WITH MORE THAN 60 YEARS OF EXPERIENCE IN COMPRESSOR TECHNOLOGY AND HIGHLY DEDICATED EMPLOYEES, OUR FOCUS IS ON DEVELOPING AND APPLYING ADVANCED COMPRESSOR TECHNOLOGIES TO ACHIEVE STANDARD SETTING PERFORMANCE FOR LEADING PRODUCTS AND BUSINESSES AROUND THE WORLD.

SECOP

CONTROLLERS FOR DLV-CN COMPRESSORS

OPERATING INSTRUCTIONS

105N4460, 100-127 V / 50/60 Hz
105N4410, 220-240 V / 50/60 Hz
105N4510, 220-240 V / 50/60 Hz, PFC

CCD® COOL CAPACITY DRIVE

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1.
INTRODUCTION

Compressors are a vital element in cooling appliances, ensuring that the entire system runs smoothly and efficiently. Looking into the core of any machine, the effectiveness of a compressor is the optimization of all its components, including motor type, pump type, and contoller type.

When it comes to compressors, variable speed drive control is almost exactly the same as a variable frequency drive (VFD) in the way it controls a DC motor. However, compressors use a brushless permanent magnet motor for improved efficiency and longevity.

Full load operation is rare in most cooling applications, restricted to only a few days per year.

Since a compressor must fulfill the full load operation, a standard compressor is far too big for normal conditions, leading to poor energy efficiency.

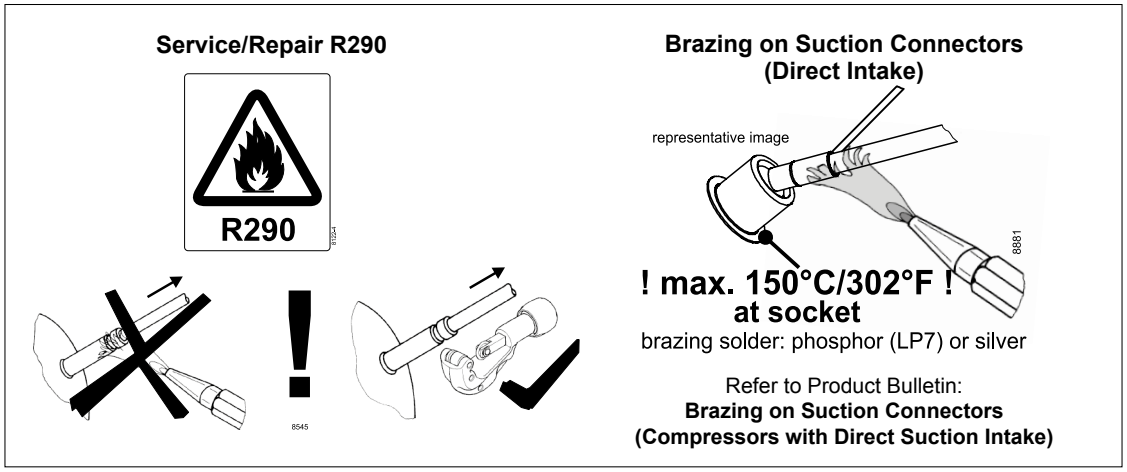
The variable speed technology makes capacity automatically adapt to your actual requirement. The compressor runs at low speed most of the time, thus minimizing energy consumption.

On top of this, system efficiency is greatly improved thanks to reduced loss when less heat is transferred via the evaporator and condenser. Altogether, substantial energy savings can be obtained.

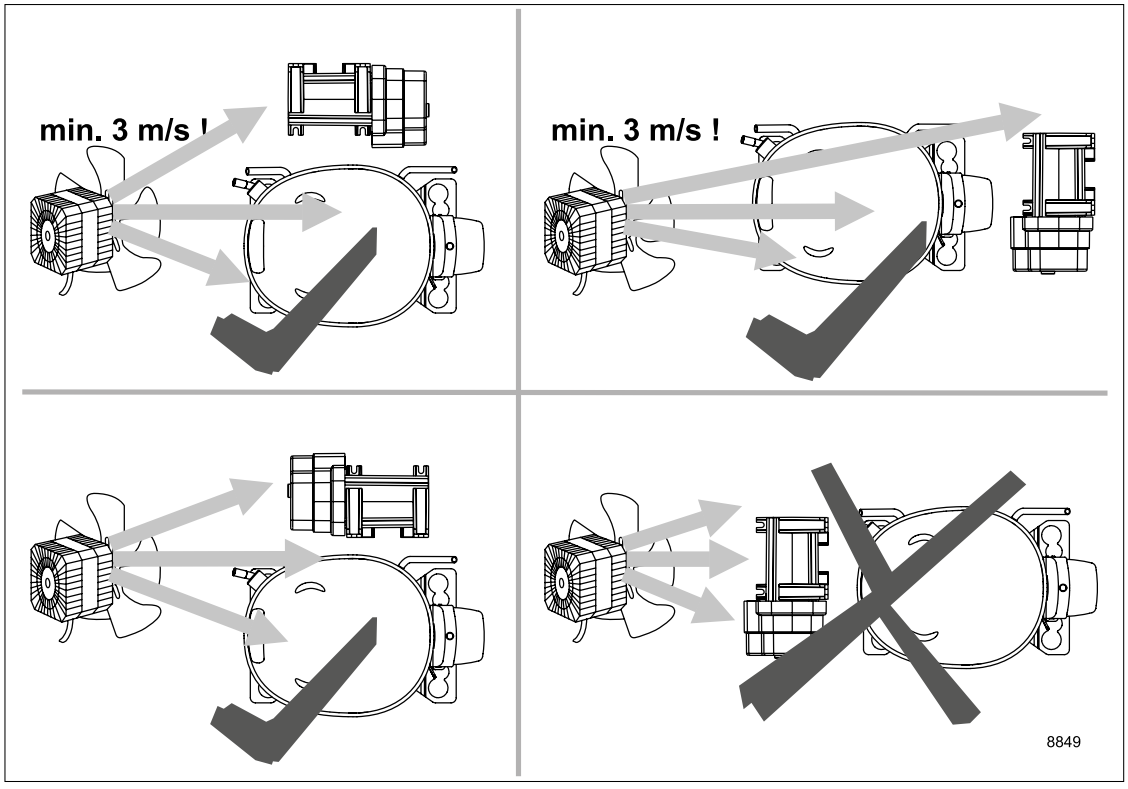
Secop DLV variable-speed compressors are designed for refrigeration systems using the designated refrigerants R290 (propane).

2. INSTALLATION

Warning

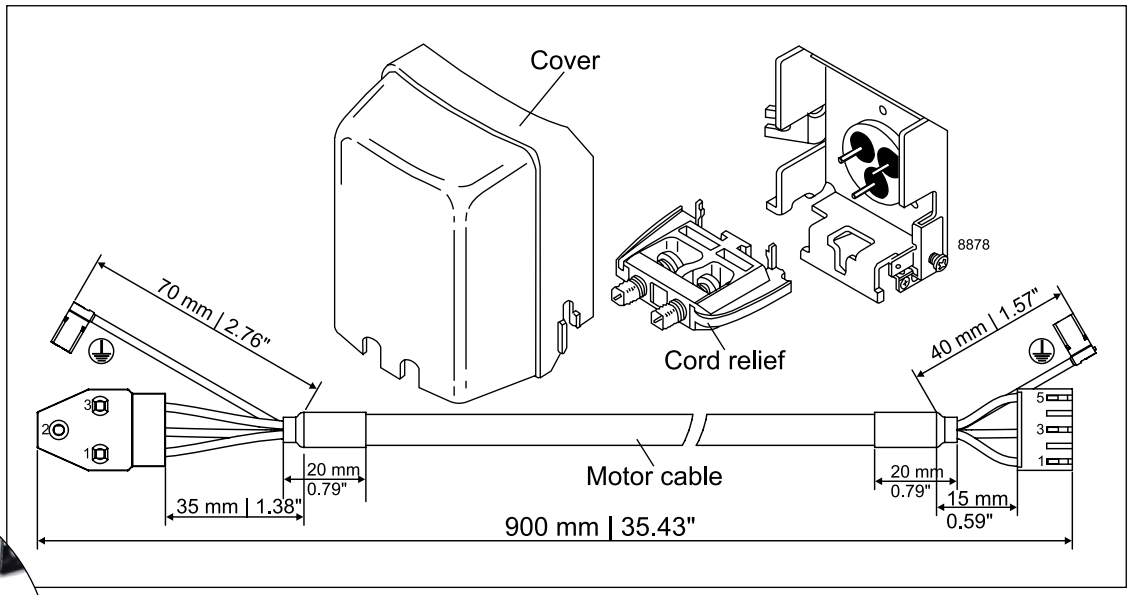


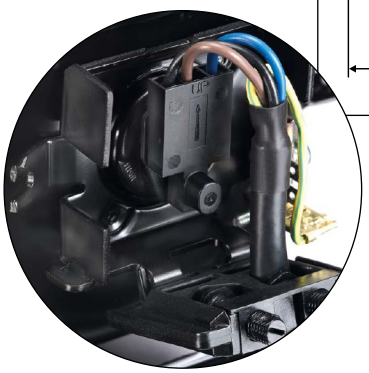
2.1 Airflow



Ensure proper airflow of 3 m/s at both compressor and electronic unit.

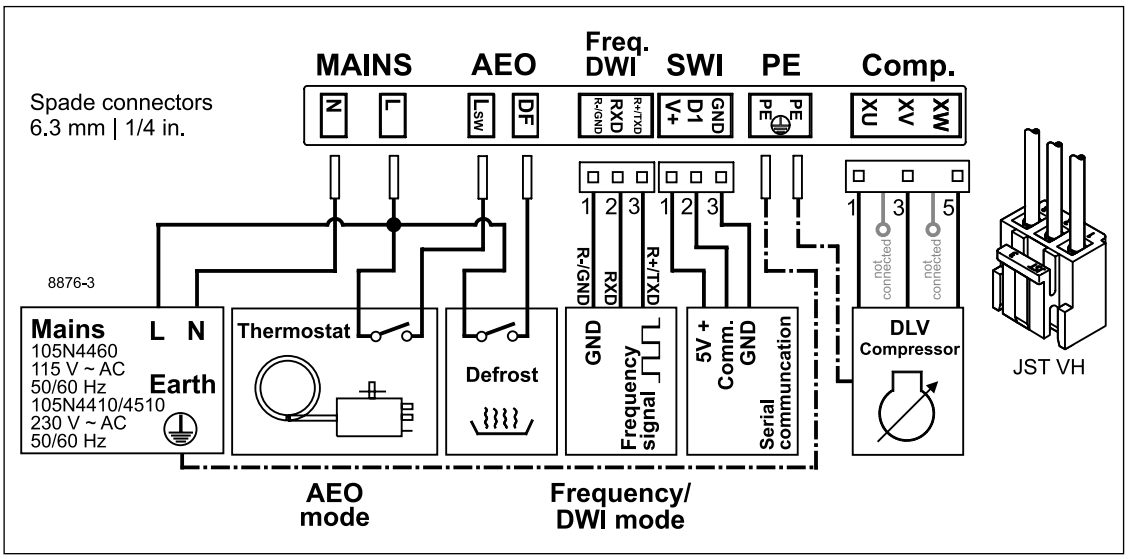
2.2 Earthing the Compressor and Controller





- For optimum EMC performance, the spade connectors on the contoller cable must be connected to both compressor and controller.
- Compressor and contoller must be connected to PE (Protective Earth) to avoid risk of electrical hazard.
- All protective earth lines, PE, in the application must be collected to one star point. This prevents loop currents which could cause problems with the electronic components, communication lines, and sensors. The star point is normally a screwed terminal on the chassis.

2.3 Wiring Diagram



Warning:

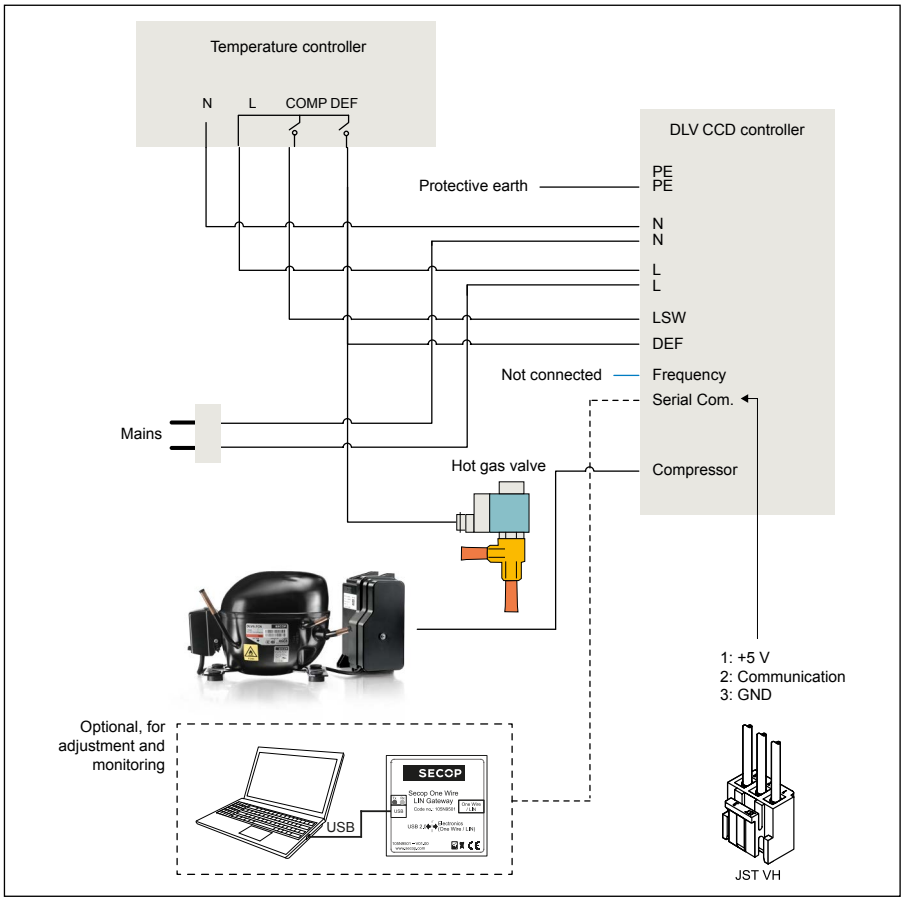
- Installation must only be done by trained personal.
- Do not remove cover of the contoller when the unit is powered.
- Disconnect from power and wait 30 seconds before accessing terminals.
- The maximum cable length should not exceed 3 meters for signal connections. A cable length of more than 3 m could alter the EMI performance.
- Signal lines must be separated from power lines.

2.4 Connections

1. Motor cable
2. Protective earth
3. SWI serial communication
4. DWI & frequency
5. Defrost
6. Thermostat/AEO
7. Line
8. Neutral

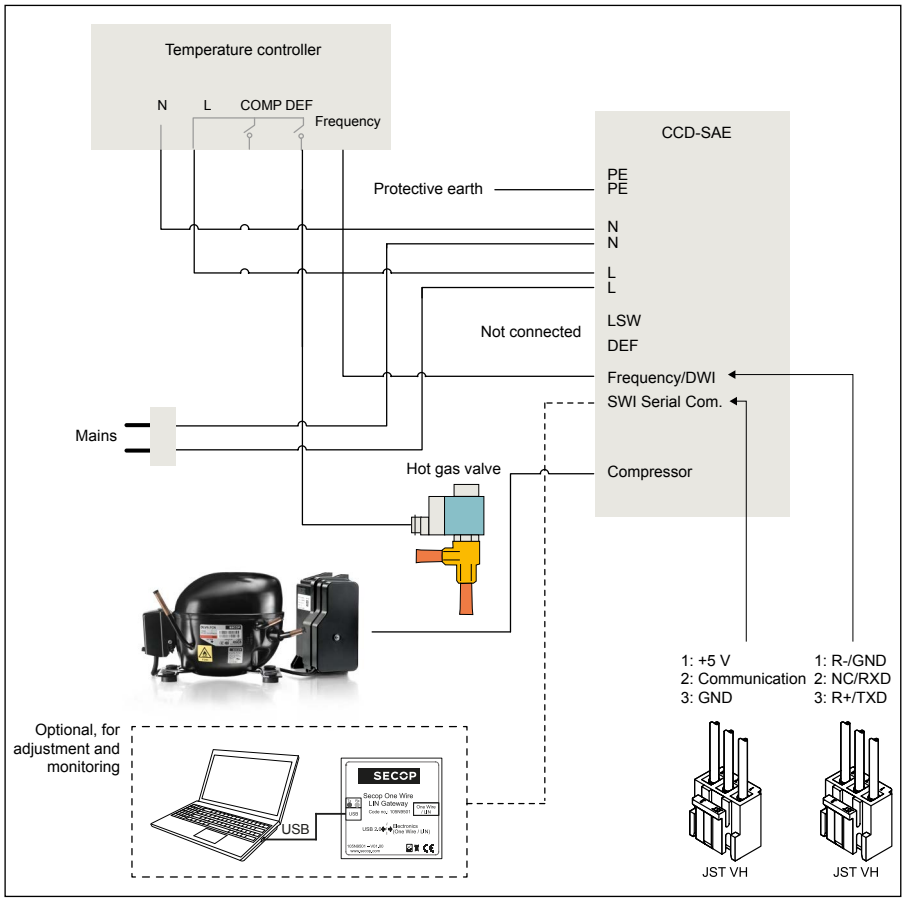
No.	Description	Type	Note
1	Motor Cable	JST VH	Delivered by Secop
2	Protective Earth	Faston 6.3 mm × 0.8 mm	Mandatory. Must be connected.
3	SWI Serial comm.	JST VH	For Tool4Cool®, or SWI only (ch. 2.7, 3.5)
4	Frequency / DWI	JST VH	For frequency or DWI only (ch 2.6, 3.3, 3.4)
5	Defrost	Faston 6.3 mm × 0.8 mm	For AEO and defrost only (ch 2.5, 3.2)
6	Thermostat	Faston 6.3 mm × 0.8 mm	For AEO only (see chapter 2.5, 3.1)
7	Line	Faston 6.3 mm × 0.8 mm	Mandatory. Must be connected.
8	Neutral	Faston 6.3 mm × 0.8 mm	Mandatory. Must be connected.

2.5 Wiring for Thermostatic Operation

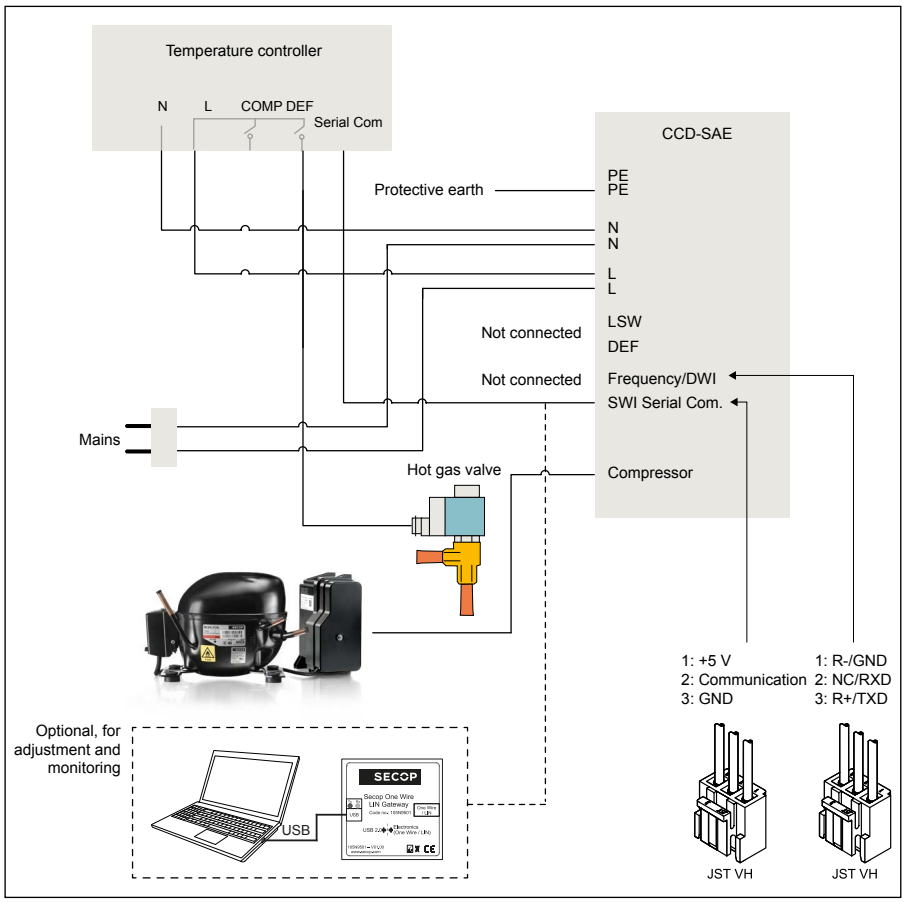


For optimal hot-gas defrost performance, the relay output of the controller should be connected to the DEF input of the contoller. This ensures that the compressor operates at full speed when the hot-gas valve is activated.

2.6 Wiring for Frequency Operation/DWI Communication



2.7 Wiring for SWI Communication



3.
SPEED CONTROL

The Secop °CCD® is equipped with four different inputs for controlling speed and ensuring easy integration.

Almost any temperature controller can be used to control the speed without needing to change the setup.

The °CCD® has automatic input detection and will automatically select the input which is active.

1. DWI, Dual Wire Interface with separated RX and TX lines
2. Frequency signal
3. Thermostatic operation with AEO, Adaptive Energy Optimization.
4. SWI, Single Wire Interface w. Modbus protocol

- If more signals are connected, the input with highest priority (1-4) will be used.
- Modbus input has lowest priority and can be used for monitoring in combination with the other inputs.
- If Tool4Cool® sends an active start command, the Modbus input will change priority to 1 and overrule all other input signals. The Modbus input will then remain selected until Tool4Cool® is closed.

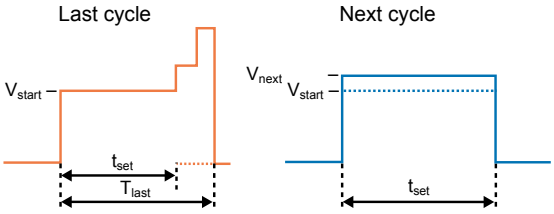
3.1 Thermostatic Operation with AEO

AEO is the only control mode where there is no direct relation between speed and input signal.
The speed is automatically calculated based on the run-time (time between cut-in and cut-out).

The AEO can be interfaced by a normal thermostat or relay.
Advantages of the AEO:
- Easy to interface
- Electromechanical thermostat
- Electronic control with relay output
- Perfect for applications with stable conditions, like freezers, catering equipment

The AEO operates with a target run-time and will automatically adapt the speed until the target run-time is met.

- If the compressor run-time is shorter than the target time, the speed in the next cycle will be reduced
- If the run-time is longer than the target time, the speed in the current cycle will be increased until the cut-out is reached. Next cycle is calculated as the average speed for the last cycle.
- Settings can be changed by Tool4Cool®



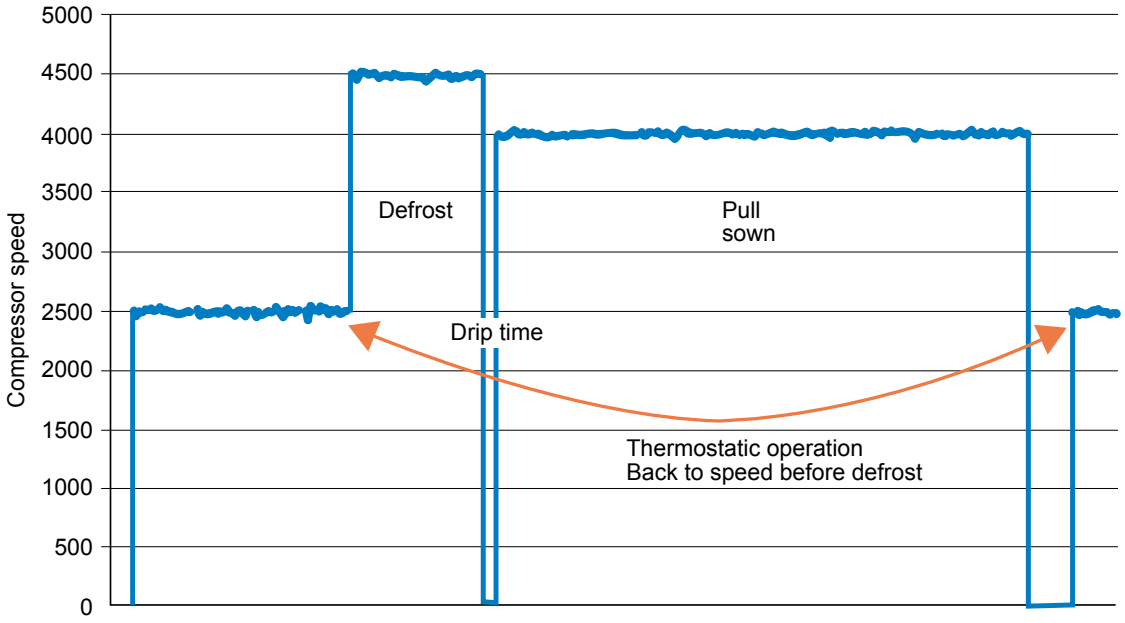
% Run-time	% Speed
100	105
110	110
120	120
140	130
160	140
190	180
220	225

3.2 Defrost Control with AEO

When variable speed compressors are used in self-adapting capacity modes, defrosting might work poor since the compressor speed cannot be controlled during defrosting: The compressor lacks capacity for hot-gas and the following pull-down.

To improve defrost when AEO is used, the °CCD® has an extra input that can be connected to the defrost relay output of the temperature controller.

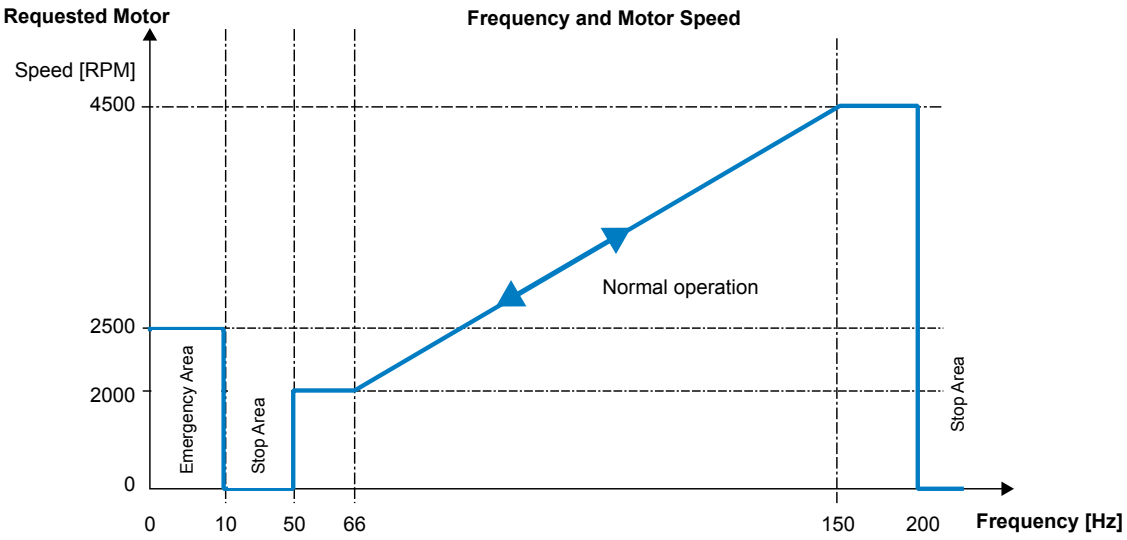
- Hot-gas defrosting: When the defrost and AEO input are activated simultaneously, the °CCD® switches to a defined fixed speed, maximum 4500 rpm
- Electrical defrosting: When only the defrost input is activated, the compressor will remain stopped, but the information is used to trigger pull-down after defrost.
- After defrosting, the °CCD® will run the first cycle at high speed to ensure that the heat is removed as fast as possible.
- After pull-down it reverts to the speed it had before defrost.
- Settings can be changed by Tool4Cool®



3.3 Frequency Speed Control

The speed can be controlled by applying a low voltage frequency signal to the frequency input

- The speed is changed linear between 66 Hz and 150 Hz.
- 66 Hz corresponds to 2000 rpm, 150 Hz to 4500 rpm.
- If the frequency is below 50 Hz, the compressor stops.
- A frequency of 25-30 Hz must be used during stop mode.
- If the frequency is lower than 10 Hz, the signal is considered faulty, and the compressor will go to emergency mode and operate at fixed speed or switch to AEO (Default disabled).
- The parameters for the frequency are fully programmable and can easily be changed by T4C.



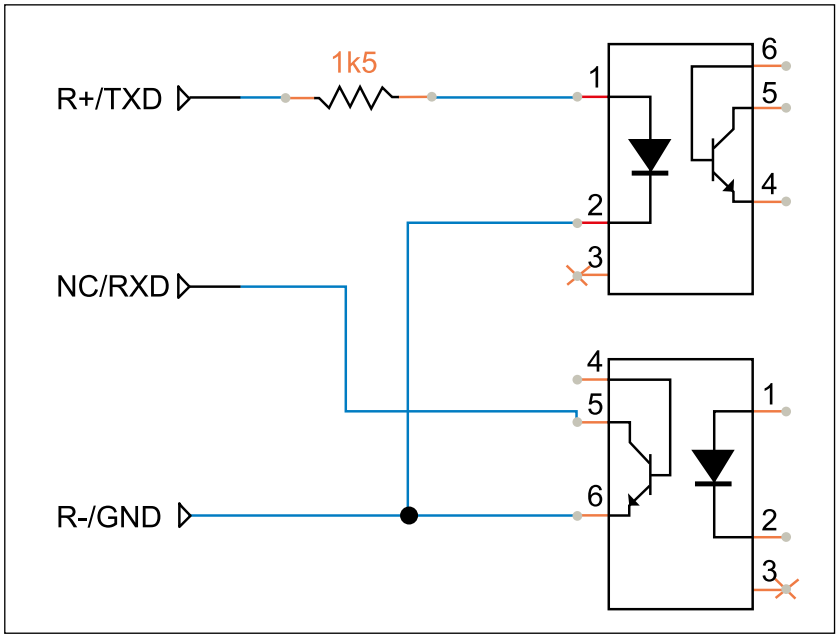
Parameter/Limiting values	Min.	Max.	Typical	Unit
Signal amplitude (high level)	4.5	12	5	V DC
Signal amplitude (low level)	-5	1	0	V DC
Signal current	2.5	8	3	mA
Signal max. rise and fall Time	0	50	---	µs
Minimum pulse length	1.5	---	-	mSec

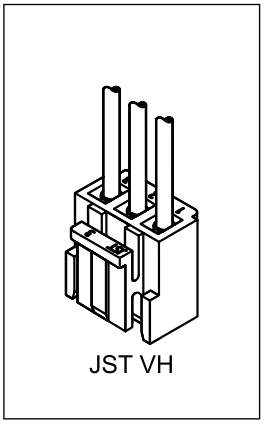
3.4 DWI Serial Communication

The DWI, Dual Wire interface, is a bi-directional communication protocol that allows the temperature controller to communicate with the compressor contoller.

Beside speed, the temperature controller can get different information from the contoller, like power consumption, actual speed, electronic temperature, and fault status.

The communication interface is shared with the frequency interface.
A full description of the interface and a list of supported commands can be requested from Secop.





Communication Specification	
Baud Rate:	600 Baud
Start Bits:	1
Data Bits:	8
Stop Bits:	1
Parity:	No
Frame Size:	5 Bytes
Appliance Controller:	Master
Compressor Controller:	Slave
Start Bit:	1 --> 0 (logic level)
Data Bits:	Inverted logic (0V --> "1")
Stop Bit:	0 --> 1 (logic level)
Control Mode:	Half duplex

3.5 SWI Serial Communication

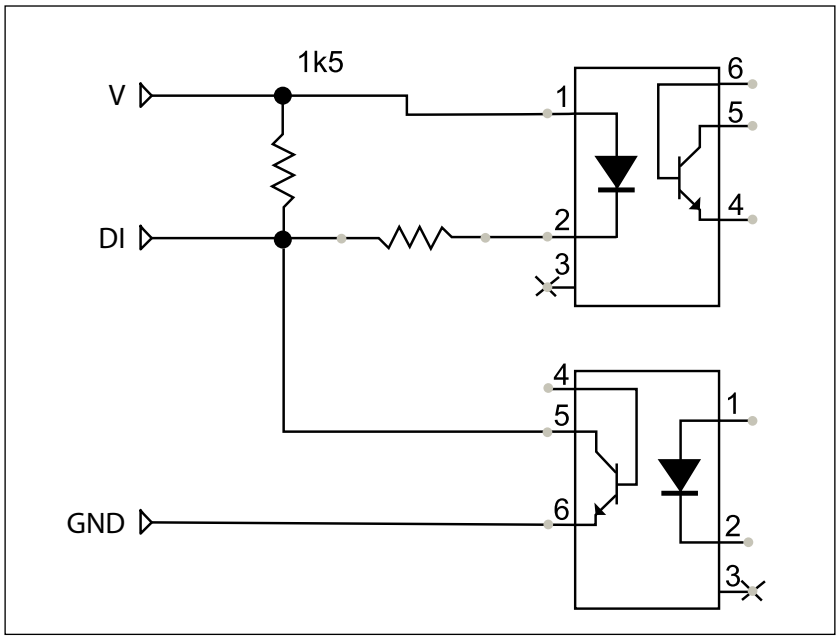
The serial communication is implemented as a single wire half-duplex line – transmitting and receiving on the same line.

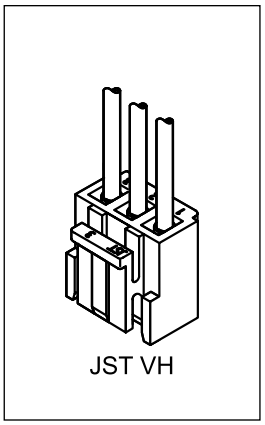
The input port is galvanic isolated from the contoller and must be supplied from the application board by a 5 V to 12 V DC. The signal level follows the supply voltage.

Up to 3 units can be wired in parallel for multi compressor systems, but it must be ensured that the controller has sufficient drive capability.

- The communication is based on the MODBUS Serial Line protocol.
- The °CCD® operates as a slave. A slave node will never transmit data without receiving a request from the master node.
- Only one master can be connected to the bus, and up to 3 °CCD®'s slave nodes can be connected to the same serial bus.
- Each °CCD® must have an individual address which is unique. The °CCD®'s will never communicate with each other.
- The master must always send a message which includes an address – even if only one unit is connected to the bus.
- The slave will always return a reply message to the master (unless it is a broad cast message).
- All Modbus transactions consist therefore of two messages – a request from the master and a reply from the °CCD®.
- The communication must be refreshed every 10 seconds for safety reasons, If this is not done, the communication is considered lost, and the compressor will stop or go to emergency mode where it will run with a predefined capacity.

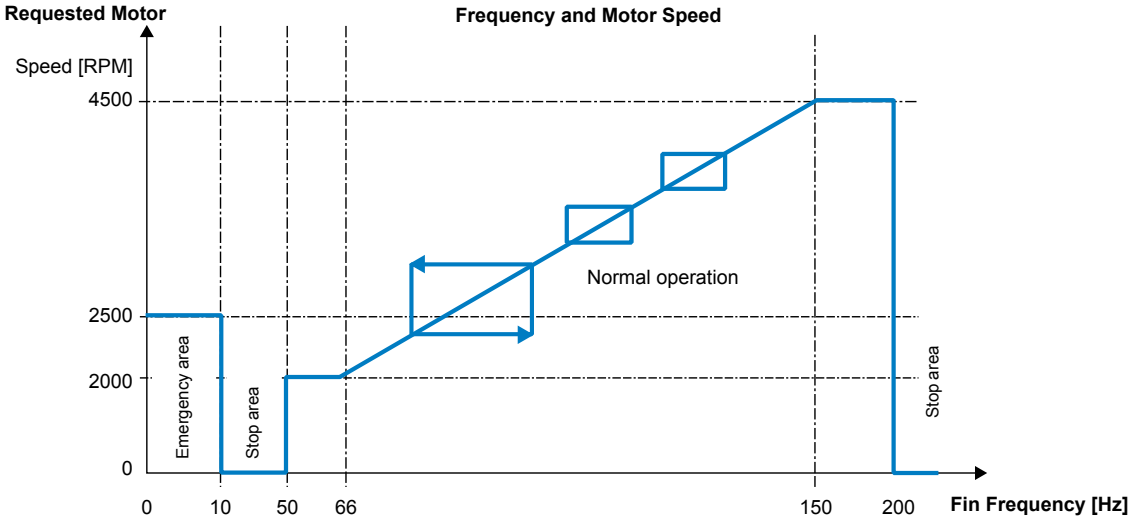
A full description of the interface and a list of supported commands can be requested at Secop.





3.6 Avoiding Resonance

- In some situations, vibration at certain speeds can make the tubes and plates rattle and vibrate
- Those speeds can be blocked by defining "forbidden speeds", at which the compressor is not allowed to operate.
- If the tubes have a resonance point at 2500 rpm, you define a minimum speed and a maximum speed for the area. For instance from 2400 to 2600 rpm.
- Up to 3 speeds can be programmed.



4.
TECHNICAL DATA

4.1 Controller Data

	Item	105N4460	105N4410 / 105N4510 (with PFC)
Power supply	Nominal voltage	100 - 127 V AC	220 - 240 V AC
	Minimum operating voltage	80 V AC	160 V AC
	Minimum starting voltage	90 V AC	180 V AC
	Maximum voltage	140 V AC	270 V AC
	Frequency	50 - 60 Hz	
	Max power input	450 W	
	Power Factor Corrector	–	105N4510: Yes, active, PF ≥ 0.95
Environment	IP class	IP54	
	Humidity	30 - 90 % rH	
	Maximum operating temperature	50 °C / 120 °F	
	Minimum operating temperature	0 °C / 32 °F	
	Storage temperature	- 30 to 70 °C / -22 °F to 158 °F	
Approvals/Safety	Compressor protection	Software protected (PEC)	
	Safety Approval	UL 60335-2-34 with Annex AA	EN 60335-2-34 with Annex AA 105N4510: CCC
	EMC conformity	According to 2004/104/EC	
	RoHs Conformity	2011/65/EU	
Speed-Control	Frequency input	5 to 12 V, max. 8 mA, 0 - 200 Hz Galvanic isolated, short and reverse protected	
	AEO Thermostat input (Lsw)	80 - 264 V AC, non-isolated	150 - 264 V AC, non-isolated
	AEO Defrost input (Def)	80 - 264 V AC, non-isolated	150 - 264 V AC, non-isolated
	RX/TX interface (DWI)	5 - 12 V, max. 8 mA, 600 baud galvanic isolated	
	Single Wire Interface (SWI)	Modbus communication port, 9600 Baud galvanic isolated	

4.2 Compressor Data

	DLV4.0CN / DLV 5.7CN		115 V	230 V
Compressor	Application		LBP/MBP	LBP/MBP
	Evaporating temperature	°C (°F)	-35 to 7.2 (-31 to 45)	-35 to 7.2 (-31 to 45)
	Voltage range / frequency	V/Hz	90 - 140 / 50/60	180 - 270 / 50/60
	Speed range	rpm	2000 - 4500	2000 - 4500


XW
XV
XU
PE
GND
D1
V+


DLV5.7CN
SECOP
LBP/MBP
ONLY WITH DLV CONTROLLER
R290
SUCTION
102H
4604
MADE IN SLOVAKIA
R290
SECOP
DLV5.7CN
SEE CONTROL FOR ELECTRICAL RATINGS
1PH
THERMALLY PROTECTED
SECOP

4.3 Capacity and Performance Data DLV4.0CN 100-127 V, 50/60 Hz

LBP: ASHRAE	115 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	120	136	153	169	185	217	249	281
Capacity [BTU/h]	409	465	522	577	632	741	849	958
Power cons. [W]	78	88	98	107	117	137	157	178
Current cons. [A]	1.07	1.25	1.42	1.60	1.79	2.23	2.68	3.12
COP [W/W]	1.54	1.55	1.56	1.58	1.58	1.58	1.59	1.58
EER [BTU/Wh]	5.27	5.31	5.35	5.38	5.42	5.41	5.40	5.39

Test conditions		
Evaporation pressure	-23.3 °C	-10 °F
Condensing pressure	54.4 °C	130 °F
Liquid temperature	32.2 °C	90 °F
Return gas temp.	32.2 °C	90 °F

LBP: CECOMAF	115 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	88	100	113	124	136	160	183	207
Capacity [BTU/h]	302	343	385	425	466	546	626	706
Power cons. [W]	75	84	94	103	112	132	151	171
Current cons. [A]	1.03	1.19	1.35	1.52	1.70	2.12	2.54	2.95
COP [W/W]	1.17	1.19	1.20	1.20	1.21	1.21	1.21	1.21
EER [BTU/Wh]	4.02	4.07	4.11	4.13	4.16	4.15	4.14	4.14

Test conditions		
Evaporation pressure	-25 °C	-13 °F
Condensing pressure	55 °C	131 °F
Liquid temperature	55 °C	131 °F
Return gas temp.	32 °C	90 °F

LBP: EN12900	115 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	65	74	83	92	100	117	135	152
Capacity [BTU/h]	222	252	283	313	342	401	460	519
Power cons. [W]	58	63	68	75	82	97	111	125
Current cons. [A]	0.76	0.84	0.92	1.03	1.15	1.42	1.68	1.95
COP [W/W]	1.12	1.17	1.22	1.23	1.22	1.21	1.22	1.22
EER [BTU/Wh]	3.81	4.00	4.16	4.16	4.16	4.16	4.15	4.15

Test conditions		
Evaporation pressure	-35 °C	-31 °F
Condensing pressure	40 °C	104 °F
Liquid temperature	40 °C	104 °F
Return gas temp.	20 °C	68 °F

MBP: ASHRAE	115 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	229	261	293	324	354	415	476	537
Capacity [BTU/h]	783	891	999	1105	1210	1418	1626	1834
Power cons. [W]	103	118	134	146	159	187	215	242
Current cons. [A]	1.52	1.82	2.12	2.40	2.68	3.40	4.11	4.83
COP [W/W]	2.22	2.21	2.19	2.22	2.23	2.22	2.21	2.22
EER [BTU/Wh]	7.60	7.53	7.48	7.54	7.60	7.59	7.58	7.57

Test conditions		
Evaporation pressure	-6.7 °C	20 °F
Condensing pressure	54.4 °C	130 °F
Liquid temperature	46.1 °C	115 °F
Return gas temp.	35 °C	95 °F

MBP: CECOMAF	115 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	180	205	230	254	279	327	374	422
Capacity [BTU/h]	616	700	785	869	952	1115	1278	1442
Power cons. [W]	99	113	128	140	153	179	206	232
Current cons. [A]	1.45	1.73	2.01	2.27	2.54	3.20	3.87	4.54
COP [W/W]	1.82	1.81	1.80	1.81	1.82	1.83	1.82	1.82
EER [BTU/Wh]	6.22	6.18	6.14	6.19	6.24	6.23	6.22	6.21

Test conditions		
Evaporation pressure	-10 °C	14 °F
Condensing pressure	55 °C	131 °F
Liquid temperature	55 °C	131 °F
Return gas temp.	32 °C	90 °F

MBP: EN12900	115 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	203	231	259	287	314	368	422	476
Capacity [BTU/h]	694	790	885	979	1073	1257	1441	1625
Power cons. [W]	90	102	115	126	137	161	185	209
Current cons. [A]	1.28	1.51	1.75	1.97	2.20	2.77	3.33	3.90
COP [W/W]	2.26	2.26	2.25	2.28	2.29	2.29	2.28	2.28
EER [BTU/Wh]	7.74	7.72	7.70	7.76	7.82	7.80	7.79	7.78

Test conditions		
Evaporation pressure	-10 °C	14 °F
Condensing pressure	45 °C	113 °F
Liquid temperature	45 °C	113 °F
Return gas temp.	20 °C	68 °F

4.4 Capacity and Performance Data DLV4.0CN 220-240 V, 50/60 Hz

LBP: ASHRAE	230 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	119	136	153	170	186	219	251	299
Capacity [BTU/h]	406	465	524	580	635	747	859	1022
Power cons. [W]	79	87	95	106	116	137	158	175
Current cons. [A]	0.43	0.45	0.48	0.52	0.57	0.65	0.74	0.80
COP [W/W]	1.51	1.57	1.61	1.61	1.60	1.60	1.59	1.72
EER [BTU/Wh]	5.14	5.34	5.51	5.49	5.48	5.45	5.43	5.86

Test conditions		
Evaporation pressure	-23.3 °C	-10 °F
Condensing pressure	54.4 °C	130 °F
Liquid temperature	32.2 °C	90 °F
Return gas temp.	32.2 °C	90 °F

LBP: CECOMAF	230 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	88	101	114	126	138	162	186	222
Capacity [BTU/h]	302	346	390	431	472	554	636	758
Power cons. [W]	76	84	92	102	112	132	153	169
Current cons. [A]	0.42	0.44	0.47	0.51	0.55	0.63	0.71	0.77
COP [W/W]	1.16	1.21	1.24	1.24	1.23	1.23	1.22	1.32
EER [BTU/Wh]	3.95	4.11	4.25	4.23	4.21	4.19	4.17	4.50

Test conditions		
Evaporation pressure	-25 °C	-13 °F
Condensing pressure	55 °C	131 °F
Liquid temperature	55 °C	131 °F
Return gas temp.	32 °C	90 °F

LBP: EN12900	230 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	71	79	88	98	109	130	151	168
Capacity [BTU/h]	241	270	300	335	371	443	515	574
Power cons. [W]	55	63	70	77	84	98	112	130
Current cons. [A]	0.32	0.36	0.39	0.41	0.44	0.48	0.53	0.61
COP [W/W]	1.27	1.27	1.26	1.28	1.30	1.33	1.35	1.30
EER [BTU/Wh]	4.35	4.33	4.31	4.38	4.44	4.54	4.61	4.43

Test conditions		
Evaporation pressure	-35 °C	-31 °F
Condensing pressure	40 °C	104 °F
Liquid temperature	40 °C	104 °F
Return gas temp.	20 °C	68 °F

MBP: ASHRAE	230 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	225	257	289	319	349	410	471	549
Capacity [BTU/h]	767	877	986	1090	1193	1400	1607	1875
Power cons. [W]	107	118	129	143	157	186	215	238
Current cons. [A]	0.55	0.58	0.61	0.67	0.74	0.86	0.99	1.06
COP [W/W]	2.11	2.18	2.25	2.23	2.22	2.20	2.19	2.31
EER [BTU/Wh]	7.19	7.45	7.67	7.62	7.58	7.52	7.48	7.88

Test conditions		
Evaporation pressure	-6.7 °C	20 °F
Condensing pressure	54.4 °C	130 °F
Liquid temperature	46.1 °C	115 °F
Return gas temp.	35 °C	95 °F

MBP: CECOMAF	230 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	176	201	227	251	275	323	371	436
Capacity [BTU/h]	600	687	774	857	939	1103	1268	1488
Power cons. [W]	102	113	123	137	150	178	205	227
Current cons. [A]	0.53	0.56	0.59	0.65	0.71	0.82	0.94	1.02
COP [W/W]	1.72	1.79	1.84	1.84	1.83	1.82	1.81	1.92
EER [BTU/Wh]	5.88	6.11	6.30	6.27	6.24	6.21	6.18	6.56

Test conditions		
Evaporation pressure	-10 °C	14 °F
Condensing pressure	55 °C	131 °F
Liquid temperature	55 °C	131 °F
Return gas temp.	32 °C	90 °F

MBP: EN12900	230 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	203	229	255	282	310	364	418	471
Capacity [BTU/h]	694	783	872	964	1057	1242	1427	1610
Power cons. [W]	90	101	112	124	136	160	183	209
Current cons. [A]	0.48	0.51	0.55	0.60	0.65	0.75	0.85	0.94
COP [W/W]	2.26	2.27	2.28	2.28	2.28	2.28	2.28	2.25
EER [BTU/Wh]	7.70	7.76	7.80	7.79	7.79	7.79	7.79	7.69

Test conditions		
Evaporation pressure	-10 °C	14 °F
Condensing pressure	45 °C	113 °F
Liquid temperature	45 °C	113 °F
Return gas temp.	20 °C	68 °F

4.5 Capacity and Performance Data DLV5.7CN 100-127 V, 50/60 Hz

LBP: ASHRAE	115 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	194	219	244	269	293	343	392	446
Capacity [BTU/h]	664	748	833	917	1002	1170	1339	1523
Power cons. [W]	115	130	144	160	176	207	239	277
Current cons. [A]	1.55	1.72	1.89	2.08	2.27	2.64	3.01	3.44
COP [W/W]	1.69	1.68	1.69	1.68	1.66	1.66	1.64	1.61
EER [BTU/Wh]	5.76	5.78	5.79	5.75	5.71	5.65	5.61	5.50

Test conditions		
Evaporation pressure	-23.3 °C	-10 °F
Condensing pressure	54.4 °C	130 °F
Liquid temperature	32.2 °C	90 °F
Return gas temp.	32.2 °C	90 °F

LBP: CECOMAF	115 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	146	164	183	201	220	257	294	334
Capacity [BTU/h]	497	561	624	687	750	877	1003	1141
Power cons. [W]	111	125	139	154	169	200	230	267
Current cons. [A]	1.49	1.66	1.83	2.01	2.19	2.54	2.90	3.32
COP [W/W]	1.32	1.31	1.32	1.31	1.30	1.29	1.28	1.25
EER [BTU/Wh]	4.48	4.49	4.50	4.47	4.44	4.39	4.36	4.28

Test conditions		
Evaporation pressure	-25 °C	-13 °F
Condensing pressure	55 °C	131 °F
Liquid temperature	55 °C	131 °F
Return gas temp.	32 °C	90 °F

LBP: EN12900	115 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	114	128	143	157	172	201	230	261
Capacity [BTU/h]	388	438	487	537	586	685	784	892
Power cons. [W]	85	96	106	118	130	153	176	205
Current cons. [A]	1.12	1.24	1.37	1.50	1.64	1.91	2.18	2.49
COP [W/W]	1.34	1.33	1.35	1.33	1.32	1.31	1.31	1.27
EER [BTU/Wh]	4.57	4.58	4.59	4.55	4.52	4.48	4.45	4.36

Test conditions		
Evaporation pressure	-35 °C	-31 °F
Condensing pressure	40 °C	104 °F
Liquid temperature	40 °C	104 °F
Return gas temp.	20 °C	68 °F

MBP: ASHRAE	115 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	344	388	433	476	520	608	695	791
Capacity [BTU/h]	1176	1326	1477	1626	1776	2075	2375	2700
Power cons. [W]	157	177	196	218	239	283	326	378
Current cons. [A]	2.11	235	2.58	2.84	3.04	3.60	4.11	4.70
COP [W/W]	2.19	2.19	2.21	2.18	2.18	2.15	2.13	2.09
EER [BTU/Wh]	7.49	7.51	7.52	7.47	7.42	7.34	7.29	7.15

Test conditions		
Evaporation pressure	-6.7 °C	20 °F
Condensing pressure	54.4 °C	130 °F
Liquid temperature	46.1 °C	115 °F
Return gas temp.	35 °C	95 °F

MBP: CECOMAF	115 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	275	310	345	380	415	485	555	631
Capacity [BTU/h]	939	1059	1179	1298	1418	1656	1895	2155
Power cons. [W]	152	171	190	211	231	273	315	365
Current cons. [A]	2.02	2.25	2.47	2.71	2.96	3.44	3.93	4.49
COP [W/W]	1.81	1.81	1.82	1.80	1.80	1.78	1.76	1.73
EER [BTU/Wh]	6.19	6.20	6.22	6.17	6.13	6.07	6.02	5.91

Test conditions		
Evaporation pressure	-10 °C	14 °F
Condensing pressure	55 °C	131 °F
Liquid temperature	55 °C	131 °F
Return gas temp.	32 °C	90 °F

MBP: EN12900	115 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	310	350	390	429	469	548	627	713
Capacity [BTU/h]	1060	1195	1331	1466	1600	1870	2140	2434
Power cons. [W]	143	161	179	199	219	258	297	345
Current cons. [A]	1.84	2.05	2.25	2.47	2.69	3.14	3.58	4.09
COP [W/W]	2.17	2.17	2.18	2.16	2.14	2.12	2.11	2.07
EER [BTU/Wh]	7.39	7.41	7.43	7.37	7.32	7.25	7.20	7.06

Test conditions		
Evaporation pressure	-10 °C	14 °F
Condensing pressure	45 °C	113 °F
Liquid temperature	45 °C	113 °F
Return gas temp.	20 °C	68 °F

4.6 Capacity and Performance Data DLV5.7CN 220-240 V, 50/60 Hz

LBP: ASHRAE	230 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	185	212	239	266	293	346	400	448
Capacity [BTU/h]	631	724	817	909	1000	1183	1366	1530
Power cons. [W]	113	127	142	156	171	201	231	266
Current cons. [A]	0.55	0.61	0.66	0.73	0.79	0.92	1.05	1.19
COP [W/W]	1.64	1.67	1.69	1.70	1.71	1.72	1.73	1.69
EER [BTU/Wh]	5.61	5.70	5.77	5.81	5.84	5.89	5.92	5.75

Test conditions		
Evaporation pressure	-23.3 °C	-10 °F
Condensing pressure	54.4 °C	130 °F
Liquid temperature	32.2 °C	90 °F
Return gas temp.	32.2 °C	90 °F

LBP: CECOMAF	230 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	138	158	178	199	219	260	301	337
Capacity [BTU/h]	470	539	608	678	748	887	1026	1150
Power cons. [W]	108	122	136	151	165	194	224	258
Current cons. [A]	0.53	0.58	0.64	0.70	0.77	0.89	1.02	1.15
COP [W/W]	1.27	1.29	1.31	1.32	1.33	1.34	1.35	1.31
EER [BTU/Wh]	4.34	4.41	4.47	4.50	4.52	4.56	4.59	4.46

Test conditions		
Evaporation pressure	-25 °C	-13 °F
Condensing pressure	55 °C	131 °F
Liquid temperature	55 °C	131 °F
Return gas temp.	32 °C	90 °F

LBP: EN12900	230 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	103	118	133	148	167	194	225	252
Capacity [BTU/h]	351	403	455	507	559	664	768	861
Power cons. [W]	77	88	99	111	123	147	170	195
Current cons. [A]	0.41	0.45	0.49	0.54	0.59	0.69	0.79	0.88
COP [W/W]	1.34	1.34	1.35	1.34	1.33	1.33	1.32	1.30
EER [BTU/Wh]	4.57	4.58	4.59	4.57	4.56	4.53	4.51	4.42

Test conditions		
Evaporation pressure	-35 °C	-31 °F
Condensing pressure	40 °C	104 °F
Liquid temperature	40 °C	104 °F
Return gas temp.	20 °C	68 °F

MBP: ASHRAE	230 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	339	389	439	481	523	608	692	775
Capacity [BTU/h]	1158	1329	1500	1644	1788	2075	2363	2647
Power cons. [W]	154	175	196	215	234	272	311	356
Current cons. [A]	0.71	0.81	0.91	0.99	1.07	1.24	1.40	1.58
COP [W/W]	2.20	2.23	2.25	2.24	2.24	2.23	2.23	2.18
EER [BTU/Wh]	7.51	7.60	7.67	7.65	7.64	7.62	7.60	7.44

Test conditions		
Evaporation pressure	-6.7 °C	20 °F
Condensing pressure	54.4 °C	130 °F
Liquid temperature	46.1 °C	115 °F
Return gas temp.	35 °C	95 °F

MBP: CECOMAF	230 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	269	308	348	382	416	484	552	619
Capacity [BTU/h]	917	1053	1188	1304	1421	1653	1886	2113
Power cons. [W]	148	167	187	205	224	260	297	341
Current cons. [A]	0.68	0.78	0.87	0.95	1.03	1.19	1.34	1.51
COP [W/W]	1.82	1.84	1.86	1.86	1.86	1.86	1.86	1.82
EER [BTU/Wh]	6.21	6.29	6.36	6.36	6.35	6.35	6.35	6.20

Test conditions		
Evaporation pressure	-10 °C	14 °F
Condensing pressure	55 °C	131 °F
Liquid temperature	55 °C	131 °F
Return gas temp.	32 °C	90 °F

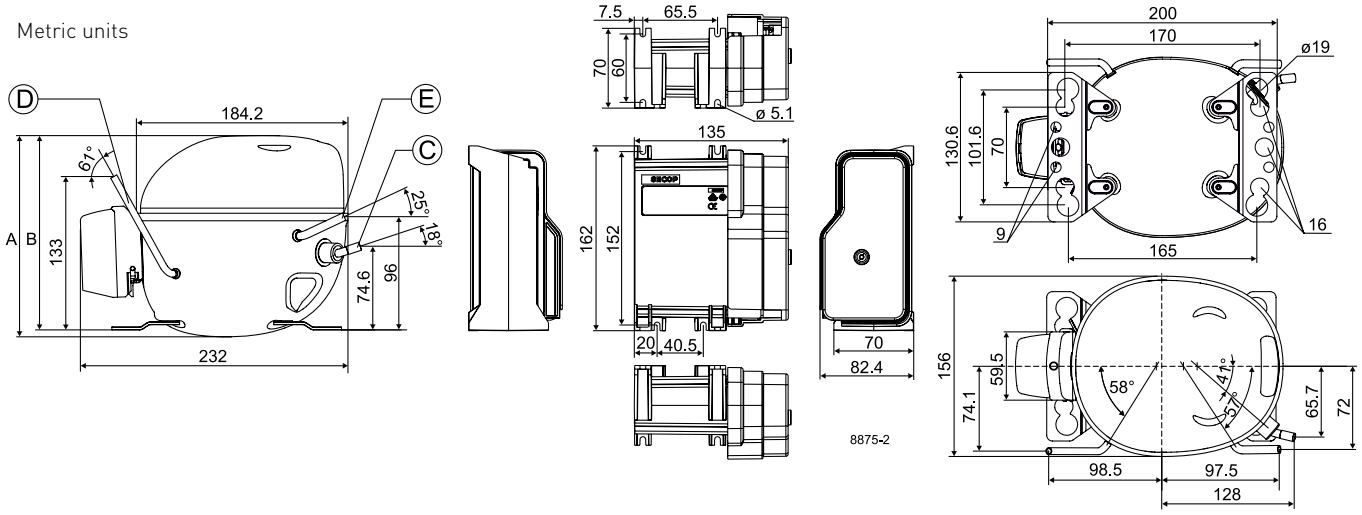
MBP: EN12900	230 V, 50/60 Hz, fan cooling F_2							
Speed (rpm)	2000	2250	2500	2750	3000	3500	4000	4500
Capacity [W]	298	342	386	422	459	533	606	679
Capacity [BTU/h]	1017	1167	1317	1442	1568	1820	2071	2320
Power cons. [W]	131	149	168	185	203	238	273	311
Current cons. [A]	0.62	0.71	0.79	0.87	0.94	1.09	1.24	1.38
COP [W/W]	2.28	2.29	2.30	2.28	2.26	2.24	2.22	2.19
EER [BTU/Wh]	7.78	7.81	7.84	7.78	7.73	7.65	7.59	7.46

Test conditions		
Evaporation pressure	-10 °C	14 °F
Condensing pressure	45 °C	113 °F
Liquid temperature	45 °C	113 °F
Return gas temp.	20 °C	68 °F

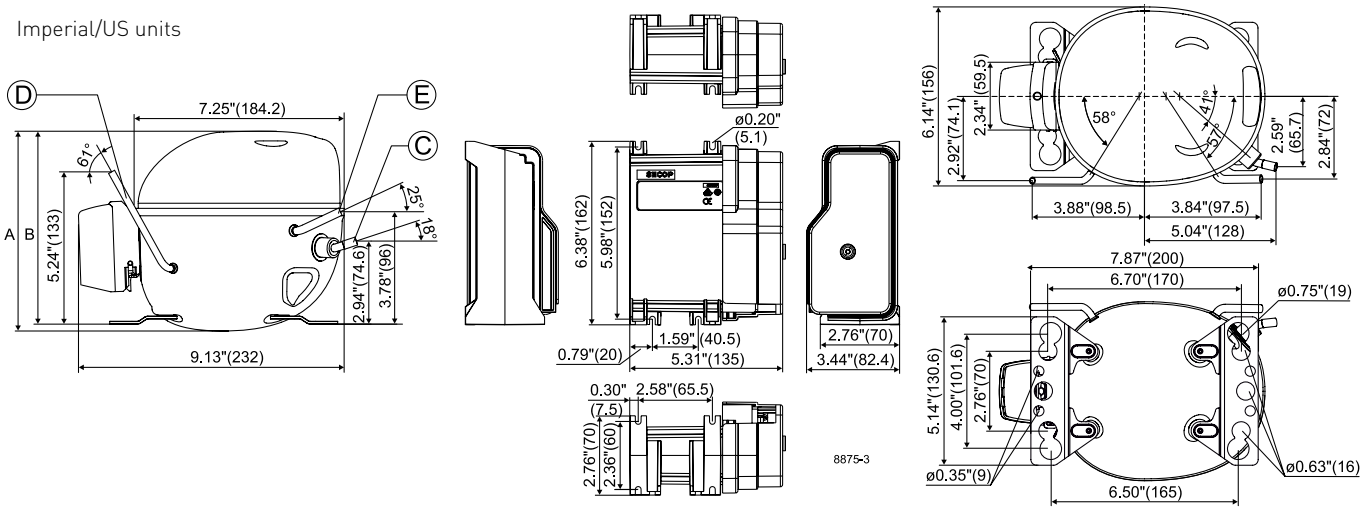
5. DIMENSIONS

Compressor dimensions **DLV4.0CN** **DLV5.7CN**			**230 V** (metric connectors) **DLV4.0CN: 102H3498,** **DLV5.7CN: 102H3698**	**115 V** (inch connectors) **DLV4.0CN: 102H3486** **DLV5.7CN: 102H4604** **230 V** (inch connectors) **DLV4.0CN: 102H3496** **DLV5.7CN: 102H3497**
Height	mm (in.)	A	175	175 (6.89)
		B	169	169 (6.65)
Suction connector	location/I.D. mm (in.) | angle	C	8.2 | 18°	8.2 (0.320-0.327) | 18°
	material | seal		Copper | Rubber plug	Copper | Rubber plug
Process connector	location/I.D. mm (in.) | angle	D	6.2 | 61°	6.5 (0.252-0.259) | 61°
	material | seal		Copper | Rubber plug	Copper | Rubber plug
Discharge connector	location/I.D. mm (in.) | angle	E	6.2 | 25°	6.5 (0.252-0.259) | 25°
	material | seal		Copper | Rubber plug	Copper | Rubber plug
Connector tolerance	I.D. mm		±0.09	–

Metric units



Imperial/US units



6. ORDERING

	Item	Code No.	Comment
Controller	Electronic controller (°CCD®), 220 - 240 V AC	105N4410	single unit
		105N4411	industrial pack
	Electronic controller (°CCD®), 220 - 240 V AC, with active PFC	105N4510	single unit
		105N4511	industrial pack
	Electronic controller (°CCD®), 100 - 127 V AC	105N4460	single unit
		105N4461	industrial pack
Compressor / Accessories	DLV4.0CN compressor, 115 V AC	102H3486	compressor w. inch connectors
	DLV4.0CN compressor, 230 V AC	102H3498	compressor w. metric connectors
		102H3496	compressor w. inch connectors
	DLV5.7CN compressor, 115 V AC	102H4604	compressor w. inch connectors
	DLV5.7CN compressor, 230 V AC	102H3698	compressor w. metric connectors
		102H3497	compressor w. inch connectors
	Bolt joint for one compressor	118-1917	single pack for one compressor
	Bolt joint in quantities	118-1918	industrial pack in any quantity
	Snap-on in quantities	118-1919	industrial pack in any quantity
	Cover	103N0492	for compressor
	Cable Relief	103N1010	for compressor
	Motor Cable	105B4477	900 mm / 35.43 in. cable length
Lab tool	Tool4Cool® LabEdition (free of charge)	https://www.secop.com/solutions/application-show/variable-speed-drive-software-tool4cool	
	Tool4Cool® Gateway	105N9501	USB to single wire converter
Literature	Compressor data sheet	https://selector.secop.com/data-sheet-search	
	°CCD® interface description	on request	
	Tool4Cool® Operating Instructions	https://www.secop.com/solutions/application-show/variable-speed-drive-software-tool4cool	


DLV5.7CN
SECOP
4604


DLV5.7CN
SECOP
R290
4604
SECOP
DLV5.7CN
THERMALLY PROTECTED

NOTES

DLV COMPRESSORS WITH INTELLIGENT CONTROLLERS

The new variable speed DLV propane compressors provide perfect cooling efficiency and easy integration while ensuring considerable energy savings.
It is the right choice if you are looking for a green solution using the environmentally friendly refrigerant propane (R290) with a low global warming potential (GWP 3).
The new °CCD® controller features a high IP54 protection class and a common interface to case controllers from all major suppliers and uses speed control through Adaptive Energy Optimization (AEO), or frequency signal or serial communication.
Only the variable speed design can obtain energy savings of up to 40% when compared to fixed speed compressors in on/off operation mode.
The controller also provides a high starting torque and can start against a differential pressure.
The DLV noise level is up to 10 dBA lower than the level of comparable fixed speed compressors.

OUR JOURNEY SO FAR

1956
Production facility and headquarters in Flensburg, Germany founded.

1958
Start of production for PW compressors.

1970
Introduction of SC compressors.
The birth of a standard-setting platform in the light commercial market.

1972
Introduction of FR compressors.

1977
Introduction TL and BD compressors.

1990
Introduction of NL compressors.

1992
Introduction of PL compressors.

1993
Start of production with natural refrigerant R600a (isobutane).
Production facility in Crnomelj, Slovenia founded.

1999
Start of production with natural refrigerant R290 (propane).

2002
Production facility in Zlate Moravce, Slovakia founded.

2005
Introduction of GS compressors.

2008
Production facility in Wuqing, China founded.

2010
Introduction SLV-CNK.2 and SLV-CLK.2 variable-speed compressors.
Introduction BD1.4F Micro DC compressor.
Introduction of DLX and NLU compressors.

2013
Introduction of the XV compressor - opening a new chapter in refrigeration history.
Secop acquires ACC Fürstenfeld, Austria.

2015
New generation of energy-efficient propane compressors.
New variable-speed platforms for household and light commercial applications.

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