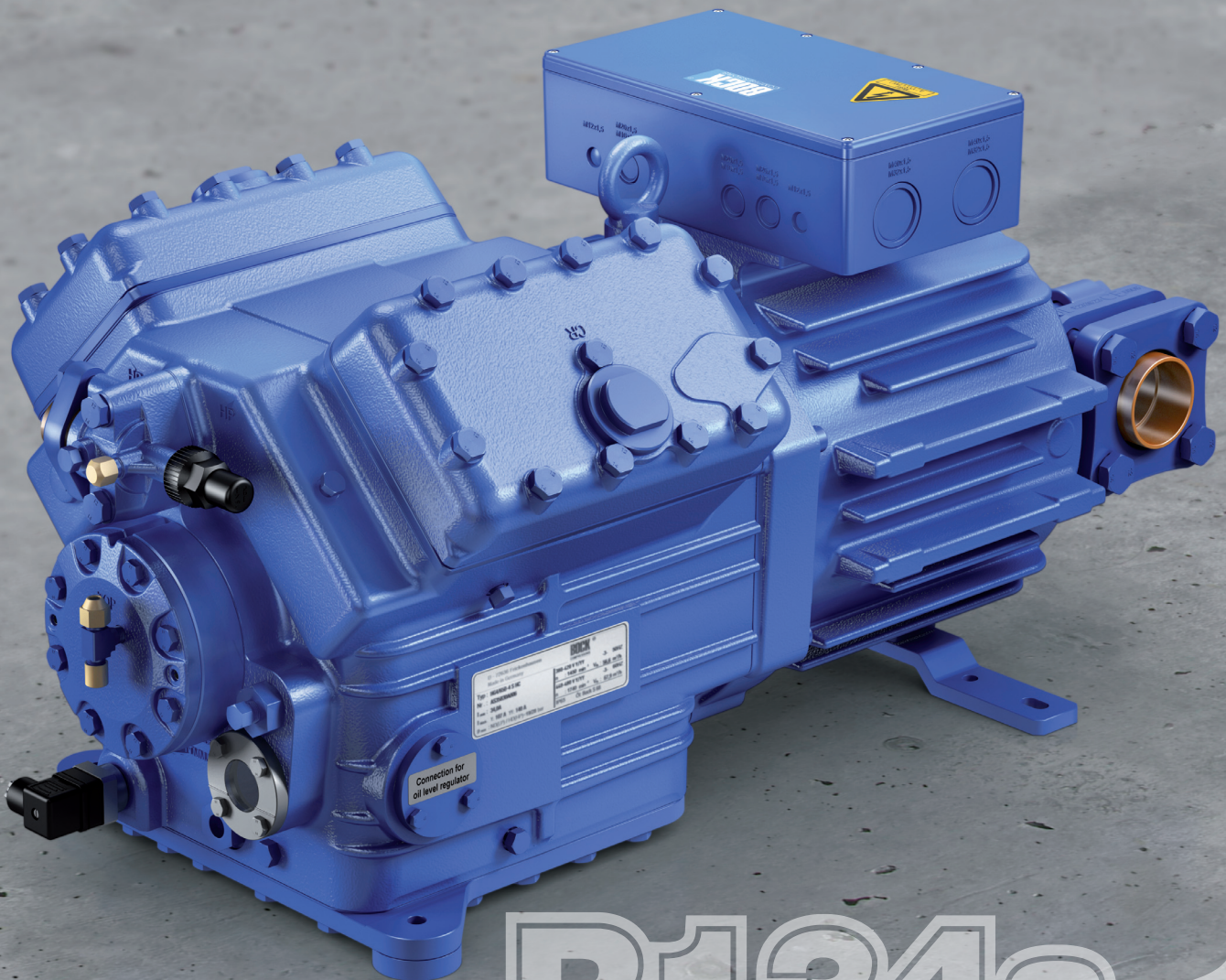



HG compressors - R134a

Semi-hermetic compressors
optimised for the refrigerant R134a



R134a 

Single-stage compressors R134a - At a glance

Based on our current semi-hermetic product range, with its outstanding advantages and features Bock now presents you a compressor variant optimised especially for the use with the refrigerant R134a.

Especially suited for normal refrigeration in supermarket applications, as well as in cascade systems in conjunction with CO₂.

The refrigerant R134a

Especially in the area of normal refrigeration for supermarket applications numerous studies have shown that R134a as a refrigerant contributes to a very high efficiency of the system.

Suitable refrigeration oils are ester oils, such as Fuchs Reniso SE55.

Special features:

With technical optimisations we continually improve the energy consumption of our compressors. Because of the special design of the different components we can adapt the compressors ideally to the individual demands. Those compressors optimised for the specific characteristics of R134a achieve a higher efficiency and therefore increase the annual capacity of the refrigeration plant.

The compressor of the type HG5 in R134a version will be available in October 2010. Other models will follow gradually during the course of 2011.

Available models	Displacement 50 Hz (1.450 rpm)
HGX5/725-4 R134a	62,90 m ³ /h
HGX5/830-4 R134a	72,20 m ³ /h
HGX5/945-4 R134a	82,20 m ³ /h

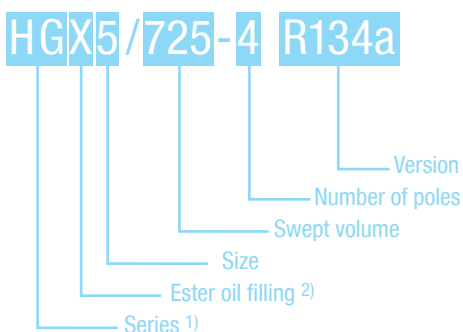
Valve plate system
optimised for R134a



Highly efficient
motors

Optimized
gas flow

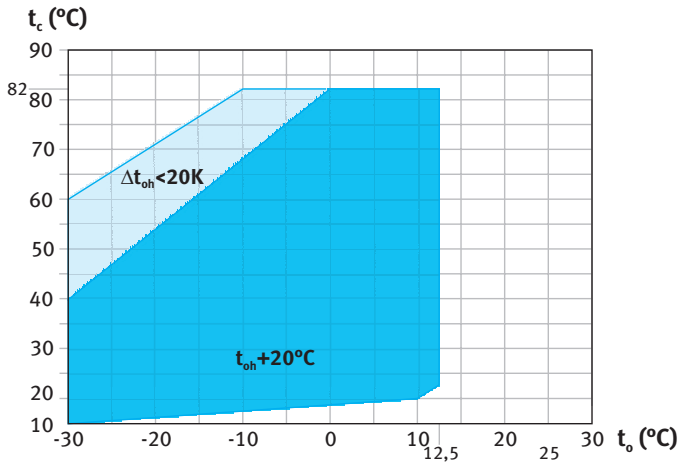
Type key | Single-stage compressors



- 1) HG = Hermetic Gas-cooled (suction gas-cooled)
HA = Hermetic Air-cooled (for deep-freezing)
- 2) X = Ester oil filling (HFC refrigerants e.g. R134a, R404A, R507, R407C)

R134a Operating limits

HGX5 R134a



- Unlimited application range
- Supplementary cooling or reduced suction gas temperature

- t_o Evaporating temperature (°C)
- t_c Condensing temperature (°C)
- Δt_{oh} Suction gas superheat (K)
- t_{oh} Suction gas temperature (°C)

Max. permissible operating pressure (LP/HP)¹⁾: 19/28 bar

¹⁾ LP = low pressure HP = high pressure

R134a Notes

Operating limits

Compressor operation is possible within the limits shown on the application diagrams. Please note the coloured areas. Compressor application limits should not be chosen for design purposes or continuous operation.

Restrictions to the operating limits may occur when using the Bock EFC (Electronic Frequency Control).

The sample calculation in our main catalogue gives a more detailed explanation.

Performance data

The performance data for R134a are based on European Standard EN 12900 with a **50 Hz power supply frequency**. This signifies: **20 °C suction gas temperature without liquid subcooling**.

This leads to significant differences compared to systems with liquid subcooling and/or other suction gas temperatures.

Conversion factor for 60 Hz = 1,2

Performance data for other operating points, see Bock software.

Single-stage compressors R134a - Performance data

R134a		Performance data											50 Hz
Type	Cond. temp. °C	Cooling capacity \dot{Q}_0 [W]						Power consumption P_e [kW]					
		Evaporating temperature °C											
		12,5	10	7,5	5	0	-5	-10	-15	-20	-25	-30	
HGX5/725-4 R134a	30	Q	56600	51600	46900	42500	34500	27500	21500	16500	12300	8880	6230
		P	7,84	7,85	7,80	7,71	7,40	6,96	6,40	5,77	5,09	4,39	3,70
	40	Q	49800	45200	41000	37000	29800	23600	18200	13700	9990	7000	4660
		P	9,87	9,68	9,44	9,17	8,53	7,78	6,96	6,10	5,22	4,36	3,54
	50	Q	42800	38700	35000	31400	25100	19600	14900	11000	7770	5190	3180
		P	11,50	11,10	10,70	10,30	9,36	8,33	7,26	6,19	5,13	4,13	3,21
60	Q	35700	32200	28900	25800	20400	15700	11700	8360	5690	3550	1890	
	P	12,90	12,30	11,70	11,10	9,89	8,60	7,31	6,04	4,83	3,70	2,69	
70	Q	28800	25800	23000	20400	15800	11900	8610	5960	3840			
	P	13,90	13,10	12,40	11,60	10,10	8,60	7,09	5,65	4,30			
HGX5/830-4 R134a	30	Q	65100	59400	53900	48900	39600	31600	24800	19000	14200	10300	7200
		P	8,97	8,98	8,92	8,82	8,46	7,95	7,31	6,59	5,81	5,01	4,24
	40	Q	57200	52000	47100	42600	34300	27100	21000	15800	11600	8080	5380
		P	11,30	11,00	10,80	10,40	9,75	8,90	7,95	6,96	5,96	4,98	4,05
	50	Q	49200	44600	40200	36100	28800	22500	17200	12700	8960	5990	3680
		P	13,20	12,80	12,30	11,80	10,70	9,53	8,30	7,07	5,86	4,71	3,66
60	Q	41100	37000	33300	29700	23400	18000	13500	9640	6560	4100	2200	
	P	14,70	14,10	13,40	12,70	11,30	9,84	8,35	6,90	5,51	4,22	3,07	
70	Q	33100	29600	26400	23400	18100	13700	9920	6880	4440			
	P	15,90	15,00	14,20	13,30	11,50	9,83	8,11	6,45	4,90			
HGX5/945-4 R134a	30	Q	74200	67600	61400	55600	45100	36000	28200	21600	16100	11700	8170
		P	10,20	10,20	10,10	10,00	9,63	9,05	8,33	7,51	6,62	5,71	4,81
	40	Q	65200	59300	53700	48500	39000	30900	23900	18000	13200	9180	6100
		P	12,80	12,60	12,30	11,90	11,10	10,10	9,06	7,94	6,80	5,67	4,60
	50	Q	56000	50700	45800	41200	32800	25600	19500	14400	10200	6810	4160
		P	15,00	14,50	14,00	13,40	12,10	10,80	9,46	8,06	6,69	5,38	4,17
60	Q	46800	42200	37900	33900	26700	20500	15300	11000	7470	4670	2480	
	P	16,80	16,00	15,30	14,50	12,80	11,20	9,52	7,87	6,29	4,82	3,49	
70	Q	37700	33700	30100	26700	20700	15600	11300	7840	5060			
	P	18,10	17,10	16,10	15,20	13,10	11,10	9,24	7,36	5,59			

Relating to 20 °C suction gas temperature, without liquid subcooling

 Supplementary cooling or reduced suction gas temp.

Type	Number of cylinders	Displacement 50 / 60 Hz (1450/1740 rpm) m ³ /h	Electrical data ③				Weight kg	Connections ⑤		Oil charge Ltr.
			Voltage	Max. working current	Max. power consumption	Starting current (rotor locked)		Discharge line DV	Suction line SV	
			①	②	②	A		mm inch	mm inch	
				A	kW	A				
				* PW 1+2		* PW1 / PW 1+2				
HGX5/725-4 R134a	4	62,90 / 75,50	④	25	14,6	84 / 109	198	28 / 1 ¹ / ₈	42 / 1 ⁵ / ₈	4,5
HGX5/830-4 R134a	4	72,20 / 86,70	④	28	16,7	84 / 109	197	28 / 1 ¹ / ₈	42 / 1 ⁵ / ₈	4,5
HGX5/945-4 R134a	4	82,20 / 98,60	④	33	19,1	110 / 141	201	35 / 1 ³ / ₈	54 / 2 ¹ / ₈	4,5

* PW = Part Winding, motors for part winding start 1 = 1. part winding 2 = 2. part winding

Oil sump heater 230 V - 1 - 50/60 Hz (standard)

140 W, Permanently set version, installation in immersion sleeve

Explanations:

- | | |
|---|---|
| <p>① Tolerance ($\pm 10\%$) relates to the mean value of the voltage range. Other voltages and current types on request.</p> <p>② Take account of the max. operating current / max. power consumption when designing contactors, leads and fuses. Switches: Service category AC3</p> <p>③ All data are based on the mean value of the voltage range.</p> | <p>④ 380-420 V Y/YY - 3 - 50 Hz PW
440-480 V Y/YY - 3 - 60 Hz PW
PW = Part Winding, motors for part winding start (no start unloaders required)
- Winding ratios: HG5 = 66% / 33%
- Designs for Y/Δ on request</p> <p>⑤ For soldering connections</p> |
|---|---|

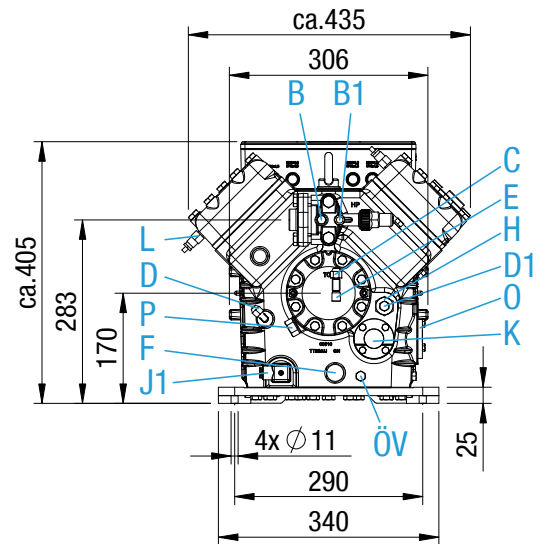
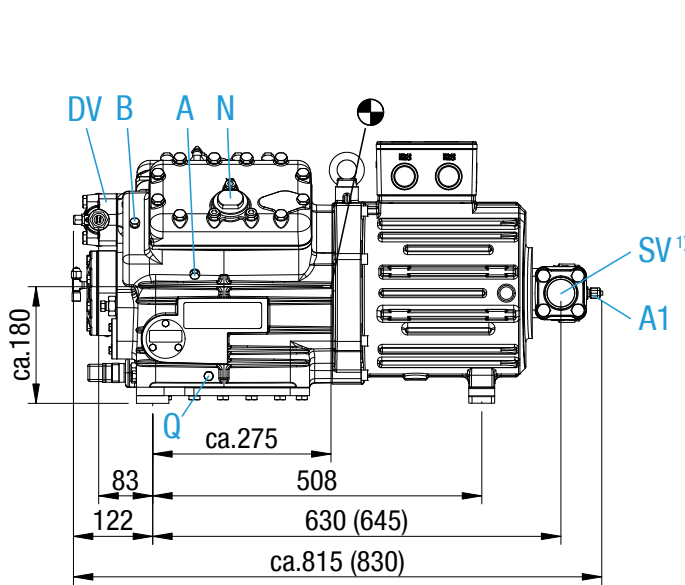
Single-stage compressors R134a - Dimensions and connections

HG5...R134a

HG5/725-4 R134a

HG5/830-4 R134a

HG5/945-4 R134a



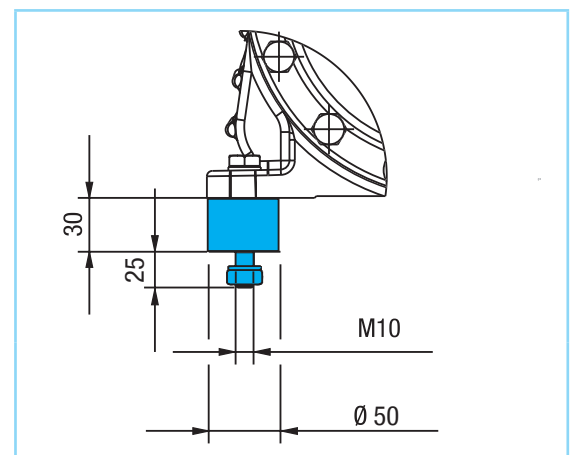
Dimensions in () = HG5/945-4

Dimensions in mm

- ¹⁾ SV 90° rotatable
- ☉ Centre of gravity

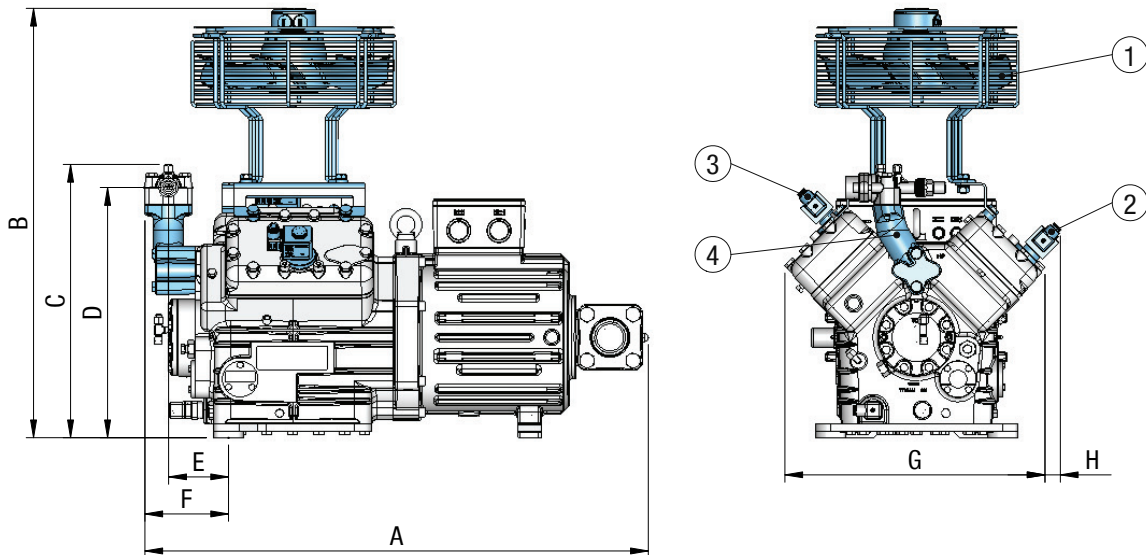
Connections	HG5...R134a
SV Suction line	Please refer to technical data, page 5
DV Discharge line	
A Connection suction side, not lockable	1/8" NPTF
A1 Connection suction side, lockable	7/16" UNF
B Connection discharge side, not lockable	1/8" NPTF
B1 Connection discharge side, lockable	7/16" UNF
C Connection 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
J1 Oil sump heater	M 22 x 1,5
K Sight glass	4 hole M 6
L Connection thermal protection thermostat	1/8" NPTF
N Connection capacity controller	M 45 x 1,5
O Connection oil level regulator	3 x M 6
ÖV Connection oil service valve	1/4" NPTF
P Connection oil pressure differential sensor	M 20 x 1,5
Q Connection oil temperature sensor	1/8" NPTF

Dimensions for anti-vibration pad



Dimensions with accessories

HG5



- ① Additional fan ② Capacity regulator ③ Start unloader ④ Intermediate adapter for discharge line valve

Type	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm
HG5/725, HG5/830	ca. 835	ca. 730	ca. 465	422	101	141	ca. 440	ca. 30
HG5/945	ca. 850	ca. 730	ca. 465	422	101	141	ca. 440	ca. 30

Scope of supply HG

Semi-hermetic four cylinder reciprocating compressor with drive motor for part winding start

380-420 V Y/YY - 3 - 50 Hz

440-480 V Y/YY - 3 - 60 Hz

Motor unit flanged onto the compressor housing

Winding protection with PTC resistor sensors and electronic triggering unit Bock MP10

Oil pump cover with screwed connection for differential oil pressure sensor (Δp -switch Kriwan make)

Possibility to connect to oil level controllers ESK, AC+R or CARLY

Possibility to connect to oil level controllers e.g. Traxoil

Oil sump heater 230 V - 1 - 50/60 Hz, 140 W

Oil charge:

HGX: FUCHS Reniso Triton SE 55

Sight glass

Prepared for capacity regulator (1 cylinder cover)

Decompression valve

Suction and discharge line valve

Inert gas charge

4 anti-vibration pads enclosed

Accessories

Start unloader 230 V - 1 - 50/60 Hz, IP65, without check valve, including thermal protection thermostat (PTC sensor)

Start unloader by means of a Bock-ESS (Electronic Soft Start) IP20 (Connection clamps IP00) for installation in switch cabinet

Capacity regulator 230 V - 1 - 50/60 Hz, IP65
1 capacity regulator = 50% residual capacity

Continuously variable speed control by means of a Bock EFCe (Electronic Frequency Control for individual installation) IP54

Oil pressure safety switch MP 54 230 V - 1 - 50/60 Hz, IP20 incl. mounting

Oil differential pressure sensor (Δp -switch Kriwan make) 220-240 V - 1 - 50/60 Hz

Oil service valve

Thermal protection thermostat (PTC sensor) IP67

Bock Compressor Management BCM2000 including oil pressure control, oil temperature control (NTC), thermal protection thermostat (PTC) per cylinder cover

Water-cooled cylinder covers

Sea water resistant water-cooled cylinder covers

Additional fan 230 V Δ / 400 V Y - 3 - 50 Hz, 120 W, 230-265 V Δ / 400-460 V Y - 3 - 60 Hz, 190 W, IP54 enclosed

Intermediate adapter for discharge line valve

Special voltage and/or frequency (on request)

www.bock.de



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