

Single Pack BD35F 12/24V DC PM

Single pack code number: **195B4573**

| Position | Title | Code | Amount |
|----------|--|----------|--------|
| 1 | Compressor BD35F | 101Z0200 | 1 |
| 2 | Electronic unit 12/24V DC - Automotive | 101N0651 | 1 |
| 3 | Bolt joint for one compressor M6 ø16mm | 118-1917 | 1 |

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BD35F Direct Current Compressor R134a, R1234yf 12/24V DC, 10-45V DC Solar & 100-240V AC 50/60Hz



General

| | |
|---|----------------------------|
| Code number (without electronic units) | 101Z0200 |
| Electronic unit 12/24V DC - Standard | 101N0242, 30 pcs: 101N0243 |
| Electronic unit 12/24V DC - AEO | 101N0340, 30 pcs: 101N0341 |
| Electronic unit 10-45V DC - Solar | 101N0420, 30 pcs: 101N0421 |
| 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 |
| VDE | - | - |
| VDE | - | UL |
| | - | 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 |
| Voltage range for solar applications | VDC | 10 - 45 |
| 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.

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) |

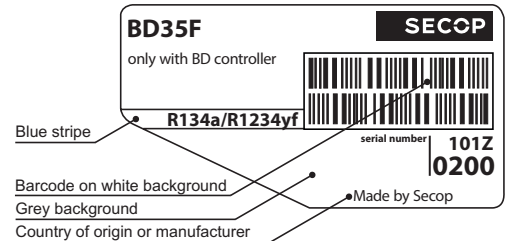
Standard battery protection settings (refer to electronic unit Instructions for optional settings)

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

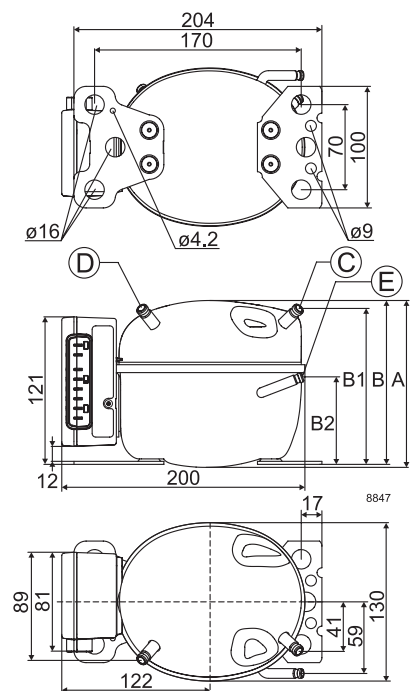
Dimensions

| | | | |
|---------------------|--------------------------|----|---------------------------|
| Height | mm | 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:



- 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



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 | 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 cooling watt | | | | | | | | | | | | |
|---|------|------|-------|------|------|------|------|-----|-----|-----|-----|----|
| rpm \ °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 | | | | |
| 3,500 | 33.9 | 45.1 | 50.5 | 63.1 | 87.3 | 117 | 153 | | | | | |

| 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 | 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 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 | 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 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 | 0.90 | 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 (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 | 1.30 | 1.36 | 1.49 | 1.70 | 1.93 | 2.18 | 2.44 | 2.70 | 2.81 | 2.95 | |
| 2,500 | 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 | | | | |
| 3,500 | 0.98 | 1.09 | 1.15 | 1.29 | 1.53 | 1.78 | 2.03 | | | | | |

| 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 BD35F | | 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 min. 20A | Not deliverable from Secop |
| AC usage: | Fuse, 100-240V Main switch min. 6A | |

| 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 | 0 | AEO |
| 101N0420 with 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 | 17.0 | 24.8 | 27.8 | 34.2 | 45.1 | 57.7 | 72.0 | 87.9 | 106 | 114 | 125 | |
| 2,500 | 18.5 | 29.6 | 33.8 | 42.6 | 57.3 | 73.8 | 92.0 | 111.8 | 133 | 143 | | |
| 3,000 | 25.5 | 35.4 | 39.2 | 47.6 | 62.6 | 80.6 | 102 | 127 | | | | |
| 3,500 | 30.3 | 39.3 | 43.4 | 52.6 | 69.9 | 91.1 | 116 | | | | | |

| 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 | 22.1 | 32.3 | 36.2 | 44.5 | 58.7 | 75.1 | 93.6 | 114 | 137 | 148 | 163 | |
| 2,500 | 24.1 | 38.5 | 44.0 | 55.3 | 74.4 | 95.7 | 119 | 145 | 173 | 186 | | |
| 3,000 | 33.5 | 46.3 | 51.4 | 62.3 | 81.8 | 105 | 133 | 165 | | | | |
| 3,500 | 39.4 | 51.3 | 56.6 | 68.7 | 91.3 | 119 | 152 | | | | | |

| 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 | 19.2 | 24.1 | 25.7 | 28.8 | 33.3 | 37.8 | 42.3 | 46.8 | 51.4 | 53.4 | 56.1 | |
| 2,500 | 24.0 | 31.4 | 33.7 | 38.1 | 44.4 | 50.3 | 55.8 | 61.0 | 66.0 | 68.2 | | |
| 3,000 | 32.6 | 37.0 | 38.9 | 42.9 | 49.7 | 57.1 | 64.5 | 71.5 | | | | |
| 3,500 | 38.7 | 44.8 | 47.1 | 51.8 | 59.5 | 67.5 | 75.8 | | | | | |

| 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 | 1.6 | 2.0 | 2.1 | 2.4 | 2.8 | 3.1 | 3.5 | 3.9 | 4.3 | 4.5 | 4.7 | |
| 2,500 | 2.0 | 2.6 | 2.8 | 3.2 | 3.7 | 4.2 | 4.6 | 5.1 | 5.5 | 5.7 | | |
| 3,000 | 2.7 | 3.1 | 3.2 | 3.6 | 4.1 | 4.8 | 5.4 | 6.0 | | | | |
| 3,500 | 3.2 | 3.7 | 3.9 | 4.3 | 5.0 | 5.6 | 6.3 | | | | | |

| 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 | 0.88 | 1.03 | 1.08 | 1.19 | 1.35 | 1.52 | 1.69 | 1.87 | 2.04 | 2.11 | 2.21 | |
| 2,500 | 0.77 | 0.94 | 1.00 | 1.11 | 1.28 | 1.46 | 1.64 | 1.82 | 2.00 | 2.08 | | |
| 3,000 | 0.78 | 0.95 | 1.01 | 1.11 | 1.25 | 1.41 | 1.57 | 1.77 | | | | |
| 3,500 | 0.78 | 0.88 | 0.92 | 1.01 | 1.17 | 1.34 | 1.52 | | | | | |

| 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 | 1.15 | 1.34 | 1.41 | 1.55 | 1.76 | 1.99 | 2.21 | 2.45 | 2.68 | 2.78 | 2.90 | |
| 2,500 | 1.00 | 1.23 | 1.30 | 1.45 | 1.67 | 1.90 | 2.14 | 2.38 | 2.62 | 2.73 | | |
| 3,000 | 1.03 | 1.25 | 1.32 | 1.45 | 1.65 | 1.84 | 2.06 | 2.31 | | | | |
| 3,500 | 1.02 | 1.15 | 1.20 | 1.33 | 1.54 | 1.76 | 2.00 | | | | | |

| 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 BD35F | | 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 min. 20A | Not deliverable from Secop |
| AC usage: | Fuse, 100-240V Main switch min. 6A | |

| 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 | 0 | AEO |
| 101N0420 | 173 | 2,000 |
| with AEO | 450 | 2,500 |
| | 865 | 3,000 |
| | 1696 | 3,500 |

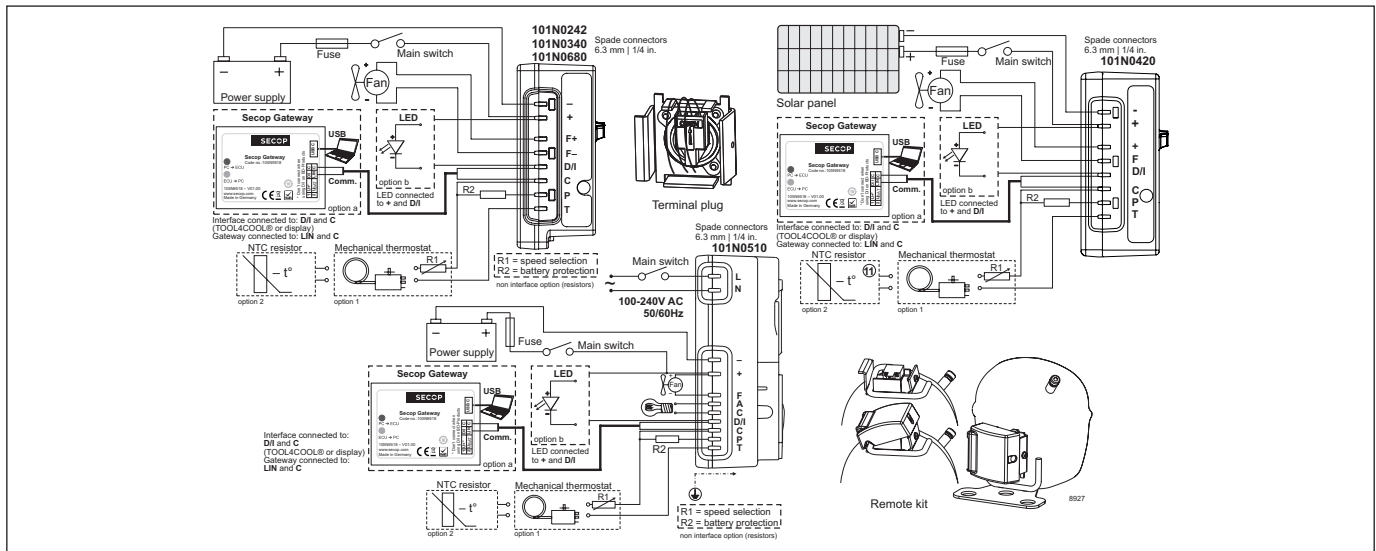
In AEO (Adaptive Energy Optimizing) speed mode the BD compressor will always adapt its speed to the actual cooling demand.

| 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). |



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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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