

Single Pack BDN45F 12/24V DC PM

Single pack code number: **195B3447**

| Position | Title | Code | Amount |
|----------|--|----------|--------|
| 1 | Compressor BDN45F | 109Z0400 | 1 |
| 2 | Electronic unit - Leisure BD | 101M2741 | 1 |
| 3 | Snap-on for one compressor $\varnothing 7$ $\varnothing 17.5\text{mm}$ | 118-1959 | 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.

BDN45F Direct Current Compressor R134a, R1234yf 12/24V DC

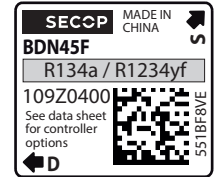


General

| | |
|---------------------------------------|----------------------------|
| Code number (without electronic unit) | 109Z0400 |
| Electronic unit - Leisure | 101N2740, 40 pcs: 101N2741 |
| Compressors on pallet | 240 |

Approvals

UL / CB



Application

| | |
|-------------------|------------------------|
| Application range | LBP/MBP |
| Voltage range | VDC 9.6 - 17 / 19 - 34 |

Cooling requirements

| | | |
|--------------------|-----|-----|
| Application | LBP | MBP |
| 32°C / 38°C / 43°C | S | S |

Absolute maximum ratings

| | | |
|---|----|--------------------------|
| Machine compartment temperature for compressor operation | °C | -10 to 50 |
| Max. compressor tilt angle for temporary operation | | ±30° |
| Operating pressure range | | see diagram to the right |
| Any levels of stress exceeding the absolute maximum value of machine compartment temperature range or operating pressure range or tilt angle may damage the device. Prolonged exposure to stress above the recommended operating conditions may also affect the device's reliability. | | |

Motor

| | |
|---|-------------------------------|
| Motor type | permanet magnet, brushless DC |
| Speed | rpm variable speed |
| Resistance, each of the three windings (25°C) | Ω 3.1 |

Design

| | | |
|-------------------------------------|-----------------|------------------|
| Displacement | cm ³ | 1.42 |
| Oil quantity (type) | cm ³ | 53 (polyolester) |
| Maximum refrigerant charge | g | 70 |
| Free gas volume in compressor | cm ³ | 472 |
| Weight - Compressor/Electronic unit | kg | 1.37 / 0.14 |

Standard battery protection settings

| Voltage (0.1 steps) | | | | Default | Min. value | Max. value |
|---------------------------|-----------------------|---------------|-----|---------|------------|------------|
| 12V | ± 0.3V DC, all values | Cut out level | VDC | 10.4 | 9.6 | 17 |
| 24V | ± 0.3V DC, all values | Cut out level | VDC | 21.3 | 19 | 32 |
| Battery cut-in difference | | | VDC | 1.3 | 0.5 | 10 |

Dimensions

| | | | |
|--|--------------------------|----|-------------------------------|
| Height | mm | A | 89.0 |
| | | B | 82.4 |
| | | B1 | 48.7 |
| | | B2 | 45.8 |
| Suction connector | location/I.D. mm angle | C | 6.2 5° |
| | material comment | | Copper Rubber plug |
| Process connector | location/I.D. mm angle | D | 6.2 77.9° |
| | material comment | | Copper Rubber plug |
| Discharge connector | location/I.D. mm angle | E | 5.0 86.9° |
| | material comment | | Cu-plated steel Rubber plug |
| Connector tolerance | I.D. mm | | ±0.09, on 5.0 +0.12/+0.20 |
| Remarks: Please follow the brazing instructions on page 4 (Product Bulletin DES.N.101.M1). | | | |

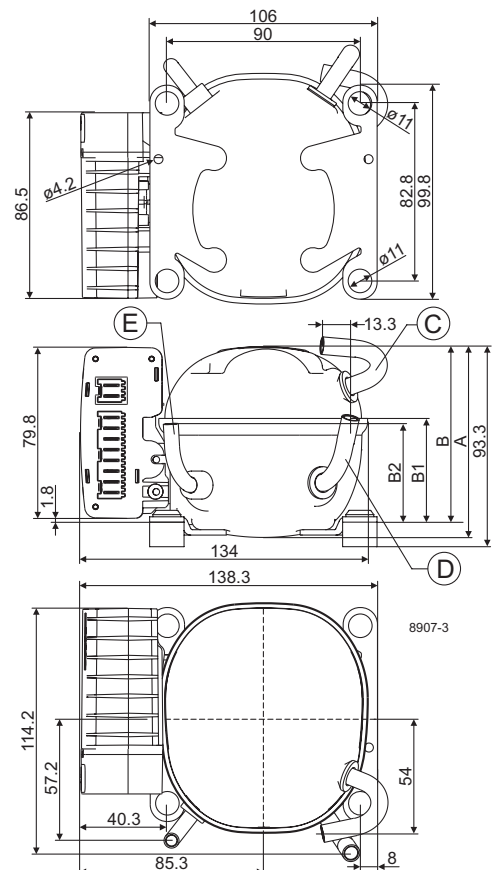
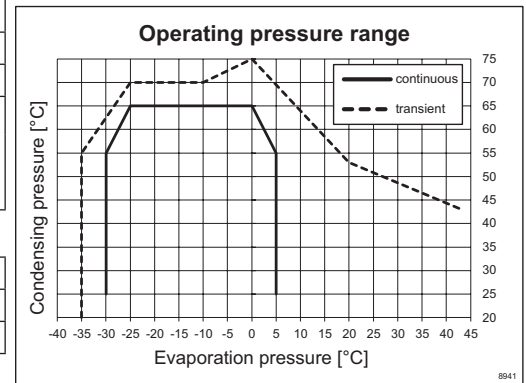


Approvals and warning label

S = Static cooling normally sufficient

Note: In case fan cooling is used:

condenser => fan => electronic => compressor



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 |
|----------|------|------|-------|------|------|------|-------|-------|------|
| 2,300 | 14.3 | 19.9 | 22.2 | 27.1 | 36.0 | 47.0 | 60.1 | 75.6 | 93.8 |
| 3,000 | 18.5 | 26.2 | 29.4 | 36.4 | 49.0 | 64.0 | 81.5 | 102 | |
| 4,000 | 25.2 | 36.6 | 41.2 | 50.9 | 67.6 | 86.5 | 107.4 | 129.9 | |
| 4,500 | 28.7 | 42.0 | 47.3 | 58.4 | 77.4 | 98.4 | 121.2 | | |

Capacity (ASHRAE LBP) 12V DC, static cooling **watt**

| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 |
|----------|------|------|-------|------|------|-------|-------|-------|-------|
| 2,300 | 17.9 | 24.9 | 27.6 | 33.7 | 44.8 | 58.4 | 74.7 | 94.1 | 116.7 |
| 3,000 | 23.1 | 32.7 | 36.6 | 45.2 | 60.8 | 79.5 | 101.3 | 126.3 | |
| 4,000 | 31.4 | 45.5 | 51.1 | 63.1 | 83.8 | 107.3 | 133.3 | 161.4 | |
| 4,500 | 35.7 | 52.2 | 58.7 | 72.4 | 95.9 | 122.0 | 150.4 | | |

Power consumption 12V DC, static cooling **watt**

| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 |
|----------|------|------|-------|------|------|------|------|------|------|
| 2,300 | 15.9 | 19.0 | 20.2 | 22.6 | 26.5 | 30.8 | 35.3 | 40.1 | 45.1 |
| 3,000 | 19.2 | 23.3 | 24.8 | 28.0 | 33.1 | 38.4 | 43.6 | 48.6 | |
| 4,000 | 25.1 | 31.3 | 33.5 | 37.9 | 44.7 | 51.4 | 57.6 | 62.9 | |
| 4,500 | 28.8 | 36.1 | 38.7 | 43.9 | 51.8 | 59.3 | 66.2 | | |

Current consumption (for 24V applications the following must be halved)

| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 |
|----------|------|------|-------|------|------|------|------|------|------|
| 2,300 | 1.40 | 1.70 | 1.81 | 2.03 | 2.40 | 2.79 | 3.21 | 3.66 | 4.12 |
| 3,000 | 1.62 | 1.98 | 2.11 | 2.39 | 2.83 | 3.29 | 3.75 | 4.18 | |
| 4,000 | 2.10 | 2.61 | 2.79 | 3.15 | 3.71 | 4.26 | 4.77 | 5.21 | |
| 4,500 | 2.39 | 2.99 | 3.21 | 3.64 | 4.28 | 4.91 | 5.47 | | |

COP (EN 12900 Household/CECOMAF) 12V DC, static cooling **W/W**

| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 |
|----------|------|------|-------|------|------|------|------|------|------|
| 2,300 | 0.90 | 1.05 | 1.10 | 1.20 | 1.36 | 1.52 | 1.70 | 1.88 | 2.08 |
| 3,000 | 0.96 | 1.13 | 1.18 | 1.30 | 1.48 | 1.67 | 1.87 | 2.09 | |
| 4,000 | 1.00 | 1.17 | 1.23 | 1.34 | 1.51 | 1.68 | 1.86 | 2.06 | |
| 4,500 | 1.00 | 1.16 | 1.22 | 1.33 | 1.49 | 1.66 | 1.83 | | |

COP (ASHRAE LBP) 12V DC, static cooling **W/W**

| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 |
|----------|------|------|-------|------|------|------|------|------|------|
| 2,300 | 1.13 | 1.31 | 1.37 | 1.49 | 1.69 | 1.90 | 2.11 | 2.34 | 2.59 |
| 3,000 | 1.20 | 1.40 | 1.47 | 1.62 | 1.84 | 2.07 | 2.32 | 2.60 | |
| 4,000 | 1.25 | 1.45 | 1.53 | 1.66 | 1.87 | 2.09 | 2.31 | 2.56 | |
| 4,500 | 1.24 | 1.45 | 1.52 | 1.65 | 1.85 | 2.06 | 2.27 | | |

Operational errors (TOOL4COOL® or LED flashes)

| Error code or LED flashes | Error type |
|---------------------------|---|
| | Can be read out in the software TOOL4COOL® |
| 7 | Communication error (Communication of master controller stopped for 15 minutes (default)) |
| 6 | Thermostat failure (If a NTC thermistor is short-circuit or has no connection, the electronic unit will enter manual mode). |
| 5 | Thermal cut-out of electronic unit (PCB or machine compartment temperature exceeds minimum or maximum limits). |
| 4 | Minimum motor speed error (If the refrigeration system is too heavily loaded, the motor cannot maintain min. speed at approximately 2,150 rpm). |
| 3 | Motor start error (The rotor is blocked or the differential pressure in the refrigeration system is too high (>5 bar)). |
| 2 | Fan over-current cut-out (The fan is overloading the electronic unit). |
| 1 | Battery protection cut-out (The voltage is outside the cut-out setting). |

A Wire Dimensions DC

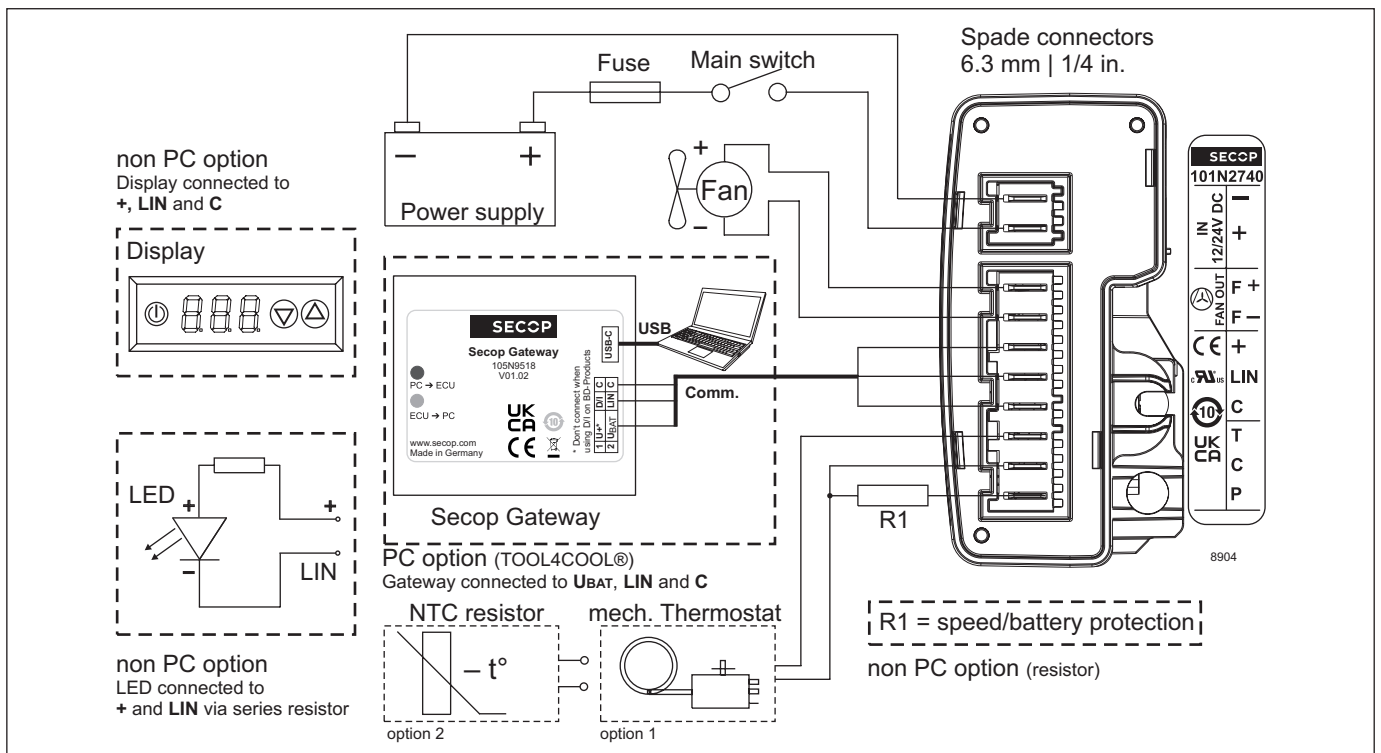
| Cross section | Size | | Max. length* 12V operation | | Max. length* 24V operation | |
|---------------|------|---------|----------------------------|-------|----------------------------|-------|
| | AWG | [Gauge] | [m] | [ft.] | [m] | [ft.] |
| 2.5 | 12 | | 2.5 | 8 | 5 | 16 |
| 4 | 12 | | 4 | 13 |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

*Length between battery and electronic unit

Accessories for BDN45F

| Mounting | Code number |
|-------------------------------|-------------|
| Bolt joint for one compressor | 118-1960 |
| Snap-on for one compressor | 118-1959 |
| Secop Gateway | 105N9518 |

| 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 |



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 |
|----------|------|------|-------|------|------|------|-------|-------|------|
| 2,300 | 15.8 | 21.2 | 23.4 | 28.1 | 36.5 | 46.7 | 58.8 | 72.9 | 89.2 |
| 3,000 | 20.4 | 28.0 | 31.0 | 37.7 | 49.6 | 63.7 | 79.8 | 98.0 | |
| 4,000 | 27.8 | 39.0 | 43.4 | 52.7 | 68.5 | 86.1 | 105.1 | 125.3 | |
| 4,500 | 31.7 | 44.8 | 49.8 | 60.4 | 78.2 | 97.7 | 118.5 | | |

Capacity (ASHRAE LBP) 12V DC, static cooling **watt**

| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 |
|----------|------|------|-------|------|-------|-------|-------|-------|-------|
| 2,300 | 20.6 | 27.7 | 30.5 | 36.5 | 47.5 | 60.7 | 76.4 | 94.8 | 116.2 |
| 3,000 | 26.6 | 36.3 | 40.3 | 48.9 | 64.4 | 82.6 | 103.6 | 127.4 | |
| 4,000 | 36.1 | 50.6 | 56.3 | 68.3 | 88.7 | 111.5 | 136.4 | 162.9 | |
| 4,500 | 41.2 | 58.0 | 64.5 | 78.2 | 101.2 | 126.5 | 153.7 | | |

Power consumption 12V DC, static cooling **watt**

| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 |
|----------|------|------|-------|------|------|------|------|------|------|
| 2,300 | 18.0 | 20.9 | 21.9 | 24.1 | 27.6 | 31.5 | 35.6 | 39.9 | 44.2 |
| 3,000 | 21.6 | 25.4 | 26.9 | 29.8 | 34.5 | 39.3 | 44.0 | 48.4 | |
| 4,000 | 28.3 | 34.1 | 36.2 | 40.3 | 46.6 | 52.6 | 58.1 | 62.7 | |
| 4,500 | 32.5 | 39.3 | 41.8 | 46.6 | 53.8 | 60.6 | 66.6 | | |

Current consumption (for 24V applications the following must be halved)

| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 |
|----------|------|------|-------|------|------|------|------|------|------|
| 2,300 | 1.60 | 1.86 | 1.96 | 2.16 | 2.50 | 2.86 | 3.24 | 3.63 | 4.04 |
| 3,000 | 1.83 | 2.16 | 2.29 | 2.54 | 2.95 | 3.37 | 3.78 | 4.16 | |
| 4,000 | 2.37 | 2.85 | 3.02 | 3.35 | 3.87 | 4.36 | 4.81 | 5.19 | |
| 4,500 | 2.70 | 3.26 | 3.46 | 3.86 | 4.45 | 5.01 | 5.51 | | |

COP (EN 12900 Household/CECOMAF) 12V DC, static cooling **W/W**

| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 |
|----------|------|------|-------|------|------|------|------|------|------|
| 2,300 | 0.88 | 1.02 | 1.07 | 1.17 | 1.32 | 1.48 | 1.65 | 1.83 | 2.02 |
| 3,000 | 0.94 | 1.10 | 1.15 | 1.27 | 1.44 | 1.62 | 1.81 | 2.03 | |
| 4,000 | 0.98 | 1.14 | 1.20 | 1.31 | 1.47 | 1.64 | 1.81 | 2.00 | |
| 4,500 | 0.98 | 1.14 | 1.19 | 1.30 | 1.45 | 1.61 | 1.78 | | |

COP (ASHRAE LBP) 12V DC, static cooling **W/W**

| rpm \ °C | -30 | -25 | -23.3 | -20 | -15 | -10 | -5 | 0 | 5 |
|----------|------|------|-------|------|------|------|------|------|------|
| 2,300 | 1.15 | 1.33 | 1.39 | 1.52 | 1.72 | 1.93 | 2.15 | 2.38 | 2.63 |
| 3,000 | 1.23 | 1.43 | 1.50 | 1.64 | 1.87 | 2.10 | 2.36 | 2.63 | |
| 4,000 | 1.28 | 1.48 | 1.55 | 1.69 | 1.90 | 2.12 | 2.35 | 2.60 | |
| 4,500 | 1.27 | 1.47 | 1.54 | 1.68 | 1.88 | 2.09 | 2.31 | | |

Operational errors (TOOL4COOL® or LED flashes)

| Error code or LED flashes | Error type |
|---------------------------|---|
| | Can be read out in the software TOOL4COOL® |
| 7 | Communication error (Communication of master controller stopped for 15 minutes (default)) |
| 6 | Thermostat failure (If a NTC thermistor is short-circuit or has no connection, the electronic unit will enter manual mode). |
| 5 | Thermal cut-out of electronic unit (PCB or machine compartment temperature exceeds minimum or maximum limits). |
| 4 | Minimum motor speed error (If the refrigeration system is too heavily loaded, the motor cannot maintain min. speed at approximately 2,150 rpm). |
| 3 | Motor start error (The rotor is blocked or the differential pressure in the refrigeration system is too high (>5 bar)). |
| 2 | Fan over-current cut-out (The fan is overloading the electronic unit). |
| 1 | Battery protection cut-out (The voltage is outside the cut-out setting). |

A Wire Dimensions DC

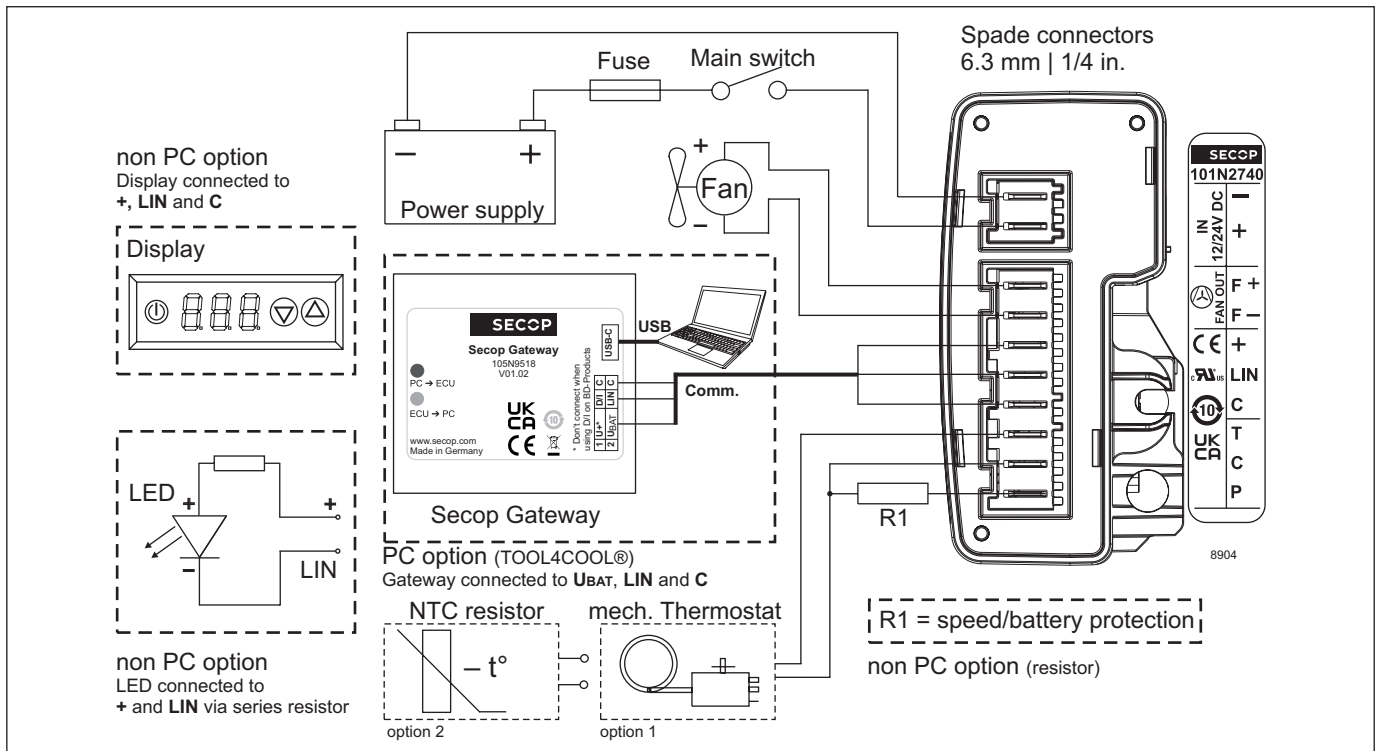
| Cross section [mm ²] | Size | | Max. length* 12V operation | | Max. length* 24V operation | |
|-------------------------------------|------|---------|-------------------------------|-------|-------------------------------|-------|
| | AWG | [Gauge] | [m] | [ft.] | [m] | [ft.] |
| 2.5 | 12 | | 2.5 | 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

Accessories for BDN45F

| Mounting | Code number |
|-------------------------------|-------------|
| Bolt joint for one compressor | 118-1960 |
| Snap-on for one compressor | 118-1959 |
| Secop Gateway | 105N9518 |

| 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 |

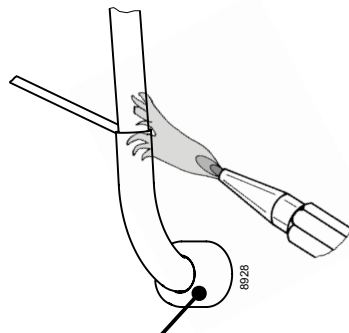


Secop accepts no responsibility for possible errors in catalogs, brochures, and other printed material. Secop reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without consequential changes being necessary 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

Brazing on Discharge Connector (BDN45F, BDN50K, BDN45F-A, and MB3CKV)

The BDN45F, BDN50K, and MB3CKV compressors use a special discharge connector element (see figure 2) that is directly connected to the discharge tube to optimize energy consumption. This element is made from plastic and sensitive to high heat exposure.

When brazing a tube into the discharge connector (see figure 1) please ensure that the area with the discharge connector element never exceeds 150°C / 302°F. Don't heat up the bottom of the connector directly.



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

Use a fork burner (see figure 3) and/or a damp cloth, if necessary. A protective plate can also serve to protect the discharge connector element from direct heat from a flame. Do not braze longer than 10 seconds and wait for 5 minutes for the next soldering attempt.

Further information:

Product Bulletin – Brazing Technique for Compressor Connectors (DES.N.600.A1.02)



Fig.1 BDN45F discharge connector

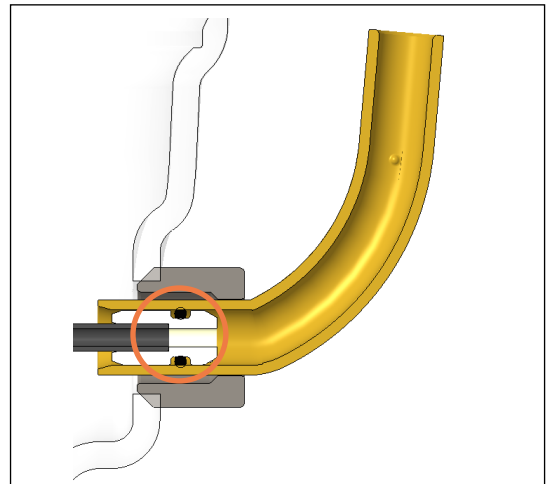


Fig.2 Discharge connector element

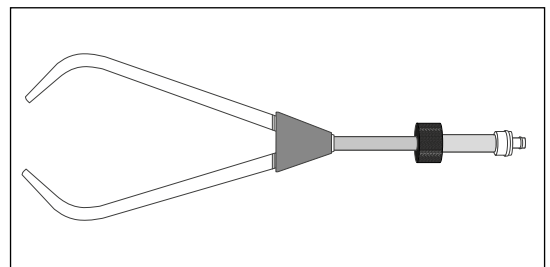


Fig.3 Fork burner



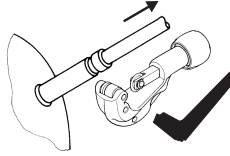
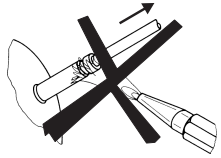
Instructions for Electronic Units
are available for download on
www.secop.com



BD Compressors



Service/Repair



BD Nano

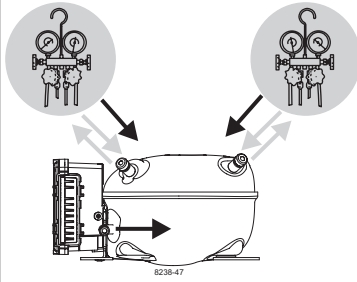


! max. 150°C/302°F !
at socket

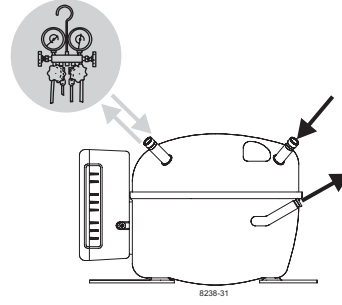
brazing solder: silver with flux

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).

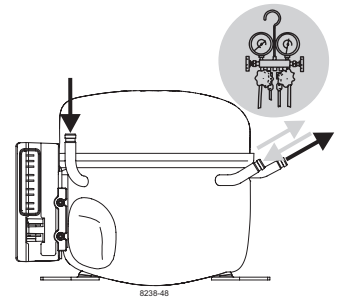
BD Micro



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 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