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Version Number: C-RC06-EN-V1.0

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RefComp

Reciprocating Compressor

SBC Series Semi Hermetic Double Stage Reciprocating Compressor

Global Service Hotline
400-109-6660

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Structural Diagram of the RefComp SBC Series Semi-hermetic Double-Stage Reciprocating Compressor

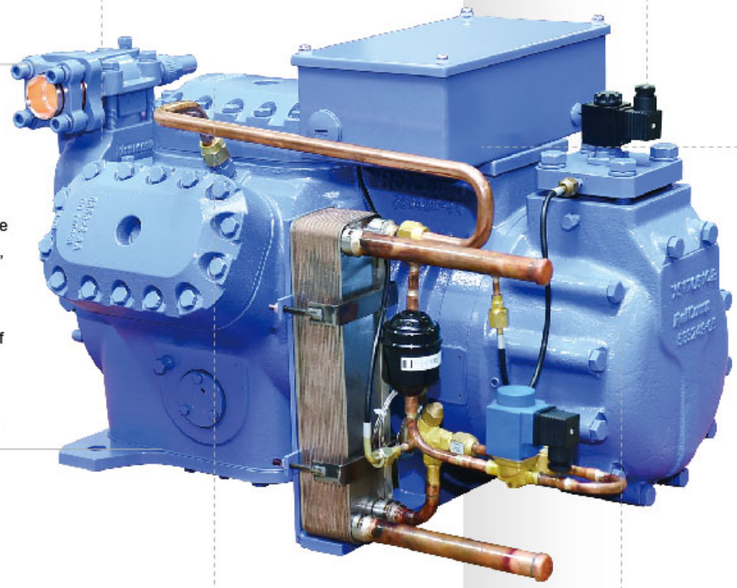
The SBC series compressor is an efficient, compact double-stage reciprocating compressor with low noise and low vibration. Compared with single-stage compressors, the double-stage compressor significantly reduces the discharge temperature and thus improves the overall efficiency of the compressor by lowering the compression ratio of each stage and combining intermediate cooling technology.

Suction filter

- The internal and highly integrated suction filter effectively removes impurities from the refrigerant gas and protects the motor.
- Integrated within the suction pipe, the design is compact and facilitates easy replacement.

Shut-off valve

- Suction/discharge shut-off valves can be rotated by 360°, offering simple, compact, and flexible installation.



Compressor body

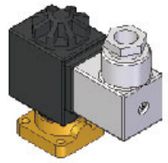
- The designated pressure is as high as 25bar.
- The intake passage is designed with low pressure drop, resulting in minimal intake resistance while effectively cooling the motor. The straight-through middle passage reduces the along-the-way loss, and the exhaust throttling loss is minimal, ensuring low energy consumption.
- Compact design, optimized mass balance, and highly integrated components such as safety valves, stop valves, and suction filters. The compact structure effectively enhances the reliability of the equipment.
- The connection channel between the first and second stages has been moved internally, with compact structure and streamlined appearance.structure effectively enhances the reliability of the equipment.

safety valve

- The built-in safety valve, connecting he intermediate chamber to the low-pressure chamber, ensures the stable pressure inside the machine body.
- The design meets high specifications, ensuring reliable sealing, accurate activation, timely full opening, stable discharge, and prompt reset, thereby guaranteeing stable and reliable performance.

Motor spray liquid cooling control valve

- The motor cooling system used can accurately inject the liquid required for cooling the motor and can be timely activated and deactivated, ensuring that the motor operates within an appropriate temperature range.



Motor protection

- Integrated with INT69 B2 motor protection module.
- Dynamic monitoring and track of the system operation, ensuring predictive alerts and safety protection.

Motor

- The motor can be equipped with a variable frequency drive (VFD) motor to achieve vector control.
- Special customized materials, compatible with multiple refrigerants including R404A, R507A, and R410A.
- The built-in special sensor switch enables timely and accurate spray signals, ensuring the motor operates within an appropriate temperature range.
- The optimized rotor and stator profiles achieve the highest efficiency and power output.

Model Description

Compressor	SB	4	C	-	1400
	SB	6	C	-	300E

Series	
SB	Semi-hermetic Reciprocating Compressor

Cylinder number
SBC Series: 4, 6

Specification	C compact

Motor rated power HP X 100(1)

Models ending with letter "E" indicate compressors using POE oil.

Technical Parameters

Model		SB4C-1200	SB4C-1400	SB6C-1600	SB6C-2000	SB6C-2500	SB6C-3000
		SB4C-120E	SB4C-140E	SB6C-160E	SB6C-200E	SB6C-250E	SB6C-300E
Rated power	HP/kW	12 / 8.8	14 / 10.3	16 / 11.8	20 / 14.7	25 / 18.4	30 / 22.1
Displacement (50[Hz]-h-LP/HP)	m³/hr	43 / 27.6	51.5 / 32.3	64.7 / 32.4	75 / 37.5	86.1 / 43	102.9 / 51.5
Number of Cylinder		4		6			
Weight	kg	202	206	215	225	235	242
Oil charge	dm³	3.7	3.7	4.2	4.2	4.2	4.2
Crankcase heater		230V-150W-50/60Hz					
Inner diameter of discharge pipeØ	mm/inch	28 1 1/8"	28 1 1/8"	35 1 3/8"	35 1 3/8"	35 1 3/8"	35 1 3/8"
Inner diameter of suction pipeØ	mm/inch	35 1 3/8"	35 1 3/8"	42 1 5/8"	42 1 5/8"	42 1 5/8"	42 1 5/8"
Standard motor(Partial winding start)		400V/3/50Hz or 460V/3/60Hz PW(1)					
Starting current (LRA)	A	74 / 123	88 / 146	88 / 146	102 / 170	123 / 201	150 / 243
Maximum power consumption	kW	15	20	22	26	29	33
Maximum operating current	A	27	34	39	46	50	55

(1)current ±10%

Product Features

Flexible application in different fields

SBC series

Compact structure and easy installation

- The design is compact and easy to install. · It features strong sealing with a special internal gas flow passage.
- The external connection pipes are eliminated, along with the need for insulation in that area, resulting in improved system efficiency.

Low vibration and noise

- Smooth operation is ensured through an optimized mass balance design.
- The compression efficiency can be further enhanced by optionally adding a sub-cooler.

Highly reliable drive components

a. The crankshaft surface is strengthened by hardening. b. A high-capacity oil pump is used.

c. Low-friction bearings and aluminum pistons are selected. d. The piston rings are surface-hardened with chrome plating.

Optimized lubrication system

The lubrication system is designed with a bidirectional gear oil pump and an internal return oil system using a Venturi tube. It also includes an oil filter and a differential pressure switch for protection and monitoring of the lubrication process.

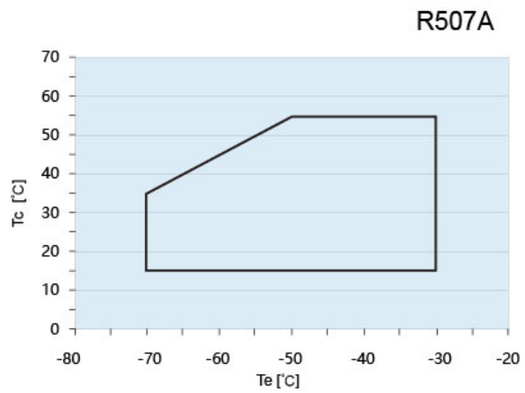
High cooling capacity with low energy Consumption

a. High-efficiency working valve plates and impact-resistant spring steel valve plates are used.

b. The design incorporates a minimal clearance at the dead center.

c. High-efficiency, large-capacity motors are selected, with built-in special sensor switches for motor-end spray control.

Application Range



Full load operating range
Suction superheat: 20 [°C]

Performance parameters (SBC, refrigerant R507A)

SB4C-1200										
Tc	20		30		40		50		55	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-70	1.7	2.8	1.4	2.8	-	-	-	-	-	-
-65	2.4	3.5	2	3.6	1.8	3.7	-	-	-	-
-60	3.5	4.1	2.8	4.3	2.3	4.5	-	-	-	-
-55	4.8	4.8	4	5.1	3.2	5.4	2.7	5.7	-	-
-50	6.5	5.5	5.5	5.9	4.4	6.3	3.6	6.7	3.2	7
-45	8.4	6.2	7.2	6.7	6	7.2	4.8	7.7	4.2	8
-40	10.6	6.8	9.3	7.5	7.9	8.1	6.3	8.7	5.6	9.1
-35	13.1	7.5	11.8	8.3	10.1	9	8.3	9.7	7.3	10.1
-30	15.9	8.2	14.5	9.1	12.7	9.9	10.5	10.7	9.4	11.2

SB4C-1400										
Tc	20		30		40		50		55	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-70	2	3.3	1.6	3.3	-	-	-	-	-	-
-65	2.9	4.1	2.3	4.2	2.1	4.3	-	-	-	-
-60	4.2	4.9	3.4	5.2	2.8	5.4	-	-	-	-
-55	5.8	5.7	4.8	6.1	3.9	6.4	3.2	6.8	-	-
-50	7.7	6.5	6.5	7	5.3	7.5	4.3	8	3.9	8.3
-45	10	7.3	8.7	7.9	7.2	8.5	5.7	9.1	5.1	9.5
-40	12.7	8.1	11.2	8.9	9.4	9.6	7.6	10.3	6.7	10.7
-35	15.7	8.9	14.1	9.8	12.1	10.7	9.9	11.5	8.8	12
-30	19.1	9.7	17.4	10.8	15.2	11.7	12.6	12.7	11.3	13.2

SB6C-1600										
Tc	20		30		40		50		55	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-70	2.5	4.4	2	4.3	-	-	-	-	-	-
-65	3.7	5	3	5.1	2.6	5.3	-	-	-	-
-60	5.3	5.6	4.3	5.9	3.5	6.3	-	-	-	-
-55	7.2	6.4	6	6.9	4.9	7.4	4	8.1	-	-
-50	9.7	7.3	8.2	7.9	6.7	8.6	5.4	9.4	4.8	9.8
-45	12.5	8.3	10.8	9	9	9.8	7.2	10.7	6.4	11.2
-40	15.9	9.4	14	10.2	11.8	11.1	9.5	12.1	8.4	12.7
-35	19.8	10.5	17.6	11.5	15.1	12.5	12.4	13.6	11	14.2
-30	24.2	11.8	21.8	12.8	18.9	14	15.8	15.2	14.1	15.8

SB6C-2000										
Tc	20		30		40		50		55	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-70	2.9	5	2.4	5.3	-	-	-	-	-	-
-65	4.3	5.5	3.4	6	3	6.4	-	-	-	-
-60	6.1	6.3	5	6.9	4.1	7.5	-	-	-	-
-55	8.4	7.1	7	7.9	5.6	8.6	4.7	9.5	-	-
-50	11.2	8.2	9.5	9.1	7.8	9.9	6.2	10.9	5.6	11.4
-45	14.5	9.3	12.6	10.4	10.4	11.4	8.3	12.4	7.4	13
-40	18.4	10.6	16.2	11.8	13.7	12.9	11	14.1	9.7	14.7
-35	22.9	12	20.4	13.4	17.5	14.6	14.3	15.9	12.7	16.6
-30	27.9	13.6	25.3	15	22	16.4	18.3	17.8	16.4	18.5

SB6C-2500										
Tc	20		30		40		50		55	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-70	3.3	5.9	2.7	6	-	-	-	-	-	-
-65	4.9	6.5	3.9	6.9	3.5	7.4	-	-	-	-
-60	7	7.3	5.7	7.9	4.7	8.6	-	-	-	-
-55	9.6	8.3	8	9.1	6.5	9.9	5.4	10.8	-	-
-50	12.9	9.6	10.9	10.4	8.9	11.4	7.1	12.5	6.4	13
-45	16.7	11	14.4	11.9	12	13	9.5	14.2	8.5	14.8
-40	21.2	12.5	18.6	13.6	15.7	14.8	12.6	16.1	11.2	16.8
-35	26.3	14.3	23.5	15.4	20.1	16.7	16.4	18.1	14.6	18.9
-30	32	16.2	29	17.4	25.2	18.8	21	20.2	18.8	21

SB6C-3000										
Tc	20		30		40		50		55	
Te	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa	Pf	Pa
-70	4	7.4	3.2	7.6	-	-	-	-	-	-
-65	5.8	8	4.7	8.5	4.1	9	-	-	-	-
-60	8.4	8.9	6.8	9.6	5.6	10.3	-	-	-	-
-55	11.5	10	9.6	10.9	7.7	11.9	6.5	12.9	-	-
-50	15.4	11.4	13	12.5	10.6	13.6	8.5	14.9	7.7	15.5
-45	20	12.9	17.3	14.2	14.3	15.6	11.4	17	10.1	17.8
-40	25.3	14.7	22.3	16.2	18.7	17.7	15.1	19.3	13.3	20.2
-35	31.4	16.7	28.1	18.3	24	20	19.6	21.8	17.4	22.7
-30	38.3	19	34.7	20.7	30.2	22.5	25.1	24.4	22.4	25.4

Key
Pf = Refrigeration capacity
Pa = Input power
Te =Evaporating temperature
Tc =Condensing temperature
Superheat 20K
Sub cooling 5K
Liquid approach temperature difference
Power supply frequency 50 Hz (1450rpm)

Product Supply

Standard Accessories :

- Partial winding start motor (400V/3/50Hz or 460V/3/60Hz).
- Crankcase heater.
- Discharge shut-off valve.
- Suction shut-off valve.
- Spring vibration damper.
- Direct on-line starter (DOL)
- Motor protection module INT69B2(230V/ 1 /50 or 60 Hz).
- Oil charge.
- Safety valve.
- Oil sight glass.
- Oil filter.
- PTC protective thermistor.
- IP54 terminal box.

Optional accessories :

- Special voltage motor.
- Star-Delta started motors (400V/3/50Hz or 460/3/60Hz).
- Special packaging.
- Oil pressure differential switch.
- Discharge temperature probe assembly.
- Expansion valve kit without liquid sub cooler.
- Expansion valve kit with liquid sub cooler.
- LCM liquid sub cooler.
- LCM spray module.

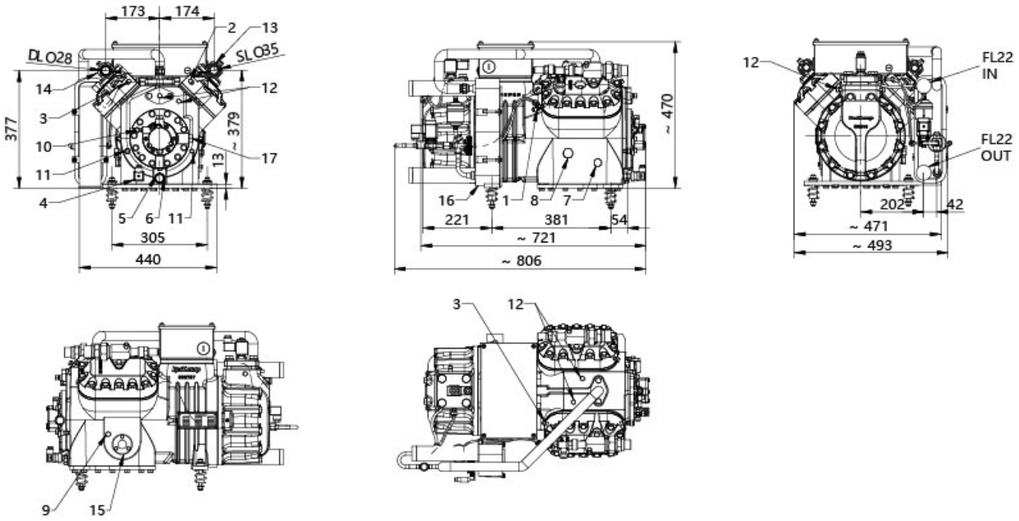
The electronic accessories for the compressor (electronic protection module, crankcase heater, CR, SU solenoid valve coils) come with a standard electrical configuration of 230VAC 50/60Hz. If you require accessories with a special electrical configuration, please consult RefComp.

Accessories available for packaging at the time of compressor dispatch include:

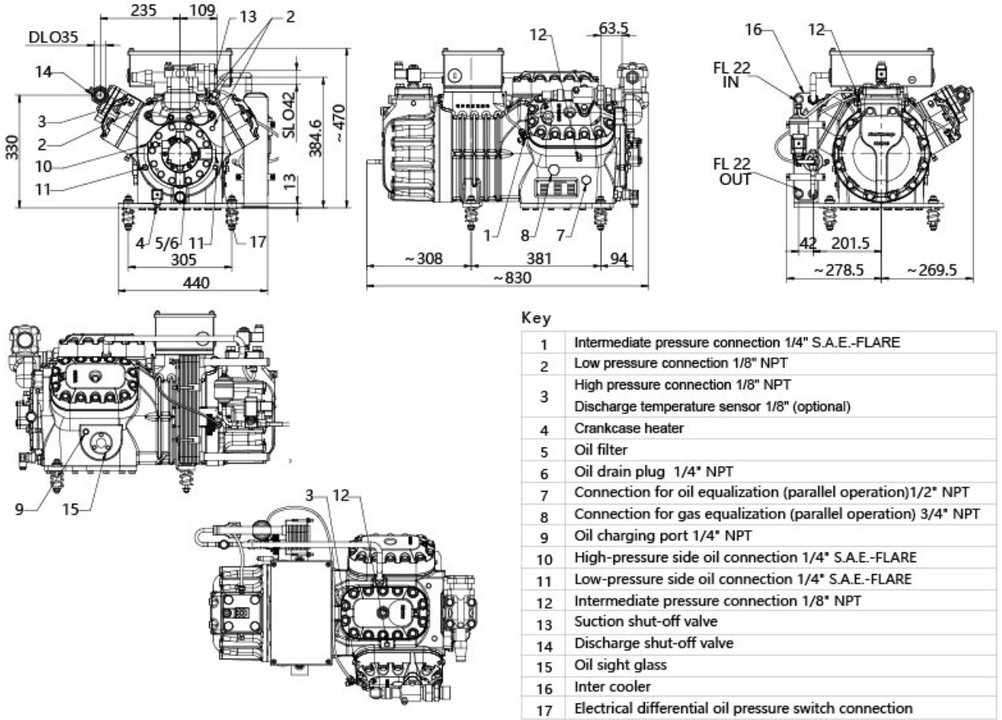
- Crankcase heater.
- Electronic oil pressure differential Switch (for control systems).
- Mechanical oil pressure differential switch.
- Expansion valve kit without liquid sub cooler.
- Expansion valve kit with liquid sub cooler (recommended for priority selection).
- LCM Liquid sub cooler.
- LCM Spray module.

The compressor is generally nitrogen-charged to a pressure of 1-2 bar/15-30 PSI at the time of manufacturing. When disassembling the compressor components, ensure that the nitrogen is released and that both high and low pressures are at atmospheric levels.

SB4C-1200/120E
SB4C-1400/140E



SB6C-1600/160E SB6C-2000/200E
SB6C-2500/250E SB6C-3000/300E



Key

1	Intermediate pressure connection 1/4" S.A.E.-FLARE
2	Low pressure connection 1/8" NPT
3	High pressure connection 1/8" NPT Discharge temperature sensor 1/8" (optional)
4	Crankcase heater
5	Oil filter
6	Oil drain plug 1/4" NPT
7	Connection for oil equalization (parallel operation)1/2" NPT
8	Connection for gas equalization (parallel operation) 3/4" NPT
9	Oil charging port 1/4" NPT
10	High-pressure side oil connection 1/4" S.A.E.-FLARE
11	Low-pressure side oil connection 1/4" S.A.E.-FLARE
12	Intermediate pressure connection 1/8" NPT
13	Suction shut-off valve
14	Discharge shut-off valve
15	Oil sight glass
16	Inter cooler
17	Electrical differential oil pressure switch connection