

## Single Pack BD50F 12/24V DC PM

Single pack code number: **195B4554**

Position	Title	Code	Amount
1	Compressor BD50F	101Z1220	1
2	Bolt joint for one compressor   M6   ø16mm	118-1917	1
3	Electronic unit 12/24V DC - Standard	101N0213	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)	101Z1220
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 °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)



Blue stripe  
Barcode on white background  
Grey background  
Country of origin or manufacturer

### 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.

- 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

### 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)

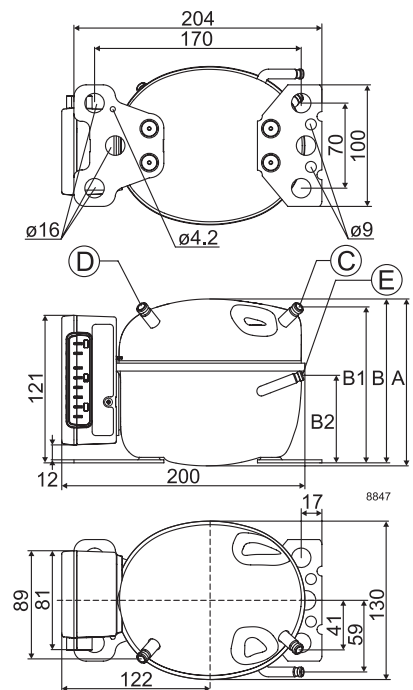
### Standard battery protection settings (refer to electronic unit Instructions for optional settings)

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:



# Performance Data with Refrigerant R134a

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)												
12V DC, static cooling											A	
rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	2.1	2.6	2.8	3.1	3.7	4.3	4.9	5.6	6.3*	6.6*	7.1*	
2,500	2.6	3.2	3.5	3.9	4.6	5.4	6.1	6.9*	7.6*	8.0*		
3,000	3.2	4.0	4.3	4.8	5.6	6.5	7.3*	8.2*				
3,500	3.9	4.7	5.0	5.6	6.6	7.6*	8.7*					

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	0.84	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	101N0242 101N0510 101N0680	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
Secop Gateway		105N9518
DC usage:	Automobile fuse, DIN 7258 12V: 15A   24V: 7.5 A Main switch	Not deliverable from Secop
AC usage:	Fuse, 100-240V Main switch	

## 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.]	[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

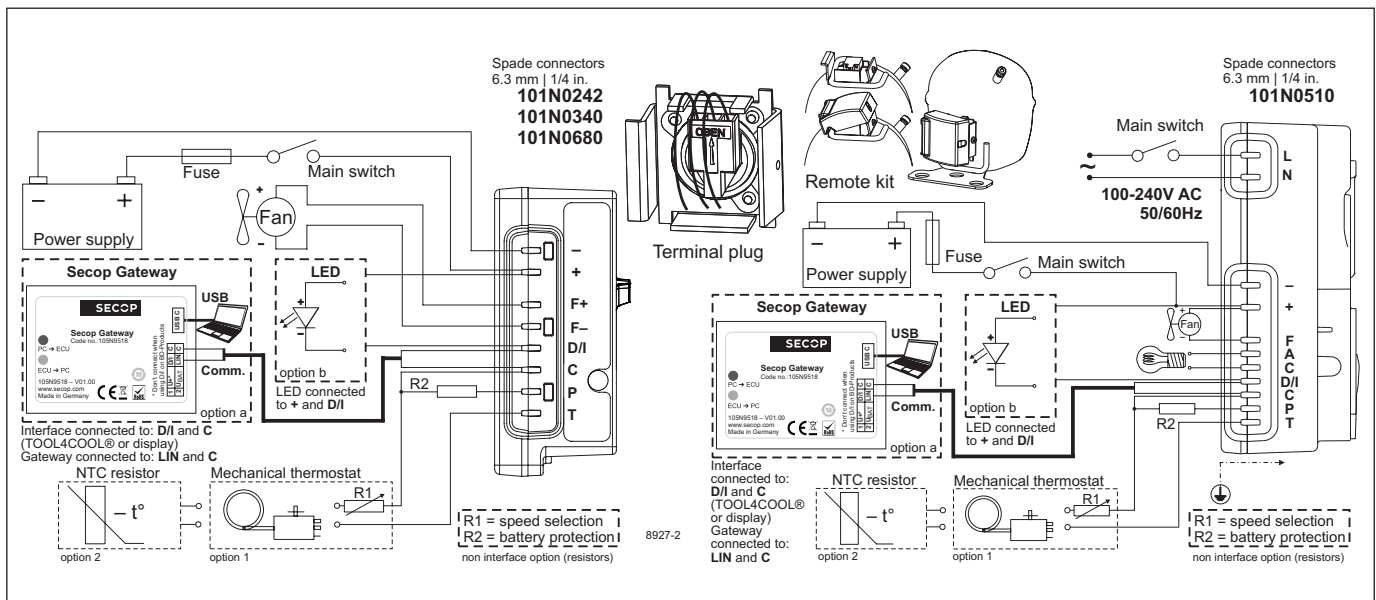
\*Length between battery and electronic unit

## 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 (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	23.4	32.3	35.9	43.5	56.7	72.1	89.7	109	131*	142*	155*	
2,500	28.9	39.6	43.8	52.8	68.8	88.0	110	136*	166*	181*		
3,000	34.7	48.0	53.1	64.1	83.4	106	133*	163*				
3,500	42.1	57.6	63.6	76.5	99.0	126*	156*					

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	30.1	41.6	46.2	56.0	73.1	93.0	116	141	170*	183*	201*	
2,500	37.3	51.1	56.5	68.2	88.9	114	143	177*	216*	235*		
3,000	44.6	61.7	68.4	82.6	108	137	171*	211*				
3,500	54.2	74.1	81.9	98.5	128	162*	202*					

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	26.7	32.8	34.9	39.0	45.3	51.8	58.5	65.5	72.9*	76.2*	80.5*	
2,500	33.3	42.0	44.9	50.5	58.8	66.9	74.8	82.4*	89.7*	92.8*		
3,000	40.1	50.7	54.2	60.9	70.7	80.2	89.5*	98.4*				
3,500	49.1	59.9	63.6	70.8	82.0	93.6*	106*					

Current consumption (for 24V applications the following must be halved)												
12V DC, static cooling											A	
rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	2.2	2.7	2.9	3.2	3.8	4.3	4.9	5.5	6.1*	6.3*	6.7*	
2,500	2.8	3.5	3.7	4.2	4.9	5.6	6.2	6.9*	7.5*	7.7*		
3,000	3.3	4.2	4.5	5.1	5.9	6.7*	7.5*	8.2*				
3,500	4.1	5.0	5.3	5.9	6.8	7.8*	8.8*					

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	0.87	0.98	1.02	1.11	1.24	1.38	1.52	1.65	1.78*	1.84*	1.91*	
2,500	0.87	0.94	0.97	1.04	1.17	1.31	1.47	1.64*	1.84*	1.93*		
3,000	0.87	0.94	0.98	1.05	1.17	1.31	1.47*	1.64*				
3,500	0.86	0.96	1.00	1.08	1.20	1.33*	1.47*					

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	1.13	1.27	1.33	1.44	1.61	1.80	1.98	2.16	2.33*	2.41*	2.50*	
2,500	1.12	1.22	1.26	1.35	1.51	1.70	1.91	2.15*	2.41*	2.53*		
3,000	1.11	1.22	1.26	1.36	1.52	1.71	1.92*	2.14*				
3,500	1.10	1.24	1.29	1.39	1.56	1.73*	1.91*					

\* fan cooling of electronic unit compulsory

Test conditions with electronic units		EN 12900/CECOMAF	ASHRAE LBP
Condensing temperature	101N0242 101N0510 101N0680	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
Secop Gateway		105N9518
DC usage:	Automobile fuse, DIN 7258 12V: 15A   24V: 7.5 A Main switch	Not deliverable from Secop
AC usage:	Fuse, 100-240V Main switch	

## Compressor speed

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	0	AEO
	173	2,000
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## Wire dimensions DC

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

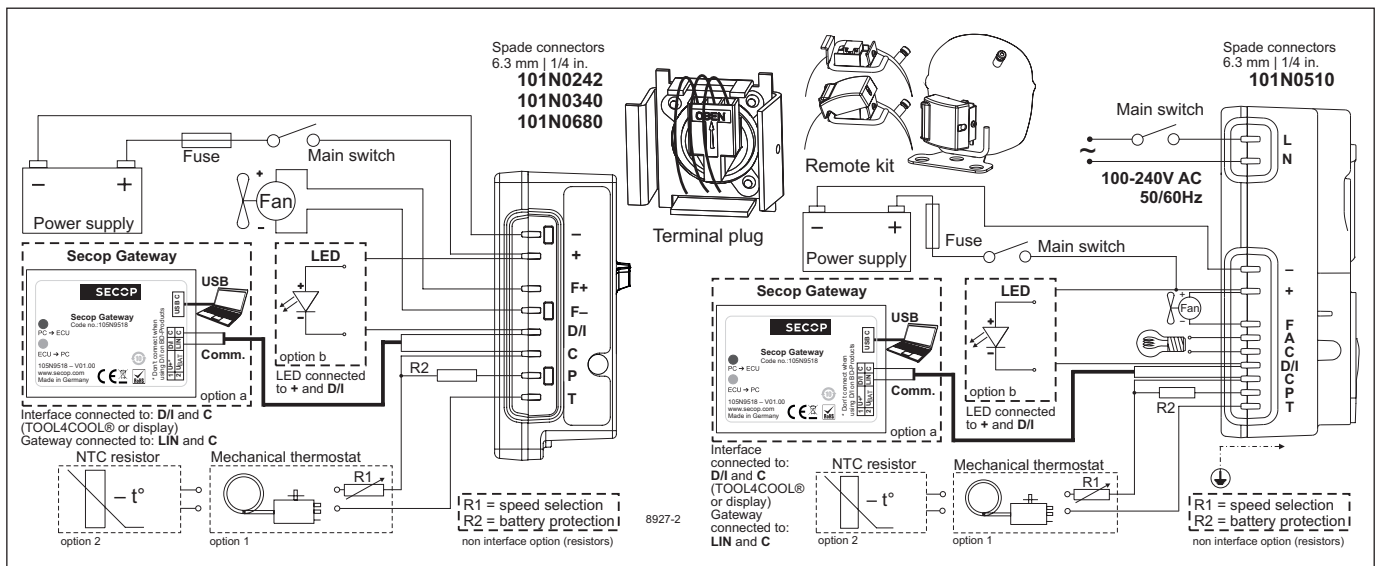
\*Length between battery and electronic unit

## Wire dimensions AC

Cross section min. 0.75 mm² or AWG 18

## 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).
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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  
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# BD Compressors



## Service/Repair



### BD Nano



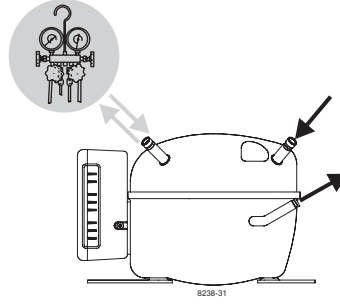
**! max. 150°C/302°F !  
at socket**  
brazing solder: silver with flux

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

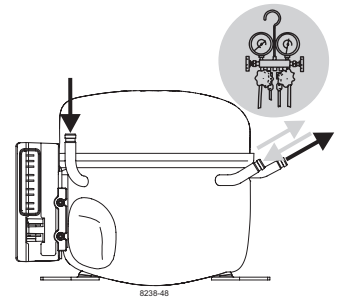
### BD Micro



### BD P-Housing



### BD T-Housing



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