

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

### General

|  |   |
|--|---|
| Code number (without electronic units)                 | 101Z0200                                  |
| Electronic unit - Standard                             | 101N0210, 30 pcs: 101N0211                |
| Electronic unit 12-24V DC - EMI (with metal shielding) | 101N0220, 30 pcs: 101N0221                |
| Electronic unit 12-24V DC - AEO & EMI                  | 101N0320, 30 pcs: 101N0321                |
| Electronic unit 10-30V DC - Solar                      | 101N0400, 30 pcs: 101N0401                |
| Electronic unit 20-45V DC - Solar                      | 101N0410, 30 pcs: 101N0411                |
| Electronic unit 12-24V DC & 100-240V AC 50/60Hz        | 101N0500, 36 pcs: 101N0501                |
| Electronic unit 12-24V DC - Automotive                 | 101N0600, 30 pcs: 101N0601                |
| Electronic unit 12-24V DC - Automotive                 | 101N0630, 30 pcs: 101N0631                |
| Approved compressor - electronic unit combinations     | refer to <i>Instructions</i> for 101N0xxx |
| Additional approvals                                   | e4, C-Tick                                |
| 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    |
| Voltage range for solar applications           | VDC         | 10 - 30 / 20 - 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 F<sub>1</sub> depending on application and speed.

### Motor

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

### Design

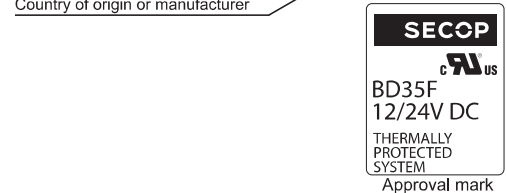
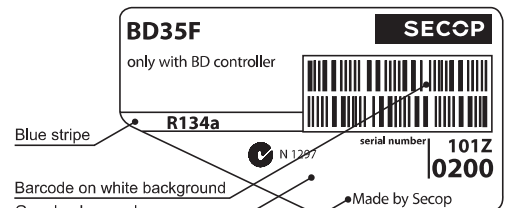
|                                     |                 |                       |
|-------------------------------------|-----------------|-----------------------|
| Displacement                        | cm <sup>3</sup> | 2.00                  |
| Oil quantity (type)                 | cm <sup>3</sup> | 150 (polyolester)     |
| Maximum refrigerant charge          | g               | 300                   |
| Free gas volume in compressor       | cm <sup>3</sup> | 870                   |
| Weight - Compressor/Electronic unit | kg              | 4.3 / 0.27 (Standard) |

### Standard battery protection settings (refer to 101N0xxx *Instructions* for optional settings)

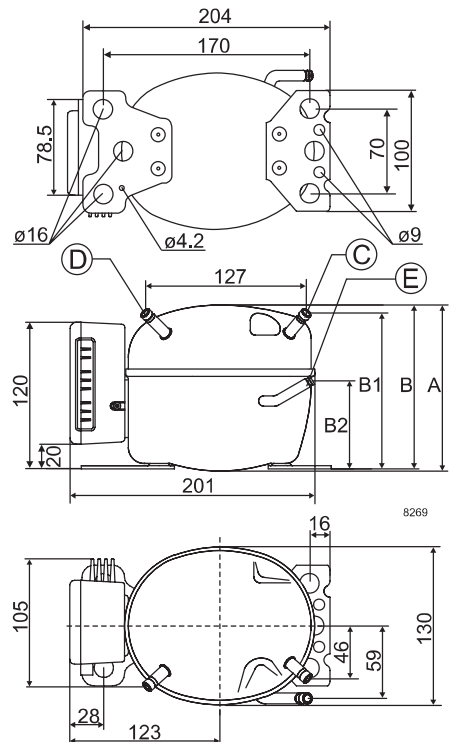
|         |          |      |
|---------|----------|------|
| Voltage | 12V      | 24V  |
| Cut out | VDC 10.4 | 22.8 |
| Cut in  | VDC 11.7 | 24.2 |

### 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 |           |



- S = Static cooling normally sufficient
- O = Oil cooling
- F<sub>1</sub> = Fan cooling 1.5 m/s  
(compressor compartment temperature equal to ambient temperature)
- F<sub>2</sub> = Fan cooling 3.0 m/s necessary
- SG = Suction gas cooling normally sufficient
- = not applicable in this area



| 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                                 | 15.8 | 23.9                   | 26.9  | 33.1 | 43.8 | 56.6 | 71.7 | 89.9 | 111 | 122 | 136 |      |
| 2,500                                 | 20.2 | 29.9                   | 33.5  | 41.2 | 54.6 | 70.7 | 89.7 | 112  | 139 | 152 |     |      |
| 3,000                                 | 22.5 | 32.4                   | 36.5  | 45.4 | 61.8 | 81.7 | 105  | 133  |     |     |     |      |
| 3,500                                 | 26.2 | 35.9                   | 40.4  | 50.5 | 69.8 | 93.6 | 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                 | 19.5 | 29.4                   | 33.1  | 40.7 | 54.0 | 69.8 | 88.6 | 111 | 137 | 151 | 169 |      |
| 2,500                 | 24.9 | 36.8                   | 41.3  | 50.7 | 67.3 | 87.1 | 111  | 139 | 172 | 189 |     |      |
| 3,000                 | 27.7 | 39.9                   | 44.9  | 55.9 | 76.1 | 101  | 130  | 164 |     |     |     |      |
| 3,500                 | 32.2 | 44.2                   | 49.7  | 62.2 | 86.0 | 115  | 150  |     |     |     |     |      |

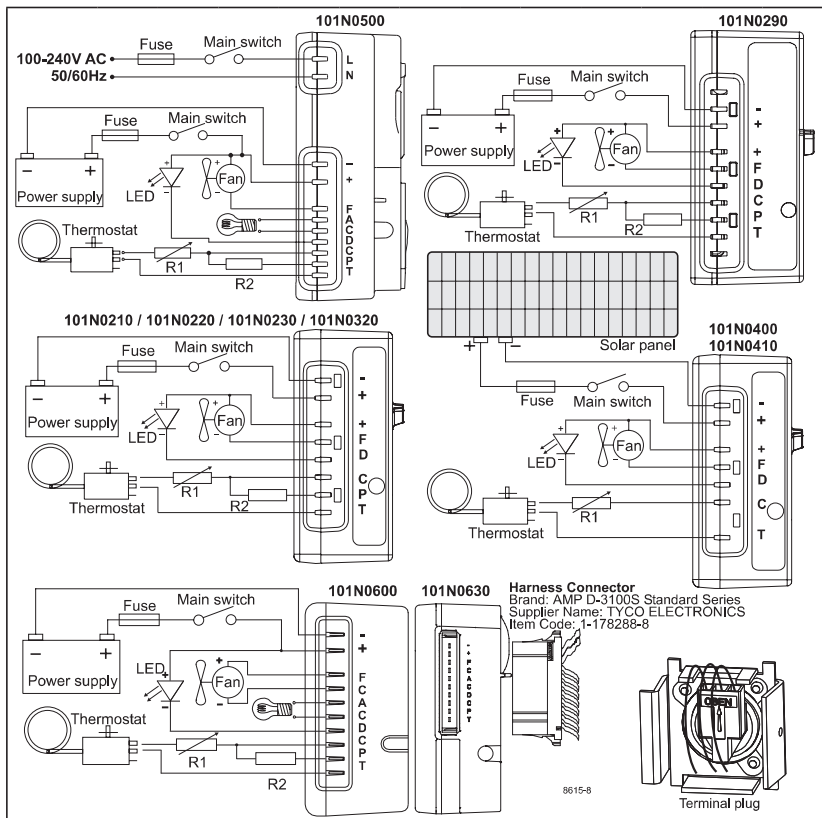
| Power consumption |      | 12V DC, static cooling |       |      |      |      |      |      |      |      |      | watt |
|-------------------|------|------------------------|-------|------|------|------|------|------|------|------|------|------|
| rpm \ °C          | -30  | -25                    | -23.3 | -20  | -15  | -10  | -5   | 0    | 5    | 7.2  | 10   | 15   |
| 2,000             | 17.6 | 23.4                   | 25.3  | 28.7 | 33.6 | 38.3 | 43.0 | 48.0 | 53.4 | 56.0 | 59.5 |      |
| 2,500             | 23.3 | 30.9                   | 33.3  | 37.8 | 44.1 | 50.2 | 56.2 | 62.3 | 68.7 | 71.7 |      |      |
| 3,000             | 29.9 | 36.0                   | 38.3  | 43.0 | 50.7 | 58.7 | 66.8 | 74.8 |      |      |      |      |
| 3,500             | 36.0 | 42.8                   | 45.4  | 50.8 | 59.5 | 68.9 | 78.5 |      |      |      |      |      |

| 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   | 1.5 | 2.0 | 2.1   | 2.4 | 2.8 | 3.2 | 3.6 | 4.0 | 4.5 | 4.67 | 5.0 |    |
| 2,500   | 1.9 | 2.6 | 2.8   | 3.2 | 3.7 | 4.2 | 4.7 | 5.2 | 5.8 | 5.98 |     |    |
| 3,000   | 2.5 | 3.0 | 3.2   | 3.6 | 4.2 | 4.9 | 5.6 | 6.2 |     |      |     |    |
| 3,500   | 3.0 | 3.6 | 3.8   | 4.3 | 5.0 | 5.7 | 6.5 |     |     |      |     |    |

| 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 | 1.02                   | 1.06  | 1.15 | 1.31 | 1.48 | 1.67 | 1.87 | 2.08 | 2.17 | 2.29 |     |
| 2,500                            | 0.87 | 0.97                   | 1.01  | 1.09 | 1.24 | 1.41 | 1.60 | 1.80 | 2.02 | 2.12 |      |     |
| 3,000                            | 0.75 | 0.90                   | 0.95  | 1.06 | 1.22 | 1.39 | 1.58 | 1.78 |      |      |      |     |
| 3,500                            | 0.73 | 0.84                   | 0.89  | 1.00 | 1.17 | 1.36 | 1.55 |      |      |      |      |     |

| 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            | 1.10 | 1.25                   | 1.31  | 1.42 | 1.61 | 1.82 | 2.06 | 2.31 | 2.57 | 2.70 | 2.84 |     |
| 2,500            | 1.07 | 1.19                   | 1.24  | 1.34 | 1.53 | 1.74 | 1.97 | 2.23 | 2.50 | 2.63 |      |     |
| 3,000            | 0.93 | 1.11                   | 1.17  | 1.30 | 1.50 | 1.72 | 1.95 | 2.20 |      |      |      |     |
| 3,500            | 0.89 | 1.03                   | 1.09  | 1.23 | 1.44 | 1.68 | 1.91 |      |      |      |      |     |

| 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       |



| Operational errors shown by LED (optional) |  |
|--|--|
| Error code                                 | Error type   |
| 5  | <b>Thermal cut-out of electronic unit</b><br>(If the refrigeration system has been too heavily loaded, or if the ambient temperature is high, the electronic unit will run too hot). |
| 4  | <b>Minimum motor speed error</b><br>(If the refrigeration system is too heavily loaded, the motor cannot maintain minimum speed at approximately 1,850 rpm).                         |
| 3  | <b>Motor start error</b><br>(The rotor is blocked or the differential pressure in the refrigeration system is too high (>5 bar)).  |
| 2  | <b>Fan over-current cut-out</b><br>(The fan loads the electronic unit with more than 1A <sub>peak</sub> ).   |
| 1  | <b>Battery protection cut-out</b><br>(The voltage is outside the cut-out setting).   |

| Compressor speed  |                                     |                   |                              |
|-------------------|-------------------------------------|-------------------|------------------------------|
| Electronit unit   | Resistor (R1) [Ω] calculated values | Motor speed [rpm] | Control circuit current [mA] |
| 101N0210          | 0                                   | 2,000             | 5                            |
| 101N0220          | 277                                 | 2,500             | 4                            |
| 101N0500          | 692                                 | 3,000             | 3                            |
| 101N0600          | 1523                                | 3,500             | 2                            |
| 101N0320          | 0                                   | AEO               | 6                            |
| 101N0400          | 173                                 | 2,000             | 5                            |
| 101N0410          | 450                                 | 2,500             | 4                            |
| 101N0410 with AEO | 865                                 | 3,000             | 3                            |
|                   | 1696                                | 3,500             | 2                            |

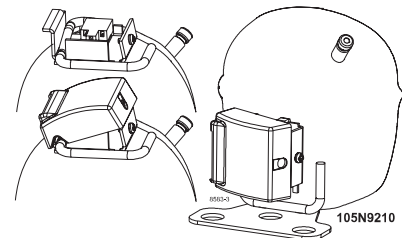
In AEO (Adaptive Energy Optimizing) speed mode the BD compressor will always adapt its speed to the actual cooling demand.

| Wire Dimensions DC |                    |             |                            |       |                            |       |
|--------------------|--------------------|-------------|----------------------------|-------|----------------------------|-------|
| Cross section      | Size               |             | Max. length* 12V operation |       | Max. length* 24V operation |       |
|                    | [mm <sup>2</sup> ] | AWG [Gauge] | [m]                        | [ft.] | [m]                        | [ft.] |
| 2.5                | 12                 | 12          | 2.5                        | 8     | 5                          | 16    |
| 4                  | 12                 | 12          | 4                          | 13    | 8                          | 26    |
| 6                  | 10                 | 10          | 6                          | 20    | 12                         | 39    |
| 10                 | 8                  | 8           | 10                         | 33    | 20                         | 66    |

\*Length between battery and electronic unit

**Wire Dimensions AC**  
Cross section min. 0.75 mm<sup>2</sup> or AWG 18

| 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         |



|                           |   |
|---------------------------|---|
| AC line cord UL approved  | 105N9520  |
| AC line cord VDE approved | 105N9530  |
| DC usage:                 | Automobile fuse 12V: 15A<br>DIN 7258 24V: 7.5 A |
|                           | Main switch min. 20A                            |
| AC usage:                 | Fuse, 100-240V min. 4A<br>Main switch min. 6A   |
|                           | Not deliverable from Secop                      |

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