

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	single: 101N0210, 30 pcs: 101N0211
Electronic unit 12-24V DC - with metal shielding	single: 101N0220, 30 pcs: 101N0221
Electronic unit 12-24V DC - high start performance	single: 101N0230, 30 pcs: 101N0231
Electronic unit 12-24V DC - with AEO	single: 101N0300, 30 pcs: 101N0301
Electronic unit 12-24V DC - with AEO & metal shielding	single: 101N0320, 30 pcs: 101N0321
Electronic unit 12-24V DC & 100-240V AC 50/60Hz	single: 101N0500, 36 pcs: 101N0501
Approved compressor - electronic unit combinations	refer to <i>Technical Info</i> DEHC.El.100.C
Additional approvals	e4, C-Tick
Compressors on pallet	150

Application

Application	LBP/MBP/HBP
Evaporating temperature °C	-30 to 0 (10)
Voltage range (DC & AC)	12-24V DC & 100-240V AC 50/60Hz
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 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	cm ³	2.50
Oil quantity (type)	cm ³	150 (polyolester)
Maximum refrigerant charge	g	300
Free gas volume in compressor	cm ³	870
Weight - Compressor/Electronic unit	kg	4.3/0.25

Dimensions

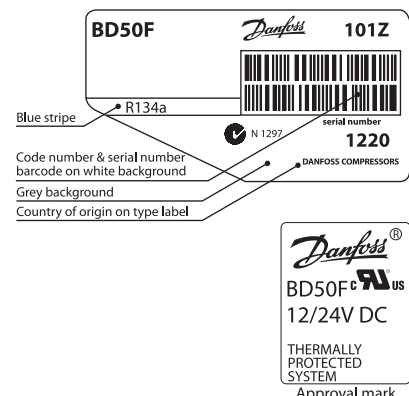
Height	mm	A	137
		B	135
		B1	128
		B2	73
Suction connector	location/I.D. mm angle	C	6.2 41.5°
Process connector	location/I.D. mm angle	D	6.2 45°
Discharge connector	location/I.D. mm angle	E	5.0 21°
Connector tolerance	I.D. mm		±0.09, on 5.0 +0.12/+0.20

Standard battery protection settings (no connection C - P)

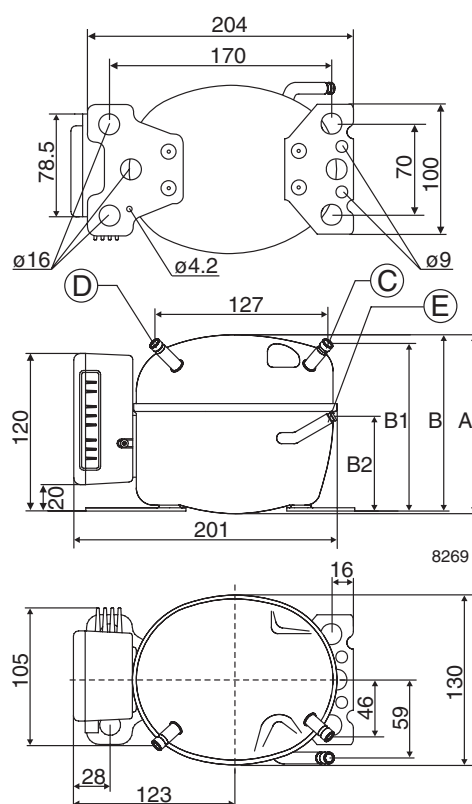
12V cut-out [V]	12V cut-in [V]	24V cut-out [V]	24V cut-in [V]
10.4	11.7	22.8	24.2

Optional battery protections settings

Resistor (R2)	12V cut-out	12V cut-in	12V max.	24V cut-out	24V cut-in	24V max.
[kΩ]	[V]	[V]	Voltage [V]	[V]	[V]	Voltage [V]
0	9.6	10.9	17.0	21.3	22.7	31.5
1.6	9.7	11.0	17.0	21.5	22.9	31.5
2.4	9.9	11.1	17.0	21.8	23.2	31.5
3.6	10.0	11.3	17.0	22.0	23.4	31.5
4.7	10.1	11.4	17.0	22.3	23.7	31.5
6.2	10.2	11.5	17.0	22.5	23.9	31.5
8.2	10.4	11.7	17.0	22.8	24.2	31.5
11	10.5	11.8	17.0	23.0	24.5	31.5
14	10.6	11.9	17.0	23.3	24.7	31.5
18	10.8	12.0	17.0	23.6	25.0	31.5
24	10.9	12.2	17.0	23.8	25.2	31.5
33	11.0	12.3	17.0	24.1	25.5	31.5
47	11.1	12.4	17.0	24.3	25.7	31.5
82	11.3	12.5	17.0	24.6	26.0	31.5
220	9.6	10.9				31.5



- 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)

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)

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

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*					

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

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)

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)

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 electronic unit 101N0500.

* fan cooling of electronic unit compulsory

Operational errors shown by LED (optional)

Number of flashes	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).

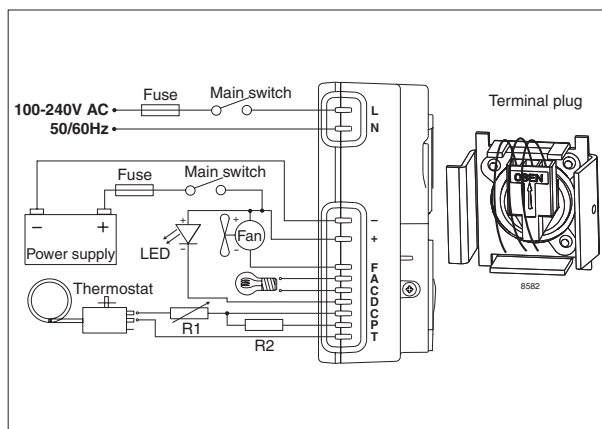
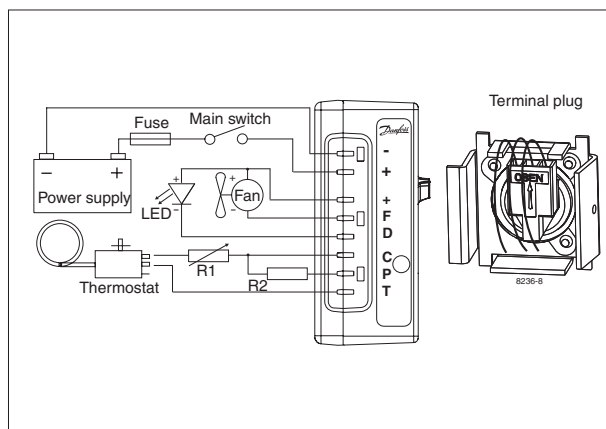
Wire Dimensions DC

Cross section	Size	Max. length* 12V operation		Max. length* 24V operation	
	AWG				
[mm ²]	[Gauge]	[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



Compressor speed

Electronit unit Code number	Resistor (R1) [Ω] <i>calculated values</i>	Motor speed [rpm]	Control circuit current [mA]
101N0210 101N0220 101N0230 101N0500	0	2,000	5
	277	2,500	4
	692	3,000	3
	1523	3,500	2
101N0300 101N0320 with AEO	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.

Test conditions	EN 12900/CECOMAF	ASHRAE
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 compressor	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/VDE approved)		105N9520/30
DC usage: Std. automobile fuse 12V: 15A / 24V: 7.5A Main switch: rated to min. 20A		Not deliverable from Danfoss
AC usage: Fuse 100-240V: 4A / Main switch: min. 6A		