

Single Pack BD50F 10-45V DC Solar PM

Single pack code number: **195B4333**

| Position | Title | Code | Amount |
|----------|--|----------|--------|
| 1 | Compressor BD50F | 101Z1220 | 1 |
| 2 | Electronic unit 10-45 DC - Solar | 101N0420 | 1 |
| 3 | Bolt joint for one compressor M6 ø16mm | 118-1917 | 1 |

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



General

| | |
|---|----------------------------|
| Code number (without electronic units) | 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) |

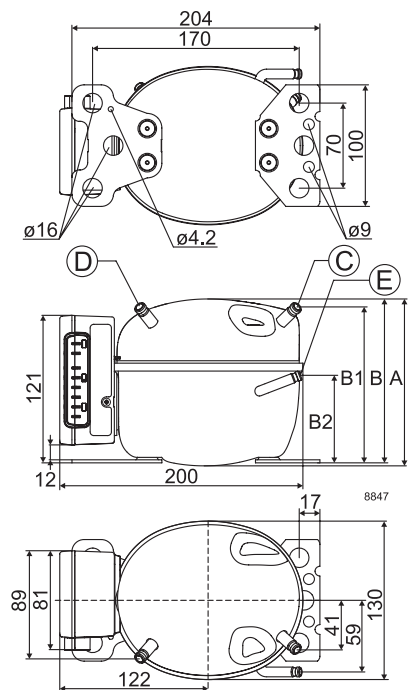
Standard battery protection settings (refer to electronic unit Instructions for optional settings)

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

| COP (EN 12900 Household/CECOMAF) | | | | | | | | | | | | |
|----------------------------------|------|------|-------|------|------|-------|-------|-------|-------|-------|-------|----|
| 12V DC, static cooling | | | | | | | | | | | W/W | |
| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 | 7.2 | 10 | 15 |
| 2,000 | 0.84 | 0.95 | 1.00 | 1.10 | 1.27 | 1.43 | 1.60 | 1.74 | 1.87* | 1.92* | 1.97* | |
| 2,500 | 0.85 | 0.94 | 0.98 | 1.06 | 1.20 | 1.37 | 1.54 | 1.73* | 1.92* | 2.01* | | |
| 3,000 | 0.83 | 0.93 | 0.97 | 1.06 | 1.21 | 1.37 | 1.54* | 1.72* | | | | |
| 3,500 | 0.82 | 0.92 | 0.96 | 1.04 | 1.19 | 1.35* | 1.51* | | | | | |

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

* fan cooling of electronic unit compulsory

| Test conditions with electronic units | | EN 12900/CECOMAF | ASHRAE LBP |
|---------------------------------------|----------------------|------------------|------------|
| Condensing temperature | 101N0242 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 |

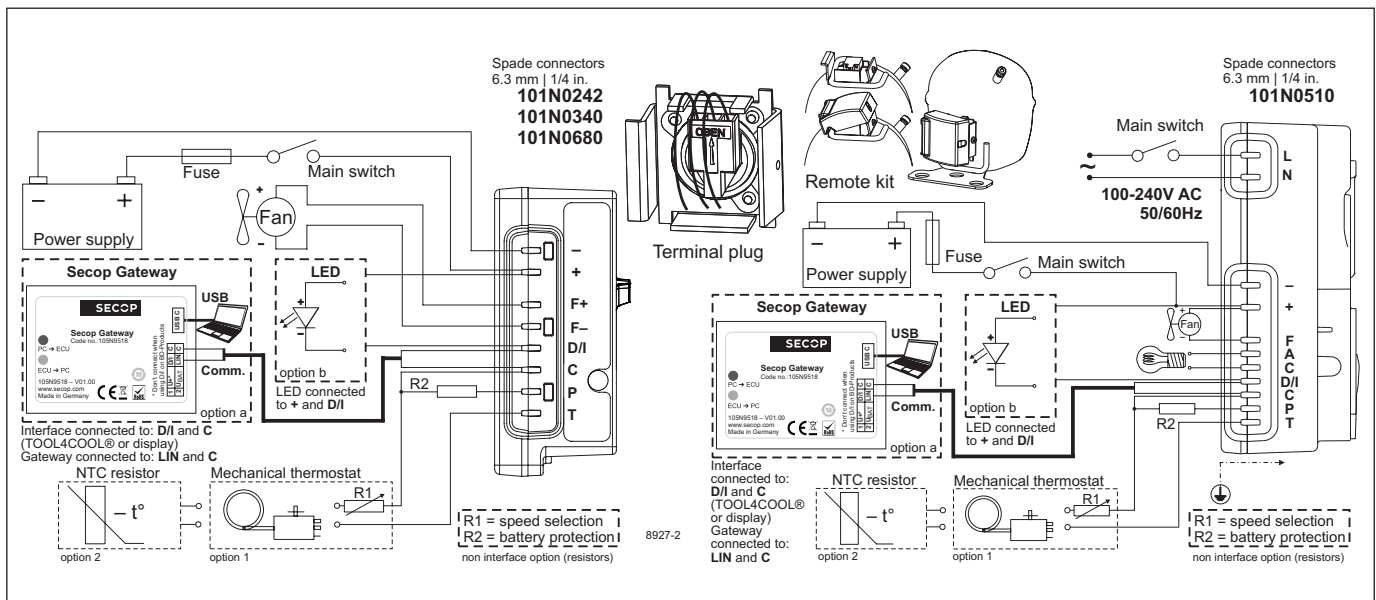
*Length between battery and electronic unit

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). |



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] |
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| | 450 | 2,500 |
| | 865 | 3,000 |
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Wire dimensions DC

| Cross section | Size | | Max. length* 12V operation | | Max. length* 24V operation | |
|---------------|-------|---------|----------------------------|-------|----------------------------|-------|
| | [mm²] | [Gauge] | [m] | [ft.] | [m] | [ft.] |
| 2.5 | 12 | | 2.5 | 8 | 5 | 16 |
| 4 | 12 | | 4 | 13 | 8 | 26 |
| 6 | 10 | | 6 | 20 | 12 | 39 |
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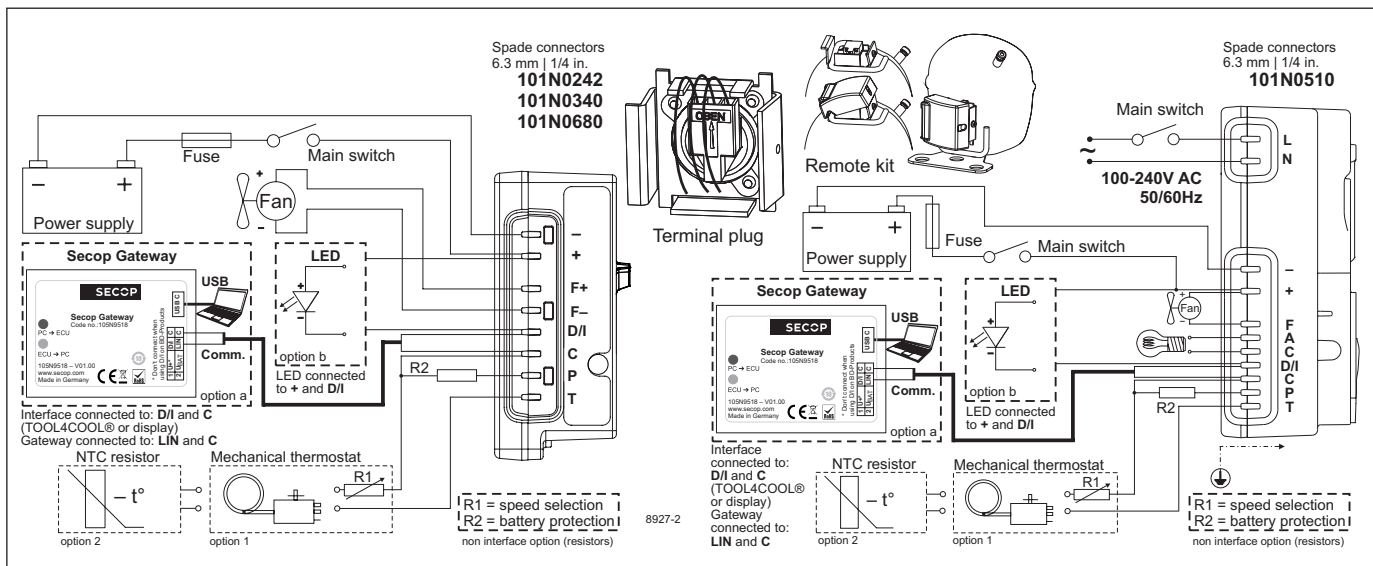
*Length between battery and electronic unit

Wire dimensions AC

Cross section min. 0.75 mm² or AWG 18

Operational errors

| Error code or LED flashes | Error type |
|---------------------------|--|
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| 1 | Battery protection cut-out (The voltage is outside the cut-out setting). |



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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



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