

BD50F

Direct Current Compressor

R134a, 12-24V DC & 100-240V AC 50/60Hz



General

Code number (without electronic units)	101Z0203
Electronic unit - standard	101N0210, 30 pcs: 101N0211
Electronic unit 12-24V DC - with metal shielding	101N0220, 30 pcs: 101N0221
Electronic unit 12-24V DC - high start performance	101N0230, 30 pcs: 101N0231
Electronic unit 12-24V DC - AEO & metal shielding	101N0320, 30 pcs: 101N0321
Electronic unit 12-24V DC & 100-240V AC 50/60Hz	101N0500, 36 pcs: 101N0501
Approved compressor - electronic unit combinations	refer to <i>Instructions</i> for 101N0xxx
Additional approvals	e4, C-Tick
Compressors on pallet	150

Application

Application	LBP/MBP/HBP
Evaporating temperature °F	-20 to 50
Voltage range (DC & AC)	12-24V DC & 100-240V AC 50/60Hz
Max. condensing temperature continuous (short) °F	140 (158)
Max. winding temperature continuous (short) °F	257 (275)

Cooling requirements

Application	LBP	MBP	HBP
32°C	S	S	F ₁
38°C	S	S	F ₁
43°C	S	S	F ₁

Remarks on application: Fan cooling F₁ depending on application and speed.

Motor

Motor type	Variable speed
Resistance, all 3 windings (25°C) Ω	1.8

Design

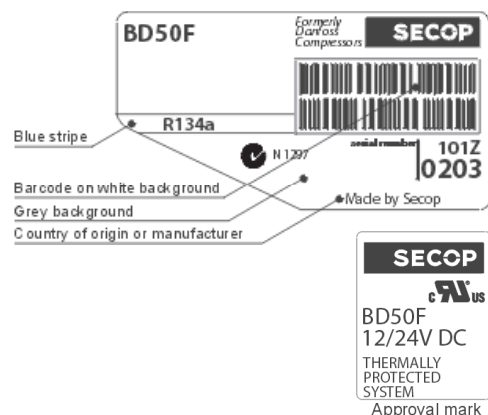
Displacement cu.in.	0.15
Oil quantity (type) fl.oz.	5.1 (polyolester)
Maximum refrigerant charge oz.	10.5
Free gas volume in compressor fl.oz.	29.6
Weight - Compressor/Electronic unit lbs.	9.5/0.55

Standard battery protection settings (refer to 101N0xxx *Instructions* for optional settings)

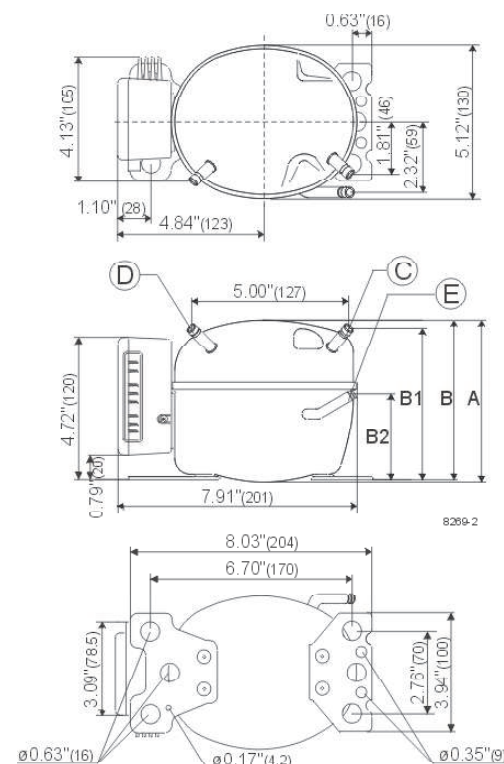
	12V	24V
Voltage		
Cut out VDC	10.4	22.8
Cut in VDC	11.7	24.2

Dimensions

Height	inch	A	5.39
		B	5.32
		B1	5.04
		B2	2.87
Suction connector	location/I.D. mm angle	C	0.252-0.259 41.5°
	material comment		Cu-plated steel Al cap
Process connector	location/I.D. mm angle	D	0.252-0.259 45°
	material comment		Cu-plated steel Al cap
Discharge connector	location/I.D. mm angle	E	0.202-0.205 21°
	material comment		Cu-plated steel Al cap
Remarks: inch connectors			



- S = Static cooling normally sufficient
- O = Oil cooling
- F₁ = Fan cooling 1.5 m/s (compressor compartment temperature equal to ambient temperature)
- F₂ = Fan cooling 3.0 m/s necessary
- SG = Suction gas cooling normally sufficient
- = not applicable in this area



Capacity (EN 12900 Household/CECOMAF) 12V DC, static cooling watt

rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	95	126	142	201	273	308	359	458	571	583	632*	697*
2,500	119	157	176	247	335	375	442	570	723*	740	809*	
3,000	142	189	211	297	402	450	529	682*	863*			
3,500	167	220	245	343	464	518*	612*	790*				

Capacity (ASHRAE LBP) 12V DC, static cooling watt

rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	22.6	30.0	33.6	47.7	64.9	72.6	85.2	109	135	138*	150*	165*
2,500	28.2	37.3	41.7	58.5	79.3	88.9	105	135	171*	175*	191*	
3,000	33.7	44.8	50.1	70.4	95.2	107	125	161*	204*			
3,500	39.8	52.2	58.2	81.3	110	123*	145*	187*				

Power consumption 12V DC, static cooling watt

rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	27.4	32.5	34.6	41.7	49.0	52.6	56.8	65.4	75.1	76.9*	80.4*	86.2*
2,500	34.3	41.4	44.3	54.0	63.4	67.7	73.0	82.8	93.1*	94.9*	98.6*	
3,000	41.4	50.1	53.7	65.2	76.2	81.3	87.4	98.9*	111*			
3,500	49.6	58.8	62.6	75.5	88.7	95.0*	103*	119*				

Current consumption (for 24V applications the following must be halved) A

rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	2.28	2.69	2.87	3.50	4.18	4.49	4.90	5.65	6.45	6.58*	6.87*	7.29*
2,500	2.86	3.41	3.65	4.45	5.26	5.61	6.10	6.94	7.81*	7.94*	8.25*	
3,000	3.52	4.16	4.43	5.37	6.33	6.75	7.31	8.32	9.34*			
3,500	4.20	4.88	5.18	6.24	7.39	7.90*	8.61*	9.91*				

COP (ASHRAE LBP) 12V DC, static cooling W/W

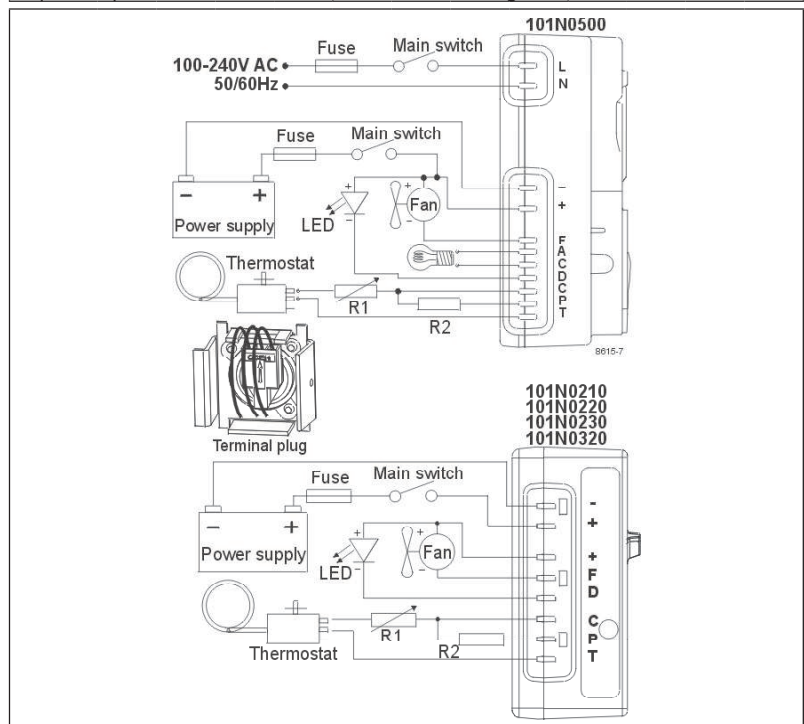
rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	3.49	3.89	4.09	4.81	5.57	5.83	6.32	7.00	7.60	7.63*	7.86*	8.09*
2,500	3.47	3.81	3.97	4.58	5.28	5.52	6.05	6.89	7.76*	7.77*	8.21*	
3,000	3.43	3.77	3.93	4.55	5.27	5.52	6.05	6.89	7.76*			
3,500	3.37	3.74	3.91	4.54	5.23	5.46*	5.94*	6.66*				

COP (EN 12900 Household/CECOMAF) 12V DC, static cooling W/W

rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	0.82	0.92	0.96	1.13	1.31	1.38	1.48	1.64	1.78	1.79*	1.84*	1.90*
2,500	0.82	0.90	0.94	1.08	1.24	1.31	1.42	1.62	1.82	1.89*	1.93*	
3,000	0.81	0.89	0.93	1.07	1.24	1.31	1.42	1.62	1.82*			
3,500	0.80	0.88	0.92	1.07	1.23	1.30*	1.40*	1.56*				

power consumption is limited to 100W with 101N0500 * fan cooling of electronic unit compulsory

Test conditions	EN 12900/CECOMAF	ASHRAE LBP
Condensing temperature	131°F	130°F
Ambient temperature	90°F	90°F
Suction gas temperature	90°F	90°F
Liquid temperature	no subcooling	90°F



Operational errors shown by LED (optional)

Error code	Error type
5	Thermal cut-out of electronic unit (If the refrigeration system has been too heavily loaded, or if the ambient temperature is high, the electronic unit will run too hot).
4	Minimum motor speed error (If the refrigeration system is too heavily loaded, the motor cannot maintain minimum speed at approximately 1,850 rpm).
3	Motor start error (The rotor is blocked or the differential pressure in the refrigeration system is too high (>5 bar)).
2	Fan over-current cut-out (The fan loads the electronic unit with more than 1A _{peak}).
1	Battery protection cut-out (The voltage is outside the cut-out setting).

Compressor speed

Electronit unit	Resistor (R1) [Ω] calculated values	Motor speed [rpm]	Control circuit current [mA]
Code number			
101N0210	0	2,000	5
101N0220	277	2,500	4
101N0230	692	3,000	3
101N0500	1523	3,500	2
101N0320	0	AEO	6
101N0400	173	2,000	5
with AEO	450	2,500	4
	865	3,000	3
	1696	3,500	2

In AEO (Adaptive Energy Optimizing) speed mode the BD compressor will always adapt its speed to the actual cooling demand.

Wire Dimensions DC

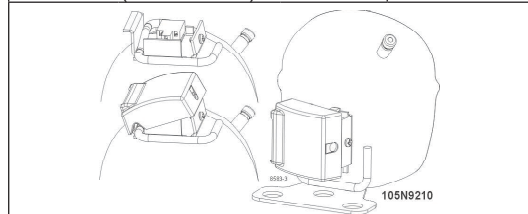
Size	Max. length* 12V operation	Max. length* 24V operation
Cross section [mm²]		
AWG [Gauge]		
2.5	2.5	5
4	4	8
6	6	12
10	10	20
	8	33
		20
		66

*Length between battery and electronic unit

Wire Dimensions AC

Cross section min. 0.75 mm² or AWG 18

Accessories for BD50F	Code number
Bolt joint for one comp.	Ø: 5/8 in. 118-1917
Bolt joint in quantities	Ø: 5/8 in. 118-1918
Snap-on in quantities	Ø: 5/8 in. 118-1919
Remote kit (without cable)	105N9210



AC line cord UL approved			105N9520
AC line cord VDE approved			105N9530
DC usage:	Automobile fuse	12V: 15A	Not deliverable from Secop
	DIN 7258	24V: 7.5 A	
	Main switch	min. 20A	
AC usage:	Fuse, 100-240V	min. 4A	
	Main switch	min. 6A	

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