

Single Pack BD50F 12/24V DC PM

Single pack code number: **195B4326**

| Position | Title | Code | Amount |
|----------|--|----------|--------|
| 1 | Compressor BD50F | 101Z1220 | 1 |
| 2 | Electronic unit 12/24V DC - Automotive | 101N0650 | 1 |
| 3 | 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

Secop accepts no responsibility for possible errors in catalogs, brochures, and other printed material. Secop reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequent changes being necessary to specifications already agreed. All trademarks in this material are the property of the respective companies. Secop and the Secop logotype are trademarks of Secop GmbH. All rights reserved.

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



General

| | |
|---|----------------------------|
| Code number (without electronic units) | 101Z1220 |
| Electronic unit 12/24V DC - Standard | 101N0242, 30 pcs: 101N0243 |
| Electronic unit 12/24V DC - AEO | 101N0340, 30 pcs: 101N0341 |
| Electronic unit 12/24V DC & 100-240V AC 50/60Hz | 101N0510, 28 pcs: 101N0511 |
| Electronic unit 12/24V DC - Automotive | 101N0680, 30 pcs: 101N0681 |
| Compressors on pallet | 150 |

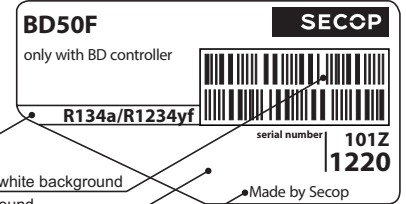
Approvals

| R134a | R134a/R1234yf |
|-------|---------------|
| - | - |
| VDE | UL / CB |
| VDE | UL / CB |
| - | UL / CB |



Application

| | |
|---|------------------------|
| Application | LBP/MBP/HBP |
| Evaporating temperature °C | -30 to 0 (10) |
| Voltage range DC VDC | 9.6 - 17 / 21.3 - 31.5 |
| Voltage range AC V/Hz | 100 - 240 / 50 - 60 |
| Max. condensing temperature continuous (short) °C | 60 (70) |
| Max. winding temperature continuous (short) °C | 125 (135) |



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

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 F₁ depending on application and speed.

- 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 sufficient
- = not applicable in this area

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) |

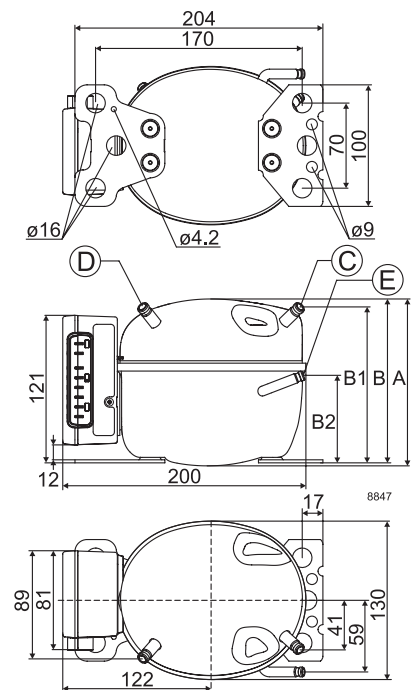
Standard battery protection settings (refer to electronic unit Instructions for optional settings)

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

Dimensions

| Height mm | A | 137 |
|--|----|---------------------------|
| | B | 135 |
| | B1 | 128 |
| | B2 | 73 |
| Suction connector location/I.D. mm angle | C | 6.2 40° |
| material comment | | Cu-plated steel Al cap |
| Process connector location/I.D. mm angle | D | 6.2 45° |
| material comment | | Cu-plated steel Al cap |
| Discharge connector location/I.D. mm angle | E | 5.0 21° |
| material comment | | Cu-plated steel Al cap |
| Connector tolerance I.D. mm | | ±0.09, on 5.0 +0.12/+0.20 |

Remarks:



Performance Data with Refrigerant R134a

| Capacity (EN 12900 Household/CECOMAF) | | 12V DC, static cooling | | | | | | | | | | watt |
|---------------------------------------|------|------------------------|-------|------|------|------|------|------|------|------|------|------|
| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 | 7.2 | 10 | 15 |
| 2,000 | 20.9 | 30.1 | 33.8 | 41.8 | 56.1 | 72.8 | 92.1 | 114 | 138* | 150* | 165* | |
| 2,500 | 26.1 | 37.0 | 41.4 | 50.9 | 68.0 | 88.7 | 113 | 142* | 175* | 191* | | |
| 3,000 | 31.2 | 44.8 | 50.2 | 61.8 | 82.4 | 107 | 136* | 169* | | | | |
| 3,500 | 37.0 | 52.0 | 58.0 | 71.1 | 94.7 | 123* | 157* | | | | | |

| Capacity (ASHRAE LBP) | | 12V DC, static cooling | | | | | | | | | | watt |
|-----------------------|------|------------------------|-------|------|------|------|------|------|------|------|------|------|
| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 | 7.2 | 10 | 15 |
| 2,000 | 25.9 | 37.2 | 41.8 | 51.7 | 69.3 | 90.0 | 114 | 141 | 171* | 185* | 205* | |
| 2,500 | 32.3 | 45.9 | 51.3 | 63.1 | 84.3 | 110 | 140 | 176* | 217* | 237* | | |
| 3,000 | 38.5 | 55.4 | 62.0 | 76.4 | 102 | 132 | 168* | 210* | | | | |
| 3,500 | 45.5 | 64.2 | 71.6 | 87.8 | 117 | 152* | 194* | | | | | |

| Power consumption | | 12V DC, static cooling | | | | | | | | | | watt |
|-------------------|------|------------------------|-------|------|------|-------|-------|-------|-------|-------|-------|------|
| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 | 7.2 | 10 | 15 |
| 2,000 | 25.0 | 31.6 | 33.8 | 38.0 | 44.3 | 50.8 | 57.7 | 65.3 | 73.8* | 77.9* | 83.5* | |
| 2,500 | 30.7 | 39.5 | 42.4 | 48.0 | 56.5 | 64.9 | 73.4 | 82.0* | 90.9* | 94.9* | | |
| 3,000 | 37.4 | 48.1 | 51.6 | 58.3 | 68.3 | 78.1 | 87.9* | 98.0* | | | | |
| 3,500 | 45.0 | 56.8 | 60.7 | 68.2 | 79.5 | 91.2* | 104* | | | | | |

| Current consumption (for 24V applications the following must be halved) | | | | | | | | | | | | A |
|---|-----|-----|-------|-----|-----|------|------|------|------|------|------|----|
| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 | 7.2 | 10 | 15 |
| 2,000 | 2.1 | 2.6 | 2.8 | 3.1 | 3.7 | 4.3 | 4.9 | 5.6 | 6.3* | 6.6* | 7.1* | |
| 2,500 | 2.6 | 3.2 | 3.5 | 3.9 | 4.6 | 5.4 | 6.1 | 6.9* | 7.6* | 8.0* | | |
| 3,000 | 3.2 | 4.0 | 4.3 | 4.8 | 5.6 | 6.5 | 7.3* | 8.2* | | | | |
| 3,500 | 3.9 | 4.7 | 5.0 | 5.6 | 6.6 | 7.6* | 8.7* | | | | | |

| COP (EN 12900 Household/CECOMAF) | | | | | | | | | | | | W/W |
|----------------------------------|------|------|-------|------|------|-------|-------|-------|-------|-------|-------|-----|
| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 | 7.2 | 10 | 15 |
| 2,000 | 0.84 | 0.95 | 1.00 | 1.10 | 1.27 | 1.43 | 1.60 | 1.74 | 1.87* | 1.92* | 1.97* | |
| 2,500 | 0.85 | 0.94 | 0.98 | 1.06 | 1.20 | 1.37 | 1.54 | 1.73* | 1.92* | 2.01* | | |
| 3,000 | 0.83 | 0.93 | 0.97 | 1.06 | 1.21 | 1.37 | 1.54* | 1.72* | | | | |
| 3,500 | 0.82 | 0.92 | 0.96 | 1.04 | 1.19 | 1.35* | 1.51* | | | | | |

| COP (ASHRAE LBP) | | 12V DC, static cooling | | | | | | | | | | W/W |
|------------------|------|------------------------|-------|------|------|-------|-------|-------|-------|-------|-------|-----|
| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 | 7.2 | 10 | 15 |
| 2,000 | 1.04 | 1.19 | 1.25 | 1.37 | 1.58 | 1.79 | 1.99 | 2.18 | 2.34* | 2.40* | 2.47* | |
| 2,500 | 1.05 | 1.16 | 1.21 | 1.32 | 1.50 | 1.70 | 1.93 | 2.16* | 2.41* | 2.52* | | |
| 3,000 | 1.03 | 1.15 | 1.21 | 1.32 | 1.50 | 1.71 | 1.93* | 2.16* | | | | |
| 3,500 | 1.01 | 1.13 | 1.18 | 1.29 | 1.48 | 1.68* | 1.89* | | | | | |

* fan cooling of electronic unit compulsory

| Test conditions with electronic units | | EN 12900/CECOMAF | ASHRAE LBP |
|---------------------------------------|----------------------------------|------------------|------------|
| Condensing temperature | 101N0242 101N0510 101N0680 | 55°C | 54.4°C |
| Ambient temperature | | 32°C | 32°C |
| Suction gas temperature | | 32°C | 32°C |
| Liquid temperature | | no subcooling | 32°C |

| Accessories for BD50F | | Code number |
|----------------------------|--|----------------------------|
| Bolt joint for one comp. | Ø:16 mm | 118-1917 |
| Bolt joint in quantities | Ø:16 mm | 118-1918 |
| Snap-on in quantities | Ø:16 mm | 118-1919 |
| Remote kit (without cable) | | 105N9210 |
| Secop Gateway | | 105N9518 |
| DC usage: | Automobile fuse, DIN 7258 12V: 15A 24V: 7.5 A Main switch | Not deliverable from Secop |
| AC usage: | Fuse, 100-240V Main switch | |

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

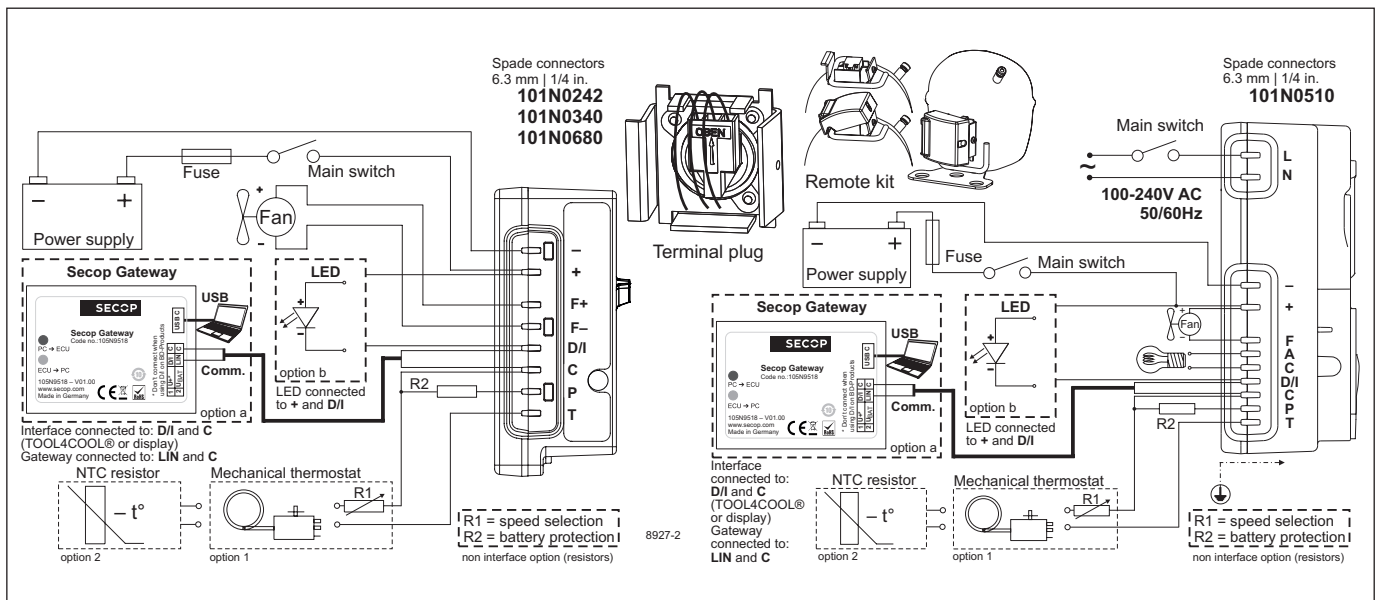
In AEO (Adaptive Energy Optimizing) speed mode the BD compressor will always adapt its speed to the actual cooling demand.

| Wire dimensions DC | | Max. length* 12V operation | | Max. length* 24V operation | |
|--------------------|------|----------------------------|-------|----------------------------|-------|
| Cross section | Size | | | | |
| | AWG | [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). |



Performance Data with Refrigerant R1234yf

| Capacity (EN 12900 Household/CECOMAF) | | | | | | | | | | | | |
|---------------------------------------|------|------|-------|------|------|------|------|------|------|------|------|----|
| 12V DC, static cooling | | | | | | | | | | | watt | |
| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 | 7.2 | 10 | 15 |
| 2,000 | 23.4 | 32.3 | 35.9 | 43.5 | 56.7 | 72.1 | 89.7 | 109 | 131* | 142* | 155* | |
| 2,500 | 28.9 | 39.6 | 43.8 | 52.8 | 68.8 | 88.0 | 110 | 136* | 166* | 181* | | |
| 3,000 | 34.7 | 48.0 | 53.1 | 64.1 | 83.4 | 106 | 133* | 163* | | | | |
| 3,500 | 42.1 | 57.6 | 63.6 | 76.5 | 99.0 | 126* | 156* | | | | | |

| Capacity (ASHRAE LBP) | | | | | | | | | | | | |
|------------------------|------|------|-------|------|------|------|------|------|------|------|------|----|
| 12V DC, static cooling | | | | | | | | | | | watt | |
| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 | 7.2 | 10 | 15 |
| 2,000 | 30.1 | 41.6 | 46.2 | 56.0 | 73.1 | 93.0 | 116 | 141 | 170* | 183* | 201* | |
| 2,500 | 37.3 | 51.1 | 56.5 | 68.2 | 88.9 | 114 | 143 | 177* | 216* | 235* | | |
| 3,000 | 44.6 | 61.7 | 68.4 | 82.6 | 108 | 137 | 171* | 211* | | | | |
| 3,500 | 54.2 | 74.1 | 81.9 | 98.5 | 128 | 162* | 202* | | | | | |

| Power consumption | | | | | | | | | | | | |
|------------------------|------|------|-------|------|------|-------|-------|-------|-------|-------|-------|----|
| 12V DC, static cooling | | | | | | | | | | | watt | |
| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 | 7.2 | 10 | 15 |
| 2,000 | 26.7 | 32.8 | 34.9 | 39.0 | 45.3 | 51.8 | 58.5 | 65.5 | 72.9* | 76.2* | 80.5* | |
| 2,500 | 33.3 | 42.0 | 44.9 | 50.5 | 58.8 | 66.9 | 74.8 | 82.4* | 89.7* | 92.8* | | |
| 3,000 | 40.1 | 50.7 | 54.2 | 60.9 | 70.7 | 80.2 | 89.5* | 98.4* | | | | |
| 3,500 | 49.1 | 59.9 | 63.6 | 70.8 | 82.0 | 93.6* | 106* | | | | | |

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

| COP (EN 12900 Household/CECOMAF) | | | | | | | | | | | | |
|----------------------------------|------|------|-------|------|------|-------|-------|-------|-------|-------|-------|----|
| 12V DC, static cooling | | | | | | | | | | | W/W | |
| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 | 7.2 | 10 | 15 |
| 2,000 | 0.87 | 0.98 | 1.02 | 1.11 | 1.24 | 1.38 | 1.52 | 1.65 | 1.78* | 1.84* | 1.91* | |
| 2,500 | 0.87 | 0.94 | 0.97 | 1.04 | 1.17 | 1.31 | 1.47 | 1.64* | 1.84* | 1.93* | | |
| 3,000 | 0.87 | 0.94 | 0.98 | 1.05 | 1.17 | 1.31 | 1.47* | 1.64* | | | | |
| 3,500 | 0.86 | 0.96 | 1.00 | 1.08 | 1.20 | 1.33* | 1.47* | | | | | |

| COP (ASHRAE LBP) | | | | | | | | | | | | |
|------------------------|------|------|-------|------|------|-------|-------|-------|-------|-------|-------|----|
| 12V DC, static cooling | | | | | | | | | | | W/W | |
| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 | 7.2 | 10 | 15 |
| 2,000 | 1.13 | 1.27 | 1.33 | 1.44 | 1.61 | 1.80 | 1.98 | 2.16 | 2.33* | 2.41* | 2.50* | |
| 2,500 | 1.12 | 1.22 | 1.26 | 1.35 | 1.51 | 1.70 | 1.91 | 2.15* | 2.41* | 2.53* | | |
| 3,000 | 1.11 | 1.22 | 1.26 | 1.36 | 1.52 | 1.71 | 1.92* | 2.14* | | | | |
| 3,500 | 1.10 | 1.24 | 1.29 | 1.39 | 1.56 | 1.73* | 1.91* | | | | | |

* fan cooling of electronic unit compulsory

| Test conditions with electronic units | | EN 12900/CECOMAF | ASHRAE LBP |
|---------------------------------------|----------------------------------|------------------|------------|
| Condensing temperature | 101N0242 101N0510 101N0680 | 55°C | 54.4°C |
| Ambient temperature | | 32°C | 32°C |
| Suction gas temperature | | 32°C | 32°C |
| Liquid temperature | | no subcooling | 32°C |

| Accessories for BD50F | | Code number |
|----------------------------|--|----------------------------|
| Bolt joint for one comp. | Ø:16 mm | 118-1917 |
| Bolt joint in quantities | Ø:16 mm | 118-1918 |
| Snap-on in quantities | Ø:16 mm | 118-1919 |
| Remote kit (without cable) | | 105N9210 |
| Secop Gateway | | 105N9518 |
| DC usage: | Automobile fuse, DIN 7258 12V: 15A 24V: 7.5 A Main switch | Not deliverable from Secop |
| AC usage: | Fuse, 100-240V Main switch | |

Compressor speed

| Electronit unit | Resistor (R1) [Ω] | Motor speed |
|-------------------|-------------------|-------------|
| Code number | calculated values | [rpm] |
| 101N0242 | 0 | 2,000 |
| 101N0510 | 277 | 2,500 |
| 101N0680 | 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

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

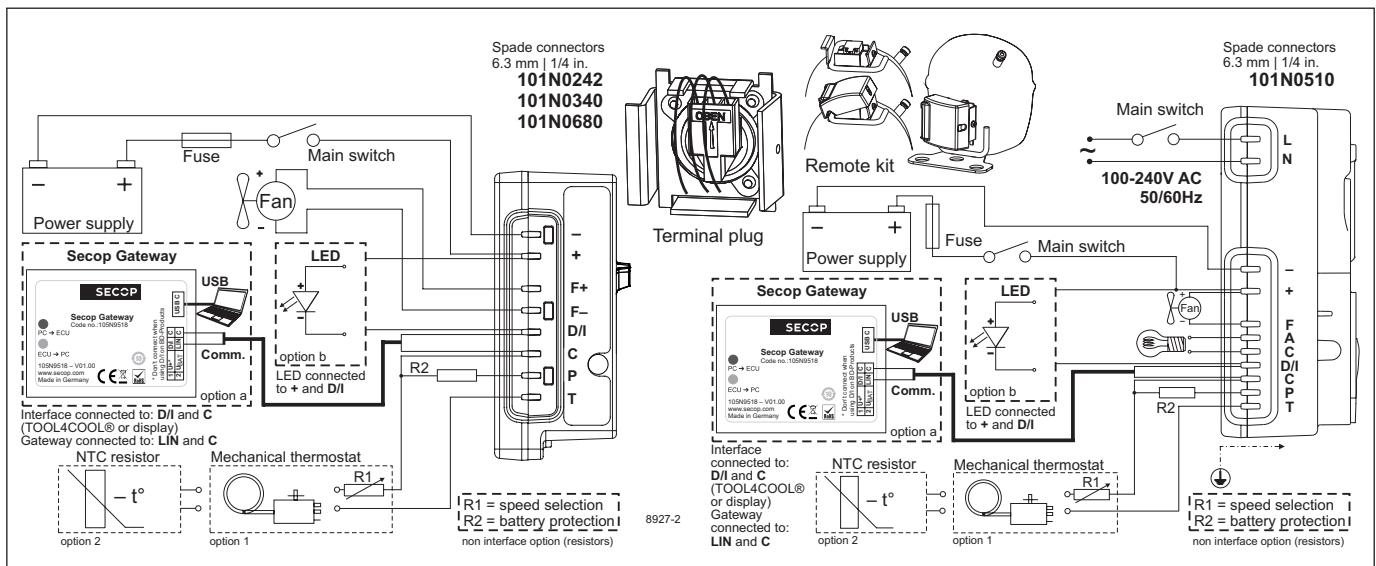
*Length between battery and electronic unit

Wire dimensions AC

Cross section min. 0.75 mm² or AWG 18

Operational errors

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



Secop accepts no responsibility for possible errors in catalogs, brochures, and other printed material. Secop reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequent changes being necessary to specifications already agreed. All trademarks in this material are the property of the respective companies. Secop and the Secop logotype are trademarks of Secop GmbH. All rights reserved. www.secop.com



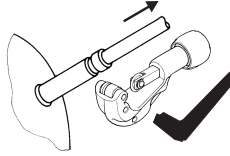
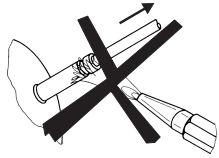
Instructions for Electronic Units
are available for download on
www.secop.com



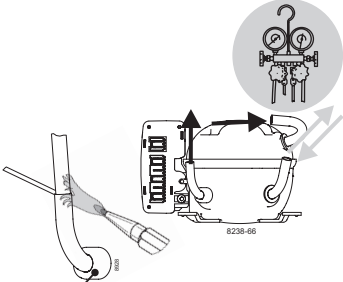
BD Compressors



Service/Repair



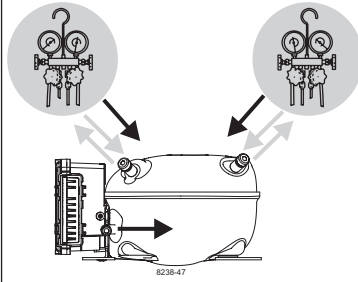
BD Nano



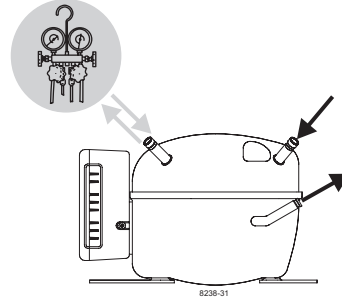
**! max. 150°C/302°F !
at socket**
brazing solder: silver with flux

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

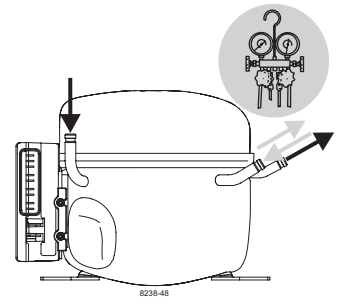
BD Micro



BD P-Housing



BD T-Housing



Secop accepts no responsibility for possible errors in catalogs, brochures, and other printed material. Secop reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary to specifications already agreed. All trademarks in this material are the property of the respective companies. Secop and the Secop logotype are trademarks of Secop GmbH. All rights reserved. www.secop.com