



Subject:

Performance data

Application: Refrigeration & AC

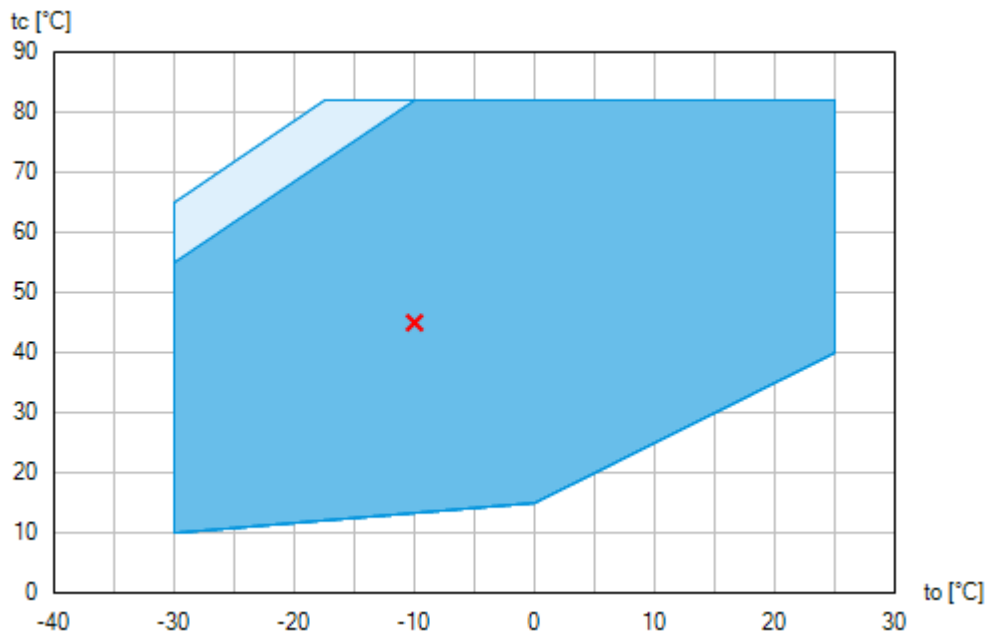
Refrigerant	R513A	Compressor refrigeration capacity	86.10 kW
Reference temperature	Dew point	Evaporator refrigeration capacity	86.10 kW
Power supply	50 Hz, 400 V	Power consumption	36.90 kW
Supply frequency	50 Hz	Current draw (400 V)	73.80 A
Evaporating temperature	-10.0 °C	Coefficient of performance (COP/EER)	2.33
<i>Evaporating pressure (abs.)</i>	<i>2.23 bar</i>	Condensing capacity	123.00 kW
Condensing temperature	45.0 °C	Mass flow	0.735 kg/s
<i>Condensing pressure (abs.)</i>	<i>12.17 bar</i>	Discharge end temperature	67.6 °C ¹⁾
Suction gas superheat	8 K		
Subcooling (outside cond.)	0 K		
Usable superheat	100%		

Preliminary capacity data.

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- 1) The stated value of the discharge end temperature is a mere calculated value. Additional cooling and heat dissipation are not considered. Deviations (particularly in deep freezing applications) from the real measured discharge temperature during operation are possible.

Subject:

Operating limits



-  Unlimited application range
-  Supplementary cooling or reduced suction gas temperature ($\Delta t_{oh} < 20K$)

Compressor operation is possible within the limits shown on the diagrams of application. Please note the coloured areas. Compressor application limits should not be chosen for design purposes or continuous operation. Axis values refer to dew point (saturated vapour line).

BOCK® HGX88e/3235-4 S

Engine: 380-420V Y/YY -3- 50Hz PW

Refrigerant: R513A

**Subject:****Technical data**

Number of cylinders / Bore / Stroke	8 / 87 mm / 68 mm
Displacement 50/60 Hz (1450/1740 ¹ /min)	281,30 / 337,60 m ³ /h
Voltage ¹⁾	380-420V Y/YY -3- 50Hz PW
	440-480V Y/YY -3- 60Hz PW
Winding divided into	50% / 50%
Max. working current ²⁾	162.0 A
Max. power consumption ²⁾	93.9 kW
Starting current (rotor blocked) ²⁾	466.0 / 657.0 A
Motor protection	INT69 G
Protection terminal box	IP 65
Weight	467 kg
Frequency range ³⁾	25 - 60 Hz
Max. permissible overpressure (g) (LP/HP) ⁴⁾	19 / 28 bar
Connection suction line SV	76 mm - 3 1/8 "
Connection discharge line DV	54 mm - 2 1/8 "
Lubrication	Oil pump
Oil type R134a, R404A, R407A/C/F, R448A, R449A, R450A, R513A	BOCKlub E55
Oil type R22	BOCKlub A46
Oil charge	9,6 Ltr.
Oil sump heater	230 V - 1 - 50/60 Hz, 200 W
Dimensions Length / Width / Height	943 / 648 / 656 mm
Sound power level L _{WA} ⁵⁾	90 dB(A) @ -35 °C / +40 °C
	86 dB(A) @ -10 °C / +45 °C
	86 dB(A) @ +5 °C / +50 °C
Sound pressure level L _{pA} ⁵⁾	76 dB(A) @ -35 °C / +40 °C
	72 dB(A) @ -10 °C / +45 °C
	72 dB(A) @ +5 °C / +50 °C

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Subject:

- 1) Tolerance ($\pm 10\%$) relates to the mean value of the voltage range. Other voltages and current types on request

All data are based on voltage rms values

PW = part winding, motors for part winding starting
(no start unloaders required)
Designs for Y/D on request
- 2) - The stated value for the max. power consumption is valid for the adjusted power supply.

- Starting current (rotor blocked):
 - Part winding (PW) motors: Winding 1 / Winding 1+2
 - Delta/Star (Δ/Y) motors: Δ / Y- Take account of the max. operating current / max. power consumption for designing motor contractors, feed lines, fuses and motor protection switches. Motor contractors: Consumption category AC3.
- 3) The maximum permissible working current of the compressor (I_{max}) must not be exceeded. Take account of the guidelines for use of frequency inverter (see compressor assembly instruction or selection software).
- 4) LP = Low pressure
HP = High pressure
- 5) Declared dual-number noise emission values are in accordance with ISO 4871. The corresponding uncertainty to the sound power level is $K_{WA} = 2,5$ dB and to the sound pressure level is $K_{pA} = 2,5$ dB. The values are valid for 50 Hz with the refrigerant R404A at the standard rating points according to EN 12900.
 - A-weighted sound power level L_{WA} (re 1 pW), in decibel. To determine the values, measurement methods of the ISO 3740 standard with accuracy class 2 or higher were used .
 - A-weighted sound pressure level L_{pA} (re 20 μ Pa), in decibel. The values are calculated from the sound power level in accordance with ISO 11203: $L_{pA} = L_{WA} - Q_2$ at a distance of $d = 1$ m to the reference box.

BOCK® HGX88e/3235-4 S

Engine: 380-420V Y/YY -3- 50Hz PW

Refrigerant: R513A

**Subject:****Performance data table**

Application: Refrigeration & AC

Reference temperature: Dew point

Supply frequency: 50 Hz

Voltage: 400 V

Suction gas superheat: 8 K

Subcooling (outside cond.): 0 K

tc [°C]		to [°C]									
		10.0	5.0	0.0	-5.0	-10.0	-15.0	-20.0	-25.0	-30.0	-35.0
10.0	Q [W] P [kW] I [A]									52600 18.80 53.40	
15.0	Q [W] P [kW] I [A]			204000 27.80 63.00	166000 27.60 62.80	134000 26.70 61.80	107000 25.30 60.30	83100 23.50 58.30	64000 21.50 56.10	48700 19.30 53.90	
20.0	Q [W] P [kW] I [A]		236000 31.00 66.60	195000 30.90 66.60	158000 30.10 65.70	127000 28.70 64.10	101000 26.90 61.90	77800 24.60 59.50	59500 22.20 56.90	44600 19.70 54.40	
25.0	Q [W] P [kW] I [A]	271000 34.40 70.70	225000 34.60 71.00	185000 33.90 70.20	150000 32.50 68.50	120000 30.60 66.30	93700 28.30 63.60	72300 25.70 60.60	54700 22.90 57.60	40400 20.10 54.80	
30.0	Q [W] P [kW] I [A]	257000 38.50 75.90	212000 38.00 75.20	174000 36.70 73.60	140000 34.80 71.30	112000 32.40 68.40	86900 29.60 65.10	66600 26.60 61.70	49800 23.50 58.30	36300 20.50 55.10	
35.0	Q [W] P [kW] I [A]	242000 42.40 81.00	199000 41.30 79.50	163000 39.40 77.00	131000 37.00 73.90	103000 34.10 70.30	80000 30.90 66.50	60800 27.50 62.60	45000 24.10 58.90	32200 20.70 55.40	
40.0	Q [W] P [kW] I [A]	226000 46.20 85.90	186000 44.40 83.50	151000 41.90 80.30	121000 38.90 76.40	94600 35.60 72.20	72900 31.90 67.80	54900 28.20 63.40	40200 24.50 59.30	28400 20.90 55.50	
45.0	Q [W] P [kW] I [A]	210000 49.70 90.80	172000 47.30 87.40	139000 44.20 83.30	111000 40.70 78.70	86100 36.90 73.80	65900 32.80 68.90	49200 28.70 64.10	35600 24.70 59.60	24800 20.90 55.60	
50.0	Q [W] P [kW] I [A]	194000 53.00 95.30	158000 49.90 91.10	127000 46.30 86.10	99800 42.30 80.80	77500 38.00 75.20	58900 33.60 69.80	43600 29.10 64.50	31300 24.80 59.70	21600 20.80 55.40	
55.0	Q [W] P [kW] I [A]	177000 56.00 99.60	143000 52.30 94.40	114000 48.20 88.70	89400 43.70 82.60	68900 38.90 76.40	52000 34.10 70.40	38300 29.30 64.80	27300 24.80 59.60	18800 20.50 55.20	
60.0	Q [W] P [kW] I [A]	160000 58.80 104.00	129000 54.50 97.50	102000 49.80 90.90	79100 44.80 84.10	60500 39.60 77.30	45400 34.40 70.80	33300 29.30 64.80	23800 24.50 59.40	16600 20.10 54.70	
65.0	Q [W] P [kW] I [A]	143000 61.20 108.00	114000 56.40 101.00	89100 51.10 92.80	68900 45.70 85.30	52300 40.10 77.90	39100 34.50 70.90	28700 29.10 64.50	20800 24.00 58.80	15000 19.40 54.00	
70.0	Q [W] P [kW] I [A]	125000 63.40 111.00	98600 57.90 103.00	76800 52.20 94.20	58900 46.30 86.10	44500 40.30 78.10	33200 34.40 70.70	24700 28.70 64.00	18400 23.30 58.10		
75.0	Q [W] P [kW] I [A]	108000 65.20 113.00	84000 59.20 105.00	64700 52.90 95.30	49200 46.60 86.50	37100 40.20 78.00	27900 33.90 70.20	21200 28.00 63.20			

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Refrigerant: R513A



Subject:

80.0	Q [W]	90100	69500	52900	39900	30100	23100				
	P [kW]	66.70	60.10	53.40	46.50	39.80	33.20				
	I [A]	116.00	106.00	95.90	86.40	77.50	69.30				

Preliminary capacity data.



Supplementary cooling or reduced suction gas temperature ($\Delta t_{oh} < 20K$)

- t_o* Evaporating temperature
- t_c* Condensing temperature
- Q* Compressor refrigeration capacity
- P* Power consumption
- I* Current draw

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BOCK® HGX88e/3235-4 S

Engine: 380-420V Y/YY -3- 50Hz PW

Refrigerant: R513A



Subject:

Scope of supply

Semi-hermetic eight-cylinder reciprocating compressor with drive motor
Single-section Compressor housing with hermetically integrated electric motor

Winding protection with PTC resistor sensors and electronic trigger unit INT69 G
115-230 V AC, 50/60 Hz, IP00

Oil pump

Possibility of connection of oil level controllers ESK, AC+R or CARLY

Oil pump cover with screw-in option for oil differential pressure sensor DELTA-P II

Possibility of connection of oil level controllers Traxoil ¹⁾

Possibility for connection of oil pressure safety switch MP54

Oil charge:

HG: **BOCK**lub A46

HGX: **BOCK**lub E55

Three sight glasses

Pressure relief valve

Suction and discharge line valve

Inert gas charge

Accessories

Capacity regulator 110 V - 1 - 50/60 Hz, IP65
1-3 capacity regulator = 75/50/25% residual capacity ²⁾

Capacity regulator 230 V - 1 - 50/60 Hz, IP65
1-3 capacity regulator = 75/50/25% residual capacity ²⁾

Cylinder cover prepared for capacity regulator

Oil sump heater 230 V - 1 - 50/60 Hz, 200 W ³⁾

Oil service valve ³⁾

INT69 GTML Diagnose 115-230 V AC, 50/60 Hz, IP00, including oil differential pressure sensor INT250G, thermal protection thermostat per cylinder covers, (INT69 G not applicable)

Oil pressure safety switch MP54 230 V - 1 - 50/60 Hz, IP20 ⁴⁾

Thermal protection thermostat per cylinder cover ³⁾

Connection piece suction and discharge valve in welding design

Oil differential pressure sensor DELTA-P II 220-240 V - 1 - 50/60 Hz ⁴⁾

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BOCK® HGX88e/3235-4 S

Engine: 380-420V Y/YY -3- 50Hz PW

Refrigerant: R513A



Subject:

Oil temperature sensor (Pt1000, for external evaluation) ³⁾

Hot gas temperature sensor (Pt1000, for external evaluation) ³⁾

Thermal protection thermostat per cylinder cover

USB converter for INT69 G Diagnose and INT69 GTML Diagnose ⁴⁾

Additional fan

230 V AC - 1 - 50 Hz, 97 W, IP44

230 V AC - 1 - 60 Hz, 128 W ⁴⁾

Intermediate adapter for discharge line valve ⁴⁾

Step protection

4 anti-vibration pads enclosed

Special voltage and/or frequency (on request)

-
- 1) Only with additional adapter possible
 - 2) Capacity regulator premounted, control unit enclosed
 - 3) Mounted
 - 4) Enclosure

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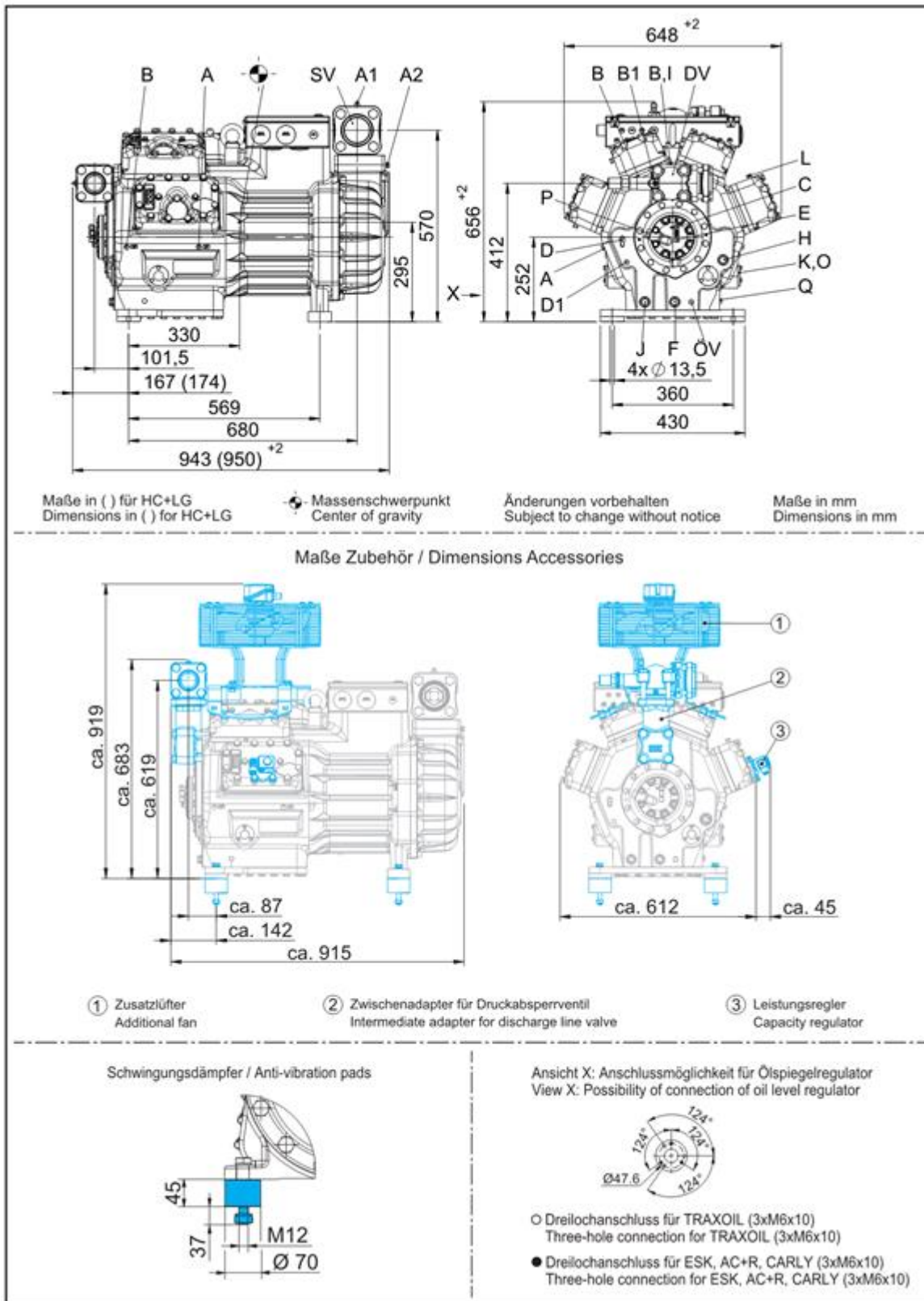
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Refrigerant: R513A



Subject:

Dimensions and connections



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BOCK® HGX88e/3235-4 S

Engine: 380-420V Y/YY -3- 50Hz PW

Refrigerant: R513A

**Subject:**

SV	Suction line valve, tube \varnothing ¹⁾	76 mm - 3 1/8 "
DV	Discharge line valve, tube \varnothing ¹⁾	54 mm - 2 1/8 "
A	Connection suction side, not lockable	1/8 " NPTF
A1	Connection suction side, lockable	7/16 " UNF
A2	Connection suction side, not lockable	1/4 " NPTF
B	Connection discharge side, not lockable	1/8 " NPTF
B1	Connection discharge side, lockable	7/16 " UNF
C	Connection oil pressure safety switch OIL	7/16 " UNF
D	Connection oil pressure safety switch LP	7/16 " UNF
D1	Connection oil return from oil separator	1/4 " NPTF
E	Connection oil pressure gauge	7/16 " UNF
F	Oil drain	M 22 x 1.5
H	Oil charge plug	M 22 x 1.5
I	Connection hot gas temperature sensor	1/8 " NPTF
J	Connection oil sump heater	M 22 x 1.5
K	Sight glass	-
L	Connection thermal protection thermostat	1/8 " NPTF
O	Connection oil level regulator	3 x M 6
ÖV	Connection oil service valve	1/4 " NPTF
P	Connection oil differential pressure sensor	M 20 x 1.5
Q	Connection oil temperature sensor	1/8 " NPTF

1) Brazing connection

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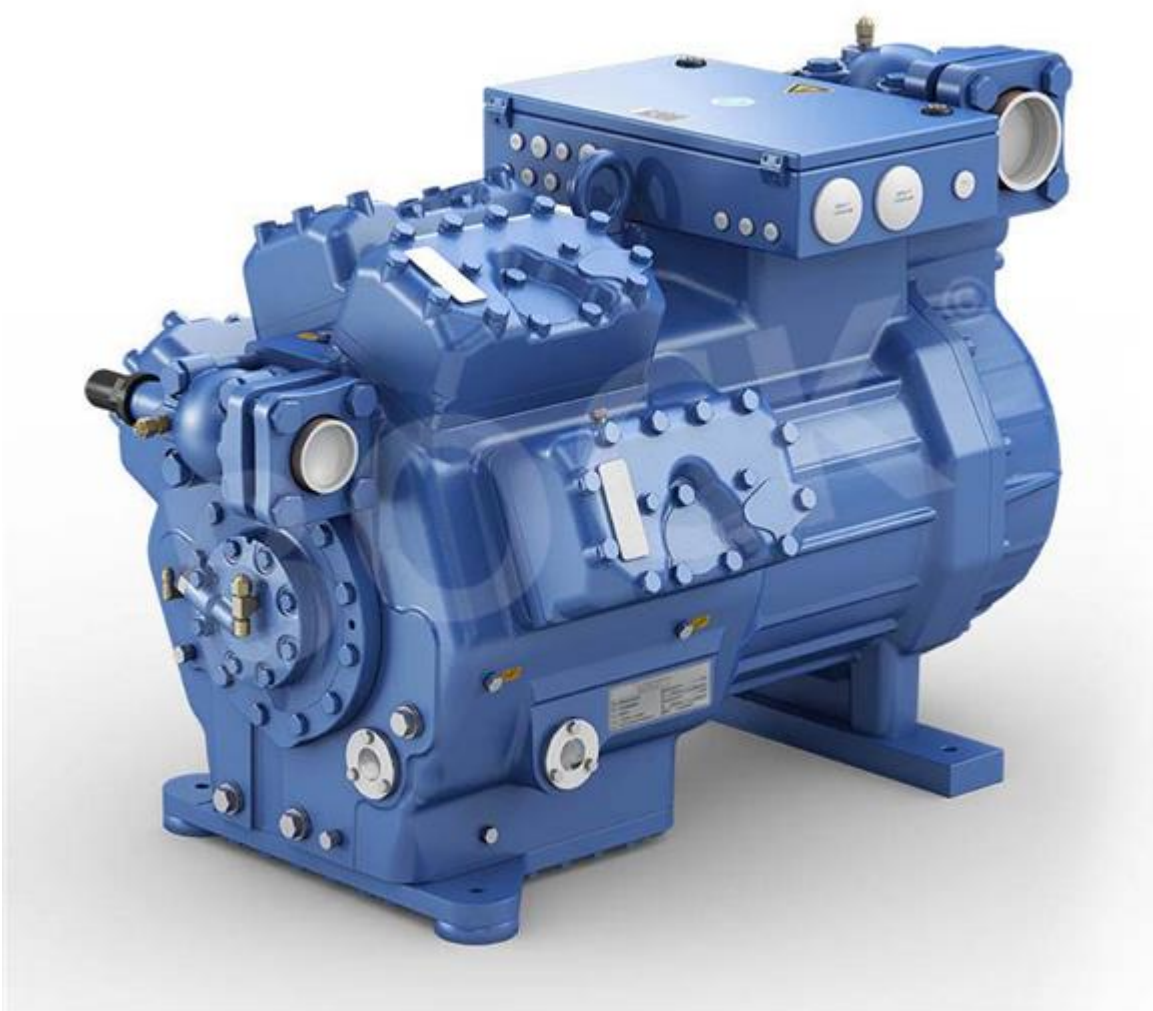
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Refrigerant: R513A



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Product photo



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