

# BD50F Direct Current Compressor R134a, 12-24V DC & 100-240V AC 50/60Hz

## General

Code number (without electronic units)	101Z1220
Electronic unit - Standard	101N0210, 30 pcs: 101N0211
Electronic unit 12-24V DC - EMI (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 & EMI	101N0320, 30 pcs: 101N0321
Electronic unit 12-24V DC - AEO & EMI & High Start	101N0330, 30 pcs: 101N0331
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	°C	-30 to 0 (10)	
Voltage range DC	VDC	9.6 - 17 / 21.3 - 31.5	
Voltage range AC	V/Hz	100 - 240 / 50 - 60	
Max. condensing temperature continuous (short)	°C	60 (70)	
Max. winding temperature continuous (short)	°C	125 (135)	

## Cooling requirements

Application	LBP	MBP	HBP
32°C	S	S	F <sub>1</sub>
38°C	S	S	F <sub>1</sub>
43°C	S	S	F <sub>1</sub>

Remarks on application: Fan cooling F<sub>1</sub> depending on application and speed.

## Motor

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

## Design

Displacement	cm <sup>3</sup>	2.50
Oil quantity (type)	cm <sup>3</sup>	150 (polyolester)
Maximum refrigerant charge	g	300
Free gas volume in compressor	cm <sup>3</sup>	870
Weight - Compressor/Electronic unit	kg	4.3 / 0.27 (Standard)

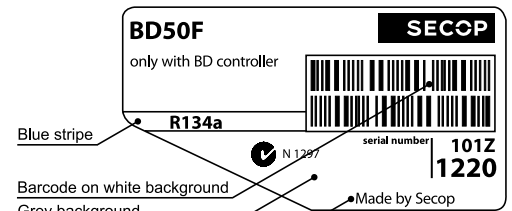
## Standard battery protection settings (refer to 101N0xxx *Instructions* for optional settings)

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

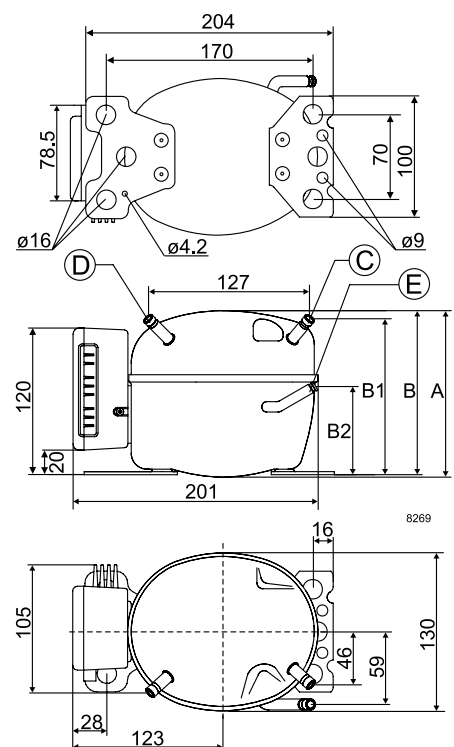
## Dimensions

Height	mm	A	137
		B	135
		B1	128
		B2	73
Suction connector	location/I.D. mm   angle	C	6.2   40°
	material   comment		Cu-plated steel   Al cap
Process connector	location/I.D. mm   angle	D	6.2   45°
	material   comment		Cu-plated steel   Al cap
Discharge connector	location/I.D. mm   angle	E	5.0   21°
	material   comment		Cu-plated steel   Al cap
Connector tolerance	I.D. mm		±0.09, on 5.0 +0.12/+0.20

Remarks:



- S = Static cooling normally sufficient
- O = Oil cooling
- F<sub>1</sub> = Fan cooling 1.5 m/s  
(compressor compartment temperature equal to ambient temperature)
- F<sub>2</sub> = 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 \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	20.8	30.0	33.6	41.6	55.9	72.6	91.9	114	138*	150*	165*	
2,500	25.9	37.3	41.8	51.4	68.4	88.9	113	142*	175*	191*		
3,000	30.9	44.8	50.2	61.7	82.2	107	136*	169*				
3,500	36.7	52.2	58.3	71.4	94.9	123*	157*					

Capacity (ASHRAE LBP)		12V DC, static cooling										watt
rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	25.6	37.0	41.5	51.4	69.0	89.8	114	141	171*	186*	205*	
2,500	31.9	46.0	51.5	63.4	84.5	110	140	176*	217*	237*		
3,000	38.1	55.3	61.9	76.2	101	132	168*	210*				
3,500	45.2	64.4	71.9	88.2	117	152*	194*					

Power consumption		12V DC, static cooling										watt
rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	26.0	32.7	34.9	39.2	45.8	52.6	60.0	68.0	76.9*	81.2*	87.0*	
2,500	32.2	41.4	44.5	50.3	59.0	67.7	76.4	85.4*	94.9*	99.2*		
3,000	38.9	50.3	54.0	61.0	71.2	81.3	91.5*	102*				
3,500	47.0	59.0	63.0	70.7	82.6	95.0*	108*					

Power consumption is limited to 100W with electronic unit 101N0500.

Current consumption (for 24V applications the following must be halved)		12V DC, static cooling										watt
rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	2.16	2.69	2.88	3.26	3.85	4.49	5.15	5.85	6.58*	6.91*	7.35*	
2,500	2.69	3.40	3.65	4.12	4.86	5.61	6.37	7.15*	7.94*	8.29*		
3,000	3.33	4.16	4.44	5.00	5.87	6.75	7.65*	8.57*				
3,500	4.02	4.89	5.20	5.83	6.83	7.90*	9.03*					

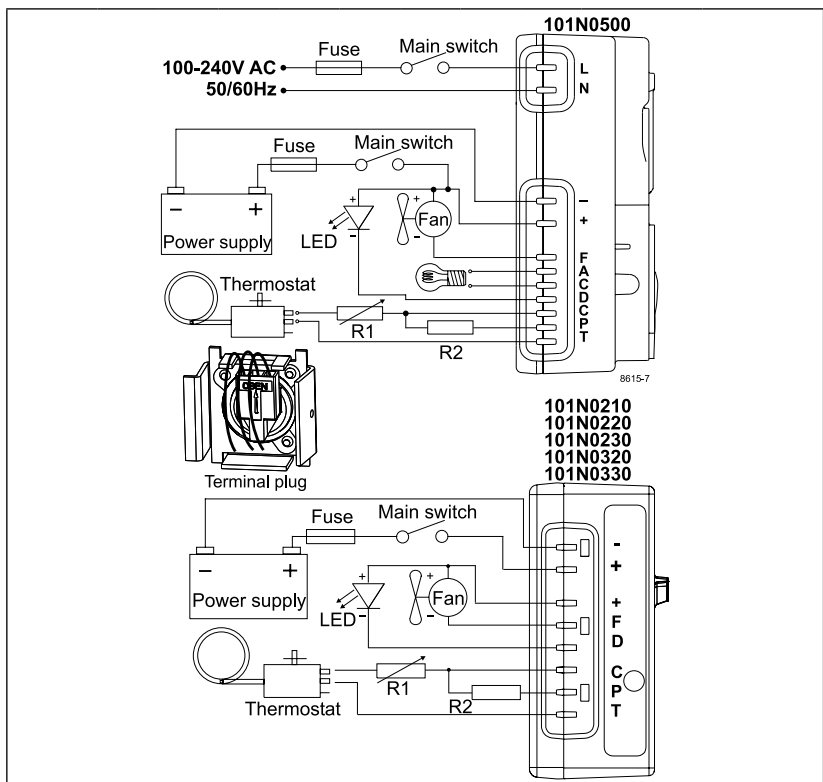
COP (EN 12900 Household/CECOMAF)		12V DC, static cooling										W/W
rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	0.80	0.92	0.96	1.06	1.22	1.38	1.53	1.67	1.79*	1.84*	1.90*	
2,500	0.80	0.90	0.94	1.02	1.16	1.31	1.48	1.66*	1.84*	1.92*		
3,000	0.79	0.89	0.93	1.01	1.15	1.31	1.48*	1.66*				
3,500	0.78	0.88	0.93	1.01	1.15	1.30*	1.45*					

COP (ASHRAE LBP)		12V DC, static cooling										W/W
rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	0.99	1.13	1.19	1.31	1.51	1.71	1.90	2.07	2.23*	2.29*	2.36*	
2,500	0.99	1.11	1.16	1.26	1.43	1.62	1.83	2.05*	2.29*	2.39*		
3,000	0.98	1.10	1.15	1.25	1.43	1.62	1.83*	2.05*				
3,500	0.96	1.09	1.14	1.25	1.42	1.60*	1.79*					

power consumption is limited to 100W with 101N0500

\* fan cooling of electronic unit compulsory

Test conditions	EN 12900/CECOMAF	ASHRAE LBP
Condensing temperature	55°C	54.4°C
Ambient temperature	32°C	32°C
Suction gas temperature	32°C	32°C
Liquid temperature	no subcooling	32°C



### Operational errors shown by LED (optional)

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

### A Compressor speed

Electronit unit	Resistor (R1) [Ω]	Motor speed [rpm]	Control circuit current [mA]
Code number	calculated values		
101N0210	0	2,000	5
101N0220	277	2,500	4
101N0230	692	3,000	3
101N0500	1523	3,500	2
101N0320 with AEO	0	AEO	6
	173	2,000	5
101N0330 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

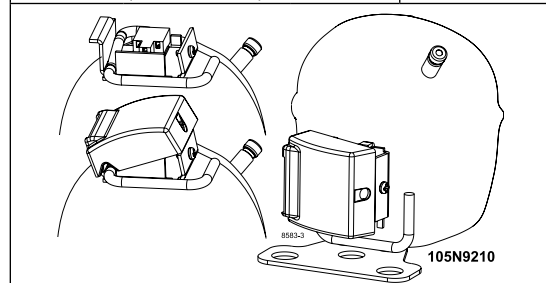
Cross section [mm²]	Size AWG	Max. length* 12V operation		Max. length* 24V operation	
		[m]	[ft.]	[m]	[ft.]
2.5	12	2.5	8	5	16
4	12	4	13	8	26
6	10	6	20	12	39
10	8	10	33	20	66

\*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: 16 mm 118-1917
Bolt joint in quantities	Ø: 16 mm 118-1918
Snap-on in quantities	Ø: 16 mm 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 DIN 7258 24V: 7.5 A
AC usage:	Main switch min. 20A Fuse, 100-240V min. 4A Main switch min. 6A

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