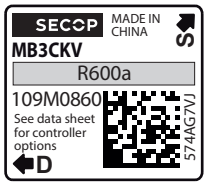
MB3CKV
Direct Current Compressor
R600a, Medical
12/24V DC

TOOL4COOL®



Approvals and warning label

General

Code number (without electronic unit)	109M0860
Electronic unit - Solar 1	101N2742, 40 pcs: 101N2743
Compressors on pallet	240

Approvals

UL / CB

Application

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

Cooling requirements

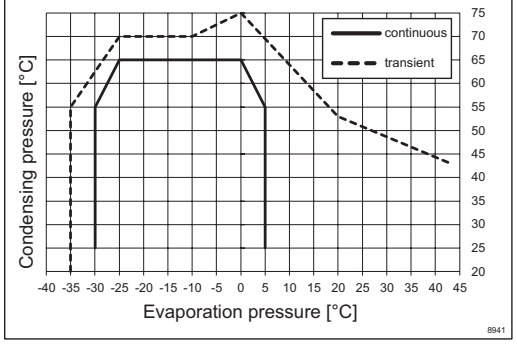
Application	LBP	MBP
32°C / 38°C / 43°C	S	S

S = Static cooling normally sufficient
Note: In case fan cooling is used:
condenser => fan => electronic => compressor

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.		

Operating pressure range



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	2.60
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

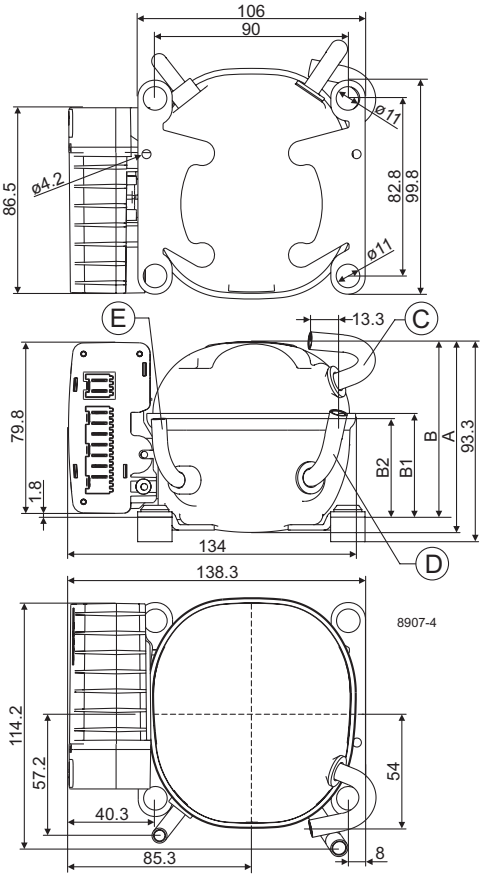
Standard battery protection settings

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	22.8	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 3 (Product Bulletin DES.N.101.M).



Capacity (EN 12900 Household/CECOMAF) 12V DC, static cooling **watt**

rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5
2,300	16.8	23.3	25.9	31.3	40.9	52.2	65.4	80.5	97.7
3,000	23.8	32.6	35.9	43.0	55.4	70.0	87.0	106.8	
4,000	32.5	44.7	49.2	58.9	75.8	95.7	119.1	146.4	
4,500	36.0	50.2	55.3	65.5	82.8	103.2	127.9		

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

rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5
2,300	20.6	28.5	31.6	38.3	50.0	63.8	79.9	98.4	119.4
3,000	29.3	39.9	43.9	52.6	67.6	85.4	106.2	130.4	
4,000	39.8	54.6	60.2	72.0	92.6	116.9	145.5	178.9	
4,500	44.6	62.0	68.1	80.6	101.6	126.5	156.4		

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

rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5
2,300	16.8	20.2	21.4	24.0	28.2	32.5	36.8	41.1	45.1
3,000	21.9	26.6	28.2	31.3	36.1	40.9	45.6	50.2	
4,000	30.1	36.9	39.3	43.8	50.6	57.4	64.3	71.2	
4,500	34.4	41.8	44.3	49.0	56.0	62.9	69.7		

Current consumption (for 24V applications the following must be halfed) **A**

rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5
2,300	1.40	1.68	1.79	2.00	2.35	2.71	3.07	3.42	3.76
3,000	1.82	2.22	2.35	2.61	3.01	3.41	3.80	4.19	
4,000	2.51	3.08	3.27	3.65	4.22	4.79	5.36	5.93	
4,500	2.87	3.49	3.69	4.09	4.67	5.24	5.80		

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	1.00	1.16	1.21	1.30	1.45	1.61	1.78	1.96	2.17
3,000	1.09	1.23	1.27	1.37	1.53	1.71	1.91	2.13	
4,000	1.08	1.21	1.25	1.35	1.50	1.67	1.85	2.06	
4,500	1.05	1.20	1.25	1.34	1.48	1.64	1.84		

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

rpm \ °C	-30	-25	-23.3	-20	-15	-10	-5	0	5
2,300	1.24	1.42	1.48	1.60	1.79	1.98	2.18	2.41	2.67
3,000	1.33	1.50	1.56	1.68	1.88	2.10	2.34	2.61	
4,000	1.32	1.48	1.53	1.65	1.83	2.04	2.27	2.53	
4,500	1.30	1.48	1.54	1.64	1.82	2.02	2.25		

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).

Wire Dimensions DC

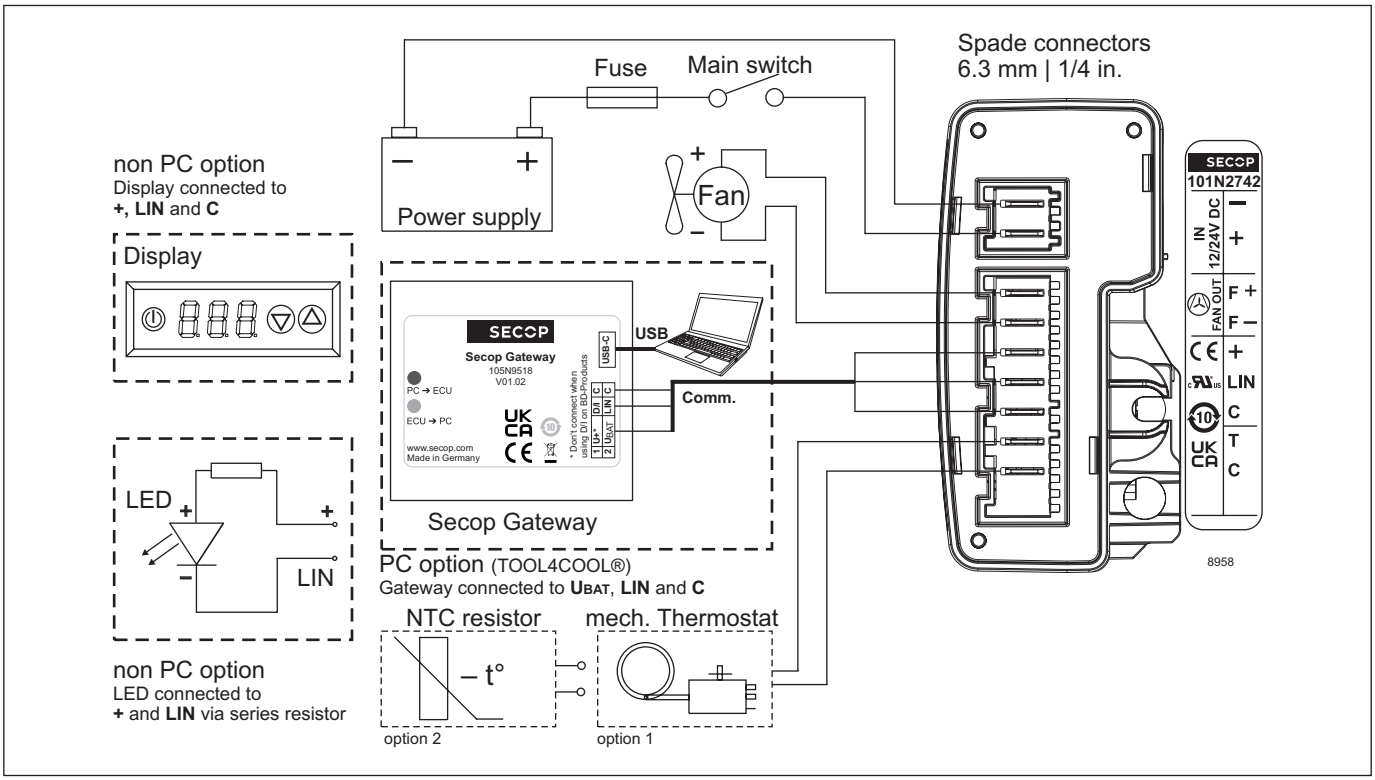
Size		Max. length* 12V operation		Max. length* 24V operation	
Cross section	AWG				
[mm²]	[Gauge]	[m]	[ft.]	[m]	[ft.]
2.5	12	2.5	8	5	16
4	12	4	13	8	26
6	10	6	20	12	39
10	8	10	33	20	66

*Length between battery and electronic unit

Accessories for MB3CKV

Mounting	Code number
Bolt joint for one compressor	118-1960
SDD Power Management Module	101N3110
SDD Connector Package	105N9030
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



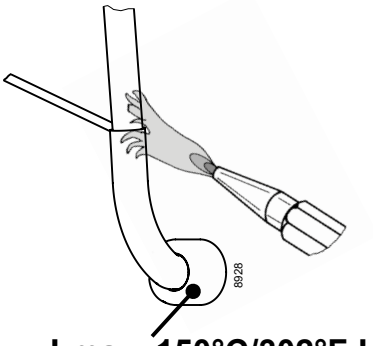
PRODUCT BULLETIN

SECOP

Brazing on BD Nano Discharge Connector (BDN45F, BDN50K, BDN45F-A, BDN50K-A, MB3CKV, and BDN-EV)

Secop BDN45F/-A, BDN50K/-A, MB3CKV, BDN-EV 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.



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

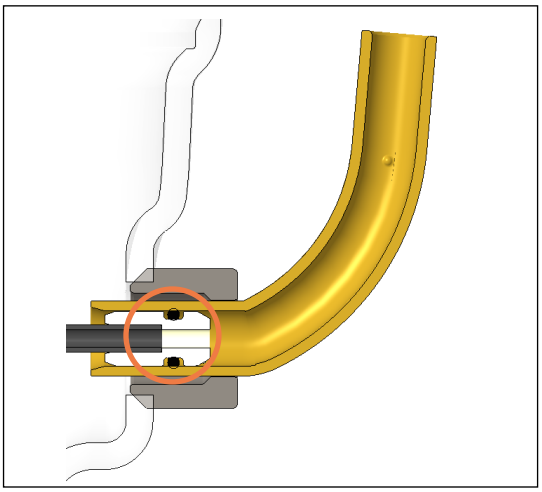


Fig.2 Discharge connector element

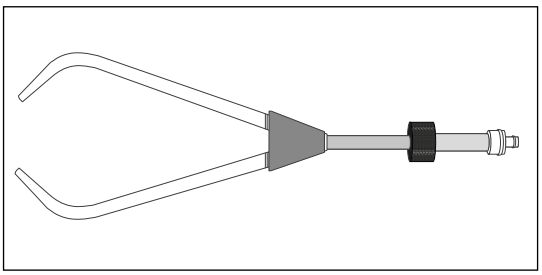


Fig.3 Fork burner

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