

ENGINEERING TOMORROW

Catalogue

Light Commercial Compressors - BD series for DC Voltage

12 / 24 / 48 V DC





Content

3D Compressors	4
3D Compressors Product Range	4
Electronic Units & Applications	5
Code numbers - BD35/50/80F, BD250GH.2, BD35F-HD.2, BD35F-B, BD35/50K, BD80/100CN	7
Code Numbers BD250GH.2 BD350GH with 101N07xx Series Controllers	8
Code Numbers BD350GH BD220CL with 101N08xx Series Controllers	9
Code Numbers BD1.4F-AUTO.3 BD1.4F-VSD.2 BD1.4F-VSD-HD	10
Code Numbers BD350GH BD220CL with 101N08xx Series Controllers Code Numbers BD1.4F-AUTO.3 BD1.4F-VSD.2 BD1.4F-VSD-HD Application Examples Comfort Cooling in Trucks cooling in maritime appliances cooling in recreational vehicles (RV) Refrigerators in trucks Cooling in medi boxes Cooling in medi boxes Cooling in portable cooling boxes control your cold chain BD van boxes Felerom cooling increase battery lifetime	. 11
Comfort Cooling in Trucks	12
cooling in maritime appliances	13
cooling in recreational vehicles (RV)	14
Refrigerators in trucks	15
Cooling in medi boxes	16
Solar assisted cooling	17
Cooling in portable cooling boxes	18
control your cold chain BD van boxes	19
Felecom cooling increase battery lifetime	20
Nobile Refrigeration in Cars	21
Mobile Refrigeration in Buses	22
Felecom cooling increase battery lifetime Nobile Refrigeration in Cars Mobile Refrigeration in Buses Air Freight Cooling	23

DC Compressors	
1. Variable Speed Compressors For Direct Current	25
1.1 Refrigerants	25
1.2 Handling of refrigerants	25
1.3 Charging with refrigerant	26
1.4 HFC refrigerants (R134a)	
1.5 Flammable refrigerants R290 and R600a	26
1.6 Connectors	
1.7 Advantages of direct current compressors	
1.8 Denomination - Key to DC-Compressor type designation	
1.9 Date code format & country of origin	
1.10 Country of origin on typelabel	
1.11 Typelabels overview	
1.12 Labels on electronic units	
1.13 Label design	
1.14 VDE/CB/UL approved compressor - electronic unit combinations (BD P-Housing)	
Electronic Units	
2. Electronic Units - Technical Data	
3. Electronic Units - Housings	
4. Electronic Units - Features	
4.1 Voltage ranges with compressors	
4.2 Cable dimensions	
4.3 Compressor speed control	
4.4 Thermostat connection	
4.5 Adaptive Energy Optimization (AEO) function	
4.6 AEO function for BD35F/K, BD50F, BD80F, BD250GH.2 and BD100CN	
4.7 ECO function	
4.8 Fan connections	
4.9 Fan output power	
4.10 Lamp connection	
4.12 Overload protections	
4.13 Battery protection	
4.14 Set point selection during standalone operation (w/o Tool4Cool®) for electronic unit 101N2100	
4.15 Mounting the electronic unit	
4.16 Mounting the remote kit	45



5. Precondition for long operating life	46
5.1 Motor overload	46
5.2 Thermal overload	46
6. Design Limits	47
6.1 Coil temperature	47
6.2 Condensing temperature	47
7. moisture and impurities/FIIter Drier Selection	48
7.1 Filter drier selection	48
8. Condition at Delivery/Warnings	49
9. Max. Refrigerant Charge	50
R134a, R600, R290, and R404A/R507	50
10. Conversions	51
From R404A to R452A	51
From R134a to R600a or R290	51
From R134a to R1234yf	51
11. Mounting The Compressor	52
12. Mounting Accessories	53
 5. Precondition for long operating life	54
Cutaway drawing BD35F	55

Data Sheets	
R134a	
BD1.4F-AUTO.3 - DC Compressor - 12V DC	56
BD1.4F-VSD.2 DC Compressor - 12/24V DC - 100-240V AC 50/60Hz	58
BD1.4F-VSD-HD Heavy Duty DC Compressor - 12/24V DC	60
BD1.4F-VSD.2 DC Compressor - 12/24DC V - Inch Connectors	62
BD1.4F-VSD-HD Heavy Duty DC Compressor - 12/24DC V - Inch Connectors	64
BD35F DC Compressor - 12/24V DC - 10-45V Solar - 100-240V AC 50/60Hz	66
BD35F DC Compressor - 12/24V DC - 10-45V Solar - 100-240V AC 50/60Hz - Inch Connectors	68
BD35F-HD.2 Heavy DC Compressor - 12/24V DC	
BD35F-B Bus-optimized DC Compressor - 12/24V DC - 100-240V AC 50/60Hz	72
BD50F DC Compressor - 12/24V DC - 100-240V AC 50/60Hz	74
BD50F DC Compressor - 12/24V DC - 100-240V AC 50/60Hz - Inch Connectors	76
BD80F DC Compressor - 12/24V DC	78
BD250GH.2 DC Compressor - 12/24V DC	80
BD250GH.2 DC Compressor - 48V DC	
BD350GH DC Compressor - 12V DC - with 101N08xx Series Controllers	84
BD350GH DC Compressor - 24V DC - with 101N07xx Series Controllers	86
BD350GH DC Compressor - 24V DC - with 101N08xx Series Controllers	88
BD350GH DC Compressor - 48-56V DC	90
R600a	
BD35K DC Compressor - 12/24V DC - 10-45V Solar - 100-240V AC 50/60Hz	
BD50K DC Compressor - 12/24V DC	94
R290	
BD80CN DC Compressor - 12/24V DC	
BD100CN DC Compressor - 12/24V DC	
R404A/R507	100
BD220CL DC Compressor - 12V - with 101N08xx Series Controllers	

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BD Compressors Product Range

Modern comfort is brought into life when leaving home. As people go mobile, so does food. The excellent performance of the BD series safeguards food preservation.

With our outstanding DC compressors for cars, vans, boats, trucks, etc., the barriers for mobile refrigeration are continuously transcended.

Compressors R134a R404A/R507 *					E	N12900 F	lousehold	max. spee /CECOMA mperatur	F ASHRA	E				
R600a **, R290 ***	-40	-35	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
BD35F /-B /-HD.2			27 34	36 45	40 51	50 63	70 87	94 117	122 153					
BD50F			37 46	52 64	58 72	71 88	95 117	123 152	157 194					
BD80F			55 68	78 96	87 108	105 130	138 170	176 218	221 274					
BD250GH.2				61 76	69 86	87 108	119 148	156 194	200 249	251 311	308 383	336 418	373 465	446 556
BD250GH.2 /-HD (48V)				64 80	73 91	91 113	124 153	162 201	208 257	261 323	322 400	352 437	392 488	472 589
BD350GH (12V)				126 156	139 173	169 209	220 273	282 349	355 440	440 546	540 670	588 731	654 814	786 979
BD350GH (24V)				126 156	139 173	169 209	220 273	282 349	355 440	440 546	540 670	588 731	654 814	786 979
BD350GH (48V)				121 150	135 167	164 203	216 267	277 343	350 434	436 540	535 664	584 725	650 808	781 973
BD220CL *	83 96	121 140	166 193	220 255	240 279	283 328	355 413	439 511	535 624					
BD35K **			25 31	36 44	40 49	49 60	65 79	84 102	106 129					
BD50K **			30 36	42 51	47 57	58 70	77 94	101 123	129 158	162 198	199 244	218 266	242 296	
BD80CN ***	31 35	45 51	62 69	82 91	90 100	105 118	133 148	164 184						
BD100CN ***	44 49	62 70	83 93	108 120	117 131	137 153	170 190	209 233						
BD1.4F-VSD.2 /-HD			12 15	23 29	27 34	36 45	52 65	71 88	92 114	116 144	144 179	158 197	178 222	218 272
BD1.4F-AUTO.3				14 18	18 22	24 31	36 45	50 62	66 83	86 106	108 134			

Compressors		Power consumption [W] at max.													
R134a R404A/R507 *	Code numbers						Evapo	rating te	mperatu	ıre [°C]					
R600a **, R290 ***		-40	-35	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
BD35F /-B /-HD.2	101Z0200 /204 /205 /216			35	41	44	49	57	66	75					
BD50F	101Z1220/0203			45	57	61	68	80	91	104					
BD80F	101Z0280			66	83	89	100	118	138	161					
BD250GH.2	101Z0406				65	69	78	91	104	117	132	150	158	170	194
BD250GH.2 /-HD (48V)	101Z0405 /410				72	77	85	99	113	128	143	160	167	177	196
BD350GH (12V)	102Z3015				140	149	168	197	228	259	292	325	340	358	391
BD350GH (24V)	102Z3016				122	129	144	169	194	221	248	276	288	303	330
BD350GH (48V)	102Z3031				131	139	155	181	208	236	265	294	307	323	352
BD220CL *	102Z3020	121	147	173	200	209	227	255	284	314					
BD35K **	101Z0211			34	41	44	48	54	60	67					
BD50K **	101Z0213			42	50	53	59	68	77	86	94	103	107	111	
BD80CN ***	101Z0403	47	55	63	72	75	81	89	97						
BD100CN ***	101Z0401	55	66	78	89	93	100	110	120						
BD1.4F-VSD.2 /-HD	109Z0204 /206 /250 /251			27	34	36	41	48	55	61	68	76	79	83	90
BD1.4F-AUTO.3	109Z0104				26	28	30	35	40	45	50	56			

**** Please refer to the individual compressor data sheets for the complete application range.

BD Compressors Electronic Units & Applications

					Ele	ctronic units	(voltages &	code numb				
Compressors R134a R404A/R507 * R600a ** R290 ***	Code numbers	Standard 12-24V DC 101N0212	High Speed 12-24V DC 101N0390	AEO 12-24V DC 101N0340	Solar 10-45V DC 101N0420	AC/DC converter 12-24V DC & 100 -240 V AC 101 N0510	Automotive 12-24V DC 101N0650	101N08xxx 12V DC 101N0820+0800 (alt.: 101N0830)	101N8xxx 24V DC 101N0820+0810	101N07xx 24V DC 101N0715	Telecom 48V DC 101N0720	Telecom 48V DC 101N0732
BD35F	101Z0200	✓		✓	✓	✓	✓					
BD35F (inch con.)	101Z0204	\checkmark		✓	✓	✓	\checkmark					
BD35F-B	101Z0205	✓		✓		✓	✓					
BD35F-HD.2	101Z0216	\checkmark		✓			\checkmark					
BD50F	101Z1220	\checkmark		✓		✓	\checkmark					
BD50F (inch con.)	101Z0203	\checkmark		✓		✓	\checkmark					
BD80F	101Z0280		✓									
BD250GH.2	101Z0406		✓									
BD250GH.2 (48V)	101Z0405											✓
BD250GH.2-HD (48V)	101Z0410											✓
BD350GH (12V)	102Z3015							√ + √				
BD350GH (24V)	102Z3016								√ + √	✓		
BD350GH (48V)	102Z3031										✓	
BD220CL *	102Z3020							√ + √				
BD35K **	101Z0211	✓		✓	✓	✓	✓					
BD50K **	101Z0213		✓									
BD80CN ***	101Z0403	✓		✓		✓	✓					
BD100CN ***	101Z0401		✓									
TOOL4COOL® applicab	le	✓	~	~	✓	✓	✓	~	✓	✓	✓	✓

			Electronic unit	5
Compressors R134a	Code numbers	Variable Speed (VSD) 12-24V DC 101N2100	Variable Speed (VSD) w. AC/DC converter 12-24V DC & 100 -240V AC 101N5100	Automotive 12V DC 101N1010
BD1.4F-AUTO.3	109Z0104			\checkmark
BD1.4F-VSD.2	109Z0204	\checkmark	~	
BD1.4F-VSD-HD	109Z0250	\checkmark		
BD1.4F-VSD.2 (inch connectors)	109Z0206	\checkmark	~	
BD1.4F-VSD-HD (inch connectors)	109Z0251	\checkmark		
TOOL4COOL® applic	able	✓	✓	~

						(Com	pres	sor	s					
Applications	BD1.4F-AUTO.3	BD1.4F-VSD.2	BD1.4F-VSD-HD	BD35F	BD35F-B	BD35F-HD.2	BD35K	BD50K	BD50F	BD80F	BD80CN	BD100CN	BD250GH.2	BD350GH	BD220CL
Truck refrigerators		~	~	~		~	~	~	~		~				
Boat refrigerators		\checkmark		\checkmark			✓	✓	✓	~	~	✓			
Bus refrigerators		\checkmark		\checkmark	✓		✓	✓			~				
Portable boxes		\checkmark		\checkmark			✓	✓	✓	\checkmark					
Car minbars (high end)	~	~		~			~								
Car minibars (SUV, MPV)		\checkmark		\checkmark			\checkmark								
Spot cooling (e.g. trucks)													~	~	
Van boxes									✓	\checkmark	✓	✓	✓	✓	\checkmark
Battery cooling													~	~	
Solar cabinets				✓			✓	✓	✓		~	✓			

BD Compressors - Electronic Units & Applications



BD1.4F-AUTO.3 and BD1.4F-VSD.2/-HD R134a, -30°C, +5 and +15 / 0°C evap. temp. In-car cabinets and all mobile applications for portable boxes, boats, trucks etc., 14-108 W and 7-218 W / 5-85 W cooling capacity*.



BD80/100CN R290, -40°C, -10°C evap. temp. Freezer application (not approved for vehicles), solar-powered systems, ice cream boxes up to 200 l, 20-164 W / 31-209 W cooling capacity*.

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BD35K Multivoltage and BD50K

R600a, -30°C, +10°C evap. temp. Solar-powered vaccine coolers etc., 100-250 l coolers, 13-242 W cooling capacity*. BD35K can be powered with AC and DC, 85-240 V AC 50/60 Hz, 12-24 V DC, automatic selection of AC when available.



BD250GH.2 R134a, -25°C, +15°C evap. temp. Designed for cabin cooling in trucks during nighttime, very silent operation, 32-446 W cooling capacity*.



BD35F/50F Multivoltage R134a, -30°C, +10°C evap. temp. All mobile applications for portable boxes, boats, trucks etc., can be powered with AC and DC, 85-240 V AC 50/60 Hz, 12-24 V DC, automatic selection of AC when available, 15-152 W / 20-191 W cooling capacity*.



BD35F/50F/80F Basic R134a, -30°C, +10°C evap. temp. All mobile applications for portable boxes, boats, trucks etc., 15-152 W / 20-191 W / 35-221 W cooling capacity*.



BD350GH R134a, -25°C, +15°C evap. temp. Tailored for spotcooling systems in sleeping compartments in trucks, caravans, golf buggies etc., 85-786 W cooling capacity*.

* Test conditions	EN 12900/CECOMAF
Condensing temperature	55℃
Ambient temperature	32℃
Suction gas temperature	32℃
Liquid temperature	no subcooling



Code numbers - BD35/50/80F, BD250GH.2, BD35F-HD.2, BD35F-B, BD35/50K, BD80/100CN

Compressors	Code number	Description
BD35F	101Z0200	standard compressor, mm tube connectors
BD35F inch	101Z0204	same as 101Z0200, inch tube connectors
BD35F-B	101Z0205	optimized for rough vehicle motions (especially in buses), mm tube connectors
BD35F-HD.2	101Z0216	heavy duty version which can handle extreme vibrations, mm tube connectors
BD35K (R600a)	101Z0211	mainly solar applications, mm tube connectors
BD50K (R600a)	101Z0213	standard compressor, mm tube connectors
BD50F	101Z1220	standard compressor, mm tube connectors
BD50F inch	101Z0203	same as 101Z1220, inch tube connectors
BD80F	101Z0280	standard compressor, mm tube connectors
BD250GH.2	101Z0406	mm tube connectors, HBP compressor
BD80CN (R290)	101Z0403	mm tube connectors
BD100CN (R290)	101Z0401	mm tube connectors
Electronic Unit Single Pack	Code number	· Description
Standard (2nd generation) for gateway or sensors refer to page 9	101N0212	for BD35F/BD50F/BD35K, speed setting, battery protection, ECO function, communication interface for PC software Tool- 4Cool®, high starting torque (HST), reduced EMI and leakage current
AEO	101N0340	for BD35F/BD50F/BD80CN, Adaptive Energy Optimization
High speed	101N0390	for BD80F/BD250GH.2/etc., Adaptive Energy Optimization, speed setting, battery protection
Solar 10-45 V DC	101N0420	for BD35F/BD35K, optimized for direct solar panel operation, speed setting
AC/DC converter	101N0510	for BD35F/BD50F/BD35K, speed setting, battery protection, integrated AC/DC converter
Automotive (2nd generation) for gateway or sensors refer to page 9	101N0650	for BD35F/BD50F, speed setting, battery protection, ECO function, communication interface for PC software Tool4Cool®, high starting torque (HST), significant reduced EMI and leakage current
Remote kit with cable	105N9100	bracket, cover, 750 mm cable with two plugs
Remote kit without cable	105N9210	bracket, cover, two plugs
Electronic Unit I - Pack	Code number	Description
Standard (2nd generation) for gateway or sensors refer to page 9	101N0213 101N0215	for BD35F/BD50F/BD35K, speed setting, battery protection, ECO function, communication interface for PC software Tool- 4Cool®, high starting torque (HST), reduced EMI and leakage current, 30 pcs.
AEO	101N0341	for BD35F/BD50F/BD80CN, Adaptive Energy Optimization, 30 pcs.
High speed	101N0391	for BD80F/BD250GH.2/etc., Adaptive Energy Optimization, speed setting, battery protection, 28 pcs.
Solar 10-45 V DC	101N0421	for BD35F/BD35K, optimized for direct solar panel operation, speed setting, 30 pcs.
AC/DC converter	101N0511	for BD35F/BD50F/BD35K, speed setting, battery protection, integrated AC/DC converter, 36 pcs.
Automotive	101N0601	for BD35F, speed setting, battery protection, lamp output, 30 pcs.
Automotive (harness connector)	101N0631	for BD35F, speed setting, battery protection, lamp output, 30 pcs.
Automotive (harness connector) Automotive (2nd generation) for gateway or sensors refer to page 9	101N0631 101N0651	for BD35F, speed setting, battery protection, lamp output, 30 pcs. for BD35F/BD50F, speed setting, battery protection, ECO function, communication interface for PC software Tool4Cool®, high starting torque (HST), significant reduced EMI and leakage current, 30 pcs.

Code Numbers BD250GH.2 | BD350GH with 101N07xx Series Controllers

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10170405	· · · · · · · · · · · · · · · ·
101Z0405	for telecommunication applications (battery cooling)
102Z3016	for cooling and comfort cooling in trucks and vans
101Z3031	for telecommunication applications (battery cooling)
101N0715	for BD350GH (24 V), 40/60 W fan output, ECO function
101N0732	for BD250GH.2 (48 V), 60 W fan output, ECO function
101N0720	for BD350GH (48 V), 60 W fan output, ECO function
105N9542	accessories
105N9540	accessories
105N9538	accessories
105N9612	accessories
105N9614	accessories
105N9616	accessories
105N9501	accessories
101N0714	for BD350GH (24 V), 36 pcs.
101N0733	for BD250GH.2 (48 V), 36 pcs.
101N0721	for BD350GH (48 V), 36 pcs.
105N9545	100 pcs.
105N9547	50 pcs.
105N9543	36 pcs.
105N9541	36 pcs.
105N9539	36 pcs.
105N9613	200 pcs.
105N9615	100 pcs.
105N9617	100 pcs.
105N9611	200 pcs.
	101Z3031 101N0715 101N0732 101N0732 101N0732 101N0720 105N9542 105N9542 105N9540 105N9542 105N9540 105N9540 105N9541 105N9501 105N9501 105N9501 105N9501 105N9501 105N9501 105N9501 105N9501 105N9501 105N9545 105N9547 105N9543 105N9613 105N9615 105N9615

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Softwi

Code Numbers BD350GH | BD220CL with 101N08xx Series Controllers

	Item	Code number	Description
es	BD350GH 12 V DC supply	102Z3015	for cooling and comfort cooling in trucks and vans
Compres- sors	BD350GH 24 V DC supply	102Z3016	for cooling and comfort cooling in trucks and vans
ů	BD220CL 12 V DC supply	102Z3020	for mobile refrigeration units (boxes, containers, trolleys)
	Electronic unit (compressor module) 12 V DC	101N0800	electronic module (to be used together with 101N0820)
	Electronic unit (compressor module) 24 V DC	101N0810	electronic module (to be used together with 101N0820)
	Electronic unit (application module) 12 & 24 V DC	101N0820	electronic module (to be used together with 101N800/810)
ack	Electronic unit (single solution) 12 V DC	101N0830	electronic unit (no fan control)
Single-Pack	Temperature sensor, 470 mm, spade connectors	105N9612	accessories
Sin	Temperature sensor, 1000 mm, spade connectors	105N9614	accessories
	Temperature sensor, 1500 mm, spade connectors	105N9616	accessories
	One Wire/LIN gateway with cables & driver	105N9501	accessories
	One Wire/LIN gateway communication cable	105N9524	accessories (for 101N8xxx series)
	Electronic unit (compressor module) 12 V DC	101N0801	30 pcs.
	Electronic unit (compressor module) 24 V DC	101N0811	30 pcs.
	Electronic unit (application module) 12 & 24 V DC	101N0821	24 pcs.
Pack)	Electronic unit (single solution) 12 V DC	101N0831	30 pcs.
k (I-F	Compressor communication cable assembly 1500 mm	105N9553	80 pcs.
Industrial-Pack (I-Pack)	Compressor communication cable assembly 3000 mm	105N9554	45 pcs.
stria	Temperature sensor, 470 mm, spade connectors	105N9613	200 pcs.
npu	Temperature sensor, 1000 mm, spade connectors	105N9615	100 pcs.
	Temperature sensor, 1500 mm, spade connectors	105N9617	100 pcs.
	Display cable assembly without fuse 1500 mm	105N9557	65 pcs.
	Display cable assembly without fuse 3000 mm	105N9558	35 pcs.
Software	Tool4Cool® LabEdition	www.Seco	download from: p.com/solutions/application-detail/tool4cool-software/

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Code Numbers BD1.4F-AUTO.3 | BD1.4F-VSD.2 | BD1.4F-VSD-HD

Compressors	Code number	Description
BD1.4F-AUTO.3 mm	109Z0104	automotive compressor, mm tube connectors
BD1.4F-VSD.2 mm	109Z0204	variable speed drive compressor, mm tube connectors
BD1.4F-VSD.2 inch	109Z0206	same as 109Z0204, inch tube connectors
BD1.4F-VSD-HD mm	109Z0250	variable speed drive compressor (heavy duty), mm tube connectors, for trucks and buses
BD1.4F-VSD-HD inch	109Z0251	same as 109Z0250, inch tube connectors, for trucks and buses

Electronic Single Pack	Code number	Description
Automotive	101N1010	for BD1.4F-AUTO.3, battery protection, 12 V, fixed speed (3,000 rpm)
Variable Speed (VSD)	101N2100	for BD1.4F-VSD.2/ BD1.4F-VSD-HD, speed setting, battery protection, 12/24 V, ECO function
VSD with AC/DC converter	101N5100	for BD1.4F-VSD.2, speed setting, battery protection, 12/24 V DC & 100 - 240 V AC, ECO function

Electronic I - Pack	Code number	Description
Automotive	101N1011	for BD1.4F-AUTO.3, battery protection, 12 V, fixed speed (3,000 rpm), 30 pcs.
Variable Speed (VSD)	101N2101	for BD1.4F-VSD.2/ BD1.4F-VSD-HD, speed setting, battery protection, 12/24 V, ECO function, 30 pcs.
VSD with AC/DC converter	101N5101	for BD1.4F-VSD.2, speed setting, battery protection, 12/24 V DC & 100-240 V AC, ECO function, 24 pcs.

Software	Location
Tool4Cool® LabEdition	download from: www.Secop.com/solutions/application-detail/tool4cool-software/

BD Compressors - Application Examples

BD compressors bring comfort at work and leisure

The direct current compressors BD-35F/50F/80F for 12/24 V DC power supply can be used in mobile refrigerators and freezers with refrigerant R134a.

The BD250GH.2 and the BD350GH compressors in 12/24 or 48 V DC versions are R134a HBP compressors used for mobile spot cooling systems or telecommunication cooling.

BD35/50K (R600a) and BD80/100CN (R290) are compressors using HFC-free refrigerants.

All compressors are equipped with an electronic unit with built-in protection against shortages, operation outside temperature limits and destructive battery discharge. The advanced micro controller technology enables new functions like: electronic thermostat, fan speed, ECO function, alarm log, event log and software main switch.

Second to none – even cooling "without power supply"

Thanks to an extensive voltage rate the BD compressors are ideal for solar energy supply. The exceptionally low starting current eliminates the need for current batteries if an ice bank is used for energy storage. When storing the sun energy in ice packs the cabinet can be kept at desired temperatures both night and day.

This feature offers numerous uses in areas without power supply like storage and transportation of drugs, ice cream stands in holiday resorts, food preservation under off road conditions, refrigerators in boats to name only a few.

BD1.4F-VSD.2 (Variable Speed Drive)

The new BD1.4F-VSD.2 is 60 % smaller than previous models and weighs in at only 2.3 kilos. Perfect for 10-30 litre in car / van / boat cabinets or portable boxes that need to fit into tight spaces without compromising storage space.

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Specially designed for maximum efficiency and reliability this powerhouse of a compressor makes it easier than ever to provide leading class mobile refrigerators.

Enabling the variable speed function increases the system's COP. Low energy consumption is good for car/ boat/ van batteries – as well as the environment. The optimized, low noise motor ensures outstanding performance when you want to provide that extra degree of luxury on the move.

The electronic thermostat (NTC sensor support) provides an accurate temperature while the failure detection allows a fast fault diagnosis. The computer interface makes it easier for customization.

BD35F-HD.2 & BD1.4F-VSD-HD (Heavy Duty)

BD35F-HD.2 and BD1.4F-VSD-HD are new versions which can handle extreme vibrations.

BD35F-B (Bus-optimized)

The BD35F-B is a special version optimized for rough vehicle motions, especially in buses.

BD50K (Isobutane, R600a)

The new BD50K offers 25 % additional cooling capacity compared to the BD35K compressor.

The BD compressors mean: extraordinary performance at minimum power consumption, superbly silent running, reliable operation even when tilted up to 30 degrees, problem-free operation at 12/24/48 volts and more than 40 years' of experience in mobile refrigeration. Transport stable, speed/capacity stable, multifunctional electronic, silent, high COP and compact design.

BD Compressors - Application Examples - Comfort Cooling in Trucks

BD250GH.2, BD350GH

In the USA, Australia, Asia, South America, and Europe many of the heavy trucks are equipped with sleeping compartments. The cab gives the driver the opportunity to respond to spontaneous transport tasks and to plan his own work day.

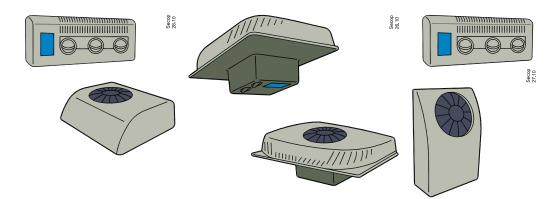
To ensure a good night sleep it is important to keep the temperature and humidity in the cabin at a comfortable level also during night time when the engine is shut off and the air conditioning system is not running. Many states and countries have abandoned idle cooling, meaning the diesel engine is not allowed to run when the truck is parked.

To keep a comfortable temperature during the hot summer nights, a small DC-driven comfort cooler system could be the solution. It cools down the cabin and at the same time lowers the humidity to a comfortable level. BD250GH.2 and BD350GH compressors are tailored to workplaces where driving is required. They are universal for 12 V and 24 V DC power supplies. In addition, they are unsurpassed when it comes to tolerating changeable climatic conditions and vibrations under harsh road conditions all over the world.

BD compressors cover a capacity range from 180 W to 850 W at Te +15 °C and are specially designed for high back pressure applications.

The compressors are controlled by an electronic unit that also offers protection against overload and hazardous battery discharge. The unit also features an internal voltage recorder as well as calibration to the applied voltage (compressor monitoring) plus many other smart features in order to save energy and maximize performance.

Features	Benefits
Silent operation	•The driver can sleep without being disturbed by a noisy compressor.
High efficiency. Low current consumption	•Energy-saving. Less battery power needed to cool overnight.
 Variable speed/capacity 	 Energy savings. Adapts speed to cooling needs.
Direct 12 V/24 V DC power supply	•Same compressor can be used globally. One product covers the world.
Modbus communication connection	•Customers can make their own control box including control of the BD compressor.
Electronic thermostat	 Cost savings. No extra thermostat needed. Fewer components and failure modes.
•Alarm & event logs	 Makes identifying errors fast and is easy to service. Lower service costs.
 Fan speed control 40-100 %. Start/stop delays 	 Less noise during night. Fewer components, fewer costs, less wiring, fewer installation costs.
Advanced battery protection function	 Safety. The battery will never be drained. Truck can be started safely every time.
•No APU necessary	•Runs directly on battery. No additional cost for an auxiliary power unit. Lower costs and failure modes.
Transport stable	Designed to resist vibrations, shocks, and bumping roads. Design lifetime 10 years. Lower service costs.



BD1.4F-VSD.2, BD35F, BD50F, BD80F

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

BD compressors cover a capacity range from 20 to 180 Watt. They are ideal for low and medium back pressure applications and refrigerator sizes up to 180 liters and freezers up to 90 liters.

The compressor's capacity can be adjusted manually. A special version of the electronic unit will adapt the capacity of the compressor automatically (AEO) to the actual load on the refrigeration system. The algorithm will adjust the speed of the compressor to achieve a running time of approximately 30 minutes. This is the most energy efficient way to operate the compressor.

The BD1.4F-VSD.2 and BD35F/BD50F (with second generation electronic unit 101N0212) offer an ECO function which adapts the speed of the compressor so that it runs at an optimal level.

Furthermore, these functions protect the compressor from short cycling in low load situations and also reduce the number of starts and thus saving battery life. An optional LED (diode) will flash and the following faults will be indicated by a blinking light:

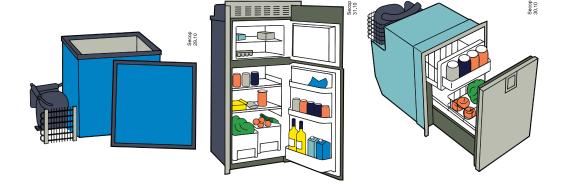
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low battery voltage, fan overload, minimum speed exceeded, thermal cut-out, motor start error.

The new BD1.4F-VSD.2 has additional features such as fan speed control, built in electronic thermostat, communication interface which makes programming the controller easy without requiring resistors or extra wiring.

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

Features	Benefits
Silent operation	 No compressor noise at night when sleeping next to the refrigerator in the boat.
High efficiency. Low current consumption	 Energy-saving. Operates on a smaller battery.
 Variable speed/capacity 	 Energy savings. Adapts speed to cooling needs.
Direct 12 V/24 V DC power supply	•Same compressor can be used globally. One product covers the world.
•Modbus communication connection	 Customized settings and fast programming on the production line are possible.
Electronic thermostat	 Cost savings. No extra thermostat needed. Fewer components and failure modes.
•Alarm & event logs	 Makes identifying errors fast and is easy to service. Lower service costs.
Fan speed control 40-100 %.	Less noise during night.
Start/stop delays	Fewer components, fewer costs, less wiring, fewer installation costs.
 Advanced battery protection function 	 Safety. The battery will never be drained to a dangerously low level.
•AC/DC module available as option	•When staying in a port the refrigerator can be powered by shore power (100–240 V AC, 50/60 Hz).
Transport stable	 Designed to resist conditions on the sea such as vibrations, shocks, and inclement weather. Design lifetime 10 year. Lower service costs.



BD1.4F-VSD.2, BD35F, BD35K, BD50F, BD50K, BD80F, BD80CN

Everybody wants to bring modern comfort with them when going on vacation or a weekend tour.

BD compressors make it possible to go on vacation in recreational vehicles all over the world and to bring along a refrigerator and a freezer – even in "off grid" places without power supply. The compressors are universal for 12 and 24 V DC power supply and can be used in recreational vehicles like luxury coaches, diesel motor homes, mini motor homes, travel trailers, and fifth wheels, truck campers, etc. They are unsurpassed when it comes to tolerating changeable climatic conditions and vibrations under harsh road conditions.

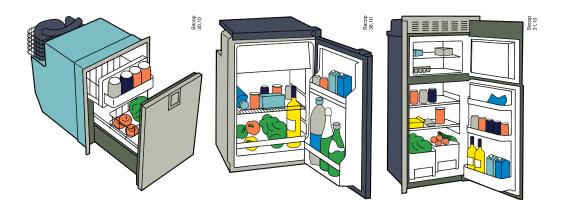
The BD1.4F-VSD.2, BD35F, BD50F and BD80F compressors cover a capacity range from 20 to 180 W. They are ideal for low and medium back pressure applications and refrigerator sizes up to 180 liters and freezers up to 90 liters.

A special version of the electronic unit adapts the capacity of the compressor automatically (AEO) to the actual load on the refrigeration system. The algorithm adjusts the speed of the compressor to achieve a running time of approximately 30 minutes. This is the most energy efficient way to operate the compressor. The BD1.4F-VSD.2 and BD35F/ BD50F (with second generation electronic unit 101N0212) offer an ECO function which adapts the speed of the compressor so that it runs at an optimal level. It has additional features such as fan speed control, built in electronic thermostat, communication interface which makes programming the controller easy, without resistors and extra wiring.

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The compressors are controlled by an electronic unit that also offers protection against overload and hazardous battery discharge. The unit also features an internal voltage recorder as well as calibration to the applied voltage (compressor monitoring).

Features	Benefits
Silent operation	 No compressor noise during night when sleeping next to the refrigerator in the RV.
•High efficiency. Low current consumption	•Energy-saving. Operates on a smaller battery. Three times less energy consumption compared to absorption and fast pull down.
 Variable speed/capacity 	 Energy savings. Adapts speed to cooling needs.
•Direct 12 V/24 V DC power supply	•Same compressor can be used globally. One product covers the world.
•Modbus communication connection	 Customized settings and fast programming on the production line are possible.
•Electronic thermostat	 Cost savings. No extra thermostat needed. Fewer components and failure modes.
•Alarm & event logs	 Makes identifying errors fast and is easy to service. Lower service costs.
 Fan speed control 40-100 %. 	Less noise during night.
Start/stop delays	Fewer components, fewer costs, less wiring, fewer installation costs.
 Advanced battery protection function 	 Safety. The battery will never be drained to a dangerously low level.
•AC/DC module available as option	•When staying in a port the refrigerator can be powered by shore power (100–240 V AC, 50/60 Hz).
Transport stable	 Designed to resist conditions on the sea such as vibrations, shocks, and inclement weather. Design lifetime 10 year. Lower service costs.



BD Compressors - Application Examples - Refrigerators in trucks

BD1.4F-VSD-HD, BD1.4F-VSD.2, BD35F-HD.2, BD35F, BD50F Most truck drivers are on the road for many days at a time. To keep their food and beverages cold they need refrigerators that can be built into the cab.

The BD compressors are tailored for the driving workplaces. BD35F-HD.2 and BD1.4F-VSD-HD are special versions designed to meet even harder road conditions where the refrigerator is mounted on the chassis of the truck. They are universal for 12 V and 24 V DC power supply.

Besides this they are unsurpassed in their ability to tolerate changeable climatic conditions and vibrations under harsh road conditions all over the world.

BD35F and BD50F compressors can be used for both refrigerators and freezers.

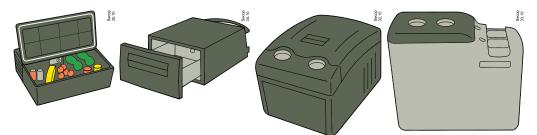
The compressors cover a capacity range from 20 to 180 W. They are ideal for low, medium and high back pressure applications and refrigerator sizes up to 80 liters incl. freezer compartment.

The compressors are controlled by an electronic unit that also offers protection against overload and hazardous battery discharge.

The unit also features an internal voltage recorder as well as calibration to the applied voltage (compressor monitoring).

The new BD1.4F-VSD.2 and the BD35F-HD.2 have additional features such as fan speed control, built-in electronic thermostat, communication interface which makes programming the controller easy without requiring resistors or extra wiring.

Features	Benefits
Silent operation	•The driver can sleep without being disturbed by a noisy compressor.
•High efficiency. Low current consumption	•Energy saving. Less batteries needed to cool overnight.
 Variable speed/capacity 	 Energy savings. Adapts speed to cooling needs.
Direct 12 V/24 V DC power supply	•Same compressor can be used globally. One product covers the world.
Modbus communication connection	•Customers can make their own control box including control of the BD compressor.
Electronic thermostat	 Cost savings. No extra thermostat needed. Fewer components and failure modes.
•Alarm & event logs	 Makes identifying errors fast and is easy to service. Lower service costs.
•Fan speed control 40-100 %. Start/stop delays	 Reduces noise Fewer components, fewer costs, less wiring, fewer installation costs.
Advanced battery protection function	Safety. The battery will never be drained. Trucks can be started safely every time.
Meets EMI standards	•The electronic unit meets automotive standards and in most cases no additional EMI filters are needed.



BD Compressors - Application Examples - Cooling in medi boxes

BD1.4F-VSD.2, BD35F, BD35K, BD50F, BD50K, BD80F

Manufacturers and users of transport equipment for medicines, vaccines, blood plasma, and organs know how critically important it is to store these products at the right temperature during transport. Vaccines and stored blood for example may only be given, if the temperature gradient during transport can be completely proven. Similar high requirements apply to protein medicines, dialysis preparations, and organs.

The BD35F and BD50F compressors have been specially designed for temperature controlled transportation. They ensure that the temperature can be kept at a constant temperature within the range of -18 °C to +8 °C and are therefore unsurpassed to be used in medi boxes for transporting medicines from main pharmacies to drugstores and organs from donor to recipient as well as storing medicines and vaccines in ambulances, for example. BD compressors are universal for 12 V and 24 V DC power supply and can be used in medi boxes up to 150 liters.

The compressors cover a capacity range from 20 to 180 W. They are ideal for low and medium back pressure applications.

An electronic unit including protection against overload and hazardous battery discharge controls the compressors.

The unit also features an internal voltage recorder as well as calibration to the applied voltage (compressor monitoring).

The new BD1.4F-VSD.2 has additional features such as fan speed control, built in electronic thermostat, communication interface which makes programming the controller easy without requiring resistors or extra wiring.

Features	Benefits
•Reliable compressor. More than 40 years in	High level of security.
the market.	No damage to vaccines, etc. due to too high temperatures.
•High efficiency. Low current consumption	•Energy-saving. Less battery consumption needed to cool overnight.
 Variable speed/capacity 	 Energy savings. Adapts speed to cooling needs.
•Direct 12 V/24 V DC power supply	•Same compressor can be used globally. One product covers the world.
•Modbus communication connection	•Customers can make their own control box including control of the BD compressor. Temperatures can be logged via communication interface.
•Electronic thermostat	•Very accurate temperature control. Cost savings. No extra thermostat needed. Fewer components and failure modes.
 Alarm & event logs 	•Makes identifying errors fast and is easy to service. Reduced service costs.
•Fan speed control 40-100 %. Start/stop delays	•Fewer components, fewer costs, less wiring, fewer installation costs.
Advanced battery protection function	• Safety. The battery will never be drained. Trucks can be started safely every time.
•Lightweight compressor	•Easy to carry a smaller medical box to small towns, even with a small battery mounted in the box.
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BD Compressors - Application Examples - Solar assisted cooling

BD1.4F-VSD.2, BD35F, BD35K, BD50F, BD50K, BD80F, BD80CN, BD100CN

BD35F and BD35K solar compressors,

offer a refrigeration solution for places with poor or no power supply. Thanks to the exceptionally low starting current, batteries are not required if an ice bank is used for energy storage.

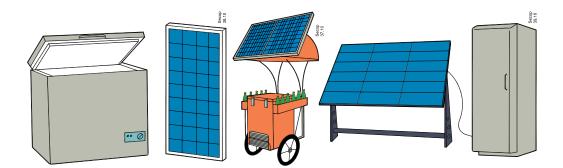
BD35F and BD35K solar compressors offer numerous functions for manufacturers within the rapidly growing area of mobile and stationary refrigeration. For example, storage and transportation of drugs, storage of food under difficult conditions without power supply, ice cream stands in holiday resorts, remote bottle coolers, refrigerators in boats, just to name a few. At times when there is no sun, the ice packs keep the cabinet at the set temperatures. Its wide voltage range (10–45 V DC) makes the BD very suitable for powering photovoltaic systems.

The new BD50K with its High Speed controller needs an addional capacitor or battery but offers higher cooling capacity.

An example on the latter was displayed at a UN summit in Johannesburg, South Africa. On this occasion, we supplied the compressor for a solar cabinet, complying with the tough demands of WHO (storage for 3 days without power supply).

The concept is well accepted by WHO and UNICEF today.

Features	Benefits
Reliable compressor.	High level of security.
More than 40 years in the market.	No damage to vaccines, etc. due to too high temperatures.
High efficiency. Low current consumption	 Energy saving. Less batteries needed to cool overnight.
Variable speed/capacity	•Energy savings. Adapts speed to cooling needs.
Direct 12 V/24 V DC power supply	•Same compressor can be used globally. One product covers the world.
•Modbus communication connection	•Customers can make their own control box including control of the BD compressor. Temperatures can be logged via communication interface.
Electronic thermostat	 Very accurate temperature control. Cost savings. No extra thermostat needed. Fewer components and failure modes.
• Alarm & event logs	 Makes identifying errors fast and is easy to service. Lower service costs.
•Fan speed control 40-100 %. Start/stop delays	Reduces noise Fewer components, fewer costs, less wiring, fewer installation costs.
Advanced battery protection function	•Safety. The battery will never be drained. Vehicles can be started safely every time.
 Very low weight of compressor 	•Easy to carry a smaller medical box to small towns, even with a small battery mounted in the box.



BD1.4F-VSD.2, BD35F, BD35K, BD50F, BD50K, BD80F

Today, more and more people want to spend their vacation in places that are off the beaten track where there is no electricity power, yet they still want to be able to cool their food and beverages. This has created a demand for a market for portable cooling boxes.

The BD35F compressor is the ideal choice for this application. It is battery-powered, compact, light, and easy to carry around. It also functions as an independent compressor to refrigerate a cooler in the car during family outings. What's more, it's also nice for a salesperson to always have chilled food and beverages at hand.

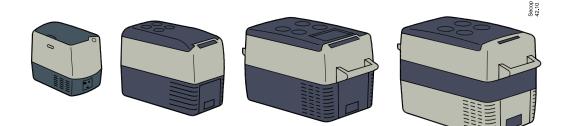
The BD35F is universal for 12 and 24 V DC power supply. The compressors cover a capacity range from 20 to 130 W. They are ideal for low and medium back pressure applications. Cooling boxes from 18-150 liters. The electronic unit is mounted on the compressor – this means no additional

mounting costs.

The compressors operate with electronic as well as standard mechanical thermostats. They can be powered directly from an AC/ DC unit. A switch in the power supply cables can be mounted to eliminate standby power consumption.

The BD compressors have an internal voltage recorder and calibration to the applied voltage as well as adjustable battery protection settings. The capacity can be varied by regulating motor speed. An electronic unit including protection against overload and hazardous battery discharge controls the compressors. The new BD1.4F-VSD.2 has additional features such as fan speed control, built-in electronic thermostat, communication interface which makes programming the controller easy, without requiring resistors or extra wiring.

Features	Benefits
•Low weight	High level of security. No damage to vaccines, etc. due to too high temperatures.
Small and compact	•Energy saving. Less batteries needed to cool overnight.
Silent operation	•The owner can sleep close to the box without being disturbed by a noisy compressor.
•High efficiency. Low current consumption	•Energy-saving. Less battery capacity needed to keep the goods cooled.
 Variable speed/capacity 	 Energy savings. Adapts speed to cooling needs.
• Direct 12 V/24 V DC power supply	•Same compressor can be used globally. One product covers the world.
•AC/DC module available as option	 If grid power is available, the box can be powered by mains power (100–240 V AC, 50/60 Hz).
Electronic thermostat	 Cost savings. No extra thermostat needed. Fewer components and failure modes.
•Alarm & event logs	 Makes identifying errors fast and is easy to service. Reduced service costs.
•Fan speed control 40-100 %. Start/stop delays	 Reducing noise. Fewer components, fewer costs, less wiring, fewer installation costs.
Advanced battery protection function	 Safety. The battery will never be drained. Cars can be started safely every time.





BD Compressors - Application Examples - control your cold chain BD van boxes

BD50F, BD80F, BD250GH.2, BD350GH, BD220CL

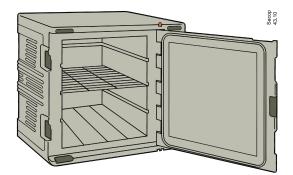
The most economical and efficient solution for small-scale transport is a mobile refrigeration unit that fits easily into cars and vans, and is powered by the car's own battery.

The advantages of such a solution are clear: The vehicle does not need to be altered. Cabinets can also be moved from vehicle to vehicle and even run on 220 V AC with the help of an AC/DC converter when the engine is turned off. In addition, the systems are more energy efficient and can be custom built to a wide range of sizes — depending on storage requirements.

Finally, an expensive, impractical, specially adapted refrigerated van is no longer the only option on the market. In recent years, mobile cooling solutions have become increasingly competitive, and the latest solutions are far more economical, practical, and efficient. This is the most flexible and cost effective solution for meeting the HACCP guidelines.

- Vans can be bought in standard model version and no extra bodywork on van is required
- Refrigeration when the engine is not running
- Both battery and AC utility can be used via a converter
- The box is mobile and can be handled separately. Can be used as extra refrigerator and can be loaded directly in the cooling or freezer room
- Lower energy consumption (lower CO₂ emission per kilometer)
- The can can be used for other purposes when not being used to carry refrigerated food
- Van can be resold much easier
- No hygiene issues with the car itself
- "Streamlined" car lower wind resistance, lower energy consumption, lower CO, emission
- Operation and service much easier

Features	Benefits
•Runs directly on the car batteries	 Keeps the goods active cooled also when the van is stopped for loading and unloading.
High efficiency. Low current consumption	 Energy-saving. Makes it possible to cool also when the van's motor is stopped.
 Variable speed/capacity 	 Energy savings. Adapt speed to cooling requirement.
• Direct 12 V/24 V DC power supply	•Same compressor can be used globally. One product covers the world.
•Modbus communication connection	 Customers can make their own control box including control of the BD compressor.
•Electronic thermostat	 Cost savings. No extra thermostat needed. Fewer components and failure modes.
•Alarm & event logs	 Makes identifying errors fast and is easy to service. Reduced service costs.
•Fan speed control 40-100 %. Start/stop delays	•Fewer components, fewer costs, less wiring, fewer installation costs.
•Advanced battery protection function	•Safety. The battery will never be drained. Vans can be started safely every time.





BD Compressors - Application Examples - Telecom cooling increase battery lifetime

BD250GH.2, BD350GH

When power fails, battery cooling systems must draw on their batteries' power. Since the compressor is the main power consumer, a lot can be gained with a solution that is extremely efficient without being overly power hungry.

By using a battery powered direct current (DC) compressor, it is possible to build a cooling system that can run on batteries, solar cells, and wind turbines without needing to convert to alternating current (AC).

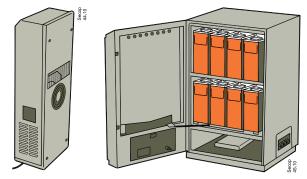
The BD250GH.2 and BD350GH compressors are unique as they are constructed with integrated fan control and electronic thermostat. In this way, it is possible to simplify the design of the overall system and still ensure maximum performance. With battery drain being a big issue, it is important to use an energy efficient compressor with the highest COP possible.

Compared to other solutions that rely on AC and 230 V AC conversion, the BD250GH.2 and BD350GH compressors save up to 250 W per hour.

In areas that rely on battery power for up to 16 hours a day, you can be certain that BD compressors will ensure that batteries will last as long as possible.

The optimal temperature for batteries is 25°C. Anything above this will shorten their life expectancy and provide their owners with an inconvenient replacement cost.

Features	Benefits
 Higher COP with DC compressors 	Better efficiency.
•Direct power supply to the compressor (32–62 V DC)	Fast installation and fewer failure modes.
 Variable speed/capacity 	•Maintaining lifetime of batteries save up to 20.000 USD over 8 years.
•Up to 90 % less failure modes on BD com- pressors compared to AC solutions.	• Reduced service costs and much better "up-time" of the BTS station.
•Modbus communication connection	•Customers can make their own control box including control of the BD compressor. Remote monitoring possible.
Electronic thermostat	• Cost savings. No extra thermostat needed. Fewer components and failure modes.
•Alarm & event logs	 Makes identifying errors fast and is easy to service. Reduced service costs.
•Fan speed control 40-100 %. Start/stop delays	•Fewer components, fewer costs, less wiring, fewer installation costs.



BD1.4F-AUTO.3, BD1.4F-VSD.2, BD35F

The demand for mobile refrigeration in cars has increased due to the increasing amount of time that people spend in them. With its compact design, low noise level, and robustness against vibrations, the BD compressor is the perfect solution for cool boxes in cars offering the driver and passengers the comfort not to stop every time they want food or something to drink. And when not on the road, the storage box keeps items cold for up to five hours after the car engine has been turned off. There are number of areas to place a cool box in a car. The center console area is possibly the most obvious location, but the cool box can also be put under the passenger seat or even within the front passenger seat — where access is via a lift-up seat cushion.

Lose excess weight and use the extra space for what really matters. The new BD1.4F-AUTO.3 and the BD1.4F-VSD.2 are 60 % smaller than previous models and weigh in at only 2.3 kilos.

Perfect for 10–15 liter in-car cabinets that need to fit into tight spaces without compromising storage space.

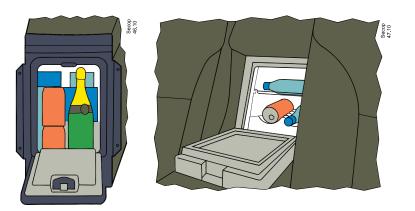
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Specially designed for maximum efficiency and reliability, this tiny powerhouse of a compressor makes it easier than ever to provide leading class mobile fridges to the discerning automobile manufacturers.

The optimized, low-noise motor ensures outstanding performance when you want to provide that extra degree of luxury on the move.

Cool beverages on demand make driving so much more of an experience. Fridges using the BD1.4F-AUTO.3 or the BD1.4F-VSD.2 take up less space and allow small fridges to fit easily with maximum storage space for snacks and beverages. Low energy consumption is good for car batteries and the environment.

Features	Benefits
•Low weight	•Only 2.3 kg for the smallest BD compressor. Overall weight reduction in the car.
Small and compact	•60 % less volume on BD1.4F-AUTO.3/-VSD.2 compared to BD35F. Increase net volume of the box.
Silent operation	•The owner can sleep close to the box without being disturbed by a noisy compressor.
High efficiency. Low current consumption	•Energy-saving. Less battery capacity needed to keep the goods cooled.
 Variable speed/capacity 	 Energy savings. Adapts speed to cooling needs.
Direct power supply	•Same compressor can be used globally. One product covers the world.
Transport stable	 If grid power is available, the box can be powered by mains power (100–240 V AC, 50/60 Hz).
Electronic thermostat	•Cost savings. No extra thermostat needed. Fewer components and failure modes.
 Alarm & event logs 	•Makes identifying errors fast and is easy to service. Reduced service costs.
•Fan speed control 40-100 %. Start/stop delays	 Reducing noise. Fewer components, fewer costs, less wiring, fewer installation costs.
Advanced battery protection function	• Safety. The battery will never be drained. Cars can be started safely every time.
Meets EMI standards	The electronic unit meets automotive standards.



BD1.4F-VSD.2, BD35F, BD35F-B

Many coaches offer passengers to buy cold beverages during a long tour. BD compressors are universal for 12 V and 24 V DC power supply and can be used in all kind of busses. They are unsurpassed in tolerating changeable climatic conditions and vibrations under harsh road conditions. The BD1.4F-VSD.2, BD35F and BD35F-B compressors cover a capacity range from 20 to 180 W. They are ideal for low and medium back pressure applications.

A special version of the electronic unit adapts the capacity of the compressor automatically (AEO) to the actual load on the refrigeration system. The algorithm adjusts the speed of the compressor to achieve a running time of approximately 30 minutes. This is the most energy efficient way to operate the compressor. The BD1.4F-VSD.2 and BD35F/BD35F-B (with second generation electronic unit 101N0212) offer an ECO function which adapt the speed of the compressor to an optimum level. It has additional features such as fan speed

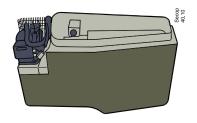
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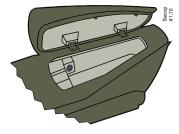
control, built-in electronic thermostat, communication interface which makes programming the controller easy, without requiring resistors or extra wiring.

Ideal for refrigerator sizes up to 30–50 liters with freezer compartment. The compressors are controlled by an electronic unit including protection against overload and hazardous battery discharge.

The unit also features an internal voltage recorder as well as calibration to the applied voltage (compressor monitoring).

Features	Benefits
•Low weight	•Only 2.3 kg for the smallest BD compressor makes it easy to carry.
•Small and compact	•60 % less volume on BD1.4F-AUTO.3/-VSD.2 compared to BD35F. Increase net volume of the box.
Silent operation	 The owner can sleep close to the box without being disturbed by a noisy compressor.
•High efficiency. Low current consumption	•Energy-saving. Less battery capacity needed to keep the goods cooled.
 Variable speed/capacity 	 Energy savings. Adapts speed to cooling needs.
• Direct 12 V/24 V DC power supply	•Same compressor can be used globally. One product covers the world.
•Special designed BD for buses.	 BD35F-B reduces any noise from the compressor to an absolute minimum even on very bumpy roads.
•Electronic thermostat	 Cost savings. No extra thermostat needed. Fewer components and failure modes.
 Alarm & event logs 	•Makes identifying errors fast and is easy to service. Reduced service costs.
•Fan speed control 40-100 %. Start/stop delays	 Reducing noise. Fewer components, fewer costs, less wiring, fewer installation costs.
Advanced battery protection function	Safety. The battery will never be drained. Cars can be started safely every time.
•Meets EMI standards	 The electronic unit meets automotive standards and in most cases no additional EMI filters are required.





BD250GH.2, BD350GH

Transporting pharmaceutical products by air around the world under safe and temperaturecontrolled conditions can mean the difference between life and death. Especially in the globalized world that we live in, reliable cooling of airfreight is vital for the patients who depend on effective medication. Having a dependable cold chain during the whole transportation is key to keeping the number of wasted pharmaceuticals due to a broken cold chain as low as possible.

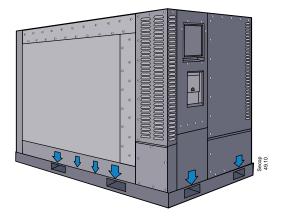
On many occasions, temperature fluctuations around 2 °C can make the difference regarding the viability of vaccines. To maintain these strict temperature conditions, Danfoss offers a multitude of DC-powered compressors to equip specialized containers. While the usual transportation methods rely on gel packs, dry ice, or operating compressors during transportation to cool goods, the installed BD series compressor operates prior to transport to freeze the container's eutectic plates. Thereby the current containers are able to get FAA approval while exceeding the World Health Organization's "Cold Chain Storage and Distribution" guidelines.

The BD series compressors use approximately 6 kilowatts of energy to freeze the cooling plates prior to the transportation which reduces the cost down to \$ 0.50. The eutectic cooling plates can keep the goods cool for days while the containers can be moved without any additional necessary equipment.

Our BD series compressors are able to withstand harsh changes in climate conditions and are unsurpassed in tolerating vibrations.

Our compressor models BD350GH and BD250GH.2 have been used for many years specifically for cooling airfreight. The installed electronic control unit is proven to be very robust while maintaining accurate temperatures and meeting the EMC requirements for aviation.

Features	Benefits
 Runs directly on batteries. 	 Active cooling through the whole cold chain.
•High efficiency. Low current consumption	•Energy-saving. Batteries will last longer.
 Variable speed/capacity 	 Energy savings. Adapts speed to cooling requirement.
 No need for insulated packaging. 	•Eliminates the need for a refrigerated truck. Saves time and costs.
•Modbus communication connection	•Customers can communicate with the compressor for monitoring and control.
 Internally powered during transport. 	•Always active cooling.
Precise temperature control.	 No scrap or damaged pharmaceutical products.
•No need for dry ice.	•Eliminates HAZMAT costs.
 Advanced battery protection function 	Safety. The battery will never be drained.



Danfos

Variable Speed Compressors

For Direct Current

Variable Speed compressors type BD (battery driven) BD1.4F-AUTO.3/-VSD.2, BD35F, BD50F, BD80F, BD250GH.2, BD350GH and BD220CL are designed for connection to 12 - 24V DC and 48V DC power supply and for refrigerant types R134a or R404A/ R507 and prepared for R1234yf.

The compressors are intended especially for use in mobile applications, e.g. cooling boxes, boats, caravans, trucks, vans, buses and cars. Due to their low energy consumption and the option for a wide supply voltage range, the compressors are also very suitable for stationary applications powered by photovoltaic solar panels.

The compressors can be used in refrigerators and freezers using either capillary tube or TEV as the throttling device.

The compressors **BD35K**, **BD50K**, **BD80CN** and **BD100CN** are especially designed for refrigeration systems using isobutane, refrigerant R600a and propane, refrigerant R290, respectively, as can be seen from the individual type label information. Isobutane and propane are also called hydrocarbons.

Hydrocarbons are not implicated in ozone depletion (ODP), and the majority of hydrocarbon refrigerants have a GWP rating (Global Warming Potential) of 3.

The role of hydrocarbon refrigerant systems in reducing harmful greenhouse gases is twofold: Firstly, direct greenhouse gas (CO₂) emissions are significantly decreased thanks to the low GWP rating of hydrocarbons. And secondly, the features of a hydrocarbon system (lower condensing point, positive thermodynamic attributes, and superior COP) act in combination to optimize energyefficient operation.

Assisted by the cheap availability of hydrocarbons produced as a by-product of gas and oil working, and by many studies demonstrating the energy savings hydrocarbon systems can deliver, hydrocarbons have proved to be viable replacements for fluorocarbons and other environmentally harmful refrigerants.

R600a and R290 are classified as flammable refrigerants of class A3 according to ANSI/ASHRAE 34. Accordingly, special safety regulations must be complied with. A special test schedule has been integrated in the European standards EN 60335-2-24 for domestic and EN 60335-2-89 for commercial appliances and in the corresponding international standards IEC 60335-2-24 and IEC 60335-2-89.

The compressors BD35K, BD50K, BD80CN and BD100CN must only and exclusively be used in appliances certified for flammable refrigerants according to these or later regulations.



BD Micro



BD P-Housina



BD T-Housing

BD compressors are intended for use in mobile and stationary applications e.g. portable cooling boxes, boats, caravans, trucks, parking cooling in trucks, vans, buses, cars and battery and shelter cooling in telecom stations. Due to the low power consumption and the option for a wide supply voltage range, the compressors are also suitable for stationary applications powered by photovoltaic solar panels, or fuel cells.

In bus applications a special version of **BD35F-B** has been developed. It is designed to minimize noise when the bus is driving. In truck applications special versions, BD35F-HD.2 and BD1.4F-VSD-HD, have been made to meet truck standards in regards to shock and vibration.

Catalogue	1. Variable Speed Compressors For Direct Current			
1.1 Refrigerants	Refrigerants with certain molecular structures have been identified as substances that can be harmful to the environment. Two properties are critical: the ozone depleting potential (ODP) and the global warming potential (GWP). The first negative property is covered by the Montreal Protocol ('Montreal Protocol on Substances that Deplete the Ozone Layer') from 1987 which is an international agreement designed to protect the earth's ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion. The result was the replacement of HCFC (halogenated chlorofluorocarbon, R22) refrigerants with HFC (hydrofluorocarbon, e.g. R134a) refrigerants which have an ODP of zero (or close to zero). The significant downside of HFC refrigerants is their high global warming potential since they belong to the category of greenhouse gases. This fact was discovered after the Montreal Protocol was adopted and was recently covered by an amendment adopted in Kigali in October 2016. Before this amendment, the United States and the EU had introduced regulations to define the phase down and replacement of these HFCs on a federal level.			
	Danfoss has been a pioneer and early adopter of hydrocarbons as refrigerants and believes the most efficient and economical friendly substances for use in cooling appliances are isobutane (R600a) and propane (R290). The first one is recommended as a replacement for household appliances and small capacities in the light commercial segment and the latter one for medium to large light commercial applications. Danfoss is also aware that the transition towards hydrocarbons is chal- lenging for manufacturers as well as for service providers and not always feasible in the short term.			
	Tests have so far shown good results with refrigerant R452A as a drop-in replacement for R404A and R507. Based on this information, Danfoss allows the use of R452A on all its light commercial R404A/R507 released compressors. It is the customer's responsibility to validate the application, and they should carefully consider the requirements and drawbacks when changing from R404A/ R507 to R452A in their application.			
	The HFO (hydrofluoroolefin) R1234yf can be used as drop-in for replacing R134a in the short- term for most of the applications. R1234yf is classified as flammable according to relevant safety standards. It is more expensive than R134a, however, it holds remarkably less greenhouse potential than R134a. Our R134a compressors can be used for testing with this refrigerant, and we will be more than happy to assist you in discovering that right solution for you and when it comes to the approval procedure. Investigations into material compatibility have so far shown good results with refrigerant R1234yf in Danfoss light commercial R134a compressors. These results must be confirmed in ongoing long-term tests. Currently, testing system performance can be conducted using compressors originally designed for R134a. The same application limits as described on the R134a data sheet may be used, however, partly with changed electrical equipment. Since R1234yf is classified as a flammable refrigerant, the compressors must be used with starting equipment approved for flammable refrigerants. The compressors designed for R134a do not have a safety approval for flammable refrigerants like R1234yf.			
1.2 Handling of refrigerants	To ensure reasonable refrigeration system life, the refrigerant must have a maximum moisture content of 20 ppm (20 mg/kg). Do not fill the refrigerant from a large container into a filling bottle through several container sizes, as with every drawing-off the water content in the refrigerant is increased considerably.			

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Catalogue	1. Variable Speed Compressors For Direct Current				
1.3 Charging with refrigerant	Normally, charging with refrigerant is no problem with a suitable charge, provided that the charging amount of the refrigeration system equipment is known.				
	Always charge the refrigerant amount and type stated by the refrigerator manufacturer. In most cases this information is stated on the refrigerator type label. The different compressor brands con- tain different amounts of oil, so when converting to another brand it may be advisable to correct the amount of refrigerant. Charge of refrigerant can be made by weight or volume.				
	Flammable refrigerants like R600a and R290 must always be charged by weight. Charging by volume must be made with a refrigerant charging cylinder. The refrigerant R404A and all other refrigerants in the 400 series must always be charged as liquid.				
	If the charging amount is unknown, charging must be done gradually until the temperature distri- bution above the evaporator is correct. However, mostly it will be more appropriate to overcharge the system and then gradually draw off refrigerant until the correct charge has been obtained. The refrigerant charge must be made with the compressor running, the refrigerator without load and with the door closed.				
	The correct charge is characterized by the temperature being the same from the inlet to the outlet of the evaporator. At the compressor suction connector the temperature must be approx. ambient temperature. Thus transfer of moisture to the refrigerator insulation is avoided.				
	Systems with an expansion valve must be charged with refrigerant until there are no bubbles in the sight glass, which should be placed as close to the expansion valve as possible.				
1.4 HFC refrigerants (R134a)	The HFC refrigerant R134a and HFC mixtures require Polyester type oil. Contamination of com- ponents and systems with mineral oil and alkylbenzols must be avoided. Greasy substances and other long-chained, high molecular substances not dissolved must not be present. Manufacturing processes which require a lubricant can be done with Polyester oil approved for the compressors. Procedures for mounting, evacuation and charging must be carried out in such a way that con- tamination with chlorine refrigerants is avoided. HFC refrigeration systems must always have a drier with 3 Angstrom Molecular Sieves.				
1.5 Flammable refrigerants R290 and R600a	appliances which fulfil th cover potential risk origir R290 are only allowed to the above-mentioned st always be highest at the f	e requirements laid down in the nated from the use of flammable be used in household appliance andard. R600a and R290 are hea	ammable and are only allowed for use in latest revision of EN/IEC 60335-2-24. (To e refrigerants). Consequently, R600a and es designed for this refrigerant and fulfil vier than air and the concentration will and transported in approved containers		
	Do not use open fire near the refrigerants R600a and R290. The refrigeration systems must be opened with a tube cutter.				
	The flammability limits are approx. as follows,				
	Refrigerant	R600a	R290		
	Lower limit	1.5 % by vol. (38 g/m ³)	2.1 % by vol. (39 g/m ³)		
	Upper limit	8.5 % by vol. (203 g/m ³)	9.5 % by vol. (177 g/m ³)		

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In order to carry out service and repair on R600a and R290 systems the service personnel must be properly trained to be able to handle flammable refrigerants. This includes knowledge on tools, transportation of the compressor and refrigerant, and the relevant regulations and safety precautions when carrying out service and repair.

Catalogue	1. Variable Speed Compressors For Direct Current		
	Do not use open fire when working with refrigerants R600a and R290!		
	Conversions from refrigerants R12 or R134a to R600a is not permitted, as the refriger- ators are not approved for operation with flammable refrigerants, and the electrical safety has not been tested according to existing standards either. The same applies to conversions from refrigerants R22, R502 or R134a to R290.		
	Compressors for the flammable refrigerants R600a and R290 are equipped with a yellow warning label as shown.		
1.6 Connectors	BD compressors are supplied with sealed connectors, which consist of a thick walled copper plated steel tube with great corrosion resistance and good braze ability. The connectors are welded in the compressor housing and thus the welding cannot be destroyed by overheating during brazing operations. The sealing is an aluminium cap which gives a tight sealing. The seal is easily removed with an ordinary pair of pliers or with the tool shown in the figure.		
	Most BD compressors are supplied with milli- metre tubes, but some variants supplied with inch tubes.		
	All connectors have a shoulder to provide optimal brazing conditions. Drifting of the connectors for more than 0.3 mm is not allowed.		
	For the refrigerants R600a and R290, process tubes can be closed with a LOKRING® con- nection. Brazing is not allowed during servicing systems with flammable refrigerants.		
1.7 Advantages of direct current compressors	BD direct current compressors can be used in applications using either capillary tube or TEV as the throttling device. The BD compressor must be mounted in a dry and clean place. The compressors will withstanc storage temperatures down to -25°C and up to +70°C. Condensing temperatures: Max. 60°C at stable conditions and max. 70°C at peak load. Ambient temperatures: Min10°C, max. 43°C		
	The BD compressor concept includes an electronic unit which features overload protection, battery protection, wrong polarity protection, evaporator and condenser fan control, LED diagnosis signal light bulb connection, load dump protection, mechanical or electronic thermostat, ECO function AEO (Adapative Energy Optimizing) function and bus communication interface. These features are model dependant. The electronic module has internal voltage recording and calibration to the applied voltage. The electronic module may also be powered directly from certain types or electronic power supply units and thus no battery is required.		
	In addition to being especially quiet in operation – ranging from 33 dB(A) to 38 dB(A)- depending on model and speed of compressor, all BD compressors have high COP values.		
1.7.1 Tilt angle	The BD compressors are designed to be mounted in a horizontal position. However they are also designed to operate temporarily in conditions with heeling up to 30° such as can occur in boats car and trucks driving in mountains. Under such heeling conditions the compressor can be noisy when internal compressor parts knock against the compressor shell.		

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1.8 Denomination - Key to DC-Compressor type designation

Key to DC-Compressor Type Designation (BD-Ser	ies)
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2		3		4	5
Compres	sor size			Special features	
Capacity	Disula sourcest	Application range	Refrigerant		Generation
at rating point	Displacement			in combination)	
35		CN = LBP	R290	- AUTO = automotive	
50					Blank →
		CL = LBP	R404A/507	- VSD = variable speed drive	first generation
				- HD = heavy duty	generation
		F = LBP/MBP/HBP	R134a	(can handle extreme vibrations)	
550		GH - (I RP/MRP)/HRP	R134a		.2 →
	1.4		ni Ja	•	second generation
		K = LBP/(MBP)	R600a	motions)	generation
	Compres Capacity at rating point 35 50 80	at rating point 35 50 80 100 250 Displacement	Compressor size Application range Capacity at rating point Displacement Application range 35 CN = LBP 50 CL = LBP 100 F = LBP/MBP/HBP 350 GH = (LBP/MBP)/HBP	Compressor sizeApplication rangeRefrigerantCapacity at rating pointDisplacementApplication rangeRefrigerant35 50CN = LBPR29080 100CL = LBPR404A/507250 350F = LBP/MBP/HBPR134a1.4GH = (LBP/MBP)/HBPR134a	Compressor size Application range Refrigerant Special features (optional, can be used in combination) 35 Displacement Application range Refrigerant Control (optional, can be used in combination) 35 CN = LBP R290 -AUTO = automotive 50 CL = LBP R404A/507 -VSD = variable speed drive 100 250 F = LBP/MBP/HBP R134a -HD = heavy duty (can handle extreme vibrations) 50 GH = (LBP/MBP)/HBP R134a -B = bus-optimized (optimized for rough vehicle

1 The first letter of the denomination indicates compressor series

2 For BD-Micro compressors a number indicates the displacement in cm³, but for BD compressors based on P/T housing the number indicates the nominal capacity.

3 The letter after the displacement indicates which refrigerant must be used as well as the field of application for the compressor.

LBP (Low Back Pressure) indicates the range of low evaporating temperatures, typically -10°C down to -35°C or even -45°C.

MBP (Medium Back Pressure) indicates the range of medium evaporating temperatures, typically -20°C up to 0°C.

HBP (High Back Pressure) indicates high evaporating temperatures, typically -5°C up to +15°C. **R134a** > **F**: BD Compressors with denominations ending with F are primarily designed for low evaporating temperatures (LBP/MBP) but will also work with high evaporating temperatures (HBP). **R134a** > **GH**: Compressors with denominations ending with GH are designed for high evaporating temperatures (HBP).

R290 > CN: Compressors with denominations ending with CN are designed for low evaporating temperatures (LBP) and medium evaporating temperatures (MBP).

R404A/R507 > CL: Compressors with denominations ending with CL are primarily designed for low evaporating temperatures (LBP).

R600a > **K**: All compressors for R600a have denominations ending with K after the number for displacement or capacity. They are designed for low operating temperatures (LBP).

4 The next letter in the compressor denomination provides information on special features the BD compressor offers.

5 The final letter (separated by a dot) mentions the generation of the compressor.

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1. Variable Speed Compressors For Direct Current

1.9 Date code format & country of origin

The BD compressors have a manufacturing date code stamping on the housing. The content of the coding (Fig.1) is in two lines according to the example below: H4485C (6 characters) 051D11R (7 characters, 8 characters for BD Micro)

Composition of line 1

H4485: Compressor type information (102H4485 = H4485)

C: Internal manufacturer code

Composition of line 2

- 05: Production week
- 1: Production year
- D: Production day
 - A = Monday, B = Tuesday,
 - C = Wednesday, D=Thursday, etc.
- **11:** Production hour 00 to 23 or shift code -1, -2, -3
- **R:** Internal production location code
 - A to G, U Germany:
 - A until week 50/2005 D until week 35/2006 U until week 08/2010

K to N Slovenia:

K until week 39/2012 L until week 34/2011 M until week 02/2012 N until week 02/2012

A, D, L,M, R, U Slovakia:

A from week 01/2006 D from week 38/2006 L from week 45/2011 M from week 09/2012 R from week 01/2005 U from week 12/2010

S, R Mexico:

R up to week 27/2004 W to Z China

1.10 Country of origin on typelabel

On BD Micro compressors (code number 109Z....), the production year is indicated by two digits, e.g. "11" for 2011 and a serial number behind the location code.

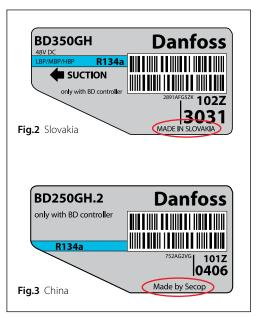
The country of origin (in capital letters) or the manufacturer will also be marked on the typelabel,

examples: MADE IN SLOVAKIA

- for compressors made in Slovakia (Fig.2) - for compressors...

- Made by Secop | optional label "Made in China"
 - for compressors made in China (Fig.3)
 - "made by Nidec" from 05/2018 to 12/2019





<u>Danfošš</u>

101Z 0211

Catalogue

1. Variable Speed Compressors For Direct Current

Voltage printed on label

1.11 Typelabels overview

BD Micro Series	Label Width = 47 mm	Example
Background colour	grey	BD1.4F-VSD.2 Danfoss
Coloured stripe for refrigerant	R134a: blue	only with BD controller
Barcode	on white background	
Approvals printed on label	yes	R134a
Voltage printed on label	no	551BFAVE 109Z
Application printed on label	no	Made by Secop
BD Series based on P-Housing	Label Width = 67 mm	Example
Background colour	grey	BD35K Danfoss
Coloured stripe for refrigerant	R134a: blue, R600a or R290: red	only with BD controller
Barcode	on white background	
Approvals printed on label	yes (except UL)	R600a

Application printed on label	no	Made by Secop
BD Series based on T-Housing	Label Width = 85 mm	Example
Background colour	grey	BD220CL Danfoss
Coloured stripe for refrigerant	R134a: blue, R404A/R507: lilac	12V DC
Barcode	on white background	LBP R404A SUCTION R507
Approvals printed on label	yes (except UL)	only with BD controller
Voltage printed on label	yes	2891AFG5ZK 102Z
Application printed on label	yes	 3020 MADE IN SLOVAKIA

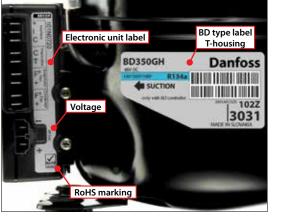
no

Note: The remark "only with BD controller" will be introduced on all BD compressors in the mid of 2013.

1.12 Labels on electronic units

Labels on electronic units	Examples			
Labels on electronic units consist of a 2D Data Matrix code area and a number of				
lines with informations.				
The 2D Data Matrix Code is always built up with 62 characters containing informa-	ID: 040749000520			
tion about type, code number, product version, product revision, unit ID, supplier,	Date: 0749			
part number and text.	44 Ver: 01			
Text information on the label:	Text:			
Line 1: ID: PLYYWWsssss (unique number)				
Line 2: Date: YYWW				
Line 3: Ver.: VV				
Line 4: Text: text	220			
Meaning:	Karana 8			
PL Production location, 01 99	04074900052 8: 0749 1:			
YY Year, 12 = 2012				
WW Week number, 01 52				
sssss Serial number, 000001 999999	Dat: Ver Tex			
VV Version, 00 99				

1.13 Label design



A lot of our BD compressors have UL approvals. Approved compressor - electronic unit combinations can be found in the table below.



UL approval mark

Nominal voltage has been removed from BD compressor type labels based on the P-housing and moved to the electronic unit.

Application marking (LBP/MBP/HBP) has been removed on BD compressors based on the P- and BD-Micro housings.

The European CE mark has been removed from most electronic units. On the AC/DC units it will remain. The label on the electronic unit contains the nominal supply voltage. Located between + and – terminal. AC/DC units contain in addition the applied nominal AC voltage.

1.14 VDE/CB/UL approved compressor - electronic unit combinations (BD P-Housing)

		Electronic Units								
Compressors		Standard	AEO	High speed	Solar	AC/DC	Automotive	Telecomm.		
		101N0212	101N0340	101N0390	101N0420	101N0510	101N0650	101N0732		
BD35F mm	101Z0200	N	UL/CB/VDE	**	CB / VDE	UL/VDE	UL/CB/VDE	**		
BD35F inch	101Z0204	Ν	UL/CB/VDE	**	CB / VDE	UL/VDE	UL/CB/VDE	**		
BD35F-B	101Z0205	Ν	UL/CB/VDE	**	CB / VDE	UL/VDE	UL/CB/VDE	**		
BD35F-HD.2	101Z0216	Ν	**	**	**	**	UL/CB/VDE	**		
BD35K (R600a)	101Z0211	N	UL/CB/VDE	**	CB / VDE	CB / VDE	UL/CB/VDE	**		
BD50F mm	101Z1220	Ν	UL/CB/VDE	**	**	UL/VDE	UL/CB/VDE	**		
BD50F inch	101Z0203	N	UL/CB/VDE	**	**	UL/VDE	UL/CB/VDE	**		
BD50K (R600a)	101Z0213	**	**	Ν	**	**	**	**		
BD80F mm	101Z0280	**	**	Ν	**	**	**	**		
BD80CN (R290)	101Z0403	Ν	UL/CB/VDE	**	**	UL	UL/CB/VDE	**		
BD100CN (R290)	101Z0401	**	**	Ν	**	**	**	**		
BD250GH.2 (12/24V)	101Z0406	**	**	Ν	**	**	**	**		
BD250GH.2 (48V)	101Z0405	**	**	**	**	**	**	UL		

UL/CB/VDE = Combination possible, VDE, CB or UL approval

N= Combination possible, but no approval

** = Combination not possible

	Electronic units (code number)							
		BD, P-Housing						
Tech	nnical data	Standard (2nd generation) 101N0212	High Speed 101N0390	AEO 101N0340	Solar 101N0420	AC/DC converter 101N0510	Automotive 2nd generation) 101N0650	Telecom 101N0732
	Approvals and certificates *	-	-	UL/VDE/CB	UL/VDE/CB	UL/VDE	UL/ VDE/CB UN-ECE-R10	UL
vals	Type approval (E-marking) 2004/104/EC	-	-	-	-	e4 03 1588	-	-
Approvals	EU declaration 2014/30/EU and RoHS declaration 2011/65/EU	yes	yes	yes	yes	yes	yes	yes
	Further EMC tests	CISPR25/1 CISPR14	CISPR25/1	CISPR25/1	CISPR25/1	-	CISPR25/5	-
age	DC supply voltage range (V)	(9) 9.6 - 17, 21.3 - 31.5	(9) 9.6 - 17, 21.3 - 31.5	(9) 9.6 - 17, 21.3 - 31.5	10 - 45	(9) 9.6 - 17, 21.3 - 31.5	(9) 9.6 - 17, 21.3 - 31.5	32 - 60
Supply voltage	AC supply voltage range (V) Frequency (Hz)	-	-	-	-	100 -240 50-60	-	-
Sup	Fuses required for e.g. 12/24V DC usage (A)	15 / 7.5	30 / 15	15 / 7.5	15	15 / 7.5	15 / 7.5	15
	Fuse required AC usage	-	-	-	-	4	-	-
Environments	Ambient temperature operation (°C)	55	55	55	55	55	55	55
Enviro	Ambient temp. during storage/transport (°C)	-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85
Enclosure	IP Class	20	20	20	20	20	20	20
Encle	Weight (kg)	0.19	0.26	0.19	0.19	0.40	0.19	0.24
	Connectors (6.3 mm spades or purpose-built)	spades	spades	spades	spades	spades	spades	spades
	Fan (V/W _{max})	12/6	12/6	12/6	12/6	12/6	6/12	48 / 60+60
Ę	NTC sensor	yes	yes	yes	yes	yes	yes	yes
Connectivity	Bus communication	1 wire	1 wire	1 wire	1 wire	1 wire	1 wire	1 wire
ouu	Light (V/W)	-	-	-	-	12/5	-	-
Ŭ	LED (alarm)	yes	yes	yes	yes	yes	yes	-
	TOOL4COOL*	yes	yes	yes	yes	yes	yes	yes
	Setpoint selection (mechanical thermostat -M / (external resistor -R / TOOL4COOL® - T)	M/-/T	M/-/T	M/-/T	M/-/T	M/-/T	M/-/T	M / - / T

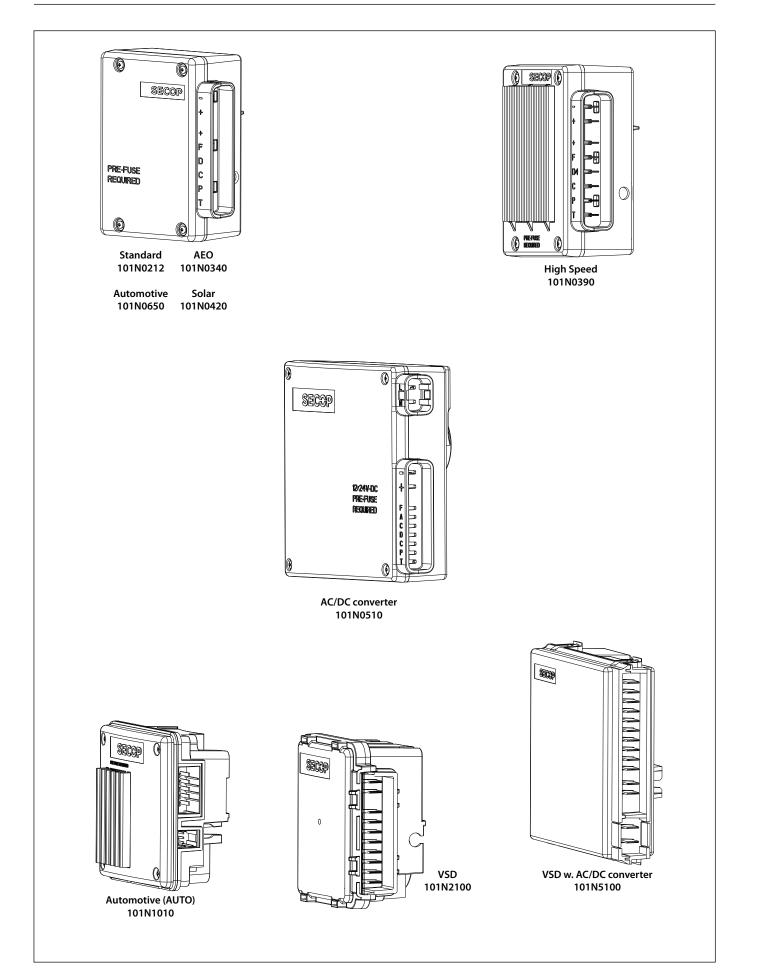
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 ${}^* {\it please refer to table: VDE/CB/UL approved compressor - electronic unit combinations}$



Electronic units (code number)									
BD, T-Housing						BD-Micro			
101N8xxx-Series 101N0820+0800	101N8xxx-Series 101N0820+0810	101N8xxx-Series 101N0830	101N07.xx-Series 101N0715	Telecom 101N0720	Variable Speed (VSD) 101N2100	Variable Speed (VSD) AC/DC conv. 101N5100	Automotive (AUTO) 101N1010		
-	-	-	-	-	-	UL	-		
-	-	-	-	-	compliant	compliant	compliant		
yes	yes	yes	yes	yes	yes	yes	yes		
CISPR25/1	-	-	CISPR25/3	-	CISPR25/1	CISPR25/1	VW 80101		
9.6 - 17	19 - 31.5	9.6 - 17	19 - 31.5	32 - 60	9.6 - 17 19 - 34	9.6 - 17 19 - 34	8.5 - 17		
-	-	-	-	-	-	100 - 240 50 - 60	-		
30 + 2 x 60	15 + 2 x 30	60	30	15	15/7.5	15 / 7.5	12		
-	-	-	-	-	-	4	-		
55	55	55	55	55	55	55	55		
-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85		
20	20	20	20	20	42	42	40		
0.28 + 0.33	0.28 + 0.25	0.28	0.27	0.27	0.11	0.29	0.17		
special	special	special	spades	spades	spades	spades	special		
12-24 / 200+100	12-24 / 200+100	-	12+24 / 60+40	48/60+60	12/6	12/6	12 / 7.8		
yes	yes	yes	yes	yes	yes	yes	yes		
1 wire, LIN, Modbus	1 wire, LIN, Modbus	1 wire	1 wire	1 wire	1 wire	1 wire	1 wire		
-	-	-	-	-	-	12/5	LED		
-	-	-	-		yes	yes	yes		
yes	yes	yes	yes	yes	yes	yes	yes		
M/-/T	M/-/T	M / - / T	M/-/T	M/-/T	M/R/T	M/R/T	M/R/T		

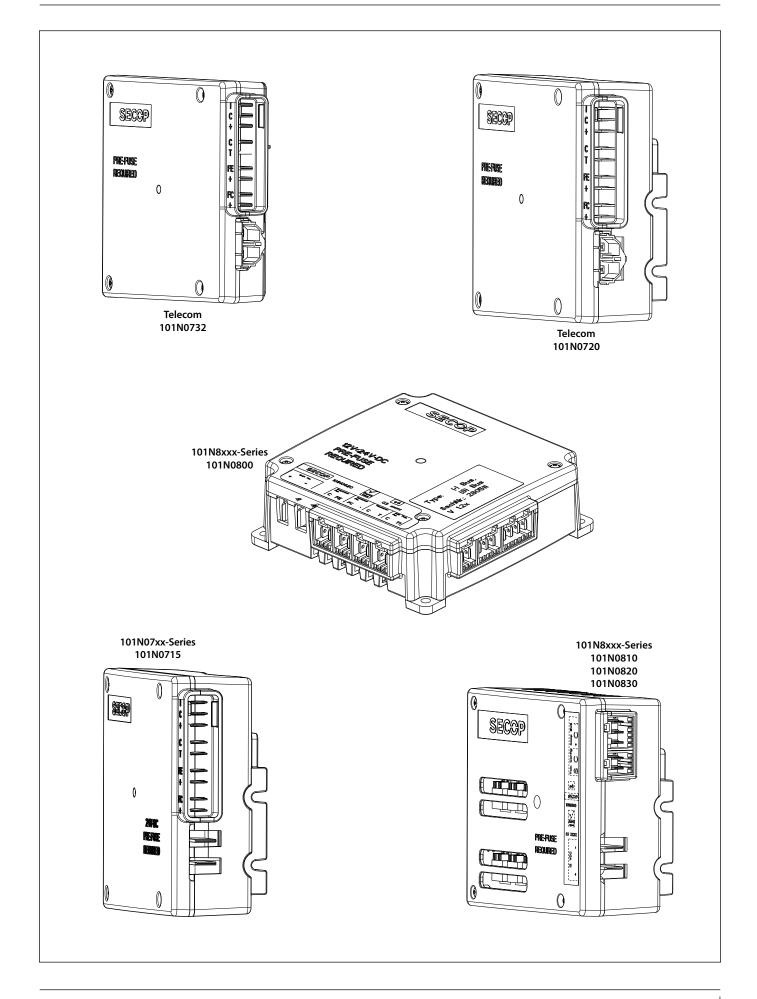
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3. Electronic Units - Housings



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The BD compressors are fitted with brushless direct current motors (BLDCM) which are electronically commutated by an electronic unit.

The electronic unit is delivered separately and for most of the units, be mounted on the compressor. A few units must be mounted separately from the compressor. Please follow our Instructions. The electronic unit must always be connected directly to the battery poles or power supply unit terminals. For the protection of the installation an external fuse must be installed in the power supply cable close to the battery or power supply unit. If the chassis is used as a conductor, a proper connection between cable and chassis must be established. Wrong polarity applied to the electronic unit does not destroy the unit - however, the compressor will not work.

Some electronic units can run on either 12 V DC or 24 V DC. The electronic unit will be calibrated to the applied voltage. This means that if the battery voltage is less than 17 V, the electric unit assumes that it is working in a 12 V DC system. If the voltage is higher than 17 V DC the electronic unit assumes that it is working in a 24 V DC system. Voltages are measured on the power supply terminals of the electronic unit.

If the compressor is planned to be stopped for long periods, a main switch can be installed.

For detailed function descriptions of the individual unit please, refer to our Instructions for that specific unit.

4.1 Voltage ranges with compressors

BD Compressors with various electronic units (P-Housing)	Voltage range	BD Compressors with various electronic units (T-Housing)	Voltage range	
BD35F /-HD.2 /-B	9.6 – 31.5 V DC	BD350GH 24V	19 – 31.5 V DC	
BD35F AC/DC	85 – 265 V AC, 50/60 Hz	BD350GH 12/24V	9.6 – 31.5 V DC	
	9.6 – 31.5 V DC	BD350GH 48V	32 - 60 V DC	
BD35F Solar	9.6 - 45 V DC	BD220CL	9.6 - 17 V DC	
BD50F	9.6 – 31.5 V DC			
BD50F AC/DC	85 – 265 V AC, 50/60 Hz	BD Compressors with		
	9.6 – 31.5 V DC	various electronic units	Voltage range	
BD80F	9.6 – 31.5 V DC	(Micro Series)		
BD35K	9.6 – 31.5 V DC	BD1.4F-AUTO.3	8.5 - 17 V DC	
BD35K AC/DC	85 – 265 V AC, 50/60 Hz	BD1.4F-VSD.2	9.6 – 34 V DC	
	9.6 – 31.5 V DC	BD1.4F-VSD-HD	9.6 – 34 V DC	
BD35K Solar	9.6 - 45 V DC	BD1.4F-VSD.2 AC/DC	85 – 265 V AC, 50/60 Hz 9.6 – 34 V DC	
BD50K	9.6 – 31.5 V DC		9.0 - 34 V DC	
BD80CN	9.6 – 31.5 V DC			
BD100CN	9.6 – 31.5 V DC			
BD250GH.2 12/24V	9.6 – 31.5 V DC			
BD250GH.2 48V	32 – 60 V DC			

4.2 Cable dimensions

To ensure correct starting and operating conditions, the cable dimensions must be observed and sized correctly.

We recommend a maximum voltage drop of 0.3 V in the cable between power supply source and supply terminals on the electronic module.

Calculation of voltage drop = 0.0175 * (cable length in meter / cable square in mm2) * 2 * current in Ampere

Example: Cable length = 5 meter Cable square = 4 mm2 Current consumption = 6.5 AVoltage drop = 0.0175 * (5/4) * 2 * 6.5 = 0.28 V.

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Catalogue	4. Electronic Units - Features
4.3 Compressor speed control	All BD compressors have brushless DC motors and therefore speed/capacity control can be made in an easy way. The applied voltage to the motor inside is proportional with compressor speed. Note - the voltage applied to the motor inside the compressor is not the same as supply voltage! On BD35F/K, BD50F/K, BD80F/CN, BD100CN and BD250GH.2 the speed can be set via an external resistor in series with the thermostat circuit between terminal C & T. For further details on the different electronic units please refer to the Instruction and Data Sheets for specific models. On electronic units with communication interface the speed can be selected via PC software Tool4Cool®. Depending on the electronic unit the speed range varies. All compressor models offer speed control by means of Tool4Cool® or by means of an external resistor. Please refer to Instructions and Operating Instructions for specific units.
4.4 Thermostat connection	The electronic unit on the BD compressor can operate with normal mechanical type thermostats as used in refrigeration appliances, or with electronic thermostats. The thermostat is connected between the terminals C and T of the electronic unit. The compressor current does not flow through the thermostat contacts. When the thermostat is cut out there will still be power on to the electronic unit. A system with no stand-by power consumption can be established if the thermostat is replaced by a jumper between the terminals C and T, and the main switch is replaced by a thermostat. In this case the full current to the compressor flows through the thermostat, which must be rated accordingly.
	Electronic units with communication interface have a built in electronic thermostat that controls the temperature via an NTC sensor connected to terminal C & T on the electronic unit. Recommended NTC sensor type Epcos M800/5K. The thermostat can be adjusted via communication interface and PC software Tool4Cool [®] . BD1.4F-VSD.2 compressor model offers thermostat adjustment feature by means of PC software Tool4Cool [®] or by means of an external resistor. For further details on thermostat function for the individual electronic units please refer to our Instructions.
4.5 Adaptive Energy Optimization (AEO) function	The AEO function is very suitable for tropical applications, systems with huge load variations and applications where energy is an important issue. Furthermore it can be an advantage to use it when it is difficult to determine at what speed the compressor should run. Customers producing condensing units see this as the preferred solution. The function will prevent short cycling of the compressor and thereby protect the battery. The AEO is built into electronic modules with separate code numbers. The AEO function can be overruled by means of a resistor to set a fixed speed. See Instructions for details on resistor size.

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Catalogue

4. Electronic Units - Features

4.6 AEO function for BD35F/K, BD50F, BD80F, BD250GH.2 and BD100CN

If no resistors are connected between C and T, speed control is done by AEO. The AEO function can be adapted via four setpoint parameters:

AEO Runtime setpoint:

The target runtime for the compressor during cut-in

AEO Start speed at power up:

The start speed of compressor in AEO mode, overruled by fixed speed with 2500 rpm for 30 sec

• AEO Max. ramp up time:

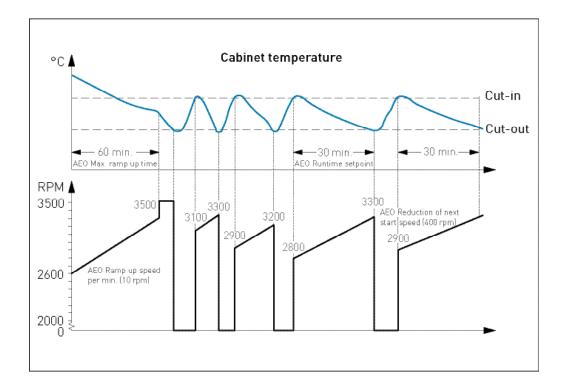
The maximum time that the speed is ramping up before reaching maximum speed for the compressor (3500 rpm for 101N0340 and 4400 rpm for 101N0390)

• AEO Reduction of next start speed:

The parameter defines how much the next start speed shall be reduced at next thermostat cut-in

	Motor speed [rpm]	Resistor R1 [Ohm]
	AEO	0
101N0340 101N0420	2000	173
with AEO	2500	450
	3000	865
	3500	1696

	Motor speed [rpm]	Resistor R1 [Ohm]
	AEO	0
101N0390	2500	203
with AEO	3100	451
	3800	867
	4400	1700



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Catalogue

4. Electronic Units - Features

4.7 ECO function

NTC and ECO Speed

"NTC and ECO speed set via Tool4Cool® / communication interface" would be used if a NTC is used to control the temperature inside the cabinet. This is the most advanced function of the new controllers. The compressor speed is automatically adapted to the current cooling requirement.

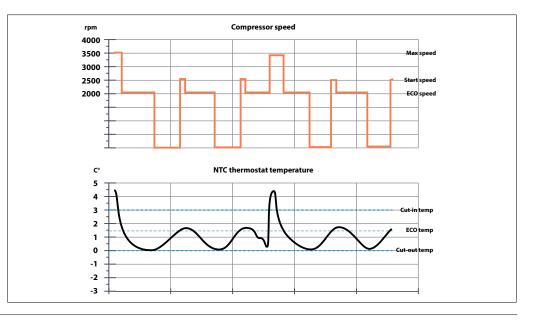
Operation in ECO mode reduces energy consumption and noise by controlling compressor speed as a function of temperature.

The Eco Temperature is automatically calculated to be in the middle between cut in temperature and cut out temperature:

• when operating below ECO temperature, compressors run at the set ECO speed (often 2000 rpm)

• when operating above ECO temperature, the compressors run at Requested speed (often 3500 rpm)

The temperatures can be adjusted in the "Thermostat" section within Tool4Cool®.



4.8 Fan connections

BD35F/K, BD50F/K, 80F/CN, 100CN and BD250GH.2

If a condenser fan is to be used, it must be connected to the electronic unit terminals + and F. Always use a 12V fan, even in 24V systems, as the electronic unit will automatically reduce the applied voltage to 12V for the fan.

The max. load on the electronic unit is 0.5A avg or 1A peak.

The fan is allowed to start with a higher current for the first 2 seconds. If the fan becomes overloaded, both fan and compressor will be cut out by the overload protection.

BD350GH, BD220CL, BD250GH.2 48 V, and BD1.4F-xxx

Electronic units with communication interface via Tool4Cool[®] have fan speed control in the range from 40 to 100 % controlled via a PWM signal.

Some of these controllers have the possibility to control both a condenser and evaporator fan via 2 fan outlets on the electronic unit.

Besides speed control it is possible to define a start and stop delay of the fans related to thermostat function.

The table below shows the different settings that can be made via PC software Tool4Cool[®]. This varies from unit to unit.

Name	Default	Max. value	Min. value	Step	Unit
Cond. Fan voltage	24	31	12	1	Volt
Fan speed	100	100	40	10	%
Fan start delay	0	240	0	1	Seconds
Fan stop delay	0	240	0	1	Seconds
Fan forced ON	OFF	ON	OFF	1	-
Detect missing fan	OFF	ON	OFF	1	-



Catalogue	4. Electronic Units - Features

4.9 Fan output power	Electronic Unit Code number	Fan output (Watt) and voltage (V)	Electronic Unit Code number	Fan output (Watt) and voltage (V)	Electronic Unit Code number	Fan output (Watt) and voltage (V)
	101N0212	6/12	101N0715	60/40 / 12 or 24	101N1010	6/12
	101N0390	5 / 12	101N0720	60 / 48	101N2100	6/12
	101N0340	6/12	101N0732	60 / 48	101N5100	6/12
	101N0420	6/12	101N0800	100/200 / 12		
	101N0510	6/12	101N0810	100/200 / 24		
	101N0650	6/12				

A 12V DC 5 Watt lamp can be connected between the terminals A and C on electronic unit 101N0510 and 101N5100. The output voltage between the terminals A and C is always regulated to 12V DC. A 12V DC lamp must be used for both 12V and 24V power supply systems. The lamp output can supply a continuous current of 0.5A avg

4.10 Lamp connection	BD35F/K, BD50F/K, 80F/CN, 100CN and BD250GH.2 12/24 V
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To diagnose why a compressor comes to an unintended stop, it is recommended to have a 10 mA Light Emitting Diode (LED) installed between the terminals + and D. Provided that the electronic unit is properly connected to the power supply, and the thermostat is on, the number of flashes depends on what kind of operational error was recorded. Each flash will last ¼ second. After the actual number of flashes there will be a delay with no flashes, so that the sequence for each error recording is repeated every 4 seconds.

LED flashes when: Battery voltage low: Battery must be charged. Hereafter start delay of 60 sec Fan is overloaded: Restart made after 60 sec Motor start error: Restart made after 60 sec Compressor speed too low: Restart made after 60 sec PCB temperature too high: Temperature must be below 90 / 100 °C. Hereafter delay of 60 sec

Electronic unit with communications interface via Tool4Cool® shows actual alarm message on the PC screen. Alarm messages (depending on electronic unit): No error Voltage failure Fan failure Motor failure Min. speed failure Max. speed failure Thermal failure NTC Sensor Failure

Some units also offer the possibility to connect an LED in order to get a flash pattern to identify the error.

For details please refer to the Instructions for a specific unit.

Catalogue

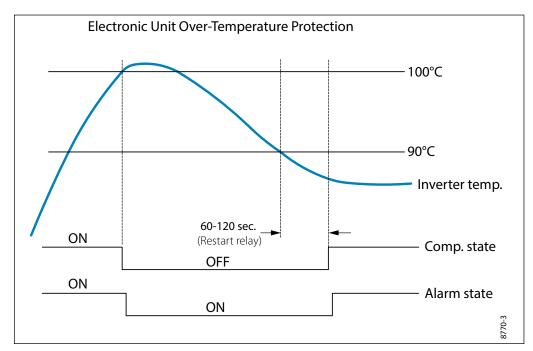
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4.12 Overload protections

In order to protect the electronic unit from destruction due to overheating a built in temperature sensor monitors the PCB temperature.

If the temperature exceeds 100 °C the compressor is stopped until the PCB temperature has dropped below 90 °C. For the second generation electronic units 101N0212 and 101N0650 the temperature limits are 10 °C above these values. The compressor is stopped until the PCB temperature has dropped below 100 °C. Hereafter the compressor will start again with a delay of approx. 1 minute (depends on the electronic unit).

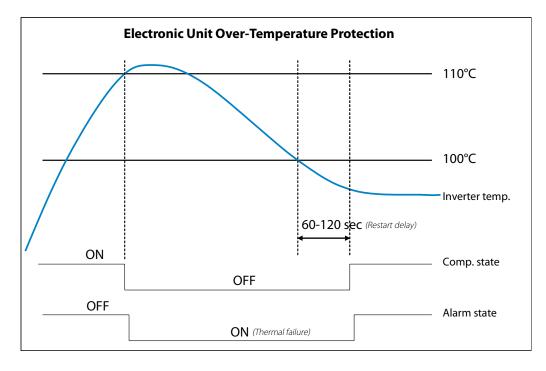
The heat influencing the PCB comes from its surrounding temperature and the temperature generated in the PCB due to load, meaning that a higher load is possible when surrounding temperature is low and vice versa.



101N0212, 101N0340. 101N0390, 101N0420, 101N0510

When the unit reaches 110 °C the system will shut down and an alarm error (Alarm 6: Thermal failure) will be sent.

The system restarts automatically after the temperature has dropped below 100 °C. Hereafter the set delay **Compressor restart delay** must be terminated. The default duration is 60 sec.



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Catalogue 4. Electronic Units - Features

4.13 Battery protection The battery protection prevents permanent damage to the battery by discharge.

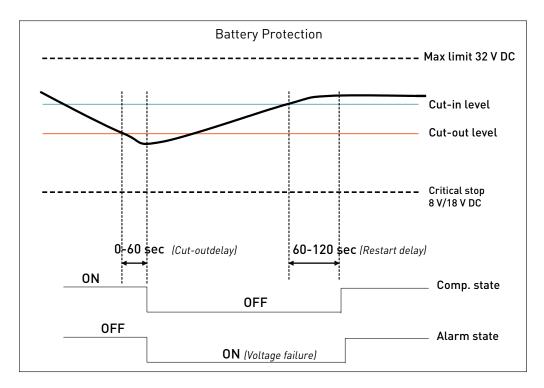
The setting range is 9-17 V DC for 12 V DC systems, and 19 to 27 V DC for 24 V DC systems. The cut out values and cut in differences can be set individual for 12 V systems and 24 V systems. Battery protection function is disabled in Solar controller 101N0420 (fixed range 10 to 45 V DC).

If the voltage remains below the cut-out voltage for the time specified in the parameter "Cut-out delay" (default 3s), compressor and fan are stopped.

Compressor and fan are stopped immediately, if the voltage drops below 8 V in 12 V systems and below

18 V in 24 V systems (critical stop).

If Solar mode is enabled, the electronic will be able to run over the entire input voltage range (9-32 V), without stopping between 12 V and 24 V range.



Tolerances are ± 0.30 V DC.

Settings

Name	Default	Max value	Min value	Step	Unit
Battery cutout level 12 V DC	10.4	17	9	0.1	Volt
Battery cut-in diff. 12 V DC	1.3	10	0.5	0.1	Volt
Battery cut-out level 24 V DC	22.8	32	19	0.1	Volt
Battery cut-in diff. 24 V DC	1.3	10	0.5	0.1	Volt
Battery Solar mode on/off	Disable	Enable	Disable	-	-
Cutout delay	3	60	0	1	Seconds

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Catalogue

4. Electronic Units - Features

4.13.1 Battery protection for electronic units 101N0212, 101N0390, 101N0340, 101N0510, and 101N0650

Standard battery protection settings

12V cut-out [V]	12V cu	t-in [V]	24V cut	t-out [V]	24V cu	t-in [V]
10.4	11	.7	2	2.8	24	4.2
Optional battery prote	_	5				
Resistor [kΩ]	12V cut-out	12V cut-in	12V max.	24V cut-out	24V cut-in	24V max.
terminals C - P	[V]	[V]	Voltage	[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

4.13.2 Battery protection for electronic unit 101N1010

Standard battery protection settings

,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
12V cut-out [V]	12V cut-in [V]
8.5	9.0

Optional battery protections settings

Resistor [kΩ]	12V cut-out	12V cut-in	12V max.
terminals S2 - C	[V]	[V]	Voltage [V]
0	9.60	10.90	17.0
0.17	9.73	11.03	17.0
0.34	9.86	11.16	17.0
0.54	10.00	11.30	17.0
0.75	10.12	11.42	17.0
0.97	10.25	11.55	17.0
1.23	10.38	11.68	17.0
1.50	10.52	11.82	17.0
1.81	10.65	11.95	17.0
2.15	10.78	12.08	17.0
2.53	10.91	12.21	17.0
2.96	11.04	12.34	17.0
3.44	11.17	12.47	17.0
3.99	11.30	12.60	17.0

4. Electronic Units - Features

± 0.3V DC,

all values

± 0.3V DC,

all values

Cut-out

Cut-out

Cut-in diff.

Cut-in diff.

Voltage (0.1 steps)

12V

24V

Catalogue

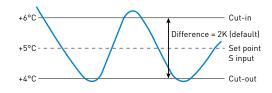
4.13.3 Standard battery protection settings for electronic units 101N2100 / 101N5100

4.13.4 Optional battery protection settings for electronic units 101N2100 / 101N5100

Resistor [kΩ] erminals C - P	Duty Cycle [%]	Speed [RPM]	Cut-out level [V]	Cut-in level [V]	Cut-out level [V]	Cut-in level [V]
open	0	Maintain	Maintain	n current value. Ca	in be changed via	Modbus
220	3	-	Maintain	n current value. Ca	in be changed via	Modbus
130	6	-	Maintain	n current value. Ca	in be changed via	Modbus
91	9	-	Maintain	n current value. Ca	in be changed via	Modbus
68	12	-	Maintain	n current value. Ca	in be changed via	Modbus
51	15			9.6 - 3	4 V DC	
43	18			De	fault	
36	21			Reset ba	ttery only	
30	24		Re	set battery and sp	peed to default va	lue
27	27	4000	Maintain	n current value. Ca	in be changed via	Modbus
22	30	4000	9.6	10.9	21.3	22.6
20	33	4000	10.1	11.4	22.3	23.6
18	36	4000	11.1	12.4	23.3	24.6
15	39	4000	12.1	13.4	24.3	25.6
13	42	3500	Maintain	n current value. Ca	in be changed via	Modbus
12	45	3500	9.6	10.9	21.3	22.6
11	48	3500	10.1	11.4	22.3	23.6
9.1	51	3500	11.1	12.4	23.3	24.6
8.2	54	3500	12.1	13.4	24.3	25.6
7.5	57	3000	Maintain	n current value. Ca	in be changed via	Modbus
6.2	60	3000	9.6	10.9	21.3	22.6
5.6	63	3000	10.1	11.4	22.3	23.6
5.1	66	3000	11.1	12.4	23.3	24.6
4.3	69	3000	12.1	13.4	24.3	25.6
3.9	72	2500	Maintain	n current value. Ca	in be changed via	Modbus
3.3	75	2500	9.6	10.9	21.3	22.6
2.7	78	2500	10.1	11.4	22.3	23.6
2.2	81	2500	11.1	12.4	23.3	24.6
1.8	84	2500	12.1	13.4	24.3	25.6
1.5	87	2000	Maintain	current value. Ca	in be changed via	Modbus
1.0	90	2000	9.6	10.9	21.3	22.6
0.68	93	2000	10.1	11.4	22.3	23.6
0.36	96	2000	11.1	12.4	23.3	24.6
0.051	99	2000	12.1	13.4	24.3	25.6

4.14 Set point selection during standalone operation (w/o Tool4Cool®) for electronic unit 101N2100

et point [°C]	R2 [Ohm]	Set point [°C]	R2 [Ohm]	Set point [°C]	R2 [Ohm]	Set point [°C]	R2 [Ohm]
-20	0	-12	2667	-4	5333	4	8000
-19	333	-11	3000	-3	5667	5	8333
-18	667	-10	3333	-2	6000	6	8667
-17	1000	-9	3667	-1	6333	7	9000
-16	1333	-8	4000	0	6667	8	9333
-15	1667	-7	4333	1	7000	9	9667
-14	2000	-6	4667	2	7333	10	10000
-13	2333	-5	5000	3	7667		



Example: R2 = $8330 \Omega \sim +5^{\circ}C$ Difference 2K (default value, can be changed via T4C) Cut-out = $+4^{\circ}C$ Cut-in = $+6^{\circ}C$

> Cut-out value will be written into EEPROM
> If R2 resistor is removed, Cut-out will continue to be 4°C and difference 2K

In order to utilize the integrated temperature control, connect a 10K potentiometer (or fixed resistor), between S and C (R2). Via the resistance, a temperature set point between -20 $^{\circ}$ C and 10 $^{\circ}$ C can be selected as per the table above.

The resistance adjusts the temperature set point around which the Cut-in and Cut-out occurs. It is defined as the average value between Cut-in and Cut-out.

The temperature set point will not change the Cut-in difference, but only adjust the Cut-out based on the temperature set point and the actual Cut-in diff setting.

(Cut-out = temperature set point – Cut-in diff / 2).



Default

10.4

1.3

21.3

1.3

Min. value

9.6

0.5

19

0.5

VDC

VDC

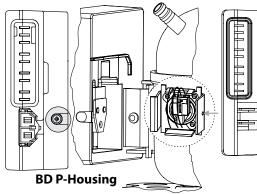
VDC

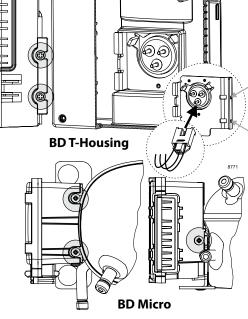
VDC



Catalogue

4.15 Mounting the electronic unit





BD P-Housing

The cable plug of the electronic unit is mounted on the pins of the current lead-in on the compressor.

Then the electronic unit itself is mounted on the bracket of the compressor. At first the left side is mounted, then the right side is pressed over the screw on the bracket (sideways, marked in grey). The electronic unit snaps on to the bracket and is now securely mounted on the compressor. Earth connection (via compressor baseplate) can be used if required.

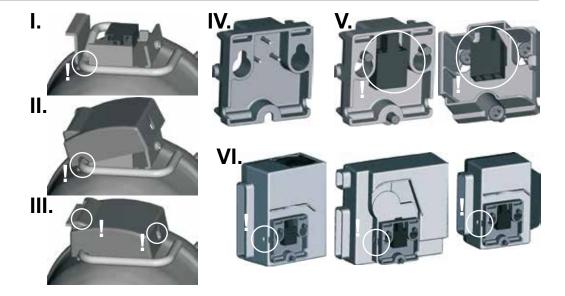
BD T-Housing

Connect the terminal plug from the electronic unit to the compressor terminal. Mount the electronic unit on the compressor and fix it with two screws (sideways, marked in grey).

BD Micro

Mount the electronic unit directly on the compressor plug and fix it with two screws (sideways or from above, marked in grey)

4.16 Mounting the remote kit



The remote kit was originally designed to be used together with the BD250GH twin compressor.

It is applicable to all electronic units used with the BD P-Housing compressor platform.

The remote kit supports in mounting the electronic unit in small machine compartments.

The electronits unit can be placed next to the compressor.



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Catalogue	5. Precondition for long operating life
	In order to achieve trouble free operation and long operating life for a hermetic compressor, the following preconditions should be observed:
	1. Sufficient starting torque of the compressor motor to allow the motor to start at the pressure conditions in the refrigeration system.
	2. Sufficient breakdown torque to allow the motor to handle the load conditions at start up and during operation.
	 When the refrigeration system is in operation, the temperature in the compressor should not rise to levels which could damage its components. Consequently, condensing and compression temperatures should be kept as low as possible. Precise dimensioning of the refrigeration system in question and careful evaluation of the operating conditions of the compressor at expected maximum loads. Sufficient cleanliness and low residual humidity in the circuit.
5.1 Motor overload	Compressor start up is influenced by the starting and/ or breakdown torque of the motor. If starting and/ or breakdown torque is insufficient, the compressor either cannot start or the start will be hampered and delayed because the motor protector is activated. Repeated start attempts subject the motor to overload, which sooner or later will result in failure. Faults of this kind can mostly be avoided by using the correct compressor/ motor combination. Danfoss offers the best solution for nearly all applications. It is a question of selecting the correct compressor for difficult fields of application.
5.2 Thermal overload	Operating conditions resulting in thermal decomposition of the materials used in the compressor must be avoided to ensure long compressor life. The materials relevant in this relation are motor insulation, refrigerant and oil.
	The motor insulation consists of the insulating enamel for the copper wires, the slot liner of the stator iron, bandages and feeder cables.
	As early as 1960, Danfoss Compressors introduced fully synthetic insulation materials on all its compressors and the enamel for the wire insulation and the insulating system itself has improved continuously ever since. The result is constantly improved protection against motor overload. Like all other CFC gases, R12 and R502 were found to be harmful to the environment and were consequently prohibited. These refrigerants were used together with mineral oils. A so called Spauschus reaction between oil and refrigerant could consequently occur at high temperatures, which led to valve coking, especially at high residual humidity.

	Danfoss
Catalogue	6. Design Limits
	In order to secure a satisfying lifetime of the compressor, some design criteria for the appliances must be fulfilled. Both the condensing temperature and the compressor temperature should be kept as low as possible. This can be done by using well dimensioned condenser surfaces and by ensuring good ventilation around the compressor under all operating conditions.
	In order to protect the compressor against overload, the compressor must start and work properly through pressure peaks obtained in the highest ambient temperature and lowest working voltage. These limitations ensure a protection of valves, gaskets, oil, and motor insulation. Refrigerants R134a, R404A or R507 need polyester oils (POE).
	Because of these oil types and the application of the above mentioned refrigerants there is – in practice – no longer any danger of valve coking. Restrictions on condensing and motor temperatures are now set to protect the motor and thus increase its life.
	For the application of compressors in household, commercial and mobile refrigeration using the available refrigerants, we recommend the following rules to be observed:
6.1 Coil temperature	Coil temperature must not exceed 125°C during continuous operation.
	For limited periods of time, e.g. during compressor start up or in the case of short load peaks, the temperature should not exceed 135°C.
	For commercial refrigeration with R134a the same limits as for household refrigeration apply.
	However, fan cooling of the compressor is recommended.
6.2 Condensing temperature	When using R600a or R134a the condensing temperature during continuous operation must not exceed 60°C. During limited load peaks the temperature must not exceed 70°C. In commercial refrigeration using R404A and R507 the condensing temperature limit is 48°C during continuous operation and 58°C in the case of load peaks.

Danfoss

The compressors are dried to a maximum moisture content of 60 to 75 mg depending on the compressor size. The maximum impurity content is 40 to 50 mg depending on the compressor size.

The BD compressors leave the factories with a moisture load less or equal 125 ppm. This ppm rate includes a safety factor for a storing time up to one year or longer. In addiction of storing time and storing conditions the moisture level will increase. A level between 200 and 250 ppm in general is not critical and will not harm the compressors or systems, where the compressors will be implemented.

Measurement method

Test parameters	Demand
Conditioning	24 h, room temperature
Condition of compressor	charged with oil
Measurement temperature	room temperature
Measurement time	1-2 min
Medium	dew point
Measurement cell	electrical hydrometer
Demand	max.125 ppm H ₂ O

With this measurement method, the total moisture in the air volume will be measured. The water, which is fixed in the plastic structure and the oil, will only be measured indirectly. Within 24 hours equilibrium between the humidity contents of the air and compressor parts is reached. The limit of 125 ppm is very low, if we consider that the surrounding air contains approx. 8000 ppm at 22°C and a relative humidity load of 40 %.

7.1 Filter drier selection

Only filter driers which are declared by the manufacturer to be suitable for mobile applications must be used in refrigeration systems with BD compressors. Filter material powder ending up in the compressor will lead to excessive wear of the piston and transmission parts, and metal particles deposited in the motor windings will cause the compressor to stop because the electric signal back to the electronic unit is disturbed.

The common desiccant is a molecular sieve, a zeolite. For R134a, R404A, R290 and R600a a material with 3 Å pores is recommended, e.g. UOP, XH 9 or XH 11, Grace 594, CECA Siliporite H3R. Pencil driers for R134a can possibly be used for R290, if they are tested according to IEC / EN 60 335 burst pressure demands.

In systems using a TEV value it can be recommend using a combo drier, which is a drier with a free volume that functions as receiver.

Catalogue

The compressors are delivered without mounted starting devices on pallets. The standard pack can be stacked and is intended for transport by forklift truck. The bottom pallet has the dimensions 1144 x 800mm.

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Quantities per pallets are specified in the individual data sheets. Electrical equipment is packed in separate boxes.

The most important performance controls carried out during manufacturing are,

- A high potential insulation test with 1650V for 1 second
- Pumping capacity
- Tightness of discharge side and discharge valve
- Tightness of compressor housing
- Check of the right oil charge
- Noise test

The compressors are supplied with sealed connectors and the sealing should not be removed before the system assembly takes place. (max. 15 minutes with open connectors).

The compressors are supplied charged with dried and degassed oil, which is normally sufficient for the lifetime of the compressor. The refrigeration systems and the system components must be dimensioned in such a way that the oil can be lead back continuously to the compressor housing without accumulating in the system, e.g. without the oil pockets and with sufficient gas velocity. The compressors use polyolester or mineral oils and are approved only for these oils and for the refrigerant to be used. The oil charge is specified in the individual data sheets.

A high potential test with 1650V for 1 second is carried out on all compressors before delivery. No high potential test or start tests must be carried out while the compressor is under vacuum. No attempt must be made to start the compressor without a complete starting device.

Allow the compressor to reach a temperature above 10°C before starting the first time in order to avoid starting problems.

Anti freeze agents must not be used in the compressors as such agents are damaging to several of the materials used. In particular, the ethyl or methyl alcohol contents of such anti freeze agents have a destructive effect on the synthetic motor insulation

R134a, R600, R290, and
R404A/R507Only the refrigerant amount which is necessary for the system to function must be charged. The
refrigerant amount may be critical, regarding oil foaming and liquid hammer after long standstill
periods. Because of this, limitations of refrigerant charges have been introduced.

If the permissible limit of refrigerant charge stated in the compressor data sheet is exceeded the oil will foam in the compressor after a cold start and may result in a damaged valve system in the compressor. The refrigerant charge must never exceed the amount that can be contained in the condenser side of the system.

If these limitations cannot be complied with, the risk may be reduced if a crankcase heater is properly used or if a pump down system is established.

Please refer to the compressor data sheets, as the maximum refrigerant charge may deviate on single types from the statements in the form. The maximum charge of 150g for R600a, R290 and R1234yf is an upper safety limit of the appliance standards, whereas the other weights are stated to avoid liquid hammer.

Compression	Max. refrigerant charge						
Compressor type	R134a	R1234yf	R600a	R290	R404A/R507		
BD, P-Housing	300 g	150 g	120 g	120 g	-		
BD, T-Housing	400 g	150 g	-	-	400 g		
BD-Micro	75 g	-	-	-	-		

According to the European Standard EN 60335-2-24 or draft IEC 60335-2-89, which must be complied with, the refrigerant charge must not exceed 150g.

Commercially available R600a and R290 must not be used because the fuel grades of these products are of a variable composition. These products may also contain impurities which could significantly reduce the reliability and performance of the system and lead to premature failure. Compressors for R600a and R290 are released for a base purity of 97 % or better. Impurity limits shall comply with DIN 8960 of 1998 (extended version of ISO 916).

All users of refrigerant R600a should refer to the chemical data safety sheets for full information on the safe handling of R600a and R290.

In general the charge of R600a or R290 is approximately 40-50 % by weight than that for HFC.

The refrigerant charge must never be too large to be contained on the condenser side of the refrigeration system. Only the refrigerant amount which is necessary for the system to function must be charged.

	Danfoss
Catalogue	10. Conversions
From R404A to R452A	At Danfoss strategy is focused on high efficiency and eco-friendly products. We believe – as all the major market stakeholders – that hydrocarbon refrigerants (isobutane R600a and propane R290) are the best solution for DC-powered applications. The use of R404A is under pressure due to global regulations, however special attention is given to F-gas regulation in Europe. We recommend the move to hydrocarbon refrigerant solutions (R600a and R290) which perfectly meet the increasing market demand for high efficiency while utilizing natural refrigerants with very low GWPs. We understand that there is a transition period, where specific applications will use different refrigerants while application redesign to hydrocarbons is not possible in a short time. Tests have so far shown good results with refrigerant R452A as a drop-in replacement for R404A. Based on this information, Danfoss allows the use of R452A on all its light commercial R404A released compressors. It is the customer's responsibility to validate the application and they should carefully consider the requirements and constrains when changing the R404A to R452A in their application.
From R134a to R600a or R290	Conversions from refrigerants R134a to R600a are not permitted as 1:1 replacements, as the refrig- erator must be approved for operation with flammable refrigerants, and the electrical safety has to be tested according to existing standards. The same applies to conversions from refrigerants R502 or R134a to R290. In many cases of transition from non-flammable to flammable refrigerants the appliance cabinet must be modified for safety or other reasons. Refrigerant containing system parts according to IEC / EN 60335 must withstand a specified pressure without leaking. High pressure side must withstand saturation overpressure of 70 °C times 3.5, low pressure side must withstand saturation overpressure of 20 °C times 5. Danfoss Compressors has been a pioneer and early adopter of hydrocarbons as refrigerants and offers a variety of suitable compressors for R600a and R290. (Please refer to Application Guideline "Practical Application of Refrigerants R600a and R290 in Small Hermetic Systems").
From R134a to R1234yf	R1234yf is a future refrigerant candidate in auto air conditioning replacing R134a. Likewise it might be used in DC-powered applications where redesign of the system to propane is not possible. R1234yf is classified as flammable in the relevant safety standards. It is more expensive than R134a, however holds remarkably less greenhouse potential than R134a. Our R134a compressors can be used for testing with this refrigerant and we are ready to support you in your investigation and approval procedure. Investigations on material compatibility have so far shown good results with refrigerant R1234yf in Danfoss light commercial R134a compressors. These results must be confirmed in the ongoing long term tests. At present, testing system performance can be carried out with the compressors originally de- signed for R134a. The same application limits as described on the R134a data sheet may be used. The compressors designed for R134a do currently (07/2017) not have a safety approval for flam- mable refrigerants like R1234yf, but might be available in approved variants within the near future.

Danfoss

Brazing problems caused by oil in the connectors can be avoided by placing the compressor on its base plate some time before brazing it into the system.

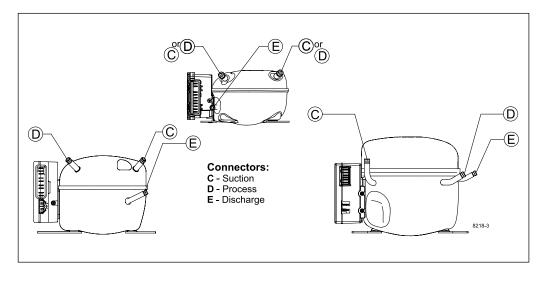
The compressor must never be placed upside down when mounting the rubber grommets in the base plate. Instead place the compressor on its side with

the connectors upwards.

The system should be closed within 15 minutes to avoid moisture and dirt penetration.

Tightening torque for M6 bolt joint mountings should be 5 Nm \pm 0,5 (hand-tight).

The positions of connectors are found in the sketches. C means suction and must always be connected to the suction line. E means discharge and must be connected to the discharge line. D means process and is used for processing the system.



The BD compressors are equipped with tube connectors of thick-walled, copper-plated steel tube which have a brazeability which comes up to that of conventional copper connectors.

The connectors are welded into the compressor housing and weldings cannot be damaged by overheating during brazing.

These copper-plated steel connectors have an aluminium cap sealing which gives a tight sealing. The sealing secures that the compressors have not been opened after leaving Danfoss's production lines. In addition to that, the sealing makes a protecting charge of nitrogen superfluous.

11.1 Connector positions

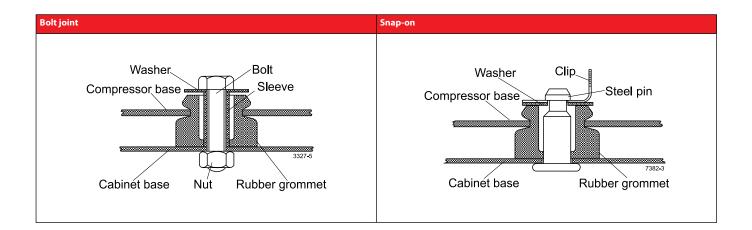


Catalogue 12. Mounting Accessories

Mounting type	Code number for ordering	Bolt / pin dimension	Compressor base hole	Parts list	Type of packaging
Bolt joint	118-1917	M6 metric	16 mm	I	Single pack for one compressor
Bolt joint	118-1918	M6 metric	16 mm	L	Industrial pack in any quantity
Snap-on *	118-1947	Ø 7.3 mm	16 mm	Ш	Single pack for one compressor
Snap-on *	118-1919	Ø 7.3 mm	16 mm	Ш	Industrial pack in any quantity

* not applicable to BD80F, BD100CN and BD250GH.2 using electronic units 101N0290 or 101N0732

Parts list		Code number
	Sleeve Ø 8 mm x 6.4 mm x 0.8 mm	112-2052
	Washer Ø 20 mm x Ø 6.7 mm x 1 mm	112-2053
I	Bolt M6 x 25 mm	681X1130
	Nut M6	118-3659
	Rubber grommet 16 mm	118-3661
	Steel pin	118-3586
	Washer Ø 21 x Ø 8.1 mm x 0.9 mm	118-3588
п	Clip	118-3585
	Rubber Grommet 16 mm	118-3661



13. Shipment Positions

Shipment of refrigeration appliances in horizontal position

When refrigeration appliances are shipped in the normal vertical position, this will normally not cause any damage to the compressor. If transported in horizontal position, the compressor must be oriented as shown in the table on the next page to prevent the accumulation of oil in the muffler and subsequent risk of damage. It is important to note that the compressor must be securely fastened and well supported during transportation.

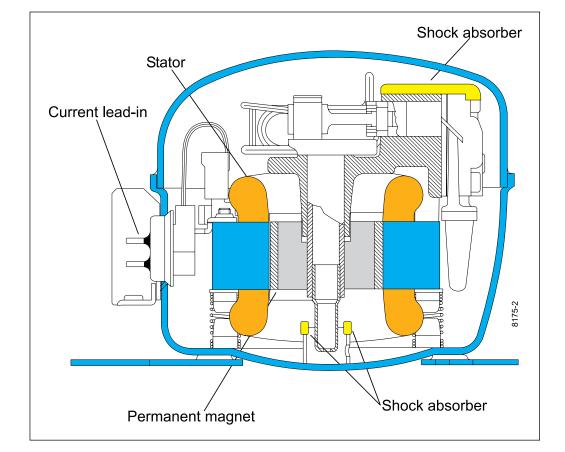
Refrigeration appliances can be safely transported in horizontal position:

• with trucks on roads and motorways in good condition

- by ship in containers
- on railways in good condition

Compressors Verdichter		Shipment positions of re	efrigeration appliances - Po	sition X must not be used		
Compresors	Connectors up	Electrical lead-in up	Connectors down	Electrical lead-in down	Base plate up	
BD Micro - Series						
BD - Series (P-Housing)						
BD - Series (T-Housing)						





R134a - BD1.4F-AUTO.3 - DC Compressor - 12V DC

BD1.4F-AUTO.3 - DC Compressor R134a, 12V DC

General

Code number (without electronic unit)	109Z0104
Electronic unit - Automotive	101N1010, 30 pcs: 101N1011
Approvals	-
Compressors on pallet	180

Application

Application		LBP/MBP
Evaporating temperature	°C	-25 to 5
Voltage range	VDC	8.5 - 17
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	-
38°C	S	S	-
43°C	S	S	-

Remarks on application:

New generation with optimized noise level during rough vehicle motions.

Motor

Motor type		permanent magnet, brushless DC
Speed	rpm	3,000
Resistance, all 3 windings (25°C)	mΩ	370

Design

Displacement	cm ³	1.41
Oil quantity (type)	cm ³	75 (polyolester)
Maximum refrigerant charge	g	70
Free gas volume in compressor	cm ³	500
Weight - Compressor/Electronic unit	kg	2.1/0.17

Standard battery protection settings (refer to 101N1000 Instructions for optional settings)

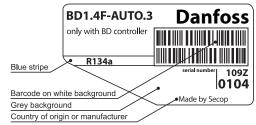
Voltage			Min. value	Default	Max. value
Cut out	(0.1 steps)	VDC	8.5	8.5	17
Cut in diff.	(0.1 steps)	VDC	0.5	0.5	8

Dimensions

Height	mm	A 96.25
		B 91.25
		B1 88.00
		B2 25.20
Suction connector	location/I.D. mm angle	C 6.2 25°
	material comment	Cu-plated steel Al cap
Process connector	location/I.D. mm angle	D 6.2 25°
	material comment	Cu-plated steel Al cap
Discharge connector	location/I.D. mm angle	E 5.0 0°
	material comment	Cu-plated steel Al cap
Connector tolerance	I.D. mm	±0.09, on 5.0 +0.12/+0.20
Remarks		



Danfoss



- = Static cooling normally sufficient
- = Oil cooling

S

0

- F₁ = Fan cooling 1.5 m/s (compressor compartment temperature equal to ambient temperature)
- F_2 = Fan cooling 3.0 m/s necessary
- SG = Suction gas cooling normally sufficent
- suction gas cooling normally si
 = not applicable in this area
- 155.5 136 ₹~ <u>စ</u>ုစ္ထ E \mathbf{C} $\overset{\circ}{\mathbb{C}}$ ٢D 106 \mathbf{D} A B1B A Σ В2 173.5 8700 174.9 00 2 ŝ <u>9.75</u>

Danfosis

Data sheets

R134a- BD1.4F-AUTO.3 - DC Compressor - 12V DC

EN 12900 Household (CECOMAF)

Evap. temp. in °C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5
Capacity in W	14.3	17.5	24.3	36.1	50.0	60.5	66.4	85.5	108
Power cons. in W	26.1	27.5	30.3	35.0	40.0	43.4	45.2	50.4	55.6
Current cons. in A	1.98	2.08	2.30	2.65	3.03	3.29	3.42	3.82	4.21
COP in W/W	0.55	0.64	0.80	1.03	1.25	1.39	1.47	1.70	1.94

EN 12900 Household (CECOMAF)

Evap. temp. in °F	-13	-10	0	10	14	20	30	40	41
Capacity in W	14.3	17.5	29.3	43.6	50.0	60.6	81.0	105	108
Power cons. in W	26.1	27.5	32.3	37.7	40.0	43.4	49.3	55.0	55.6
Current cons. in A	1.98	2.08	2.45	2.86	3.03	3.29	3.73	4.17	4.21
COP in W/W	0.55	0.64	0.91	1.15	1.25	1.40	1.64	1.91	1.94
COP in W/W	0.55	0.64	0.91	1.15	1.25	1.40	1.64	1.91	1

ASHRAE LBP

Evap. temp. in °F	-13	-10	0	10	14	20	30	40	41
Capacity in BTU/h	61.8	75.1	125	185	212	257	344	446	457
Power cons. in W	26.2	27.5	32.3	37.7	39.9	43.4	49.1	54.8	55.3
Current cons. in A	1.98	2.08	2.45	2.86	3.03	3.28	3.72	4.15	4.19
ERR in BTU/h	2.36	2.73	3.86	4.91	5.32	5.94	7.00	8.15	8.27

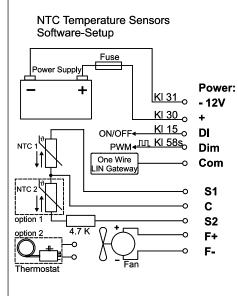
ASHRAE LBP

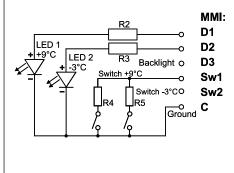
Evap. temp. in °C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5
Capacity in W	18.1	22.1	30.5	45.0	62.3	75.3	82.6	106	134
Power cons. in W	26.2	27.5	30.3	35.0	39.9	43.3	45.1	50.3	55.3
Current cons. in A	1.98	2.08	2.30	2.65	3.03	3.28	3.42	3.81	4.19
COP in W/W	0.69	0.80	1.00	1.29	1.56	1.74	1.83	2.12	2.43

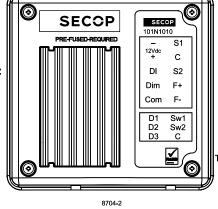
Test conditions	EN 12900/CECOMAF	ASHRAE LBP		
Condensing temperature	55°C	54.4°C		
Ambient temperature	32°C	32°C		
Suction gas temperature	32°C	32°C		
Liquid temperature	no subcooling	32°C		

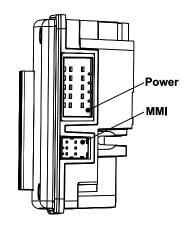
Error	E	rror type					
code	Can be read out in the software TOOL4COOL ®						
7	Communication failure						
6	Thermostat failure						
	(If the NTC thermistor is s the electronic unit will ent						
5	Thermal cut-out of elect	ronic unit					
	(If the refrigeration system has been too heavily loaded, or if the ambient temperature is high, the electronic unit will run too hot).						
4	Minimum motor speed	error					
	(If the refrigeration syster cannot maintain minimu rpm).	,	,				
3	Motor start error						
	(The rotor is blocked or refrigeration system is too		al pressure in the				
2	Fan over-current cut-ou	t					
	(The fan loads the electro	nic unit with mo	re than 0.65A _{peak}).				
1	Battery protection cut-o	out					
	(The voltage is outside the	e cut-out setting).				
cces	sories for BD1.4F-AU	TO.3					
Noun			Code number				
Bolt jo	int for one compressor	Ø: 16 mm	118-1917				
	int in quantities	Ø. 16 mm	118-1018				

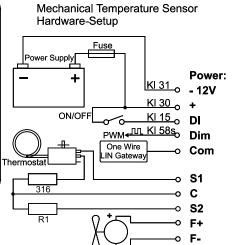
mounting		code number
Bolt joint for one compressor	Ø: 16 mm	118-1917
Bolt joint in quantities	Ø: 16 mm	118-1918
Snap-on in quantities	Ø: 16 mm	118-1919
One Wire/LIN gateway		105N9501
Not deliverable from Danfoss		
Automobile fuse	DIN 7258	15A











Far Resistors Marking R1 Value [Ω] see Instructions battery protection

4 6

10

12

10

IN I	3CC III3ti u	Cuons	battery protection			
R2	750		res	istor LED 1		
R3	750		resistor LED 2			
R4	1500)	codir	ng resistor S1		
R5	330		codir	ng resistor S2		
Connectors (Tyco Electronics)						
Code no	Male	Fer	nale	Crimp		
Power	178305-5	178	289-5	1-175218-20		
ммі	1376136-1	1-131	8119-3	1-318108-1		
Wire Dim	ensions DC					
S	ize	Max. length*				
Cross	AWG		12V op	eration		
section			-			
[mm ²]	[Gauge]	[n	n]	[ft.]		
2.5	12	2	.5	8		

Function

8 10 33 *Length between battery and electronic unit

4

6

13

20

R134a - BD1.4F-VSD.2 DC Compressor - 12/24V DC - 100-240V AC 50/60Hz

BD1.4F-VSD.2 - DC Compressor R134a, 12/24V DC & 100-240V AC 50/60Hz

TOOL4COOL®
Flexible control settings

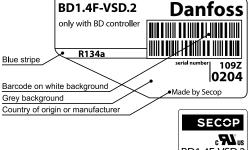
General	
Code number (without electronic unit)	109Z0204
Electronic unit - Variable Speed	101N2100, 30 pcs: 101N2101
Electronic unit - Variable Speed w. AC/DC converter	101N5100, 24 pcs: 101N5101
Approvals	UL
Compressors on pallet	180

Application

Application		LBP/MBP/HBP
Evaporating temperature	°C	-30 to 15
Voltage range DC	VDC	9.6 - 17 / 19 - 34
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

	HBP	
S	S	E.
S	S	SG
S	S	1 -
	S	S S





- = Static cooling normally sufficient S
- 0 = Oil cooling F_1

- = Fan cooling 1.5 m/s (compressor compartment temperature
- equal to ambient temperature)
- = Fan cooling 3.0 m/s necessary
- = Suction gas cooling normally sufficent

155.5 136

= not applicable in this area

Remarks on application:

New generation with optimized noise level during rough vehicle motions.

Motor

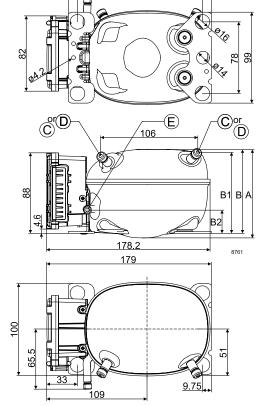
Motor type		permanet magnet, brushless DC
Speed	rpm	variable speed
Resistance, all 3 windings (25°C)	mΩ	210

Design

-		
Displacement	cm ³	1.41
Oil quantity (type)	cm ³	75 (polyolester)
Maximum refrigerant charge	g	70
Free gas volume in compressor	cm ³	500
Weight - Compressor/Electronic unit	kg	2.1 / 0.11 (DC) / 0.29 (AC/DC)

Standard battery protection settings (refer to 101N2100/5100 Instructions for optional settings)

Voltag	e (0.1 steps)			Min. value	Default	Max. value
12V	± 0.3V DC,	Cut out	VDC	9.6	10.4	17
120	all values	Cut in diff.	VDC	0.5	1.3	10
24V	± 0.3V DC,	Cut out	VDC	19	21.3	27
240	all values	Cut in diff.	VDC	0.5	1.3	10



Dimensions

Dimensions			
Height	mm	А	96.25
		В	91.25
		B1	88.00
		B2	25.20
Suction connector	location/I.D. mm angle	С	6.2 25°
	material comment		Cu-plated steel Al cap
Process connector	location/I.D. mm angle	D	6.2 25°
	material comment		Cu-plated steel Al cap
Discharge connector	location/I.D. mm angle	Е	5.0 0°
	material comment		Cu-plated steel Al cap
Connector tolerance	I.D. mm		±0.09, on 5.0 +0.12/+0.20



Data sheets

R134a - BD1.4F-VSD.2 DC Compressor - 12/24V DC - 100-240V AC 50/60Hz

		0 Hous			<u> </u>		-	1	ŕ	cooling		watt	Operationa	1	JOL4COOL			
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15	Error code or LED			Error type	2	
2,000		9	11	15	22	31	42	54	69	76	86	106	flashes	Can I	pe read out	in the softw	are TOOL	4COOL®
2,500	7	13	15	20	30	41	55	70	87	96	109	134	6	Thermos	tat failure			
3,000	9	16	19	26	37	51	67	85	105	116	131	161		(If the I	NTC therm	istor is sho	ort-circuit	or has
3,500	10	20	23	31	45	61	80	101	124	137	154	190			on, the ele	ectronic un	it will er	ter man
4,000	12	23	27	36	52	71	92	116	144	158	178	218		mode).				
apacity (A	SHRAF	I RP)						12V D	C, static	cooling		watt	5			electronic u		
rpm\°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15				ystem has be		
2.000	-30	12	14	19	28	39	-5 52	68	86	95	107	132			amplent te run too hot)	mperature	is nign, th	e electro
2,500	9	16	19	25	37	51	68	87	109	120	135	167	4		n motor sp			
3,000	11	20	24	32	47	64	84	106	109	144	163	201	-		-	system is	too hee	ulu load
3,000	13	20	24	32	47 56	76	84 99	106	155	144	163	201				maintain		
,	15	24	34	45	65	88	114	125	179	197	222	237			nately 1,850		-	
4,000	15	29	54	45	05	00	114	144	1/9	197	222	272	3	Motor st	art error			
ower cons	umptio	on						12V D0	C, static	cooling		watt		(The roto	r is blocked	l or the diffe	erential pre	ssure in
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15		refrigerat	ion system	is too high (>5 bar)).	
2,000		16	17	19	22	25	29	34	40	42	43	45	2	Fan over	-current cu	ıt-out		
2,500	16	20	21	24	28	32	37	42	48	50	52	54				electronic	unit with	more th
3,000	19	24	26	29	34	39	45	50	57	59	61	63		0.65A _{peak})				
3,500	23	29	31	35	41	47	53	59	66	69	72	77	1	Battery	protection	cut-out		
4,000	27	34	36	41	48	55	61	68	76	79	83	90		(The volt	age is outsi	de the cut-o	ut setting)	•
.,		5.				55		00					Wire Dimen	sions DC				
urrent cor	nsumpt	ion (fo	r 24V aj	oplicati	ons the	follow	ing mu	st be ha	lfed)			<u>A</u>	Siz			ength*		length*
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15	Cross	AWG	12V op	eration	24V o	peration
2,000		1.25	1.33	1.48	1.74	2.02	2.32	2.65	2.74	2.85	3.00	3.28	section	[C 1	[]	16.1	[]	1 10.3
2,500	1.25	1.53	1.63	1.83	2.15	2.48	2.84	3.22	3.69	3.84	4.00	4.20	[mm ²] 2.5	[Gauge] 12	[m] 2.5	[ft.] 8	[m] 5	[ft.] 16
3,000	1.49	1.84	1.96	2.20	2.59	2.98	3.40	3.82	4.38	4.56	4.77	5.09	4	12	2.5	0 13	8	26
3,500	1.77	2.19	2.34	2.63	3.07	3.53	4.00	4.47	5.06	5.26	5.51	5.89	6	12	6	20	12	39
4,000	2.08	2.58	2.75	3.08	3.59	4.10	4.63	5.16	5.87	6.07	6.31	6.63	10	8	10	33	20	66
															*Lenath b	etween batt	terv and el	ectronic
OP (EN 12	900 Ho	usehol	d/CECO	MAF)				1	C, static	cooling		W/W		(5			
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15	Accessories					e numbe
2,000		0.59	0.66	0.81	1.03	1.24	1.43	1.60	1.72	1.83	1.99	2.36	Bolt joint fo			Ø:16 m		18-1917
2,500	0.43	0.64	0.72	0.86	1.08	1.29	1.48	1.67	1.83	1.94	2.10	2.46	Bolt joint in			Ø:16 m		18-1918
3,000	0.45	0.67	0.74	0.89	1.10	1.30	1.50	1.69	1.84	1.97	2.14	2.54	Snap-on in			Ø:16 n		18-1919
3,500	0.46	0.68	0.75	0.89	1.10	1.30	1.51	1.70	1.88	1.99	2.15	2.47	Terminal co		tronic unit			5N9120
4,000	0.45	0.68	0.75	0.89	1.09	1.30	1.50	1.70	1.88	1.99	2.14	2.42	Automoblie	e fuse		12V: 1		Not
					<u>^</u>								DIN 7258			24V: 1		liverable
OP (ASHR								1	C, static			W/W	Main switch	۱		min. 2	OA from	n Danfos
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15	Test condit	ions		EN 1290		ASHRAE
2,000		0.74	0.83	1.01	1.29	1.55	1.79	2.01	2.17	2.31	2.52	2.98	i con con an	lons		CECOM		LBP
2,500	0.54	0.80	0.89	1.07	1.34	1.60	1.84	2.08	2.29	2.43	2.64	3.10	Condensing	a temperat	ure	55°C		54.4°C
3,000	0.57	0.84	0.93	1.11	1.37	1.62	1.87	2.11	2.35	2.47	2.70	3.20	Ambient te			32°C		32°C
3,500	0.58	0.85	0.94	1.11	1.36	1.62	1.87	2.12	2.36	2.49	2.69	3.11	Suction gas		ıre	32°C		32°C
4,000	0.58	0.85	0.94	1.11	1.36	1.61	1.87	2.12	2.36	2.50	2.68	3.05	Liquid tem	oerature		no subcoc	oling	32°C
1011	on option 2	PC opt Gatway o	ion (TOOL connected to re LIN Ga	4COOL®) D/I and C			2 = spee			1	N2100	LEI non PC c LED conner + and D/I	Power supply	Use Use Control of the Control of th	ECOP Converse	R1 = sp	eed/battery tpoint	
					in swjtch) (Fa	n) 12V						option 2	option		non PC op	otion (resistors)

Accessories for BD1.4F-VSD.2		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
Terminal cover for electronic unit		105N9120
Automoblie fuse	12V: 15A	Not
DIN 7258	24V: 15A	deliverable
Main switch	min. 20A	from Danfoss

Test conditions	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

BD1.4F-VSD-HD Heavy Duty - DC Compressor R134a, 12/24V DC



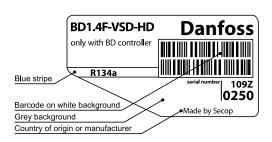
Danfoss

General

Code number (without electronic unit)	109Z0250
Electronic unit - Variable Speed	101N2100, 30 pcs: 101N2101
Approvals	-
Compressors on pallet	180

Application

••		
Application		LBP/MBP/HBP
Evaporating temperature	°C	-30 to 15
Voltage range	VDC	9.6 - 17 / 19 - 34
Max. condensing temperature continuous (short)	°C	60 (70)
Max. winding temperature continuous (short)	°C	125 (135)



Cooling requirements

Application	LBP	MBP	HBP			
	LDF	IVIDE	пр			
32°C	S	S	S			
38°C	S	S	S			
43°C	S	S	S			
Remarks on application:						
HD (Heavy Duty) version of the BD1.4F-VSD which can handle extreme vibrations.						

Motor

Motor type	permanet magnet, brushless DC	
Speed	rpm	variable speed
Resistance, all 3 windings (25°C)	mΩ	210

S	= Static cooling	normally	/ sufficient

- O = Oil coolingF₁ = Fan cooling 1.
 - = Fan cooling 1.5 m/s (compressor compartment temperature
 - equal to ambient temperature)
- $F_2 = Fan \text{ cooling } 3.0 \text{ m/s necessary}$
- SG = Suction gas cooling normally sufficent
 - = not applicable in this area

Design

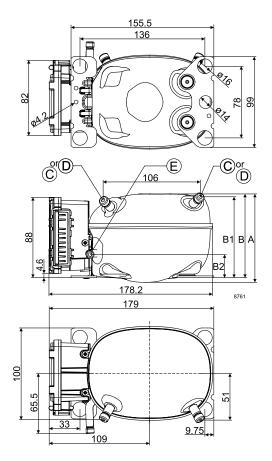
Displacement	cm ³	1.41	
Oil quantity (type)	cm ³	75 (polyolester)	
Maximum refrigerant charge	g	70	
Free gas volume in compressor	cm ³	500	
Weight - Compressor/Electronic unit	kg	2.1/0.11	

Standard battery protection settings (refer to 101N2100 *Instructions* for optional settings)

Voltag	e (0.1 steps)			Min. value	Default	Max. value
12V	± 0.3V DC,	Cut out	VDC	9.6	10.4	17
120	all values	Cut in diff.	VDC	0.5	1.3	10
24V	± 0.3V DC,	Cut out	VDC	19	21.3	27
240	all values	Cut in diff.	VDC	0.5	1.3	10

Dimensions

Dimensions			
Height	mm	А	96.25
		В	91.25
		B1	88.00
		B2	25.20
Suction connector	location/I.D. mm angle	С	6.2 25°
	material comment		Cu-plated steel Al cap
Process connector	location/I.D. mm angle	D	6.2 25°
	material comment		Cu-plated steel Al cap
Discharge connector	location/I.D. mm angle	Е	5.0 0°
	material comment		Cu-plated steel Al cap
Connector tolerance	I.D. mm		±0.09, on 5.0 +0.12/+0.20





Data sheets

R134a - BD1.4F-VSD-HD Heavy Duty DC Compressor - 12/24V DC

Capacity							1	<u> </u>	T	ooling	·	wat
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000		9	11	15	22	31	42	54	69	76	86	106
2,500	7	13	15	20	30	41	55	70	87	96	109	134
3,000	9	16	19	26	37	51	67	85	105	116	131	161
3,500	10	20	23	31	45	61	80	101	124	137	154	190
4,000	12	23	27	36	52	71	92	116	144	158	178	218
Capacity	ASHR	AE LB	P)				12	V DC, s	static c	ooling	I	wat
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000		12	14	19	28	39	52	68	86	95	107	132
2,500	9	16	19	25	37	51	68	87	109	120	135	167
3,000	11	20	24	32	47	64	84	106	131	144	163	201
3,500	13	24	29	39	56	76	99	125	155	170	192	237
4,000	15	29	34	45	65	88	114	144	179	197	222	272
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		16	17	19	22	25	29	34	40	42	43	45
2,500	16	20	21	24	28	32	37	42	48	50	52	54
3,000	19	24	26	29	34	39	45	50	57	59	61	63
3,500	23	29	31	35	41	47	53	59	66	69	72	77
4,000	27	34	36	41	48	55	61	68	76	79	83	90
Current co	onsum	ption	(for 24	V appli	ication	s the fo	llowing	a must	be half	ed)		
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000		1.25	1.33	1.48	1.74	2.02	2.32	2.65	2.74	2.85	3.00	3.28
2,500	1.25	1.53	1.63	1.83	2.15	2.48	2.84	3.22	3.69	3.84	4.00	4.20
3,000	1.49	1.84	1.96	2.20	2.59	2.98	3.40	3.82	4.38	4.56	4.77	5.09
3,500	1.77	2.19	2.34	2.63	3.07	3.53	4.00	4.47	5.06	5.26	5.51	5.89
4,000	2.08	2.58	2.75	3.08	3.59	4.10	4.63	5.16	5.87	6.07	6.31	6.63
COP (EN 1	2900	House	hold/(FCON			12		static c	ooling		w/v
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000		0.59	0.66	0.81	1.03	1.24	1.43	1.60	1.72	1.83	1.99	2.36
2,500	0.43	0.64	0.72	0.86	1.08	1.29	1.48	1.67	1.83	1.94	2.10	2.46
3,000	0.45	0.67	0.74	0.89	1.10	1.30	1.50	1.69	1.84	1.97	2.14	2.54
3,500	0.46	0.68	0.75	0.89	1.10	1.30	1.51	1.70	1.88	1.99	2.15	2.47
4,000	0.45	0.68	0.75	0.89	1.09	1.30	1.50	1.70	1.88	1.99	2.14	2.42
COP (ASH	RAFI	RP)					. 12		static c	ooling		w/\
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	<u> </u>	0.74	0.83	1.01	1.29	1.55	1.79	2.01	2.17	2.31	2.52	2.98
2,500	0.54	0.80	0.89	1.07	1.34	1.60	1.84	2.08	2.29	2.43	2.64	3.10
3,000	0.57	0.84	0.93	1.11	1.37	1.62	1.87	2.11	2.35	2.47	2.70	3.20
3,500	0.58	0.85	0.94	1.11	1.36	1.62	1.87	2.12	2.36	2.49	2.69	3.11
4,000	0.58	0.85	0.94	1.11	1.36	1.61	1.87	2.12	2.36	2.50	2.68	3.05
.,000	0.00	0.05	0.01		1.55	1 1.01	1.07	1 2.12	12.55	12.55	1 2.00	. 5.55
								F	use	Mai	n swj	tch
										\sim	$\sim \sim$	

Operational	errors (TOOL4COOL [®] or LED flashes)
Error code or LED	Error type
flashes	Can be read out in the software TOOL4COOL ®
6	Thermostat failure
	(If the NTC thermistor is short-circuit or has no connection, the electronic unit will enter manual mode).
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 $0.65A_{\text{peak}}$).
1	Battery protection cut-out
	(The voltage is outside the cut-out setting).

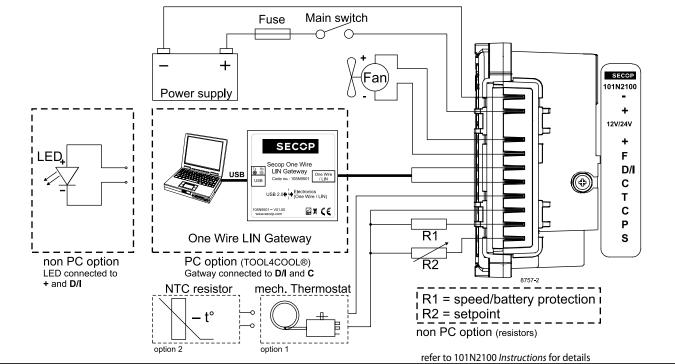
Wire Dimensions DC

whe bille	Whe Dimensions DC							
Si	ze	Max. length* Max. length*			ength*			
Cross section	AWG	12V operation		24V op	eration			
[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

Accessories for BD1.4F-VSD-HD		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
Terminal cover for electronic unit		105N9120
Automoblie fuse	12V: 15A	Not
DIN 7258	24V: 15A	deliverable
Main switch	min. 20A	from Danfoss
Test conditions	EN 12900	ASHRAE
	CECOMAF	LBP

Condensing temperature	55℃	54.4°C
Ambient temperature	32°C	32°C
Suction gas temperature	32°C	32°C
Liquid temperature	no subcooling	32°C



TOOL 4 COOL

R134a - BD1.4F-VSD.2 DC Compressor - 12/24DC V - Inch Connectors

BD1.4F-VSD.2 - DC Compressor R134a, 12/24V DC & 100-240V AC 50/60Hz

General

Code number (without electronic units)	109Z0206
Electronic unit - Variable Speed	101N2100, 30 pcs: 101N2101
Electronic unit - Variable Speed w. AC/DC converter	101N5100, 24 pcs: 101N5101
Approvals	UL
Compressors on pallet	180

Application

Application		LBP/MBP/HBP
Evaporating temperature	°F	-20 to 59
Voltage range DC	VDC	9.6 - 17 / 19 - 34
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	S
38°C	S	S	S
43°C	S	S	S
Remarks on application:			· · · · · · · · · · · · · · · · · · ·

New generation with optimized noise level during rough vehicle motions.

Motor

Motor type		permanet magnet, brushless DC
Speed		variable speed
Resistance, all 3 windings (25°C)	mΩ	210

Design

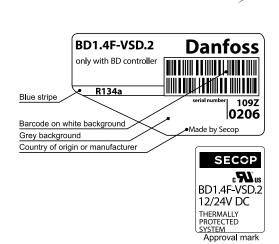
Displacement	cu.in.	0.086
Oil quantity (type)	fl.oz.	2.64 (polyolester)
Maximum refrigerant charge	oz.	2.47
Free gas volume in compressor	fl.oz.	17.60
Weight - Compressor/Electronic unit	lbs.	4.63 / 0.24 (DC) / 0.64 (AC/DC)

Standard battery protection settings (refer to 101N2100/5100 Instructions for optional settings)

	· · · · · · · · · · · · · · · · · · ·					5,
Voltage	e (0.1 steps)			Min. value	Default	Max. value
12V	± 0.3V DC,	Cut out	VDC	9.6	10.4	17
120	all values	Cut in diff.	VDC	0.5	1.3	10
2414	± 0.3V DC,	Cut out	VDC	19	21.3	27
24V all values	all values	Cut in diff.	VDC	0.5	1.3	10

Dimensions

Dimensions			
Height	inch	А	3.79
		В	3.59
		B1	3.46
		B2	0.99
Suction connector	location/I.D. inch angle	С	0.252-0259 25°
	material comment		Cu-plated steel Al cap
Process connector	location/I.D. inch angle	D	0.252-0259 25°
	material comment		Cu-plated steel Al cap
Discharge connector	location/I.D. inch angle	Е	0.202-0.205 0°
	material comment		Cu-plated steel Al cap
Remarks: inch connectors			



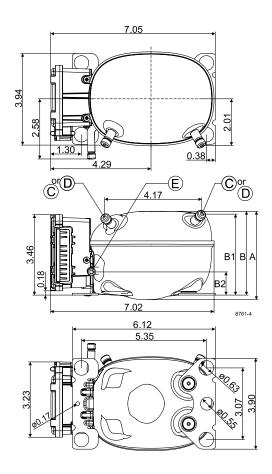
= Static cooling normally sufficient

O = Oil cooling

S

F₁

- Fan cooling 1.5 m/s (compressor compartment temperature equal to ambient temperature)
- F_2 = Fan cooling 3.0 m/s necessary
- SG = Suction gas cooling normally sufficent
 - = not applicable in this area





Data sheets

R134a - BD1.4F-VSD.2 DC Compressor - 12/24DC V - Inch Connectors

rpm \ °F 2,000	-20	-13	-10	0	10	14	20	30	41	45	50	59	Error code	1		Error type		
						4.4.5				-			or LED					
	22	41	48	78	115	133	162	218	294	325	366	450	flashes			in the softwa	are TOO	L4CO
2,500	32 52	57 80	67 92	107 138	154 192	175 216	210	278 337	370 447	409 493	461 556	569 685	6	Thermost				
3,000 3,500	52	80 89	92	138	229	216	257 306	400	447 528	493 582	556 656	685 809				s short-circu		
4,000	67	105	106	185	229	258	306	400	611	673	757	928	5			enter manu electronic u		
						275	552				737	520	2			stem has be		heav
Capacity (E	r	r			-			-	<u> </u>	cooling		watt				perature is h		
rpm \ °F	-20	-13	-10	0	10	14	20	30	41	45	50	59		will run too	hot).		-	
2,000		10	12	19	28	32	39	52	70	77	87	107	4		motor sp			
2,500	9	16	19	31	45	51	61	80	105	116	130	159				tem is too he num speed		
3,000 3,500	14 11	22 24	26 30	39 48	55 68	62 76	74 90	97 116	127 149	140 163	157 181	192 219		rpm).	intain minir	num speed	at appro	XIIIId
4,000	21	32	36	40 54	75	85	100	130	170	186	209	253	3	Motor sta	rt error			
4,000	21	52	50	74	75	05	100	150	170	100	209	255		(The rotor	is blocked	or the diffe	rential p	oress
Power con	sumptio	on						12V D	C, static	cooling		watt		refrigeratio	on system is	too high (>5	bar)).	
rpm \ °F	-20	-13	-10	0	10	14	20	30	41	45	50	59	2	Fan over-	current cu	t-out		
2,000		14	15	19	24	26	29	35	40	41	43	44		(The fan loa	ads the elect	tronic unit w	ith more	than
2,500	19	21	22	25	29	31	34	38	42	43	44	45						
3,000	22	24	26	30	36	38	41	46	51	52	53	54	1		rotection			
3,500	25	29	31	37	44	46	50	55	60	62	63	65		(The voltag	je is outside	the cut-out	setting).	·
4,000	31	36	38	45	51	53	57	63	69	71	74	79	Wire Dime	nsions DC				
Current co	nsumpt	ion (for	24V ap	plicatio	ns the	followir	ng must	be half	ed)			А	Si	ze		ength*	Ma	x. le
rpm∖°F	-20	-13	-10	0	10	14	20	30	41	45	50	59	Cross	AWG	12V op	eration	24V	/ ope
2,000		1.31	1.39	1.65	1.90	2.00	2.15	2.41	2.71	2.82	2.96	3.23	section [mm ²]	[Gauge]	[m]	[ft.]	[m]	I
2,500	1.51	1.62	1.68	1.95	2.28	2.42	2.63	2.96	3.25	3.33	3.40	3.45	2.5	[Gauge]	[m] 2.5	8	[m] 5	\rightarrow
3,000	1.78	1.97	2.06	2.40	2.76	2.91	3.14	3.49	3.82	3.92	4.03	4.17	4	12	4	13	8	
3,500	1.95	2.25	2.38	2.85	3.32	3.51	3.78	4.20	4.58	4.69	4.81	4.95	6	10	6	20	12	
4,000	3.17	3.24	3.29	3.56	3.93	4.11	4.38	4.86	5.37	5.55	5.75	6.05	10	8	10	33	20	
EER (ASHR	AE LBP)							12V D	Cistatic	cooling		BTU/h			*Length	between bai	tery and	d elec
rpm\°F	-20	-13	-10	0	10	14	20	30	41	45	50	59	Accessorie	es for BD1.4	4F-VSD		(Code
2.000		2.88	3.19	4.06	4.78	5.06	5.49	6.29	7.39	7.88	8.58	10.17	Bolt joint f	or one com	pressor	Ø:16	mm	11
2.500	1.88	2.95	3.33	4.32	5.09	5.38	5.83	6.66	7.79	8.29	9.00	10.57	Bolt joint i	n quantitie	s	Ø:16	mm	11
3.000	2.73	3.55	3.82	4.54	5.16	5.42	5.84	6.68	7.89	8.43	9.19	10.90	Snap-on ii	n quantities		Ø:16	mm	11
3.500	2.09	3.14	3.49	4.42	5.18	5.49	5.96	6.84	8.01	8.50	9.18	10.60	Terminal c	over for ele	ctronic uni			105
4.000	2.36	3.09	3.36	4.19	5.00	5.34	5.87	6.83	8.03	8.51	9.15	10.40	Automobl	ie fuse			: 15A	
COP (EN 12	000 11-	urahal						121/0	C static	cooling		w/w	DIN 7258				: 15A . 20A	deli from
rpm \ °F	-20	-13	-10	0	10	14	20	30	41	45	50	59	Main swite	.n		min	. 20A	
2.000	20	0.69	0.77	0.97	1.14	1.21	1.31	1.50	1.76	1.88	2.04	2.42	Test condi	tions		EN 129		A
2.500	0.45	0.77	0.89	1.23	1.52	1.62	1.79	2.09	2.50	2.68	2.94	3.53				CECON		
3.000	0.62	0.90	1.00	1.29	1.54	1.64	1.80	2.10	2.52	2.70	2.96	3.55		ng tempera		131°		
3.500	0.46	0.83	0.96	1.29	1.56	1.66	1.81	2.10	2.48	2.64	2.87	3.35		emperature as temperat		90°l		
4.000	0.67	0.88	0.96	1.21	1.48	1.58	1.76	2.07	2.46	2.61	2.82	3.22	Liquid ten		uie	no subco		
																	21	
101N5	tion option ad to	PC op Gatway One Wi	ion (TOOL connected It re LIN Ge	DI and C teway ECOP Sp One Wire N Gateway Coe Wire N Gateway Coe Wire Coe Coe Coe Coe Coe Coe Coe Coe Coe Coe Coe Coe Coe Coe Coe Coe	n switch	R R Far	= speec = setpoi	Lamp 12				01N21	r supply	USB SECOND		R1 R2 R1 = spe		8757-3
	· · •			1 1		э <u> </u>		<u> U</u> P	━ Щ I	∟ÿį́			$+ 1$ $^{-}$		≒ ⊧⊢	_ R2 = set	μοιήτ	tors)

or LED	Error type					
flashes	Can be read out in the software TOOL4COOL®					
6	Thermostat failure					
	(If the NTC thermistor is short-circuit or has no connection, the electronic unit will enter manual mode).					
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 $0.65 {\rm A}_{\rm peak}$).					
1	Battery protection cut-out					
	(The voltage is outside the cut-out setting).					

Si	ze	ength*	Max. length*				
Cross section	AWG		12V operation		eration		
[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		

ngth between battery and electronic unit

Accessories for BD1.4F-VSD		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
Terminal cover for electronic unit		105N9120
Automoblie fuse	12V: 15A	Not
DIN 7258	24V: 15A	deliverable
Main switch	min. 20A	from Danfoss
Test conditions	EN 12900 CECOMAF	ASHRAE LBP
Condensing temperature	131°F	130°F
Ambient temperature	90°F	90°F
Suction gas temperature	90°F	90°F
Liquid temperature	no subcooling	90°F

÷ + F D/I C T C

s

R1 = speed/battery protection R2 = setpoint non PC option (resistors)

BD1.4F-VSD-HD Heavy Duty - DC Compressor R134a, 12/24V DC



Janfoss

General

Code number (without electronic units)	109Z0251
Electronic unit - Variable Speed	101N2100, 30 pcs: 101N2101
Approvals	_
Compressors on pallet	180

Application

Application		LBP/MBP/HBP
Evaporating temperature	°F	-20 to 59
Voltage range	VDC	9.6 - 17 / 19 - 34
Max. condensing temperature continuous (short)	°F	140 (158)
Max. winding temperature continuous (short)	°F	257 (275)

BD1.4F-VSD-HD Danfoss only with BD controller R134a Blue stripe R134a Barcode on white background Grey background Country of origin or manufacturer

Cooling requirements

oooning requirements			
Application	LBP	MBP	HBP
32°C	S	S	S
38°C	S	S	S
43°C	S	S	S
Remarks on application:			

HD (Heavy Duty) version of the BD1.4F-VSD which can handle extreme vibrations.

Motor

Motor type		permanet magnet, brushless DC
Speed		variable speed
Resistance, all 3 windings (25°C)	mΩ	210

= Static cooling normally sufficient

O = Oil cooling

S

- $F_1 = Fan \text{ cooling } 1.5 \text{ m/s}$
 - (compressor compartment temperature equal to ambient temperature)
- F₂ = Fan cooling 3.0 m/s necessary
- SG = Suction gas cooling normally sufficent
 - = not applicable in this area

Design

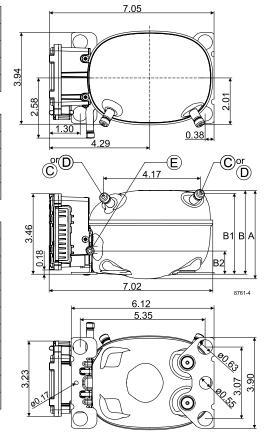
Displacement	cu.in.	0.086
Oil quantity (type)	fl.oz.	2.64 (polyolester)
Maximum refrigerant charge	oz.	2.47
Free gas volume in compressor	fl.oz.	17.60
Weight - Compressor/Electronic unit	lbs.	4.63/0.24

Standard battery protection settings (refer to 101N2100 Instructions for optional settings)

		• •				υ,
Voltag	e (0.1 steps)			Min. value	Default	Max. value
121/	12V ± 0.3V DC, all values	Cut out	VDC	9.6	10.4	17
120		Cut in diff.	VDC	0.5	1.3	10
241/	± 0.3V DC,	Cut out	VDC	19	21.3	27
24 V	24V all values	Cut in diff.	VDC	0.5	1.3	10

Dimensions

Dimensions			
Height	inch	Α	3.79
		В	3.59
		B1	3.46
		B2	0.99
Suction connector	location/I.D. inch angle	С	0.252-0259 25°
	material comment		Cu-plated steel Al cap
Process connector	location/I.D. inch angle	D	0.252-0259 25°
	material comment		Cu-plated steel Al cap
Discharge connector	location/I.D. inch angle	Е	0.202-0.205 0°
	material comment		Cu-plated steel Al cap
Remarks: inch connectors			





Data sheets

R134a - BD35F DC Compressor - 12/24V DC - 10-45V Solar - 100-240V AC 50/60Hz

Capacity (A	SHRAE	LBP)						12V D0	C, static	cooling		BTU/h	Operatio	nal
rpm∖°F	-20	-13	-10	0	10	14	20	30	41	45	50	59	Error code or LED	;
2,000		41	48	78	115	133	162	218	294	325	366	450	flashes	
2,500	32	57	67	107	154	175	210	278	370	409	461	569	6	1
3,000	52	80	92	138	192	216	257	337	447	493	556	685		(
3,500	51	89	106	164	229	258	306	400	528	582	656	809		t
4,000	67	105	122	185	260	295	352	462	611	673	757	928	5	1
Capacity (E	EN 1290	0 Hous	ehold/(сесом	AF)			12V D0	C. static	cooling		watt		(
rpm\°F	-20	-13	-10	0	10	14	20	30	41	45	50	59		t
2,000		10	12	19	28	32	39	52	70	77	87	107	4	I
2,500	9	16	19	31	45	51	61	80	105	116	130	159	-	
3,000	14	22	26	39	55	62	74	97	127	140	157	192		c
3,500	11	24	30	48	68	76	90	116	149	163	181	219		r
4,000	21	32	36	54	75	85	100	130	170	186	209	253	3	N
-														(
Power cons	<u> </u>	r	10		10	14	20	r	r -	cooling		watt		r
rpm \ °F	-20	-13	-10	0	10	14	20	30	41	45	50	59	2	F
2,000	10	14	15	19	24	26	29	35	40	41	43	44		(
2,500	19	21	22	25	29	31	34	38	42	43	44	45	1	E
3,000	22 25	24 29	26 31	30 37	36 44	38 46	41	46 55	51	52	53 63	54 65	'	
3,500	31	36	31	45	44 51	53	50 57	63	60 69	62 71	74	79		
4,000	1 21	50	50	L 1	1 21		57	05	09	//	/4	75	Wire Dim	ens
Current co	nsumpt	ion (foi	r 24V aj	oplicati	ons the	follow	ing mu	st be ha	lfed)			A		Size
rpm \ °F	-20	-13	-10	0	10	14	20	30	41	45	50	59	Cross section	
2,000		1.31	1.39	1.65	1.90	2.00	2.15	2.41	2.71	2.82	2.96	3.23	[mm ²]	
2,500	1.51	1.62	1.68	1.95	2.28	2.42	2.63	2.96	3.25	3.33	3.40	3.45	2.5	+
3,000	1.78	1.97	2.06	2.40	2.76	2.91	3.14	3.49	3.82	3.92	4.03	4.17	4	
3,500	1.95	2.25	2.38	2.85	3.32	3.51	3.78	4.20	4.58	4.69	4.81	4.95	6	
4,000	3.17	3.24	3.29	3.56	3.93	4.11	4.38	4.86	5.37	5.55	5.75	6.05	10	
EER (ASHR	AE LBP)							12V D0	C, static	cooling		BTU/h		
rpm \ °F	-20	-13	-10	0	10	14	20	30	41	45	50	59	Accessor	
2.000		2.88	3.19	4.06	4.78	5.06	5.49	6.29	7.39	7.88	8.58	10.17	Bolt joint	
2.500	1.88	2.95	3.33	4.32	5.09	5.38	5.83	6.66	7.79	8.29	9.00	10.57	Bolt joint	
3.000	2.73	3.55	3.82	4.54	5.16	5.42	5.84	6.68	7.89	8.43	9.19	10.90	Snap-on	
3.500	2.09	3.14	3.49	4.42	5.18	5.49	5.96	6.84	8.01	8.50	9.18	10.60	Terminal	
4.000	2.36	3.09	3.36	4.19	5.00	5.34	5.87	6.83	8.03	8.51	9.15	10.40	Automol DIN 7258	
COP (EN 12	900 Ho	usehol	d/CECO	MAF)				12V D0	C. static	cooling		w/w	Main swi	
rpm \ °F	-20	-13	-10	0	10	14	20	30	41	45	50	59		
2.000		0.69	0.77	0.97	1.14	1.21	1.31	1.50	1.76	1.88	2.04	2.42	Test cond	litio
2.500	0.45	0.77	0.89	1.23	1.52	1.62	1.79	2.09	2.50	2.68	2.94	3.53		
3.000	0.62	0.90	1.00	1.29	1.54	1.64	1.80	2.10	2.52	2.70	2.96	3.55	Condens	
3.500	0.46	0.83	0.96	1.29	1.56	1.66	1.81	2.10	2.48	2.64	2.87	3.35	Ambient Suction of	
4.000	0.67	0.88	0.96	1.21	1.48	1.58	1.76	2.07	2.46	2.61	2.82	3.22	Liquid te	
												<u> </u>		
										Main	swjtch			
							_		use					
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		-						105N90	01 – V01.00 ecop.com	ØX CE				

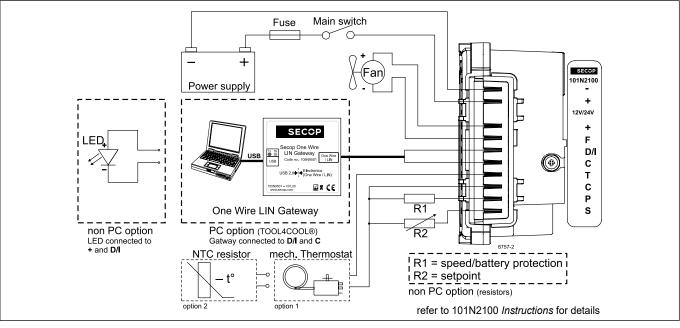
l errors (TOOL4COOL[®] or LED flashes) Error type Can be read out in the software TOOL4COOL® Thermostat failure (If the NTC thermistor is short-circuit or has no connection, the electronic unit will enter manual mode). Thermal cut-out of electronic unit (If the refrigeration system has been too heavily loaded, or if the ambient temperature is high, the electronic unit will run too hot). Minimum motor speed error (If the refrigeration system is too heavily loaded, the motor cannot maintain minimum speed at approximately 1,850 rpm). Motor start error (The rotor is blocked or the differential pressure in the refrigeration system is too high (>5 bar)). Fan over-current cut-out (The fan loads the electronic unit with more than $0.65A_{\text{peak}}$). Battery protection cut-out (The voltage is outside the cut-out setting).

nsions DC

Si	ze	Max. l	ength*	Max. length*				
Cross section	AWG	12V operation		24V op	eration			
[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

Accessories for BD1.4F-VSD-HD)	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
Terminal cover for electronic uni	t	105N9120
Automoblie fuse	12V: 15A	Not
DIN 7258	24V: 15A	deliverable
Main switch	min. 20A	from Danfoss
Test conditions	EN 12900 CECOMAF	ASHRAE LBP
Condensing temperature	131°F	130°F
Ambient temperature	90°F	90°F
Suction gas temperature	90°F	90°F
Liquid temperature	no subcooling	90°F





BD35F - DC Compressor R134a, 12/24V DC, 10-45V DC Solar & 100-240V AC 50/60Hz



General

Code number (without electronic units)	101Z0200	Approvals
Electronic unit 12/24V DC - Standard	101N0212, 30 pcs: 101N0213	_
Electronic unit 12/24V DC - AEO	101N0340, 30 pcs: 101N0341	UL/VDE/CB
Electronic unit 10-45V DC - Solar	101N0420, 30 pcs: 101N0421	VDE / CB
Electronic unit 12/24V DC & 100-240V AC 50/60Hz	101N0510, 28 pcs: 101N0511	UL / VDE
Electronic unit 12/24V DC - Automotive	101N0650, 30 pcs: 101N0651	UL/VDE/CB
Compressors on pallet	150	



Danfoss

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
Voltage range for solar applications	VDC	10 - 45
Max. condensing temperature continuous (short)	°C	60 (70)
Max. winding temperature continuous (short)	°C	125 (135)
Max. condensing temperature continuous (short)	C	

entry with BD controller R134a Blue stripe Barcode on white background Grey background Country of origin or manufacturer

= Static cooling normally sufficient

= Fan cooling 3.0 m/s necessary

= not applicable in this area

(compressor compartment temperature equal to ambient temperature)

= Suction gas cooling normally sufficent

BD35F

= Oil cooling

= Fan cooling 1.5 m/s

S O

 F_1

 F_2

SG

Cooling requirements

Application	LBP	MBP	HBP			
32°C	S	S	S			
38°C	S	S	S			
43°C	S	S	S			
Remarks on application: Fan cooling F ₁ depending on application and speed.						

Motor		
Motor type		variable speed
Resistance, all 3 windings (25°C)	Ω	2.2

Design

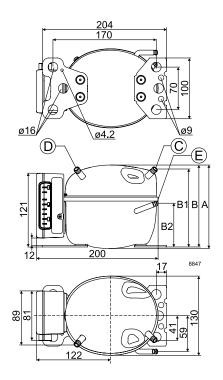
Displacement	cm ³	2.00
Oil quantity (type)	cm ³	150 (polyolester)
Maximum refrigerant charge	g	300
Free gas volume in compressor	cm ³	870
Weight - Compressor/Electronic unit	kg	4.3 / 0.19 (Standard)

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

Dimensions			
Height	mm	А	137
		В	135
		B1	128
		B2	73
Suction connector	location/I.D. mm angle	С	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	Е	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:			





Data sheets

R134a - BD35F DC Compressor - 12/24V DC - 10-45V Solar - 100-240V AC 50/60Hz

Capacity (El			1	1	r				1	, static c		watt	Compr	
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15	Electro	onit
2,000	16.0	23.8	26.7	32.9	43.7	56.5	71.8	89.8	111	121	136			
2,500	18.8	29.9	33.9	41.9	55.4	71.1	89.8	112	139	152			Code	num
3,000	22.4	32.9	37.1	46.1	62.5	82.2	106	133						
3,500	27.0	35.9	40.2	50.3	69.8	93.9	122							
Capacity (A	SHRAE	LBP)							12V DC	, static c	ooling	watt	101N	0212
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15	101N	0510
2,000	20.0	29.8	33.4	41.2	54.6	70.6	89.7	112	139	152	169		101N	0650
2,500	23.6	37.5	42.4	52.4	69.2	88.8	112	140	173	190				
3,000	28.1	41.3	46.5	57.9	78.2	103	132	166						
3,500	33.9	45.1	50.5	63.1	87.3	117	153						101N	0241
Power consi	umptic	n							12V DC	, static c	oolina	watt	101N	
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15	with A	
2,000	17.7	22.9	24.6	27.7	32.2	36.7	41.3	46.2	51.6	54.3	57.8		with <i>r</i>	LO
2,500	22.1	29.7	32.0	36.3	42.4	48.1	53.8	59.7	66.1	69.1				
3,000	29.3	34.6	36.7	41.2	48.7	56.5	64.5	72.0					In AEO (/	
3,500	34.5	41.3	43.8	48.9	57.3	66.2	75.4						ressor w	rill alv
Current con	sumnt	ion (fo	r 24V ar	onlicati	ons the	follow	ina mu	st he ha	alfed)			A	Wire d	ime
rpm \ ℃	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15	when	
2,000	1.4	1.9	2.0	2.3	2.7	3.1	3.4	3.8	4.3	4.5	4.8	.5	-	Siz
2,500	1.4	2.5	2.0	3.0	3.5	4.0	4.5	5.0	5.5	5.8			Cros	
3,000	2.4	2.5	3.1	3.4	4.0	4.0	5.3	6.0	5.5	5.0			sectio	on
3,500	2.9	3.4	3.6	4.1	4.8	5.5	6.3	0.0	<u> </u>				[mm ²	2]
						5.5	0.5		121/06				2.5	
COP (EN 129			1	<u> </u>	15	10	-		1	, static c		W/W	4	
rpm \°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15	6	
2,000	0.90	1.04	1.09	1.19	1.36	1.54	1.74	1.94	2.15	2.24	2.35		10	
2,500	0.85	1.01	1.06	1.15	1.31	1.48	1.67	1.88	2.10	2.20				
3,000 3,500	0.76 0.78	0.95 0.87	1.01 0.92	1.12	1.28	1.45	1.64 1.62	1.85					Wine d	
			0.92	1.05	1.22	1.42	1.02						Wire d Cross s	
COP (ASHRA				,		r	r		1	, static c		W/W	C1033 3	ecu
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15	Operat	tion
2,000	1.13	1.30	1.36	1.49	1.70	1.93	2.18	2.44	2.70	2.81	2.95		Error code	
2,500	1.07	1.26	1.33	1.45	1.64	1.86	2.10	2.36	2.64	2.77			or LED	
3,000	0.96	1.19	1.27	1.41	1.61	1.83	2.06	2.32					flashes	;
3,500	0.98	1.09	1.15	1.29	1.53	1.78	2.03						6	The
Test condit			tronic	units	EN	12900		1AF		ASHR/				(If th
Condensing				01N0212		-	5°C				4°C		5	The
Ambient ter Suction gas				22			2°C 2°C				<u>°C</u> °C			(lf tł
Liquid temp				101							<u>°C</u>			amb
Liquid terrip	<u>veratar</u>	-			J	110 544							4	Min
Accessories	s for BC	35F								Coc	de numl	ber		(lf th
Bolt joint fo								Ø:1	6 mm		18-1917			mai
Bolt joint in	quanti	ties						Ø:1	6 mm	1	18-1918	3	3	Mo
Snap-on in	quanti	ies						Ø:1	6 mm	1	18-1919)		(The
Remote kit	(withou	ut cable	e)							1	05N921	0		refri
One Wire/Ll	IN gate	way								1	05N950	1	2	Тоо
DC usage:			e fuse, D	DIN 7258	3		12V: 1	5A 24V	': 7.5 A		Not			(Toc high
be usuge.	_	n switc						mi	n. 20A	de	eliverabl	le		-
AC usage:		e, 100-2									m Danfo		1	Bat
5	Mai	n switc	n					m	nin. 6A					(The
					_			101N021				П		TTn=
		L	T	use	Main :	switch	٦ L	101N034 101N065	0					Ηō-
	ŕ	-	+	٧ċ	5		f		7					
		Power sup	ply	27	an) 			a .		<i>S</i> um∉	₩ZZZ	Sola	ar panel	
	Ĩ	One V	/ire LIN Gat	eway	LED	7		+" +		╓╢Ÿ⋬		· · · ·	One Wire LIN G	ateway
	- i		SEC	CP		→ <mark>├──</mark> └└└			P		U_U)) •	ſ		COP
	2		Secop One LIN Gatew USB Con ro. 189	Wine Ray Dreamer	i tu			-+"∥ ¤/	I		₩6) J		USB Secop 0	Drie Wire ateway Croit
	1		USB 2.0	emonica le Wire (Use	LED connect					<u> </u>	/\D			Cectronics (One Wire UN
		ption a			LED connect to + and D/		R2			Termir	nal plug	optic		8× C
	In (1		nected to D/ L® or displa				ļĮ	FL	_		4041	Interf (TOC	ace connected to L4COOL® or disp	D/I and blay)
		NTC	resistor	mech. Th	ermostat	R1	R1 = sp	eed selectic	on i	Main switch		0510	NTC resistor	me
				-o: // ``)	ㅠ 어	ΣΫ		ttery protect	tion	-0 'o-	⊪եյր		\ _t°	
		N	_t° ⊨		⊷	-							1.1.	
		option 2	-t°	option 1	<u> </u>			_	•	0-240V AC	TP)	'	option 2	opti
		option 2	-t°	option 1	<u> </u>	i	ţ.		•	0-240V AC 50/60Hz		'	option 2	opti
		option 2	-t° [option 1	•	- Power sup	+		•	0-240V AC 50/60Hz			option 2	opti
		option 2	-t°	option 1	<u> </u>		+	50 O M	100	50/60Hz			option 2	opti
		option 2	-t°	option 1	<u> </u>		+ + yy		4ain switch	0-240V AC 50/60Hz			option 2	opti

Compressor speed						
Electronit unit	Resistor (R1) [Ω]	Motor speed				
Code number	calculated values					
		[rpm]				
	0	2,000				
101N0212 101N0510	277	2,500				
101N0510	692	3,000				
	1523	3,500				
	0	AEO				
101N0340	173	2,000				
101N0420	450	2,500				
with AEO	865	3,000				
	1696	3,500				

ptive Energy Optimizing) speed mode the BD comlways adapt its speed to the actual cooling demand.

ensions DC

Si	ze	Max. le	ength*	Max. length*		
Cross	AWG	12V operation		24V op	eration	
section						
[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	

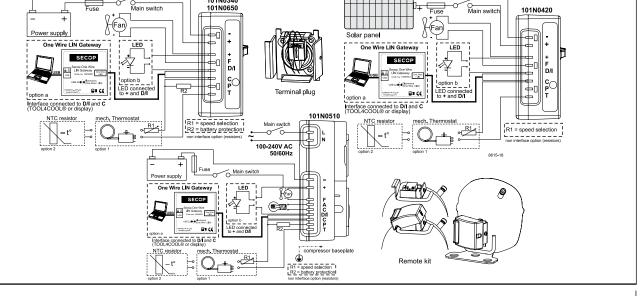
*Length between battery and electronic unit

ensions AC

tion min. 0.75 mm² or AWG 18

nal errors

Error	Error type
code or LED flashes	Can be read out in the software TOOL4COOL®
6	Thermostat failure
	(If the NTC thermistor is short-circuit or has no connection).
	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).
	Minimum motor speed error (If the refrigeration system is too heavily loaded, the motor cannot maintain minimum speed at approximately 1,850 rpm).
-	Motor start error (The rotor is blocked or the differential pressure in the refrigeration system is too high (>5 bar)).
2	Too many start attempts or fan over current (Too many compressor or fan starts in short time or fan current higher than $0.5A_{sog}$).
	Battery protection cut-out (The voltage is outside the cut-out setting).





R134a - BD35F DC Compressor - 12/24V DC - 10-45V Solar - 100-240V AC 50/60Hz - Inch Connectors

BD35F - DC Compressor R134a, 12/24V DC, 10-45V DC Solar & 100-240V AC 50/60Hz

LBP/MBP/HBP

-20 to 50

9.6 - 17 / 21.3 - 31.5

100 - 240 / 50 - 60

10 - 45

140 (158)

257 (275)



SECOP

BD35F

12/24V DC

General

Application

Application

Code number (without electronic units)	101Z0204	Approvals
Electronic unit 12/24V DC - Standard	101N0212, 30 pcs: 101N0213	-
Electronic unit 12/24V DC - AEO	101N0340, 30 pcs: 101N0341	UL / VDE / CB
Electronic unit 10-45V DC - Solar	101N0420, 30 pcs: 101N0421	VDE / CB
Electronic unit 12/24V DC & 100-240V AC 50/60Hz	101N0510, 28 pcs: 101N0511	UL / VDE
Electronic unit 12/24V DC - Automotive	101N0650, 30 pcs: 101N0651	UL / VDE / CB
Compressors on pallet	150	

°F

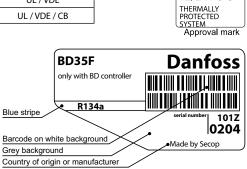
VDC

V/Hz

VDC

°F

°F



Cooling requirements

Evaporating temperature

Voltage range for solar applications

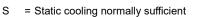
Max. condensing temperature continuous (short)

Max. winding temperature continuous (short)

Voltage range DC

Voltage range AC

Application		LBP	MBP	HBP
32℃		S	S	S
38°C		S	S	S
43°C		S	S	S
Remarks on application: Fan cooling F ₁ depending on application and speed.				



- O = Oil cooling
- F₁ = Fan cooling 1.5 m/s (compressor compartment temperature equal to ambient temperature)
- F_2 = Fan cooling 3.0 m/s necessary
- SG = Suction gas cooling normally sufficent
- = not applicable in this area

Motor

Motor type		variable speed
Resistance, all 3 windings (25°C)	Ω	2.2

Design

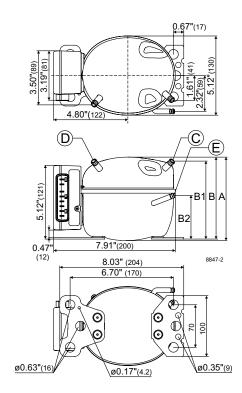
Displacement	cu.in.	0.12
Oil quantity (type)	fl.oz.	5.1 (polyolester)
Maximum refrigerant charge	oz.	10.5
Free gas volume in compressor	fl.oz.	29.6
Weight - Compressor/Electronic unit	lbs.	9.5 / 0.42 (Standard)

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	А	5.39
		В	5.32
		B1	5.04
		B2	2.87
Suction connector	location/I.D. inch angle	С	0.252-0259 40°
	material comment		Cu-plated steel Al cap
Process connector	location/I.D. inch angle	D	0.252-0259 45°
	material comment		Cu-plated steel Al cap
Discharge connector	location/I.D. inch angle	Е	0.202-0.205 21°
	material comment		Cu-plated steel Al cap
Remarks: inch connectors			





Data sheets

Remote kit (without cable)

Automobile fuse, DIN 7258

Main switch

Main switch

Fuse, 100-240V

One Wire/LIN gateway

DC usage:

AC usage:

R134a - BD35F DC Compressor - 12/24V DC - 10-45V Solar - 100-240V AC 50/60Hz - Inch Connectors

Capacity (ASHRAE	LBP)						12V D	C, static	cooling		BTU/ł
rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	75.2	101	114	160	215	241	283	364	462	472	517	577
2,500	90.9	128	144	203	272	303	354	455	577	591	649	
3,000	105	141	158	226	311	350	415	539	685			
3,500	122	154	172	249	352	400	479	626				
Capacity (EN 12900 Household/CECOMAF) 12V DC, stati									C, static	cooling		wat
rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	17.7	23.8	26.7	37.4	50.5	56.5	66.4	85.5	108	111	121	136
2,500	21.3	29.9	33.8	47.6	63.8	71.1	83.2	107	136	139	152	
3,000	24.5	32.9	37.0	53.0	73.0	82.2	97.4	127	161			
3,500	28.5	35.9	40.1	58.4	82.6	93.9	112	147				
Power con	sumptio	on						12V D	C, static	cooling		wat
rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	19.0	22.9	24.5	29.6	34.6	36.5	39.5	44.8	50.7	51.4	54.0	57.5
2,500	23.9	29.7	31.9	39.0	45.4	47.9	51.6	58.0	65.0	65.7	68.8	
3,000	30.4	34.6	36.6	44.3	52.8	56.3	61.5	70.0	77.6			
3,500	36.0	41.3	43.7	52.5	62.0	65.9	72.0	82.2				
Current co	nsumpt	ion (fo	24V ar	plicati	ons the	follow	ina mu	st be ha	lfed)			
rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	1.51	1.87	2.02	2.47	2.89	3.05	3.30	3.73	4.20	4.25	4.46	4.74
2,500	1.99	2.47	2.66	3.25	3.79	4.00	4.31	4.84	5.42	5.48	5.74	
3,000	2.49	2.88	3.05	3.70	4.39	4.67	5.10	5.81	6.49	51.10	5	
3,500	2.99	3.42	3.63	4.36	5.15	5.48	5.99	6.85	0115			
EER (ASHR									 	cooling	, F	STU/WI
rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	3.97	4.42	4.63	5.38	6.23	6.59	7.15	8.12	9.10	9.20	9.58	10.05
2,500	3.80	4.31	4.51	5.21	5.98	6.32	6.86	7.84	8.89	9.00	9.43	10.05
3,000	3.45	4.06	4.31	5.11	5.89	6.22	6.74	7.70	8.83	5.00	5.45	
3,500	3.39	3.73	3.93	4.75	5.68	6.07	6.65	7.62	0.05			
COP (EN 12					5.00	0.07	0.05		r static	cooling	1	w/w
rpm \ °F	-20	-13	-10		10	14	20	30	40	cooling 41	45	50
2,000	0.93	1.04	1.09	1.26	1.46	1.54	1.67	1.90	2.13	2.15	2.24	2.35
2,500	0.95	1.04	1.09	1.20	1.40	1.48	1.67	1.90	2.13	2.15	2.24	2.55
3,000	0.89	0.95	1.00	1.19	1.40	1.46	1.58	1.80	2.08	2.10		
3,500	0.81	0.95	0.92	1.19	1.30	1.45	1.56	1.78	2.00			<u> </u>
	1									ACUD		
Test cond Condensir			tronic		EN	12900	1°F			ASHR/	0°F	
				121			0°F)°F	
	t temperature 6 8 90°F 90°F gas temperature 90°F 90°F											
Liquid ten				101N0212 101N0650			cooling	J)°F	
Accessori	es for Bl	035F								Coc	le num	ber
Bolt joint									/8 in.		18-191	
Bolt joint in quantities Ø: 5/8 in. 118-1							18-191					
Snap-on i	n quanti	ties						Ø: 5	/8 in.	1	18-191	9
Remote ki	t (witho	ut cable	<u> </u>							1(05N921	0

Compressor speed							
Electronit unit	Resistor (R1) [Ω]	Motor speed					
Code number	calculated values						
		[rpm]					
	0	2,000					
101N0212 101N0510	277	2,500					
101N0510	692	3,000					
101110050	1523	3,500					
	0	AEO					
101N0340	173	2,000					
101N0420	450	2,500					
with AEO	865	3,000					
	1696	3,500					

In AEO (Adaptive Energy Optimizing) speed mode the BD comressor will always adapt its speed to the actual cooling demand.

Wire dimensions DC

Size		Max. length*		Max. length*		
Cross	AWG	12V op	eration	24V op	eration	
section						
[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	

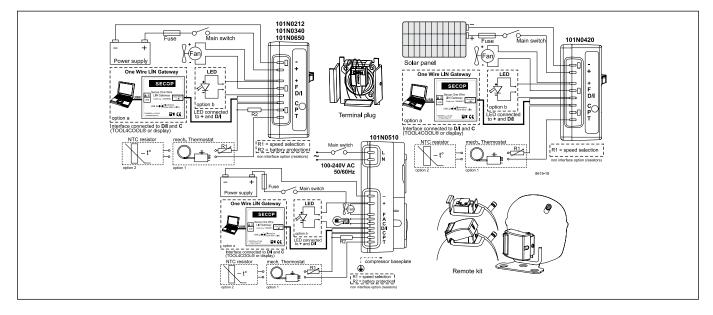
*Length between battery and electronic unit

Wire dimensions AC

Cross section min. 0.75 $\rm mm^2$ or AWG 18

Operational errors

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



105N9210

105N9501

Not

deliverable

from Danfoss

12V: 15A | 24V: 7.5 A

min. 20A

min. 6A

BD35F-HD.2 Heavy Duty - DC Compressor

R134a, 12/24V DC



General

Code number (without electronic units)	101Z0216	Approvals
Electronic unit 12/24V DC - Standard	101N0212, 30 pcs: 101N0213	-
Electronic unit 12/24V DC - Automotive	101N0650, 30 pcs: 101N0651	UL / VDE / CB
Compressors on pallet	150	

Application

Application		LBP/MBP/HBP
Evaporating temperature	°C	-30 to 0 (10)
Voltage range	VDC	9.6 - 17 / 21.3 - 31.5
Max. condensing temperature continuous (short)	°C	60 (70)
Max. winding temperature continuous (short)	°C	125 (135)

Cooling requirements

		MBP	HBP
32°C	S	S	S
38°C	S	S	S
43°C	S	S	S

Remarks on application: Fan cooling F₁ depending on application and speed.

HD (Heavy Duty) version of the BD35F which can handle extreme vibrations.

New generation with optimized noise level during rough vehicle motions.

Motor

Motor type		variable speed
Resistance, all 3 windings (25°C)	Ω	2.2

Design

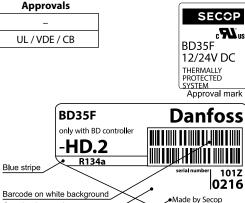
Displacement	cm ³	2.00
Oil quantity (type)	cm ³	150 (polyolester)
Maximum refrigerant charge	g	300
Free gas volume in compressor	cm ³	870
Weight - Compressor/Electronic unit	kg	4.3/0.19

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

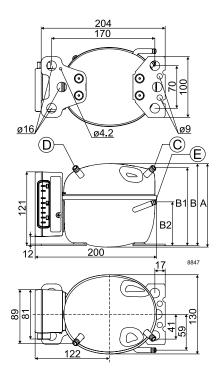
Dimensions

Dimensions				
Height	mm	Α	137	
		В	135	
		B1	128	
		B2	73	
Suction connector	location/I.D. mm angle	С	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:				



Grey background Country of origin or manufacturer

- S = Static cooling normally sufficient
- = Oil cooling 0 F₁
 - = Fan cooling 1.5 m/s (compressor compartment temperature equal to ambient temperature)
- F_2 = Fan cooling 3.0 m/s necessary
- SG = Suction gas cooling normally sufficent
- = not applicable in this area







Data sheets

R134a - BD35F-HD.2 Heavy DC Compressor - 12/24V DC

nm \ °C	(EN 12	-					-5	0	5	tatic co		wat
<u>°C</u>	-30	-25	-23.3	-20	-15	-10			-	7.2	10	15
2,000	16.0	23.8	26.7	32.9	43.7	56.5	71.8	89.8	111	121	136	
2,500	18.8	29.9	33.9	41.9	55.4	71.1	89.8	112	139	152		
3,000	22.4	32.9	37.1	46.1	62.5	82.2	106	133				
8,500	27.0	35.9	40.2	50.3	69.8	93.9	122					
apacity										tatic co		wat
′pm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	20.0	29.8	33.4	41.2	54.6	70.6	89.7	112	139	152	169	
2,500	23.6	37.5	42.4	52.4	69.2	88.8	112	140	173	190		
3,000	28.1	41.3	46.5	57.9	78.2	103	132	166				
,500	33.9	45.1	50.5	63.1	87.3	117	153					
ower co	nsump	tion						12	V DC, s	tatic co	poling	wat
pm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
,000	17.7	22.9	24.6	27.7	32.2	36.7	41.3	46.2	51.6	54.3	57.8	
,500	22.1	29.7	32.0	36.3	42.4	48.1	53.8	59.7	66.1	69.1		
3,000	29.3	34.6	36.7	41.2	48.7	56.5	64.5	72.0				
,500	34.5	41.3	43.8	48.9	57.3	66.2	75.4					
urrent c	onsum	ption	(for 24)	/ applie	ations	the foll	owing	must be	halfer	n		
pm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	1.4	1.9	2.0	2.3	2.7	3.1	3.4	3.8	4.3	4.5	4.8	1.5
2,500	1.8	2.5	2.7	3.0	3.5	4.0	4.5	5.0	5.5	5.8		
3,000	2.4	2.9	3.1	3.4	4.0	4.7	5.3	6.0	5.5	5.0		
,500	2.9	3.4	3.6	4.1	4.8	5.5	6.3	0.0				
								1.5			alina	w/w
OP (EN 1 pm \ ℃	-30	-25	-23.3	-20	-15	-10	-5	0	<u>v DC, s</u>	tatic co 7.2	10	15
2,000	0.90	1.04	1.09	1.19	-	1.54	-5 1.74	1.94	2.15	2.24	2.35	15
2,500	0.90	1.04	1.09	1.19	1.36 1.31	1.48	1.67	1.94	2.13	2.24	2.55	
3,000 3,000	0.85	0.95	1.00	1.12	1.28	1.40	1.64	1.85	2.10	2.20		
,500	0.78	0.95	0.92	1.03	1.20	1.42	1.62	1.05				
			0.72	1.05	1.22	1.72	1.02					
OP (ASH	1						_		· · · · ·	tatic co		W/W
pm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	1.13	1.30	1.36	1.49	1.70	1.93	2.18	2.44	2.70	2.81	2.95	
,500	1.07	1.26	1.33	1.45	1.64	1.86	2.10	2.36	2.64	2.77		
3,000	0.96	1.19	1.27	1.41	1.61	1.83	2.06	2.32				
	0.98	1.09	1.15	1.29	1.53	1.78	2.03					
,500			ctronic	unit	EN	12900		/AF			AE LBP	
,500 est cond							5°C 2°C				4°C	
5,500 Test cond Condensir	ng temp			6.2			20				2°C 2°C	
5,500 Test cond Condensir Ambient t	ng temp emperat	ture		N021 N065								
500 est cond condensir mbient t uction ga	ng tempo emperat Is tempe	ture erature		101N021		32	2°C					
,500 est cond ondensir mbient t uction ga iquid tem	ng temp emperat is tempe iperatur	ture erature e		101N0212 101N0650		32				32	2°C	
Arbitic Section densir Ambient t Suction ga Liquid tem	ng tempo emperat is tempo iperatur ories fo	ture erature e or BD3				32	2°C			32 Cod	²℃ e num	
500 cest cond condensir mbient t uction ga iquid tem ccesso Bolt joint	ng temperat emperat s tempe peratur ories fo t for on	erature erature e or BD3 e com	p.			32	2°C	Ø:16		32 Cod 11	²℃ e num 18-191	7
,500 est cond ondensir mbient t uction ga iquid tem ccesso Bolt joint Bolt joint	ng temperat emperat is tempe peratur pries fo t for on t in qua	erature e or BD3 e com antities	р. 6			32	2°C	Ø:16 Ø:16	mm	32 Cod 1' 1'	2°C I e num 18-191 18-191	7 8
3,500 Test cond Condensir Ambient t Suction ga Liquid tem Accesso Bolt joint Bolt joint Snap-on	ng temperat emperatur peratur ories for t for on t in qua in qua	ture erature e or BD3 e com antities antities	р. ;			32	2°C	Ø:16	mm	32 Cod 1' 1' 1'	2°C e num 18-191 18-191 18-191	7 8 9
3,500 Test cond Condensir Ambient t iduction ga iduid terr Accesso Bolt joint Bolt joint Snap-on Remote	ng temperations temperations temperatures for the second s	erature e or BD3 e com antities antities hout c	p. able)			32	2°C	Ø:16 Ø:16	mm	32 Cod 1' 1' 1' 10	<u>e</u> num 18-191 18-191 18-191 18-191 05N921	7 8 9 0
3,500 Fest cond Condensir Ambient t Suction ga Liquid ten Accesso Bolt joint Bolt joint Snap-on Remote Dne Wir	ng temperat emperatur ories for t for on t in qua in qua kit (wit e/LIN g	erature e or BD3 e com antities hout c gatewa	p. able)			32 no sub	2°C cooling	Ø:16 Ø:16 Ø:16	mm mm	32 Cod 1 ⁻ 1 ⁻ 1 ⁻ 10 10	2°C e num 18-191 18-191 18-191 05N921 05N950	7 8 9 0 01
3,500 Test cond Condensir Ambient t Suction ga .iquid ten Accesso Bolt joint Bolt joint Snap-on Remote	ig temperat is temperatur ories for in qua kit (wit e/LIN g bile fus	erature e or BD3 e com antities hout c gatewa	p. able)			32 no sub	2°C	Ø:16 Ø:16 Ø:16	mm mm	32 Cod 1 1 1 1 1 1 0 10 10 Not 0	<u>e</u> num 18-191 18-191 18-191 18-191 05N921	7 8 9 0)1 able

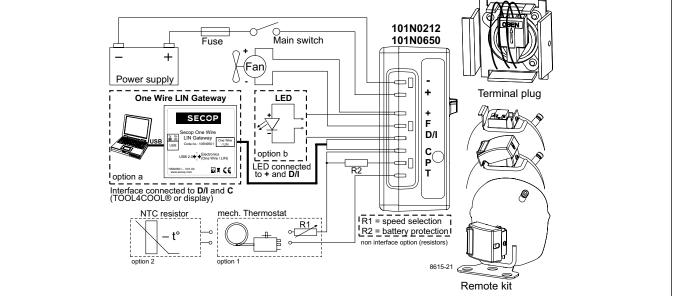
Compressor speed							
Electronit unit	Resistor (R1) $[\Omega]$	Motor speed					
Code number	calculated values						
		[rpm]					
	0	2,000					
101N0212	277	2,500					
101N0650	692	3,000					
	1523	3,500					

dimensions Size Max. length* Max. length* AWG 12V operation 24V operation oss tion [ft.] [ft.] m²] [Gauge] [m] [m] 2.5 .5 12 8 5 16 4 12 4 13 8 26 5 10 6 20 12 39 0 8 10 33 20 66

*Length between battery and electronic unit

perational errors

Error type
Can be read out in the software TOOL4COOL®
Thermostat failure
(If the NTC thermistor is short-circuit or has no connection).
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).
Minimum motor speed error (If the refrigeration system is too heavily loaded, the motor cannot maintain minimum speed at approximately 1,850 rpm).
Motor start error (The rotor is blocked or the differential pressure in the refrigeration system is too high (>5 bar)).
Too many start attempts or fan over current (Too many compressor or fan starts in short time or fan current higher than $0.5A_{srg}$).
Battery protection cut-out (The voltage is outside the cut-out setting).



R134a - BD35F-B Bus-optimized DC Compressor - 12/24V DC - 100-240V AC 50/60Hz

BD35F-B Bus-optimized - DC Compressor R134a, 12/24V DC & 100-240V AC 50/60Hz



SECOP

BD35F-B 12/24V DC THERMALLY PROTECTED

General

Code number (without electronic units)	101Z0205	Approvals
Electronic unit 12/24V DC - Standard	101N0212, 30 pcs: 101N0213	-
Electronic unit 12/24V DC - AEO	101N0340, 30 pcs: 101N0341	UL/VDE/CB
Electronic unit 12/24V DC & 100-240V AC 50/60Hz	101N0510, 28 pcs: 101N0511	UL / VDE
Electronic unit 12/24V DC - Automotive	101N0650, 30 pcs: 101N0651	UL/VDE/CB
Compressors on pallet	150	

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	S
38°C	S	S	S
43°C	S	S	S

Remarks on application: Fan cooling F₁ depending on application and speed.

Special version of the BD35F optimized for rough vehicle motions,

especially in buses.

Motor						
Motor type		variable speed				
Resistance, all 3 windings (25°C)	Ω	2.2				

Design

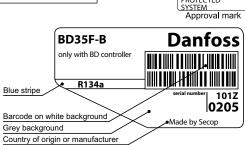
Displacement	cm ³	2.00
Oil quantity (type)	cm ³	150 (polyolester)
Maximum refrigerant charge	g	300
Free gas volume in compressor	cm ³	870
Weight - Compressor/Electronic unit	kg	4.3 / 0.19 (Standard)

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

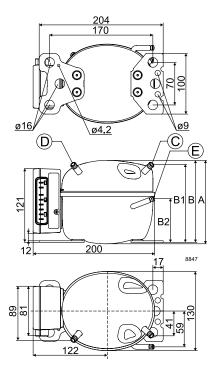
Dimensions

Height	mm	А	137
		В	135
		B1	128
		B2	73
Suction connector	location/I.D. mm angle	С	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	Е	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
- $F_1 = Fan \text{ cooling } 1.5 \text{ m/s}$
 - (compressor compartment temperature equal to ambient temperature)
- F₂ = Fan cooling 3.0 m/s necessary
- SG = Suction gas cooling normally sufficent
- = not applicable in this area





2,500

3,000

3,500

1.07

0.96

0.98

Condensing temperature

Accessories for BD35F-B

Bolt joint for one comp.

Bolt joint in quantities Snap-on in quantities

One Wire/LIN gateway

DC usage:

AC usage:

Remote kit (without cable)

Ambient temperature Suction gas temperature

Liquid temperature

1.26

1.19

1.09

Test conditions with electronic units

1.33

1.27

1.15

Automobile fuse, DIN 7258

Main switch

Main switch

Fuse, 100-240V

1.45

1.41

1.29

101N0212 101N0650

1.64

1.61

1.53

1.86

1.83

1.78

2.10

2.06

2.03

EN 12900/CECOMAF

55°C

32°C

32°C

no subcooling

2.36

2.32

2.64

Ø:16 mm

Ø:16 mm

Ø:16 mm

min. 20A

min. 6A

12V: 15A | 24V: 7.5 A

2.77

ASHRAE LBP

54.4°C

32°C

32°C

32°0

Code number

118-1917 118-1918

118-1919

105N9210

105N9501

Not

deliverable

from Danfoss

R134a - BD35F-B Bus-optimized DC Compressor - 12/24V DC - 100-240V AC 50/60Hz

watt 15

> watt 15

> watt 15

15

W/W 15

W/W

15

Capacity (I	EN 1290	0 Hous	ehold/0	сесом	AF)				12V DC	, static o	coolina	
rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	Г
2,000	16.0	23.8	26.7	32.9	43.7	56.5	71.8	89.8	111	121	136	
2,500	18.8	29.9	33.9	41.9	55.4	71.1	89.8	112	139	152		
3,000	22.4	32.9	37.1	46.1	62.5	82.2	106	133				
3,500	27.0	35.9	40.2	50.3	69.8	93.9	122					
Capacity (/	ASHRAE	LBP)							12V DC	, static o	cooling	_
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	
2,000	20.0	29.8	33.4	41.2	54.6	70.6	89.7	112	139	152	169	
2,500	23.6	37.5	42.4	52.4	69.2	88.8	112	140	173	190		
3,000	28.1	41.3	46.5	57.9	78.2	103	132	166				
3,500	33.9	45.1	50.5	63.1	87.3	117	153					
Power con	sumptio	on							12V DC	, static c	cooling	_
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	
2,000	17.7	22.9	24.6	27.7	32.2	36.7	41.3	46.2	51.6	54.3	57.8	
2,500	22.1	29.7	32.0	36.3	42.4	48.1	53.8	59.7	66.1	69.1		
3,000	29.3	34.6	36.7	41.2	48.7	56.5	64.5	72.0				
3,500	34.5	41.3	43.8	48.9	57.3	66.2	75.4					
Current co	nsumpt	ion (fo	r 24V ap	oplicati	ons the	follow	ing mu	st be ha	alfed)			
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	
2,000	1.4	1.9	2.0	2.3	2.7	3.1	3.4	3.8	4.3	4.5	4.8	
2,500	1.8	2.5	2.7	3.0	3.5	4.0	4.5	5.0	5.5	5.8		
3,000	2.4	2.9	3.1	3.4	4.0	4.7	5.3	6.0				
3,500	2.9	3.4	3.6	4.1	4.8	5.5	6.3					
COP (EN 12	2900 Ho	usehol	d/CECO	MAF)		-			12V DC	, static c	cooling	
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	
2,000	0.90	1.04	1.09	1.19	1.36	1.54	1.74	1.94	2.15	2.24	2.35	
2,500	0.85	1.01	1.06	1.15	1.31	1.48	1.67	1.88	2.10	2.20		
3,000	0.76	0.95	1.01	1.12	1.28	1.45	1.64	1.85				
3,500	0.78	0.87	0.92	1.03	1.22	1.42	1.62					
COP (ASHR	AE LBP)							12V DC	, static c	cooling	
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	Γ
2,000	1.13	1.30	1.36	1.49	1.70	1.93	2.18	2.44	2.70	2.81	2.95	

Compressor speed	l	
Electronit unit	Resistor (R1) [Ω]	Motor speed
Code number	calculated values	
		[rpm]
101N0212	0	2,000
101N0510	277	2,500
101N0650	692	3,000
	1523	3,500
	0	AEO
	173	2,000
101N0340 with AEO	450	2,500
	865	3,000
	1696	3,500

In AEO (Adaptive Energy Optimizing) speed mode the BD comressor will always adapt its speed to the actual cooling demand.

Wire dimensions DC

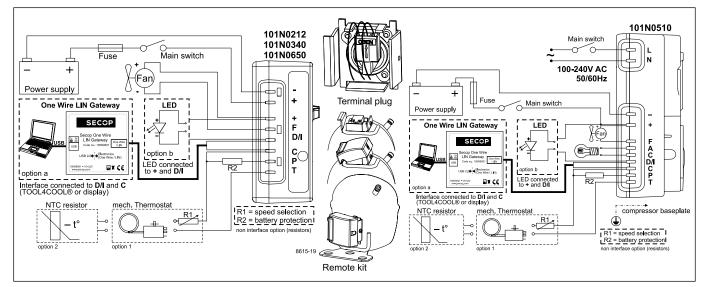
Si	Size Max. length*			Max. length*		
Cross section	AWG	12V op	eration	24V op	eration	
[mm ²]	[Gauge]	[m]	[ft.]	[m]	[ft.]	
2.5	12	2.5	8	5	16	
4	12	4	13	8	26	
6	10	6	20	12	39	
10	8	10	33	20	66	

*Length between battery and electronic unit

Wire dimensions AC

Cross section min. 0.75 mm² or AWG 18

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



R134a - BD50F DC Compressor - 12/24V DC - 100-240V AC 50/60Hz

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



BD50F 12/24V DC

General

Annliention

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

	LBP/MBP/HBP
°C	-30 to 0 (10)
VDC	9.6 - 17 / 21.3 - 31.5
V/Hz	100 - 240 / 50 - 60
°C	60 (70)
°C	125 (135)
	VDC V/Hz °C

Cooling requirements

Application	LBP	MBP	HBP
32℃	S	S	F ₁
38°C	S	S	F ₁
43°C	S	S	F ₁
Remarks on application: Fan cooling E1 depending on applic	ation and speed		

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

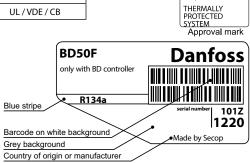
Displacement	cm ³	2.50
Oil quantity (type)	cm ³	150 (polyolester)
Maximum refrigerant charge	g	300
Free gas volume in compressor	cm ³	870
Weight - Compressor/Electronic unit	kg	4.3 / 0.19 (Standard)

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

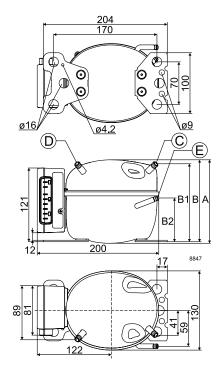
Dimensions

Height	mm	А	137
		В	135
		B1	128
		B2	73
Suction connector	location/I.D. mm angle	С	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
- $F_1 = Fan \text{ cooling } 1.5 \text{ m/s}$
 - (compressor compartment temperature equal to ambient temperature)
- $F_2 = Fan \text{ cooling } 3.0 \text{ m/s necessary}$
- \overline{SG} = Suction gas cooling normally sufficent
- = not applicable in this area





R134a - BD50F DC Compressor - 12/24V DC - 100-240V AC 50/60Hz

12900 Had 30 -25 0.9 30. 6.1 37.0 1.1.2 44.1 7.0 52.1 HRE LBP 30 3.0 -25 5.9 37.7 2.3 45.5 5.5.5 64.1 mption 30 3.0 -25 5.0 31.4 6.7 39 7.7 48. 45.0 56.4	-23.3 33.8 41.4 50.2 58.0 -23.3 2 41.8 51.3 4 62.0 2 71.6 -23.3 5 33.8 5 33.8 5 42.4 51.6	-20 41.8 50.9 61.8 71.1 -20 51.7 63.1 76.4 87.8 -20 38.0 48.0	-15 56.1 68.0 82.4 94.7 -15 69.3 84.3 102 1117 -15 44.3	-10 72.8 88.7 107 123* -10 90.0 110 132 152* -10	-5 92.1 113 136* 157* -5 114 140 168* 194*	0 114 142* 169* 0 141 176* 210*	5 138* 175*	static c 7.2 150* 191* static c 7.2 185* 237*	10 165*	watt 15 watt 15
0.9 30. 6.1 37. 1.2 44. 7.0 52. HRAE LBP 30 30 -25 5.9 37. 2.3 45. 5.5.5 64. mption -30 300 -25 5.0 31. 0.7 39. 7.4 48. 5.0 56. Jaption (7.4)	33.8 33.8 41.4 50.2 58.0 -23.3 2 41.8 51.3 4 62.0 2 71.6 -23.3 33.8 42.4 51.6	41.8 50.9 61.8 71.1 -20 51.7 63.1 76.4 87.8 -20 38.0	56.1 68.0 82.4 94.7 -15 69.3 84.3 102 117 -15	72.8 88.7 107 123* -10 90.0 110 132 152*	92.1 113 136* 157* -5 114 140 168* 194*	114 142* 169* 0 141 176* 210*	138* 175* 2V DC, 5 171*	150* 191* static c 7.2 185*	165* ooling	watt
6.1 37.0 11.2 44.1 17.0 52.1 HRAE LBP 30 30 -255.9 37.1 2.3 45.5 55.5 55.5 64.3 mption -30 30.7 -255.0 31.4 39.1 7.7.4 48.5 5.5.0 56.3 Imption (7.4)	0 41.4 3 50.2 0 58.0 -23.3 -23.3 2 41.8 0 51.3 4 62.0 2 71.6 -23.3 33.8 5 33.8 5 13.6	50.9 61.8 71.1 -20 51.7 63.1 76.4 87.8 -20 38.0	68.0 82.4 94.7 -15 69.3 84.3 102 117 -15	88.7 107 123* -10 90.0 110 132 152*	113 136* 157* -5 114 140 168* 194*	142* 169* 0 141 176* 210*	175* 2V DC, 5 171*	191* static c 7.2 185*	ooling 10	
i1.2 44.4 i7.0 52.1 IRRE LBP 30 -255.9 i3.0 -255.9 37 i2.3 45.5 55.5 i5.5 64 mption -30 -255.0 i3.0 -255.0 31.4 i0.7 39 -7.4 i5.0 56 35 imption (interpretent) -1.1	3 50.2 0 58.0 -23.3 -23.3 2 41.8 0 51.3 4 62.0 2 71.6 -23.3 5 33.8 5 33.8 5 13.6	61.8 71.1 -20 51.7 63.1 76.4 87.8 -20 38.0	82.4 94.7 69.3 84.3 102 117 -15	107 123* -10 90.0 110 132 152*	136* 157* -5 114 140 168* 194*	169* 0 141 176* 210*	2V DC, 5 171*	static c 7.2 185*	10	
7.0 52.1 IRAE LBP 30 -25 5.9 37 37 2.3 45 55. 5.5 64 9 30 -25 5.0 31 30 -25 5.0 31 0.7 39 7.4 48. 5.0 56 35 36) 58.0 -23.3 -23.3 2 41.8 0 51.3 4 62.0 2 71.6 -23.3 33.8 i 33.8 i 42.4 51.6	71.1 -20 51.7 63.1 76.4 87.8 -20 38.0	94.7 -15 69.3 84.3 102 117 -15	123* -10 90.0 110 132 152*	-5 114 140 168* 194*	1 0 141 176* 210*	5 171*	7.2 185*	10	
Image: state state state Image: state state Image: state state Image: state <thimage: state<="" th=""> <thimage: state<="" th=""></thimage:></thimage:>	-23.3 2 41.8 9 51.3 4 62.0 2 71.6 -23.3 5 33.8 5 42.4 51.6	-20 51.7 63.1 76.4 87.8 -20 38.0	-15 69.3 84.3 102 117 -15	-10 90.0 110 132 152*	-5 114 140 168* 194*	0 141 176* 210*	5 171*	7.2 185*	10	
30 -255 55.9 37.7 32.3 45.9 85.5 55.6 85.5 55.6 930 -25 930 -25 930 -25 931.1 -39.1 937.4 48.3 95.0 56.4	-23.3 2 41.8 3 51.3 4 62.0 2 71.6 -23.3 3 3.8 5 42.4 51.6	51.7 63.1 76.4 87.8 -20 38.0	69.3 84.3 102 117 -15	90.0 110 132 152*	114 140 168* 194*	0 141 176* 210*	5 171*	7.2 185*	10	
30 -255 55.9 37.7 32.3 45.9 85.5 55.6 85.5 55.6 930 -25 930 -25 930 -25 931.1 -39.1 937.4 48.3 95.0 56.4	-23.3 2 41.8 3 51.3 4 62.0 2 71.6 -23.3 3 3.8 5 42.4 51.6	51.7 63.1 76.4 87.8 -20 38.0	69.3 84.3 102 117 -15	90.0 110 132 152*	114 140 168* 194*	0 141 176* 210*	5 171*	7.2 185*	10	
5.9 37 12.3 45 18.5 55 15.5 64 19 -25 10.0 -25 10.0 31 10.7 39 17.4 48. 15.0 56 sumption (10.10)	2 41.8 9 51.3 4 62.0 2 71.6 -23.3 33.8 5 33.8 5 42.4 51.6 51.6	51.7 63.1 76.4 87.8 -20 38.0	69.3 84.3 102 117 -15	90.0 110 132 152*	114 140 168* 194*	141 176* 210*	171*	185*		13
2.3 45.1 88.5 55.2 45.5 64.1 mption 30 30 -25 30.7 39.3 30.7 39.3 37.4 48.5 45.0 56.6	0 51.3 4 62.0 2 71.6 -23.3 33.8 5 33.8 5 42.4 51.6	63.1 76.4 87.8 -20 38.0	84.3 102 117 -15	110 132 152*	140 168* 194*	176* 210*			205*	
8.5 55.7 55.5 64.1 mption 30 -25 31.0 30.7 39.3 37.4 48. 55.0 56.3 umption 56.4	 62.0 71.6 -23.3 33.8 42.4 51.6 	76.4 87.8 -20 38.0	102 117 -15	132 152*	168* 194*	210*	21/*	23/*		
5.5 64. nption 30 -25 5.0 31. 30.7 39. 7.4 48. 5.0 56. umption (2 71.6 -23.3 5 33.8 5 42.4 51.6	87.8 -20 38.0	117 -15	152*	194*					
mption 30 -25 5.0 31.0 30.7 39.3 37.4 48.3 45.0 56.3 umption (10,11)	-23.3 5 33.8 5 42.4 51.6	-20 38.0	-15	r	r	1				
30 -25 5.0 31.0 30.7 39.1 37.4 48. 5.0 56.0 umption (33.8 42.4 51.6	38.0		-10	5	1				
5.0 31.0 30.7 39.1 37.4 48.1 5.0 56.1 umption (33.8 42.4 51.6	38.0		-10	5		2V DC,	static c	ooling	wat
0.7 39.1 7.4 48. 5.0 56.1 umption (5 42.4 51.6		44.3		-5	0	5	7.2	10	15
7.4 48. 5.0 56.3 Imption (51.6	48.0		50.8	57.7	65.3	73.8*	77.9*	83.5*	
7.4 48. 5.0 56.3 Imption (51.6		56.5	64.9	73.4	82.0*	90.9*	94.9*		
5.0 56.		58.3	68.3	78.1	87.9*	98.0*				
umption (68.2	79.5	91.2*	104*	2010				
								I		_
20 1 25	1	<u> </u>	1	1			· · · ·			A
		-20	-15	-10	-5	0	5	7.2	10	15
.07 2.5	_	3.12	3.70	4.31	4.94	5.62	6.32*	6.64*	7.05*	
.62 3.2	-	3.92	4.63	5.38	6.13	6.88*	7.63*	7.95*		
.20 3.9	4.27	4.80	5.63	6.48	7.34*	8.23*				
.86 4.7) 4.99	5.60	6.56	7.58*	8.67*					
	old/CEC									w/w
1	1	· · ·	-15	-10	_5	0	5	7 2	10	15
							-			5
	_								1.97~	
	_						1.92*	2.01*		
						1.72*				
.82 0.9	0.96	1.04	1.19	1.35*	1.51*					
LBP)						1	12V DC,	static c	ooling	W/W
-30 -25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
.04 1.19	1.25	1.37	1.58	1.79	1.99	2.18	2.34*	2.40*	2.47*	
.05 1.10	5 1.21	1.32	1.50	1.70	1.93	2.16*	2.41*	2.52*		
.03 1.1	1.21	1.32	1.50	1.71	1.93*	2.16*				
.01 1.1	1.18	1.29	1.48	1.68*	1.89*					
					* fan d	oolina	of elect	ronic u	nit com	oulsory
ons with e	lectronic	units	EN	12900						
perature		8 8					i			
emperatu	e	Ž Ž		32	2°C			32	°C	
rature		2 5		no sub	cooling	1		32	°C	
										er
uantities						Ø:16	mm			
uantities						Ø:16	mm			
	ole)									
gateway								10	5N9501	
		DIN 725	8	1.	2V: 15A	24V:7	.5 A		Net	
Main sw	tch					min.	20A	del		
Fuse, 10)-240V									
A 4	tch					min	. 6A	non	i Dunio.	55
Main sw										
	0 Househ 0 Househ 30 -25 84 0.93 85 0.94 83 0.93 82 0.92 LBP) 30 -25 30 -25 0.94 30 -25 0.94 30 -25 0.04 30 -25 0.04 0.05 1.16 0.03 0.03 1.15 0.01 0.01 1.13 0.01 ns with elemperature emperature emperature or BD50F one comp. uantities iantities ithout call gateway Automot Main swi Fuse, 100	0 Household/CECG 30 -25 -23.3 .84 0.95 1.00 .85 0.94 0.98 .83 0.93 0.97 .82 0.92 0.96 LBP) 30 -25 -23.3 .04 1.19 1.25 .05 1.16 1.21 .03 1.15 1.21 .03 1.15 1.21 .01 1.13 1.18 ms with electronic emperature .05 DSOF .06 COMP. .07 BDSOF .08 comp. .07 BDSOF	0 Household/CECCOMAF) 30 -25 -23.3 -20 .84 0.95 1.00 1.10 .85 0.94 0.98 1.06 .83 0.93 0.97 1.06 .82 0.92 0.96 1.04 LBP) 30 -25 -23.3 -20 .04 1.19 1.25 1.37 .05 1.16 1.21 1.32 .03 1.15 1.21 1.32 .03 1.15 1.21 1.32 .01 1.13 1.18 1.29 mperature emperature 70 50 emperature 70 50 emperature 70 50 or BD50F	O Household/CECOMAF) 0 -25 -23.3 -20 -15 .84 0.95 1.00 1.10 1.27 .85 0.94 0.98 1.06 1.20 .83 0.93 0.97 1.06 1.21 .82 0.92 0.96 1.04 1.19 LBP) 30 -25 -23.3 -20 -15 .04 1.19 1.25 1.37 1.58 .05 1.16 1.21 1.32 1.50 .03 1.15 1.21 1.32 1.50 .03 1.15 1.21 1.32 1.50 .01 1.13 1.18 1.29 1.48 mperature perature perature CP OO	O Household/CECOMAF) 30 -25 -23.3 -20 -15 -10 .84 0.95 1.00 1.10 1.27 1.43 .85 0.94 0.98 1.06 1.20 1.37 .83 0.93 0.97 1.06 1.21 1.37 .82 0.92 0.96 1.04 1.19 1.35* LBP) 30 -25 -23.3 -20 -15 -10 .04 1.19 1.25 1.37 1.58 1.79 .05 1.16 1.21 1.32 1.50 1.70 .03 1.15 1.21 1.32 1.50 1.71 .01 1.13 1.18 1.29 1.48 1.68* mperature To So	O Household/CECOMAF) 30 -25 -23.3 -20 -15 -10 -5 .84 0.95 1.00 1.10 1.27 1.43 1.60 .85 0.94 0.98 1.06 1.20 1.37 1.54* .83 0.93 0.97 1.06 1.21 1.37 1.54* .82 0.92 0.96 1.04 1.19 1.35* 1.51* LBP) 30 -25 -23.3 -20 -15 -10 -5 .04 1.19 1.25 1.37 1.58 1.79 1.99 .05 1.16 1.21 1.32 1.50 1.70 1.93 .03 1.15 1.21 1.32 1.50 1.71 1.93* .01 1.13 1.18 1.29 1.48 1.68* 1.89* emperature 75 6 32°C 32°C 32°C rature 76 75 10	O Household/CECOMAF) 30 -25 -23.3 -20 -15 -10 -5 0 8.4 0.95 1.00 1.10 1.27 1.43 1.60 1.74 8.5 0.94 0.98 1.06 1.20 1.37 1.54 1.73* 8.8 0.92 0.96 1.04 1.19 1.35* 1.51* - LBP) 30 -25 -23.3 -20 -15 -10 -5 0 .04 1.19 1.25 1.37 1.58 1.79 1.99 2.18 .05 1.16 1.21 1.32 1.50 1.70 1.93 2.16* .03 1.15 1.21 1.32 1.50 1.71 1.93* 2.16* .01 1.13 1.18 1.29 1.48 1.68* 1.89* - * fan cooling mereature 55°C perature 55°C 32°C - 32°C - rature Ø:1	O Household/CECOMAF) 30 -25 -23.3 -20 -15 -10 -5 0 5 84 0.95 1.00 1.10 1.27 1.43 1.60 1.74 1.87* .85 0.94 0.98 1.06 1.20 1.37 1.54 1.73* 1.92* .83 0.93 0.97 1.06 1.21 1.37 1.54* 1.73* 1.92* .83 0.93 0.97 1.06 1.21 1.37 1.54* 1.72* .82 0.92 0.96 1.04 1.19 1.35* 1.51* LBP) 20 -15 -10 -5 0 5 2.16* 2.41* 2.16* 2.41* 2.16* 2.41* 3.15 1.21 1.32 1.50 1.71 1.93* 2.16* 2.41* 3.216* 2.41* 3.216* 2.41* <td< td=""><td>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</td><td>$\begin{array}{c c c c c c c c c c c c c c c c c c c$</td></td<>	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $

Compressor speed	l			
Electronit unit	Resistor (R1) [Ω]	Motor speed		
Code number	calculated values	[rpm]		
101N0212	0	2,000		
101N0212 101N0510 101N0650	277	2,500		
	692	3,000		
	1523	3,500		
	0	AEO		
	173	2,000		
101N0340 with AEO	450	2,500		
	865	3,000		
	1696	3,500		

n AEO (Adaptive Energy Optimizing) speed mode the BD comressor will always adapt its speed to the actual cooling demand.

Wire dimensions DC

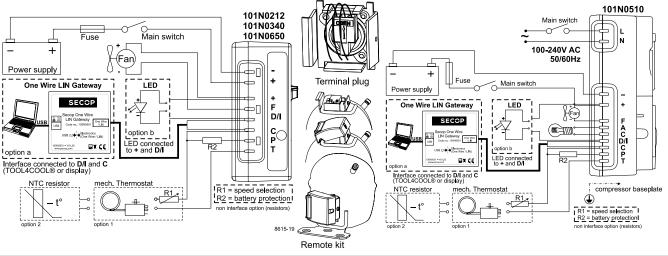
Si	ze	Max. l	ength*	Max. length*			
Cross section	AWG	12V op	eration	24V op	eration		
[mm ²]	[Gauge]	[m]	[ft.]	[m]	[ft.]		
2.5	12	2.5	8	5	16		
4	12	4	13	8	26		
6	10	6	20	12	39		
10	8	10	33	20	66		

*Length between battery and electronic unit

Wire dimensions AC

Cross section min. 0.75 mm² or AWG 18

Error code							
or LED flashes							
6	Thermostat failure						
	(If the NTC thermistor is short-circuit or has no connection).						
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	Too many start attempts or fan over current (Too many compressor or fan starts in short time or fan current higher than 0.5A _{avg}).						
1	Battery protection cut-out (The voltage is outside the cut-out setting).						



antoss

Data sheets

R134a - BD50F DC Compressor - 12/24V DC - 100-240V AC 50/60Hz - Inch Connectors

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



SECOP

THERMALLY PROTECTED SYSTEM Approval mark

BD50F 12/24V DC

General

Code number (without electronic units)	101Z0203	Approvals
Electronic unit 12/24V DC - Standard	101N0212, 30 pcs: 101N0213	-
Electronic unit 12/24V DC - AEO	101N0340, 30 pcs: 101N0341	UL / VDE / CB
Electronic unit 12/24V DC & 100-240V AC 50/60Hz	101N0510, 28 pcs: 101N0511	UL / VDE
Electronic unit 12/24V DC - Automotive	101N0650, 30 pcs: 101N0651	UL/VDE/CB
Compressors on pallet	150	

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 ₁
38°C	S	S	F ₁
43°C	S	S	F ₁

Motor

Motor type		variable speed
Resistance, all 3 windings (25°C)	Ω	1.8

Design

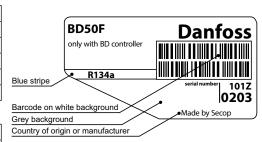
Displacement	cu.in.	0.15
Oil quantity (type)	fl.oz.	5.1 (polyolester)
Maximum refrigerant charge	oz.	10.5
Free gas volume in compressor	fl.oz.	29.6
Weight - Compressor/Electronic unit	lbs.	9.5 / 0.42 (Standard)

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

٧	/oltage		12V	24V
0	Lut out	VDC	10.4	22.8
0	Lut in	VDC	11.7	24.2

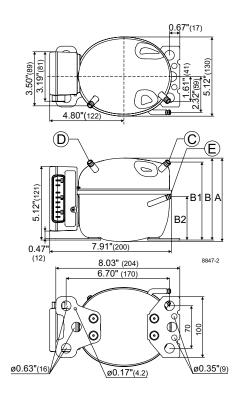
Dimensions

Height	inch	А	5.39	
		В	5.32	
		B1	5.04	
		B2	2.87	
Suction connector	location/I.D. inch angle	С	0.252-0259 40°	
	material comment		Cu-plated steel Al cap	
Process connector	location/I.D. inch angle	D	0.252-0259 45°	
	material comment		Cu-plated steel Al cap	
Discharge connector	location/I.D. inch angle	E	0.202-0.205 21°	
	material comment		Cu-plated steel Al cap	
Remarks: inch connectors				



= Static cooling normally sufficient S

- 0 = Oil cooling
- F_1 = Fan cooling 1.5 m/s
 - (compressor compartment temperature equal to ambient temperature)
- F_2 = Fan cooling 3.0 m/s necessary
- SG = Suction gas cooling normally sufficent
- = not applicable in this area





R134a - BD50F DC Compressor - 12/24V DC - 100-240V AC 50/60Hz - Inch Connectors

Capacity (A	SHRAE	LBP)						12V DC	, static	cooling		BTU/ł
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	858*			
3,500	168	219	244	342	464	520*	613*	792*				
apacity (E	N 1290	0 Hous	ehold/	CECON	AF)			12V DC	, static	cooling		wat
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	203*	1		
3,500	40.0	52.0	57.9	81.0	110	123*	145*	187*				
ower cons	umptie	on						12V DC	. static	cooling		wat
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*	02.0
3,000	39.9	48.0	51.4	62.5	73.2	77.5	84.0	95.0	107*	50.5	74.4	
3,500	47.7	56.7	60.5	72.9	85.4	90.6*	98.7*	113*	107			
Surrent con									halfad)			
rpm \ °F	-20	-13	-10		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*	7.01
3,000	3.38	3.99	4.26	5.16	6.08	6.46	7.03	7.99	8.98*	7.55	7.51	
3,500	4.04	4.69	4.98	6.00	7.09	7.55*	8.27*	9.51*	0.90			
			4.90	0.00	7.09	1.55	0.27					
ER (ASHRA					10				<u> </u>	cooling		TU/WI
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	8.06*			
3,500	3.53	3.86	4.03	4.69	5.43	5.74*	6.21*	6.99*				
OP (EN 12				<u> </u>				T		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	1.89*			
3,500	0.84	0.92	0.95	1.11	1.28	1.35*	1.46*	1.64*				
								ooling c	felectr			oulsory
Test condi				1	EN	12900		MAF			AE LBP	
Condensing				212			1°F				0°F	
Ambient te				22			D°F)°F	
Suction gas				01N0212 01N0650			D°F)°F	
Liquid tem	peratur	e				no sub	cooling]	<u> </u>	90)°F	
Accessori											e num	
Bolt joint								Ø: 5/			18-191	
		n quantities Ø: 5/8 in. 118-1918										
		guantities Ø: 5/8 in. 118-1919										
Remote k	<u>it (with</u>	nout ca	able)							10	05N921	0
One Wire/										10)5N95()1
DC usage				e, DIN I	7258	12	V: 15A	24V:	7.5 A		Not	
DC usaye	Ma	in swit	ch					min	. 20A	da	liverat	
Euse 100-240V												
AC usage: Main switch min. 6A from Danfoss												

Compressor speed

Electronit unit	Resistor (R1) [Ω]	Motor speed
Code number	calculated values	
		[rpm]
101N0212	0	2,000
101N0212	277	2,500
101N0650	692	3,000
10110050	1523	3,500
	0	AEO
101N0340	173	2,000
with AEO	450	2,500
WIGHAEO	865	3,000
	1696	3,500

In AEO (Adaptive Energy Optimizing) speed mode the BD comressor will always adapt its speed to the actual cooling demand.

Wire dimensions DC

Si	ze	Max. l	ength*	Max. length		
Cross	AWG	12V op	eration	24V op	eration	
section						
[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	

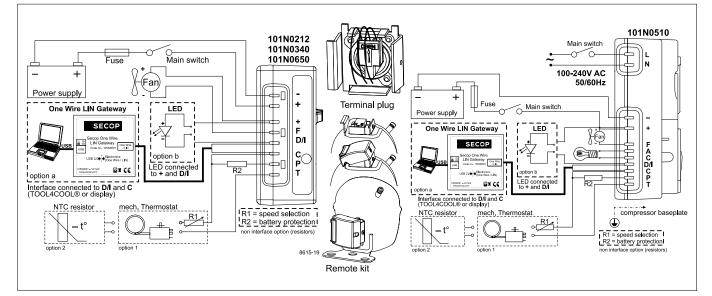
*Length between battery and electronic unit

Wire dimensions AC

Cross section min. 0.75 mm² or AWG 18

Operational errors

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



R134a - BD80F DC Compressor - 12/24V DC

BD80F - DC Compressor R134a 12/24V DC



Janfoss

General

Code number (without electronic units)	101Z0280		
Electronic unit - High Speed	101N0390, 28 pcs: 101N0391		
Compressors on pallet	150		

Application

Application		LBP
Evaporating temperature	°C	-30 to -5
Voltage/max. voltage	VDC	9.6 - 17 / 21.3 - 31.5
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	-	-
38℃	S	-	_
43℃	S	-	_
Remarks on application:			

BD80F Danfoss only with BD controller R134a Blue stripe Barcode on white background Grey background Country of origin or manufacturer

- = Static cooling normally sufficient
- O = Oil coolingF₁ = Fan cooling 1.5

S

- 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 sufficent
- not applicable in this area

Motor

Motor type		variable speed
Resistance, all 3 windings (25°C)	Ω	1.8

Design

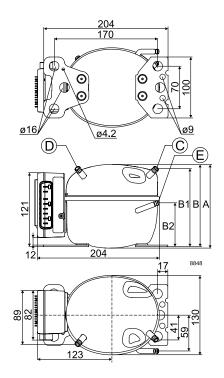
Displacement	cm ³	3.00
Oil quantity (type)	cm ³	150 (polyolester)
Maximum refrigerant charge	g	300
Free gas volume in compressor	cm ³	870
Weight - Compressor/Electronic unit	kg	4.4/0.32

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
		В	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	Е	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:			



<u>Danfoss</u>

One Wire/LIN gateway Automobile fuse, DIN 7258

Main switch

R134a - BD80F DC Compressor - 12/24V DC

Capacity	Î.					1	,		/ DC, s	1		wat
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,500	35.2	49.8	55.3	67.0	87.3	112	140					
3,100	41.9	59.2	65.8	79.8	104	133	168					
3,800	50.1	70.8	78.7	95.4	125	159	200					
4,400	54.9	78.1	86.8	105	138	176	221					
apacity	(ASHR	AE LB	P)					24\	/ DC, s	tatic co	oling	wat
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,500	43.7	61.8	68.6	83.1	108	138	174					
3,100	52.0	73.4	81.6	98.8	129	165	208					
3,800	62.1	87.8	97.5	118	154	197	248					
4,400	68.1	96.7	108	130	171	218	274					
			100	150	171	210	2/4	241				
Power con			222	20	10	10	-5		· · · ·	tatic co		wat
<u>rpm∖°C</u>	-30	-25	-23.3	-20	-15	-10		0	5	7.2	10	15
2,500	38.4	47.9	51.2	57.8	68.2	79.5	91.9					
3,100	46.9	58.9	62.9	70.8	83.4	97.3	113					
3,800	57.5	72.0	76.9	86.5	102	119	139					
4,400	66.3	83.5	89.2	100	118	138	161					
Current co										1		
rpm \ ℃	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,500	1.6	2.0	2.1	2.4	2.8	3.3	3.8					
3,100	1.9	2.4	2.6	3.0	3.5	4.1	4.7					
3,800	2.4	3.0	3.2	3.6	4.3	5.0	5.8					
4,400	2.8	3.5	3.7	4.2	4.9	5.8	6.7					
OP (EN 1	2900	House	hold/	CECON	/AF)			24\	/ DC, s	tatic co	oling	W/V
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,500	0.92	1.04	1.08	1.16	1.28	1.40	1.53					
3,100	0.89	1.01	1.05	1.13	1.25	1.37	1.48					
3,800	0.87	0.98	1.02	1.10	1.22	1.34	1.44		Ì	1		
4,400	0.83	0.94	0.97	1.05	1.16	1.27	1.37			1		
OP (ASH		BP)						24\	DC.s	tatic co	olina	w/v
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,500	1.14	1.29	1.34	1.44	1.59	1.75	1.90					
3,100	1.10	1.25	1.30	1.40	1.55	1.70	1.85			1		
3,800	1.07	1.22	1.27	1.37	1.52	1.66	1.80					
4,400	1.02	1.16	1.21	1.30	1.45	1.58	1.71					
Test condi	tions				EN	12900	/CECON	/AF		ASHR	AE LBP	
Condensin		erature					5°C				4°C	
Ambient te	empera	ture				32	2°C			32	°C	
Suction ga	s temp	erature			32°C				32	°C		
Liquid tem	peratu	re				no sub	cooling			32	°C	
A			r							Cod		har
Accessori Bolt joint								Ø.16	mm		e num 18-191	
Bolt joint			•						mm		18-191	
Snap-on i			- - -					16:16	mm		18-191	
Remote k	at (with	nout c	able))5N921	U
											ENIOF C	

Compressor speed

Electronit unit	Resistor (R1) [Ω]	Motor speed
Code number	calculated	
	values	[rpm]
101N0390 with AEO	0	AEO
	203	2,500
	451	3,100
	867	3,800
	1700	4,400

In AEO (Adaptive Energy Optimizing) speed mode the BD comressor will always adapt its speed to the actual cooling demand.

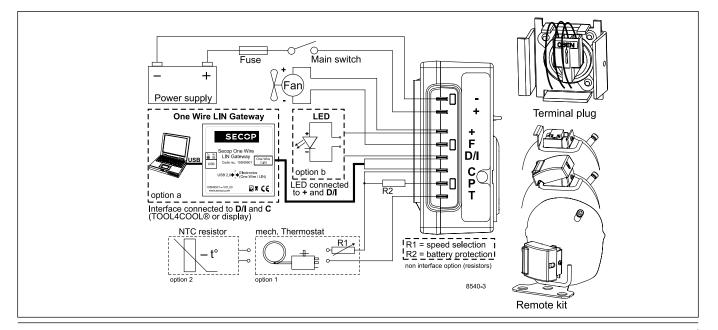
Wire dimensions

Si Cross section	ze AWG	Max. length* 12V operation			ength* eration
[mm ²]	[Gauge]	[m] [ft.]		[m]	[ft.]
6	10	2.5	8	5	16

*Length between battery and electronic unit

|--|

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



105N9501

Not deliverable

from Danfoss

12V: 30A | 24V: 15 A

min. 30A

BD250GH.2 - DC Compressor R134a 12/24V DC



Danfoss

101Z 0406

Made by Secop

Danfoss

General

Code number (without electronic units)	101Z0406		
Electronic unit - High Speed	101N0390, 28 pcs: 101N0391		
Compressors on pallet	150		

Application

••		
Application		LBP/MBP/HBP
Evaporating temperature	°C	-25 to 15
Voltage range	VDC	9.6 - 17 / 21.3 - 31.5
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	S
38°C	S	S	S
43℃	S	S	S
Remarks on application:		· · · · · · · · · · · · · · · · · · ·	

- = Static cooling normally sufficient

BD250GH.2

R134a

only with BD controller

0 = Oil cooling F_1

Barcode on white background

Country of origin or manufacturer

Blue stripe

S

Grey background

- = Fan cooling 1.5 m/s (compressor compartment temperature
- equal to ambient temperature)
- F_2 = Fan cooling 3.0 m/s necessary
- SG = Suction gas cooling normally sufficent
 - = not applicable in this area

Motor

Motor type		variable speed
Resistance, all 3 windings (25°C)	Ω	1.8

Design

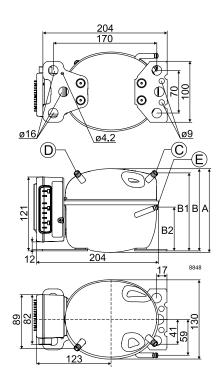
Displacement		2.50
Oil quantity (type)	cm ³	150 (polyolester)
Maximum refrigerant charge	g	300
Free gas volume in compressor	cm ³	870
Weight - Compressor/Electronic unit	kg	4.4/0.32

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	А	137
		В	135
		B1	128
		B2	73
Suction connector	location/I.D. mm angle	С	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	Е	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:			



<u>Danfoss</u>

R134a - BD250GH.2 DC Compressor - 12/24V DC

Capacity			r		r	<u> </u>		r	r ć	static co		wat
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	31.3	38.1	50.8	70.0	90.5	106	114	142	177	194	219	271
3,100	42.9	48.5	61.0	83.5	111	132	143	181	225	246	275	332
3,800	54.6	61.9	77.7	106	140	165	179	225	278	303	337	404
4,400	61.2	69.4	87.2	119	156	184	200	251	308	336	373	446
Capacity	ASHR	AE LBF	<u>)</u>					24	V DC,	static co	oling	wat
rpm \ ℃	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	38.3	46.8	62.6	86.6	112	131	142	177	220	242	274	340
3,100	53.4	60.4	75.9	104	138	164	178	225	280	307	343	415
3,800	68.1	77.1	96.7	132	173	205	223	280	345	377	420	504
4,400	76.3	86.5	109	148	194	229	249	311	383	418	465	556
ower co	nsump	tion						24	V DC,	static co	oling	wat
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	38.1	42.0	48.5	55.9	61.4	64.4	65.9	70.7	76.6	79.9	84.8	96.4
3,100	42.0	46.0	53.1	62.4	70.8	76.2	79.0	87.8	98	103	110	125
3,800	55.0	59.4	67.6	79.0	90.2	97.7	102	114	129	136	146	167
4,400	64.8	69.5	78.2	91	104	113	117	132	150	158	170	194
Current co	onsum	ption	(for 12)	/ applic	ations	the foll	owina	must be	doub	led)		
rpm \ °C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	1.7	1.8	2.0	2.3	2.5	2.6	2.6	2.8	3.0	3.2	3.3	3.7
3,100	2.0	2.1	2.3	2.7	3.0	3.2	3.3	3.7	4.1	4.3	4.6	5.1
3,800	2.5	2.6	2.9	3.3	3.7	4.0	4.2	4.7	5.3	5.6	6.0	6.8
4,400	2.7	2.9	3.2	3.6	4.1	4.5	4.7	5.3	6.0	6.4	6.8	7.8
COP (EN 1	2900	House	hold/C	ЕСОМ	AF)			24	V DC.	static co	olina	w/\
rpm \ °C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	0.82	0.91	1.05	1.25	1.47	1.64	1.73	2.01	2.31	2.43	2.58	2.82
3,100	1.02	1.05	1.15	1.34	1.56	1.73	1.81	2.06	2.30	2.40	2.51	2.66
3,800	0.99	1.04	1.15	1.34	1.55	1.69	1.76	1.97	2.15	2.22	2.30	2.42
4,400	0.94	1.00	1.11	1.31	1.51	1.64	1.71	1.89	2.06	2.12	2.20	2.30
COP (ASH	RAE LI	BP)						24	V DC,	static co	oling	W/V
rpm \ ℃	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	1.01	1.11	1.30	1.56	1.84	2.05	2.17	2.53	2.91	3.07	3.26	3.55
3,100	1.27	1.31	1.43	1.67	1.95	2.15	2.26	2.58	2.88	3.00	3.14	3.35
3,800	1.24	1.30	1.43	1.67	1.93	2.11	2.20	2.46	2.69	2.78	2.88	3.04
4,400	1.18	1.24	1.39	1.63	1.88	2.04	2.13	2.36	2.57	2.65	2.75	2.88
Test cond	ditions	;			EN 1	12900/	CECO	MAF		ASHRAE LBP		
Condensi			ure				°C			54.4°C		
Ambient							°C			32		
Suction g			re			32	-			32		
Liquid ter	nperat	ure				no sub	cooling]		32	Ľ	
Accessori	ies for	BD250	GH.2							Code	numb	ber
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										105	5N950	1
			2250			1.01	1 204	241/1	F A	NI / 1		
Automob	ile fuse	e, din <i>i</i>	258			12	V: 30A	24V: 1	5 A I	Not d	elivera	ble

Compressor speed

Electronit unit	Resistor (R1) [Ω]	Motor speed
Code number	calculated	
	values	[rpm]
	0	AEO
101N0390 with AEO	203	2,500
	451	3,100
	867	3,800
	1700	4,400

In AEO (Adaptive Energy Optimizing) speed mode the BD comressor will always adapt its speed to the actual cooling demand.

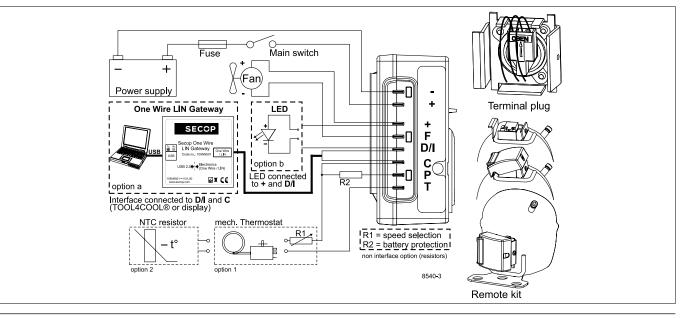
Wire dimensions

Si	ze	Max. le	ength*	Max. length*		
Cross	AWG	12V op	eration	24V op	eration	
section						
[mm ²]	[Gauge]	[m]	[ft.]	[m]	[ft.]	
6	10	2.5	8	5	16	

*Length between battery and electronic unit

Operational errors

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



BD250GH.2 - DC Compressor R134a 48V DC

General

Code number (without electronic units)	101Z0405
Electronic unit - Telecom	101N0732, 36 pcs: 101N0733
Approvals	UL
Compressors on pallet	150

Application

Application		LBP/MBP/HBP
Evaporating temperature	°C	-25 to 15
Voltage range	VDC	32 - 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	S
38°C	S	S	S
43°C	S	S	F ₁
Remarks on application:			

BD250GH.2 only with BD controller R134a Blue stripe R134a Blue stripe Code number & serial number barcode on white background Grey background Country of origin or manufacturer



- S = Static cooling normally sufficient
- O = Oil cooling
- $F_1 = Fan \text{ cooling } 1.5 \text{ m/s}$
- (compressor compartment temperature equal to ambient temperature)
- F₂ = Fan cooling 3.0 m/s necessary
- SG = Suction gas cooling normally sufficent
 - = not applicable in this area

Motor

Motor type		variable speed
Resistance, all 3 windings (25°C)	Ω	1.03

Design

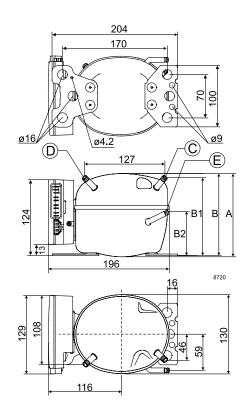
Displacement	cm ³	2.50
Oil quantity (type)	cm ³	150 (polyolester)
Maximum refrigerant charge	g	300
Free gas volume in compressor	cm ³	870
Weight - Compressor/Electronic unit	kg	4.4/0.24

Battery protection settings

Voltage			Min. value	Default	Max. value
Cut out	(0.1 steps)	VDC	32	36	60
Cut in diff.	(0.1 steps)	VDC	0.5	4.0	10.0

Dimensions

Height	mm	А	137	
		В		
		B1	128	
		B2	73	
Suction connector	location/I.D. mm angle	С	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	Е	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: Clearance between electronic unit and baseplate does not allow the snap-on option for mounting.				





TOOL4COOL

Flexible control settings



R134a - BD250GH.2 DC Compressor - R134a - 48V DC

Capacity (I	1	r	r	-					3V DC, 1	r	<u> </u>	wa
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	31.4	36.6	47.2	65.5	87.0	103	112	143	178	195	219	267
3,100	42.9	49.1	62.1	84.8	112	132	144	181	224	246	275	333
3,800	55.0	62.4	78.3	106	139	165	179	224	277	303	337	408
4,400	64.3	72.8	91.1	124	162	191	208	261	322	352	392	472
Capacity (/	SHRAE	ELBP)						5	3V DC, I	fan coo	ling F ₁	wa
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	40.1	46.3	59.3	81.8	108	129	140	177	222	243	273	334
3,100	54.0	61.6	77.6	106	139	164	178	225	279	306	342	416
3,800	68.7	77.9	97.4	132	173	204	222	279	345	377	421	509
4,400	80.0	90.5	113	153	201	237	257	323	400	437	488	589
Power con	sumpti	on						5	3V DC, 1	fan coo	ling F ₁	wa
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	40.8	44.1	50.1	58.5	66.0	70.4	72.5	78.5	83.9	86.1	88.7	93.1
3,100	46.5	50.1	57.0	66.9	76.5	82.6	85.7	94.7	103	107	112	121
3,800	58.2	62.2	70.0	81.7	93.7	102	106	119	132	137	145	159
4,400	72.4	76.7	85.3	98.8	113	122	128	143	160	167	177	196
Current co	nsumpt	tion						5	3V DC, 1	fan coo	ling F ₁	
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	0.78	0.86	1.01	1.23	1.43	1.55	1.60	1.75	1.87	1.91	1.95	1.98
3,100	0.65	0.74	0.90	1.14	1.38	1.52	1.59	1.79	1.97	2.04	2.12	2.23
3,800	0.87	0.96	1.13	1.40	1.67	1.85	1.94	2.20	2.45	2.55	2.68	2.89
4,400	1.36	1.45	1.64	1.93	2.24	2.44	2.55	2.86	3.17	3.30	3.47	3.76
COP (EN 12	2900 Ho	ouseho	d/CEC	OMAF)				5	3V DC, f	fan coo	ling F ₁	w/
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	0.77	0.83	0.94	1.12	1.32	1.47	1.55	1.82	2.12	2.27	2.47	2.87
3,100	0.92	0.98	1.09	1.27	1.46	1.60	1.67	1.91	2.17	2.29	2.45	2.74
3,800	0.94	1.00	1.12	1.30	1.49	1.62	1.68	1.89	2.11	2.21	2.33	2.57
4,400	0.89	0.95	1.07	1.25	1.44	1.56	1.63	1.82	2.01	2.10	2.21	2.41
COP (ASHF)						5	3V DC, f	fan coo	ling F ₁	W/
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	0.98	1.05	1.19	1.41	1.66	1.84	1.95	2.28	2.67	2.86	3.12	3.63
3,100	1.16	1.23	1.37	1.59	1.83	2.00	2.09	2.39	2.72	2.87	3.07	3.45
3,800	1.18	1.25	1.40	1.62	1.85	2.01	2.10	2.36	2.64	2.76	2.92	3.22
4,400	1.10	1.18	1.33	1.55	1.79	1.94	2.02	2.27	2.51	2.62	2.76	3.02

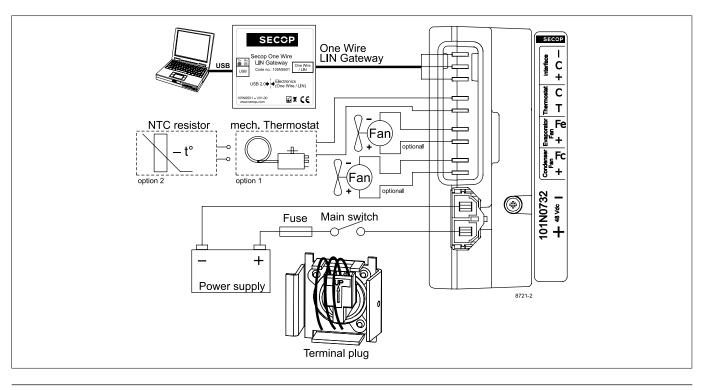
Test conditions	EN 12900/CECOMAF	ASHRAE LBP		
Condensing temperature	55°C	54.4°C		
Ambient temperature	32°C	32°C		
Suction gas temperature	32°C	32°C		
Liquid temperature	no subcooling	32°C		

Operation	al errors
Error code	Error type
code	Can be read out in the software TOOL4COOL ®
6	Thermostat failure
	(If the NTC thermistor is short-circuit or has no connection, the electronic unit will enter manual mode).
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).
2	Fan over-current cut-out (The fan loads the electronic unit with more than 1.8A _{peak}).
1	Battery protection cut-out (The voltage is outside the cut-out setting).

Accessories for BD250GH.2

Mounting		Code number	
Bolt joint for one compressor	Ø: 16 mm	118-1917	
Bolt joint in quantities	Ø: 16 mm	118-1918	
Electrical	Co	de number	
(cables, sensors, etc.)	Single pack	I - Pack	
DC line cord, 900 mm	105N9542	105N9543, 36 pcs.	
DC line cord, 2000 mm	105N9540	105N9541, 36 pcs.	
DC line cord, 5000 mm	105N9538	105N9539, 36 pcs.	
Temperature sensor 470 mm	105N9612	105N9613, 200 pcs.	
Temperature sensor 1000 mm	105N9614	105N9615, 100 pcs.	
Temperature sensor 1500 mm	105N9616	105N9617, 100 pcs.	
One Wire/LIN gateway	105N9501	-	
Comm. cable, 1500 mm	-	105N9545, 100 pcs.	
Comm. cable, 3000 mm	-	105N9547, 50 pcs.	

Not deliverable from Danfoss				
Slow-blow fuse	16A			
Main switch	rated to min. 25A			



R134a - BD350GH DC Compressor - 12V DC - with 101N08xx Series Controllers

BD350GH - DC Compressor R134a 12V DC

with 101N08xx Series Controllers

General

Code number (without electronic units)	102Z3015
Compressor module	101N0800, 30 pcs: 101N0801
Application module	101N0820, 24 pcs: 101N0821
Alternative (one interface only): Electronic Unit (no fan connection/no twin option)	101N0830, 30 pcs: 101N0831
Approvals	-
Compressors on pallet	125

Application

Application		LBP/MBP/HBP
Evaporating temperature	°C	-25 to 15
Voltage range	VDC	9.6 - 17
Max. condensing temperature continuous (short)	°C	60 (70)
Max. winding temperature continuous (short)	°C	125 (135)

Cooling requirements

···· 3 · 1 · · · ·			
Application	LBP	MBP	НВР
32°C	F ₁	F ₁	F ₁
38°C	F ₁	F ₁	F ₁
43°C	F ₁	F ₁	F ₁
Remarks on application: - evaporator fan max. 200W			

condenser fan max. 100W

- starting ability: LST (low starting torque) only

Motor

Motor type		Variable speed
Resistance, all 3 windings (25°C)	Ω	0.1

Design

Displacement	cm³	5.08
Oil quantity (type)	cm ³	280 (polyolester)
Maximum refrigerant charge	g	400
Free gas volume in compressor	cm ³	1690
Weight - Compressor/Electronic unit	kg	7.9 / 0.33 / 0.28 (101N820)

Battery protection settings

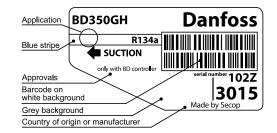
V	oltage			Min. value	Default	Max. value
C	ut out	(0.1 steps)	VDC	9.6	10.4	17
C	ut in diff.	(0.1 steps)	VDC	0.5	1.3	10

Dimensions

Height	mm	А	173
		В	169
		B1	-
		B2	-
Suction connector	location/I.D. mm angle	С	6.2 90°
	material comment		Cu-plated steel Al cap
Process connector	location/I.D. mm angle	D	6.2 31.5°
	material comment		Cu-plated steel Al cap
Discharge connector	location/I.D. mm angle	Е	5.0 28°
	material comment		Cu-plated steel Al cap
Connector tolerance	I.D. mm		±0.09, on 5.0 +0.12/+0.20



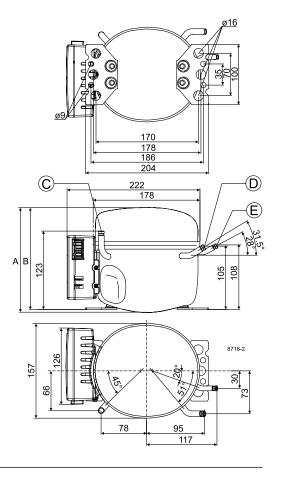
anfoss



- = Static cooling normally sufficient 0
 - = Oil cooling

S

- F_1 = Fan cooling 1.5 m/s (compressor compartment temperature
- equal to ambient temperature) F_2
 - = Fan cooling 3.0 m/s necessary
- = Suction gas cooling normally sufficent SG
- = not applicable in this area





Suction gas temperature

R134a - BD350GH DC Compressor - 12V DC - with 101N08xx Series Controllers

cupacity (E	IN 1290	U HOUS	ehold/0	-ECOM	AF)			1	IZV DC,	fan coo	ling F ₁	wat
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	87.5	96.9	117	152	194	226	244	302	370	403	448	538
3,000	101	112	136	177	225	262	283	351	430	468	521	625
3,500	114	126	152	198	254	296	319	396	485	528	588	706
4,000	126	139	169	220	282	329	355	440	540	588	654	786
Capacity (A	SHRAE	LBP)							12V DC,	fan coo	ling F ₁	wat
rpm \ ℃	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	108	120	145	188.3	240	280	302	375	459	501	557	670
3,000	126	139	168	219	279	325	351	435	534	582	648	778
3,500	141	156	188	246	314	366	395	491	602	656	731	879
4,000	156	173	209	273	349	407	440	546	670	731	814	979
Power cons	sumptio	on							2V DC.	fan coo	lina F1	wat
rpm \ °C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	90.5	95.6	106	123	140	152	156	177	196	204	215	233
3,000	108	114	127	148	169	184	192	215	238	248	261	284
3,500	122	130	146	170	197	214	224	252	280	292	308	335
4,000	140	149	168	197	228	249	259	292	325	340	358	391
Current co	nsumnt	ion						·1	21/ DC	fan coo	lina F1	A
rpm \ ℃	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	7.71	8.15	9.03	10.45	11.93	12.95	13.48	15.06	16.65	17.36	18.25	19.82
3,000	8.99	9.52	10.60	12.32	14.12	15.35	16.00	17.92	19.86	20.71	21.79	23.70
3,500	10.46	11.10	12.39	14.47	16.65	18.13	18.91	21.23	23.57	24.60	25.90	28.21
4,000	11.70	12.46	13.98	16.41	18.97	20.72	21.63	24.35	27.10	28.31	29.84	32.55
COP (EN 12	900 Ho	usehol	d/CECO	MAF)				. 1	2V DC.	fan coo	lina F1	w/w
rpm \ °C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	0.97	1.01	1.10	1.24	1.38	1.48	1.54	1.71	1.89	1.97	2.09	2.30
3,000	0.94	0.98	1.07	1.20	1.33	1.43	1.48	1.63	1.81	1.89	1.99	2.20
3,500	0.93	0.97	1.04	1.16	1.29	1.38	1.43	1.57	1.73	1.81	1.91	2.10
4,000	0.90	0.93	1.01	1.12	1.24	1.32	1.37	1.51	1.66	1.73	1.83	2.01
COP (ASHR	AE LBP)						1	2V DC.	fan coo	lina F1	w/w
rpm \°C	-25	, -23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	1.20	1.26	1.37	1.54	1.72	1.85	1.92	2.13	2.36	2.47	2.61	2.89
3,000	1.17	1.22	1.33	1.49	1.66	1.78	1.84	2.04	2.26	2.36	2.50	2.76
3,500	1.15	1.20	1.30	1.45	1.61	1.72	1.78	1.96	2.17	2.26	2.39	2.64
4,000	1.11	1.16	1.25	1.39	1.54	1.65	1.70	1.88	2.08	2.17	2.29	2.53
Tost sor d	tions.				E 11	12000						
Test condi		oratura			EN	12900	CECON	IAF			AE LBP	
Condensing temperature					2°C				4°C 2°C			
Ambion++	Ambient temperature											

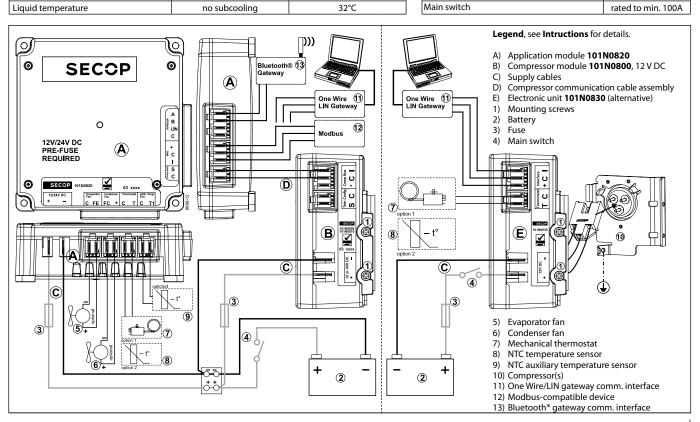
32°C

Error	Error type
code	Can be read out in the software TOOL4COOL®
6	Thermostat failure
	(If the NTC thermistor is short-circuit or has no connection the electronic unit will enter manual mode).
5	Thermal cut-out of electronic unit
	(If the refrigeration system has been too heavily loaded, or i the ambient temperature is high, the electronic unit will rur too hot).
4	Minimum motor speed error
	(If the refrigeration system is too heavily loaded, the moto 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).
2	Fan over-current cut-out
	(The fan loads the electronic unit with too high current).
1	Battery protection cut-out
	(The voltage is outside the cut-out setting).

essories for BD350GH

Mounting		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

Electrical	Code number				
(cables, sensors, etc.)	Single pack	I - Pack			
One Wire/LIN gateway	105N9501	-			
communication cable	105N9524	-			
Bluetooth [®] gateway	105N9502	-			
communication cable	105N9525	-			
Temperature sensor 470 mm	105N9612	105N9613, 200 pcs.			
Temperature sensor 1000 mm	105N9614	105N9615, 100 pcs.			
Temperature sensor 1500 mm	105N9616	105N9617, 100 pcs.			
Comm. cable, 1500 mm	-	105N9553, 80 pcs.			
Comm. cable, 3000 mm	-	105N9554, 45 pcs.			
Display cable, 1500 mm	-	105N9557, 65 pcs.			
Display cable, 3000 mm	-	105N9558, 35 pcs.			
Not deliverable from Danfoss					
Slow-blow fuse compressor mod	60A				
Slow-blow fuse application mod	lule	30A			
Main switch		rated to min. 100A			



32°C

32°C

BD350GH - DC Compressor

R134a 24V DC

with 101N07xx Series Controllers

General

Code number (without electronic units)	102Z3016
Electronic unit	101N0715, 36 pcs: 101N0714
Approvals	-
Compressors on pallet	125

Application

Application		LBP/MBP/HBP
Evaporating temperature	°C	-25 to 15
Voltage range	VDC	19 - 31.5
Max. condensing temperature continuous (short)	°C	60 (70)
Max. winding temperature continuous (short)	°C	125 (135)

Cooling requirements

Cooling requirements				
Application	LE	βP	MBP	HBP
32°C	F	1	F ₁	F ₁
38°C	F	1	F ₁	F ₁
43°C	F	1	F ₁	F ₁
Remarks on application: - evaporator fan max. 60W			×	

- condenser fan max. 40W

- starting ability: LST (low starting torque) only

Motor

Motor type		variable speed
Resistance, all 3 windings (25°C)	Ω	0.2

Design

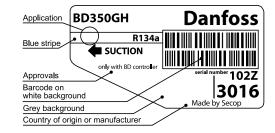
Displacement	cm³	5.08
Oil quantity (type)	cm ³	280 (polyolester)
Maximum refrigerant charge	g	400
Free gas volume in compressor	cm ³	1690
Weight - Compressor/Electronic unit	kg	7.9/0.27

Battery protection settings

Voltage			Min. value	Default	Max. value
Cut out	(0.1 steps)	VDC	19.0	21.1	27.0
Cut in diff.	(0.1 steps)	VDC	0.5	3.9	10.0

Dimensions

Height	mm	A 173
		B 169
		B1 –
		B2 –
Suction connector	location/I.D. mm angle	C 6.2 90°
	material comment	Cu-plated steel Al cap
Process connector	location/I.D. mm angle	D 6.2 31.5°
	material comment	Cu-plated steel Al cap
Discharge connector	location/I.D. mm angle	E 5.0 28°
	material comment	Cu-plated steel Al cap
Connector tolerance	I.D. mm	±0.09, on 5.0 +0.12/+0.20
Remarks		

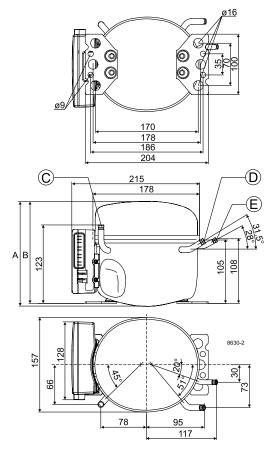


= Static cooling normally sufficient

0 = Oil cooling

S

- $F_1 = Fan \text{ cooling } 1.5 \text{ m/s}$
 - (compressor compartment temperature equal to ambient temperature)
- F_2 = Fan cooling 3.0 m/s necessary
- SG = Suction gas cooling normally sufficent
- = not applicable in this area





TOOL4COOL

Flexible control settings



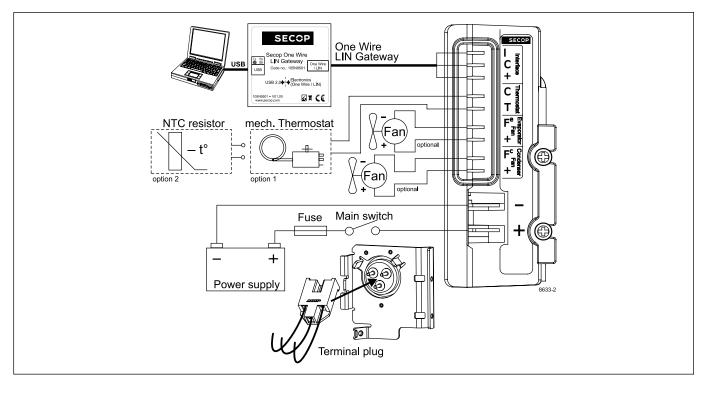
R134a - BD350GH DC Compressor - 24V DC - with 101N07xx Series Controllers

34 520 321 625 388 706 554 786 554 786 354 786 357 786 339 648 448 779 31 879 314 979 371 874 10 15 84 200 32 245 264 288 333 330 341 330	90 434 58 521 28 588 38 654 38 654 30 539 32 648 36 731 31 814 00ling F1 2 .2 10 75 184 15 226	7.2 485 582 656 731	5 445 534 602 670 / DC, fa 5	0 363 435 491 546	-5 236 283 319 355 -5 292 351 395 440	-6.7 219 262 296 329 -6.7 271 325 366 407	-10 188 225 254 282 -10 233 279 314	-15 147 176 198 220 -15 182 219	-20 140	-23.3 93.7 112 126 139 AE LBP -23.3 116	-25	rpm \ °C 2,500 3,000 3,500 4,000							
i21 625 i88 706 i54 786 i0 15 i39 648 i48 779 i10 15 i39 648 i48 779 i14 979 i14 979 i10 15 i84 200 i22 245 i24 208 i03 330 i15 15	58 521 28 588 38 654 30 654 32 10 35 539 32 648 56 731 31 814 cooling F1 .2 .2 10 75 184 15 226	468 528 588 n cooli 7.2 485 582 656 731 n cooli 7.2	430 485 540 / DC, fa 5 445 534 602 670 / DC, fa 5	351 396 440 24\ 0 363 435 491 546 24\	283 319 355 -5 292 351 395	262 296 329 -6.7 271 325 366	225 254 282 -10 233 279 314	176 198 220 -15 182	136 152 169) -20 140	112 126 139 AE LBP -23.3	101 114 126 (ASHR) -25	3,000 3,500							
88 706 9 F1 wa 10 15 339 648 448 779 31 879 9 F1 wa 10 15 339 648 448 779 31 879 9 F1 wa 10 15 84 200 226 245 264 288 303 330 9 F1	28 588 38 654 38 654 38 654 38 539 32 648 56 731 31 814 cooling F1 .2 .2 10 75 184 15 226	528 588 n cooli 7.2 485 582 656 731 n cooli 7.2	485 540 / DC, fa 5 445 534 602 670 / DC, fa 5	396 440 24\ 0 363 435 491 546 24\	319 355 -5 292 351 395	296 329 -6.7 271 325 366	254 282 -10 233 279 314	198 220 -15 182	152 169) -20 140	126 139 AE LBP -23.3	114 126 ASHR -25	3,500							
554 786 g F1 wa 10 15 339 648 448 779 31 879 9 F1 wa 10 15 339 648 48 779 31 879 9 F1 wa 10 15 84 200 226 245 264 288 303 330 9 F1	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	588 n cooli 7.2 485 582 656 731 n cooli 7.2	540 / DC, fa 445 534 602 670 / DC, fa	440 24 0 363 435 491 546 24	355 -5 292 351 395	329 -6.7 271 325 366	282 -10 233 279 314	220 -15 182	169 •) -20 140	139 AE LBP -23.3	126 (ASHR) -25								
g F1 wai 10 15 i39 648 i48 779 i48 779 i14 979 g F1 wai i0 15 i84 200 i26 245 i26 245 i264 288 i03 330 g F1	ooling F1 .2 10 35 539 32 648 56 731 31 814 ooling F1 .2 .2 10 75 184 15 226	n cooli 7.2 485 582 656 731 n cooli 7.2	/ DC, fa 5 445 534 602 670 / DC, fa 5	24\ 0 363 435 491 546 24\	-5 292 351 395	-6.7 271 325 366	-10 233 279 314	-15 182	?) -20 140	AE LBP -23.3	ASHR -25	4.000							
10 15 i39 648 i48 779 i31 879 i44 979 i14 979 gF1 wa 10 15 84 200 226 245 264 288 i03 330 gF1	.2 10 .35 539 .32 648 .56 731 .31 814 ooling F ₁ .2 .2 10 .75 184 15 226	7.2 485 582 656 731 n cooli 7.2	5 445 534 602 670 / DC, fa 5	0 363 435 491 546 24	292 351 395	271 325 366	233 279 314	182	-20 140	-23.3	-25	.,							
39 648 348 779 31 879 314 979 37 84 38 200 226 245 264 288 303 330	35 539 32 648 56 731 31 814 ooling F1 10 .2 10 75 184 15 226	485 582 656 731 n cooli 7.2	445 534 602 670 / DC, fa 5	363 435 491 546 24\	292 351 395	271 325 366	233 279 314	182	140			Capacity (ASHRAE LBP) 24V DC, fan cooling F ₁ wa							
i48 779 i31 879 i314 979 g F1 wa 10 15 84 200 226 245 :64 288 :03 330 g F1	32 648 56 731 31 814 ooling F1 .2 .2 10 75 184 15 226	582 656 731 n cooli 7.2	534 602 670 / DC, fa 5	435 491 546 24\	351 395	325 366	279 314			116	105	rpm∖°C							
31 879 314 979 9F1 wa 10 15 84 200 226 245 664 288 303 330 9F1	56 731 31 814 ooling F ₁ .2 .2 10 75 184 15 226	656 731 n cooli 7.2	602 670 / DC, fa 5	491 546 24\	395	366	314	219		110	105	2,500							
314 979 g F ₁ wa 10 15 84 200 226 245 264 288 303 330 g F ₁	814 ooling F ₁ .2 10 75 184 15 226	731 n cooli 7.2	670 / DC, fa 5	546 24\					168	139	126	3,000							
g F ₁ wa 10 15 84 200 226 245 245 264 288 303 330 g F ₁	ooling F ₁ .2 10 75 184 15 226	n cooli 7.2	/ DC, fa 5	24\	440	407	240	246	188	156	141	3,500							
10 15 84 200 26 245 264 288 303 330 9 F ₁	.2 10 75 184 15 226	7.2	5				349	273	209	173	156	4,000							
84 200 226 245 264 288 303 330 9 F ₁	75 184 15 226		-	0						tion	nsump	Power cor							
226 245 264 288 303 330 3 F ₁	15 226	175		0	-5	-6.7	-10	-15	-20	-23.3	-25	rpm∖°C							
264 288 203 330 2 F ₁			168	152	136	130	120	105	90.8	81.8	77.4	2,500							
03 330 9 F ₁	51 264	215	206	186	167	160	148	129	112	101	95.5	3,000							
g F ₁		251	241	217	194	186	171	149	128	115	109	3,500							
	38 303	288	276	248	221	212	194	169	144	129	122	4,000							
10 15	Current consumption 24V DC, fan cooling F ₁ A																		
10 15	.2 10	7.2	5	0	-5	-6.7	-10	-15	-20	-23.3	-25	rpm∖°C							
.67 8.33	29 7.67	7.29	7.00	6.32	5.66	5.43	5.01	4.38	3.78	3.41	3.23	2,500							
.40 10.2	94 9.40	8.94	8.58	7.76	6.95	6.67	6.15	5.39	4.66	4.20	3.98	3,000							
1.01 11.9	.46 11.01	10.46	10.03	9.05	8.08	7.75	7.12	6.21	5.34	4.79	4.52	3,500							
2.63 13.7	.99 12.63	11.99	11.48	10.34	9.20	8.82	8.10	7.03	6.02	5.38	5.07	4,000							
a, F₁ ₩/	ooling F ₁	n cooli	/ DC, fa	24\			AF)	ЕСОМ	hold/C	House	2900	COP (EN 1							
10 15	.2 10	7.2	5	0	-5	-6.7	-10	-15	-20	-23.3	-25	rpm∖°C							
.36 2.60	23 2.36	2.23	2.13	1.93	1.74	1.68	1.56	1.40	1.25	1.15	1.09	2,500							
.31 2.55	18 2.31	2.18	2.09	1.88	1.70	1.64	1.53	1.37	1.21	1.11	1.06	3,000							
.22 2.45	10 2.22	2.10	2.01	1.82	1.65	1.59	1.48	1.33	1.19	1.09	1.05	3,500							
.16 2.38	05 2.16	2.05	1.96	1.77	1.61	1.55	1.45	1.31	1.17	1.08	1.03	4,000							
gF₁ W/N	ooling F ₁	n cooli	/ DC, fa	24\						BP)	RAE LI	COP (ASH							
10 15	.2 10	7.2	5	0	-5	-6.7	-10	-15	-20	-23.3	-25	rpm∖°C							
.95 3.27	79 2.95	2.79	2.67	2.40	2.17	2.09	1.95	1.74	1.55	1.42	1.36	2,500							
.89 3.20	73 2.89	2.73	2.61	2.35	2.12	2.04	1.90	1.70	1.51	1.38	1.32	3,000							
.79 3.08	63 2.79	2.63	2.52	2.27	2.05	1.98	1.85	1.66	1.48	1.36	1.30	3,500							
.71 2.99	56 2.71	2.56	2.45	2.22	2.00	1.93	1.81	1.62	1.45	1.34	1.28	4,000							
IRD	HRAE LBP			MAE		2000/	EN 1				litions	Test cond							
				TAF					Ire										
									re										
	<u>32℃</u> 32℃			r	-		,			-									
	05 2 ooling .2 79 2 73 2 63 2 56 2	2.05 n cooli 7.2 2.79 2.73 2.63 2.56 ASHR/ 54. 32 32	1.96 / DC, fa 2.67 2.61 2.52 2.45	1.77 24\ 0 2.40 2.35 2.27 2.22 WAF	1.61 -5 2.17 2.12 2.05 2.00 CECOI °C °C	1.55 -6.7 2.09 2.04 1.98 1.93 2900/ 55 32 32	1.45 -10 1.95 1.90 1.85 1.81 EN 1	1.31 -15 1.74 1.70 1.66	1.17 -20 1.55 1.51 1.48 1.45	1.08 3P) -23.3 1.42 1.38 1.36 1.34 	1.03 RAE LI -25 1.36 1.32 1.30 1.28 ditions ng ten tempe as tem	4,000 COP (ASH rpm \ °C 2,500 3,000 3,500							

operation	al errors
Error	Error type
code	Can be read out in the software TOOL4COOL ®
6	Thermostat failure
	(If the NTC thermistor is short-circuit or has no connection, the electronic unit will enter manual mode).
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.
2	Fan over-current cut-out
	(The evaporator fan loads the electronic unit with more than $1.8A_{_{peak}}$ / the condenser fan loads the electronic unit with more than 2.5A_{_{peak}}).
1	Battery protection cut-out
	(The voltage is outside the cut-out setting).

Accessories for BD350GH

Mounting		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
Electrical	de number	
(cables, sensors, etc.)	Single pack	l - Pack
Temperature sensor 470 mm	105N9612	105N9613, 200 pcs.
Temperature sensor 1000 mm	105N9614	105N9615, 100 pcs.
Temperature sensor 1500 mm	105N9616	105N9617, 100 pcs.
One Wire/LIN gateway	105N9501	-
Comm. cable, 1500 mm	-	105N9545, 100 pcs.
Comm. cable, 3000 mm	-	105N9547, 50 pcs.
Not deliverable from Danfoss		
Slow-blow fuse		30A
Main switch		rated to min. 50A



BD350GH - DC Compressor R134a 24V DC

with 101N08xx Series Controllers

TOOL 4COOL®

Danfoss

General

Code number (without electronic units)	102Z3016
Compressor module	101N0810, 30 pcs: 101N0811
Application module	101N0820, 24 pcs: 101N0821
Approvals	-
Compressors on pallet	125

Application

Application		LBP/MBP/HBP
Evaporating temperature	°C	-25 to 15
Voltage range	VDC	19 - 31.5
Max. condensing temperature continuous (short)	°C	60 (70)
Max. winding temperature continuous (short)	°C	125 (135)

Cooling requirements

Application	LBP	MBP	HBP
32°C	F ₁	F ₁	F ₁
38°C	F ₁	F ₁	F ₁
43°C	F ₁	F ₁	F ₁
Remarks on application: - evaporator fan max. 200W - condenser fan max. 100W			

- starting ability: LST (low starting torque) only

Motor

Motor type		Variable speed
Resistance, all 3 windings (25°C)	Ω	0.1

Design

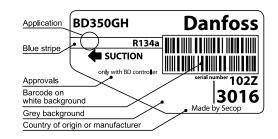
Displacement	cm ³	5.08
Oil quantity (type)	cm ³	280 (polyolester)
Maximum refrigerant charge	g	400
Free gas volume in compressor	cm ³	1690
Weight - Compressor/Electronic unit	kg	7.9 / 0.25 / 0.28 (101N820)

Battery protection settings

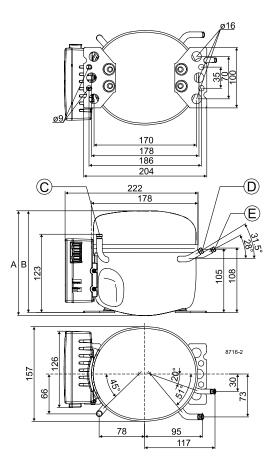
Voltage			Min. value	Default	Max. value
Cut out	(0.1 steps)	VDC	19.0	21.1	27.0
Cut in diff.	(0.1 steps)	VDC	0.5	3.9	10.0

Dimensions	

Height	mm	А	173
		В	169
		B1	-
		B2	-
Suction connector	location/I.D. mm angle	С	6.2 90°
	material comment		Cu-plated steel Al cap
Process connector	location/I.D. mm angle	D	6.2 31.5°
	material comment		Cu-plated steel Al cap
Discharge connector	location/I.D. mm angle	Е	5.0 28°
	material comment		Cu-plated steel Al cap
Connector tolerance	I.D. mm		±0.09, on 5.0 +0.12/+0.20



- S = Static cooling normally sufficient
- O = Oil cooling
- F₁ = Fan cooling 1.5 m/s (compressor compartment temperature equal to ambient temperature)
- F_2 = Fan cooling 3.0 m/s necessary
- SG = Suction gas cooling normally sufficent
- = not applicable in this area





Ambient temperature

Suction gas temperature Liquid temperature

R134a - BD350GH DC Compressor - 24V DC - with 101N08xx Series Controllers

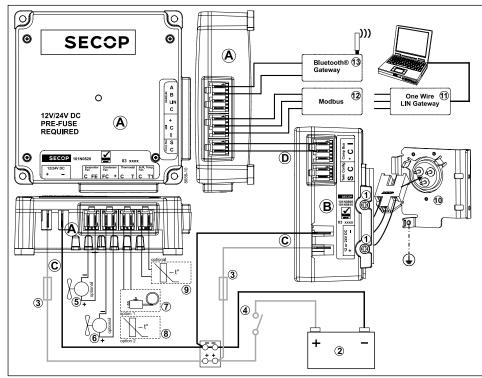
Operational errors

rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	84.7	93.7	113	147	188	219	236	292	358	390	434	520
3,000	101	112	136	176	225	262	283	351	430	468	521	625
3,500	114	126	152	198	254	296	319	396	485	528	588	706
4,000	126	139	169	220	282	329	355	440	540	588	654	786
Capacity (A	SHRAE	LBP)		•	•			2	24V DC,	fan coo	ling F ₁	wat
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	105	116	140	182	233	271	292	363	445	485	539	648
3,000	126	139	168	219	279	325	351	435	534	582	648	779
3,500	141	156	188	246	314	366	395	491	602	656	731	879
4,000	156	173	209	273	349	407	440	546	670	731	814	979
Power cons	sumptio	on						2	4V DC,	fan coo	ling F ₁	wat
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	77.4	81.8	90.8	105	120	130	136	152	168	175	184	200
3,000	95.5	101	112	129	148	160	167	186	206	215	226	245
3,500	109	115	128	149	171	186	194	217	241	251	264	288
4,000	122	129	144	169	194	212	221	248	276	288	303	330
Current co	nsumpt	ion						2	4V DC,	fan coo	ling F ₁	
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	3.23	3.41	3.78	4.38	5.01	5.43	5.66	6.32	7.00	7.29	7.67	8.33
3,000	3.98	4.20	4.66	5.39	6.15	6.67	6.95	7.76	8.58	8.94	9.40	10.21
3,500	4.52	4.79	5.34	6.21	7.12	7.75	8.08	9.05	10.03	10.46	11.01	11.98
4,000	5.07	5.38	6.02	7.03	8.10	8.82	9.20	10.34	11.48	11.99	12.63	13.75
COP (EN 12	900 Ho	usehol	d/CECC	MAF)				2	4V DC,	fan coo	ling F ₁	W/V
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	1.09	1.15	1.25	1.40	1.56	1.68	1.74	1.93	2.13	2.23	2.36	2.60
3,000	1.06	1.11	1.21	1.37	1.53	1.64	1.70	1.88	2.09	2.18	2.31	2.55
3,500	1.05	1.09	1.19	1.33	1.48	1.59	1.65	1.82	2.01	2.10	2.22	2.45
4,000	1.03	1.08	1.17	1.31	1.45	1.55	1.61	1.77	1.96	2.05	2.16	2.38
COP (ASHR	AE LBP)						2	4V DC,	fan coo	ling F ₁	w/\
rpm \ °C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	1.36	1.42	1.55	1.74	1.95	2.09	2.17	2.40	2.67	2.79	2.95	3.27
3,000	1.32	1.38	1.51	1.70	1.90	2.04	2.12	2.35	2.61	2.73	2.89	3.20
3,500	1.30	1.36	1.48	1.66	1.85	1.98	2.05	2.27	2.52	2.63	2.79	3.08
4,000	1.28	1.34	1.45	1.62	1.81	1.93	2.00	2.22	2.45	2.56	2.71	2.99
												-
Test condi	tions				EN	12900/	CECOM	ΔF			AE LBP	

Error	Error type
code	Can be read out in the software TOOL4COOL®
6	Thermostat failure
	(If the NTC thermistor is short-circuit or has no connection the electronic unit will enter manual mode).
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 moto 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).
2	Fan over-current cut-out
	(The fan loads the electronic unit with too high current).
1	Battery protection cut-out
	(The voltage is outside the cut-out setting).

Accessories for BD350GH

Accessories for BD350GH		
Mounting		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
Electrical	Co	de number
(cables, sensors, etc.)	Single pack	I - Pack
One Wire/LIN gateway	105N9501	-
communication cable	105N9524	-
Bluetooth® gateway	105N9502	-
communication cable	105N9525	-
Temperature sensor 470 mm	105N9612	105N9613, 200 pcs.
Temperature sensor 1000 mm	105N9614	105N9615, 100 pcs.
Temperature sensor 1500 mm	105N9616	105N9617, 100 pcs.
Comm. cable, 1500 mm	-	105N9553, 80 pcs.
Comm. cable, 3000 mm	-	105N9554, 45 pcs.
Display cable, 1500 mm	-	105N9557, 65 pcs.
Display cable, 3000 mm	-	105N9558, 35 pcs.
Not deliverable from Danfoss		
Slow-blow fuse compressor mo	dule	60A
Slow-blow fuse application mo	dule	30A
Main switch		rated to min. 100A



32°C

32°C

no subcooling

32°C

32°C

32°C

Legend, see Intructions for details.

- A) Application module **101N0820**B) Compressor module **101N0810**, 24 V
 DC
- C) Supply cablesD) Compressor communication cable assembly
- Mounting screws
 Battery
 Fuse

- 4) Main switch
- 5) Evaporator fan
- 6) Condenser fan
 7) Mechanical thermostat
 8) NTC temperature sensor
 9) NTC auxiliary temperature sensor
 10) Compressor(s)

- 11) One Wire/LIN gateway comm. interface
- 12) Modbus-compatible device 13) Bluetooth[®] gateway comm. interface

R134a - BD350GH DC Compressor - 48-56V DC

BD350GH - DC Compressor R134a 48-56V DC



Danfoss

102Z

3031

SECOP c**W**us BD350GH 48V DC THERMALLY PROTECTED SYSTEM Approval mark

lade by Secor

R134a

Application BD350GH

Country of origin or manufacturer

= Oil cooling $F_1 = Fan \text{ cooling } 1.5 \text{ m/s}$

SUCTION

only with BD controller

= Static cooling normally sufficient

(compressor compartment temperature equal to ambient temperature) F₂ = Fan cooling 3.0 m/s necessary

Blue stripe

Approvals Barcode on white background

S 0

Grey background

Danfoss

General

Code number (without electronic units)	102Z3031
Electronic unit - Telecom	101N0720, 36 pcs: 101N0721
Approvals	UL, CCC
Compressors on pallet	125

Application

••		
Application		LBP/MBP/HBP
Evaporating temperature	°C	-25 to 15
Voltage range	VDC	32 - 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	F ₁	F ₁	F ₁
38°C	F ₁	F ₁	F ₁
43°C	F ₁	F ₁	F ₁
Remarks on application:			

evaporator fan max. 60W

- condenser fan max. 40W

- starting ability: LST (low starting torque) only

Motor

Motor type		variable speed
Resistance, all 3 windings (25°C)	Ω	0.4

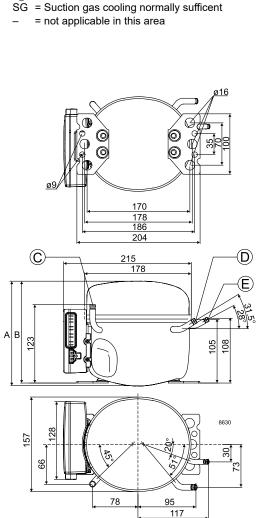
Design

Displacement	cm ³	5.08
Oil quantity (type)	cm ³	280 (polyolester)
Maximum refrigerant charge	g	400
Free gas volume in compressor	cm ³	1690
Weight - Compressor/Electronic unit	kg	7.9/0.27

Battery protection settings

Voltage			Min. value	Default	Max. value
Cut out	(0.1 steps)	VDC	32	36	60
Cut in diff.	(0.1 steps)	VDC	0.5	4.0	10.0

Dimensions			
Height	mm	A	173
		В	169
		B1	_
		B2	_
Suction connector	location/I.D. mm angle	С	6.2 90°
	material comment		Cu-plated steel Al cap
Process connector	location/I.D. mm angle	D	6.2 31.5°
	material comment		Cu-plated steel Al cap
Discharge connector	location/I.D. mm angle	Е	5.0 28°
	material comment		Cu-plated steel Al cap
Connector tolerance	I.D. mm		±0.09, on 5.0 +0.12/+0.20
Remarks			



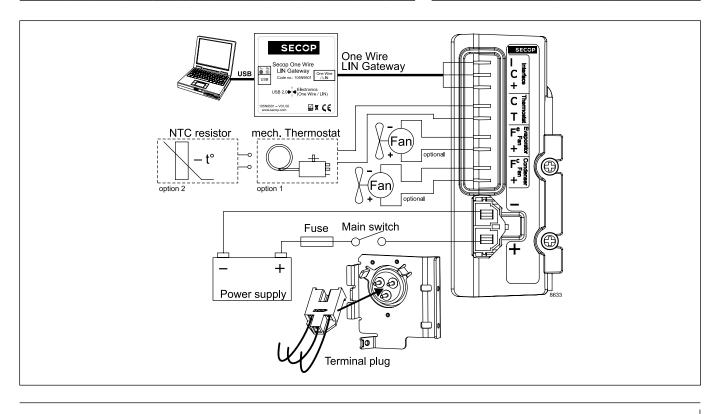


R134a - BD350GH DC Compressor - 48-56V DC

Capacity (E	1	1	r	r				ř –	56V DC,			wat
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	84,7	93,7	113	147	188	219	236	292	358	390	434	520
3,000	101	112	135	176	224	261	282	349	428	466	518	622
3,500	112	125	151	196	251	293	316	392	480	523	582	698
4,000	121	135	164	216	277	324	350	436	535	584	650	781
Capacity (<i>I</i>	ASHRAE	LBP)						5	56V DC,	fan coo	ling F ₁	wa
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	105	116	140	182	233	271	292	363	444	484	539	648
3,000	125	138	167	217	278	324	349	433	531	579	644	775
3,500	139	154	186	243	311	362	391	486	596	650	723	870
4,000	150	167	203	267	343	401	434	540	664	725	808	973
Power con	sumptio	on						5	56V DC,	fan coo	ling F ₁	wa
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	85.2	89.6	98.3	112	127	137	142	158	174	181	190	205
3,000	95.0	100	111	129	147	159	166	185	205	214	225	244
3,500	107	114	127	147	169	184	192	215	238	249	262	285
4,000	131	139	155	181	208	226	236	265	294	307	323	352
Current consumption								5	56V DC,	fan coo	ling F ₁	
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	1.52	1.60	1.76	2.01	2.27	2.45	2.54	2.82	3.11	3.23	3.39	3.67
3,000	1.70	1.79	1.99	2.30	2.62	2.85	2.96	3.31	3.66	3.81	4.01	4.35
3,500	1.92	2.03	2.26	2.63	3.02	3.29	3.43	3.84	4.26	4.44	4.67	5.08
4,000	2.34	2.48	2.77	3.23	3.71	4.04	4.22	4.73	5.25	5.48	5.77	6.28
COP (EN 12	2900 Ha	ousehol	d/CECC	MAF)				5	56V DC,	fan coo	ling F ₁	W/\
rpm \ °C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	0.99	1.05	1.15	1.31	1.48	1.59	1.66	1.85	2.06	2.16	2.29	2.53
3,000	1.06	1.11	1.21	1.37	1.53	1.64	1.70	1.88	2.09	2.18	2.31	2.55
3,500	1.05	1.09	1.19	1.33	1.48	1.59	1.65	1.82	2.01	2.10	2.22	2.45
4,000	0.92	0.97	1.06	1.19	1.33	1.43	1.48	1.64	1.82	1.90	2.01	2.22
OP (ASHR	RAE LBP	')							56V DC,	fan coo	ling F ₁	w/\
rpm∖°C	-25	-23.3	-20	-15	-10	-6.7	-5	0	5	7.2	10	15
2,500	1.23	1.30	1.43	1.63	1.84	1.98	2.06	2.31	2.57	2.70	2.86	3.18
3,000	1.32	1.38	1.51	1.70	1.90	2.04	2.12	2.35	2.61	2.73	2.89	3.20
3,500	1.30	1.36	1.48	1.66	1.85	1.98	2.05	2.27	2.52	2.63	2.79	3.08
4,000	1.15	1.21	1.31	1.48	1.66	1.78	1.85	2.05	2.28	2.38	2.52	2.79
Test cond	itions				EN	12900/					AE LBP	
Condensir		erature			EIN		S°C				4°C	
Ambient t	<u> </u>						°C				<u>۹ د</u>	
Suction ga							2°C				°C	
5							cooling				°C	
Liquid temperature				L	iio sub	coomig		L	52			

Error	Error type					
code	Can be read out in the softwar	re TOOL4COOL®				
6	Thermostat failure					
	(If the NTC thermistor is shor connection, the electronic unit will					
5	Thermal cut-out of electronic uni	it				
	(If the refrigeration system has been or if the ambient temperature is hig will run too hot).					
4	Minimum motor speed error (If the refrigeration system is the motor cannot maintain r approximately 1,850 rpm).					
3	Motor start error					
5	(The rotor is blocked or the difference refrigeration system is too high.	ential pressure in the				
2	Fan over-current cut-out					
	(The fan loads the electronic u $1.8A_{peak}$).	nit with more than				
1	Battery protection cut-out					
	(The voltage is outside the cut-out	setting).				
ccessorie	es for BD350GH					

Mounting		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
Electrical	Co	de number
(cables, sensors, etc.)	Single pack	I - Pack
DC line cord, 900 mm	105N9542	105N9543, 36 pcs.
DC line cord, 2000 mm	105N9540	105N9541, 36 pcs.
DC line cord, 5000 mm	105N9538	105N9539, 36 pcs.
Temperature sensor 470 mm	105N9612	105N9613, 200 pcs.
Temperature sensor 1000 mm	105N9614	105N9615, 100 pcs.
Temperature sensor 1500 mm	105N9616	105N9617, 100 pcs.
One Wire/LIN gateway	105N9501	-
Comm. cable, 1500 mm	-	105N9545, 100 pcs.
Comm. cable, 3000 mm	-	105N9547, 50 pcs.
Not deliverable from Danfoss		
Slow-blow fuse		16A
Main switch		rated to min. 25A





R600a - BD35K DC Compressor - 12/24V DC - 10-45V Solar - 100-240V AC 50/60Hz

BD35K - DC Compressor R600a,12/24V DC, 10-45V DC Solar, & 100-240V AC 50/60Hz

General		
Code number (without electronic units)	101Z0211	Approvals
Electronic unit 12/24V DC - Standard	101N0212, 30 pcs: 101N0213	-
Electronic unit 12/24V DC - AEO	101N0340, 30 pcs: 101N0341	CB / VDE
Electronic unit 10-45V DC - Solar	101N0420, 30 pcs: 101N0421	CB / VDE
Electronic unit 12/24V DC & 100-240V AC 50/60Hz	101N0510, 28 pcs: 101N0511	CB / VDE
Electronic unit 12/24V DC - Automotive	101N0650, 30 pcs: 101N0651	CB / VDE
Compressors on pallet	150	





Application

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
Voltage range for solar applications	VDC	10 - 45
Max. condensing temperature continuous (short)	°C	60 (70)
Max. winding temperature continuous (short)	°C	125 (135)

Danfoss BD35K only with BD controller R600a Red stripe 101Z 0211 Barcode on white background Made by Secop Grey background Country of origin or manufacturer

Cooling requirements

Application	LBP	MBP	HBP		
32°C	S	S	S		
38°C	S	S	S		
43°C	S	S	S		
Remarks on application: Fan cooling F1 depending on application and speed.					

MOLOI			
Motor type		variable speed	
Resistance, all 3 windings (25°C)	Ω	1.8	

Design

Motor

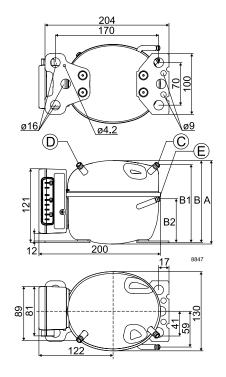
Displacement	cm ³	3.00
Oil quantity (type)	cm ³	150 (polyolester)
Maximum refrigerant charge	g	120
Free gas volume in compressor	cm ³	870
Weight - Compressor/Electronic unit	kg	4.3 / 0.19 (Standard)

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

Dimensions			
Height	mm	А	137
		В	135
		B1	128
		B2	73
Suction connector	location/I.D. mm angle	С	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	Е	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_1 = 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 sufficent
- = not applicable in this area _



R600a - BD35K DC Compressor - 12/24V DC - 10-45V Solar - 100-240V AC 50/60Hz

city (EN 12000 Household (CECOMAE)

2,300	55.0		1.2.0	00.0	, ,	1.52	127	1	1	I	ı l	
2,500 3,000	20.7 25.8	30.9 37.4	34.8 42.0	43.1 51.6	57.5 68.6	74.5 88.9	94.3 113	117 140	144	157		
3,500	30.6	43.9	49.0	60.0	79.2	102	129					
Power cons	umptio	on							12V DC	, static c	oolina	wa
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	17.5	21.5	22.8	25.4	29.1	32.8	36.5	40.2	44.1	45.8	48.0	
2,500	22.9	27.2	28.6	31.3	35.4	39.5	43.6	48.0	52.5	54.5		
3,000	28.9	34.6	36.4	40.0	45.4	50.9	56.5	62.5				
3,500	33.7	41.1	43.5	47.8	54.1	60.4	67.1					
								at ha hi	الأعطا			
Current cou	-30	-25	-23.3	-20	-15	1	-5	1	iffed)	70	10	15
rpm \ ℃ 2,000		-25		2.12	1	-10 2.74		0	5 3.65	7.2	10	15
2,000	1.48 1.90	2.28	1.91 2.40	2.12	2.43 2.98	3.32	3.04 3.67	3.35 4.02	3.65 4.40	3.79 4.57	3.97	
-					3.79	4.23			4.40	4.57		
3,000	2.36	2.87	3.03	3.34			4.69	5.16				
3,500	2.81	3.42	3.61	3.98	4.52	5.04	5.58					
COP (EN 12		T	1	-					1	, static c		W/
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	0.75	0.97	1.04	1.17	1.36	1.56	1.76	1.97	2.18	2.28	2.41	
2,500	0.73	0.93	1.00	1.12	1.33	1.54	1.76	1.99	2.23	2.34		
3,000	0.73	0.89	0.94	1.05	1.24	1.43	1.63	1.84				
3,500	0.74	0.87	0.92	1.03	1.20	1.39	1.58					
COP (ASHR	AE LBP)							12V DC	, static c	ooling	W/\
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,000	0.91	1.19	1.27	1.43	1.67	1.91	2.15	2.41	2.69	2.81	2.97	
2,500	0.90	1.14	1.22	1.38	1.63	1.89	2.16	2.45	2.74	2.87		
3,000	0.89	1.08	1.15	1.29	1.51	1.75	2.00	2.26				
3,500	0.90	1.07	1.13	1.26	1.47	1.70	1.94					
Test condi	tions w	ith elec	tronic	units	EN	12900	CECON	/AF	1	ASHR	AE LBP	
Condensin				12			5℃				4°C	
Ambient te	<u> </u>			06		32	2°C				2°C	
Suction ga				101 N021 2 101 N0650			2°C				2°C	
Liquid tem	peratur	e		55		no sub	cooling	1		32	2°C	
Accessorie										Coc	le numb	er
Bolt joint f									6 m m		18-1917	
Bolt joint i									6 mm	1	18-1918	
Snap-on ir								Ø:1	6 mm		18-1919	
			e)								05N9210	
Remote kit	.IN gate							<u> </u>		10	05N9501	
Remote kit One Wire/I			ο fuico Γ)IN 7258	3		12V: 1	5A 24V	:7.5 A			
One Wire/I			DC usage: Automobile fuse, DIN 7258 12V: 15A 24V: 7.5 A Main switch min. 20A Not					Not				
One Wire/I	Mai	n switc	h					mi	n. 20A	de		e
One Wire/I	Mai Fus		h 40V						n. 20A nin. 6A		Not eliverabl m Danfo	

Compressor speed						
Electronit unit	Resistor (R1) [Ω]	Motor speed				
Code number	calculated values					
		[rpm]				
	0	2,000				
101N0212 101N0510	277	2,500				
101N0650	692	3,000				
	1523	3,500				
	0	AEO				
101N0340	173	2,000				
101N0420	450	2,500				
with AEO	865	3,000				
	1696	3,500				

In AEO (Adaptive Energy Optimizing) speed mode the BD comressor will always adapt its speed to the actual cooling demand.

Wire dimensions DC

Size		Max. le	Max. length*		ength*
Cross	AWG	12V operation		24V op	eration
section					
[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

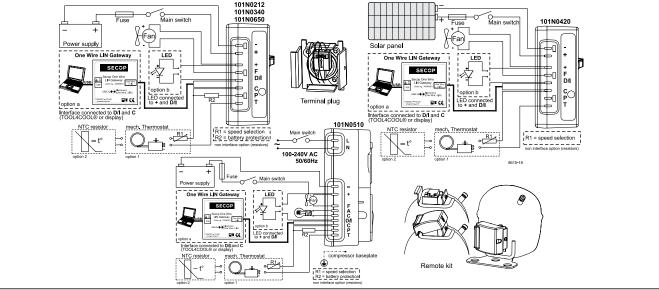
*Length between battery and electronic unit

Wire dimensions AC

Cross section min. 0.75 $\rm mm^2$ or AWG 18

0	oerati	onal	errors
~	Jeruti	unai	enois

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



R600a - BD50K DC Compressor - 12/24V DC

BD50K - DC Compressor R600a 12/24V DC



TOOL4COOL Flexible control settings

R600a

General

Code number (without electronic units)	101Z0213
Electronic unit 12/24V DC - High Speed	101N0390, 28 pcs: 101N0391
Compressors on pallet	150

Application

Application		LBP/MBP/HBP
Evaporating temperature	°C	-30 to 10
Voltage range DC	VDC	9.6 - 17 / 21.3 - 31.5
Max. condensing temperature continuous (short)	°C	60 (70)
Max. winding temperature continuous (short)	°C	125 (135)

Cooling requirements

Application	LBP	MBP	HBP
32℃	S	S	S
38°C	S	S	S
43°C	S	S	S
Remarks on application:			

Remarks on application:

Motor

Motor type		variable speed
Resistance, all 3 windings (25°C)	Ω	1.8

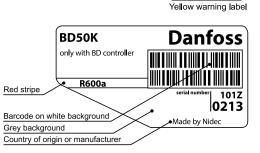
Design		
Displacement	cm ³	3.00
Oil quantity (type)	cm ³	150 (polyolester)
Maximum refrigerant charge	g	120
Free gas volume in compressor	cm ³	870
Weight - Compressor/Electronic unit	kg	4.4 / 0.32

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	А	137	
		В	135	
		B1	128	
		B2	73	
Suction connector	location/I.D. mm angle	С	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	Е	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:				



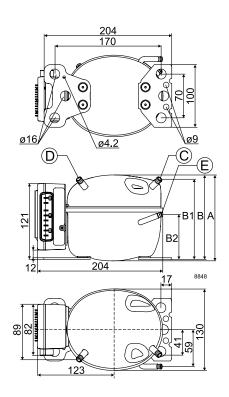
= Static cooling normally sufficient

= Oil cooling 0 F_1

S

_

- = Fan cooling 1.5 m/s (compressor compartment temperature equal to ambient temperature)
- F_2 = Fan cooling 3.0 m/s necessary SG
 - = Suction gas cooling normally sufficent
 - = not applicable in this area





R600a - BD50K DC Compressor · R600a · 12/24V DC

Capacity (E rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	C, static c	10	wa 15
2,500	16.9	23.8	26.6	32.7	43.8	57.2	73.1	91.7	113	123	137	15
3,100		25.8							142			
,	21.3		33.4	41.1	55.0	71.9	91.9	115		155	173	
3,800	25.9	36.4	40.7	50.1	67.0	87.6	112	140	173	189	210	
4,400	29.9	42.0	46.9	57.7	77.3	101	129	162	199	218	242	
Capacity (<i>I</i>	ASHRAE	LBP)							24V D0	C, static c	ooling	wa
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,500	20.6	29.0	32.4	39.9	53.4	69.8	89.3	112	138	151	168	
3,100	25.9	36.4	40.7	50.1	67.1	87.7	112	141	174	189	211	
3,800	31.5	44.4	49.6	61.1	81.8	107	137	171	211	231	257	
4,400	36.4	51.2	57.2	70.4	94.3	123	158	198	244	266	296	
Power con	sumptio	on							24V D0	C, static c	ooling	wa
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,500	24.9	26.8	27.6	29.3	32.4	35.8	39.6	43.6	47.6	49.4	51.7	
3,100	32.4	35.5	36.8	39.6	44.4	49.8	55.6	61.6	67.6	70.2	73.5	
3,800	37.4	43.1	45.2	49.5	56.6	64.1	71.9	79.6	87.3	90.5	94.6	
4,400	41.6	50.0	53.0	58.8	67.7	76.7	85.7	94.4	103	107	111	
Current co	nsumpt	ion (fo	r 12V au	oplicati	ons the	follow	ina mu	st be d	oubled	1)		
rpm\°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,500	0.6	0.8	0.8	1.0	1.2	1.4	1.7	1.9	2.2	2.2	2.4	
3,100	0.8	1.0	1.1	1.3	1.6	1.9	2.3	2.7	3.0	3.1	3.3	
3,800	1.1	1.4	1.5	1.7	2.1	2.5	2.9	3.3	3.7	3.8	4.0	
4,400	1.6	1.9	2.0	2.3	2.6	3.0	3.4	3.8	4.1	4.2	4.4	
				l	2.0	5.0						
COP (EN 12	1			<u> </u>	10	10	-	r		C, static c		W/\
rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,500	0.68	0.89	0.96	1.11	1.35	1.60	1.85	2.10	2.37	2.50	2.66	
3,100	0.66	0.84	0.91	1.04	1.24	1.44	1.65	1.87	2.10	2.21	2.35	
3,800	0.69	0.85	0.90	1.01	1.18	1.37	1.56	1.76	1.98	2.09	2.22	
4,400	0.72	0.84	0.89	0.98	1.14	1.32	1.51	1.71	1.94	2.04	2.18	
COP (ASHR	1	<u> </u>		r	r			r		C, static c	<u> </u>	W/\
rpm∖°C	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2	10	15
2,500	0.83	1.08	1.17	1.36	1.65	1.95	2.26	2.58	2.91	3.07	3.27	
3,100	0.80	1.02	1.10	1.26	1.51	1.76	2.02	2.29	2.58	2.71	2.89	
3,800	0.84	1.03	1.10	1.23	1.45	1.67	1.91	2.16	2.43	2.56	2.73	
4,400	0.87	1.02	1.08	1.20	1.39	1.61	1.84	2.10	2.38	2.51	2.68	
Test cond	itions				EN	12900	/CECON	/AF		ASHR	AE LBP	
Condensir	ng temp	erature					5℃				4°C	
Ambient t							2°C				°C	
Suction ga							2°C			-	2°C	
Liquid tem	peratur	e				no sub	cooling			32	°C	
Accesso	ories fo	or BD	50K							Code	numb	er
							Ø	:16 m	m		-1917	
Bolt joint for one comp. Ø:16 mm 118-1917 Bolt joint in quantities Ø:16 mm 118-1918												
Snap-on								:16 m			-1919	
Remote							2	• • •			N9210	
One Wir			/								N9501	
		<i>.</i>				12\/- 2	0010	1\/- 15				from
Automobile fuse, DIN 7258 12V: 30A 24V: 15 A Main switch min. 30A Nidec GA Compressors												
Main sw	itch							min. 30		der GA	Compre	ecore

Compressor speed

<u> </u>		
Electronit unit	Resistor (R1) [Ω]	Motor speed
Code number	calculated	
	values	[rpm]
	0	AEO
	203	2,500
101N0390 with AEO	451	3,100
WITTLE	867	3,800
	1700	4,400

In AEO (Adaptive Energy Optimizing) speed mode the BD comressor will always adapt its speed to the actual cooling demand.

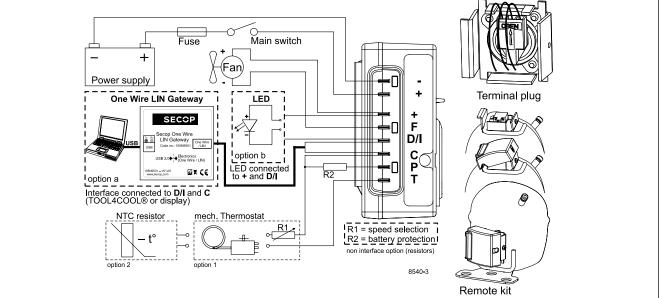
Wire dimensions

Si Cross section	ze AWG	Max. length* 12V operation		Max. lo 24V op	ength* eration
[mm²]	[Gauge]	[m]	[ft.]	[m]	[ft.]
6	10	2.5	8	5	16

*Length between battery and electronic unit

Operational errors

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



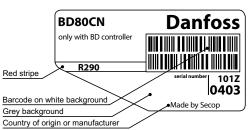
R290 - BD80CN DC Compressor - 12/24V DC

BD80CN - DC Compressor R290, 12/24V DC & 100-240V AC 50/60Hz

General			
Code number (without electronic units)	101Z0403	Approvals	
Electronic unit 12/24V DC - Standard	101N0212, 30 pcs: 101N0213	-	BD80CN
Electronic unit 12/24V DC - AEO	101N0340, 30 pcs: 101N0341	UL / VDE / CB	12/24V DC
Electronic unit 12/24V DC & 100-240V AC 50/60Hz	101N0510, 28 pcs: 101N0511	UL	THERMALLY PROTECTED R290
Electronic unit 12/24V DC - Automotive	101N0650, 30 pcs: 101N0651	UL/VDE/CB	Approval mark Yellow warning label
Compressors on pallet	150		

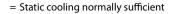
Application

	LBP/MBP
°C	-40 to -5 (5)
VDC	9.6 - 17 / 21.3 - 31.5
V/Hz	100 - 240 / 50 - 60
°C	55 (65)
°C	125 (135)
	VDC V/Hz ℃



Cooling requirements

Application	LBP	MBP	HBP
32°C	S	F1	-
38°C	S	F1	-
43°C	S	F1	-
Remarks on application:			



0 = Oil cooling F1

S

 F_2

- = Fan cooling 1.5 m/s (compressor compartment temperature equal to ambient temperature)
- = Fan cooling 3.0 m/s necessary SG
 - = Suction gas cooling normally sufficent
 - = not applicable in this area

Motor

Motor type		variable speed
Resistance, all 3 windings (25°C)	Ω	1.8

Design

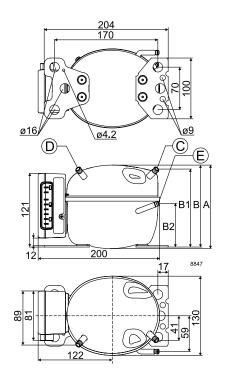
Displacement	cm ³	2.00
Oil quantity (type)	cm ³	150 (polyolester)
Maximum refrigerant charge	g	120
Free gas volume in compressor	cm ³	870
Weight - Compressor/Electronic unit	kg	4.3 / 0.19 (Standard)

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

mm	Α	137
	В	135
	B1	128
	B2	73
location/I.D. mm angle	С	6.2 40°
material comment		Cu-plated steel Al cap
location/I.D. mm angle	D	6.2 45°
material comment		Cu-plated steel Al cap
location/I.D. mm angle	E	5.0 21°
material comment		Cu-plated steel Al cap
I.D. mm		±0.09, on 5.0 +0.12/+0.20
	location/I.D. mm angle material comment location/I.D. mm angle material comment location/I.D. mm angle material comment	B B1 B2 Iocation/I.D. mm angle C material comment Iocation/I.D. mm angle Iocation/I.D. mm angle E material comment





TOOL4COOL Flexible control settings



R290 - BD80CN DC Compressor - 12/24V DC

Capacity (E rpm∖°C	-40	-35	-30	-25	-23.3	-20	-15	-10	-5	, static c 0	5	7.2
										-		7.2
2,000	16.4	24.7	34.6	46.4	50.8	60.2	76.2	94.8	116	140	167	
2,500	20.2	29.0	40.7	55.5	61.2	73.0	95.0	119	147	179	215	
3,000 3,500	26.3	39.6 45.6	54.4	71.6	78.0	92.0	116 132	144 165	178	217		
	31.1		62.3	82.0	89.0	105	152		203			
Capacity (A								r r		, static c		wa
rpm∖°C	-40	-35	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2
2,000	18.2	27.5	38.6	51.7	56.7	67.2	85.1	106	130	157	187	
2,500	22.5	32.3	45.4	61.9	68.0	82.0	106	133	165	200	240	
3,000	29.3	44.1	60.7	80.0	87.0	102	129	161	199	243		
3,500	34.7	50.8	69.5	91.0	100	117	148	184	227			
ower cons	umptio	on						1	2V DC	, static c	ooling	wa
rpm∖°C	-40	-35	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2
2,000	27.3	29	31.8	35.5	36.9	39.8	44.3	48.9	53.3	57.1	60.1	
2,500	31.5	35.9	41.1	46.9	49.0	53.0	58.9	64.4	69.2	72.9	75.1	
3,000	42.9	45.3	51.0	58.8	61.6	67.3	75.2	81.4	85.0	89.0		
3,500	45.3	52.2	60.4	69.3	72.4	78.2	87.0	93.0	98.0			
Current cor	nsumpt	tiom (fo	or 24V a	applica	tions tl	ne follo	wina n	nust be	halfed	0		
rpm∖°C	-40	-35	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2
2,000	2.13	2.25	2.47	2.78	2.89	3.13	3.51	3.89	4.23	4.52	4.73	
2,500	2.84	3.20	3.60	4.03	4.18	4.48	4.93	5.36	5.76	6.11	6.40	
3,000	3.60	3.78	4.25	4.89	5.13	5.60	6.27	6.78	7.02	7.20		
3,500	3.31	3.99	4.56	5.08	5.26	5.63	6.28	7.10	8.17			
										, static c	aaling	W/
COP (EN 12 rpm \ ℃	-40	-35	-30	-25	-23.3	20	15	-10	-5		5 5	7.2
•	0.60					-20	-15			2.45		7.2
2,000	0.60	0.85	1.09 0.99	1.31	1.38	1.51	1.72	1.94	2.18	2.45	2.78 2.85	
2,500 3,000	0.64	0.87	1.07	1.18	1.25 1.27	1.39 1.36	1.61 1.54	1.85 1.77	2.13	2.40	2.05	
3,500	0.69	0.87	1.07	1.18	1.27	1.30	1.54	1.76	2.10	2.45		
			1.05	1.10	1.25	1.54	1.55					
COP (ASHR		ŕ						r r		, static c		W/\
rpm∖°C	-40	-35	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2
2,000	0.67	0.95	1.21	1.46	1.54	1.69	1.92	2.16	2.43	2.75	3.12	
2,500	0.71	0.90	1.10	1.32	1.40	1.55	1.79	2.07	2.38	2.75	3.20	
3,000	0.68	0.97	1.19	1.36	1.41	1.52	1.72	1.98	2.35	2.73		
3,500	0.77	0.97	1.15	1.32	1.38	1.50	1.71	1.97	2.30			
Test condi	tions				EN	12900/	CECON	1AF*		ASHRA	E LBP*	
Condensin							5°C				°C	
Ambient te							2°C				°C	
Suction ga							2°C				°C	
Liquid tem	peratur	e				no sub	cooling			52	°C	
	s for BI	D80CN								Code	numbe	r
Accessorie							(ð:16 mi	m		3-1917	
Accessorie Bolt joint fo		ities						ð:16 mi	_		3-1918	
Bolt joint fo	n guant						(ð:16 mi	m	118	3-1919	
Bolt joint fo Bolt joint ir										105	N9210	
Bolt joint fo Bolt joint ir Snap-on in	quanti		e)									
Bolt joint fo Bolt joint ir Snap-on in Remote kit	quanti (witho	ut cable	2)							105	N9501	
Bolt joint fo Bolt joint ir Snap-on in Remote kit One Wire/L	quanti (witho IN gate	ut cable way		N 7258		12\	/: 15A	24V: 7.5	A			
Bolt joint fo Bolt joint ir Snap-on in Remote kit	quanti (witho IN gate Auto	ut cable way	fuse, D	N 7258		12	/: 15A	24V: 7.5 min. 20			Not	
Bolt joint fo Bolt joint ir Snap-on in Remote kit One Wire/L	quanti (witho IN gate Auto Main	ut cable way mobile	fuse, DI	N 7258	· · · · · · · · · · · · · · · · · · ·	12	/: 15A	24V: 7.5 min. 20		deli		

Compressor speed

Electronit unit	Resistor (R1) [Ω]	Motor speed
Code number	calculated values	
		[rpm]
	0	2,000
101N0212 101N0510	277	2,500
101N0510	692	3,000
	1523	3,500
	0	AEO
	173	2,000
101N0340 with AEO	450	2,500
	865	3,000
	1696	3,500

In AEO (Adaptive Energy Optimizing) speed mode the BD comressor will always adapt its speed to the actual cooling demand.

Wire dimensions DC

Size		Max. l	ength*	Max. length*		
Cross	AWG	12V operation		12V operation 24V opera		
section						
[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	

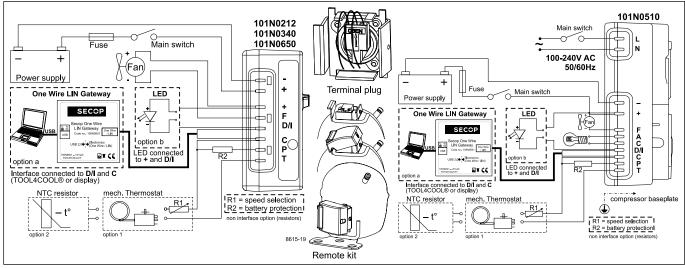
*Length between battery and electronic unit

Wire dimensions AC

Cross section min. 0.75 mm² or AWG 18

Operational errors

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



R290 - BD100CN DC Compressor - 12/24V DC

BD100CN - DC Compressor R290 12/24V DC



Danfoss



General

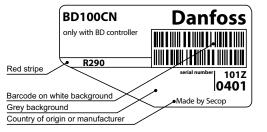
Code number (without electronic units)	101Z0401
Electronic unit - High Speed	101N0390, 28 pcs: 101N0391
Compressors on pallet	150

Application

Application		LBP/MBP
Evaporating temperature	°C	-40 to -5 (5)
Voltage/max. voltage	VDC	9.6 - 17 / 21.3 - 31.5
Max. condensing temperature continuous (short)	°C	55 (65)
Max. winding temperature continuous (short)	°C	125 (135)

Cooling requirements

Application	LBP	MBP	HBP
32℃	S	S	-
38°C	S	S	-
43℃	S	S	-



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 sufficent
- = not applicable in this area

Motor

Motor type		Variable speed	
Resistance, all 3 windings (25°C)	Ω	1.8	

Design

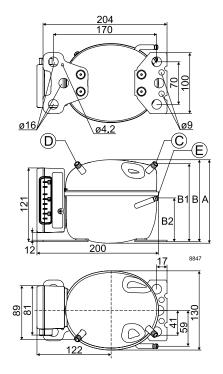
Displacement	cm ³	2.00
Oil quantity (type)	cm ³	150 (polyolester)
Maximum refrigerant charge	g	120
Free gas volume in compressor	cm ³	870
Weight - Compressor/Electronic unit	kg	4.3/0.32

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	А	137
		В	135
		B1	128
		B2	73
Suction connector	location/I.D. mm angle	С	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:			





R290 - BD100CN DC Compressor - 12/24V DC

	N 1290		r			20	1 -			static c		wat
rpm \ ℃	-40	-35	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2
2,500	20.2	31.8	50.9	67.6	73.0	83.7	101	121	146	178	217	
3,100	27.2	43.9	64.0	84.1	91.2	106	130	159	194	236	287	
3,800	42.9	58.5	77.0	98.6	107	124	153	185	223	264		
4,400	47.2	61.3	83.4	108	118	137	169	207	250			
apacity (A										static c		wat
rpm∖°C	-40	-35	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2
2,500	22.5	35.5	56.7	75.4	81.5	93.4	113	135	163	199	243	
3,100	29.3	49.0	71.4	93.8	102	118	145	177	216	264	321	
3,800	47.8	65.2	85.9	110	119	138	170	207	249	296		
4,400	52.7	68.4	93.1	121	131	153	189	231	280			
ower cons	umpti	on						2	24V DC,	static c	ooling	wat
rpm∖°C	-40	-35	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2
2,500	33.6	38.3	43.3	48.5	50.3	53.8	58.9	63.7	68.1	72.0	75.2	
3,100	36.9	45.5	53.8	61.5	64.1	68.9	75.9	82.7	89.2	95.5	102	
3,800	44.8	55.5	65.7	75.5	78.7	84.7	93.2	101	108	115		
4,400	51.7	65.4	77.8	89.3	93.0	99.9	110	119	129			
Current cor	nsumpt	tion (fo	r 12V a	pplicat	ions th	e follo	wina m	ust be	double	d)		
rpm∖°C	-40	-35	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2
2,500	2.51	3.05	3.57	4.05	4.21	4.51	4.93	5.32	5.67	5.99	6.27	
3,100	3.10	3.81	4.49	5.14	5.35	5.75	6.34	6.90	7.43	7.94	8.42	
3,800	3.99	4,74	5.51	6.28	6.54	7.04	7.77	8.44	9.04	9.54		
4,400	5.64	6.05	6.64	7.37	7.64	8.18	9.05	9.92	10.70			
OP (EN 12										static c	oolina	W/N
rpm \°C	-40	-35	-30	-25	-23.3	-20	-15	-10	-5	0	5	7.2
2,500	0.60	0.83	1.17	1.39	1.45	1.56	1.72	1.90	2.15	2.47	2.89	/12
3,100	0.74	0.96	1.19	1.37	1.42	1.53	1.71	1.92	2.17	2.47	2.82	
3,800	0.96	1.05	1.17	1.31	1.36	1.46	1.64	1.83	2.05	2.30	2.02	
4,400	0.91	0.94	1.07	1.21	1.26	1.37	1.54	1.73	1.95	2.50		
OP (ASHR										static c	ooling	W/V
rpm \ ℃	-40	-35	-30	-25	-23.3	-20	-15	-10	-5		5	7.2
2,500	0.67	0.93	1.31	1.55	1.62	1.74	1.92	2.13	2.40	2.76	3.23	7.2
3,100	0.07	1.08	1.33	1.55	1.59	1.74	1.92	2.15	2.40	2.76	3.16	
3,800	1.07	1.18	1.33	1.46	1.59	1.63	1.83	2.05	2.43	2.70	5.10	
4,400	1.07	1.18	1.20	1.40	1.41	1.53	1.85	1.94	2.30	2.50		
Test condi		1.05	1.20	1.55								
Condensin		oraturo			EN	12900/	CECON 5°C	IAF*		АЗНКА 45	E LBP*	
							2°C				<u>۳۲</u>	
Ambient temperature Suction gas temperature							2°C				°C	
Suction ga							cooling	1			°C	
	peratur	C								Codo	numbe	~
Liquid tem	-											
Liquid tem Accessorie	s for Bl	D100CI	N					7.16 m	m			
Liquid tem Accessorie Bolt joint fo	s for Bl	D100CI comp.	N					0:16 m	_	118	3-1917	
Liquid tem Accessorie Bolt joint fo Bolt joint ir	s for Bl or one c n quant	D100CI comp. ities	N				ç	ð:16 m	m	118 118	3-1917 3-1918	
Liquid tem Accessorie Bolt joint fo Bolt joint ir Snap-on in	s for Bl or one c n quant quanti	D100CI comp. ities ties					ç		m	118 118 118	3-1917 3-1918 3-1919	
Liquid tem Accessorie Bolt joint fo Bolt joint ir Snap-on in Remote kit	s for BI or one c n quant quanti (witho	D100CI comp. ities ties ut cable					ç	ð:16 m	m	118 118 118 118	3-1917 3-1918 3-1919 3-1919	
Liquid tem Accessorie Bolt joint fo Bolt joint ir Snap-on in	s for BI or one c n quanti quanti (witho IN gate	D100Cl comp. ities ties ut cable way	2)				ç	ð:16 m	m m	118 118 118 105	3-1917 3-1918 3-1919	

Compressor speed

····· ··· ··· ··· ··· ··· ···						
Electronit unit	Resistor (R1) [Ω]	Motor speed				
Code number	calculated					
	values	[rpm]				
	0	AEO				
	203	2,500				
101N0390 with AEO	451	3,100				
	867	3,800				
	1700	4,400				

In AEO (Adaptive Energy Optimizing) speed mode the BD comressor will always adapt its speed to the actual cooling demand.

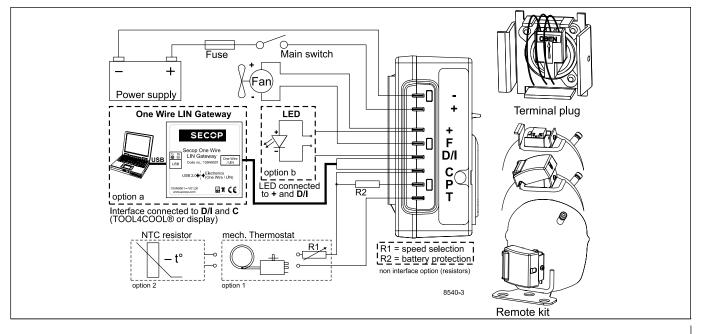
Wire dimensions

Size		Max. le	ength*	Max. length*		
Cross section	AWG	12V operation		24V op	eration	
[mm ²]	[Gauge]	[m]	[ft.]	[m]	[ft.]	
[]	[Gauge]	[11]	[11.]	[11]	լույ	
6	10	2.5	8	5	16	

*Length between battery and electronic unit

Operational errors

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



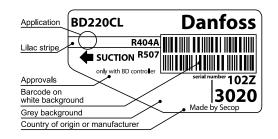
R404A/R507 - BD220CL DC Compressor - 12V - with 101N08xx Series Controllers

BD220CL - DC Compressor R404A/R507 12V DC

with 101N08xx Series Controllers

General

Code number (without electronic units)	102Z3020
Compressor module	101N0800, 30 pcs: 101N0801
Application module	101N0820, 24 pcs: 101N0821
Alternative (one interface only): Electronic Unit (no fan connection/no twin option)	101N0830, 30 pcs: 101N0831
Approvals	_
Compressors on pallet	125



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TOOL4COOL

Flexible control settings

Application

Application		LBP
Evaporating temperature	°C	-45 to -5
Voltage range	VDC	9.6 - 17
Max. condensing temperature continuous (short)	°C	50 (60)
Max. winding temperature continuous (short)	°C	125 (135)

= Static cooling normally sufficient

Cooling requirements

Application	LBP	MBP	НВР
32°C	F ₁	-	-
38°C	F ₁	-	-
43°C	F ₁	-	-

- 0 = Oil cooling

S

- F_1 = Fan cooling 1.5 m/s (compressor compartment temperature equal to ambient temperature)
- F_2 = Fan cooling 3.0 m/s necessary
- = Suction gas cooling normally sufficent SG
- = not applicable in this area

Remarks on application:

- evaporator fan max. 200W - condenser fan max. 100W

Motor

Motor type		variable speed
Resistance, all 3 windings (25°C)	Ω	0.1

Design

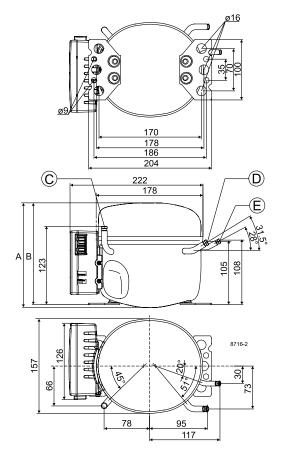
Displacement	cm ³	3.86
Oil quantity (type)	cm ³	280 (polyolester)
Maximum refrigerant charge	g	400
Free gas volume in compressor	cm ³	1690
Weight - Compressor/Electronic unit	kg	7.9 / 0.33 / 0.28 (101N820)

Battery protection settings

Voltage	oltage		Min. value	Default	Max. value
Cut out	(0.1 steps)	VDC	9.6	10.4	17
Cut in diff.	(0.1 steps)	VDC	0.5	1.3	10

Dimensions

Height	mm	А	173	
		В	169	
		B1	-	
		B2	-	
Suction connector	location/I.D. mm angle	С	6.2 90°	
	material comment		Cu-plated steel Al cap	
Process connector	location/I.D. mm angle	D	6.2 31.5°	
	material comment		Cu-plated steel Al cap	
Discharge connector	location/I.D. mm angle	Е	5.0 28°	
	material comment		Cu-plated steel Al cap	
Connector tolerance	I.D. mm		±0.09, on 5.0 +0.12/+0.20	







Code number

118-1917

118-1918

Data sheets

Suction gas temperature

R404A/R507 - BD220CL DC Compressor - 12V - with 101N08xx Series Controllers

rpm∖°C	-45	-40	-35	-30	-25	-23.3	-20	-15	-10	-6.7	-5	0
•					-						-	0
2,500	26.4	47.1	71.9	101	136	149	177	224	278	318	340	
3,000	31.4	56.0	85.5	121	162	178	210	266	331	379	405	
3,500	36.3	64.9	99.2	140	188	206	244	309	384	439	470	
4,000	40.8	73.1	112	158	212	232	275	349	433	495	530	
Capacity (A	SHRAE	LBP)						1	2V DC, 1	fan coo	ling F ₁	wat
rpm∖°C	-45	-40	-35	-30	-25	-23.3	-20	-15	-10	-6.7	-5	0
2,500	31	55	83	117	158	173	205	260	323	370	396	
3,000	36	65	99	140	188	206	244	310	385	441	472	
3,500	42	75	115	162	218	239	284	360	447	512	547	
4,000	47	85	130	183	246	270	320	405	504	577	617	
Power con	sumpti	on						1	2V DC, 1	fan cool	ling F ₁	wat
rpm∖°C	-45	-40	-35	-30	-25	-23.3	-20	-15	-10	-6.7	-5	0
2,500	65.2	82.8	98.9	114	129	133	143	158	174	185	191	
3,000	75.2	96.0	115	134	152	158	170	190	210	225	233	
3,500	84.3	108	131	152	174	181	196	219	245	263	272	
4,000	94.3	121	147	172	197	206	223	251	281	303	314	
Current co	nsumpt	tion						1	2V DC, 1	fan cool	ling F ₁	
rpm∖°C	-45	-40	-35	-30	-25	-23.3	-20	-15	-10	-6.7	-5	0
2,500	5.43	6.90	8.24	9.50	10.71	11.12	11.92	13.16	14.48	15.40	15.90	
3,000	6.27	8.00	9.62	11.16	12.67	13.19	14.20	15.81	17.53	18.75	19.42	
3,500	7.03	9.02	10.89	12.69	14.48	15.10	16.32	18.27	20.38	21.89	22.71	
4,000	7.86	10.12	12.26	14.34	16.43	17.15	18.59	20.90	23.41	25.22	26.20	
COP (EN 12	900 Ho	ouseho	d/CECO	OMAF)				1.	2V DC, 1	fan cool	ling F ₁	W/V
rpm∖°C	-45	-40	-35	-30	-25	-23.3	-20	-15	-10	-6.7	-5	0
2,500	0.41	0.57	0.73	0.89	1.06	1.12	1.23	1.42	1.60	1.72	1.78	
3,000	0.42	0.58	0.74	0.90	1.07	1.12	1.23	1.40	1.57	1.68	1.74	
3,500	0.43	0.60	0.76	0.92	1.08	1.14	1.25	1.41	1.57	1.67	1.72	
4,000	0.43	0.60	0.76	0.92	1.08	1.13	1.23	1.39	1.54	1.64	1.68	
COP (ASHR	AE LBP))						1	2V DC, 1	fan cool	ling F ₁	W/V
rpm \ °C	-45	-40	-35	-30	-25	-23.3	-20	-15	-10	-6.7	-5	0
2,500	0.47	0.66	0.84	1.03	1.23	1.30	1.43	1.65	1.86	2.00	2.07	
3,000	0.48	0.68	0.86	1.05	1.24	1.30	1.43	1.63	1.83	1.96	2.02	
3,500	0.50	0.69	0.88	1.07	1.26	1.32	1.45	1.64	1.83	1.95	2.01	
4,000	0.50	0.70	0.88	1.06	1.25	1.31	1.43	1.62	1.79	1.91	1.96	
,							CECON			ACUE		
Test conditions				EN 12900/CECOMAF				ASHRAE LBP				
Condensing temperature					45°C			45°C				
Ambient temperature					32°C				32°C			

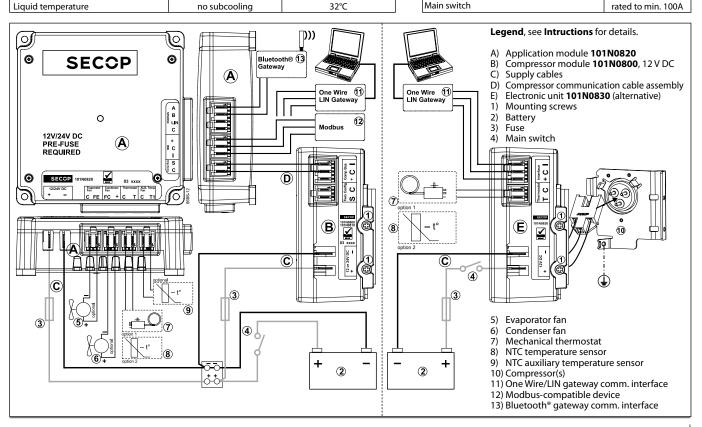
32°C

Error	Error type					
code	Can be read out in the software TOOL4COOL ®					
6	Thermostat failure					
	(If the NTC thermistor is short-circuit or has no connection, the electronic unit will enter manual mode).					
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).					
2	Fan over-current cut-out					
	(The fan loads the electronic unit with too high current).					
1	Battery protection cut-out					
	(The voltage is outside the cut-out setting).					

Mounting Bolt joint for one compressor Ø: 16 mm Bolt joint in quantities Ø: 16 mm Span-on in quantities Ø: 16 mm

Accessories for BD220CL

Snap-on in quantities	Ø: 16 mm	118-1919						
Electrical	Code number							
(cables, sensors, etc.)	Single pack	I - Pack						
One Wire/LIN gateway	105N9501	-						
communication cable	105N9524	-						
Bluetooth [®] gateway	105N9502	-						
communication cable	105N9525	-						
Temperature sensor 470 mm	105N9612	105N9613, 200 pcs.						
Temperature sensor 1000 mm	105N9614	105N9615, 100 pcs.						
Temperature sensor 1500 mm	105N9616	105N9617, 100 pcs.						
Comm. cable, 1500 mm	-	105N9553, 80 pcs.						
Comm. cable, 3000 mm	-	105N9554, 45 pcs.						
Display cable, 1500 mm	-	105N9557, 65 pcs.						
Display cable, 3000 mm	-	105N9558, 35 pcs.						
Not deliverable from Danfoss								
Slow-blow fuse compressor mod	60A							
Slow-blow fuse application mod	30A							
Main switch	rated to min. 100A							



32°C



ENGINEERING TOMORROW

Danfoss Commercial Compressors

is a worldwide manufacturer of compressors and condensing units for refrigeration and HVAC applications. With a wide range of high quality and innovative products we help your company to find the best possible energy efficient solution that respects the environment and reduces total life cycle costs.

We have 40 years of experience within the development of hermetic compressors which has brought us amongst the global leaders in our business, and positioned us as distinct variable speed technology specialists. Today we operate from engineering and manufacturing facilities spanning across three continents.



Our products can be found in a variety of applications such as rooftops, chillers, residential air conditioners, heatpumps, coldrooms, supermarkets, milk tank cooling and industrial cooling processes.

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