



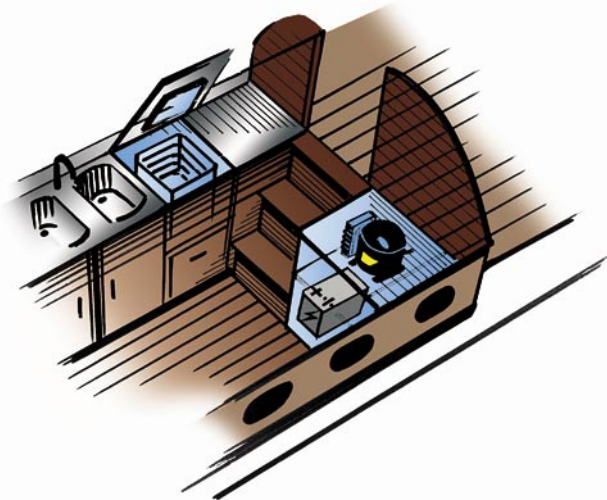
## Application Note

### Cooling in maritime appliances

The **BD compressor** series is specially designed for refrigeration in boat applications. A sturdy design enables it to resist vibrations, hard impacts and heavy sea.

It is available in two different types, BD 35F and 50F using R134a as refrigerant.

BD 35F and 50F are applicable for 12 and 24 V DC.



The compressors cover a capacity range from 20 to 180 W. Low, medium and high back pressure applications. (See specification sheet on the next page).

Refrigerator sizes up to 160 liters and freezers up to 90 liters.

It is possible to adjust the capacity of the compressor manually.

A special version of the electronic unit will adapt the capacity of the compressor automatically to the actual load on the refrigeration system. The algorithm will adjust the speed of the compressor so that a running time of approximately 30 minutes is achieved. This is the most energy efficient way to operate the compressor.

Furthermore it will protect the compressor from short cycling in low load situations and it will also reduce the number of starts and thereby protect the battery from being drained.

An optional LED (diode) will flash and the following faults will be indicated by means of a flash pattern.

- Low battery voltage
- Fan overload
- Minimum speed exceeded
- Thermal cut out
- Motor start error

The electronic unit provides a protection against electro magnetic interference (EMI) which will allow communication and navigation equipment to work unproblematically without any disturbance.



#### Features

- High efficiency/Low current consumption/high COP
- Compact design
- Low noise
- Variable capacity (manually adjustable or automatic)
- Adaptive energy optimization (AEO)
- Dedicated products for US market available

Also available for solar power. For further information please contact Danfoss.

## Technical data BD35F

### General

Compressor	BD35F	BD50F
Code number: Comp. without electronic unit	101Z0200	101Z1220
Code number: Electronic unit 12-24 V DC, single packing	101N0220	
Code number: Electronic unit 12-24 V DC, industrial packing, 30 pcs.	101N0221	

### Application

Application	LBP/MBP/(HBP)	
Evaporating temperature range °C	-30 to 0 (10)	
Voltage	12 - 24 V DC	
Max. voltage	31.5 V	
Max. machine compartment temperature °C	55	
Comp. cooling at ambient temp. 43°C	S or F <sub>1</sub> *	

\* depending on application

### Design

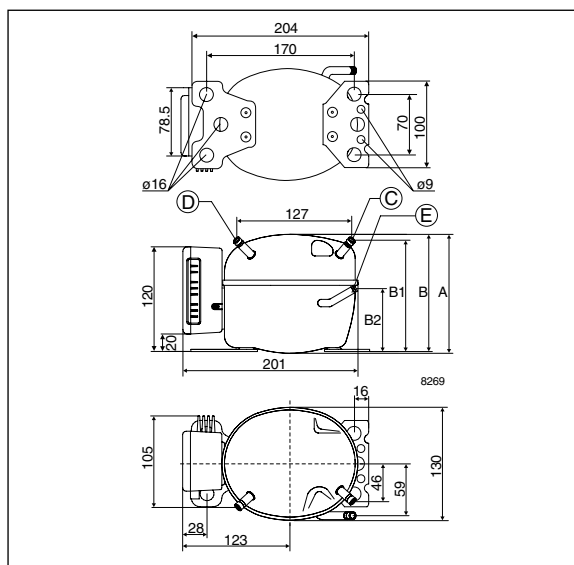
Displacement	cm <sup>3</sup>	2.00	2.50
Oil quantity	cm <sup>3</sup>	150	
Maximum refrigerant charge	g	300	
Free gas vol. in compressor housing	cm <sup>3</sup>	870	
Weight: Compressor/Electronic unit	kg	4.3/0.25	

### Motor

Motor type	Variable Speed		
Resistance, all 3 windings (25°C)	Ω	2.3	2.0
Approvals	E4 72/245 95/54 0277 00		

### Dimensions

<b>Height</b>	<b>mm</b>	A	137
		B	135
		B1	128
		B2	73
Suction connector	location/I.D. mm	C	6.2±0.09
Process connector	location/I.D. mm	D	6.2±0.09
Discharge connector	location/I.D. mm	E	5.0 +0.12/+0.20
Compressors on a pallet	pcs.	120	



## Performance data BD35F

### Capacity (EN 12900/CECOMAF)

watt

rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	10
2,000	15.8	23.9	26.9	33.1	43.8	56.6	71.7	89.9	111	136
2,500	20.2	29.9	33.5	41.2	54.6	70.7	89.7	112	139	
3,000	22.5	32.4	36.5	45.4	61.8	81.7	105	133		
3,500	26.2	35.9	40.4	50.5	69.8	93.6	122			

### Power consumption

watt

rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	10
2,000	17.6	23.4	25.3	28.7	33.6	38.3	43.0	48.0	53.4	59.5
2,500	23.3	30.9	33.3	37.8	44.1	50.2	56.2	62.3	68.7	
3,000	29.9	36.0	38.3	43.0	50.7	58.7	66.8	74.8		
3,500	36.0	42.8	45.4	50.8	59.5	68.9	78.5			

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

A

rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	10
2,000	1.5	2.0	2.1	2.4	2.8	3.2	3.6	4.0	4.5	5.0
2,500	1.9	2.6	2.8	3.2	3.7	4.2	4.7	5.2	5.8	
3,000	2.5	3.0	3.2	3.6	4.2	4.9	5.6	6.2		
3,500	3.0	3.6	3.8	4.3	5.0	5.7	6.5			

### COP (EN 12900/CECOMAF)

W/W

rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	10
2,000	0.90	1.02	1.06	1.15	1.31	1.48	1.67	1.87	2.08	2.29
2,500	0.87	0.97	1.01	1.09	1.24	1.41	1.60	1.80	2.02	
3,000	0.75	0.90	0.95	1.06	1.22	1.39	1.58	1.78		
3,500	0.73	0.84	0.89	1.00	1.17	1.36	1.55			

## Performance data BD50F

### Capacity (EN 12900/CECOMAF)

watt

rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	10
2,000	20.1	31.0	34.9	42.8	56.3	42.2	91.6	115	144*	178*
2,500	27.0	39.0	43.4	52.7	68.9	88.9	113	144*	181*	
3,000	31.0	45.4	50.6	61.5	80.7	104	134*	171*		
3,500	38.1	53.2	59.1	71.9	95.0	124*	159*			

### Power consumption

watt

rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	10
2,000	25.1	31.8	34.0	38.2	44.7	51.3	58.3	65.8	74.2*	83.5*
2,500	34.1	40.5	42.9	47.8	55.8	64.7	74.3	84.8*	96.1*	
3,000	39.9	49.2	52.2	57.8	66.5	76.4	88.4*	104*		
3,500	50.2	59.3	62.5	69.0	80.2	93.4*	109*			

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

A

rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	10
2,000	2.2	2.6	2.8	3.1	3.8	4.4	5.1	5.8	6.4*	6.9*
2,500	2.9	3.4	3.6	4.0	4.7	5.4	6.2	7.0*	7.8*	
3,000	3.5	4.2	4.4	4.9	5.6	6.5	7.4*	8.5*		
3,500	4.2	4.9	5.2	5.8	6.7	7.8*	9.0*			

### COP (EN 12900/CECOMAF)

W/W

rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	10
2,000	0.80	0.98	1.03	1.12	1.26	1.41	1.57	1.75	1.94*	2.13*
2,500	0.79	0.96	1.01	1.10	1.24	1.37	1.53	1.70*	1.88*	
3,000	0.78	0.92	0.97	1.06	1.21	1.37	1.51*	1.65*		
3,500	0.76	0.90	0.95	1.04	1.19	1.32*	1.45*			

\* Fan cooling of electronic unit compulsory

### Test conditions

Condensing temperature  
Ambient and suction gas temp.  
Liquid temperature  
Static cooling, 12 V DC  
1 Watt = 0.86 kcal/h

<b>EN 12900/CECOMAF</b>	<b>ASHRAE</b>
55°C	55°C
32°C	32°C
55°C	32°C

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