

## BD1.4F-VSD-HD Heavy Duty Direct Current Compressor R134a, 12/24V DC



### General

|                                        |                            |
|----------------------------------------|----------------------------|
| Code number (without electronic units) | 109Z0251                   |
| Electronic unit - Variable Speed       | 101N2100, 30 pcs: 101N2101 |
| Approvals                              | -                          |
| Compressors on pallet                  | 180                        |

### Application

|                                                   |                    |
|---------------------------------------------------|--------------------|
| Application                                       | LBP/MBP/HBP        |
| Evaporating temperature °F                        | -20 to 59          |
| Voltage range VDC                                 | 9.6 - 17 / 19 - 34 |
| 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   | S   |
| 38°C        | S   | S   | S   |
| 43°C        | S   | S   | S   |

Remarks on application:

**HD (Heavy Duty) version of the BD1.4F-VSD which can handle extreme vibrations.**

For more info please contact: [mobile@secop.com](mailto:mobile@secop.com).

### Motor

|                                      |                               |
|--------------------------------------|-------------------------------|
| Motor type                           | permanet magnet, brushless DC |
| Speed                                | variable speed                |
| Resistance, all 3 windings (25°C) mΩ | 210                           |

### Design

|                                          |                    |
|------------------------------------------|--------------------|
| Displacement cu.in.                      | 0.086              |
| Oil quantity (type) fl.oz.               | 2.64 (polyolester) |
| Maximum refrigerant charge oz.           | 5.29               |
| Free gas volume in compressor fl.oz.     | 17.60              |
| Weight - Compressor/Electronic unit lbs. | 4.63/0.24          |

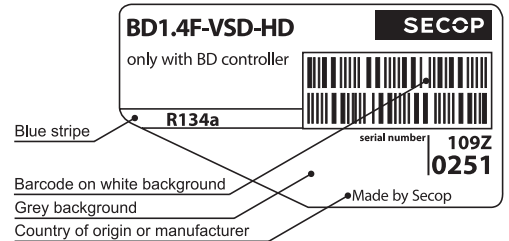
### Standard battery protection settings (refer to 101N2100 Instructions for optional settings)

| Voltage (0.1 steps) |                       | Min. value       | Default | Max. value |
|---------------------|-----------------------|------------------|---------|------------|
| 12V                 | ± 0.3V DC, all values | Cut out VDC      | 9.6     | 10.4       |
|                     |                       | Cut in diff. VDC | 0.5     | 1.3        |
| 24V                 | ± 0.3V DC, all values | Cut out VDC      | 19      | 21.3       |
|                     |                       | Cut in diff. VDC | 0.5     | 1.3        |

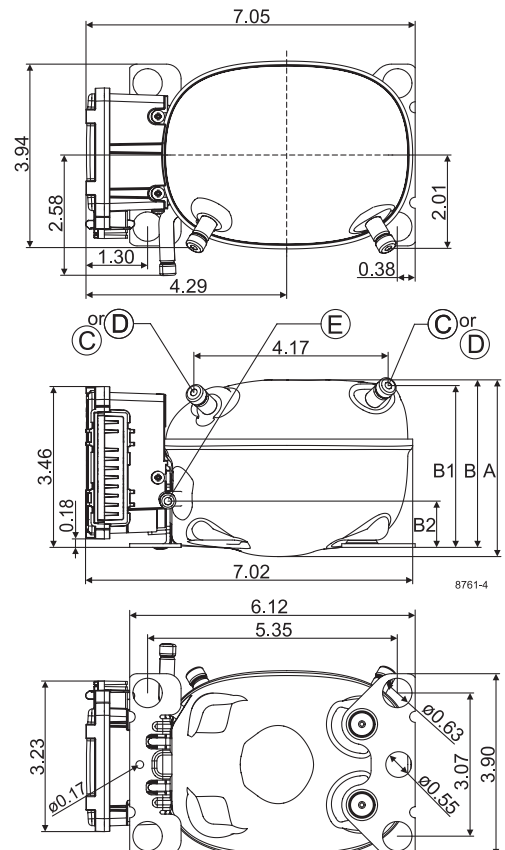
### Dimensions

|                     |                            |    |                          |
|---------------------|----------------------------|----|--------------------------|
| Height              | inch                       | A  | 3.79                     |
|                     |                            | B  | 3.59                     |
|                     |                            | B1 | 3.46                     |
|                     |                            | B2 | 0.99                     |
| Suction connector   | location/I.D. inch   angle | C  | 0.252-0.259   25°        |
|                     | material   comment         |    | Cu-plated steel   Al cap |
| Process connector   | location/I.D. inch   angle | D  | 0.252-0.259   25°        |
|                     | material   comment         |    | Cu-plated steel   Al cap |
| Discharge connector | location/I.D. inch   angle | E  | 0.202-0.205   0°         |
|                     | material   comment         |    | Cu-plated steel   Al cap |

Remarks: **inch connectors**



- 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 (ASHRAE LBP) |     | 12V DC, static cooling |     |     |     |     |     |     |     |     |     | BTU/h |
|-----------------------|-----|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| rpm \ °F              | -20 | -13                    | -10 | 0   | 10  | 14  | 20  | 30  | 41  | 45  | 50  | 59    |
| 2,000                 |     | 41                     | 48  | 78  | 115 | 133 | 162 | 218 | 294 | 325 | 366 | 450   |
| 2,500                 | 32  | 57                     | 67  | 107 | 154 | 175 | 210 | 278 | 370 | 409 | 461 | 569   |
| 3,000                 | 52  | 80                     | 92  | 138 | 192 | 216 | 257 | 337 | 447 | 493 | 556 | 685   |
| 3,500                 | 51  | 89                     | 106 | 164 | 229 | 258 | 306 | 400 | 528 | 582 | 656 | 809   |
| 4,000                 | 67  | 105                    | 122 | 185 | 260 | 295 | 352 | 462 | 611 | 673 | 757 | 928   |

| Capacity (EN 12900 Household/CECOMAF) |     | 12V DC, static cooling |     |    |    |    |     |     |     |     |     | watt |
|---------------------------------------|-----|------------------------|-----|----|----|----|-----|-----|-----|-----|-----|------|
| rpm \ °F                              | -20 | -13                    | -10 | 0  | 10 | 14 | 20  | 30  | 41  | 45  | 50  | 59   |
| 2,000                                 |     | 10                     | 12  | 19 | 28 | 32 | 39  | 52  | 70  | 77  | 87  | 107  |
| 2,500                                 | 9   | 16                     | 19  | 31 | 45 | 51 | 61  | 80  | 105 | 116 | 130 | 159  |
| 3,000                                 | 14  | 22                     | 26  | 39 | 55 | 62 | 74  | 97  | 127 | 140 | 157 | 192  |
| 3,500                                 | 11  | 24                     | 30  | 48 | 68 | 76 | 90  | 116 | 149 | 163 | 181 | 219  |
| 4,000                                 | 21  | 32                     | 36  | 54 | 75 | 85 | 100 | 130 | 170 | 186 | 209 | 253  |

| Power consumption |     | 12V DC, static cooling |     |    |    |    |    |    |    |    |    | watt |
|-------------------|-----|------------------------|-----|----|----|----|----|----|----|----|----|------|
| rpm \ °F          | -20 | -13                    | -10 | 0  | 10 | 14 | 20 | 30 | 41 | 45 | 50 | 59   |
| 2,000             |     | 14                     | 15  | 19 | 24 | 26 | 29 | 35 | 40 | 41 | 43 | 44   |
| 2,500             | 19  | 21                     | 22  | 25 | 29 | 31 | 34 | 38 | 42 | 43 | 44 | 45   |
| 3,000             | 22  | 24                     | 26  | 30 | 36 | 38 | 41 | 46 | 51 | 52 | 53 | 54   |
| 3,500             | 25  | 29                     | 31  | 37 | 44 | 46 | 50 | 55 | 60 | 62 | 63 | 65   |
| 4,000             | 31  | 36                     | 38  | 45 | 51 | 53 | 57 | 63 | 69 | 71 | 74 | 79   |

| Current consumption (for 24V applications the following must be halved) |      | A    |      |      |      |      |      |      |      |      |      |      |
|-------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| rpm \ °F                                                                | -20  | -13  | -10  | 0    | 10   | 14   | 20   | 30   | 41   | 45   | 50   | 59   |
| 2,000                                                                   |      | 1.31 | 1.39 | 1.65 | 1.90 | 2.00 | 2.15 | 2.41 | 2.71 | 2.82 | 2.96 | 3.23 |
| 2,500                                                                   | 1.51 | 1.62 | 1.68 | 1.95 | 2.28 | 2.42 | 2.63 | 2.96 | 3.25 | 3.33 | 3.40 | 3.45 |
| 3,000                                                                   | 1.78 | 1.97 | 2.06 | 2.40 | 2.76 | 2.91 | 3.14 | 3.49 | 3.82 | 3.92 | 4.03 | 4.17 |
| 3,500                                                                   | 1.95 | 2.25 | 2.38 | 2.85 | 3.32 | 3.51 | 3.78 | 4.20 | 4.58 | 4.69 | 4.81 | 4.95 |
| 4,000                                                                   | 3.17 | 3.24 | 3.29 | 3.56 | 3.93 | 4.11 | 4.38 | 4.86 | 5.37 | 5.55 | 5.75 | 6.05 |

| EER (ASHRAE LBP) |      | 12V DC, static cooling |      |      |      |      |      |      |      |      |      | BTU/h |
|------------------|------|------------------------|------|------|------|------|------|------|------|------|------|-------|
| rpm \ °F         | -20  | -13                    | -10  | 0    | 10   | 14   | 20   | 30   | 41   | 45   | 50   | 59    |
| 2,000            |      | 2.88                   | 3.19 | 4.06 | 4.78 | 5.06 | 5.49 | 6.29 | 7.39 | 7.88 | 8.58 | 10.17 |
| 2,500            | 1.88 | 2.95                   | 3.33 | 4.32 | 5.09 | 5.38 | 5.83 | 6.66 | 7.79 | 8.29 | 9.00 | 10.57 |
| 3,000            | 2.73 | 3.55                   | 3.82 | 4.54 | 5.16 | 5.42 | 5.84 | 6.68 | 7.89 | 8.43 | 9.19 | 10.90 |
| 3,500            | 2.09 | 3.14                   | 3.49 | 4.42 | 5.18 | 5.49 | 5.96 | 6.84 | 8.01 | 8.50 | 9.18 | 10.60 |
| 4,000            | 2.36 | 3.09                   | 3.36 | 4.19 | 5.00 | 5.34 | 5.87 | 6.83 | 8.03 | 8.51 | 9.15 | 10.40 |

| COP (EN 12900 Household/CECOMAF) |      | 12V DC, static cooling |      |      |      |      |      |      |      |      |      | W/W  |
|----------------------------------|------|------------------------|------|------|------|------|------|------|------|------|------|------|
| rpm \ °F                         | -20  | -13                    | -10  | 0    | 10   | 14   | 20   | 30   | 41   | 45   | 50   | 59   |
| 2,000                            |      | 0.69                   | 0.77 | 0.97 | 1.14 | 1.21 | 1.31 | 1.50 | 1.76 | 1.88 | 2.04 | 2.42 |
| 2,500                            | 0.45 | 0.77                   | 0.89 | 1.23 | 1.52 | 1.62 | 1.79 | 2.09 | 2.50 | 2.68 | 2.94 | 3.53 |
| 3,000                            | 0.62 | 0.90                   | 1.00 | 1.29 | 1.54 | 1.64 | 1.80 | 2.10 | 2.52 | 2.70 | 2.96 | 3.55 |
| 3,500                            | 0.46 | 0.83                   | 0.96 | 1.29 | 1.56 | 1.66 | 1.81 | 2.10 | 2.48 | 2.64 | 2.87 | 3.35 |
| 4,000                            | 0.67 | 0.88                   | 0.96 | 1.21 | 1.48 | 1.58 | 1.76 | 2.07 | 2.46 | 2.61 | 2.82 | 3.22 |

### Operational errors (TOOL4COOL® or LED flashes)

| Error code or LED flashes | Error type                                                                                                                                                                           |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           | Can be read out in the software TOOL4COOL®                                                                                                                                           |
| 6                         | <b>Thermostat failure</b><br>(If the NTC thermistor is short-circuit or has no connection, the electronic unit will enter manual mode).                                              |
| 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 0.65A <sub>peak</sub> ).                                                                        |
| 1                         | <b>Battery protection cut-out</b><br>(The voltage is outside the cut-out setting).                                                                                                   |

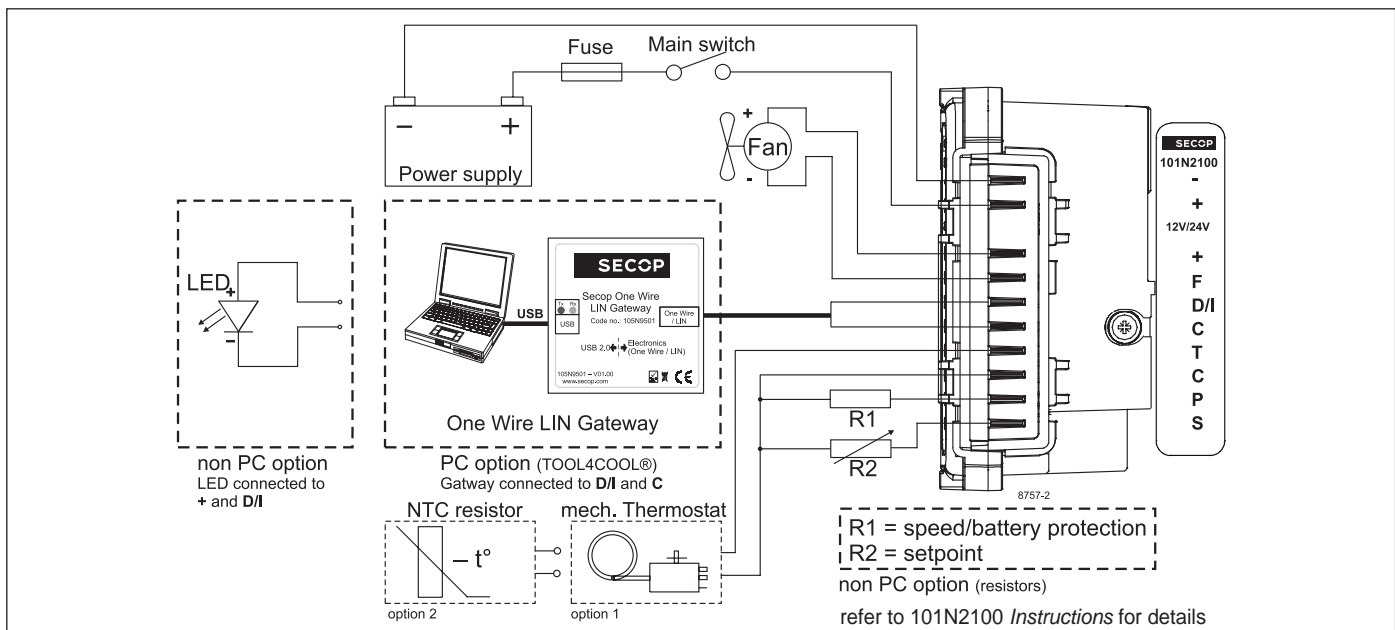
### Wire Dimensions DC

| Cross section [mm²] | Size AWG [Gauge] | Max. length* 12V operation |       | Max. length* 24V operation |       |
|---------------------|------------------|----------------------------|-------|----------------------------|-------|
|                     |                  | [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

| Accessories for BD1.4F-VSD-HD      | Code number                         |
|------------------------------------|-------------------------------------|
| Bolt joint for one compressor      | Ø:16 mm 118-1917                    |
| Bolt joint in quantities           | Ø:16 mm 118-1918                    |
| Snap-on in quantities              | Ø:16 mm 118-1919                    |
| Terminal cover for electronic unit | 105N9120                            |
| Automobile fuse DIN 7258           | 12V: 15A<br>24V: 15A                |
| Main switch                        | min. 20A Not deliverable from Secop |

| Test conditions         | EN 12900 CECOMAF | ASHRAE LBP |
|-------------------------|------------------|------------|
| Condensing temperature  | 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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