Smaller compressor in terms of displacement and size
- Lower noise emission thanks to low speed — up to 5 dB(A)
- Released for rough applications, unstable power supply, and tropical regions
- Bi-frequency at 220-240 V 50/60 Hz and 100-127 V 50/60 Hz
- R290 models for commercial applications (LBP/MBP)
- High starting torque (HST) features; no pressure equalization needed to start up the compressor
- Same compressor type for different markets!

The most important advantage of adaptable capacity is reduced energy consumption, which is possible in different ways. The easiest, most efficient and cheapest way to reach this target is to use adaptable capacity compressors.

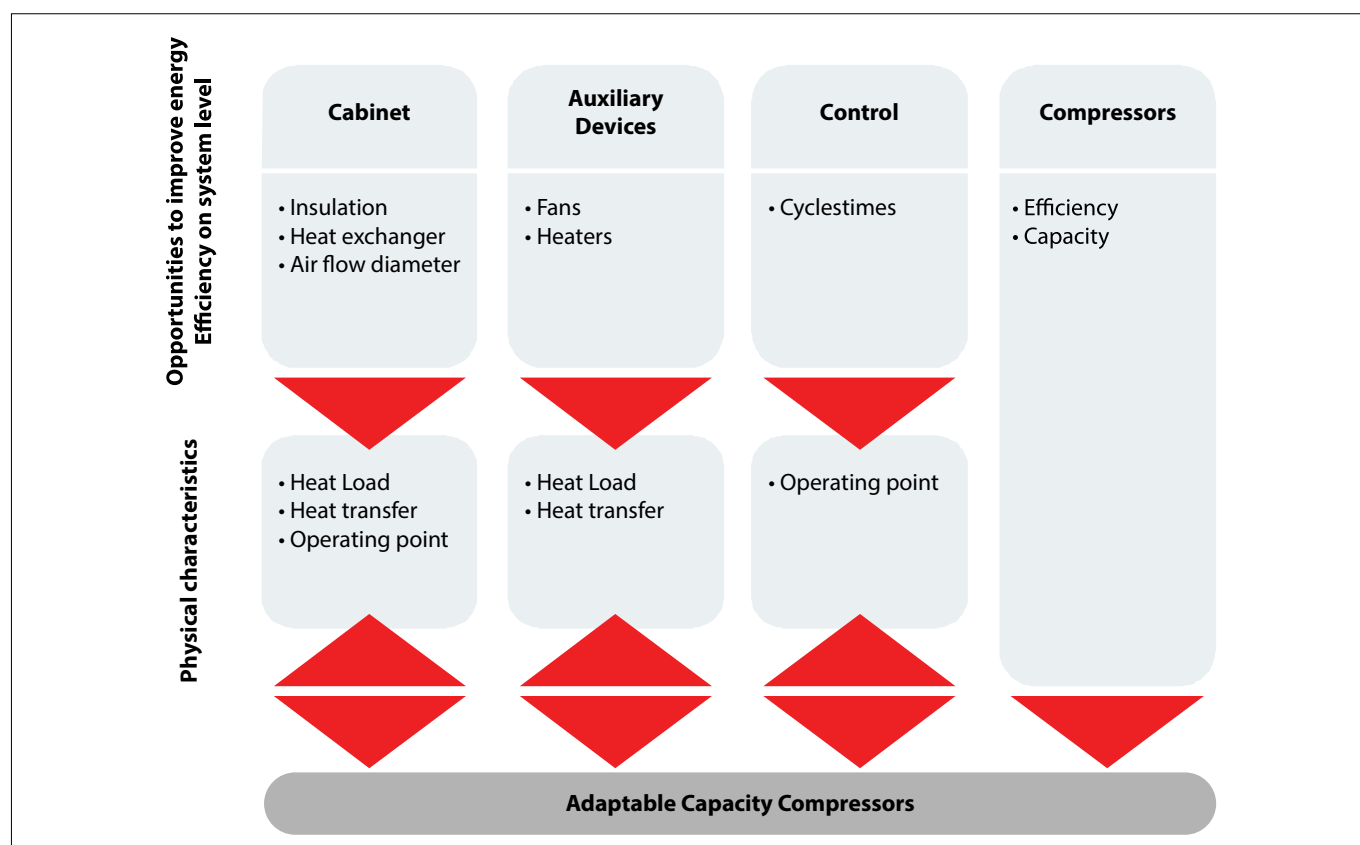
### General

DLV, NLV and SLV adaptable capacity compressors offer the possibility to adjust the refrigeration capacity according to the desired need by controlling the motor speed of the compressor and therefore the cycle times of the piston. The compressors are highly optimized with very high motor and mechanical efficiency. Tests have shown improvements in energy consumption of up to 40 %, depending on the system design. The average noise level can be reduced by up to 5 dB(A). The compressors are small in volume which allows space for a bigger net volume for usage.

### Targets

The aim of all refrigeration appliance design is to define and optimize the essential functions such as: minimal cost, high performance, and high efficiency, minimized compressor size to enable larger internal cabinet volume, low noise levels and stabilized cabinet temperature at different operation loads.

## Adaptable Capacity Compressors



## TOOL4COOL® – Variable-Speed Drive Software

### Optimum control and monitoring

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

As well as using Tool4Cool® to customise and optimize settings during development, you can also use it for remote control and monitoring of your refrigeration circuit during operation.

Tool4Cool® retrieves and sends information to all controllers in the refrigeration system, including settings, temperature and speed. This enables you to control and monitor your system from a central station. With Tool4Cool® your service department has a constant overview of your cooling system, so trouble-shooting can be carried out remotely. Technicians only need to visit the plant in the event that a component needs to be replaced, for example.

### Designed for easy operation

Tool4Cool® is a unique PC software tool that enables you to precisely configure your Secop 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. Designed to be used with our automotive and light commercial range of compressors and controllers, Tool4Cool® covers a wide range of applications within parking cooling, light commercial cooling and transport cooling.

Using Tool4Cool®, you can determine the basic specifications of your product, giving you the ability to clearly differentiate yourself in the market.

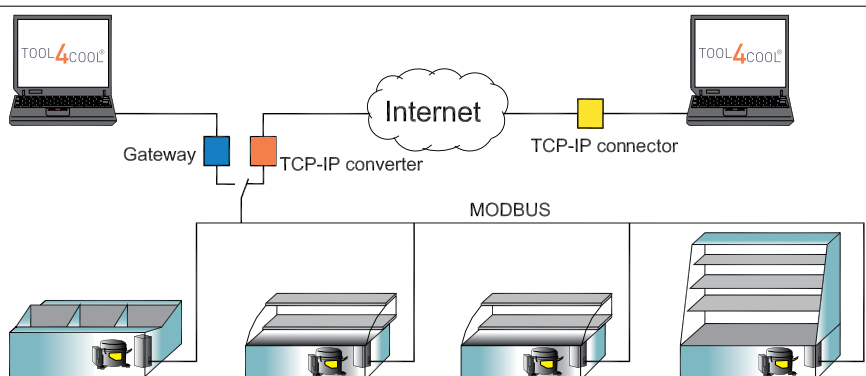
### Software installation

- Visit the Tool4Cool® LabEdition page
- Direct link: [www.secop.com/solutions/application-detail/variable-speed-drive-software-tool4cool/](http://www.secop.com/solutions/application-detail/variable-speed-drive-software-tool4cool/)
- Download and unzip the The Tool4Cool® installation package and then run the file setup.exe.



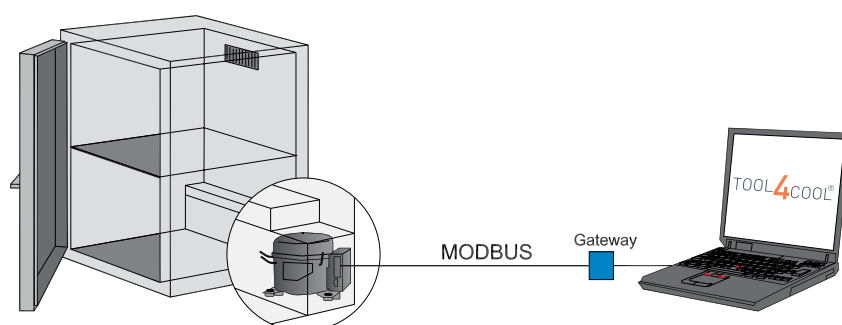
### TOOL4COOL® in a Network System

- Easy monitoring and optimization
- Alarm log and event log
- Easy service
- HACCP logging possible



### TOOL4COOL® in a Standalone System

- Optimize operation during development
- Alarm and eventlog readout
- Logging during development
- Download settings on the production line



Notes:

# Danfoss Commercial Compressors

is a worldwide manufacturer of compressors and condensing units for refrigeration and HVAC applications. With a wide range of high quality and innovative products we help your company to find the best possible energy efficient solution that respects the environment and reduces total life cycle costs.

We have 40 years of experience within the development of hermetic compressors which has brought us amongst the global leaders in our business, and positioned us as distinct variable speed technology specialists. Today we operate from engineering and manufacturing facilities spanning across three continents.



Danfoss Scrolls



Danfoss Inverter Scrolls



Danfoss Light Commercial Refrigeration Compressors



Danfoss Maneurop Reciprocating Compressors



Danfoss Turbocor Compressors



Danfoss Optyma Condensing Units

Our products can be found in a variety of applications such as rooftops, chillers, residential air conditioners, heatpumps, coldrooms, supermarkets, milk tank cooling and industrial cooling processes.

<http://cc.danfoss.com>

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