Single
Packs

Single Pack BD50F 12/24V DC PM

Single pack code number: **195B4243**

Position	Title	Code	Amount
1	Compressor BD50F	101Z0203	1
2	Bolt joint for one compressor | M6 | ø16mm	118-1917	1

Secop GmbH • Lise-Meitner-Straße 29 • 24941 Flensburg, Germany • Tel: +49 461 4941 0 • **www.secop.com**

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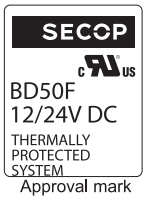
BD50F
Direct Current Compressor
R134a, R1234yf, 12/24V DC & 100-240V AC 50/60Hz

TOOL4COOL®

General

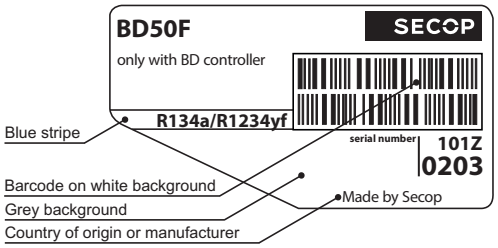
		Approvals R134a	Approvals R134a/R1234yf
Code number (without electronic units)	101Z0203		
Electronic unit 12/24V DC - Standard	101N0242, 30 pcs: 101N0243	–	–
Electronic unit 12/24V DC - AEO	101N0340, 30 pcs: 101N0341	VDE	UL / CB
Electronic unit 12/24V DC & 100-240V AC 50/60Hz	101N0510, 28 pcs: 101N0511	VDE	UL / CB
Electronic unit 12/24V DC - Automotive	101N0680, 30 pcs: 101N0681	–	UL / CB
Compressors on pallet	150		



Approval mark

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
Remarks on application: Fan cooling F_1 depending on application and speed.			

S = Static cooling normally sufficient
O = 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

Motor

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

Design

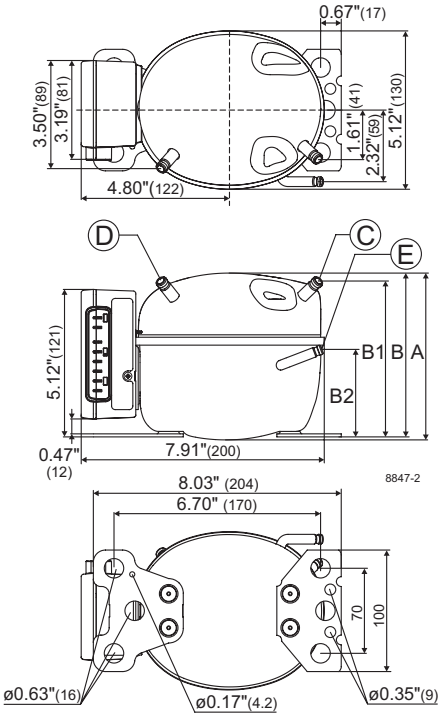
Displacement	cu.in.	0.15
Oil quantity (type)	fl.oz.	5.1 (polyolester)
Maximum refrigerant charge	oz.	10.5
Free gas volume in compressor	fl.oz.	29.6
Weight - Compressor/Electronic unit	lbs.	9.5 / 0.42 (Standard)

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

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

Dimensions

Height	inch	A	5.39
		B	5.32
		B1	5.04
		B2	2.87
Suction connector	location/I.D. inch | angle	C	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**			



Performance Data with Refrigerant R134a

Capacity (ASHRAE LBP) 12V DC, static cooling **BTU/h**

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

Capacity (EN 12900 Household/CECOMAF) 12V DC, static cooling **watt**

rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	22.8	30.1	33.7	47.8	65.1	72.8	85.4	109	135	138*	150*	165*
2,500	28.2	37.0	41.3	58.1	79.1	88.7	105	135	171	175*	191*	
3,000	33.9	44.8	50.1	70.5	95.6	107	126	161				
3,500	40.0	52.0	57.9	81.0	110	123*	145*	187*				

Power consumption 12V DC, static cooling **watt**

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

Current consumption (for 24V applications the following must be halfed) **A**

rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	2.19	2.58	2.76	3.37	4.01	4.29	4.70	5.43	6.20	6.28*	6.60*	7.01*
2,500	2.76	3.25	3.47	4.23	5.03	5.36	5.86	6.69	7.51	7.59*	7.91*	
3,000	3.38	3.99	4.26	5.16	6.08	6.46	7.03	7.99				
3,500	4.04	4.69	4.98	6.00	7.09	7.55*	8.27*	9.51*				

EER (ASHRAE LBP) 12V DC, static cooling **BTU/Wh**

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

COP (EN 12900 Household/CECOMAF) 12V DC, static cooling **W/W**

rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	0.86	0.95	1.00	1.17	1.36	1.43	1.54	1.71	1.86	1.87*	1.92*	1.97*
2,500	0.86	0.94	0.97	1.12	1.29	1.37	1.48	1.69	1.90	1.92*	2.01*	
3,000	0.85	0.93	0.97	1.12	1.30	1.37	1.49	1.68				
3,500	0.84	0.92	0.95	1.11	1.28	1.35*	1.46*	1.64*				

* fan cooling of electronic unit compulsory

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

Accessories for BD50F			Code number
Bolt joint for one comp.		Ø: 5/8 in.	118-1917
Bolt joint in quantities		Ø: 5/8 in.	118-1918
Snap-on in quantities		Ø: 5/8 in.	118-1919
Remote kit (without cable)			105N9210
Secop Gateway			105N9518
DC usage:	Automobile fuse, DIN 7258	12V: 15A | 24V: 7.5 A	Not deliverable from Secop
	Main switch	min. 20A	
AC usage:	Fuse, 100-240V		
	Main switch	min. 6A	

Compressor speed

Electronit unit Code number	Resistor (R1) [Ω] calculated values	Motor speed [rpm]
101N0242 101N0510 101N0680	0	2,000
	277	2,500
	692	3,000
	1523	3,500
101N0340 with AEO	0	AEO
	173	2,000
	450	2,500
	865	3,000
	1696	3,500

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

Wire dimensions DC

Size Cross section [mm²]	Size AWG [Gauge]	Max. length* 12V operation [m]	Max. length* 12V operation [ft.]	Max. length* 24V operation [m]	Max. length* 24V operation [ft.]
2.5	12	2.5	8	5	16
4	12	4	13	8	26
6	10	6	20	12	39
10	8	10	33	20	66

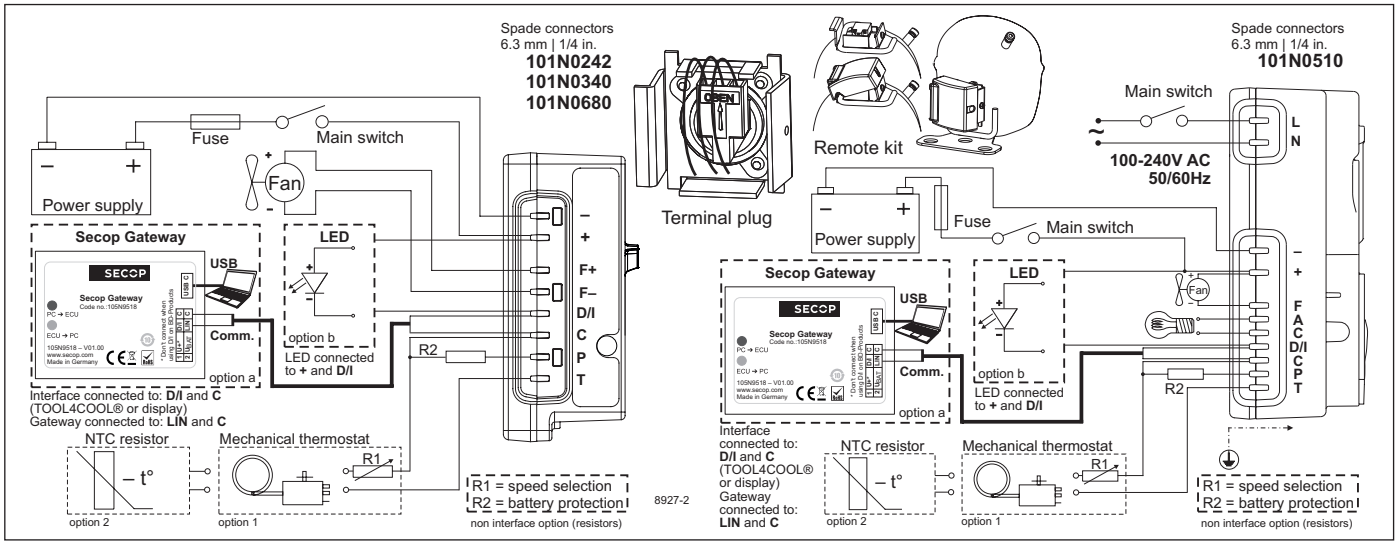
*Length between battery and electronic unit

Wire dimensions AC

Cross section min. 0.75 mm² or AWG 18

Operational errors

Error code or LED flashes	Error type Can be read out in the software **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).



Performance Data with Refrigerant R1234yf

Capacity (ASHRAE LBP) 12V DC, static cooling **BTU/h**

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

Capacity (EN 12900 Household/CECOMAF) 12V DC, static cooling **watt**

rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	25.1	32.3	35.8	49.0	65.0	72.1	83.5	105	129	131*	142*	155*
2,500	31.0	39.5	43.7	59.5	79.0	87.9	102	130	163	166*	181*	
3,000	37.4	47.9	53.1	72.2	95.5	106	123	156				
3,500	45.2	57.5	63.6	86.0	113	125*	145*	183*				

Power consumption 12V DC, static cooling **watt**

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

Current consumption (for 24V applications the following must be halfed) **A**

rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	2.19	2.58	2.76	3.37	4.01	4.29	4.70	5.43	6.20	6.28*	6.60*	7.01*
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3,500	4.04	4.69	4.98	6.00	7.09	7.55*	8.27*	9.51*				

EER (ASHRAE LBP) 12V DC, static cooling **BTU/Wh**

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

COP (EN 12900 Household/CECOMAF) 12V DC, static cooling **W/W**

rpm \ °F	-20	-13	-10	0	10	14	20	30	40	41	45	50
2,000	0.89	0.98	1.02	1.16	1.32	1.38	1.47	1.62	1.77	1.78*	1.84*	1.90*
2,500	0.88	0.94	0.97	1.09	1.24	1.31	1.41	1.60	1.81	1.84*	1.93*	
3,000	0.88	0.94	0.98	1.10	1.25	1.31	1.41	1.60				
3,500	0.88	0.96	1.00	1.13	1.27	1.33*	1.42*	1.57*				

* fan cooling of electronic unit compulsory

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

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Bolt joint for one comp.		Ø: 5/8 in.	118-1917
Bolt joint in quantities		Ø: 5/8 in.	118-1918
Snap-on in quantities		Ø: 5/8 in.	118-1919
Remote kit (without cable)			105N9210
Secop Gateway			105N9518
DC usage:	Automobile fuse, DIN 7258	12V: 15A | 24V: 7.5 A	Not deliverable from Secop
	Main switch	min. 20A	
AC usage:	Fuse, 100-240V		
	Main switch	min. 6A	

Compressor speed

Electronit unit Code number	Resistor (R1) [Ω] calculated values	Motor speed [rpm]
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	277	2,500
	692	3,000
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	173	2,000
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	865	3,000
	1696	3,500

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

Wire dimensions DC

Size		Max. length* 12V operation		Max. length* 24V operation	
Cross section	AWG				
[mm²]	[Gauge]	[m]	[ft.]	[m]	[ft.]
2.5	12	2.5	8	5	16
4	12	4	13	8	26
6	10	6	20	12	39
10	8	10	33	20	66

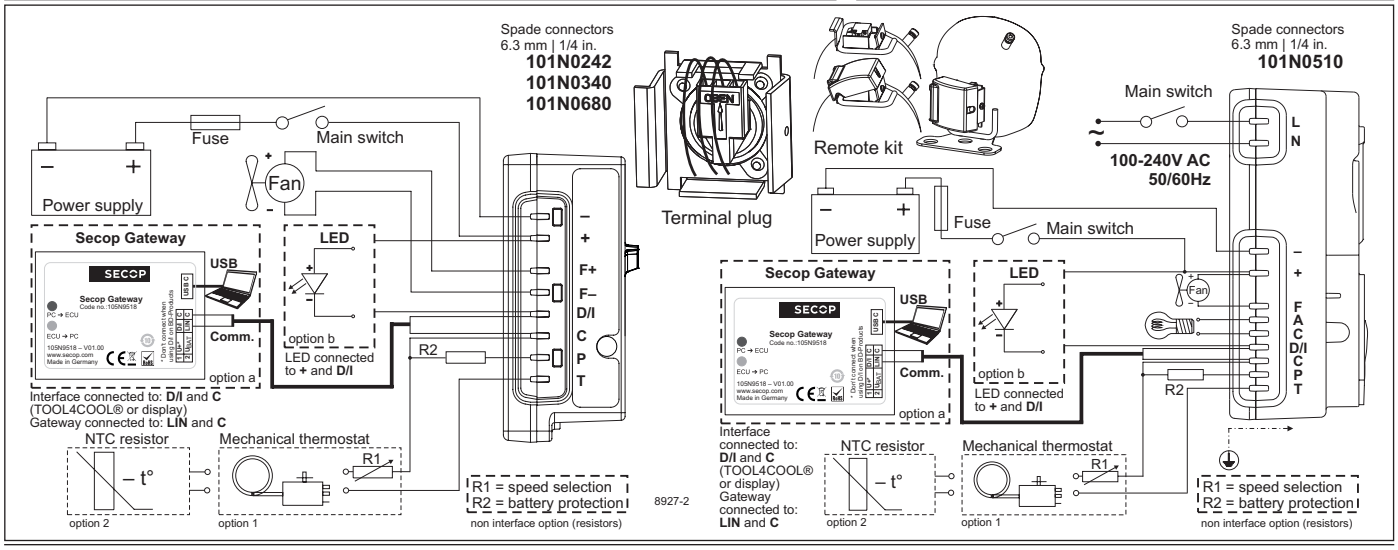
*Length between battery and electronic unit

Wire dimensions AC

Cross section min. 0.75 mm² or AWG 18

Operational errors

Error code or LED flashes	Error type Can be read out in the software **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).



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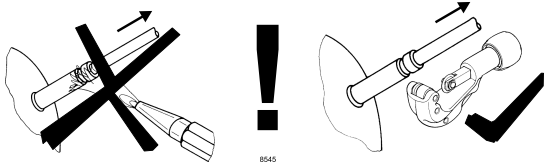
Keep electrical equipment clear from oil, chemicals, and water

BD Compressors

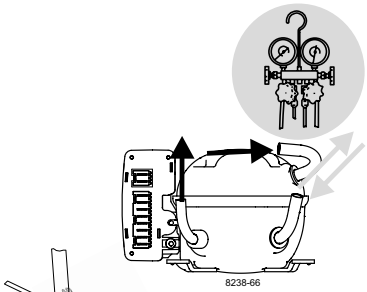
SECOP

Service/Repair – R290, R600a, R170, R1270, R1234yf (applies to all flammable refrigerants)



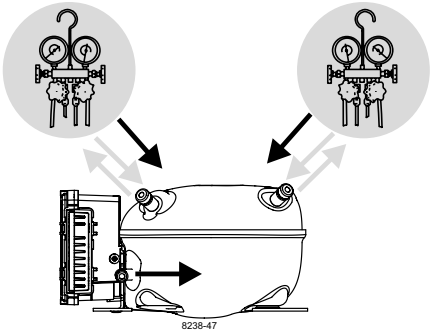
TOOL4COOL®

BD Nano

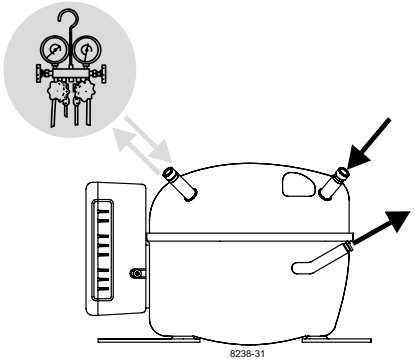


Do not heat up the bottom of the discharge connector directly.
Do not braze longer than 10 seconds and wait for 5 minutes for the next soldering attempt (Product Bulletin DES.N.101.M).

BD Micro



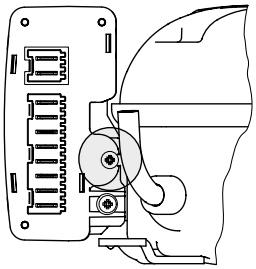
BD-P



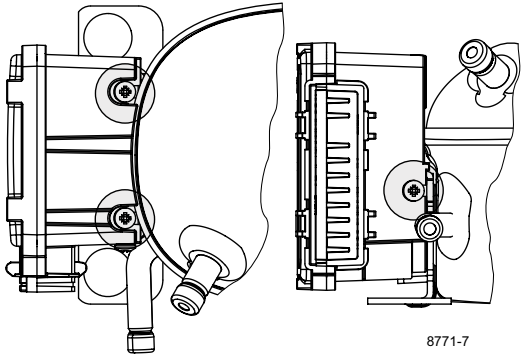
Dismantling, recycling, disposal: At the end of a compressor's lifecycle, proceed by separating and storing components according to their environmental impact. Parts that may cause pollution must be clearly identified and handled separately, ensuring appropriate disposal. Refrigerant gas must not be released into the environment and should be recovered by qualified operators. Compressor oil must also be collected separately. The compressor should be disposed of at specialized disposal centers in accordance with the applicable regulations. **Subject to modifications/alterations. www.secop.com**

Instructions for Electronic Units are available for download on **www.secop.com**

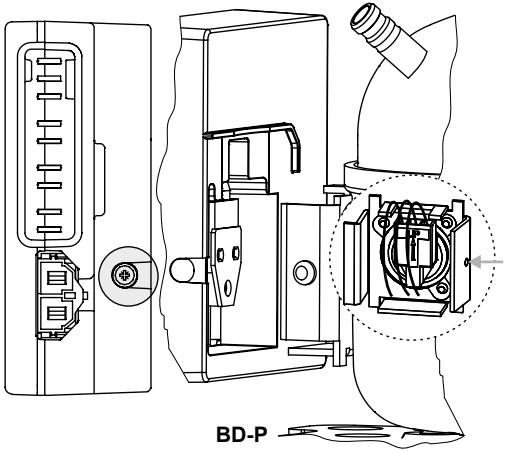
BD Compressors



BD Nano



BD Micro



BD-P

BD Nano
Attach the electronic unit by pressing it linearly onto the compressor's Fusite® connector and bracket. The electronic unit must be mounted straight onto the compressor terminals. Ensure correct alignment before pressing it into place. Apply pressure until both screw heads snap into place. For high-vibration environments, the unit can optionally be secured with a third screw (marked in grey).

BD Micro
Attach the electronic unit by pressing it linearly onto the compressor's Fusite® connector and bracket. The electronic unit must be mounted straight onto the compressor terminals. Ensure correct alignment before pressing it into place. Secure it with at least two screws, either from the side or from above (marked in grey).

BD-P
The cable plug of the electronic unit is connected to the compressor's Fusite® connector. The electronic unit is then mounted onto the compressor bracket. First, the left side is attached; next, the right side is pressed sideways over the screw on the bracket (marked in grey). The unit snaps into place on the bracket and is now securely fixed to the compressor. An earth connection (via the compressor baseplate) can be used if required.

Dismantling, recycling, disposal: At the end of a compressor's lifecycle, proceed by separating and storing components according to their environmental impact. Parts that may cause pollution must be clearly identified and handled separately, ensuring appropriate disposal. Refrigerant gas must not be released into the environment and should be recovered by qualified operators. Compressor oil must also be collected separately. The compressor should be disposed of at specialized disposal centers in accordance with the applicable regulations. **Subject to modifications/alterations. www.secop.com**