

Datasheets

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

**General**

Code number (without electronic units)	101Z1220
Electronic unit 12/24V DC - Standard	101N0212, 30 pcs: 101N0213
Electronic unit 12/24V DC - AEO	101N0340, 30 pcs: 101N0341
Electronic unit 12/24V DC & 100-240V AC 50/60Hz	101N0510, 28 pcs: 101N0511
Electronic unit 12/24V DC - Automotive	101N0650, 30 pcs: 101N0651
Compressors on pallet	150

**Approvals**

-
UL
UL / VDE
UL

**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**

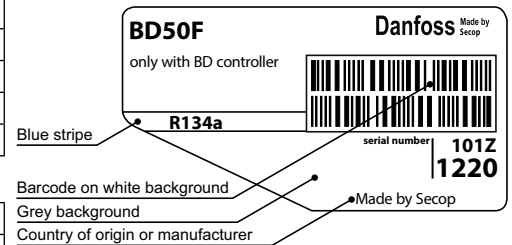
Displacement cm <sup>3</sup>	2.50
Oil quantity (type) cm <sup>3</sup>	150 (polyolester)
Maximum refrigerant charge g	300
Free gas volume in compressor cm <sup>3</sup>	870
Weight - Compressor/Electronic unit kg	4.3 / 0.19 (Standard)

**Standard battery protection settings** (refer to electronic unit *Instructions* for optional settings)

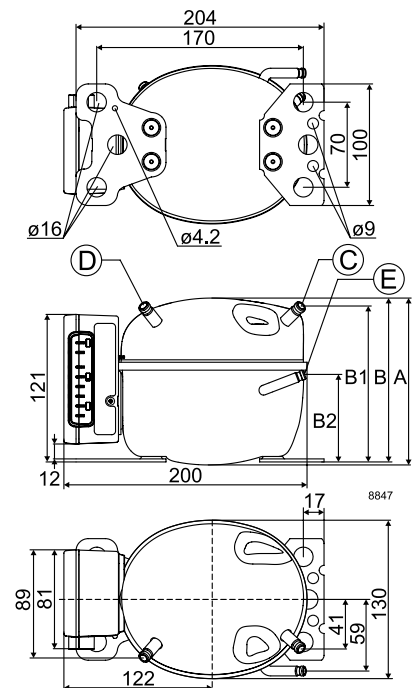
Voltage	12V	24V
Cut out VDC	10.4	22.8
Cut in VDC	11.7	24.2

**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	20.9	30.1	33.8	41.8	56.1	72.8	92.1	114	138*	150*	165*	
2,500	26.1	37.0	41.4	50.9	68.0	88.7	113	142*	175*	191*		
3,000	31.2	44.8	50.2	61.8	82.4	107	136*	169*				
3,500	37.0	52.0	58.0	71.1	94.7	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	25.9	37.2	41.8	51.7	69.3	90.0	114	141	171*	185*	205*	
2,500	32.3	45.9	51.3	63.1	84.3	110	140	176*	217*	237*		
3,000	38.5	55.4	62.0	76.4	102	132	168*	210*				
3,500	45.5	64.2	71.6	87.8	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	25.0	31.6	33.8	38.0	44.3	50.8	57.7	65.3	73.8*	77.9*	83.5*	
2,500	30.7	39.5	42.4	48.0	56.5	64.9	73.4	82.0*	90.9*	94.9*		
3,000	37.4	48.1	51.6	58.3	68.3	78.1	87.9*	98.0*				
3,500	45.0	56.8	60.7	68.2	79.5	91.2*	104*					

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

rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	2.07	2.58	2.76	3.12	3.70	4.31	4.94	5.62	6.32*	6.64*	7.05*	
2,500	2.62	3.24	3.47	3.92	4.63	5.38	6.13	6.88*	7.63*	7.95*		
3,000	3.20	3.99	4.27	4.80	5.63	6.48	7.34*	8.23*				
3,500	3.86	4.70	4.99	5.60	6.56	7.58*	8.67*					

**COP (EN 12900 Household/CECOMAF) W/W**

rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	0.84	0.95	1.00	1.10	1.27	1.43	1.60	1.74	1.87*	1.92*	1.97*	
2,500	0.85	0.94	0.98	1.06	1.20	1.37	1.54	1.73*	1.92*	2.01*		
3,000	0.83	0.93	0.97	1.06	1.21	1.37	1.54*	1.72*				
3,500	0.82	0.92	0.96	1.04	1.19	1.35*	1.51*					

**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	1.04	1.19	1.25	1.37	1.58	1.79	1.99	2.18	2.34*	2.40*	2.47*	
2,500	1.05	1.16	1.21	1.32	1.50	1.70	1.93	2.16*	2.41*	2.52*		
3,000	1.03	1.15	1.21	1.32	1.50	1.71	1.93*	2.16*				
3,500	1.01	1.13	1.18	1.29	1.48	1.68*	1.89*					

\* fan cooling of electronic unit compulsory

Test conditions with electronic units	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

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
One Wire/LIN gateway	105N9501
DC usage: Automobile fuse, DIN 7258 12V: 15A   24V: 7.5 A Main switch	min. 20A Not deliverable from Secop
AC usage: Fuse, 100-240V Main switch	min. 6A

**Compressor speed**

Electronit unit	Resistor (R1) [Ω] calculated values	Motor speed [rpm]	Control circuit current [mA]
101N0212 101N0510 101N0650	0	2,000	5
	277	2,500	4
	692	3,000	3
101N0340 with AEO	1523	3,500	2
	0	AEO	6
	173	2,000	5
	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 [Gauge]	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

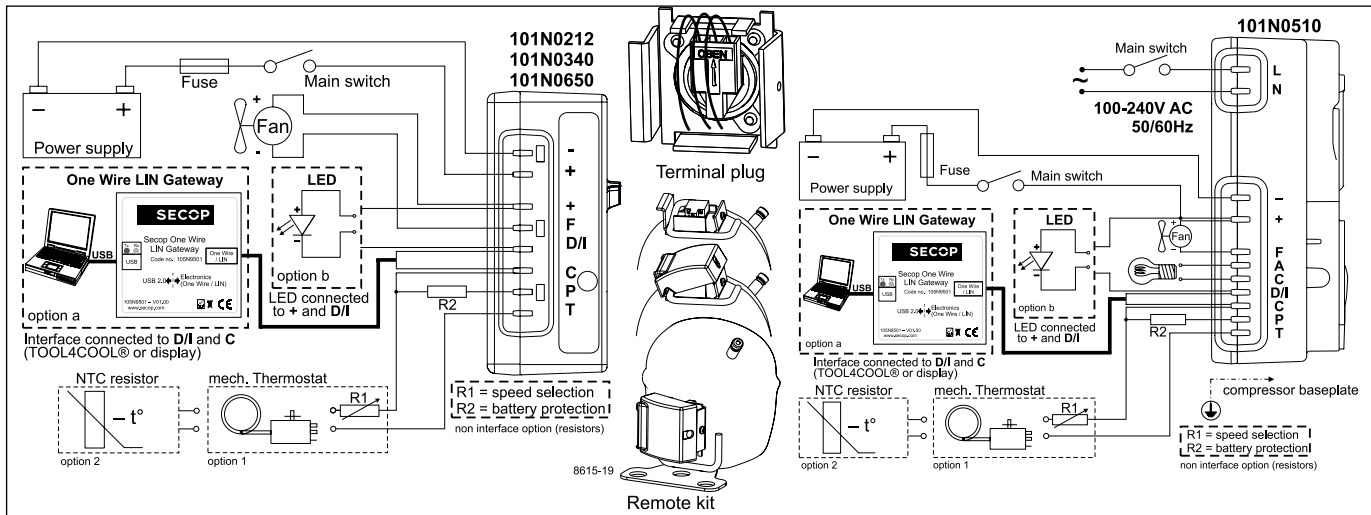
\*Length between battery and electronic unit

**Wire dimensions AC**

Cross section min. 0.75 mm² or AWG 18

**Operational errors**

Error code or LED flashes	Error type
	Can be read out in the software <b>TOOL4COOL®</b>
6	<b>Thermostat failure</b> (If the NTC thermistor is short-circuit or has no connection).
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>Too many start attempts or fan over current</b> (Too many compressor or fan starts in short time or fan current higher than 0.5A <sub>avg</sub> ).
1	<b>Battery protection cut-out</b> (The voltage is outside the cut-out setting).



Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss 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 subsequent changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.