

## Single Pack BD50F 12/24V DC PM

Single pack code number: **195B4773**

Position	Title	Code	Amount
1	Compressor BD50F	101Z0203	1
2	Electronic unit 12/24V DC - Standard	101N0243	1
3	Bolt joint for one compressor   M6   ø16mm	118-1917	1

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## BD50F Direct Current Compressor R134a, R1234yf, 12/24V DC & 100-240V AC 50/60Hz



### General

Code number (without electronic units)	101Z0203
Electronic unit 12/24V DC - Standard	101N0242, 30 pcs: 101N0243
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	101N0680, 30 pcs: 101N0681
Compressors on pallet	150

### Approvals

R134a	R134a/R1234yf
–	–
VDE	UL / CB
VDE	UL / CB
–	UL / CB



### Application

Application	LBP/MBP/HBP
Evaporating temperature	°F -20 to 50
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)	°F 140 (158)
Max. winding temperature continuous (short)	°F 257 (275)

### 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	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 / 0.42 (Standard)

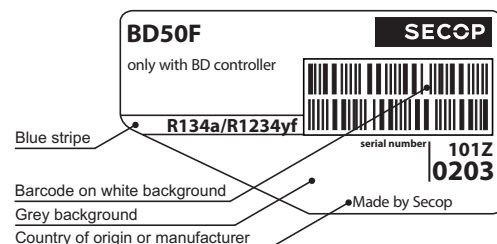
### Standard battery protection settings (refer to electronic unit *Instructions* for optional settings)

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

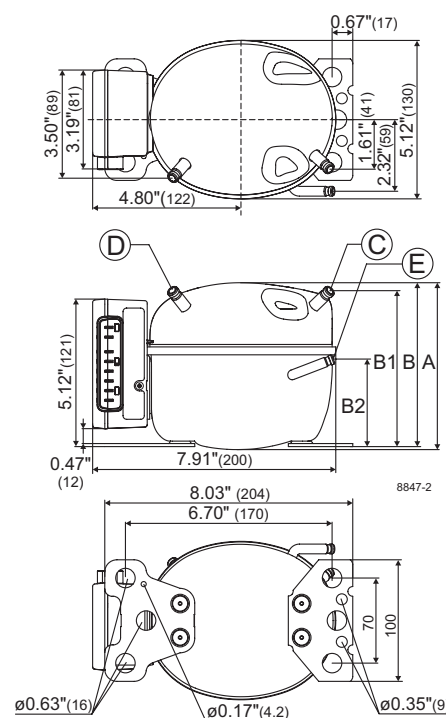
### Dimensions

Height	inch	A	5.39
		B	5.32
		B1	5.04
		B2	2.87
Suction connector	location/l.D. inch   angle	C	0.252-0259   40°
	material   comment		Cu-plated steel   Al cap
Process connector	location/l.D. inch   angle	D	0.252-0259   45°
	material   comment		Cu-plated steel   Al cap
Discharge connector	location/l.D. inch   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
- 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



# Performance Data with Refrigerant R134a

Capacity (ASHRAE LBP)		12V DC, static cooling										BTU/h
rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	96	127	142	202	274	307	360	459	572	584*	633*	698*
2,500	119	156	174	245	334	375	442	572	724	741*	810*	
3,000	143	189	211	297	403	452	531	682				
3,500	168	219	244	342	464	520*	613*	792*				

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	22.8	30.1	33.7	47.8	65.1	72.8	85.4	109	135	138*	150*	165*
2,500	28.2	37.0	41.3	58.1	79.1	88.7	105	135	171	175*	191*	
3,000	33.9	44.8	50.1	70.5	95.6	107	126	161				
3,500	40.0	52.0	57.9	81.0	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	26.4	31.4	33.5	40.5	47.4	50.3	54.8	63.0	72.2	73.2*	77.3*	82.8*
2,500	32.8	39.5	42.3	51.7	60.9	64.6	70.2	79.6	89.3	90.3*	94.4*	
3,000	39.9	48.0	51.4	62.5	73.2	77.5	84.0	95.0				
3,500	47.7	56.7	60.5	72.9	85.4	90.6*	98.7*	113*				

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	2.19	2.58	2.76	3.37	4.01	4.29	4.70	5.43	6.20	6.28*	6.60*	7.01*
2,500	2.76	3.25	3.47	4.23	5.03	5.36	5.86	6.69	7.51	7.59*	7.91*	
3,000	3.38	3.99	4.26	5.16	6.08	6.46	7.03	7.99				
3,500	4.04	4.69	4.98	6.00	7.09	7.55*	8.27*	9.51*				

EER (ASHRAE LBP)		12V DC, static cooling										BTU/W
rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	3.64	4.04	4.24	4.98	5.78	6.10	6.57	7.29	7.92	7.98*	8.19*	8.43*
2,500	3.64	3.96	4.12	4.75	5.49	5.80	6.30	7.18	8.11	8.20*	8.58*	
3,000	3.58	3.93	4.10	4.76	5.51	5.82	6.32	7.18				
3,500	3.53	3.86	4.03	4.69	5.43	5.74*	6.21*	6.99*				

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	0.86	0.95	1.00	1.17	1.36	1.43	1.54	1.71	1.86	1.87*	1.92*	1.97*
2,500	0.86	0.94	0.97	1.12	1.29	1.37	1.48	1.69	1.90	1.92*	2.01*	
3,000	0.85	0.93	0.97	1.12	1.30	1.37	1.49	1.68				
3,500	0.84	0.92	0.95	1.11	1.28	1.35*	1.46*	1.64*				

\* fan cooling of electronic unit compulsory

Test conditions with electronic units		EN 12900/CECOMAF	ASHRAE LBP
Condensing temperature	101N0242 101N0680	131°F	130°F
Ambient temperature		90°F	90°F
Suction gas temperature		90°F	90°F
Liquid temperature		no subcooling	90°F

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
Secop Gateway		105N9518
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]	Motor speed
Code number	calculated values	[rpm]
101N0242 101N0510 101N0680	0	2,000
	277	2,500
	692	3,000
101N0340 with AEO	1523	3,500
	0	AEO
	173	2,000
	450	2,500
	865	3,000
	1696	3,500

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	Size	Max. length* 12V operation		Max. length* 24V operation	
		[mm²]	[Gauge]	[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

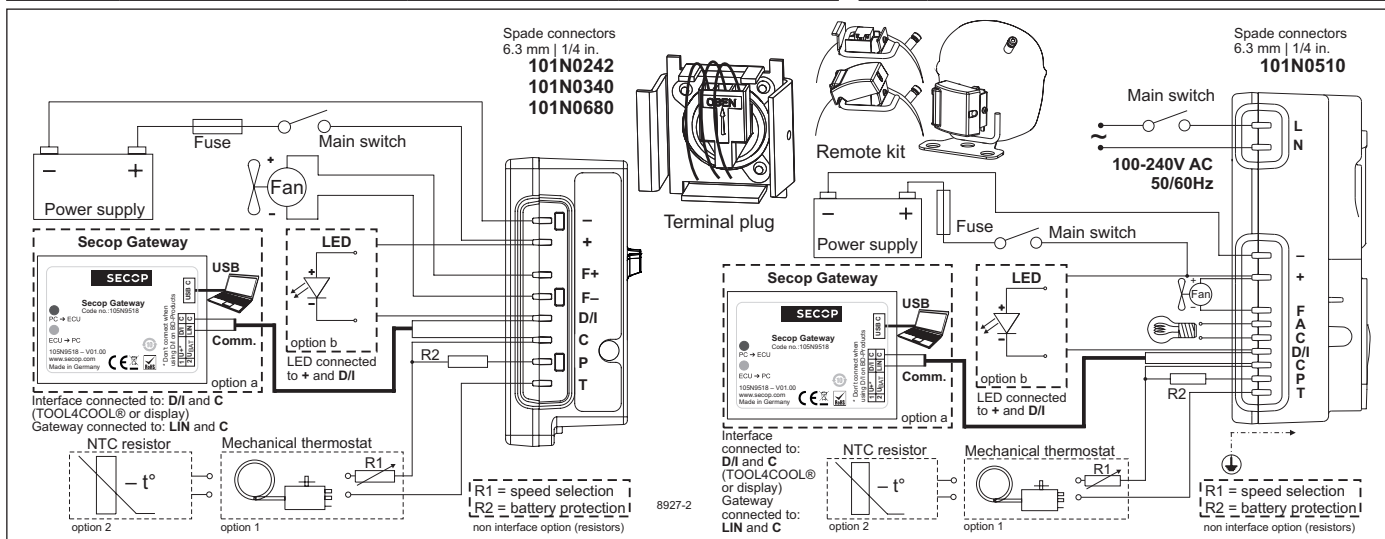
\*Length between battery and electronic unit

## 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).



# Performance Data with Refrigerant R1234yf

Capacity (ASHRAE LBP)		12V DC, static cooling										BTU/h
rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	110	142	158	216	286	317	368	462	568	579*	625*	686*
2,500	137	174	193	262	348	388	452	576	720	736*	801*	
3,000	164	211	233	318	421	468	544	688				
3,500	199	253	279	378	498	553*	641*	809*				

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	25.1	32.3	35.8	49.0	65.0	72.1	83.5	105	129	131*	142*	155*
2,500	31.0	39.5	43.7	59.5	79.0	87.9	102	130	163	166*	181*	
3,000	37.4	47.9	53.1	72.2	95.5	106	123	156				
3,500	45.2	57.5	63.6	86.0	113	125*	145*	183*				

Power consumption		12V DC, static cooling										watt
rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	26.4	31.4	33.5	40.5	47.4	50.3	54.8	63.0	72.2	73.2*	77.3*	82.8*
2,500	32.8	39.5	42.3	51.7	60.9	64.6	70.2	79.6	89.3	90.3*	94.4*	
3,000	39.9	48.0	51.4	62.5	73.2	77.5	84.0	95.0				
3,500	47.7	56.7	60.5	72.9	85.4	90.6*	98.7*	113*				

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	2.19	2.58	2.76	3.37	4.01	4.29	4.70	5.43	6.20	6.28*	6.60*	7.01*
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3,000	3.38	3.99	4.26	5.16	6.08	6.46	7.03	7.99				
3,500	4.04	4.69	4.98	6.00	7.09	7.55*	8.27*	9.51*				

EER (ASHRAE LBP)		12V DC, static cooling										BTU/W
rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	3.94	4.33	4.52	5.17	5.85	6.12	6.54	7.22	7.88	7.95*	8.21*	8.52*
2,500	3.88	4.15	4.29	4.84	5.50	5.79	6.27	7.13	8.10	8.20*	8.62*	
3,000	3.86	4.15	4.30	4.87	5.54	5.83	6.29	7.13				
3,500	3.86	4.22	4.39	4.99	5.64	5.90*	6.31*	7.00*				

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	0.89	0.98	1.02	1.16	1.32	1.38	1.47	1.62	1.77	1.78*	1.84*	1.90*
2,500	0.88	0.94	0.97	1.09	1.24	1.31	1.41	1.60	1.81	1.84*	1.93*	
3,000	0.88	0.94	0.98	1.10	1.25	1.31	1.41	1.60				
3,500	0.88	0.96	1.00	1.13	1.27	1.33*	1.42*	1.57*				

\* fan cooling of electronic unit compulsory

Test conditions with electronic units		EN 12900/CECOMAF	ASHRAE LBP
Condensing temperature	101N0242 101N0510 101N0680	131°F	130°F
Ambient temperature		90°F	90°F
Suction gas temperature		90°F	90°F
Liquid temperature		no subcooling	90°F

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
Secop Gateway		105N9518
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]	Motor speed
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	0	AEO
	173	2,000
	450	2,500
	865	3,000
	1696	3,500

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

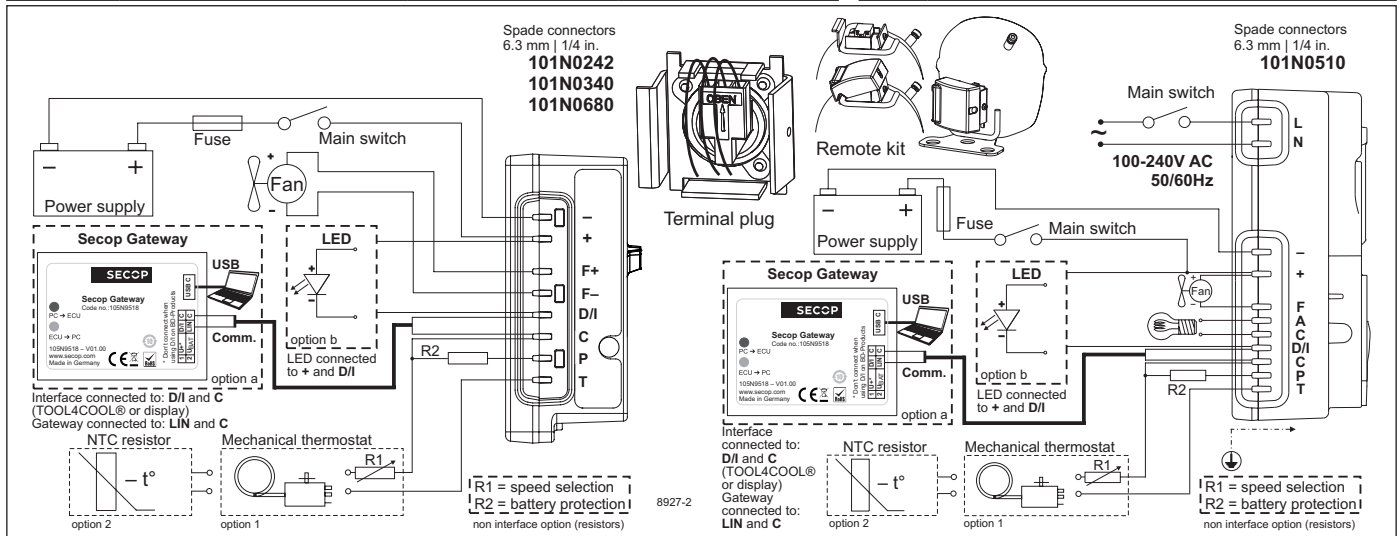
\*Length between battery and electronic unit

## 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).



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Instructions for Electronic Units  
are available for download on  
[www.secop.com](http://www.secop.com)



# BD Compressors



## Service/Repair



### BD Nano

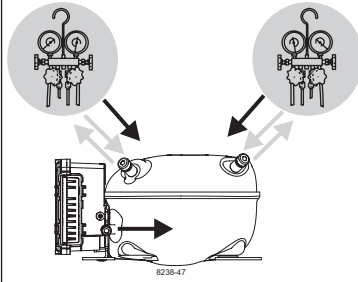


**! max. 150°C/302°F !**  
at socket

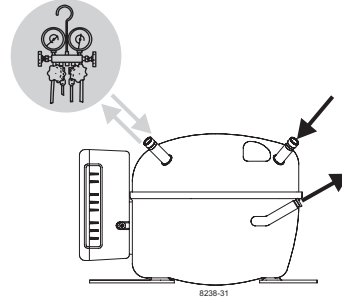
brazing solder: silver with flux

Do not heat up the bottom of the discharge connector directly.  
Do not braise longer than 10 seconds and wait for 5 minutes for the next soldering attempt (Product Bulletin DES.N.101.M1).

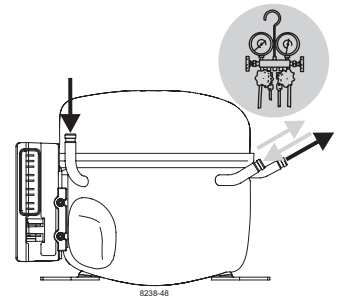
### BD Micro



### BD P-Housing



### BD T-Housing



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