



HG semi-hermetic compressors

HA semi-hermetic compressors

HGZ two-stage semi-hermetic compressors

1

2

3



ASERCOM Certification

Based on the requirements of the EU Ecodesign Directive and the corresponding regulation.

ASERCOM, the association of European manufacturers of components for refrigeration and air conditioning, addresses scientific and technical challenges, promotes performance and safety standards, supports better environmental protection, and serves the refrigeration and air conditioning industry and its customers. ASERCOM's compressors certification

program enables an objective performance comparison of the wide range of products on the market.

Many of the BOCK compressors are certified.

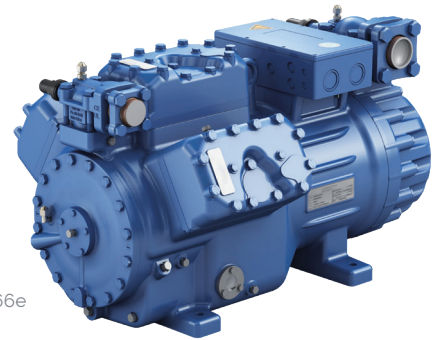
An overview can be found here:

<https://www.asercom.org/list-of-certified-compressors/>

Overview

HG (gas-cooled)

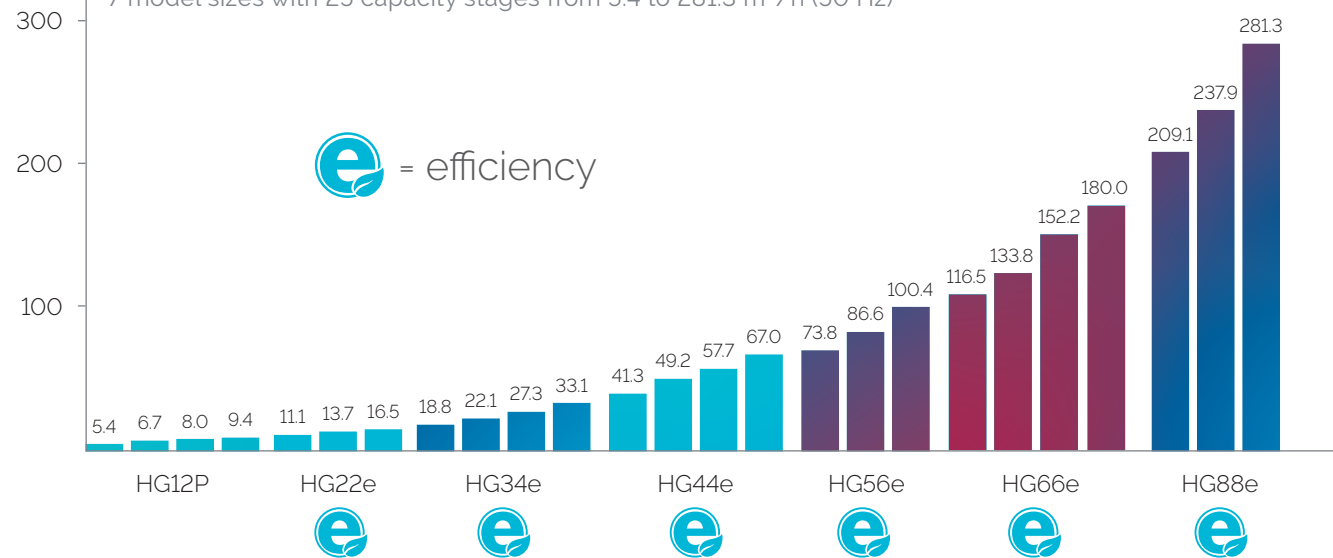
The BOCK HG range of semi-hermetic compressors offers traditional suction-gas-cooled compressor technology. These compressors are state-of-the-art, excelling in ease of running, simple maintenance, high efficiency, and reliability.



HG66e

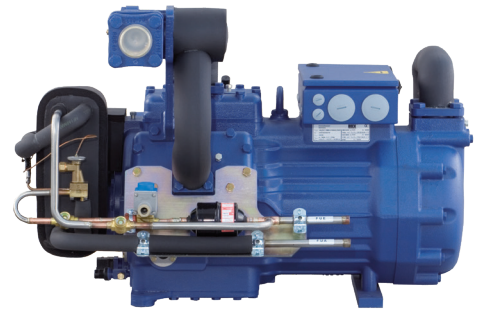
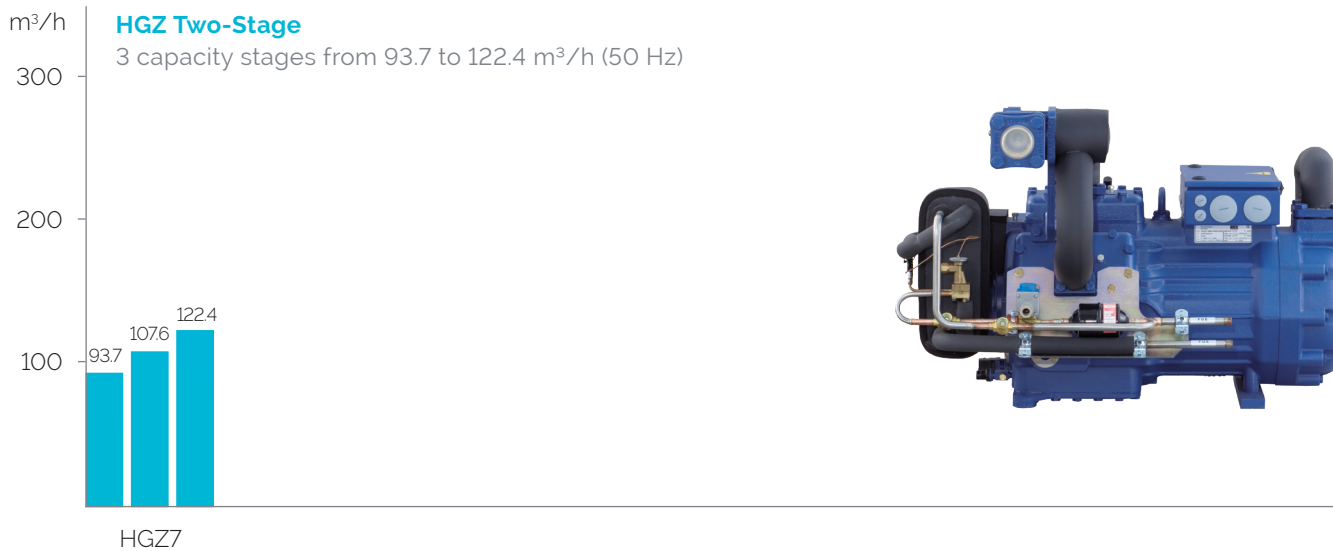
HG Single-Stage

7 model sizes with 25 capacity stages from 5.4 to 281.3 m³/h (50 Hz)



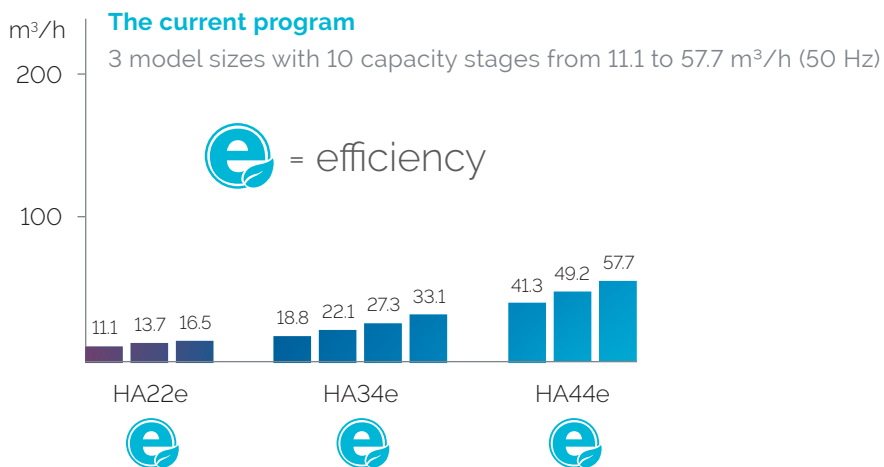
HGZ Two-Stage

3 capacity stages from 93.7 to 122.4 m³/h (50 Hz)



HA (air-cooled)

The BOCK HA range of semi-hermetic compressors has been specially engineered for low temperature applications. While gas-cooled compressors can reach their temperature limit due to heat-up of the suction gas by the drive motor, the unique BOCK HA principle prevents this: Drive motor and cylinder heads are air-cooled via a compact ventilation unit, and the suction gas is fed directly to the compressor without passing through the motor. HA compressors are suitable as standard for conventional or chlorine-free HFC refrigerants and are particularly offered for the refrigerants R404A, R507, R407A, R407F, R448A, R449A, R22.



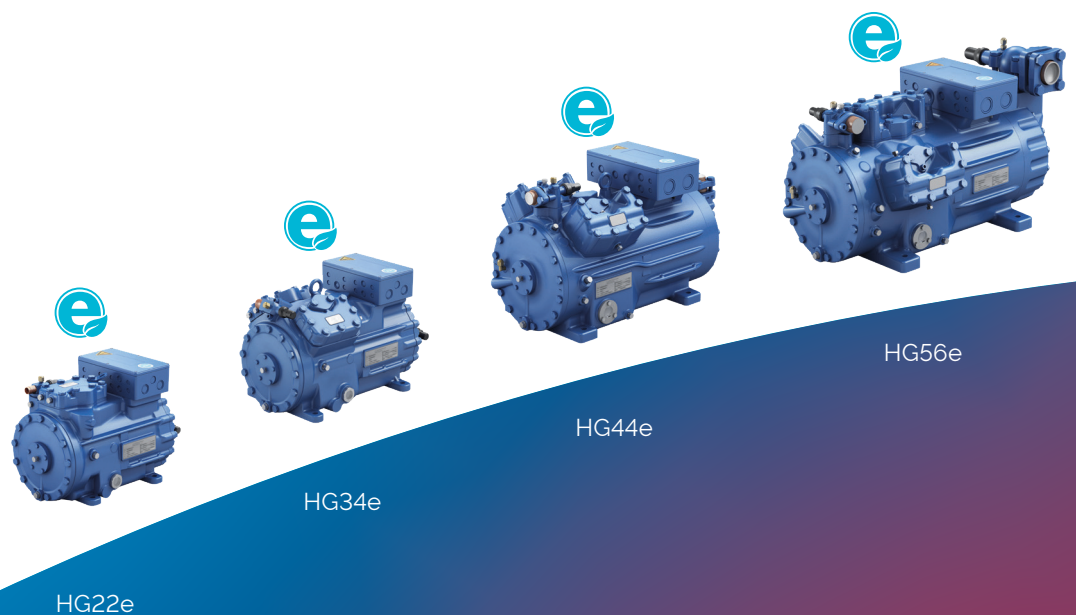
Improved HG/HA Series

For new advancements in efficiency, BOCK has now updated its entire semi-hermetic compressor range. The new models, marked with the letter "e" (= efficiency), all offer decisive mechanical improvements, a more compact design and easier-to-use connections.

The entire range of gas-cooled commercial BOCK compressors is now available in the new, optimized design. In addition to their uses in the fields of refrigeration and air-conditioning, the new compressors are ideally suited for refrigeration in supermarkets. They offer improved efficiency over their predecessors, greater displacement stages, a more compact structural design, and a new configuration of connections.

To increase efficiency and reduce energy consumption, the new models profit from a new and advanced valve plate system, electrical motors from the latest generation, and enhanced gas flow.

The re-designed connections match the gas connections normally found in the sector, to ensure that no adaptation work is necessary when the user invests in a replacement compressor. The foot mountings of the new compressor likewise conform to sector standards.



Newly designed housing with optimized gas flow

MexxFlow® 2.0 valve plate system

Proven and reliable oil pump lubrication

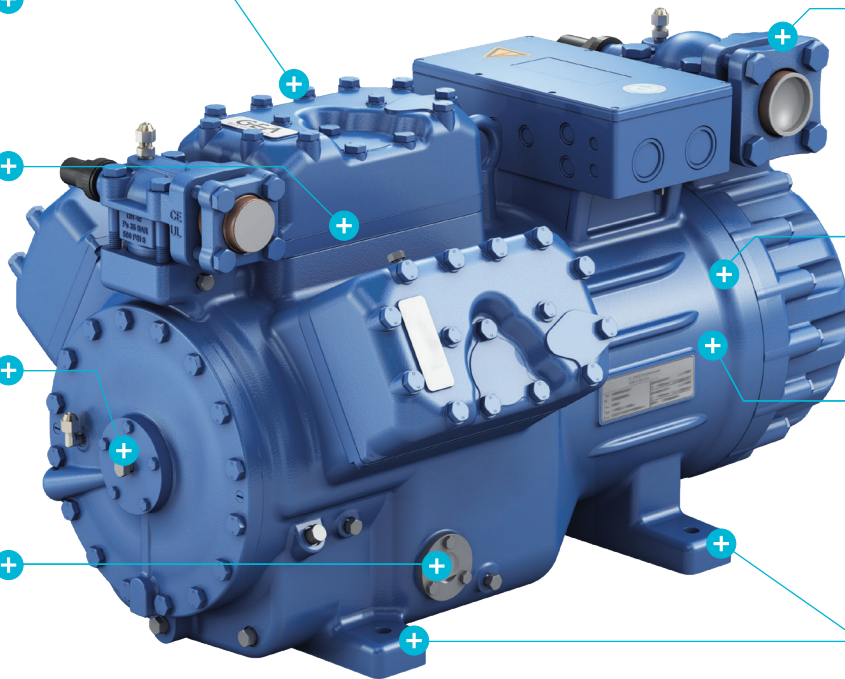
Standard-position sight glass

Standard-position valves

Highly efficient electric motors of the latest generation

Exchangeable motor

Standard footprints



HG66e

HG88e

HA22e

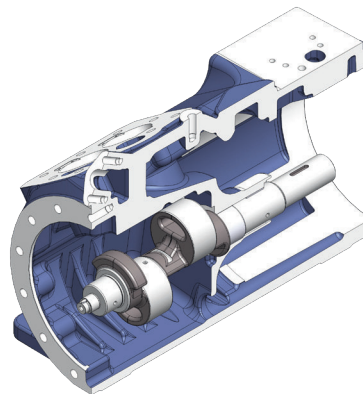
HA34e

HA44

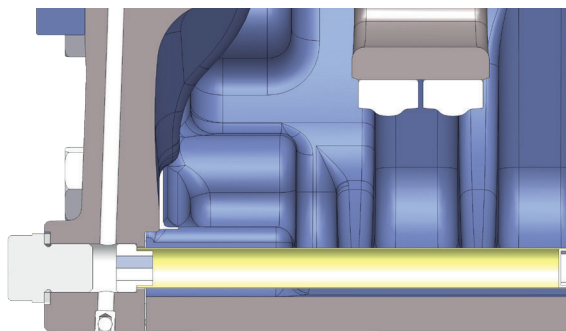
Improved technology

Optimized drive gear

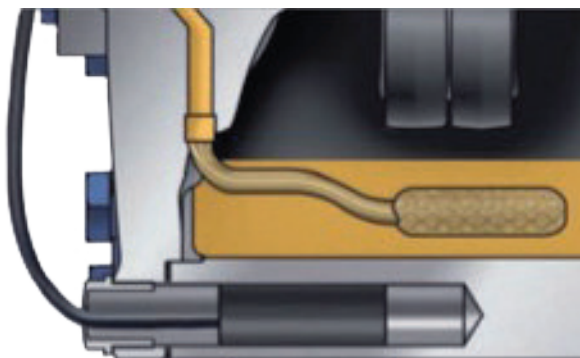
- Optimized drive gear with thrust washer, improving emergency-mode operation and resistance against damage in case of insufficient lubrication



New, easy-to-maintain strainer

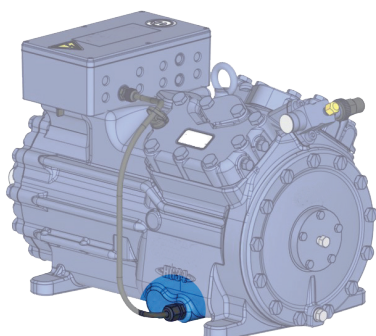


- New, easy-to-remove oil strainer for easier maintenance and increased availability

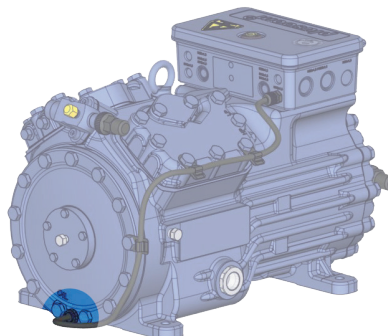


- Former version

Optimized fastening of oil sump heater

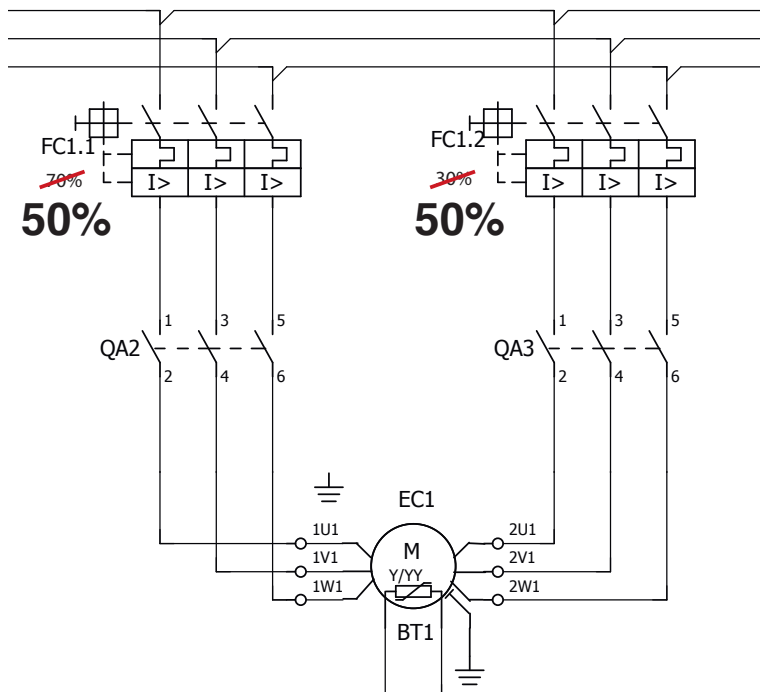


- New, optimized fastening of oil sump heater



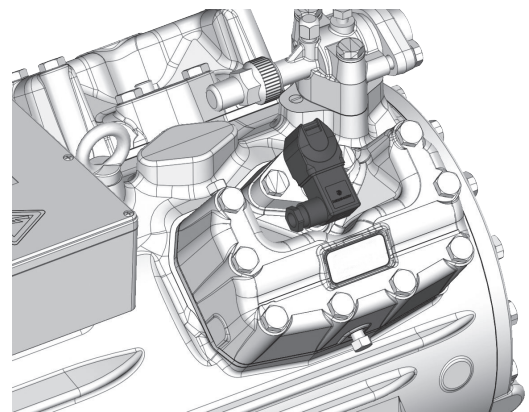
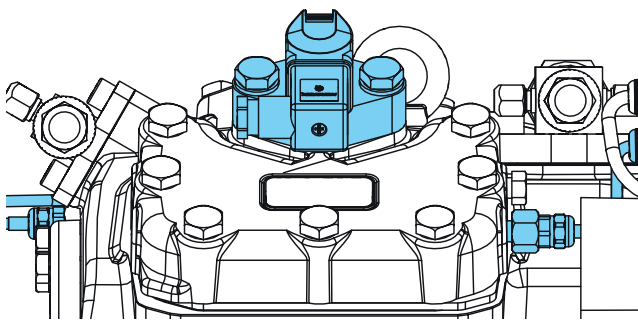
- Former version

50 / 50 winding sectioning



- HG44e, HG56e, HG66e & HG88e state-of-the-art 50/50 performance

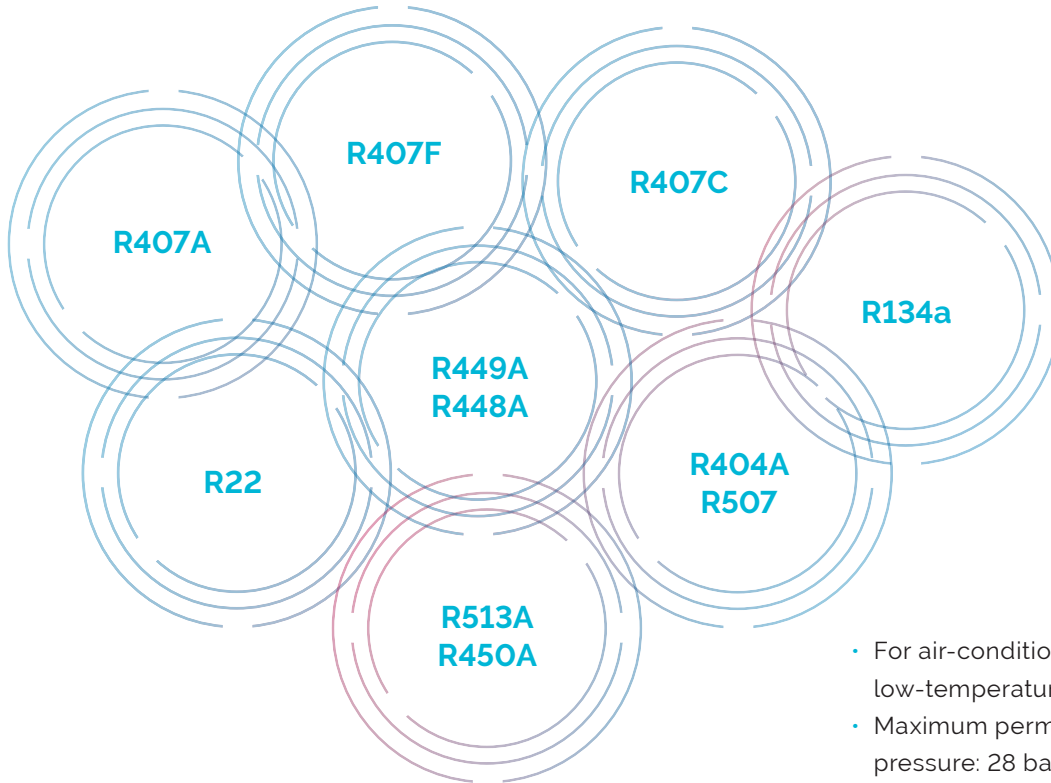
Digital Capacity Regulator DCR14 (HG34e / HG44e / HG56e / HA34e / HA44e)



- Digital control with the possibility of high switching frequency
- Almost infinite capacity regulation
- Economical alternative to a frequency converter

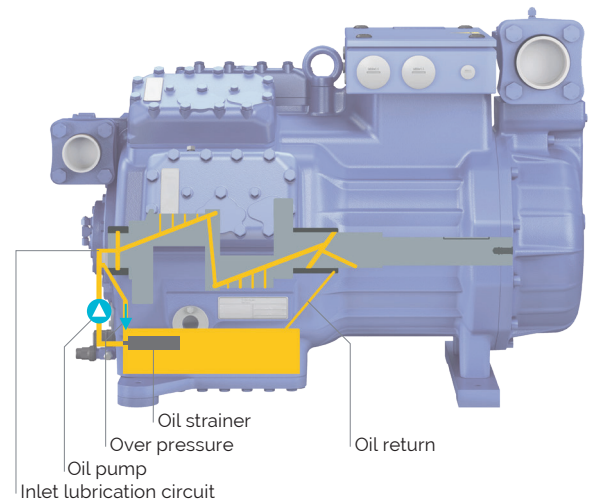
Unique features and advantages

One compressor design for all standard refrigerants



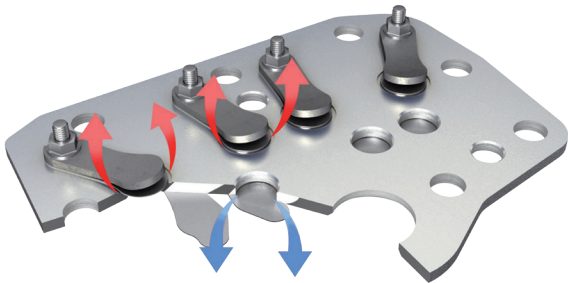
- For air-conditioning, medium and low-temperature application
- Maximum permissible operating pressure: 28 bar

Safe, reliable oil supply



- All compressors with a conventional single circuit lubricating system
- All compressors with oil pump lubrication independent of direction of rotation
- Minimized oil carryover
- Service-friendly oil strainer
- Oil pump lubrication independent of direction of rotation
- Connection possibility for oil pressure monitoring
- Large-volume oil sump
- Coupling option for oil level regulator included as standard

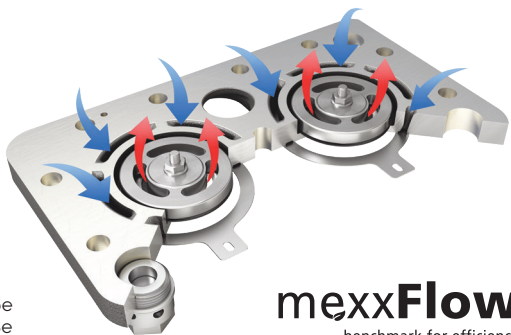
Standard valve plate design



HG12P-56e

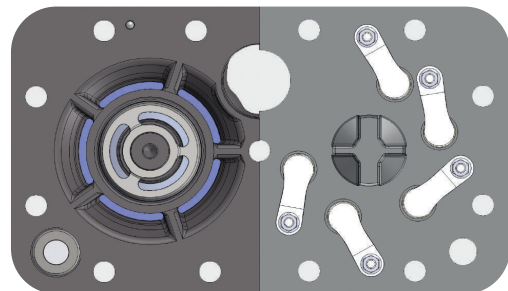
- Valves made of high-quality, impact-resistant spring steel
- Universally proven valve design with suction and discharge finger reed valves

Valve plate innovation: mexxFlow®, only from BOCK

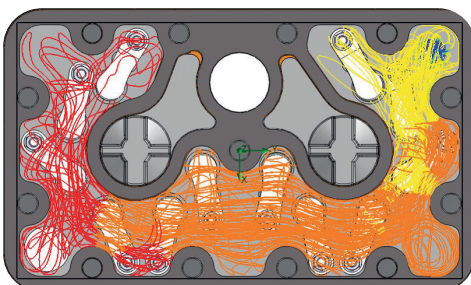


HG66e
HG88e

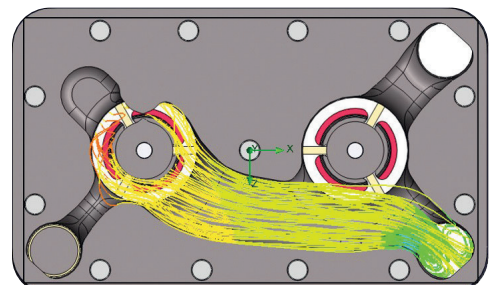
mexxFlow
benchmark for efficiency



mexxFlow® vs. previous design



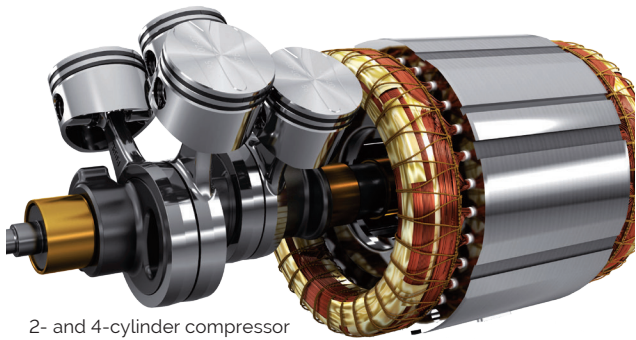
Previous cylinder cover – high pressure drops and turbulences



mexxFlow® – reduced pressure drops and improved gas flow

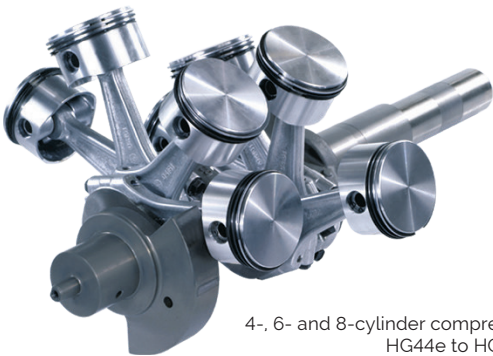
- With the mexxFlow® system pressure losses can be minimized thanks to a flow-optimized double ring fin construction of the valve plate, in combination with a cylinder head that is specially adapted to the valve plate. Thus, the efficiency of the compressor is increased significantly

Wear-resistant durable driving gear



2- and 4-cylinder compressor
HG12P to HG34e

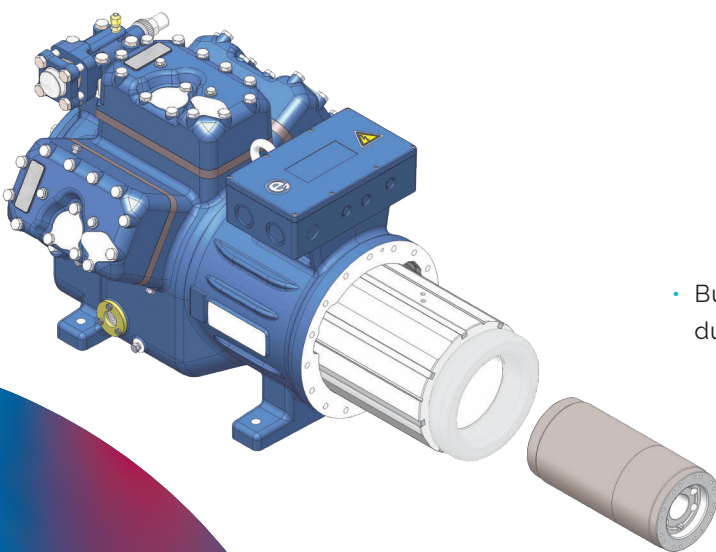
- Solid design of eccentric shaft
- High durability due to low-friction sleeve bearings
- Low oil carryover due to aluminum pistons with double ring assembly



4-, 6- and 8-cylinder compressor
HG44e to HG88e

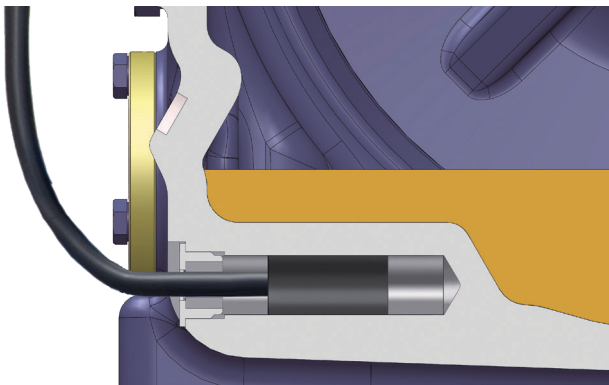
- Solid design of crankshaft
- High durability due to low-friction sleeve bearings
- Aluminum pistons with triple ring assembly, hard-chromium-plated sealing ring, HG44e and HG56e with double ring assembly
- Aluminum connecting rod with high-resistance piston bolt bearings, for HG44e and upwards
- Heavy-duty and robust, split-forged connecting rod

Service-friendly design

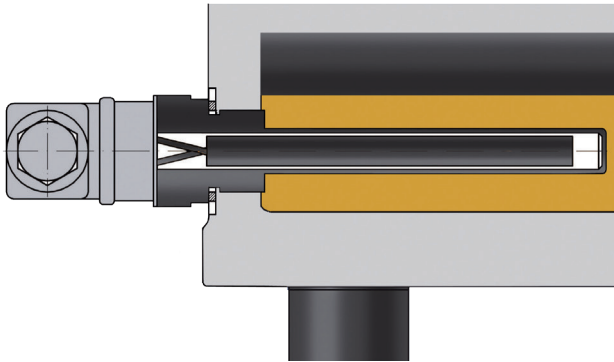


- Built-in motor, easy to replace due to slide fit (not press fit)

Oil sump heater

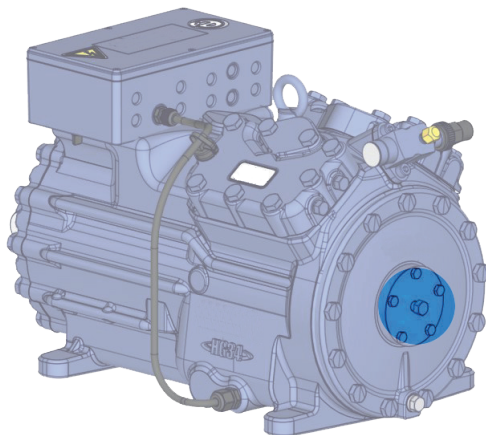


- PTC heater, self-regulating for HG12P up to HG34e
- Constant power for HG44e up to HG66e



- Standard in 8-cylinder compressors HG88e

Connection plug for oil monitoring with oil pressure safety switch MP55



- For HG12P up to HG34e compressors

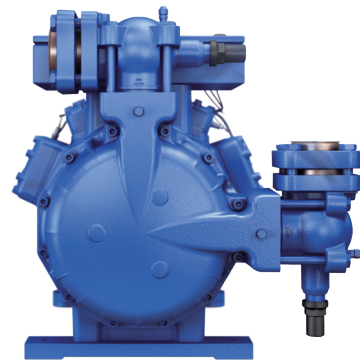
Variable suction line valve position HG

1



4-cylinder

2

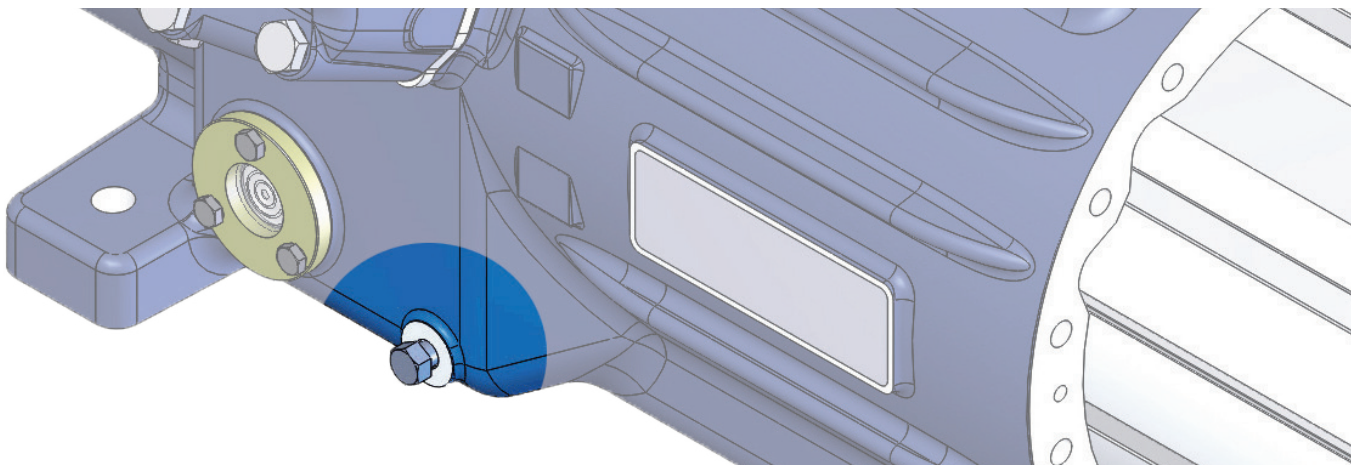


8-cylinder

- **1** Shut-off valve rotates 90°
- **2** Suction cover rotates 90°
- **1+2** Flexible position for suction line connection

	Shut-off valve rotation	Suction cover rotation
HG12P, HG22e, HG34e, HG44e	90°	-
HG56e	180°	90°
HG66e	180°	90°
HG88e	180°	90°

Connection facility oil temperature sensor



- Available for HG44e – HG88e

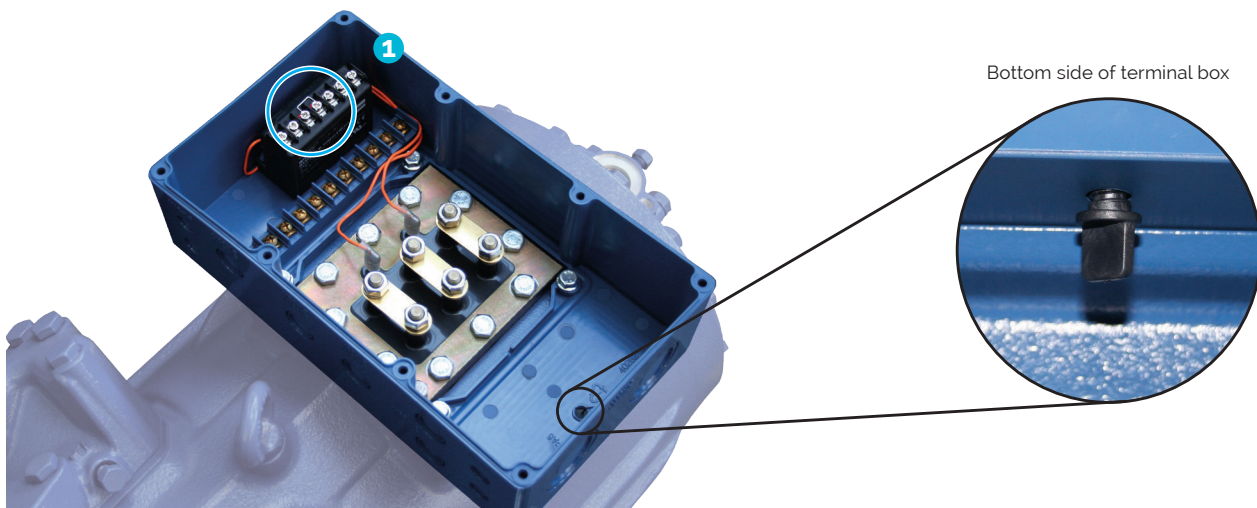
Electronic motor protection INT69 G




Temperature safety drive for the drive motor

- The INT69 G also provides the usual functions, such as:
 - Motor temperature monitoring
 - Hot gas temperature monitoring
 - Reconnection preventing device
 - Reset function
- **1** PTC sensors
- Connection of up to nine PTC sensors possible

State-of-the-art terminal box



- Easy electrical installation due to large internal volume
- Terminal board with cable entry points in glass seal model
- **1** Electrical motor protection INT69 G integrated
- High level of protection IP66
- HG12P to HG66e equipped with plug to drain condensed water from the terminal box under unfavorable circumstances (when in use, I_p protection is reduced)



Bock HG semi-hermetic compressors

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- 65** Scope of supply & accessories
- 68** INT69 G Motor Protection

Bock HG12P – HG88e



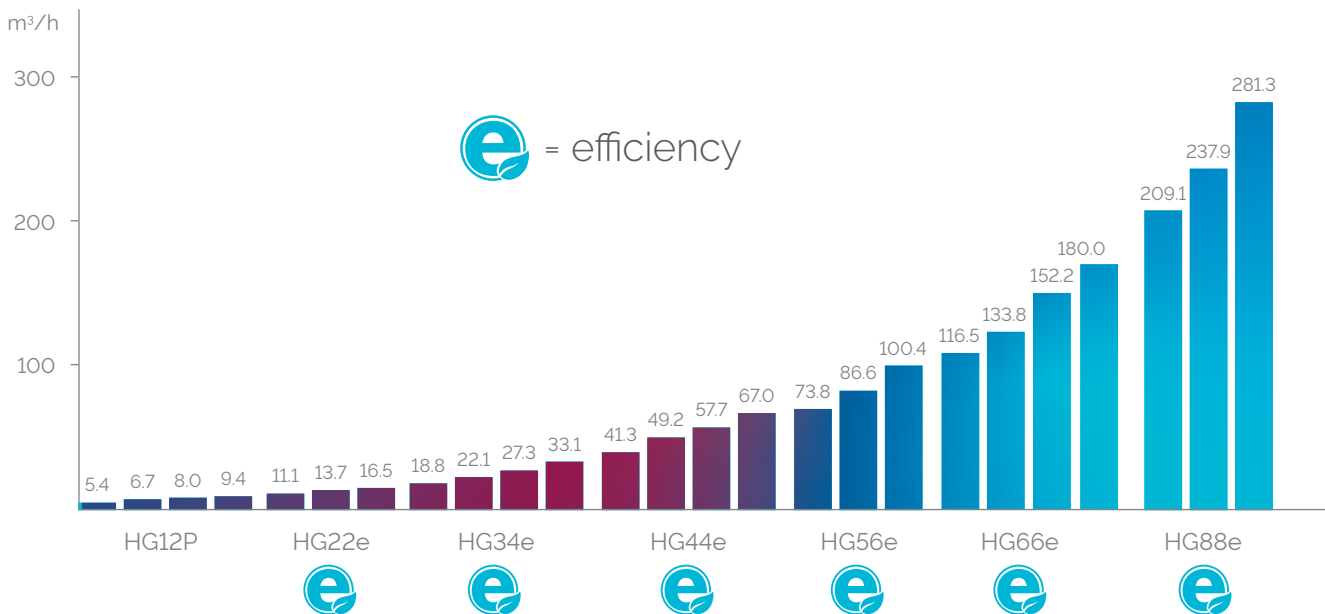
Bock HG

semi-hermetic compressors

The Bock HG (Hermetic Gas-cooled) range of single-stage, semi-hermetic compressors offers traditional suction-gas-cooled compressor technology. These compressors of the highest quality standard excel in their running comfort, easy maintenance, efficiency and reliability. They are suitable as standard for conventional or chlorine-free HFC refrigerants.

HG Single-Stage

7 model sizes with 25 capacity stages from 5.4 to 281.3 m³/h (50 Hz)

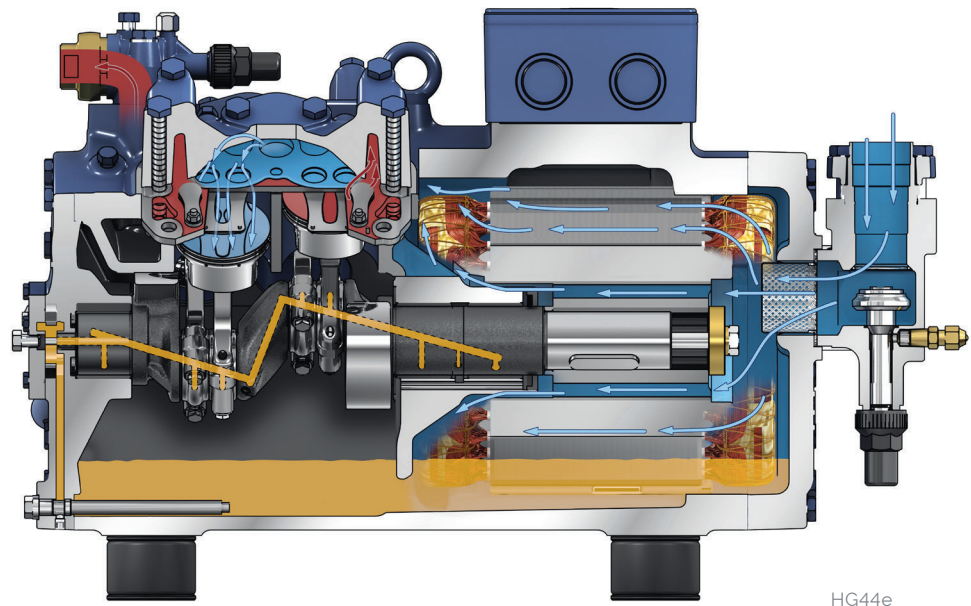


HG semi-hermetic compressors

At a glance

Special features:

- o Outstanding running comfort
- o Efficiency and reliability on the highest level of quality
- o Service-friendly design, e.g. with replaceable drive motors
- o Oil pump lubrication
- o Electronic motor protection
- o Suitable components for conventional or chlorine-free HFC refrigerants



Type key

HGX66e / 2070 - 4S

- Series ¹⁾
- Ester oil filling ²⁾
- Size
- Number of cylinders
- e-series ³⁾
- Swept volume
- Number of poles
- Motor variant ⁴⁾

¹⁾ HG = Hermetic Gas-cooled (suction gas-cooled)

²⁾ X = Ester oil filling (HFC refrigerants e.g. R134a, R404A, R448A, R449A)

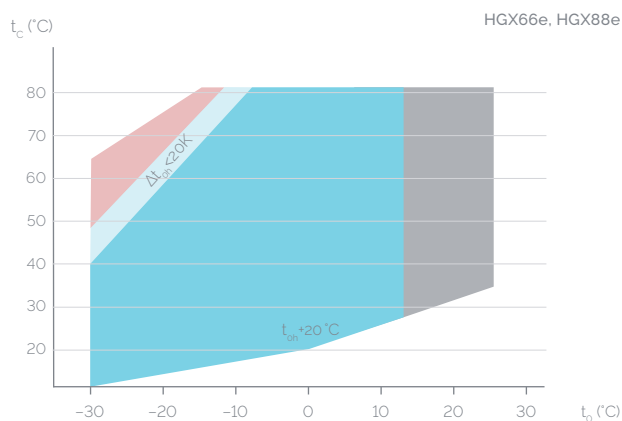
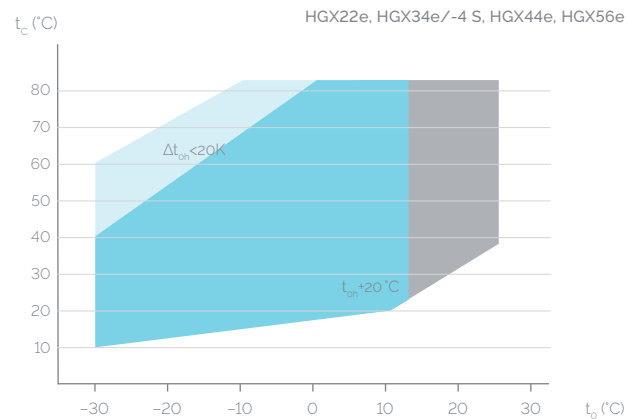
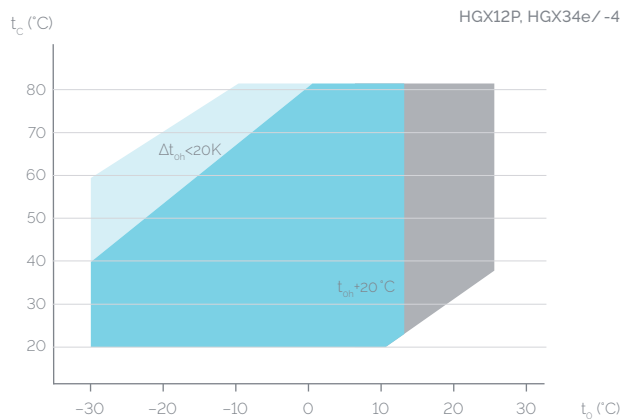
³⁾ = Additional declaration for e-series compressors

⁴⁾ S = More powerful motor e.g. air-conditioning applications

HG semi-hermetic compressors

Operating limits

R134a



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

- Unlimited application range
- Supplementary cooling or reduced suction gas temperature ($\Delta t_{oh} < 20K$)
- Supplementary cooling and reduced suction gas temperature ($\Delta t_{oh} < 20K$)
- Motor version -S- (more powerful motor)

Max. permissible operating pressure (LP/HP) ¹⁾: 19/28 bar
¹⁾ LP = low pressure, HP = high pressure

Notes

Operating limits

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

Restrictions to operating limits may occur when using a frequency converter. For further explanations consult www.bock.de

Performance data

The performance data for R134a are based on European Standard EN 12900 50 Hz power supply frequency.

This signifies: 20 °C suction gas temperature without liquid subcooling.

This results in significant differences compared to specifications with liquid undercooling and/or suction-gas temperatures.

A comprehensive modification to 20 °C suction gas temperature will follow at a later date.

Conversion factor for 60 Hz = 1.2

Performance data for other operating points, see BOCK VAP software (vap.bock.de).

ASERCOM certified performance data



For compressors with this label, the performance data are certified according to the strict requirements of ASERCOM.

ASERCOM is the Association of European Refrigeration Compressors and Controls Manufacturers.


Information about the Association and the constantly updated overview of certified BOCK compressors can be found at www.asercom.org and www.bock.de.

HG semi-hermetic compressors

Performance data

R134a 50 Hz													
Type		Cooling capacity Q_0 [kW]						Power consumption P_e [kW]					
		Evaporating temperature °C											
		12.5	10	7.5	5	0	-5	-10	-15	-20	-25	-30	
Cond. temp. °C													
		HGX12P/60-4S	30	Q	4920	4490	4080	3700	3010	2420	1910	1480	1130
	P		0.703	0.710	0.711	0.706	0.682	0.645	0.597	0.544	0.491	0.443	0.403
40	Q		4260	3880	3520	3190	2590	2070	1630	1250	932	670	456
	P		0.851	0.843	0.830	0.813	0.768	0.713	0.653	0.592	0.535	0.487	0.453
50	Q		3630	3300	2990	2700	2190	1740	1350	1030	742	505	302
	P		0.991	0.968	0.942	0.912	0.846	0.774	0.701	0.631	0.571	0.523	0.494
HGX12P/75-4	30	Q	6150	5610	5100	4620	3760	3020	2390	1850	1410	1050	756
		P	0.879	0.887	0.888	0.882	0.853	0.805	0.746	0.680	0.614	0.553	0.503
	40	Q	5320	4850	4400	3980	3230	2590	2030	1560	1170	837	569
		P	1.06	1.05	1.03	1.01	0.959	0.891	0.815	0.739	0.668	0.609	0.565
	50	Q	4530	4120	3730	3380	2730	2170	1690	1280	927	630	377
		P	1.23	1.21	1.17	1.14	1.05	0.967	0.875	0.789	0.713	0.654	0.617
HGX12P/90-4	30	Q	7300	6670	6070	5520	4510	3630	2870	2230	1700	1260	912
		P	1.08	1.10	1.12	1.12	1.10	1.06	0.997	0.915	0.826	0.735	0.649
	40	Q	6380	5820	5290	4790	3890	3110	2440	1880	1410	1020	708
		P	1.33	1.33	1.32	1.30	1.24	1.16	1.06	0.955	0.846	0.742	0.649
	50	Q	5490	4990	4520	4080	3290	2610	2030	1540	1130	793	522
		P	1.59	1.56	1.53	1.48	1.38	1.26	1.14	1.01	0.885	0.770	0.672
HGX12P/110-4	30	Q	8620	7860	7150	6480	5280	4240	3350	2600	1980	1470	1060
		P	1.23	1.24	1.24	1.23	1.19	1.13	1.04	0.954	0.861	0.776	0.706
	40	Q	7460	6790	6170	5580	4530	3620	2850	2190	1640	1180	798
		P	1.49	1.47	1.45	1.42	1.34	1.24	1.14	1.03	0.938	0.854	0.793
	50	Q	6350	5770	5230	4730	3830	3040	2370	1790	1300	884	529
		P	1.73	1.69	1.65	1.59	1.48	1.35	1.22	1.10	1.00	0.917	0.866
HGX22e/125-4	30	Q	10200	9270	8440	7660	6220	4960	3860	2930	2160	1550	1090
		P	1.30	1.35	1.38	1.39	1.39	1.34	1.25	1.14	1.02	0.891	0.765
	40	Q	8990	8200	7450	6740	5440	4300	3310	2480	1790	1260	860
		P	1.69	1.70	1.69	1.67	1.59	1.48	1.35	1.20	1.05	0.903	0.769
	50	Q	7800	7090	6420	5780	4630	3620	2750	2020	1440	978	657
		P	2.02	1.98	1.94	1.88	1.75	1.59	1.41	1.24	1.06	0.908	0.773
HGX22e/160-4	30	Q	12800	11600	10600	9560	7780	6240	4920	3810	2870	2110	1490
		P	1.63	1.65	1.66	1.65	1.63	1.59	1.51	1.41	1.29	1.15	0.983
	40	Q	11200	10200	9200	8330	6750	5390	4230	3240	2410	1730	1160
		P	2.07	2.05	2.03	2.00	1.92	1.81	1.68	1.53	1.36	1.17	0.962
	50	Q	9640	8760	7930	7170	5780	4580	3560	2680	1940	1310	783
		P	2.46	2.41	2.36	2.29	2.15	1.99	1.80	1.60	1.38	1.14	0.884
HGX22e/190-4	30	Q	15300	14000	12900	11700	9630	7800	6180	4790	3610	2640	1870
		P	2.04	2.06	2.06	2.05	2.00	1.92	1.80	1.65	1.48	1.29	1.09
	40	Q	13600	12500	11400	10400	8460	6810	5360	4110	3060	2200	1530
		P	2.59	2.55	2.51	2.46	2.33	2.17	1.98	1.78	1.57	1.34	1.11
	50	Q	11900	10800	9840	8940	7270	5800	4520	3430	2520	1790	1220
		P	3.09	3.01	2.92	2.83	2.62	2.39	2.14	1.89	1.63	1.37	1.12
HGX22e/190-4	60	Q	10100	9160	8320	7520	6070	4800	3700	2770	2010	1410	959
		P	3.54	3.41	3.28	3.14	2.86	2.56	2.26	1.96	1.66	1.37	1.10
	70	Q	8280	7510	6790	6110	4880	3810	2900	2150	1540	-	-
		P	3.91	3.74	3.57	3.39	3.03	2.68	2.32	1.97	1.64	-	-

Relating to 20 °C suction gas temperature without liquid subcooling

 Supplementary cooling or reduced suction gas temperature


vap.bock.de 

HG semi-hermetic compressors

Performance data

R134a 50 Hz													
Type		Cooling capacity Q_0 [kW]						Power consumption P_e [kW]					
		Evaporating temperature $^{\circ}\text{C}$											
		12.5	10	7.5	5	0	-5	-10	-15	-20	-25	-30	
Cond. temp. $^{\circ}\text{C}$													
		HGX44e/770-4	30	Q	63600	58000	52800	47900	39100	31600	25100	19700	15100
	P		7.62	7.68	7.70	7.67	7.48	7.14	6.69	6.14	5.54	4.90	4.25
40	Q		56000	51100	46400	42100	34200	27500	21800	16900	12800	9360	6460
	P		9.63	9.54	9.42	9.24	8.79	8.21	7.53	6.78	5.99	5.19	4.40
50	Q		48700	44200	40100	36300	29500	23600	18600	14300	10700	7510	4830
	P		11.5	11.2	11.0	10.7	9.97	9.14	8.23	7.26	6.28	5.30	4.35
HHGX56e/850-4	30	Q	71500	65200	59400	53900	43900	35300	28000	21700	16500	12300	8870
		P	8.74	8.80	8.79	8.74	8.49	8.08	7.52	6.86	6.11	5.30	4.45
	40	Q	62900	57400	52200	47300	38500	30900	24300	18800	14200	10400	7330
		P	11.1	10.9	10.8	10.5	9.99	9.27	8.43	7.50	6.51	5.48	4.45
	50	Q	54500	49600	45000	40700	33000	26400	20700	15900	11900	8470	5720
		P	13.2	12.9	12.5	12.1	11.2	10.2	9.11	7.93	6.71	5.47	4.26
HGX56e/995-4	30	Q	82900	75700	68900	62500	51000	41000	32400	25100	19000	14000	10100
		P	10.1	10.1	10.1	10.1	9.81	9.29	8.62	7.81	6.92	5.98	5.03
	40	Q	73100	66600	60600	54900	44700	35800	28100	21600	16200	11700	8050
		P	12.7	12.6	12.4	12.1	11.4	10.6	9.60	8.51	7.36	6.20	5.05
	50	Q	63200	57600	52300	47300	38300	30500	23900	18100	13300	9260	5930
		P	15.2	14.8	14.4	13.9	12.9	11.6	10.3	8.98	7.58	6.19	4.85
HGX56e/1155-4	30	Q	94600	86200	78400	71100	57800	46400	36600	28400	21600	16000	11700
		P	13.0	12.9	12.8	12.6	12.0	11.2	10.3	9.31	8.24	7.16	6.12
	40	Q	83600	76200	69200	62600	50800	40700	32000	24700	18600	13600	9550
		P	15.9	15.6	15.3	14.9	13.9	12.8	11.5	10.2	8.85	7.51	6.24
	50	Q	72600	66000	59900	54100	43800	34900	27300	20800	15500	11000	7340
		P	18.7	18.2	17.6	17.0	15.6	14.1	12.5	10.8	9.21	7.60	6.08
HGX66e/1340-4	30	Q	109000	99700	91100	82900	68000	54900	43600	33900	25800	19100	13800
		P	14.0	14.2	14.2	14.1	13.6	12.9	12.0	10.8	9.66	8.40	7.16
	40	Q	97000	88700	80800	73400	59900	48000	37800	29100	21800	15800	11100
		P	17.7	17.5	17.2	16.8	15.8	14.5	13.1	11.6	10.1	8.65	7.22
	50	Q	84400	76900	69900	63300	51300	40800	31800	24200	17900	12700	-
		P	20.9	20.4	19.7	19.0	17.5	15.8	14.0	12.1	10.3	8.62	-
HGX66e/1540-4	30	Q	125000	115000	105000	95200	78200	63300	50400	39300	30000	22300	16200
		P	16.1	16.2	16.3	16.2	15.7	14.9	13.8	12.5	11.1	9.74	8.33
	40	Q	112000	102000	92900	84400	69000	55500	43900	33900	25500	18700	13200
		P	20.4	20.2	19.8	19.4	18.2	16.8	15.2	13.5	11.8	10.1	8.50
	50	Q	97000	88500	80500	73000	59300	47400	37100	28400	21100	15200	-
		P	24.2	23.6	22.9	22.1	20.3	18.3	16.3	14.2	12.1	10.2	-
HGX66e/1750-4	30	Q	143000	131000	120000	109000	89400	72400	57600	44900	34300	25600	18600
		P	18.4	18.6	18.6	18.5	17.9	17.0	15.8	14.4	12.8	11.2	9.67
	40	Q	128000	117000	107000	96600	79000	63600	50200	38800	29300	21400	15200
		P	23.3	23.0	22.6	22.1	20.8	19.2	17.5	15.5	13.6	11.7	9.89
	50	Q	111000	102000	92200	83600	67900	54300	42500	32600	24200	17400	-
		P	27.6	26.9	26.1	25.2	23.2	21.0	18.7	16.3	14.0	11.8	-
HGX66e/1750-4	60	Q	94100	85600	77600	70100	56600	44900	34900	26500	19500	-	-
		P	31.3	30.2	29.0	27.7	25.1	22.3	19.4	16.7	14.0	-	-
	70	Q	76700	69500	62800	56500	45200	35600	27500	20800	-	-	-
		P	34.3	32.8	31.2	29.6	26.3	23.0	19.7	16.5	-	-	-

Relating to 20 $^{\circ}\text{C}$ suction gas temperature without liquid subcooling

 Supplementary cooling or reduced suction gas temperature

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HG semi-hermetic compressors

Performance data

R134a | 50 Hz

Type		Cooling capacity Q_o [kW]										Power consumption P_e [kW]			
		Evaporating temperature °C													
Cond. temp. °C		12.5	10	7.5	5	0	-5	-10	-15	-20	-25	-30			
HGX66e/2070-4	30	Q	168000	154000	141000	129000	106000	85300	67900	53000	40500	30200	22000		
		P	217	219	219	218	211	20.0	186	16.9	15.0	13.1	11.2		
	40	Q	150000	137000	125000	114000	93000	74900	59200	45800	34500	25300	17900		
		P	276	272	26.7	26.1	24.6	22.7	20.6	18.3	15.9	13.7	11.5		
	50	Q	131000	120000	109000	98300	79900	63900	50100	38400	28600	20600	-		
		P	32.8	31.9	30.9	29.9	27.5	24.8	22.0	19.2	16.4	13.8	-		
	60	Q	111000	101000	91100	82400	66500	52800	41100	31200	23000	-	-		
		P	37.3	35.9	34.4	32.9	29.7	26.3	22.9	19.6	16.5	-	-		
	70	Q	89900	81500	73700	66300	53200	41900	32400	24600	-	-	-		
		P	40.9	39.0	37.1	35.2	31.2	27.2	23.2	19.4	-	-	-		
HGX88e/2400-4	30	Q	197000	181000	165000	151000	124000	99900	79500	62000	47400	35300	25700		
		P	26.1	26.3	26.3	26.1	25.4	24.2	22.5	20.6	18.4	16.1	13.8		
	40	Q	176000	161000	147000	134000	110000	87800	69400	53700	40500	29600	21000		
		P	32.8	32.4	31.8	31.1	29.4	27.2	24.8	22.2	19.5	16.8	14.2		
	50	Q	154000	141000	128000	116000	94000	75100	58900	45100	33600	24200	-		
		P	38.8	37.8	36.7	35.4	32.7	29.7	26.5	23.3	20.1	17.0	-		
	60	Q	131000	119000	108000	97100	78400	62200	48300	36700	27100	-	-		
		P	44.0	42.4	40.7	38.9	35.3	31.5	27.6	23.8	20.2	-	-		
	70	Q	107000	96400	87100	78400	62800	49400	38200	29000	-	-	-		
		P	48.2	46.1	43.9	41.6	37.1	32.5	28.0	23.7	-	-	-		
HGX88e/2735-4	30	Q	225000	206000	188000	171000	141000	114000	90500	70600	53900	40200	29300		
		P	29.9	30.1	30.1	29.9	29.0	27.6	25.8	23.5	21.1	18.5	15.8		
	40	Q	201000	184000	168000	152000	125000	100000	79000	61100	46100	33700	23900		
		P	37.4	36.9	36.3	35.5	33.5	31.1	28.4	25.4	22.3	19.2	16.3		
	50	Q	176000	160000	146000	132000	108000	85600	67100	51400	38200	27500	-		
		P	44.1	43.0	41.7	40.3	37.3	33.9	30.3	26.7	23.0	19.5	-		
	60	Q	149000	136000	123000	111000	89400	70900	55100	41800	30900	-	-		
		P	49.8	48.1	46.2	44.3	40.2	35.9	31.5	27.2	23.1	-	-		
	70	Q	122000	111000	99400	89400	71600	56300	43500	33000	-	-	-		
		P	54.5	52.2	49.7	47.2	42.2	37.0	32.0	27.1	-	-	-		
HGX88e/3235-4	30	Q	265000	243000	222000	202000	166000	135000	107000	83300	63500	47300	34400		
		P	35.2	35.4	35.4	35.2	34.2	32.5	30.3	27.6	24.7	21.6	18.5		
	40	Q	237000	217000	198000	180000	147000	118000	93200	72000	54200	39600	28000		
		P	44.1	43.5	42.7	41.8	39.4	36.6	33.3	29.8	26.1	22.5	18.9		
	50	Q	207000	189000	172000	156000	127000	101000	78900	60400	44900	32300	-		
		P	52.0	50.6	49.1	47.5	43.8	39.8	35.6	31.2	26.9	22.7	-		
	60	Q	176000	160000	145000	131000	106000	83400	64700	49100	36100	-	-		
		P	58.7	56.6	54.4	52.1	47.2	42.1	37.0	31.8	26.9	-	-		
	70	Q	144000	130000	117000	106000	84200	66200	51100	38600	-	-	-		
		P	64.3	61.4	58.5	55.6	49.5	43.4	37.4	31.5	-	-	-		

Relating to 20 °C suction gas temperature without liquid subcooling

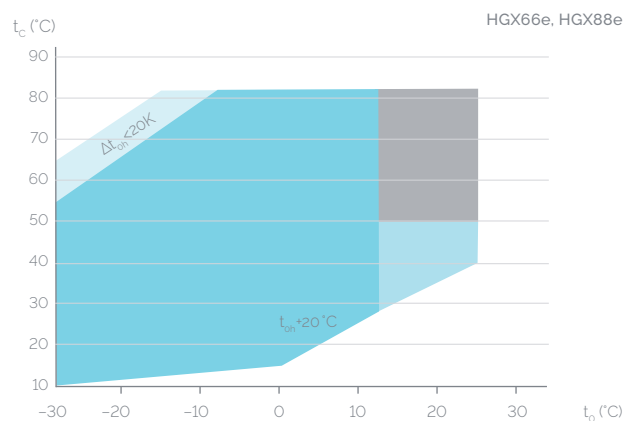
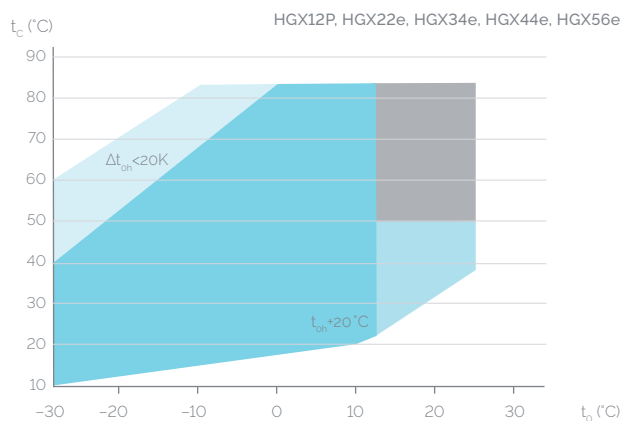
Supplementary cooling or reduced suction gas temperature



HG semi-hermetic compressors

Operating limits

R513A



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

- Unlimited application range
- Supplementary cooling or reduced suction gas temperature ($\Delta t_{oh} < 20K$)
- Motor version -S- (more powerful motor)
- Required minimum superheating $\Delta t_{oh} = 20K$

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

¹⁾ LP = low pressure, HP = high pressure

Notes

Operating limits

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

Restrictions to operating limits may occur when using a frequency converter. For further explanations consult www.bock.de

Performance data

The performance data for R513A 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 results in significant differences compared to specifications with liquid undercooling and/or suction-gas temperatures. A comprehensive modification to 20 °C suction gas temperature will follow at a later date.

Conversion factor for 60 Hz = 1.2

Performance data for other operating points, see BOCK VAP software (vap.bock.de).

HG semi-hermetic compressors

Performance data

R513A | 50 Hz

Type		Cooling capacity Q_0 [kW]										Power consumption P_e [kW]			
		Evaporating temperature °C													
		12.5	10	7.5	5	0	-5	-10	-15	-20	-25	-30			
Cond. temp. °C															
		HGX12P/60-4 S	30	Q	5040	4610	4210	3830	3150	2550	2040	1600	1230	925	677
	P		0.722	0.732	0.735	0.732	0.713	0.679	0.633	0.581	0.527	0.475	0.431		
40	Q		4320	3950	3600	3270	2680	2170	1720	1340	1020	745	520		
	P		0.879	0.873	0.862	0.847	0.805	0.751	0.691	0.629	0.569	0.516	0.474		
50	Q		3620	3310	3010	2730	2230	1800	1420	1090	809	570	365		
	P		1.02	1.00	0.981	0.953	0.888	0.816	0.741	0.668	0.603	0.548	0.508		
HGX12P/75-4 HGX12P/75-4 S	30	Q	6280	5750	5260	4790	3930	3190	2550	2000	1540	1160	846		
		P	0.970	0.987	0.998	1.00	0.891	0.848	0.791	0.726	0.658	0.594	0.538		
	40	Q	5500	5030	4590	4180	3350	2700	2150	1680	1270	931	650		
		P	1.19	1.18	1.18	1.16	1.00	0.939	0.864	0.786	0.711	0.645	0.592		
	50	Q	4690	4280	3890	3530	2790	2240	1770	1360	1010	712	456		
		P	1.39	1.37	1.34	1.31	1.10	1.01	0.926	0.835	0.753	0.684	0.635		
HGX12P/90-4 HGX12P/90-4 S	30	Q	7550	6890	6270	5690	4710	3830	3060	2410	1860	1400	1030		
		P	1.15	1.17	1.19	1.19	1.14	1.10	1.04	0.963	0.874	0.780	0.689		
	40	Q	6570	5990	5440	4940	4030	3250	2580	2010	1530	1130	800		
		P	1.42	1.42	1.41	1.39	1.30	1.22	1.12	1.01	0.908	0.799	0.698		
	50	Q	5590	5090	4620	4180	3370	2700	2130	1640	1230	880	600		
		P	1.67	1.65	1.62	1.58	1.45	1.34	1.21	1.08	0.953	0.831	0.723		
HGX12P/110-4 HGX12P/110-4 S	30	Q	8820	8070	7370	6710	5510	4470	3570	2800	2160	1620	1190		
		P	1.26	1.28	1.28	1.28	1.25	1.18	1.10	1.01	0.923	0.833	0.755		
	40	Q	7560	6910	6300	5730	4690	3790	3010	2350	1780	1310	911		
		P	1.54	1.53	1.51	1.48	1.41	1.31	1.21	1.10	0.997	0.904	0.831		
	50	Q	6340	5790	5270	4780	3900	3140	2480	1910	1420	998	640		
		P	1.80	1.76	1.71	1.66	1.55	1.42	1.29	1.17	1.05	0.960	0.891		
HGX22e/125-4 HGX22e/125-4 S	30	Q	10400	9540	8730	7970	6540	5280	4170	3210	2410	1750	1240		
		P	1.31	1.37	1.41	1.43	1.44	1.40	1.32	1.22	1.09	0.964	0.832		
	40	Q	9130	8370	7640	6950	5670	4540	3550	2700	1990	1420	975		
		P	1.73	1.74	1.74	1.73	1.66	1.56	1.43	1.28	1.13	0.980	0.837		
	50	Q	7810	7130	6490	5880	4760	3770	2920	2190	1580	1100	741		
		P	2.08	2.05	2.01	1.97	1.83	1.68	1.51	1.33	1.15	0.986	0.839		
HGX22e/160-4 HGX22e/160-4 S	30	Q	13100	12000	11000	10100	8150	6600	5270	4130	3160	2360	1700		
		P	1.71	1.75	1.77	1.79	1.71	1.66	1.59	1.50	1.38	1.24	1.07		
	40	Q	11500	10600	9600	8740	7010	5660	4490	3490	2640	1930	1340		
		P	2.17	2.16	2.15	2.12	2.00	1.90	1.78	1.63	1.46	1.27	1.07		
	50	Q	9850	8990	8170	7400	5930	4750	3740	2870	2120	1490	944		
		P	2.56	2.51	2.46	2.40	2.25	2.09	1.91	1.71	1.49	1.26	1.00		
HGX22e/190-4 HGX22e/190-4 S	30	Q	15700	14500	13300	12200	10100	8230	6620	5200	3990	2970	2140		
		P	2.11	2.13	2.14	2.14	2.10	2.02	1.90	1.76	1.59	1.41	1.21		
	40	Q	13700	12600	11600	10600	8760	7130	5690	4430	3360	2460	1740		
		P	2.64	2.62	2.59	2.55	2.45	2.29	2.11	1.91	1.69	1.47	1.24		
	50	Q	11800	10800	9840	8980	7420	5990	4740	3660	2740	1980	1380		
		P	3.15	3.08	3.01	2.93	2.76	2.53	2.28	2.03	1.77	1.51	1.25		
HGX22e/190-4 HGX22e/190-4 S	30	Q	9740	8920	8150	7410	6070	4850	3800	2900	2140	1540	1070		
		P	3.61	3.50	3.38	3.25	3.01	2.72	2.41	2.11	1.81	1.52	1.23		
	40	Q	7780	7100	6460	5850	4710	3730	2880	2170	1600	-	-		
		P	4.00	3.84	3.68	3.51	3.20	2.84	2.49	2.14	1.80	-	-		

Relating to 20 °C suction gas temperature without liquid subcooling

Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temperature

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HG semi-hermetic compressors

Performance data

R513A | 50 Hz

Type		Cooling capacity Q_0 [kW]											Power consumption P_e [kW]		
		Evaporating temperature °C													
		12.5	10	7.5	5	0	-5	-10	-15	-20	-25	-30			
Cond. temp. °C															
		HGX44e/770-4 HGX44e/770-4 S	30	Q	65200	59700	54600	49700	41000	33400	26800	21200	16500	12500	9160
	P		7.93	8.01	8.04	8.03	7.86	7.55	7.11	6.57	5.96	5.31	4.64		
40	Q		57000	52100	47500	43300	35500	28800	23100	18200	14000	10400	7400		
	P		10.0	9.95	9.83	9.68	9.24	8.68	8.02	7.27	6.47	5.65	4.83		
50	Q		48800	44500	40500	36800	30100	24300	19400	15100	11500	8350	5680		
	P		11.9	11.7	11.4	11.1	10.4	9.66	8.76	7.80	6.81	5.81	4.82		
HGX56e/850-4 HGX56e/850-4 S	30	Q	73600	67400	61600	56200	46100	37400	30000	23600	18200	13700	10100		
		P	9.23	9.29	9.30	9.26	8.96	8.57	8.03	7.37	6.62	5.80	4.94		
	40	Q	64200	58800	53600	48800	39900	32400	25800	20200	15500	11600	8310		
		P	11.6	11.5	11.3	11.1	10.5	9.83	9.00	8.08	7.09	6.05	5.00		
	50	Q	54800	50000	45600	41400	33700	27200	21600	16900	12800	9360	6530		
		P	13.7	13.4	13.1	12.7	11.8	10.8	9.76	8.58	7.35	6.11	4.87		
HGX56e/995-4 HGX56e/995-4 S	30	Q	85100	78000	71300	65000	53500	43400	34700	27200	20900	15700	11500		
		P	10.5	10.6	10.6	10.6	10.3	9.86	9.20	8.40	7.51	6.56	5.57		
	40	Q	74300	68100	62200	56600	46400	37500	29900	23300	17700	13100	9200		
		P	13.3	13.2	13.0	12.7	12.0	11.2	10.2	9.18	8.03	6.84	5.66		
	50	Q	63400	58000	52800	48000	39200	31600	25000	19300	14500	10400	6940		
		P	15.8	15.5	15.1	14.6	13.6	12.4	11.1	9.73	8.32	6.90	5.51		
HGX56e/1155-4 HGX56e/1155-4 S	30	Q	98000	89700	81900	74500	60700	49200	39300	30800	23700	17900	13200		
		P	13.8	13.8	13.7	13.5	12.7	11.9	11.0	10.0	8.95	7.83	6.72		
	40	Q	85900	78500	71600	65100	52800	42700	34000	26500	20300	15100	10800		
		P	16.8	16.5	16.2	15.8	14.7	13.6	12.3	11.0	9.65	8.26	6.91		
	50	Q	73500	67100	61100	55500	44800	36100	28600	22200	16700	12200	8410		
		P	19.5	19.1	18.5	18.0	16.5	15.0	13.4	11.7	10.1	8.43	6.83		
HGX66e/1340-4 HGX66e/1340-4 S	30	Q	116000	106000	96700	88100	72200	58700	47000	36900	28500	21500	15800		
		P	15.4	15.5	15.4	15.3	14.6	13.7	12.7	11.5	10.3	9.06	7.85		
	40	Q	102000	93100	84900	77200	62900	50800	40300	31400	23800	17600	12500		
		P	18.9	18.6	18.3	17.8	16.7	15.4	13.9	12.4	10.8	9.33	7.90		
	50	Q	87200	79600	72400	65600	53000	42500	33400	25700	19300	14000	9660		
		P	21.9	21.4	20.8	20.1	18.4	16.7	14.9	13.0	11.1	9.36	7.74		
HGX66e/1540-4 HGX66e/1540-4 S	30	Q	133000	122000	111000	102000	83100	67600	54300	42800	33100	25100	18600		
		P	17.6	17.7	17.6	17.5	16.8	15.8	14.7	13.3	11.9	10.5	9.13		
	40	Q	117000	107000	97700	88900	72500	58700	46700	36500	27800	20700	14900		
		P	21.7	21.4	21.0	20.5	19.3	17.8	16.1	14.4	12.6	10.9	9.29		
	50	Q	101000	91600	83400	75700	61300	49200	38900	30100	22700	16600	11700		
		P	25.3	24.7	24.0	23.2	21.4	19.4	17.3	15.2	13.0	11.0	9.22		
HGX66e/1750-4 HGX66e/1750-4 S	30	Q	151000	138000	126000	115000	95000	77300	62000	48900	37900	28700	21300		
		P	20.2	20.3	20.2	20.0	19.2	18.1	16.8	15.3	13.7	12.1	10.5		
	40	Q	133000	122000	111000	101000	82900	67100	53500	41800	31900	23700	17100		
		P	24.8	24.5	24.1	23.5	22.0	20.4	18.5	16.5	14.5	12.6	10.7		
	50	Q	114000	104000	94700	86000	70200	56400	44600	34500	26100	19100	13500		
		P	29.0	28.3	27.5	26.6	24.5	22.2	19.8	17.4	15.0	12.8	10.7		
HGX66e/1750-4 HGX66e/1750-4 S	30	Q	94300	85800	77900	70500	57100	45600	35800	27600	20800	15200	10800		
		P	32.6	31.5	30.4	29.1	26.4	23.6	20.7	17.9	15.2	12.6	10.3		
	40	Q	74200	67200	60800	54800	44000	35000	27500	21300	16400	12500	9160		
		P	35.5	34.0	32.6	31.0	27.7	24.4	21.1	17.9	14.8	12.0	9.16		

Relating to 20 °C suction gas temperature without liquid subcooling

Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temperature

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HG semi-hermetic compressors

Performance data

R513A 50 Hz													
Type		Cooling capacity Q_o [kW]						Power consumption P_e [kW]					
		Evaporating temperature °C											
Cond. temp. °C		12.5	10	7.5	5	0	-5	-10	-15	-20	-25	-30	
HGX66e/2070-4 HGX66e/2070-4 S	30	Q	177000	163000	149000	136000	112000	91100	73100	57700	44700	33900	25100
		P	23.8	23.9	23.8	23.6	22.6	21.3	19.8	18.0	16.1	14.1	12.3
	40	Q	157000	143000	131000	119000	97600	79100	63000	49200	37600	28000	20200
		P	29.3	29.0	28.4	27.8	26.0	24.0	21.8	19.4	17.0	14.7	12.6
	50	Q	134000	123000	112000	102000	82500	66400	52500	40700	30800	22600	15900
		P	34.3	33.5	32.5	31.5	29.0	26.3	23.4	20.5	17.7	15.0	12.5
60	Q	111000	101000	91500	82800	67100	53600	42200	32500	24500	18000	12800	
	P	38.6	37.3	36.0	34.5	31.3	27.9	24.5	21.1	17.8	14.8	12.1	
70	Q	87100	78900	71400	64300	51700	41200	32400	25100	19300	14700	-	
	P	42.1	40.4	38.6	36.8	32.9	28.9	24.9	21.0	17.4	14.0	-	
HGX88e/2400-4 HGX88e/2400-4 S	30	Q	209000	192000	175000	160000	131000	107000	85600	67500	52300	39600	29400
		P	28.9	28.9	28.8	28.6	27.1	25.7	23.9	21.8	19.6	17.3	15.1
	40	Q	185000	169000	155000	141000	115000	92800	73900	57700	44100	32900	23700
		P	35.1	34.7	34.1	33.4	31.0	28.8	26.2	23.5	20.8	18.1	15.5
	50	Q	159000	145000	132000	120000	97100	78100	61700	47800	36100	26500	18800
		P	40.7	39.8	38.7	37.5	34.4	31.4	28.1	24.8	21.5	18.4	15.5
60	Q	132000	120000	109000	98400	79100	63200	49600	38300	28900	21200	15200	
	P	45.5	44.1	42.6	41.0	37.1	33.3	29.4	25.5	21.8	18.2	15.0	
70	Q	104000	94100	85000	76600	61100	48600	38200	29700	22800	17500	-	
	P	49.4	47.5	45.6	43.6	39.1	34.5	29.9	25.5	21.3	17.4	-	
HGX88e/2735-4 HGX88e/2735-4 S	30	Q	237000	218000	199000	182000	150000	122000	97500	76900	59500	45100	33500
		P	32.6	32.6	32.5	32.2	30.9	29.3	27.3	25.0	22.5	19.9	17.3
	40	Q	210000	192000	176000	160000	131000	106000	84200	65800	50300	37400	27000
		P	39.7	39.2	38.5	37.7	35.4	32.8	30.0	26.9	23.8	20.7	17.7
	50	Q	181000	165000	150000	137000	111000	89000	70300	54500	41200	30200	21400
		P	46.1	45.0	43.8	42.4	39.2	35.8	32.1	28.4	24.7	21.1	17.7
60	Q	150000	137000	124000	112000	90200	72000	56600	43600	32900	24200	17300	
	P	51.6	50.0	48.2	46.4	42.2	38.0	33.6	29.2	24.9	20.9	17.2	
70	Q	118000	107000	96500	86900	69700	55400	43500	33800	26000	19900	-	
	P	56.1	53.9	51.7	49.4	44.4	39.3	34.2	29.2	24.4	19.9	-	
HGX88e/3235-4 HGX88e/3235-4 S	30	Q	280000	257000	235000	215000	177000	144000	116000	90700	70100	53100	39300
		P	38.4	38.5	38.4	38.0	36.4	34.5	32.1	29.3	26.3	23.3	20.2
	40	Q	248000	227000	207000	189000	155000	125000	99200	77500	59100	43900	31600
		P	46.8	46.2	45.4	44.4	41.6	38.6	35.2	31.6	27.9	24.2	20.7
	50	Q	213000	195000	177000	161000	131000	105000	82800	64000	48300	35400	25000
		P	54.3	53.0	51.5	49.9	46.1	42.0	37.7	33.3	28.8	24.6	20.6
60	Q	177000	161000	146000	132000	107000	84700	66500	51100	38500	28200	20100	
	P	60.7	58.8	56.7	54.5	49.7	44.6	39.3	34.1	29.0	24.2	19.9	
70	Q	139000	126000	114000	103000	82000	65100	51000	39600	30400	23200	-	
	P	65.9	63.4	60.7	57.9	52.1	46.1	40.0	34.0	28.3	23.0	-	

Relating to 20 °C suction gas temperature
without liquid subcooling

Motor version -S-
(more powerful motor)

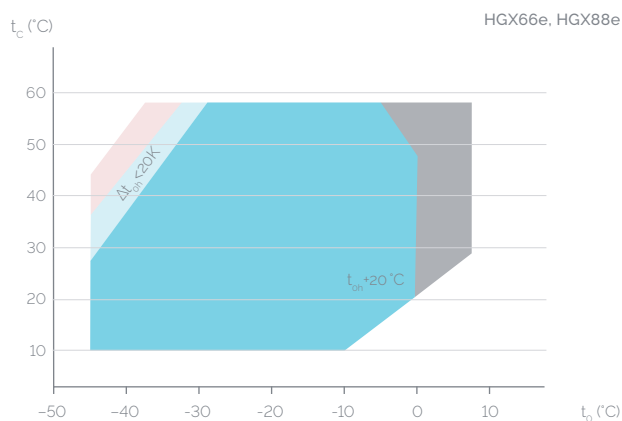
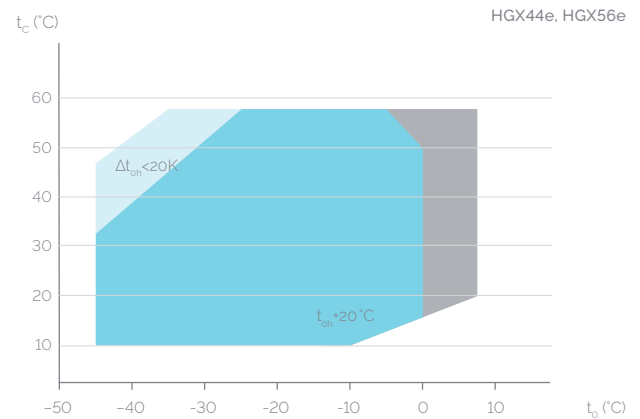
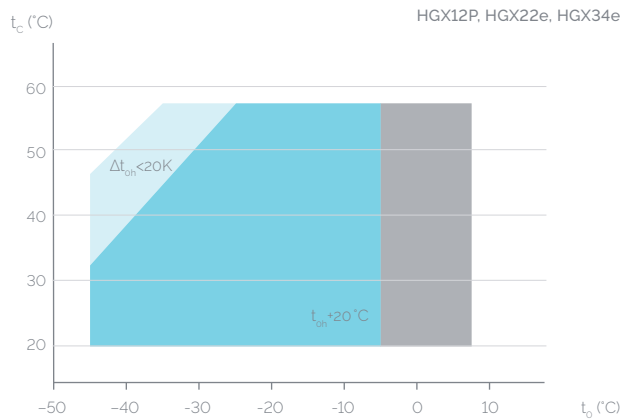
Supplementary cooling or
reduced suction gas temperature

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HG semi-hermetic compressors

Operating limits

R404A/R507



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

- Unlimited application range
- Supplementary cooling or reduced suction gas temperature ($\Delta t_{oh} < 20K$)
- Supplementary cooling and reduced suction gas temperature ($\Delta t_{oh} < 20K$)
- Motor version -S- (more powerful motor)

Max. permissible operating pressure (LP/HP) ¹⁾: 19/28 bar
¹⁾ LP = low pressure, HP = high pressure

Notes

Operating limits

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

Restrictions to operating limits may occur when using a frequency converter. For further explanations consult www.bock.de.

Performance data

The performance data for R404A/R507 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.

Performance data were compiled for R404A and R507. The base values are the data for R404A.

Conversion factor for 60 Hz = 1.2

Performance data for other operating points, see BOCK VAP software (vap.bock.de).

ASERCOM certified performance data



For compressors with this label, the performance data are certified according to the strict requirements of ASERCOM.

ASERCOM is the Association of European Refrigeration Compressors and Controls Manufacturers.

Information about the Association and the constantly updated overview of certified BOCK compressors can be found at www.asercom.org and www.bock.de.

HG semi-hermetic compressors

Performance data

R404A/R507 | 50 Hz

Type		Cooling capacity Q_0 [kW]											Power consumption P_e [kW]			
		Evaporating temperature °C														
Cond. temp. °C		7.5	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45			
		HGX66e/1750-4 HGX66e/1750-4 S	30	Q	195000	180000	151000	126000	104000	84700	68000	53700	41500	31100	22400	15200
P	32.9			32.8	31.9	30.7	28.9	26.9	24.5	22.0	19.3	16.6	14.0	11.4		
40	Q		167000	154000	129000	107000	88000	71400	57100	44800	34200	25200	17600	-		
	P		40.1	39.4	37.6	35.3	32.6	29.7	26.6	23.4	20.2	17.0	13.9	-		
50	Q		138000	127000	106000	87000	71200	57500	45700	35600	27000	19600	-	-		
	P		46.3	45.1	42.3	39.1	35.6	31.9	28.1	24.3	20.5	16.9	-	-		
HGX66e/2070-4 HGX66e/2070-4 S	30	Q	229000	211000	177000	148000	122000	99600	80000	63200	48900	36700	26500	17900		
		P	39.1	38.9	38.0	36.4	34.4	31.9	29.1	26.0	22.8	19.6	16.4	13.4		
	40	Q	196000	180000	151000	126000	104000	83800	67100	52700	40300	29800	20800	-		
		P	47.8	46.9	44.8	42.0	38.8	35.3	31.6	27.7	23.8	20.0	16.4	-		
	50	Q	162000	148000	123000	102000	83400	67400	53700	41900	31800	23100	-	-		
		P	55.4	53.8	50.6	46.7	42.4	37.9	33.3	28.7	24.2	19.9	-	-		
HGX88e/2400-4 HGX88e/2400-4 S	30	Q	272000	251000	209000	175000	144000	118000	94200	74300	57400	43100	31100	21100		
		P	46.0	45.8	44.8	43.0	40.6	37.8	34.6	31.1	27.4	23.7	20.1	16.6		
	40	Q	235000	216000	179000	149000	122000	99000	79100	62000	47400	35100	24500	-		
		P	55.6	54.6	52.7	49.5	45.8	41.8	37.5	33.1	28.6	24.3	20.1	-		
	50	Q	194000	178000	147000	121000	98900	79800	63400	49400	37500	27300	-	-		
		P	63.9	62.2	59.4	54.9	50.0	44.8	39.6	34.3	29.2	24.2	-	-		
HGX88e/2735-4 HGX88e/2735-4 S	30	Q	309000	284000	239000	199000	164000	134000	108000	84700	65400	49100	35400	24000		
		P	52.2	51.9	50.7	48.7	46.1	42.9	39.3	35.5	31.4	27.2	23.0	19.0		
	40	Q	266000	244000	204000	170000	140000	113000	90200	70700	54100	39900	27900	-		
		P	63.3	62.1	59.5	55.9	51.8	47.4	42.6	37.7	32.7	27.8	23.0	-		
	50	Q	220000	202000	168000	139000	113000	91100	72400	56400	42700	31100	-	-		
		P	73.1	71.0	67.0	61.9	56.5	50.8	44.9	39.1	33.3	27.7	-	-		
HGX88e/3235-4 HGX88e/3235-4 S	30	Q	365000	336000	282000	235000	194000	158000	127000	99800	77000	57700	41500	28100		
		P	61.5	61.1	59.8	57.5	54.3	50.6	46.3	41.6	36.8	31.8	26.9	22.1		
	40	Q	314000	288000	241000	200000	165000	133000	107000	83200	63500	46800	32600	-		
		P	74.5	73.1	70.2	66.0	61.1	55.7	50.1	44.2	38.3	32.4	26.8	-		
	50	Q	260000	238000	198000	163000	133000	108000	85100	66200	50100	36400	-	-		
		P	85.9	83.5	79.1	73.0	66.5	59.7	52.7	45.8	38.9	32.2	-	-		

Relating to 20 °C suction gas temperature without liquid subcooling

Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temperature

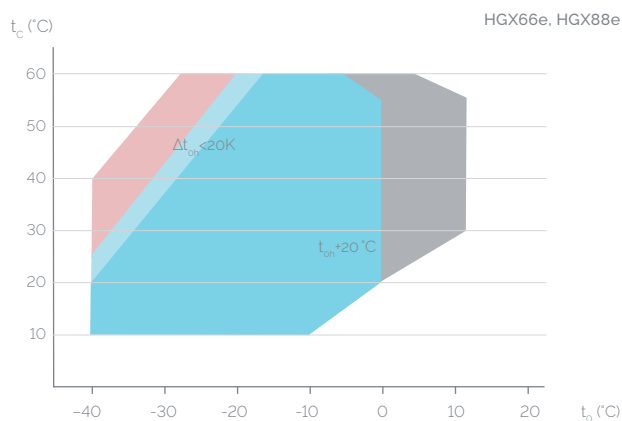
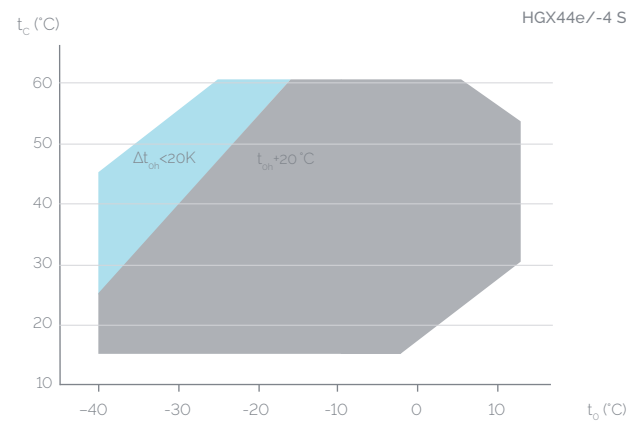
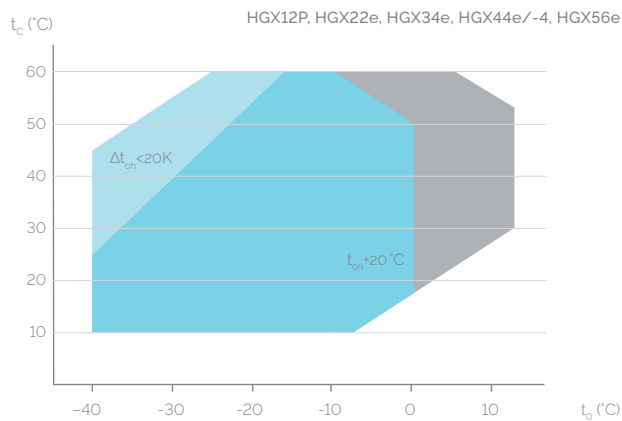
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HG semi-hermetic compressors

Operating limits

R448A/R449A



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

- Unlimited application range
- Supplementary cooling or reduced suction gas temperature ($\Delta t_{oh} < 20K$)
- Supplementary cooling and reduced suction gas temperature ($\Delta t_{oh} < 20K$)
- Motor version -S- (more powerful motor)

Max. permissible operating pressure (LP/HP) ¹⁾: 19/28 bar
¹⁾ LP = low pressure, HP = high pressure

Notes

Operating limits

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

Restrictions to the operating limits may occur when using a frequency converter.

Performance data

The performance data for R448A and R449A are based on European Standard EN 12900 50 Hz power supply frequency. This signifies: 20 °C suction gas temperature without liquid subcooling.

Evaporation and condensing temperatures are based on the dew point values (saturated vapour conditions).

Conversion factor for 60 Hz = 1.2

Performance data for other operating points, see BOCK VAP software (vap.bock.de).

ASERCOM certified performance data



For compressors with this label, the performance data are certified according to the strict requirements of ASERCOM.

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HG semi-hermetic compressors

Performance data

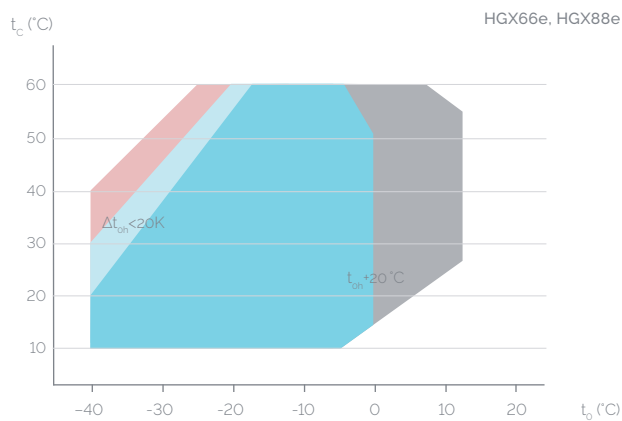
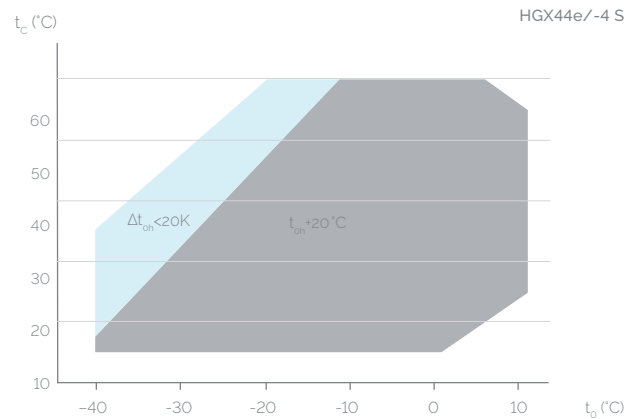
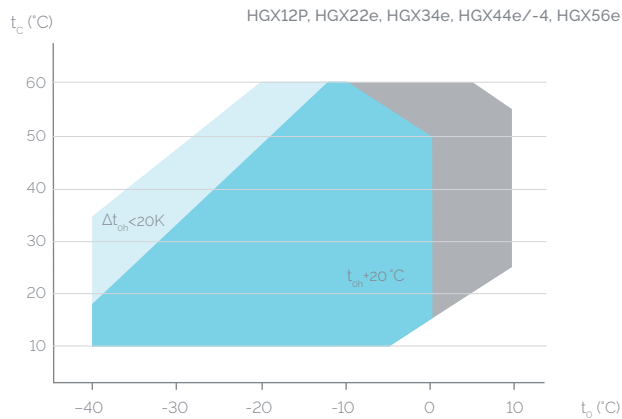
Type		Cooling capacity Q_0 [W]											Power consumption P_e [kW]	
		Evaporating temperature °C												
Cond. temp. °C		12.5	10	7.5	5	0	-5	-10	-15	-20	-25	-30	-35	-40
		HGX66e/1750-4 HGX66e/1750-4 S	30	Q 207000 30.0	189000 29.8	173000 29.5	98500 15.9	143000 28.5	117000 27.1	94000 25.3	75100 23.3	59100 21.1	45700 18.7	34400 16.2
40	Q 182000 36.8		166000 36.2	151000 35.4	86000 19.5	124000 33.5	101000 31.3	81300 28.7	64700 25.9	50600 22.9	38700 19.9	28600 16.8	-	-
50	Q 156000 43.3		142000 42.2	129000 40.9	73300 22.9	106000 38.1	85200 34.9	68300 31.5	54000 27.9	41800 24.1	31400 20.3	-	-	-
HGX66e/2070-4 HGX66e/2070-4 S	30	Q 244000 35.5	223000 35.3	203000 35.0	98500 15.9	167000 33.8	137000 32.1	110000 30.0	88300 27.6	69600 24.9	53800 22.0	40600 19.1	29400 16.1	-
	40	Q 213000 43.8	195000 43.0	177000 42.1	86000 19.5	146000 39.9	119000 37.2	95500 34.1	76100 30.7	59600 27.1	45600 23.4	33700 19.8	-	-
	50	Q 183000 51.7	166000 50.3	151000 48.7	73300 22.9	123000 45.5	99900 41.6	80200 37.5	63400 33.1	49200 28.5	37000 24.0	-	-	-
HGX88e/2400-4 HGX88e/2400-4 S	30	Q 289000 42.0	264000 41.8	241000 41.4	98500 15.9	197000 39.9	161000 38.0	130000 35.6	104000 32.9	81700 29.8	63200 26.5	47600 23.1	34500 19.7	-
	40	Q 255000 51.1	232000 50.3	211000 49.3	86000 19.5	172000 47.0	140000 43.9	113000 40.3	89600 36.5	70100 32.4	53600 28.2	39600 24.0	-	-
	50	Q 219000 59.8	199000 58.3	181000 56.7	73300 22.9	146000 53.6	119000 49.1	94800 44.3	74900 39.2	58000 34.1	43600 28.9	-	-	-
HGX88e/2735-4 HGX88e/2735-4 S	30	Q 328000 47.5	300000 47.2	273000 46.8	98500 15.9	225000 45.3	184000 43.2	149000 40.5	119000 37.4	93100 34.0	72000 30.3	54200 26.5	39300 22.6	-
	40	Q 289000 58.1	263000 57.1	240000 55.9	86000 19.5	196000 53.2	160000 49.7	129000 45.7	103000 41.4	79900 36.9	61100 32.2	45100 27.4	-	-
	50	Q 248000 68.3	226000 66.5	205000 64.6	73300 22.9	167000 60.5	136000 55.5	109000 50.2	85400 44.6	66100 38.8	49700 33.0	-	-	-
HGX88e/3235-4 HGX88e/3235-4 S	30	Q 387000 55.9	354000 55.6	323000 55.1	98500 15.9	265000 53.4	217000 50.9	175000 47.7	140000 44.0	110000 39.9	84700 35.5	63800 31.0	46100 26.4	-
	40	Q 341000 68.4	311000 67.2	283000 65.8	86000 19.5	232000 62.7	189000 58.6	152000 53.9	121000 48.7	94000 43.3	71800 37.7	53000 32.1	-	-
	50	Q 293000 80.3	267000 78.2	242000 75.9	73300 22.9	197000 71.3	160000 65.4	128000 59.0	101000 52.4	77700 45.5	58300 38.6	-	-	-

R449A 50 Hz		Cooling capacity Q_0 [W]												Power consumption P_e [kW]	
Cond. temp. °C		12.5	10	7.5	5	0	-5	-10	-15	-20	-25	-30	-35	-40	
		HGX12P/60-4 S	30	Q 7580 112	6940 113	6330 114	5760 114	4740 113	3860 108	3100 102	2460 0.955	1920 0.870	1470 0.779	1100 0.686	790 0.597
40	Q 6690 141		6100 140	5550 139	5040 137	4120 131	3330 123	2660 114	2090 103	1620 0.928	1230 0.815	905 0.704	644 0.600	429 0.507	
50	Q 5810 173		5280 170	4790 166	4330 161	3510 151	2820 139	2230 126	1730 112	1320 0.985	985 0.845	711 0.712	487 0.588	-	
HGX12P/75-4 HGX12P/75-4 S	30	Q 9430 138	8630 140	7880 141	7180 141	5920 140	4820 135	3880 127	3080 118	2410 107	1850 0.960	1390 0.844	1020 0.732	703 0.629	
	40	Q 8320 175	7600 174	6920 173	6290 170	5150 164	4170 154	3340 142	2640 129	2050 115	1560 101	1170 0.874	834 0.743	564 0.626	
	50	Q 7240 216	6580 213	5970 208	5410 202	4390 191	3530 176	2800 159	2190 141	1680 123	1270 106	922 0.892	641 0.736	-	
HGX12P/90-4 HGX12P/90-4 S	30	Q 11300 167	10300 169	9380 171	8550 171	7040 166	5740 160	4630 151	3680 140	2890 127	2230 113	1680 0.995	1230 0.860	857 0.736	
	40	Q 9890 212	9030 212	8230 210	7480 207	6130 195	4970 184	3990 170	3160 154	2460 137	1880 120	1410 103	1020 0.880	694 0.739	
	50	Q 8600 263	7830 258	7110 253	6440 246	5230 228	4210 210	3350 190	2630 169	2030 148	1530 127	1130 106	789 0.879	-	
HGX12P/110-4 HGX12P/110-4 S	30	Q 13200 195	12100 199	11000 200	10000 201	8240 195	6730 188	5430 178	4320 164	3400 149	2620 133	1980 116	1460 100	1020 0.857	
	40	Q 11600 251	10600 250	9620 247	8750 244	7170 231	5820 217	4670 200	3710 182	2900 162	2220 141	1670 122	1210 103	829 0.864	
	50	Q 10100 312	9130 306	8300 299	7520 291	6110 270	4930 249	3930 225	3090 200	2390 175	1810 150	1340 125	942 103	-	
HGX22e/125-4 HGX22e/125-4 S	30	Q 16500 199	15100 205	13800 209	12500 211	10300 211	8300 206	6650 195	5270 181	4110 165	3150 147	2360 129	1710 111	1170 0.956	
	40	Q 14400 263	13100 263	11900 262	10800 259	8820 250	7130 236	5700 218	4490 198	3480 177	2640 155	1950 134	1360 115	850 0.984	
	50	Q 12300 320	11100 314	10100 308	9110 300	7420 282	5960 260	4740 236	3710 210	2850 185	2130 160	1530 136	1010 116	-	

HG semi-hermetic compressors

Operating limits

R407A



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

- Unlimited application range
- Supplementary cooling or reduced suction gas temperature ($\Delta t_{oh} < 20K$)
- Supplementary cooling and reduced suction gas temperature ($\Delta t_{oh} < 20K$)
- Motor version -S- (more powerful motor)

Max. permissible operating pressure (LP/HP) ¹⁾: 19/28 bar
¹⁾ LP = low pressure, HP = high pressure

Notes

Operating limits

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

Restrictions to the operating limits may occur when using a frequency converter.

Performance data

The performance data for R407A are based on European Standard EN 12900 50 Hz power supply frequency. This signifies: 20 °C suction gas temperature without liquid subcooling. Evaporation and condensing temperatures are based on the dew point values (saturated vapour conditions).

Conversion factor for 60 Hz = 1.2

Performance data for other operating points, see BOCK VAP software (vap.bock.de).

ASERCOM certified performance data



For compressors with this label, the performance data are certified according to the strict requirements of ASERCOM.

ASERCOM is the Association of European Refrigeration Compressors and Controls Manufacturers. Information about the Association and the constantly updated overview of certified BOCK compressors can be found at www.asercom.org and www.bock.de.

HG semi-hermetic compressors

Performance data

R407A 50 Hz														
Type		Cooling capacity Q_0 [kW]											Power consumption P_e [kW]	
		Evaporating temperature °C												
Cond. temp. °C		10	7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40	
HGX66e/1750-4 HGX66e/1750-4 S	30	Q	203000	185000	168000	138000	113000	90200	71700	56200	43300	32400	23300	15400
		P	29.4	29.2	28.9	27.9	26.6	24.9	22.9	20.6	18.2	15.7	13.2	10.7
	40	Q	177000	161000	147000	120000	97100	78000	61800	48200	36700	26800	-	-
	P	36.4	35.8	35.0	33.1	30.8	28.2	25.4	22.4	19.3	16.1	-	-	
	50	Q	152000	138000	125000	102000	82000	65600	51600	39800	29600	-	-	
	P	43.0	41.8	40.5	37.7	34.4	30.9	27.3	23.4	19.6	-	-	-	
HGX66e/2070-4 HGX66e/2070-4 S	30	Q	239000	218000	198000	162000	132000	107000	84400	66200	51000	38200	27500	18200
		P	34.8	34.6	34.3	33.1	31.5	29.5	27.0	24.4	21.5	18.5	15.5	12.5
	40	Q	208000	189000	172000	141000	114000	91600	72700	56700	43200	31600	-	-
	P	43.3	42.5	41.5	39.4	36.6	33.5	30.1	26.5	22.8	19.0	-	-	
	50	Q	178000	161000	146000	119000	96100	77000	60700	46800	34800	-	-	
	P	51.3	49.9	48.3	45.0	41.0	36.8	32.3	27.7	23.1	-	-	-	
HGX88e/2400-4 HGX88e/2400-4 S	30	Q	283000	258000	234000	191000	155000	125000	99200	77800	59900	44900	32300	21400
		P	41.2	41.0	40.6	39.1	37.3	35.0	32.2	29.2	25.9	22.5	19.0	15.5
	40	Q	248000	226000	205000	166000	135000	108000	85600	66700	50800	37200	-	-
	P	50.6	49.7	48.7	46.4	43.2	39.6	35.8	31.7	27.4	23.1	-	-	
	50	Q	213000	194000	175000	141000	114000	91000	71600	55200	41100	-	-	
	P	59.5	57.9	56.2	52.9	48.4	43.5	38.4	33.2	27.9	-	-	-	
HGX88e/2735-4 HGX88e/2735-4 S	30	Q	321000	293000	266000	218000	177000	143000	114000	88600	68200	51100	36700	24300
		P	46.6	46.4	45.9	44.4	42.4	39.8	36.7	33.3	29.6	25.7	21.7	17.7
	40	Q	281000	256000	232000	190000	154000	124000	97600	76100	57900	42400	-	-
	P	57.5	56.5	55.3	52.5	49.0	45.0	40.7	36.1	31.3	26.4	-	-	
	50	Q	242000	219000	199000	161000	131000	104000	81700	62900	46800	-	-	
	P	67.9	66.0	64.0	59.8	54.7	49.3	43.6	37.8	31.8	-	-	-	
HGX88e/3235-4 HGX88e/3235-4 S	30	Q	379000	346000	314000	257000	209000	168000	134000	105000	80300	60100	43100	28500
		P	54.9	54.6	54.1	52.4	49.9	46.9	43.2	39.1	34.7	30.1	25.4	20.7
	40	Q	332000	302000	274000	224000	181000	146000	115000	89500	68000	49700	-	-
	P	67.7	66.5	65.1	61.9	57.7	53.0	47.8	42.3	36.7	30.9	-	-	
	50	Q	285000	259000	234000	190000	154000	123000	96100	73900	54900	-	-	
	P	79.8	77.6	75.2	70.5	64.5	58.0	51.2	44.3	37.2	-	-	-	

Relating to 20 °C suction gas temperature without liquid subcooling

Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temperature

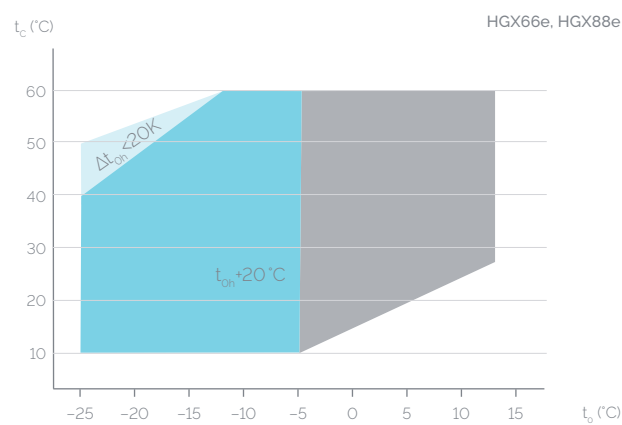
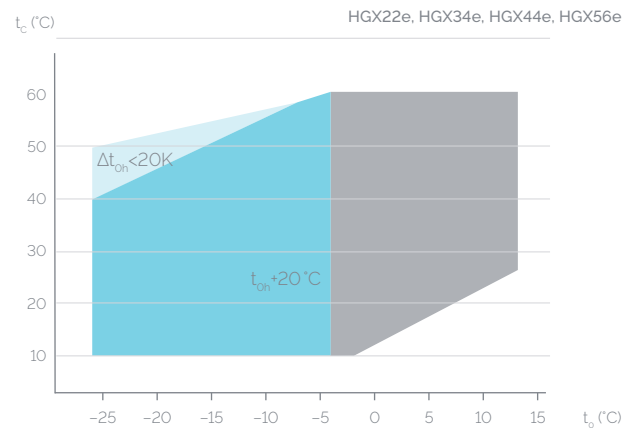
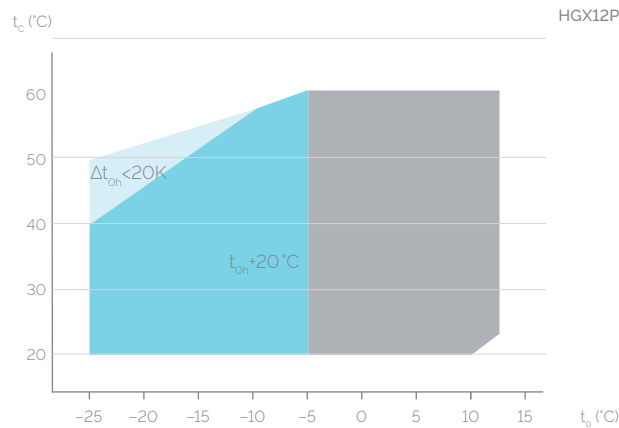
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HG semi-hermetic compressors

Operating limits

R407C



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

- Unlimited application range
- Supplementary cooling or reduced suction gas temperature ($\Delta t_{oh} < 20K$)
- Motor version -S- (more powerful motor)

Max. permissible operating pressure (LP/HP) ¹⁾: 19/28 bar
¹⁾ LP = low pressure, HP = high pressure

Notes

Operating limits

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

Restrictions to operating limits may occur when using a frequency converter. For further explanations consult www.bock.de.

Performance data

The performance data for R407C are based on European Standard EN 12900 50 Hz power supply frequency. This signifies: 20 °C suction gas temperature without liquid subcooling.

Evaporation and condensing temperatures are based on the dew point values (saturated vapour conditions).

A comprehensive modification to 20 °C suction gas temperature will follow at a later date.

This results in significant differences compared to specifications with liquid undercooling and/or suction-gas temperatures.

Conversion factor for 60 Hz = 1.2

Performance data for other operating points, see BOCK VAP software (vap.bock.de).

HG semi-hermetic compressors

Performance data

R407C 50 Hz												
Type		Cooling capacity Q_o [kW]						Power consumption P_e [kW]				
		Evaporating temperature °C										
		12.5	10	7.5	5	0	-5	-10	-15	-20	-25	
Cond. temp. °C												
HGX12P/60-4 S	30	Q	6780	6180	5610	5080	4140	3330	2650	2080	1610	1230
		P	0.88	0.90	0.92	0.92	0.91	0.88	0.82	0.76	0.69	0.62
	40	Q	5870	5340	4840	4380	3560	2860	2270	1780	1360	1020
		P	1.16	1.16	1.15	1.13	1.08	1.01	0.92	0.83	0.74	0.66
	50	Q	5010	4550	4120	3720	3020	2420	1920	1490	1130	827
		P	1.41	1.39	1.35	1.31	1.22	1.12	1.00	0.90	0.79	0.69
HGX12P/75-4 HGX12P/75-4 S	30	Q	8740	7960	7230	6550	5340	4300	3420	2680	2080	1580
		P	1.12	1.16	1.18	1.18	1.17	1.13	1.06	0.98	0.89	0.79
	40	Q	7560	6880	6240	5650	4590	3690	2920	2290	1760	1320
		P	1.50	1.49	1.48	1.46	1.39	1.30	1.19	1.07	0.96	0.84
	50	Q	6450	5860	5310	4800	3890	3120	2470	1920	1460	1070
		P	1.82	1.79	1.74	1.69	1.58	1.44	1.29	1.15	1.01	0.89
HGX12P/90-4 HGX12P/90-4 S	30	Q	10500	9490	8620	7810	6360	5120	4080	3200	2480	1890
		P	1.34	1.38	1.40	1.41	1.40	1.34	1.26	1.16	1.05	0.95
	40	Q	9020	8200	7440	6730	5470	4400	3490	2730	2090	1570
		P	1.79	1.78	1.77	1.74	1.66	1.55	1.42	1.28	1.13	1.00
	50	Q	7690	6990	6330	5720	4640	3720	2940	2290	1740	1280
		P	2.17	2.13	2.08	2.02	1.88	1.72	1.55	1.37	1.21	1.06
HGX12P/110-4 HGX12P/110-4 S	30	Q	12300	11200	10200	9180	7480	6020	4790	3760	2910	2220
		P	1.58	1.62	1.65	1.66	1.64	1.58	1.48	1.37	1.24	1.11
	40	Q	10600	9640	8750	7910	6430	5170	4100	3200	2460	1850
		P	2.10	2.10	2.08	2.05	1.95	1.82	1.67	1.50	1.33	1.18
	50	Q	9040	8210	7440	6730	5460	4370	3460	2690	2040	1500
		P	2.56	2.51	2.45	2.38	2.21	2.02	1.82	1.61	1.42	1.25
HGX22e/125-4 HGX22e/125-4 S	30	Q	14400	13100	11900	10800	8790	7070	5630	4420	3420	2600
		P	1.78	1.82	1.85	1.87	1.85	1.78	1.67	1.53	1.39	1.25
	40	Q	12500	11400	10300	9300	7560	6060	4800	3760	2890	2160
		P	2.36	2.35	2.33	2.30	2.19	2.04	1.87	1.68	1.5	1.32
	50	Q	10700	9640	8740	7910	6410	5120	4050	3150	2400	1760
		P	2.87	2.81	2.75	2.67	2.48	2.27	2.04	1.81	1.59	1.40
HHGX22e/160-4 HGX22e/160-4 S	30	Q	17600	16000	14500	13200	10700	8730	6950	5470	4240	3230
		P	2.18	2.24	2.28	2.30	2.27	2.30	2.16	1.99	1.79	1.61
	40	Q	15200	13800	12500	11300	9180	7500	5950	4650	3580	2680
		P	2.90	2.90	2.87	2.83	2.69	2.64	2.42	2.18	1.94	1.72
	50	Q	12900	11700	10700	9590	7780	6350	5020	3900	2970	2180
		P	3.53	3.46	3.38	3.28	3.05	2.93	2.64	2.34	2.06	1.81
HGX22e/190-4 HGX22e/190-4 S	30	Q	21800	19900	18100	16400	13300	10800	8550	6700	5180	3960
		P	2.67	2.74	2.79	2.81	2.78	2.83	2.65	2.44	2.20	1.98
	40	Q	18900	17200	15600	14100	11500	9220	7310	5710	4390	3290
		P	3.54	3.54	3.51	3.46	3.29	3.25	2.97	2.68	2.38	2.10
	50	Q	16100	14600	13300	12000	9700	7790	6170	4810	3650	2670
		P	4.31	4.23	4.13	4.01	3.73	3.60	3.24	2.87	2.53	2.22
HGX34e/215-4 HGX34e/215-4 S	30	Q	25600	23300	21100	19100	15600	12200	9720	7650	5910	4480
		P	3.45	3.49	3.50	3.48	3.39	3.16	2.94	2.67	2.38	2.09
	40	Q	22400	20300	18400	16600	13400	10400	8190	6410	4920	3700
		P	4.38	4.33	4.26	4.17	3.94	3.60	3.25	2.89	2.52	2.17
	50	Q	19100	17300	15600	14100	11300	8590	6820	5330	4100	3100
		P	5.19	5.06	4.91	4.75	4.39	3.98	3.54	3.09	2.66	2.27
HGX34e/255-4 HGX34e/255-4 S	30	Q	29600	27000	24600	22300	18300	14500	11500	9040	7030	5300
		P	4.30	4.30	4.28	4.23	4.08	3.84	3.54	3.20	2.85	2.48
	40	Q	26000	23600	21500	19500	15800	12300	9730	7660	5940	4430
		P	5.33	5.24	5.13	5.00	4.71	4.38	3.94	3.50	3.06	2.63
	50	Q	22200	20200	18300	16500	13400	10200	8080	6420	5050	3820
		P	6.25	6.08	5.89	5.69	5.25	4.83	4.29	3.76	3.26	2.79
HGX34e/315-4 HGX34e/315-4 S	30	Q	35900	32700	29800	27000	22100	17600	14100	11100	8590	6550
		P	4.95	5.00	5.01	4.99	4.86	4.69	4.34	3.96	3.55	3.11
	40	Q	31300	28500	25900	23500	19200	15100	12000	9420	7260	5500
		P	6.32	6.25	6.16	6.04	5.72	5.33	4.85	4.33	3.80	3.27
	50	Q	26800	24300	22100	20000	16200	12800	10200	7910	6060	4550
		P	7.63	7.45	7.24	7.02	6.50	5.87	5.25	4.63	3.99	3.37

Relating to 20 °C suction gas temperature without liquid subcooling

Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temperature

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HG semi-hermetic compressors

Performance data

R407C | 50 Hz

Type		Cooling capacity Q_o [W]					Power consumption P_e [kW]					
		Evaporating temperature °C										
Cond. temp. °C		12.5	10	7.5	5	0	-5	-10	-15	-20	-25	
		HGX34e/380-4 HGX34e/380-4 S	30	Q	43500	39600	36000	32700	26700	21600	17500	13900
P	6.40			6.35	6.27	6.17	5.93	5.84	5.38	4.91	4.42	3.90
40	Q		38000	34600	31400	28400	23200	18700	15100	12000	9320	7140
	P		7.95	7.78	7.59	7.39	6.94	6.71	6.08	5.45	4.82	4.18
50	Q		32200	29300	26500	24000	19600	15800	12800	10100	7900	6070
	P		9.52	9.23	8.92	8.60	7.93	7.49	6.69	5.91	5.13	4.36
HGX44e/475-4 HGX44e/475-4 S	30	Q	56600	51700	47100	42800	35200	28500	22900	18100	14100	10700
		P	7.20	7.25	7.25	7.21	7.03	6.66	6.24	5.73	5.18	4.59
	40	Q	50200	45800	41700	37800	30900	24900	19900	15600	12000	8850
		P	9.13	9.03	8.89	8.72	8.28	7.69	7.05	6.35	5.61	4.87
	50	Q	43600	39700	36000	32600	26500	21200	16800	13100	9850	7100
		P	10.80	10.50	10.30	10.00	9.33	8.54	7.69	6.80	5.90	5.02
HGX44e/565-4 HGX44e/565-4 S	30	Q	67400	61600	56200	51100	42000	33900	27300	21700	17000	12900
		P	8.54	8.60	8.61	8.56	8.34	7.93	7.42	6.81	6.14	5.44
	40	Q	60000	54700	49800	45200	37000	29700	23800	18700	14500	10800
		P	10.80	10.70	10.50	10.30	9.83	9.18	8.40	7.55	6.67	5.78
	50	Q	52200	47500	43100	39000	31800	25300	20100	15700	12000	8650
		P	12.80	12.50	12.20	11.80	11.00	10.20	9.18	8.10	7.01	5.95
HGX44e/665-4 HGX44e/665-4 S ¹⁾	30	Q	78700	71900	65500	59600	48900	40000	32200	25500	19800	15000
		P	10.00	10.00	10.00	10.00	9.76	9.23	8.65	7.95	7.17	6.36
	40	Q	69800	63600	57900	52500	42900	34900	27900	21900	16800	12400
		P	12.70	12.50	12.30	12.10	11.50	10.60	9.77	8.80	7.78	6.75
	50	Q	60600	55100	49900	45200	36700	29700	23500	18300	13800	9890
		P	15.10	14.70	14.40	13.90	13.00	11.80	10.60	9.43	8.18	6.96
HGX44e/770-4 HGX44e/770-4 S	30	Q	92000	84000	76600	69600	57100	46300	37100	29300	22700	17000
		P	11.60	11.70	11.70	11.60	11.30	10.80	10.00	9.22	8.26	7.23
	40	Q	81400	74200	67400	61200	49900	40300	32000	25000	19000	13900
		P	14.80	14.70	14.40	14.10	13.30	12.40	11.30	10.00	8.82	7.51
	50	Q	70400	64000	58000	52400	42500	34000	26800	20600	15400	10800
		P	17.60	17.20	16.70	16.20	15.00	13.60	12.10	10.60	9.06	7.49
HGX56e/850-4 HGX56e/850-4 S	30	Q	101000	92000	83900	76300	62800	50900	41000	32600	25400	19300
		P	12.7	12.8	12.8	12.7	12.4	11.8	11.1	10.2	9.23	8.17
	40	Q	89400	81500	74200	67400	55200	44500	35700	28100	21700	16100
		P	16.2	16.0	15.8	15.4	14.7	13.7	12.5	11.3	10.0	8.68
	50	Q	77600	70600	64100	58100	47300	38000	30200	23600	18000	13000
		P	19.3	18.8	18.3	17.8	16.5	15.2	13.7	12.1	10.5	8.93
HGX56e/995-4 HGX56e/995-4 S	30	Q	121000	111000	101000	91500	75400	61200	49300	39100	30500	23200
		P	14.3	14.5	14.6	14.6	14.4	13.8	13.0	11.9	10.7	9.45
	40	Q	107000	96900	88300	80300	65900	53300	42700	33600	25900	19400
		P	18.8	18.7	18.5	18.2	17.3	16.2	14.8	13.3	11.6	10.0
	50	Q	92100	83900	76400	69300	56700	45600	36300	28400	21600	15800
		P	23.1	22.6	22.0	21.4	19.9	18.2	16.3	14.3	12.2	10.2
HGX56e/1155-4 HGX56e/1155-4 S	30	Q	139000	127000	115000	105000	85600	69200	55500	43800	33900	25400
		P	18.2	18.3	18.3	18.2	17.7	16.9	15.7	14.4	12.8	11.2
	40	Q	123000	112000	102000	91800	74900	60100	47800	37300	28400	20700
		P	23.1	22.9	22.5	22.0	20.8	19.4	17.6	15.7	13.7	11.7
	50	Q	106000	96100	87100	78700	63800	50800	40000	30800	23000	16100
		P	27.4	26.8	26.0	25.2	23.4	21.3	19.0	16.6	14.1	11.6
HGX66e/1340-4 HGX66e/1340-4 S	30	Q	164000	149000	136000	123000	101000	80800	64600	51000	39500	29900
		P	21.3	21.1	20.9	20.6	19.8	18.8	17.6	16.1	14.5	12.6
	40	Q	144000	131000	119000	108000	87800	70300	56000	43900	33700	25100
		P	26.4	25.9	25.4	24.8	23.4	21.7	19.9	17.9	15.6	13.2
	50	Q	124000	113000	102000	92200	74900	59600	47300	36800	27900	20300
		P	31.3	30.5	29.6	28.6	26.5	24.2	21.7	19.0	16.1	13.1
HGX66e/1540-4 HGX66e/1540-4 S	30	Q	187000	171000	156000	141000	116000	92900	74500	59000	45900	34800
		P	24.4	24.3	24.0	23.7	22.8	21.7	20.3	18.7	16.8	14.7
	40	Q	165000	150000	137000	124000	102000	81000	64800	51000	39300	29400
		P	30.5	29.9	29.3	28.6	27.0	25.2	23.1	20.8	18.3	15.5
	50	Q	142000	129000	118000	107000	86400	69000	54900	43000	32800	24000
		P	36.3	35.3	34.3	33.2	30.8	28.2	25.4	22.3	19.0	15.5

¹⁾ ASERCOM certified

Relating to 20 °C suction gas temperature without liquid subcooling

Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temperature

vap.bock.de



HG semi-hermetic compressors

Performance data

R407C 50 Hz												
Type		Cooling capacity Q_o [kW]					Power consumption P_e [kW]					
		Evaporating temperature °C										
Cond. temp. °C		12.5	10	7.5	5	0	-5	-10	-15	-20	-25	
HGX66e/1750-4 HGX66e/1750-4 S	30	Q	212000	194000	177000	160000	132000	107000	85300	67500	52500	39900
		P	28.0	27.8	27.5	27.1	26.2	24.8	23.2	21.4	19.3	16.9
	40	Q	187000	171000	155000	141000	115000	92800	74200	58500	45100	33800
		P	34.9	34.2	33.5	32.7	31.0	28.8	26.4	23.8	21.0	17.8
	50	Q	161000	147000	133000	121000	98100	79100	63000	49400	37700	27600
		P	41.5	40.4	39.2	38.0	35.3	32.3	29.0	25.5	21.8	17.8
HGX66e/2070-4 HGX66e/2070-4 S	30	Q	250000	228000	208000	189000	155000	126000	101000	79500	61900	47100
		P	33.1	32.8	32.5	32.0	30.9	29.3	27.5	25.3	22.8	19.9
	40	Q	220000	200000	182000	165000	135000	109000	87300	68800	53200	39800
		P	41.4	40.6	39.8	38.8	36.7	34.2	31.3	28.2	24.8	21.0
	50	Q	189000	172000	156000	142000	116000	92800	74000	58100	44400	32500
		P	49.5	48.1	46.7	45.2	41.9	38.4	34.4	30.2	25.7	21.0
HGX88e/2400-4 HGX88e/2400-4 S	30	Q	296000	270000	246000	223000	183000	147000	118000	93300	72600	55200
		P	39.3	39.0	38.6	38.1	36.9	34.8	32.7	30.2	27.3	24.1
	40	Q	261000	238000	217000	196000	161000	129000	103000	81000	62500	46800
		P	48.5	47.7	46.7	45.7	43.3	40.4	37.2	33.6	29.6	25.4
	50	Q	226000	206000	187000	169000	138000	110000	87400	68500	52300	38400
		P	57.5	56.0	54.4	52.7	49.1	45.3	40.8	36.0	30.9	25.5
HGX88e/2735-4 HGX88e/2735-4 S	30	Q	336000	306000	279000	253000	208000	168000	135000	107000	82700	62900
		P	44.4	44.1	43.6	43.1	41.7	39.6	37.3	34.5	31.2	27.5
	40	Q	296000	270000	246000	223000	182000	147000	118000	92300	71200	53300
		P	55.1	54.1	53.0	51.8	49.1	45.9	42.3	38.2	33.8	29.1
	50	Q	257000	233000	212000	192000	156000	126000	99700	78100	59600	43700
		P	65.5	63.8	61.9	60.0	55.8	51.3	46.3	40.9	35.2	29.2
HGX88e/3235-4 HGX88e/3235-4 S	30	Q	396000	362000	329000	299000	245000	198000	159000	126000	97500	74000
		P	52.3	51.9	51.4	50.8	49.1	46.7	43.9	40.5	36.7	32.3
	40	Q	350000	319000	290000	263000	215000	173000	139000	109000	83800	62700
		P	64.9	63.7	62.4	61.0	57.8	54.0	49.7	44.9	39.7	34.0
	50	Q	303000	275000	250000	226000	184000	148000	118000	91800	70000	51300
		P	77.1	75.0	72.8	70.5	65.6	60.4	54.4	48.0	41.2	34.1

Relating to 20 °C suction gas temperature without liquid subcooling

Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temperature

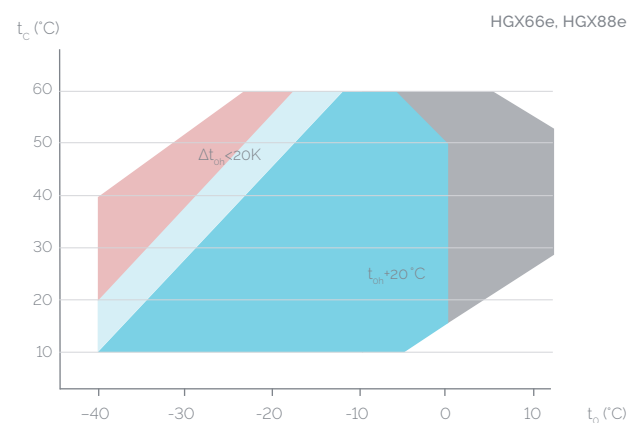
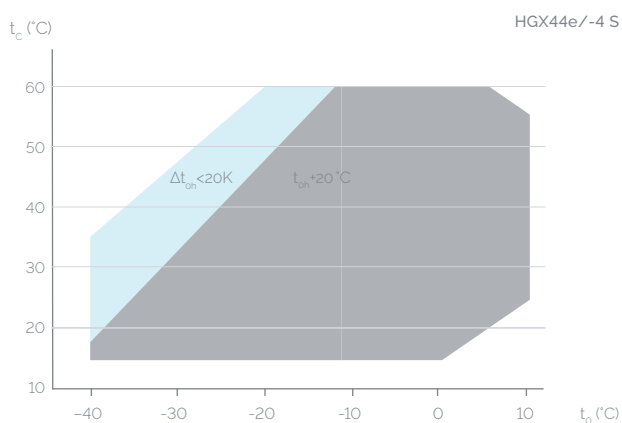
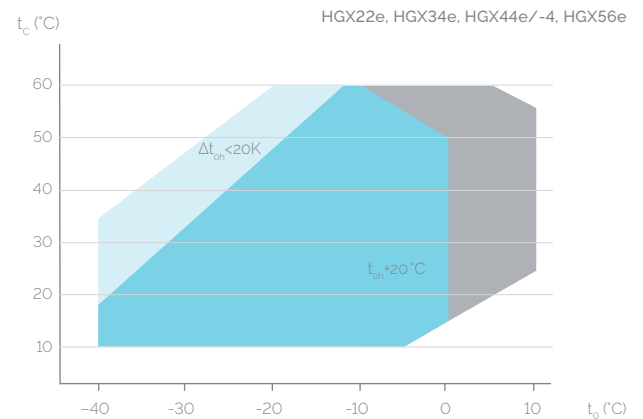
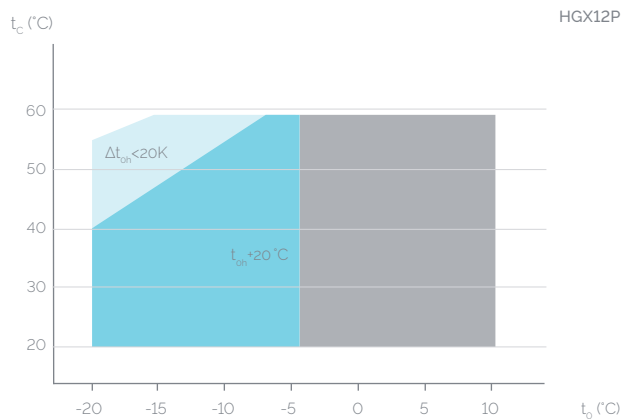
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HG semi-hermetic compressors

Operating limits

R407F



t_0 Evaporating temperature (°C)
 t_c Condensing temperature (°C)
 Δt_{oh} Suction gas superheat (K)
 t_{oh} Suction gas temperature (°C)

- Unlimited application range
- Supplementary cooling or reduced suction gas temperature ($\Delta t_{oh} < 20K$)
- Supplementary cooling and reduced suction gas temperature ($\Delta t_{oh} < 20K$)
- Motor version -S- (more powerful motor)

Max. permissible operating pressure (LP/HP)¹⁾: 19/28 bar
¹⁾ LP = low pressure, HP = high pressure

Notes

Operating limits

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

Restrictions to operating limits may occur when using a frequency converter.

For further explanations consult www.bock.de.

Performance data

The performance data for R407F are based on European Standard EN 12900 with a 50 Hz power supply frequency. This signifies: 20 °C suction gas temperature without liquid subcooling.

Evaporation and condensing temperatures are based on the dew point values (saturated vapour conditions).

Conversion factor for 60 Hz = 1.2

Performance data for other operating points, see BOCK VAP software (vap.bock.de).

ASERCOM certified performance data



For compressors with this label, the performance data are certified according to the strict requirements of ASERCOM.

ASERCOM is the Association of European Refrigeration Compressors and Controls Manufacturers.

Information about the Association and the constantly updated overview of certified BOCK compressors can be found at www.asercom.org and www.bock.de.

HG semi-hermetic compressors

Performance data

R407F 50 Hz														
Type		Cooling capacity Q_0 [kW]							Power consumption P_e [kW]					
		Evaporating temperature °C												
		10	7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40	
Cond. temp. °C														
HGX12P/60-4 S	30	Q	7240	6570	5950	4840	3890	3080	2410	1850	-	-	-	-
		P	110	113	115	115	112	106	0.982	0.894	-	-	-	-
	40	Q	6290	5700	5150	4180	3340	2640	2040	1540	-	-	-	-
		P	141	142	140	136	127	117	106	0.948	-	-	-	-
	50	Q	5300	4800	4330	3490	2780	2170	1660	1220	-	-	-	-
		P	167	164	160	151	138	124	110	0.963	-	-	-	-
HGX12P/75-4 HGX12P/75-4 S	30	Q	9010	8200	7440	6090	4950	3960	3130	2430	-	-	-	-
		P	139	143	146	146	140	133	123	112	-	-	-	-
	40	Q	7850	7140	6470	5290	4310	3440	2690	2070	-	-	-	-
		P	182	182	180	174	162	149	136	121	-	-	-	-
	50	Q	6670	6060	5490	4480	3670	2910	2260	1720	-	-	-	-
		P	215	211	206	194	178	161	144	127	-	-	-	-
HGX12P/90-4 HGX12P/90-4 S	30	Q	10800	9780	8880	7270	5760	4620	3650	2840	-	-	-	-
		P	171	174	176	175	166	155	143	129	-	-	-	-
	40	Q	9380	8530	7740	6320	5020	4000	3140	2400	-	-	-	-
		P	218	217	214	206	189	173	155	138	-	-	-	-
	50	Q	7990	7260	6580	5370	4270	3370	2620	1980	-	-	-	-
		P	260	255	248	232	209	187	165	144	-	-	-	-
HGX12P/110-4 HGX12P/110-4 S	30	Q	12500	11300	10300	8420	6830	5510	4390	3440	-	-	-	-
		P	201	204	206	203	201	188	173	157	-	-	-	-
	40	Q	10900	9860	8960	7330	5970	4800	3790	2940	-	-	-	-
		P	254	252	250	240	231	211	189	168	-	-	-	-
	50	Q	9160	8330	7560	6180	5070	4040	3170	2430	-	-	-	-
		P	304	298	291	272	254	227	200	174	-	-	-	-
HGX22e/125-4 HGX22e/125-4 S	30	Q	15400	14100	12800	10600	8560	6860	5410	4190	3180	2350	1690	1160
		P	225	226	226	222	214	203	189	174	157	139	122	105
	40	Q	13600	12400	11200	9180	7420	5910	4630	3560	2670	1940	1360	-
		P	281	277	272	260	244	226	207	187	166	146	127	-
	50	Q	11700	10600	9580	7800	6260	4950	3840	2920	2160	-	-	-
		P	335	325	316	294	271	247	222	197	173	-	-	-
HHGX22e/160-4 HGX22e/160-4 S	30	Q	19600	17900	16300	13100	10600	8470	6740	5300	4110	3120	2280	1520
		P	298	293	288	277	261	246	232	217	201	181	158	130
	40	Q	17500	15900	14400	11600	9300	7440	5890	4580	3490	2540	1690	-
		P	359	349	339	322	299	279	258	237	214	187	157	-
	50	Q	15300	13800	12500	10200	8140	6460	5040	3820	2770	-	-	-
		P	420	405	390	367	337	309	280	251	219	-	-	-
HGX22e/190-4 HGX22e/190-4 S	30	Q	22700	20800	19000	15800	13000	10600	8450	6680	5200	3960	2940	2100
		P	385	373	362	352	327	304	282	260	238	214	188	159
	40	Q	20000	18300	16700	13900	11400	9180	7330	5770	4460	3370	2450	-
		P	464	446	430	412	377	346	316	287	258	229	198	-
	50	Q	17400	15900	14500	11900	9680	7790	6180	4830	3700	-	-	-
		P	547	524	502	472	427	385	346	309	272	-	-	-
HGX34e/215-4 HGX34e/215-4 S	30	Q	25900	23600	21400	17200	13900	11100	8570	6520	4820	3430	2320	1450
		P	362	361	357	348	329	305	277	247	217	188	161	138
	40	Q	22700	20600	18600	14800	11800	9230	7080	5290	3840	2680	1770	-
		P	470	457	443	418	381	341	301	262	224	191	163	-
	50	Q	19400	17500	15700	12300	9650	7460	5650	4180	3020	-	-	-
		P	568	545	520	480	426	372	320	272	229	-	-	-
HGX34e/255-4 HGX34e/255-4 S	30	Q	30300	27700	25200	20500	16700	13400	10500	8020	5970	4280	2910	1820
		P	383	392	398	405	394	373	344	310	272	233	196	161
	40	Q	26300	24000	21800	17600	14300	11400	8860	6760	5000	3540	2360	-
		P	505	504	499	492	462	425	381	334	286	239	194	-
	50	Q	22000	20000	18100	14500	11700	9230	7190	5470	4050	-	-	-
		P	615	603	588	567	519	465	407	347	289	-	-	-
HGX34e/315-4 HGX34e/315-4 S	30	Q	38500	34900	31700	25600	20600	16400	12900	9900	7460	5450	3800	2430
		P	504	507	507	491	472	445	411	371	327	282	236	191
	40	Q	33500	30400	27500	22100	17700	14000	11000	8350	6230	4470	3000	-
		P	644	636	625	590	552	507	457	402	346	289	232	-
	50	Q	28500	25700	23200	18500	14800	11600	8990	6840	5070	-	-	-
		P	776	757	735	680	623	559	492	422	351	-	-	-

Relating to 20 °C suction gas temperature without liquid subcooling

Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temperature

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HG semi-hermetic compressors

Performance data

R407F | 50 Hz

Type		Cooling capacity Q_0 [kW]											Power consumption P_e [kW]	
		Evaporating temperature °C												
		10	7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40	
Cond. temp. °C	Q P													
		HGX34e/380-4 HGX34e/380-4 S	30	45700 6.39	41600 6.39	37800 6.36	30700 6.15	25000 5.88	20100 5.53	15900 5.09	12400 4.60	9460 4.07	7040 3.51	5030 2.94
40	39900 8.05		36200 7.93	32900 7.77	26500 7.34	21500 6.85	17200 6.29	13600 5.67	10600 5.00	8000 4.31	5870 3.61	4050 2.92	-	
50	33800 9.65		30700 9.39	27800 9.10	22300 8.45	18000 7.73	14400 6.94	11300 6.11	8760 5.26	6630 4.40	-	-	-	
30	58200 7.56		53100 7.67	48400 7.73	39600 7.62	32300 7.37	26000 6.98	20600 6.45	16100 5.84	12400 5.15	9210 4.43	6640 3.71	4520 3.00	
40	51000 9.81		46500 9.74	42400 9.63	34500 9.22	28100 8.67	22600 7.99	17900 7.21	13900 6.36	10500 5.46	7620 4.55	5210 3.65	-	
50	43900 11.8		40000 11.6	36300 11.3	29400 10.6	23900 9.78	19100 8.81	15000 7.76	11500 6.67	8460 5.55	-	-	-	
HGX44e/475-4 HGX44e/475-4 S	30	69400 9.05	63400 9.18	57800 9.24	47100 9.13	38500 8.84	31000 8.36	24700 7.73	19400 6.99	14900 6.16	11200 5.30	8120 4.42	5600 3.57	
	40	61000 11.7	55700 11.6	50700 11.5	41100 11.1	33500 10.4	27000 9.61	21500 8.66	16700 7.63	12800 6.54	9330 5.44	6460 4.36	-	
	50	52600 14.1	47900 13.8	43600 13.5	35100 12.8	28600 11.8	22900 10.6	18100 9.35	14000 8.02	10400 6.66	-	-	-	
	30	81800 10.5	74700 10.6	68000 10.7	55700 10.6	45400 10.2	36500 9.72	29000 9.00	22600 8.15	17300 7.20	12900 6.20	9260 5.18	6270 4.19	
	40	71600 13.6	65300 13.5	59400 13.4	48500 12.8	39400 12.0	31600 11.1	25000 10.0	19400 8.88	14700 7.63	10700 6.36	7220 5.11	-	
	50	61600 16.5	56000 16.2	50900 15.8	41300 14.8	33400 13.6	26700 12.3	20900 10.8	16000 9.33	11800 7.78	-	-	-	
HGX44e/665-4 HGX44e/665-4 S ¹⁾	30	93600 12.1	85500 12.3	77900 12.4	64300 12.3	52400 11.9	42200 11.3	33600 10.4	26300 9.50	20200 8.42	15100 7.29	10900 6.16	7350 5.08	
	40	82000 15.8	74900 15.7	68200 15.5	56100 14.9	45700 14.0	36700 12.9	29100 11.7	22600 10.3	17100 8.99	12500 7.58	8480 6.20	-	
	50	70500 19.2	64300 18.8	58400 18.3	47900 17.2	38900 15.8	31100 14.3	24400 12.7	18700 11.0	13900 9.27	-	-	-	
	30	104000 13.5	94600 13.7	86300 13.8	70700 13.6	57800 13.2	46600 12.5	37100 11.6	29100 10.4	22400 9.26	16800 7.96	12200 6.64	8390 5.36	
	40	90800 17.5	82900 17.4	75500 17.2	61800 16.5	50400 15.5	40600 14.3	32200 12.9	25100 11.4	19100 9.82	14100 8.18	9680 6.55	-	
	50	78100 21.3	71200 20.8	64700 20.3	52700 19.1	42900 17.5	34400 15.8	27200 13.9	21000 12.0	15600 10.0	-	-	-	
HGX56e/850-4 HGX56e/850-4 S	30	122000 16.5	112000 16.5	102000 16.4	83700 16.0	68600 15.4	55500 14.5	44200 13.4	34600 12.1	26600 10.7	19800 9.23	14100 7.65	9420 6.04	
	40	108000 20.9	98400 20.6	89700 20.2	73600 19.3	60000 18.0	48200 16.6	38100 15.0	29600 13.2	22300 11.3	16200 9.38	11000 7.36	-	
	50	93700 25.1	85400 24.4	77600 23.8	63100 22.2	51100 20.4	40700 18.4	31900 16.2	24300 13.9	17900 11.4	-	-	-	
	30	141000 18.9	129000 19.2	117000 19.3	96000 19.2	78300 18.6	63100 17.6	50200 16.3	39300 14.8	30100 13.1	22500 11.3	16300 9.59	11100 7.89	
	40	124000 24.6	113000 24.4	103000 24.1	83800 23.4	68200 22.0	54900 20.3	43500 18.3	33800 16.2	25600 14.0	18700 11.8	12700 9.65	-	
	50	106000 29.8	96600 29.2	87800 28.5	71500 27.0	58000 24.9	46400 22.5	36500 19.9	28000 17.2	20700 14.4	-	-	-	
HGX66e/1340-4 HGX66e/1340-4 S	30	164000 23.1	149000 23.0	136000 22.8	111000 22.1	89600 21.0	71900 19.6	56900 17.9	44300 16.1	33800 14.2	25000 12.2	-	-	
	40	144000 29.0	131000 28.5	119000 27.8	96300 26.3	78000 24.4	62400 22.3	49100 19.9	38000 17.5	28700 15.0	-	-	-	
	50	124000 34.5	113000 33.4	102000 32.3	82200 30.0	66200 27.3	52600 24.4	41100 21.4	31500 18.3	-	-	-	-	
	30	187000 26.6	171000 26.5	156000 26.3	127000 25.5	103000 24.3	82900 22.7	65800 20.8	51400 18.7	39300 16.5	29300 14.2	-	-	
	40	165000 33.6	150000 32.9	137000 32.2	111000 30.5	89800 28.3	72000 25.9	57000 23.3	44300 20.5	33600 17.6	-	-	-	
	50	143000 40.1	130000 38.9	118000 37.6	94600 35.0	76400 31.9	61000 28.6	47900 25.1	36900 21.6	-	-	-	-	

¹⁾ ASERCOM certified

Relating to 20 °C suction gas temperature without liquid subcooling

Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temperature

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HG semi-hermetic compressors

Performance data

R407F | 50 Hz

Type		Cooling capacity Q_o [kW]											Power consumption P_e [kW]			
		Evaporating temperature °C														
Cond. temp. °C		10	7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40			
HGX66e/1750-4 HGX66e/1750-4 S	30	Q	212000	194000	177000	145000	118000	94900	75300	58900	45100	33600	-	-		
		P	30.5	30.4	30.1	29.1	27.7	25.9	23.8	21.4	18.9	16.4	-	-		
	40	Q	187000	171000	155000	127000	103000	82600	65300	50800	38600	-	-	-		
		P	38.3	37.6	36.8	34.8	32.3	29.6	26.6	23.5	20.2	-	-	-		
	50	Q	162000	147000	133000	109000	87600	69900	55000	42400	-	-	-	-		
		P	45.8	44.4	43.0	40.0	36.4	32.7	28.8	24.8	-	-	-	-		
HGX66e/2070-4 HGX66e/2070-4 S	30	Q	250000	228000	207000	171000	139000	112000	88700	69300	53100	39700	-	-		
		P	36.1	36.0	35.7	34.5	32.8	30.7	28.1	25.3	22.3	19.3	-	-		
	40	Q	219000	200000	182000	149000	121000	97000	76800	59800	45400	-	-	-		
		P	45.6	44.8	43.8	41.4	38.5	35.1	31.5	27.7	23.9	-	-	-		
	50	Q	189000	172000	156000	127000	103000	82000	64600	49900	-	-	-	-		
		P	54.7	53.1	51.3	47.8	43.5	38.9	34.2	29.3	-	-	-	-		
HGX88e/2400-4 HGX88e/2400-4 S	30	Q	296000	270000	246000	201000	163000	132000	105000	81400	62400	46500	-	-		
		P	42.7	42.5	42.2	40.8	38.9	36.4	33.5	30.3	26.9	23.3	-	-		
	40	Q	262000	239000	217000	176000	143000	115000	90500	70400	53400	-	-	-		
		P	53.2	52.3	51.1	48.8	45.4	41.6	37.4	33.1	28.7	-	-	-		
	50	Q	227000	207000	187000	151000	122000	97100	76300	58800	-	-	-	-		
		P	63.2	61.4	59.5	56.1	51.2	45.9	40.5	35.0	-	-	-	-		
HGX88e/2735-4 HGX88e/2735-4 S	30	Q	336000	307000	279000	230000	187000	150000	119000	93000	71200	53100	-	-		
		P	48.3	48.1	47.7	46.3	44.2	41.5	38.3	34.7	30.9	26.9	-	-		
	40	Q	297000	271000	246000	202000	164000	131000	104000	80400	61000	-	-	-		
		P	60.5	59.4	58.1	55.0	51.4	47.2	42.7	37.9	33.0	-	-	-		
	50	Q	258000	234000	212000	173000	140000	112000	87300	67200	-	-	-	-		
		P	72.2	70.1	67.9	63.0	57.7	52.0	46.1	40.0	-	-	-	-		
HGX88e/3235-4 HGX88e/3235-4 S	30	Q	397000	362000	330000	270000	220000	177000	140000	110000	83700	62300	-	-		
		P	56.9	56.7	56.2	54.5	52.0	48.7	44.9	40.6	36.0	31.3	-	-		
	40	Q	351000	320000	290000	237000	192000	154000	122000	94400	71600	-	-	-		
		P	71.3	69.9	68.4	65.1	60.6	55.5	50.0	44.3	38.4	-	-	-		
	50	Q	304000	276000	250000	203000	164000	131000	103000	78800	-	-	-	-		
		P	84.9	82.4	79.8	74.7	68.2	61.2	54.0	46.7	-	-	-	-		

Relating to 20 °C suction gas temperature without liquid subcooling

Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temperature

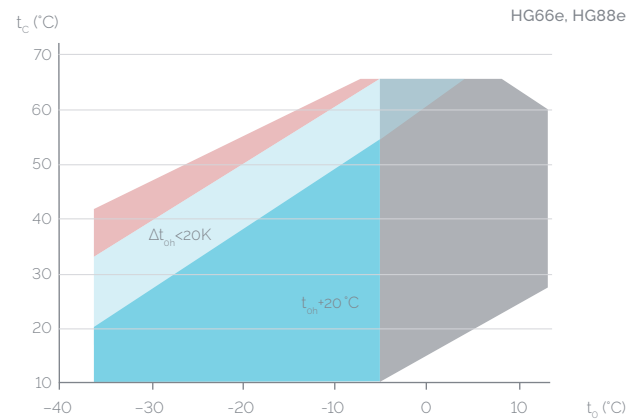
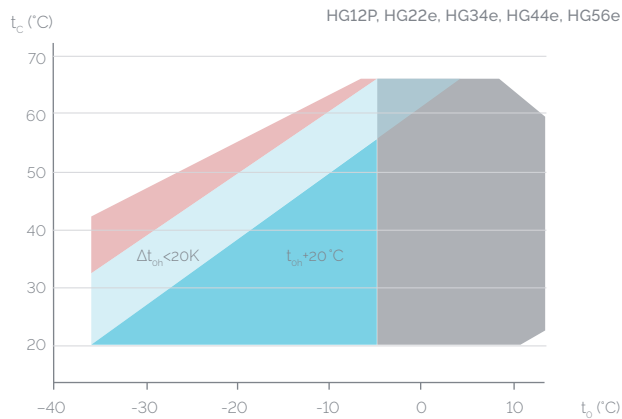
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HG semi-hermetic compressors

Operating limits

R22



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

- Unlimited application range
- Supplementary cooling or reduced suction gas temperature ($\Delta t_{oh} < 20K$)
- Supplementary cooling and reduced suction gas temperature ($\Delta t_{oh} < 20K$)
- Motor version -S- (more powerful motor)

Max. permissible operating pressure (LP/HP) ¹⁾: 19/28 bar
¹⁾ LP - low pressure, HP - high pressure

Notes

Operating limits

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

Restrictions to operating limits may occur when using a frequency converter.

For further explanations consult www.bock.de.

Performance data

The performance data for R22 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 results in significant differences compared to specifications with liquid undercooling and/or suction-gas temperatures. A comprehensive modification to 20 °C suction gas temperature will follow at a later date.

Conversion factor for 60 Hz = 1.2

Performance data for other operating points, see BOCK VAP software (vap.bock.de).

HG semi-hermetic compressors

Performance data

R22 50 Hz														
Type	Cooling capacity Q_0 [kW]												Power consumption P_e [kW]	
	Cond. temp. °C	Q	P	Evaporating temperature °C										
				12.5	10	7.5	5	0	-5	-10	-15	-20	-25	-30
HGX66e/1750-4 HGX66e/1750-4 S	30	Q	218000	201000	185000	170000	142000	118000	96400	78000	62100	48500	37100	27500
		P	28.2	28.4	28.5	28.5	27.9	26.8	25.4	23.6	21.5	19.3	16.9	14.5
	40	Q	197000	182000	167000	153000	128000	7106000	85800	69000	54500	42200	-	-
P		36.2	35.8	35.4	34.8	33.2	31.2	28.8	26.2	23.5	20.6	-	-	
50	Q	175000	161000	148000	135000	112000	91900	74600	59600	-	-	-	-	
	P	43.5	42.6	41.6	40.4	37.8	34.9	31.7	28.4	-	-	-	-	
HGX66e/2070-4 HGX66e/2070-4 S	30	Q	256000	236000	217000	200000	167000	139000	114000	91700	73100	57100	43700	32400
		P	33.3	33.6	33.7	33.7	33.0	31.8	30.0	27.9	25.4	22.7	19.9	17.1
	40	Q	231000	213000	196000	180000	150000	124000	101000	81100	64200	49700	-	-
P		43.0	42.6	42.0	41.3	39.4	37.1	34.2	31.1	27.8	24.3	-	-	
50	Q	205000	189000	173000	158000	132000	108000	87500	70000	-	-	-	-	
	P	51.9	50.8	49.5	48.1	45.0	41.6	37.8	33.7	-	-	-	-	
HGX88e/2400-4 HGX88e/2400-4 S	30	Q	304000	280000	258000	237000	198000	163000	134000	108000	85900	67200	51400	38100
		P	39.6	39.9	40.0	40.0	39.3	37.6	35.7	33.2	30.4	27.3	24.1	20.8
	40	Q	276000	254000	233000	214000	179000	146000	119000	95500	75500	58500	-	-
P		50.3	49.9	49.2	48.4	46.3	43.8	40.6	37.0	33.1	29.2	-	-	
50	Q	246000	226000	207000	190000	157000	128000	104000	82700	-	-	-	-	
	P	60.1	58.9	57.5	56.0	52.6	49.1	44.7	40.0	-	-	-	-	
HGX88e/2735-4 HGX88e/2735-4 S	30	Q	345000	318000	292000	269000	225000	186000	152000	123000	97900	76500	58500	43400
		P	44.7	45.1	45.3	45.2	44.4	42.8	40.6	37.8	34.7	31.2	27.5	23.8
	40	Q	313000	288000	265000	243000	202000	167000	136000	109000	86100	66600	-	-
P		57.2	56.6	55.9	55.0	52.6	49.6	46.0	42.0	37.7	33.3	-	-	
50	Q	279000	256000	235000	215000	179000	146000	119000	94300	-	-	-	-	
	P	68.6	67.2	65.5	63.8	59.8	55.5	50.6	45.4	-	-	-	-	
HGX88e/3235-4 HGX88e/3235-4 S	30	Q	407000	376000	346000	317000	266000	219000	180000	145000	116000	90100	68800	51000
		P	52.7	53.1	53.3	53.2	52.3	50.4	47.8	44.5	40.7	36.6	32.3	27.9
	40	Q	370000	340000	313000	286000	239000	196000	160000	129000	102000	78300	-	-
P		67.3	66.7	65.8	64.7	61.8	58.4	54.1	49.4	44.3	39.0	-	-	
50	Q	329000	303000	277000	254000	210000	172000	140000	111000	-	-	-	-	
	P	80.7	79.0	77.1	75.0	70.3	65.4	59.5	53.3	-	-	-	-	

Relating to 20 °C suction gas temperature without liquid subcooling

Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temperature

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HG semi-hermetic compressors

Technical data

HG

Type	Number of cylinders	Displacement		Electrical data						Weight	Connections ⁵⁾				Oil charge	Frequency range
		m ³ /h		Voltage ¹⁾	Max. Working current ²⁾		Max. Power consumption ²⁾	Starting current (rotor locked)			Discharge line DV		Suction line SV			
		50 Hz 1450 rpm	60 Hz 1740 rpm		Δ	Y		Δ	Y		mm	inch	mm	inch		
HG12P/60-4 S	2	5.40	6.40	³⁾	6.8	3.9	2.2	40	23	48.0	12	1/2	16	5/8	0.8	30-70
HG12P/75-4	2	6.70	8.10	³⁾	7.1	4.1	2.3	40	23	48.0	12	1/2	16	5/8	0.8	30-70
HG12P/75-4 S	2	6.70	8.10	³⁾	8.0	4.6	2.6	43	25	49.0	12	1/2	16	5/8	0.8	30-70
HG12P/90-4	2	8.00	9.60	³⁾	8.5	4.9	2.8	43	25	49.0	12	1/2	16	5/8	0.8	30-70
HG12P/90-4 S	2	8.00	9.60	³⁾	9.1	5.3	3.0	45	26	49.0	12	1/2	16	5/8	0.8	30-70
HG12P/110-4	2	9.40	11.30	³⁾	9.2	5.3	3.1	43	25	49.0	12	1/2	16	5/8	0.8	30-70
HG12P/110-4 S	2	9.40	11.30	³⁾	10.6	6.1	3.6	45	26	49.0	12	1/2	16	5/8	0.8	30-70
HG22e/125-4	2	11.10	13.30	³⁾	9.3	5.4	3.0	69	40	74.0	16	5/8	22	7/8	1.0	30-70
HG22e/125-4 S	2	11.10	13.30	³⁾	10.8	6.2	3.6	69	40	74.0	16	5/8	22	7/8	1.0	30-70
HG22e/160-4	2	13.70	16.40	³⁾	11.1	6.4	3.7	69	40	74.0	16	5/8	22	7/8	1.0	30-70
HG22e/160-4 S	2	13.70	16.40	³⁾	13.1	7.6	4.4	87	50	76.0	16	5/8	22	7/8	1.0	30-70
HG22e/190-4	2	16.50	19.80	³⁾	13.8	8.0	4.8	69	40	74.0	16	5/8	22	7/8	1.0	30-70
HG22e/190-4 S	2	16.50	19.80	³⁾	16.2	9.4	5.6	87	50	75.0	16	5/8	22	7/8	1.0	30-70
HG34e/215-4	4	18.80	22.60	³⁾	14.0	8.1	4.8	87	50	92.0	22	7/8	28	1 1/8	1.2	25-70
HG34e/215-4 S	4	18.80	22.60	³⁾	18.3	10.5	6.0	132	76	97.0	22	7/8	28	1 1/8	1.2	25-70
HG34e/255-4	4	22.10	26.60	³⁾	17.0	9.8	6.0	87	50	92.0	22	7/8	28	1 1/8	1.2	25-70
HG34e/255-4 S	4	22.10	26.60	³⁾	21.1	12.2	7.2	132	76	96.0	22	7/8	28	1 1/8	1.2	25-70
HG34e/315-4	4	27.30	32.80	³⁾	21.1	12.2	7.4	111	64	94.0	22	7/8	28	1 1/8	1.2	25-70
HG34e/315-4 S	4	27.30	32.80	³⁾	25.5	14.7	8.9	132	76	97.0	22	7/8	28	1 1/8	1.2	25-70
HG34e/380-4	4	33.10	39.70	³⁾	26.1	15.1	9.3	111	64	93.0	22	7/8	28	1 1/8	1.2	25-70
HG34e/380-4 S	4	33.10	39.70	³⁾	31.2	18.0	11.1	132	76	96.0	22	7/8	28	1 1/8	1.2	25-70
					PW 1+2'			PW1/PW1+2'								
HG44e/475-4	4	41.30	49.60	⁴⁾	19.0		11.0	83	109	164.0	28	1 1/8	35	1 3/8	2.3	25-70
HG44e/475-4 S	4	41.30	49.60	⁴⁾	23.0		13.1	115	150	168.0	28	1 1/8	35	1 3/8	2.3	25-70
HG44e/565-4	4	49.20	59.00	⁴⁾	22.0		13.2	83	109	164.0	28	1 1/8	35	1 3/8	2.3	25-70
HG44e/565-4 S	4	49.20	59.00	⁴⁾	26.0		15.6	133	171	170.0	28	1 1/8	42	1 5/8	2.3	25-70
HG44e/665-4	4	57.70	69.20	⁴⁾	26.0		15.4	115	150	171.0	28	1 1/8	42	1 5/8	2.3	25-70
HG44e/665-4 S	4	57.70	69.20	⁴⁾	30.0		18.3	133	171	168.0	28	1 1/8	42	1 5/8	2.3	25-70
HG44e/770-4	4	67.00	80.40	⁴⁾	30.0		17.8	133	171	168.0	28	1 1/8	42	1 5/8	2.3	25-70
HG44e/770-4 S	4	67.00	80.40	⁴⁾	35.0		21.4	133	171	168.0	28	1 1/8	42	1 5/8	2.3	25-70
HG56e/850-4	6	73.80	88.60	⁴⁾	32.6		19.7	133	171	194.3	35	1 3/8	54	2 1/8	2.7	25-70
HG56e/850-4 S	6	73.80	88.60	⁴⁾	39.4		23.5	162	210	211.1	35	1 3/8	54	2 1/8	2.7	25-70
HG56e/995-4	6	86.60	103.90	⁴⁾	38.9		23.2	162	210	194.3	35	1 3/8	54	2 1/8	2.7	25-70
HG56e/995-4 S	6	86.60	103.90	⁴⁾	46.4		27.7	189	246	211.3	35	1 3/8	54	2 1/8	2.7	25-70
HG56e/1155-4	6	100.40	120.50	⁴⁾	46.9		28.0	189	246	211.8	35	1 3/8	54	2 1/8	2.7	25-70
HG56e/1155-4 S	6	100.40	120.50	⁴⁾	58.3		33.3	253	330	220.6	35	1 3/8	54	2 1/8	2.7	25-70

¹⁾PW - Part Winding, motors for part winding start

1 - first part winding

2 - second part winding

HG semi-hermetic compressors

Technical data

HG																
Type	Number of cylinders	Displacement		Voltage ¹⁾	Electrical data				Weight	Connections ⁵⁾				Oil charge	Frequency range	
		50 Hz/60Hz (1450/1740 rpm)			Max. Working current ²⁾	Max. Power consumption ²⁾	Starting current (rotor locked)			Discharge line DV		Suction line SV				
		m ³ /h					A			kW		A				kg
		50 Hz 1450 rpm	60 Hz 1740 rpm		Δ	Y		Δ	Y		mm	inch	mm	inch	Ltr.	Hz
HG66e/1340-4	6	116.50	139.80	⁴⁾	53.7	31.9	170	275	282.0	42	1 5/8	54	2 1/8	4.4	25-60	
HG66e/1340-4 S	6	116.50	139.80	⁴⁾	65.3	38.1	196	335	287.0	42	1 5/8	54	2 1/8	4.4	25-60	
HG66e/1540-4	6	133.80	160.50	⁴⁾	62.1	37.2	170	275	280.0	42	1 5/8	54	2 1/8	4.4	25-60	
HG66e/1540-4 S	6	133.80	160.50	⁴⁾	75.0	44.4	196	335	285.0	42	1 5/8	54	2 1/8	4.4	25-60	
HG66e/1750-4	6	152.20	182.60	⁴⁾	71.9	42.4	196	335	280.0	42	1 5/8	54	2 1/8	4.4	25-60	
HG66e/1750-4 S	6	152.20	182.60	⁴⁾	86.8	50.7	222	361	282.0	42	1 5/8	54	2 1/8	4.4	25-60	
HG66e/2070-4	6	180.00	216.00	⁴⁾	85.1	50.7	196	335	276.0	42	1 5/8	64	2 1/8	4.4	25-60	
HG66e/2070-4 S	6	180.00	216.00	⁴⁾	103.0	60.7	222	361	278.0	42	1 5/8	64	2 1/8	4.4	25-60	
HG88e/2400-4	8	209.10	250.90	⁴⁾	101.0	59.5	298	438	452.0	54	2 1/8	76	3 1/8	9.6	25-60	
HG88e/2400-4 S	8	209.10	250.90	⁴⁾	120.0	69.8	447	657	452.0	54	2 1/8	76	3 1/8	9.6	25-60	
HG88e/2735-4	8	237.90	285.50	⁴⁾	116.0	67.1	386	567	455.0	54	2 1/8	76	3 1/8	9.6	25-60	
HG88e/2735-4 S	8	237.90	285.50	⁴⁾	136.0	80.0	447	657	464.0	54	2 1/8	76	3 1/8	9.6	25-60	
HG88e/3235-4	8	281.30	337.60	⁴⁾	135.0	79.2	447	657	459.0	54	2 1/8	76	3 1/8	9.6	25-60	
HG88e/3235-4 S	8	281.30	337.60	⁴⁾	162.0	93.9	538	791	467.0	54	2 1/8	76	3 1/8	9.6	25-60	

¹⁾PW - Part Winding, motors for part winding start

1 - first part winding

2 - second part winding

Explanations

- 1) Tolerance ($\pm 10\%$) relates to the mean value of the voltage range. Other voltages and current types on request.
- 2) • The specifications for max. power consumption apply for 50 Hz operation. For 60 Hz operation, the specifications have to be multiplied by the factor 1.2. The max. working current remains unchanged.
 - Take account of the max. operating current / max. power consumption when designing contactors, leads and fuses. Switches: Service category AC3

- 3) 220 - 240 V Δ / 380 - 420 V Y - 3 - 50 Hz,
265 - 290 V Δ / 440 - 480 V Y - 3 - 60 Hz

- 4) PW = Part Winding, motors for part winding start (no start unloaders required)

- Winding ratios:
HG44e, HG56e, HG66e, HG88e = 50% / 50%
- Designs for Y/ Δ on request

- 5) For soldering connections

Oil sump heater 110-240 V - 1 - 50 / 60 Hz (option)

- HG12P, HG22e, HG34e: 50-120 W
- PTC heater, self-regulating, installation in housing bore

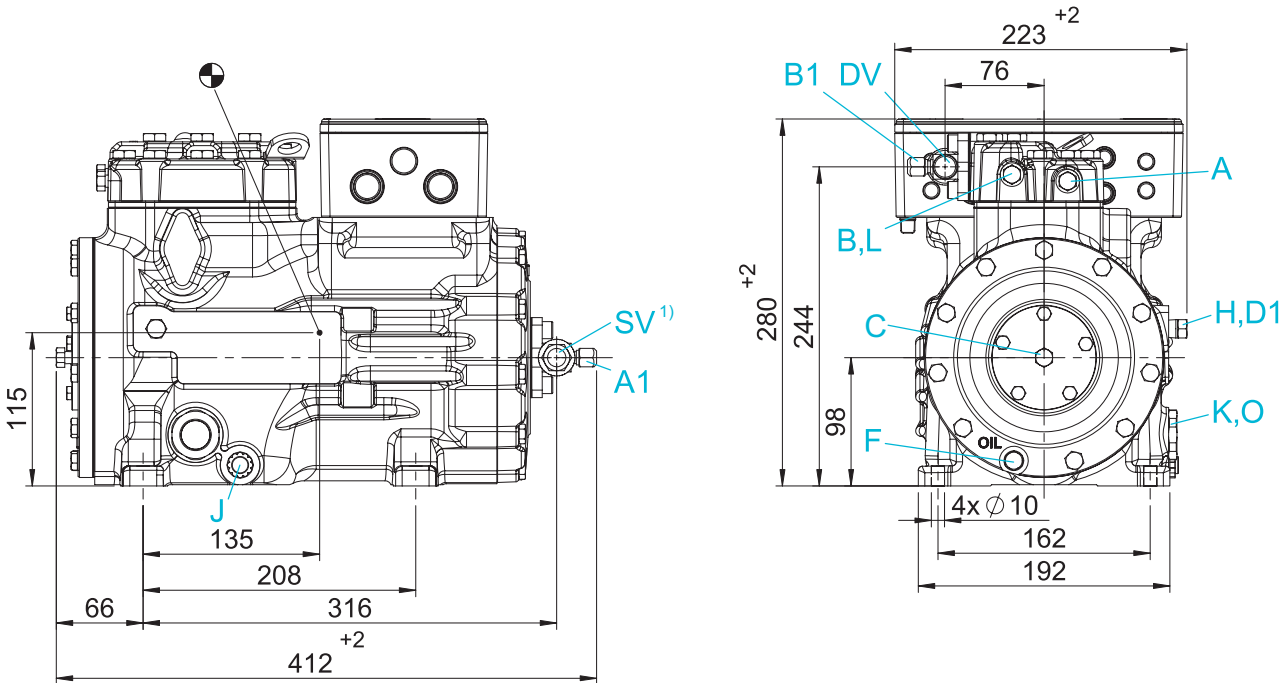
Oil sump heater 230 V - 1 - 50 / 60 Hz (option)

- HG44e, HG56e, HG66e: 160 W, installation in housing bore
- HG88e: 200 W, installation in immersion sleeve
- Permanently set version

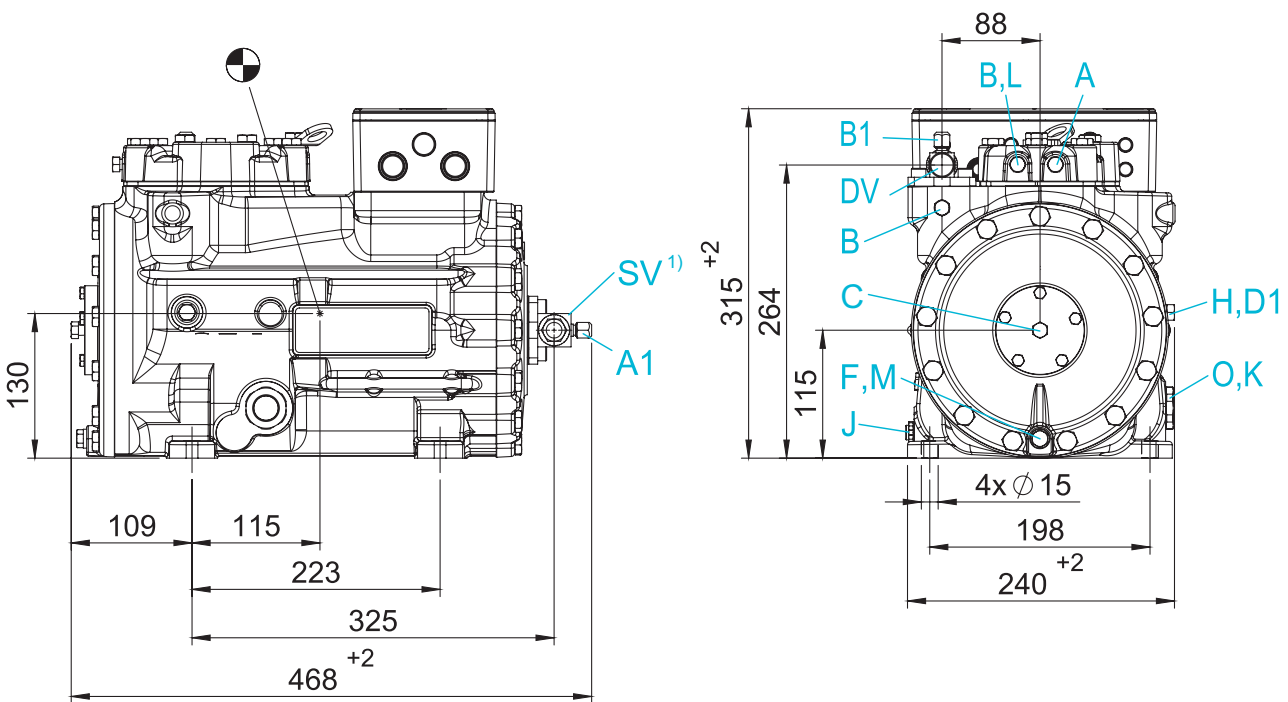
HG semi-hermetic compressors

Dimensions and connections

HG12P » HG12P/60-4 S » HG12P/75-4 » HG12P/75-4 S
 HG12P/90-4 » HG12P/90-4 S » HG12P/110-4 » HG12P/110-4 S



HG22e » HG22e/125-4 » HG22e/125-4 S » HG22e/160-4 » HG22e/160-4 S
 HG22e/190-4 » HG22e/190-4 S



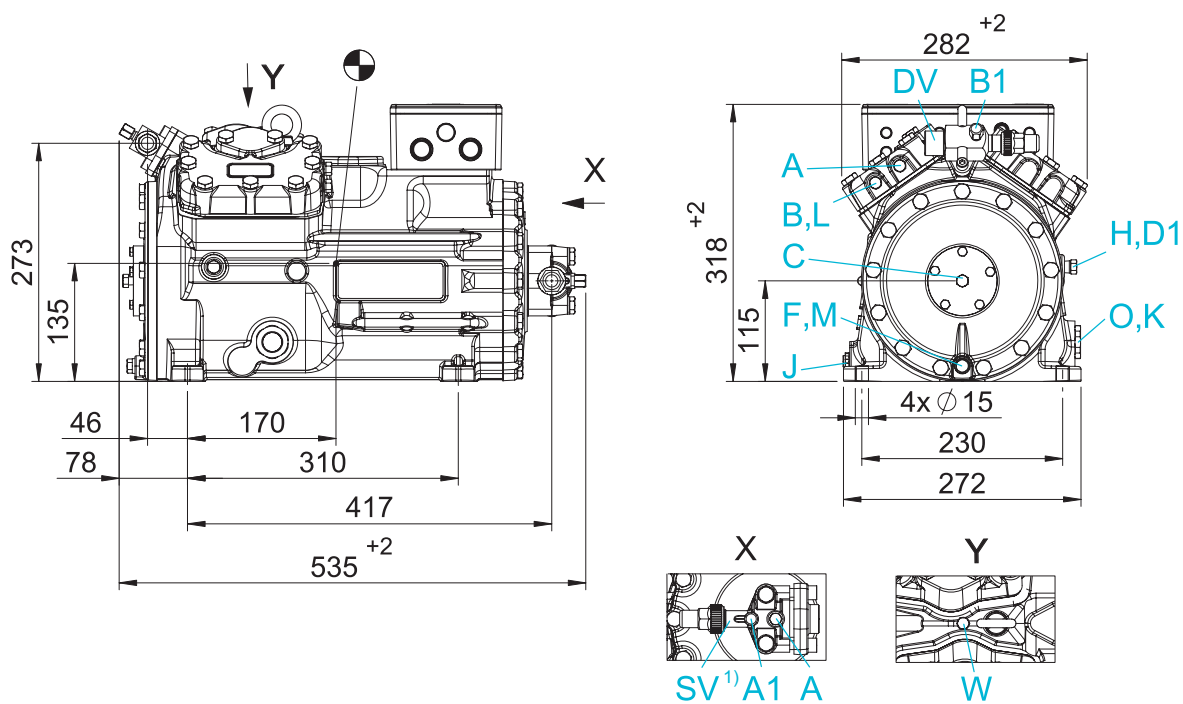
Dimensions in mm
 ● Center of gravity
¹ SV 90° rotatable

Connections see page 64
 Dimensions for anti-vibration pad see page 61

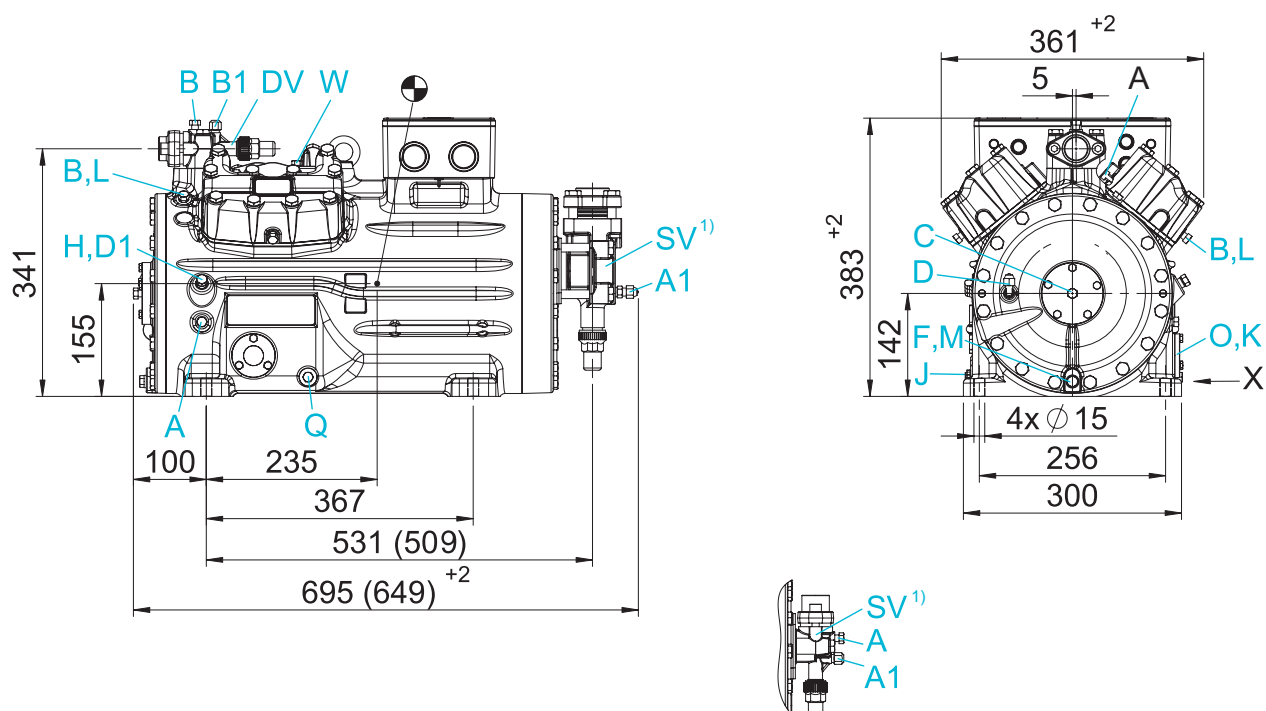
HG semi-hermetic compressors

Dimensions and connections

HG34e » HG34e/215-4 » HG34e/215-4 S » HG34e/255-4 » HG34e/255-4 S
 HG34e/315-4 » HG34e/315-4 S » HG34e/380-4 » HG34e/380-4 S



HG44e » HG44e/475-4 » HG44e/475-4 S » HG44e/565-4 » HG44e/565-4 S
 HG44e/665-4 » HG44e/665-4 S



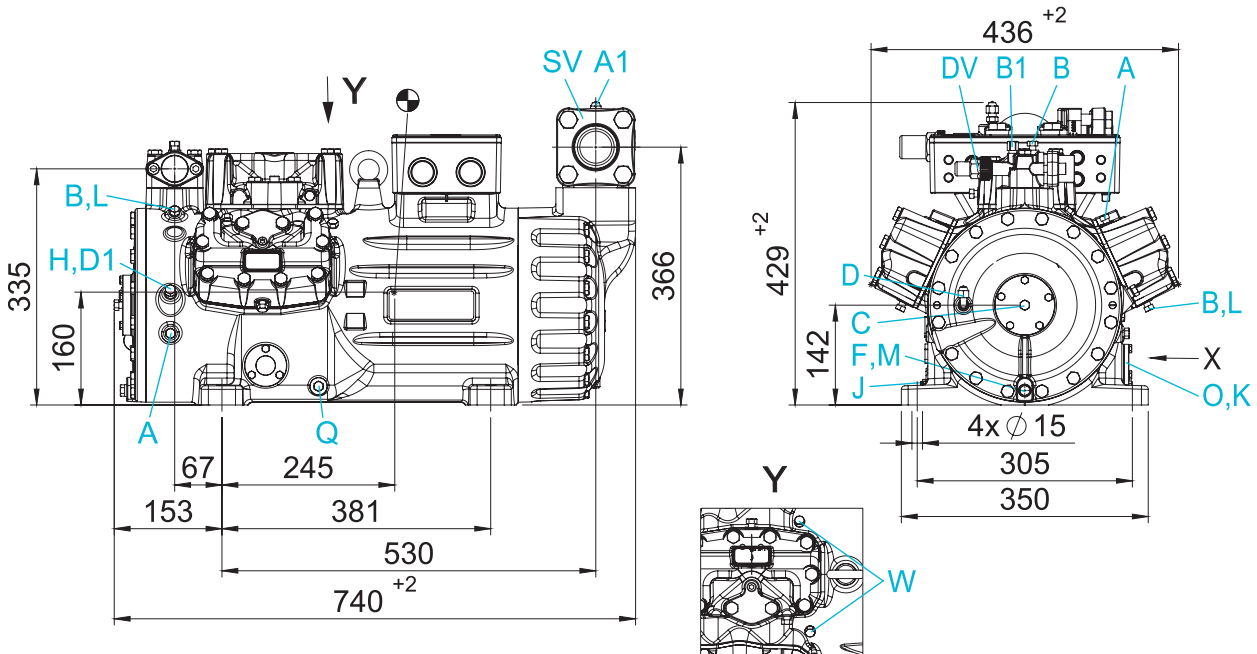
Dimensions in mm
 ● Center of gravity
¹⁾ SV 90° rotatable

Connections see page 64
 Dimensions for anti-vibration pad see page 61

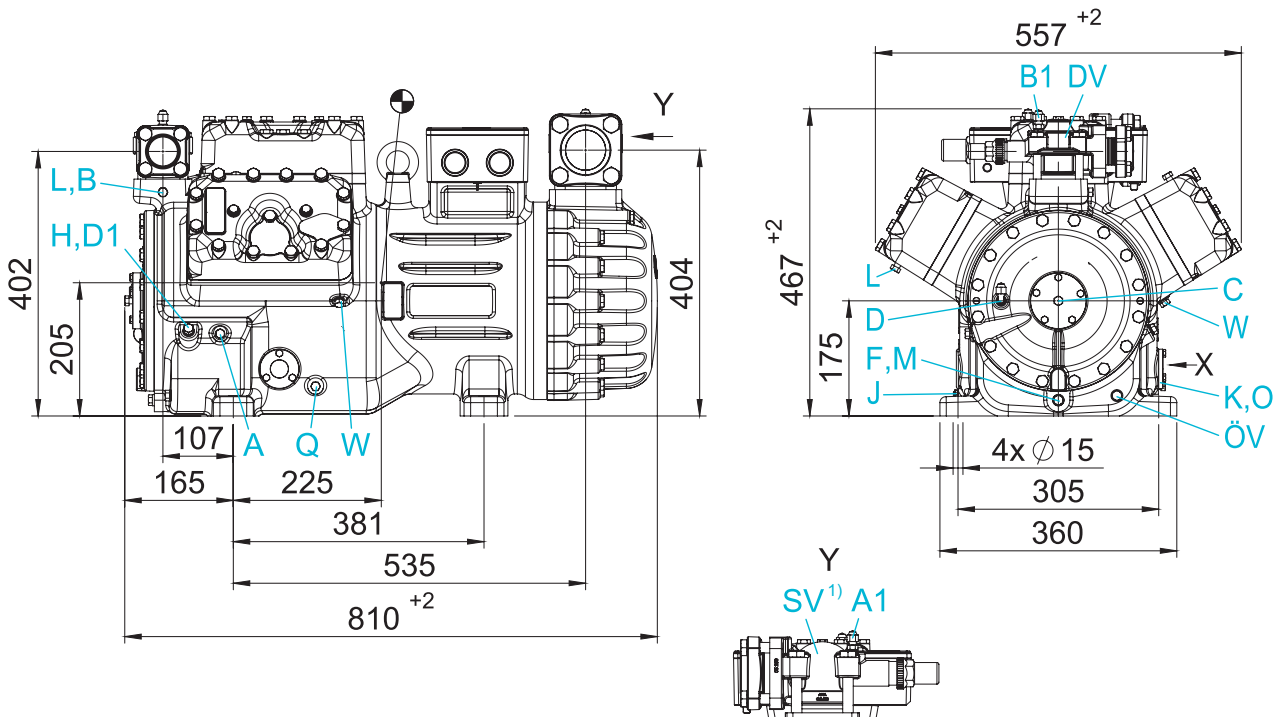
HG semi-hermetic compressors

Dimensions and connections

HG56e » HG56e/850-4 » HG56e/850-4 S » HG56e/995-4
 HG56e/995-4 S » HG56e/1155-4 » HG56e/1155-4 S



HG66e » HG66e/1340-4 » HG66e/1340-4 S » HG66e/1540-4 » HG66e/1540-4 S
 HG66e/1750-4 » HG66e/1750-4 S » HG66e/2070-4 » HG66e/2070-4 S



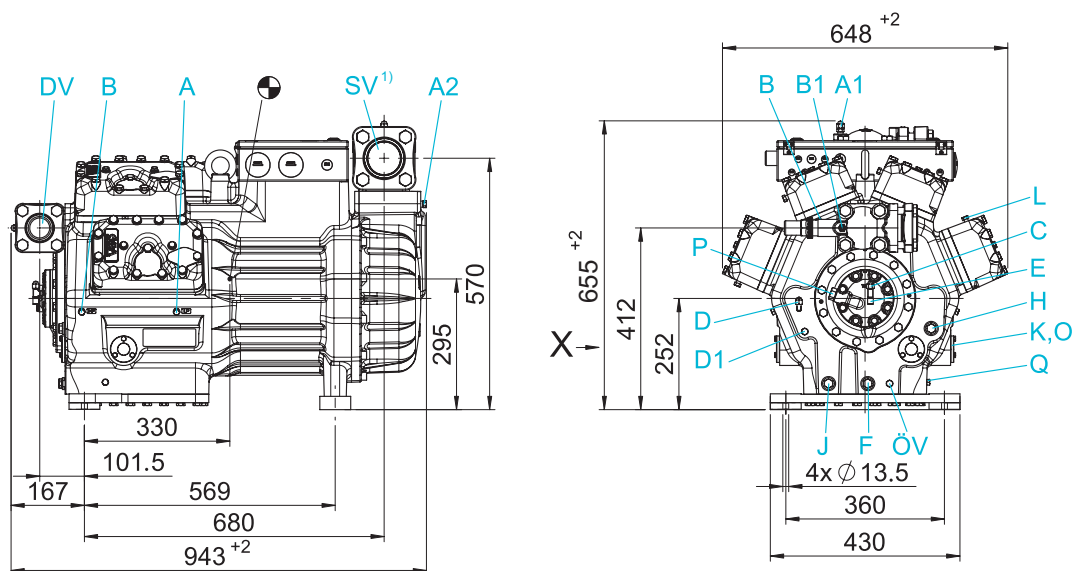
Dimensions in mm
 ☉ Center of gravity
¹⁾ SV 180° rotatable

Connections see page 64
 Dimensions for anti-vibration pad see page 61

HG semi-hermetic compressors

Dimensions and connections

HG88e » HG88e/2400-4 » HG88e/2400-4 S » HG88e/2735-4
HG88e/2735-4 S » HG88e/3235-4 » HG88e/3235-4 S



Dimensions in mm

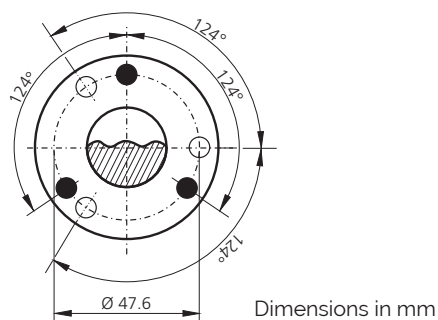
☉ Center of gravity

¹⁾ SV 180° rotatable

Connections see page 64

Dimensions for anti-vibration pad see below

View X



Possibility to connect to oil level regulator

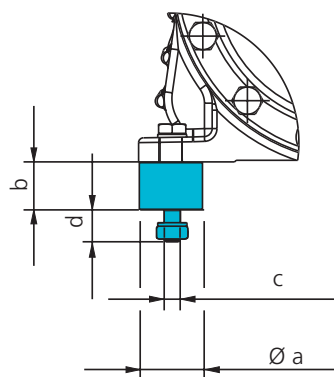
HG44e, HG56e, HG66e, HG88e

- Three-hole connection for oil level regulator of brands ESK, AC+R, CARLY (3 x M6 x 10 deep)
- Three-hole connection for oil level regulator of brand TRAXOIL (3 x M6 x 10 deep)

Dimensions for anti-vibration pad

Type	Ø a	b	c	d
HG12P	30	30	M8	20
HG22e	40	30	M10	20
HG34e	40	30	M10	20
HG44e	50	30	M12	25
HG56e	50	30	M12	25
HG66e	50	30	M12	25
HG88e	70	45	M12	37

Dimensions in mm

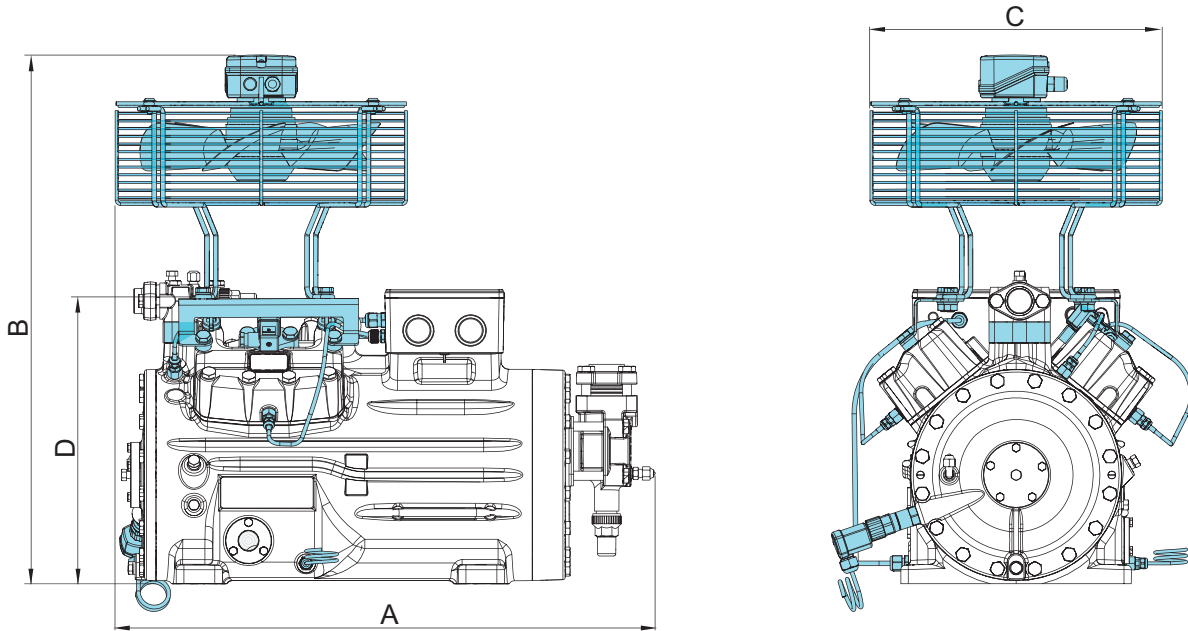


HG semi-hermetic compressors

Dimensions and connections

HG12P HG22e HG34e HG44e HG56e

Dimensions with accessories



Type	A	B	C	D
HG12P	ca. 460	ca. 500	ca. 315	-
HG22e	ca. 525	ca. 610	ca. 380	-
HG34e	ca. 580	ca. 640	ca. 380	-
HG44e	ca. 710	ca. 685	ca. 380	368
HG56e	-	ca. 710	ca. 380	-

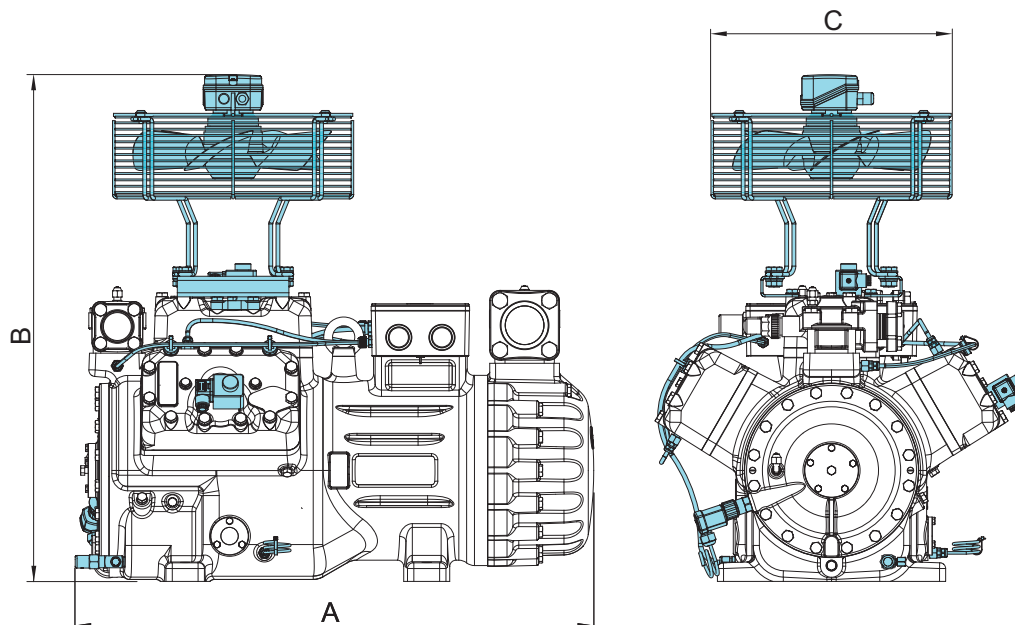
Dimensions in mm

HG semi-hermetic compressors

Dimensions and connections

HG66e

Dimensions with accessories

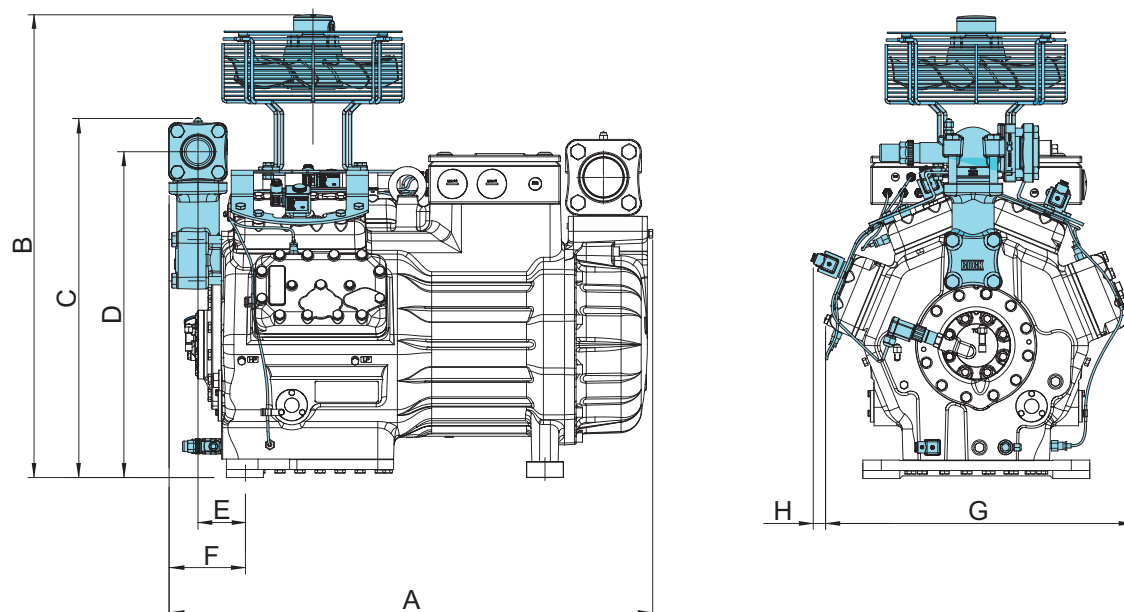


Type	A	B	C
HG66e	ca. 820	ca. 800	ca. 380

Dimensions in mm

HG88e

Dimensions with accessories



Type	A	B	C	D	E	F	G	H
HG88e	ca. 920	ca. 880	ca. 680	617	90	145	ca. 610	ca. 20

Dimensions in mm

HG semi-hermetic compressors

Dimensions and connections

Connections		HG12P	HG22e	HG34e	HG44e	HG56e	HG66e	HG88e
SV	Suction line	Please refer to technical data page 56						
DV	Discharge line	Please refer to technical data page 56						
A	Connection suction side, not lockable	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF
A1	Connection suction side, lockable	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF
A2	Connection suction side, not lockable	-	-	-	-	-	-	1/4" NPTF
B	Connection discharge side, not lockable	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF
B1	Connection discharge side, lockable	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF
C	Connection oil pressure safety switch HP	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	7/16" UNF
D	Connection oil pressure safety switch LP	-	-	-	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF
D1	Connection oil return from oil separator	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF
F	Oil drain plug	M8	M12 x 15	M12 x 15	M12 x 15	M12 x 15	M12 x 15	M22 x 15
H	Oil charge plug	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF	M22 x 15
J	Connection oil sump heater	3/8" NPTF	3/8" NPTF	3/8" NPTF	3/8" NPTF	3/8" NPTF	3/8" NPTF	M22 x 15
K	Sight glass	1 1/8" - 18 UNEF	1 1/8" - 18 UNEF	1 1/8" - 18 UNEF	3 hole M6	3 hole M6	3 hole M6	3 hole M6
L	Connection thermal protection thermostat	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF
M	Oil strainer	-	M12 x 15	M12 x 15	M12 x 15	M12 x 15	M12 x 15	M22 x 15
O	Connection oil level regulator	1 1/8" - 18 UNEF	1 1/8" - 18 UNEF	1 1/8" - 18 UNEF	1)	1)	1)	1)
ÖV	Connection oil service valve	-	-	-	-	-	1/4" NPTF	1/4" NPTF
P	Connection oil pressure differential sensor	-	-	-	-	-	-	M20 x 15
Q	Connection oil temperature sensor	-	-	-	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF
W	Connection for refrigerant injection	-	-	1/8" NPTF	1/8" NPTF	2 1/8" NPTF	2 1/8" NPTF	-

¹⁾ Dimensions see view X page 61

HG semi-hermetic compressors

Scope of supply and accessories

	HG12P	HG22e	HG34e	HG44e	HG56e	HG66e	HG88e
Semi-hermetic two-cylinder reciprocating compressor with drive motor for direct start 220–240 V Δ / 380–420 V Y - 3 - 50 Hz 265–290 V Δ / 440–480 V Y - 3 - 60 Hz	●	●	-	-	-	-	-
Semi-hermetic four-cylinder reciprocating compressor with drive motor for direct start 220–240 V Δ / 380–420 V Y - 3 - 50 Hz 265–290 V Δ / 440–480 V Y - 3 - 60 Hz	-	-	●	-	-	-	-
Semi-hermetic four-cylinder reciprocating compressor with drive motor for part winding start (50/50) 380–420 V Y/YY - 3 - 50 Hz 440–480 V Y/YY - 3 - 60 Hz	-	-	-	●	-	-	-
L Semi-hermetic six-cylinder reciprocating compressor with drive motor for part winding start (50/50) 380–420 V Y/YY - 3 - 50 Hz 440–480 V Y/YY - 3 - 60 Hz	-	-	-	-	●	●	-
Semi-hermetic eight-cylinder reciprocating compressor with drive motor for part winding start (50/50) 380–420 V Y/YY - 3 - 50 Hz 440–480 V Y/YY - 3 - 60 Hz	-	-	-	-	-	-	●
Special voltage and/or frequency	○ ³⁾	○ ³⁾	○ ³⁾	○ ³⁾	○ ³⁾	○ ³⁾	○ ³⁾
Winding protection with PTC resistor sensors with electronic triggering unit INT69 G (230 V)	●	●	●	●	●	●	●
① Thermal protection PTC	○ ²⁾	○ ²⁾	○ ²⁾	○ ²⁾	○ ²⁾	○ ²⁾	○ ²⁾
Oil pump	●	●	●	●	●	●	●
Oil charge: FUCHS Reniso SP46, HGX: FUCHS Rensio Triton SE55	●	●	●	●	●	●	●
Inert gas charge	●	●	●	●	●	●	●
4 anti-vibration pads	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾
Internal safety valve	-	-	-	●	●	●	●
Suction and discharge line valve	●	●	●	●	●	●	●
Sight glasses	One	●	●	●	●	●	-
	Three	-	-	-	-	-	●
② Oil sump heater	110–240 V - 1 - 50/60 Hz, 50–120 W, PTC heater, self-regulating	○ ²⁾	○ ²⁾	○ ²⁾	-	-	-
	220–240 V - 1 - 50/60 Hz, 160 W	-	-	-	○ ²⁾	○ ²⁾	-
	220–240 V - 1 - 50/60 Hz, 200 W	-	-	-	-	-	○ ²⁾
Rear bearing flange prepared for oil differential pressure sensor	-	-	-	○ ²⁾	○ ²⁾	○ ²⁾	● ²⁾
③ Oil differential pressure sensor DELTA-P II 220–240 V - 1 - 50/60 Hz	-	-	-	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾
④ Oil pressure safety switch	230 V - 1 - 50/60 Hz, IP20 MP54	-	-	-	○ ¹⁾	○ ¹⁾	○ ¹⁾
	230 V - 1 - 50/60 Hz, IP20 MP55	○ ¹⁾	○ ¹⁾	○ ¹⁾	-	-	-
⑤ Oil service valve	-	-	-	-	-	○ ²⁾	○ ²⁾
⑥ Capacity regulator	1 capacity regulator = 50% residual capacity	-	-	○ ²⁾	○ ²⁾	-	-
	1–2 capacity regulators = 66/33% residual capacity	-	-	-	-	○ ²⁾	○ ²⁾
	1–3 capacity regulators = 75/50/25% residual capacity	-	-	-	-	-	○ ²⁾

¹⁾ Enclosed ²⁾ Mounted ³⁾ On request
⁴⁾ Only possible with additional adapter

● Scope of supply (standard)
○ Available accessories

vap.bock.de 

HG semi-hermetic compressors

Scope of supply and accessories

		HG12P	HG22e	HG34e	HG44e	HG56e	HG66e	HG88e
7 Prepared for capacity regulator	1 cylinder cover	-	-	○ ²⁾	○ ²⁾	○ ²⁾	○ ²⁾	○ ²⁾
	2 cylinder covers	-	-	-	-	○ ²⁾	○ ²⁾	○ ²⁾
	3 cylinder covers	-	-	-	-	-	-	○ ²⁾
8 Oil temperature sensor	-	-	-	○ ²⁾	○ ²⁾	○ ²⁾	○ ²⁾	
9 Start unloader by means of ESS (Electronic Soft Start) 400 V - 3 - 50 / 60 Hz, IP20, (connection clamps IPOO) for installation in switch cabinet	-	● ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	-
10 Connection piece suction and discharge valve in welded construction	-	-	-	○ ³⁾	○ ³⁾	○ ³⁾	○ ³⁾	
11 Additional fan 230 V - 1 - 50 Hz, 97 W, IP44, 230 V - 1 - 60 Hz, 128 W, Voltage range ± 10 %	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	
12 Intermediate flange for discharge line valve on right or left, seen from oil pump	-	-	-	○ ¹⁾	-	-	-	
13 INT69 G Diagnose 115 / 230 V Ac, 50 / 60 Hz, IPOO (INT69 G not applicable)	-	● ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	-	
14 INT69 GTML Diagnose 115 / 230 V Ac, 50 / 60 Hz, IPOO, incl. oil differential pressure sensor INT250, thermal protection thermostat (PTC) per cylinder cover (INT69 G not applicable)	-	-	-	-	-	-	○ ²⁾	
15 DP - modbus gateway 115 / 230 V Ac, 50 / 60 Hz, IPOO incl. adapter cable	-	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	
16 Modbus - LAN gateway 230 V Ac, 50 / 60 Hz, IPOO	-	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	
17 USB converter for INT69 G Diagnose and INT69 GTML Diagnose	-	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	
Connection for oil level regulator of brands ESK, AC+ R or CARLY	● ⁴⁾	● ⁴⁾	● ⁴⁾	●	●	●	●	
Connection for oil level regulator of brand Traxoil	● ⁴⁾	● ⁴⁾	● ⁴⁾	● ⁴⁾	● ⁴⁾	● ⁴⁾	● ⁴⁾	

¹⁾ Enclosed ²⁾ Mounted ³⁾ On request
⁴⁾ Only possible with additional adapter

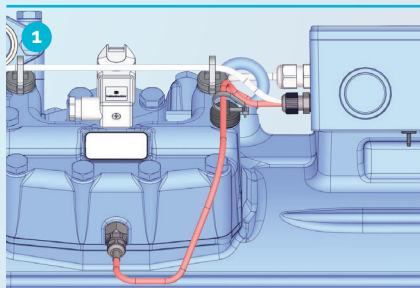
● Scope of supply (standard)
○ Available accessories

vap.bock.de 

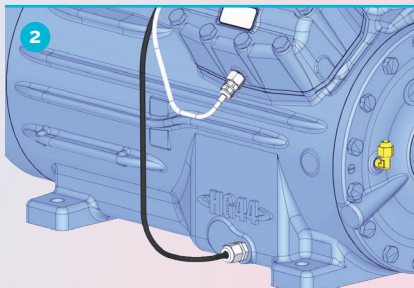
HG semi-hermetic compressors

Accessories

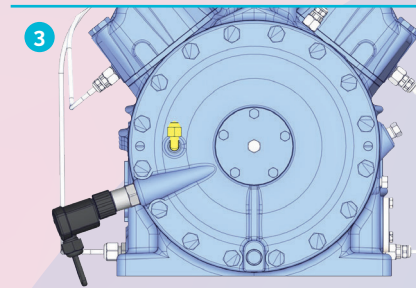
Thermal protection thermostat



Oil sump heater



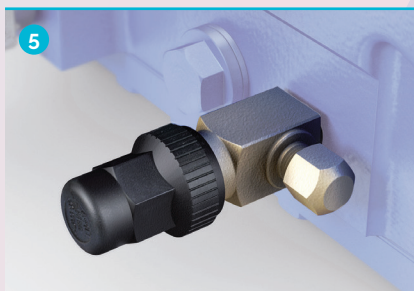
Oil differential pressure sensor



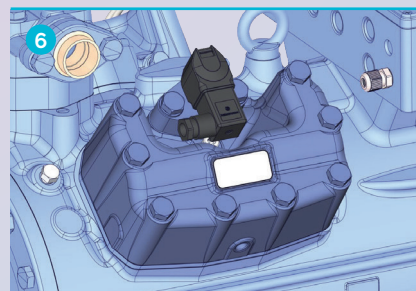
Oil pressure safety switch



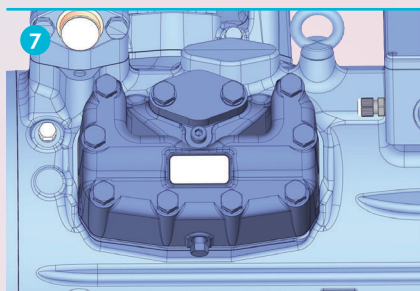
Oil service valve



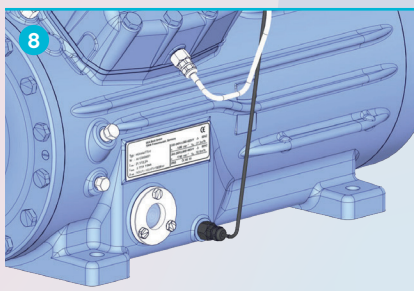
Capacity regulator



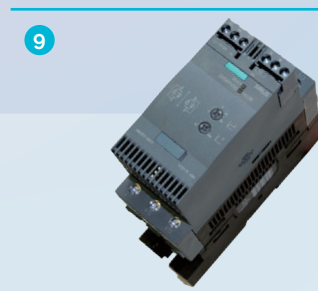
Prepared for capacity regulator



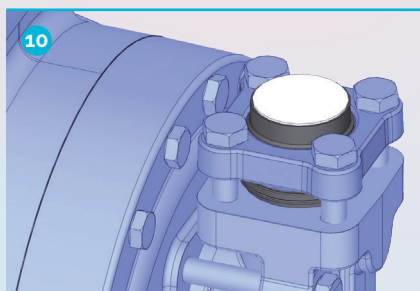
Oil temperature sensor



ESS Electronic Soft Start



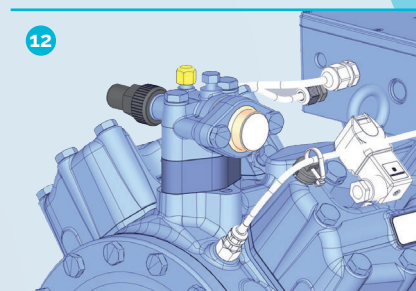
Connection piece in welded construction



Additional fan



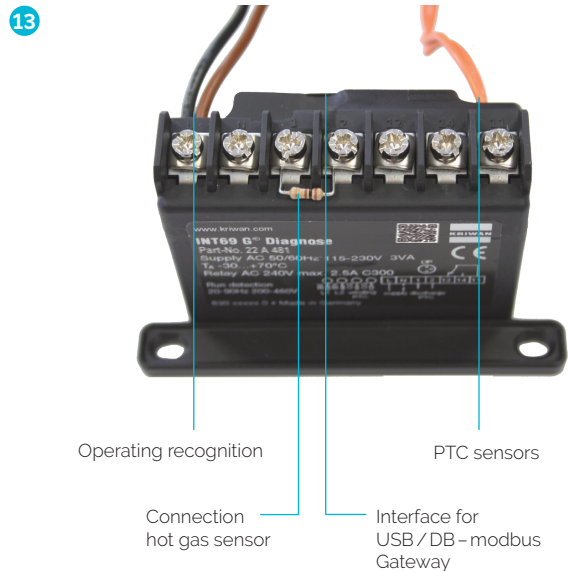
Intermediate flange for discharge line valve



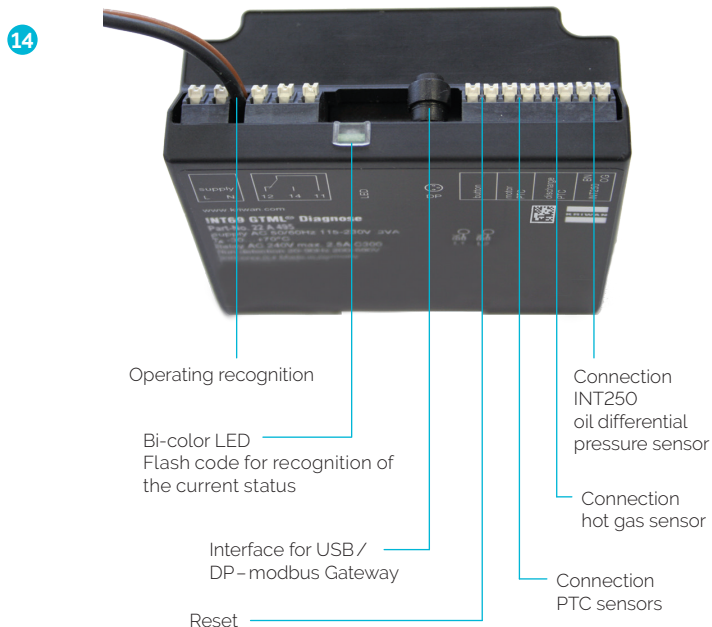
HG semi-hermetic compressors

Accessories

INT69 G Diagnose



INT69 GTML Diagnose



DP - modbus Gateway



Modbus - LAN Gateway



USB converter



INT69 G Motor Protection

Technical Data

Unit designation	INT69 G (Standard)	INT69 G Diagnose	INT69 GTML Diagnose
Connection voltage	AC 115–230 V - 1- 50/60 Hz ± 10% 3 VA	AC 115–230 V - 1- 50/60 Hz ± 10% 3 VA	AC 115–230 V - 1- 50/60 Hz ± 10% 3 VA
Relay	AC 240 V, 2.5 A, C300	AC 240 V, 2.5 A, C300	AC 240 V, 2.5 A, C300
Dimensions L/W/H	53 × 33 × 68 mm	50 × 33 × 68 mm	87 × 40 × 81.5 mm

HG semi-hermetic compressors

Accessories

INT69 G Diagnose Unit Motor Protection

Read facility via INTelligence diagnosis software

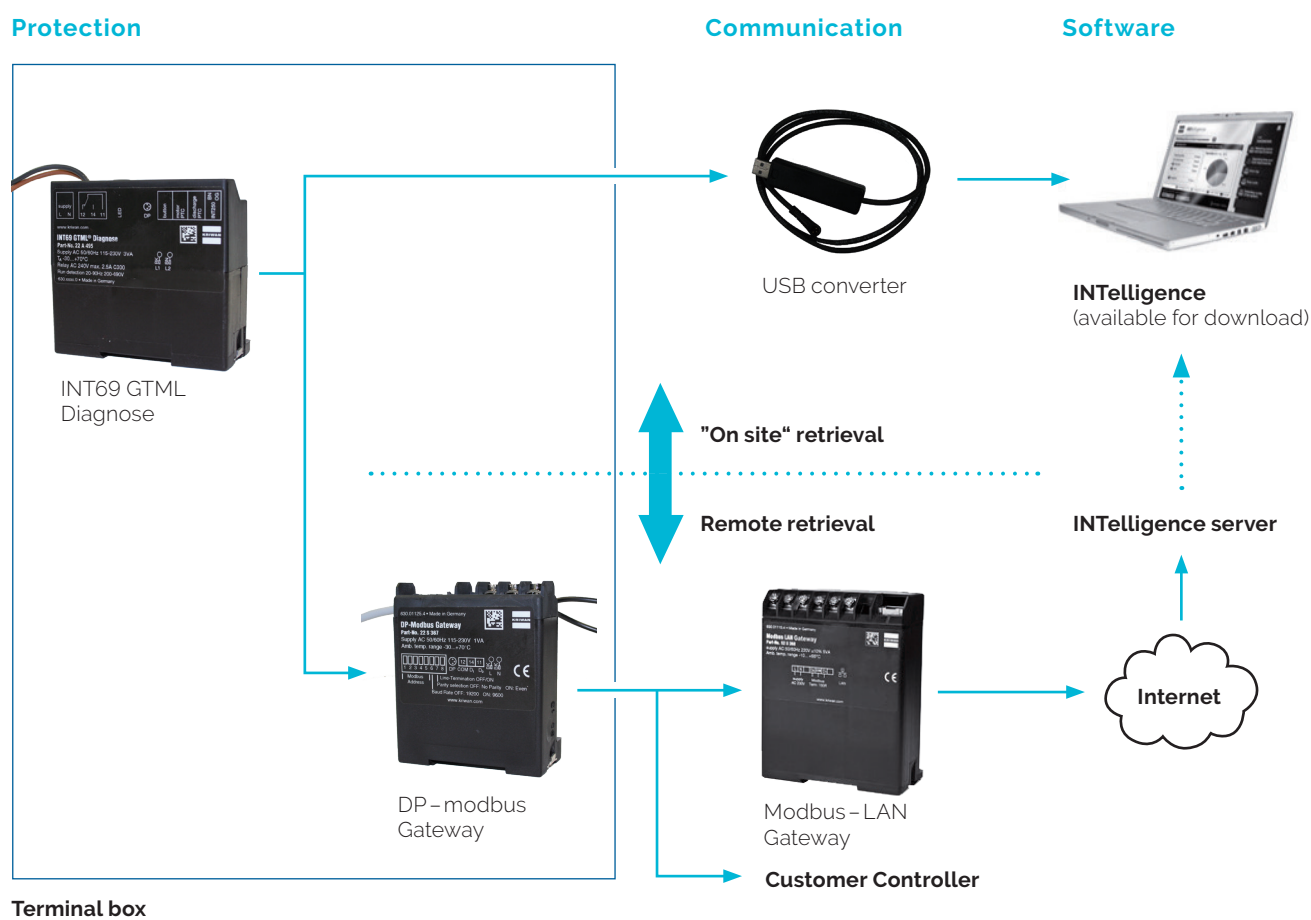
With the INTelligence software, valuable information can be obtained on the status of the compressor and the system. The diagnosis function includes the plausibility checks of the logic sequences, all important operation and error values of the compressor, and it provides clear visualization. Crucial evaluation parameters can be configured individually. This allows for a quick analysis and an efficient system management.

Advantages:

- Simple operation
- Immediate diagnosis and precise problem solving
- Specially adaptable to the user's needs

If required, data can be retrieved directly at each compressor via USB port. A modbus interface is available for integration into a network.

The data is sent periodically via the DP-modbus gateway and the modbus-LAN gateway to a server and can be retrieved remotely by the INTelligence diagnosis software. The INTelligence diagnosis software can be downloaded for free at www.kriwan.com.





Bock HA semi-hermetic compressors

- 72** At a glance
- 76** Operating limits and performance data
- 88** Technical data
- 89** Dimensions and connections
- 94** Scope of supply & accessories

Bock HA22e - HA44e

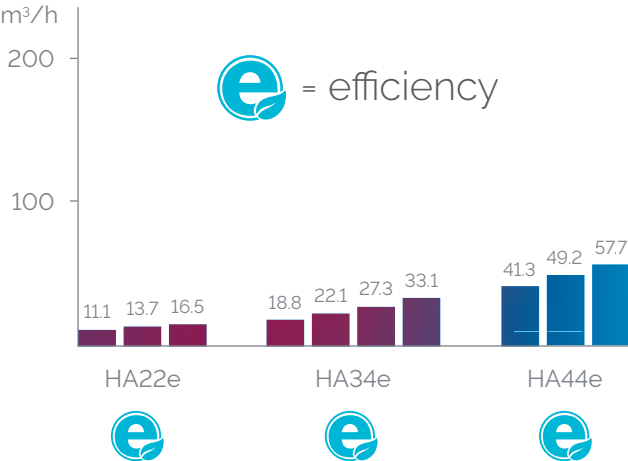


Bock HA semi-hermetic compressors

The “HA principle” of air-cooled compressors, specially developed by BOCK, is the most efficient semi-hermetic solution for low-temperature applications. It employs a direct-suction compressor combined with an air-cooled drive motor.

The current programm

3 model sizes with 10 capacity stages from 11.1 to 57.7 m³/h (50 Hz)



HA44e

HA semi-hermetic compressors

At a glance

Low-temperature applications place greater demands on compressors. This applies particularly to suction-gas-cooled semi-hermetic compressors. Within low-temperature applications the refrigerant mass flow is smaller and is heated up disproportionately by the drive motor. This has the following effects on the operation of the compressor.

- The volumetric efficiency is reduced due to the decreasing specific density
- The discharge temperature and oil temperature are higher. This means that the oil ages more quickly and the lubrication properties deteriorate

This particularly affects refrigerants with a high isentropic exponent, such as the new HFO/HFC blends with lower GWP, which are envisaged as transitional R404A replacement refrigerants.

For these refrigerants in low-temperature applications with suction-gas-cooled semi-hermetic compressors it is important that special technical measures are envisaged for reduction of the discharge temperature!

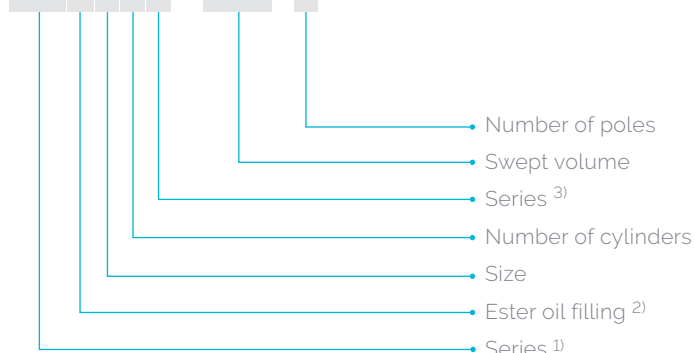
The suction gas in BOCK air-cooled HA compressors is not heated additionally, but rather fed directly into the cylinders without diversions via the motor. A compact ventilation unit is integrated to cool the motor and provide air flow for the cylinder heads, partially cooling them as well. This solution reduces the discharge temperature, increasing capacity and extending the range of applications.

HA vs. HG R449A discharge temperature



Type key

HAX44e / 465-4



¹⁾ HA = Hermetic Air-Cooled (low temperature application)

²⁾ X = Ester oil filling
(HFC refrigerants e.g. R134a, R404A, R507, R407C)

³⁾ e = Additional marker for e-series compressors

P = Additional marker for Pluscom compressors

HA semi-hermetic compressors

Overview



HA22e



HA34e

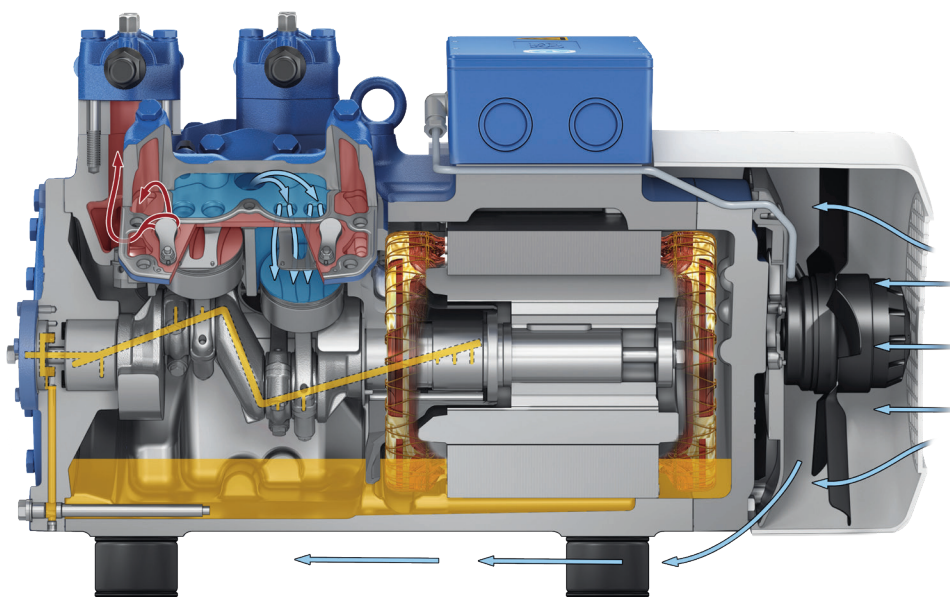


HA44e

HA semi-hermetic compressors

Overview

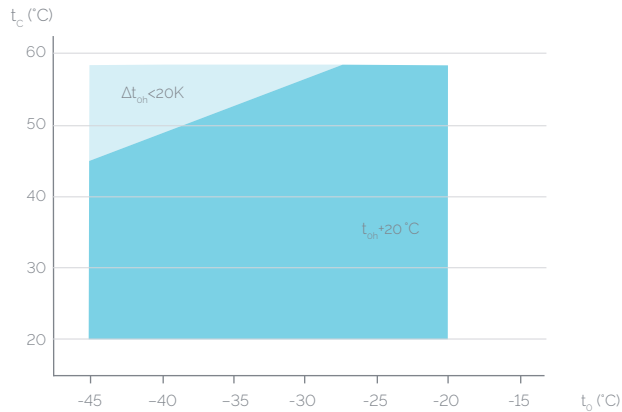
HA44e sectional drawing



HA semi-hermetic compressors

Operating limits

R404A/R507



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

- Unlimited application range
- Reduced suction gas temperature

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

¹⁾ LP = low pressure, HP = high pressure

Notes

Operating limits

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

Restrictions to operating limits may occur when using a frequency converter. For further explanations consult www.bock.de.

Performance data

The performance data for R404A/R507 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.

Performance data were compiled for R404A and R507. The base values are the data for R404A.


Conversion factor for 60 Hz = 1.2
 Performance data for other operating points, see BOCK VAP software (vap.bock.de).

HA semi-hermetic compressors

Performance data

R404A/R507 50 Hz			Cooling capacity Q_o [kW]						Power consumption P_e [kW]	
Type	Cond. temp. °C		Evaporating temperature °C							
			-20	-25	-30	-35	-40	-45		
HA22e/125-4	30	Q	4730	3800	2990	2300	1720	1250		
		P	1.91	1.71	1.51	1.31	1.13	0.94		
	40	Q	3960	3160	2470	1880	1390	978		
P		2.09	1.84	1.60	1.37	1.14	0.92			
HA22e/160-4	30	Q	5840	4690	3690	2830	2120	1540		
		P	2.36	2.11	1.86	1.62	1.39	1.16		
	40	Q	4890	3900	3050	2320	1710	1210		
P		2.58	2.27	1.97	1.69	1.41	1.13			
HA22e/190-4	30	Q	7070	5670	4460	3430	2570	1870		
		P	2.86	2.55	2.25	1.96	1.68	1.41		
	40	Q	5920	4720	3690	2810	2070	1460		
P		3.12	2.75	2.39	2.04	1.70	1.37			
HA34e/215-4	30	Q	8050	6450	5080	3900	2920	2130		
		P	3.26	2.90	2.57	2.24	1.92	1.60		
	40	Q	6740	5380	4200	3200	2350	1670		
P		3.55	3.13	2.72	2.33	1.94	1.56			
HA34e/255-4	30	Q	9460	7590	5970	4590	3440	2500		
		P	3.83	3.42	3.02	2.63	2.26	1.88		
	40	Q	7920	6320	4940	3760	2770	1960		
P		4.18	3.68	3.20	2.74	2.28	1.84			
HA34e/315-4	30	Q	11700	9370	7370	5660	4240	3080		
		P	4.73	4.22	3.73	3.25	2.79	2.33		
	40	Q	9780	7800	6090	4640	3420	2420		
P		5.16	4.54	3.95	3.38	2.82	2.27			
HA34e/380-4	30	Q	14200	11400	8910	6850	5130	3730		
		P	5.50	4.96	4.39	3.81	3.22	2.65		
	40	Q	11900	9440	7370	5610	4130	2920		
P		5.95	5.28	4.58	3.86	3.16	2.74			
HA44e/475-4	30	Q	18700	15100	11900	9100	6800	4890		
		P	6.64	6.01	5.35	4.66	3.95	3.24		
	40	Q	15700	12600	9760	7430	5450	3810		
P		7.13	6.32	5.47	4.62	3.76	2.91			
HA44e/565-4	30	Q	21900	17600	13900	10800	8040	5800		
		P	8.08	7.36	6.58	5.77	4.93	4.09		
	40	Q	18400	14700	11500	8770	6470	4530		
P		8.73	7.79	6.82	5.83	4.83	3.84			
HA44e/665-4	30	Q	25000	20200	16000	12400	9310	6750		
		P	9.33	8.43	7.49	6.52	5.53	4.55		
	40	Q	21100	16900	13300	10200	7480	5270		
P		10.10	8.97	7.79	6.60	5.42	4.27			
HA44e/665-4	50	Q	17200	13700	10600	8010	5810	3960		
		P	10.70	9.29	7.87	6.47	5.10	3.78		

Relating to 20 °C suction gas temperature without liquid subcooling

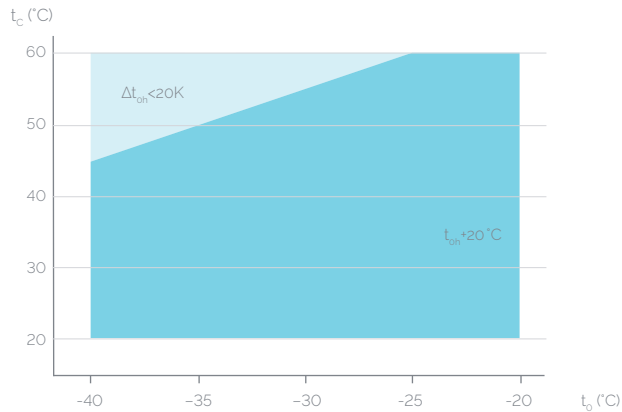
 Reduced suction gas temperature

vap.bock.de 

HA semi-hermetic compressors

Operating limits

R448A



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

- Unlimited application range
- Reduced suction gas temperature

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

¹⁾ LP = low pressure, HP = high pressure

Notes

Operating limits

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

Restrictions to operating limits may occur when using a frequency converter. For further explanations consult www.bock.de.

Performance data

The performance data for R448A are based on European Standard EN 12900 with a 50 Hz power supply frequency. This signifies: 20 °C suction gas temperature without liquid subcooling.

Evaporation and condensing temperatures are based on the dew point values (saturated vapour conditions).

Conversion factor for 60 Hz = 1.2


Performance data for other operating points, see BOCK VAP software (vap.bock.de).

HA semi-hermetic compressors

Performance data

R448A 50 Hz			Cooling capacity Q_o [W]			Power consumption P_e [kW]	
Type	Cond. temp. °C		Evaporating temperature °C				
			-20	-25	-30	-35	-40
HA22e/125-4	30	Q	4190	3250	2450	1780	1230
		P	170	153	136	118	100
	40	Q	3530	2700	2000	1410	915
		P	181	159	138	116	0.96
	50	Q	2910	2190	1570	1060	631
		P	187	162	136	112	0.88
HA22e/160-4	30	Q	5220	4030	3020	2170	1470
		P	2.03	1.83	1.62	1.39	1.17
	40	Q	4420	3350	2450	1700	1070
		P	2.17	1.90	1.64	1.37	1.10
	50	Q	3640	2700	1910	1250	691
		P	2.25	1.93	1.61	1.30	1.00
HA22e/190-4	30	Q	6310	4940	3780	2810	2010
		P	2.48	2.23	1.97	1.71	1.45
	40	Q	5440	4210	3170	2300	1570
		P	2.67	2.35	2.03	1.71	1.40
	50	Q	4570	3470	2550	1780	1140
		P	2.80	2.41	2.03	1.66	1.30
HA34e/215-4	30	Q	6790	5230	3920	2810	1900
		P	2.59	2.32	2.03	1.74	1.44
	40	Q	5690	4300	3120	2130	1310
		P	2.78	2.41	2.04	1.67	1.31
	50	Q	4600	3370	2330	1460	731
		P	2.87	2.41	1.96	1.52	1.10
HA34e/255-4	30	Q	8250	6410	4850	3540	2460
		P	3.16	2.81	2.45	2.08	1.72
	40	Q	6980	5340	3960	2800	1840
		P	3.39	2.94	2.49	2.05	1.62
	50	Q	5740	4310	3100	2090	1240
		P	3.54	2.99	2.46	1.94	1.45
HA34e/315-4	30	Q	10400	8020	6020	4370	3010
		P	3.86	3.44	3.00	2.55	2.12
	40	Q	8790	6670	4890	3410	2220
		P	4.16	3.60	3.05	2.51	1.99
	50	Q	7190	5320	3770	2490	1460
		P	4.34	3.66	3.00	2.36	1.77
HA34e/380-4	30	Q	12700	9820	7430	5430	3780
		P	4.76	4.23	3.69	3.14	2.60
	40	Q	10800	8220	6070	4260	2770
		P	5.17	4.50	3.82	3.15	2.50
	50	Q	8860	6600	4690	3090	1760
		P	5.44	4.62	3.80	3.01	2.26
HA44e/475-4	30	Q	16300	12600	9480	6890	4750
		P	5.79	5.18	4.54	3.87	3.21
	40	Q	13900	10600	7750	5420	3490
		P	6.21	5.41	4.60	3.78	2.98
	50	Q	11500	8500	6040	3970	2250
		P	6.47	5.48	4.49	3.52	2.58
HA44e/565-4	30	Q	20200	15700	11900	8740	6130
		P	7.06	6.33	5.57	4.78	3.99
	40	Q	17400	13400	9920	7070	4710
		P	7.63	6.70	5.74	4.78	3.84
	50	Q	14600	11000	7950	5420	3310
		P	8.02	6.88	5.74	4.61	3.53
HA44e/665-4	30	Q	22800	17800	13600	9960	7030
		P	8.06	7.19	6.27	5.34	4.42
	40	Q	19700	15100	11300	8100	5450
		P	8.76	7.63	6.49	5.36	4.26
	50	Q	16500	12500	9090	6270	3910
		P	9.27	7.88	6.52	5.19	3.93

Relating to 20 °C suction gas temperature without liquid subcooling

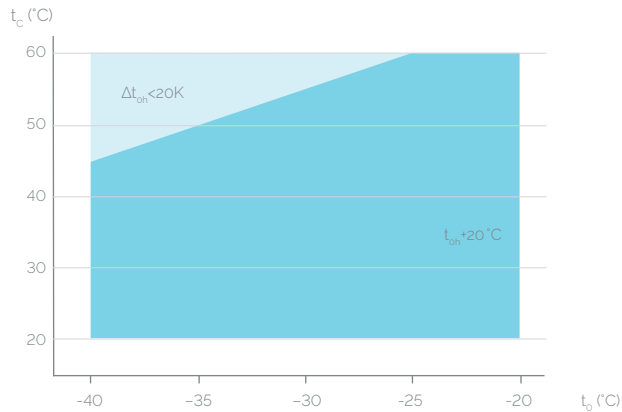
 Reduced suction gas temperature

vap.bock.de 

HA semi-hermetic compressors

Operating limits

R449A



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

- Unlimited application range
- Reduced suction gas temperature

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

¹⁾ LP = low pressure, HP = high pressure

Notes

Operating limits

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

Restrictions to operating limits may occur when using a frequency converter. For further explanations consult www.bock.de.

Performance data

The performance data for R449A are based on European Standard EN 12900 with a 50 Hz power supply frequency. This signifies: 20 °C suction gas temperature without liquid subcooling.

Evaporation and condensing temperatures are based on the dew point values (saturated vapour conditions).

Conversion factor for 60 Hz = 1.2


Performance data for other operating points, see BOCK VAP software (vap.bock.de).

HA semi-hermetic compressors

Performance data

R449A 50 Hz			Cooling capacity Q_o [W]			Power consumption P_e [kW]	
Type	Cond. temp. °C		Evaporating temperature °C				
			-20	-25	-30	-35	-40
HA22e/125-4	30	Q	4170	3240	2440	1780	1230
		P	1.69	1.53	1.35	1.18	1.00
	40	Q	3520	2690	1990	1400	912
		P	1.80	1.59	1.37	1.16	0.96
	50	Q	2890	2170	1570	1060	628
		P	1.87	1.61	1.36	1.11	0.88
HA22e/160-4	30	Q	5200	4010	3010	2160	1470
		P	2.03	1.83	1.61	1.39	1.17
	40	Q	4400	3340	2440	1690	1070
		P	2.16	1.90	1.63	1.36	1.10
	50	Q	3620	2680	1900	1240	688
		P	2.24	1.92	1.60	1.29	1.00
HA22e/190-4	30	Q	6280	4920	3770	2800	2010
		P	2.47	2.22	1.96	1.70	1.44
	40	Q	5420	4190	3150	2290	1570
		P	2.66	2.34	2.02	1.70	1.40
	50	Q	4540	3450	2540	1770	1130
		P	2.79	2.40	2.02	1.65	1.30
HA34e/215-4	30	Q	6760	5220	3900	2810	1900
		P	2.59	2.31	2.03	1.74	1.44
	40	Q	5670	4280	3110	2130	1310
		P	2.76	2.40	2.03	1.67	1.31
	50	Q	4580	3350	2320	1450	728
		P	2.86	2.40	1.96	1.52	1.10
HA34e/255-4	30	Q	8220	6390	4830	3530	2460
		P	3.15	2.80	2.44	2.08	1.72
	40	Q	6940	5320	3940	2790	1830
		P	3.37	2.93	2.48	2.04	1.62
	50	Q	5700	4280	3080	2080	1240
		P	3.52	2.98	2.45	1.94	1.45
HA34e/315-4	30	Q	10400	7990	6010	4360	3010
		P	3.85	3.42	2.99	2.55	2.11
	40	Q	8740	6640	4870	3400	2210
		P	4.14	3.59	3.04	2.50	1.99
	50	Q	7150	5290	3750	2480	1450
		P	4.32	3.65	2.99	2.36	1.77
HA34e/380-4	30	Q	12600	9790	7410	5420	3770
		P	4.74	4.22	3.68	3.14	2.60
	40	Q	10800	8180	6040	4250	2760
		P	5.15	4.48	3.81	3.14	2.49
	50	Q	8800	6560	4660	3070	1750
		P	5.42	4.60	3.79	3.00	2.25
HA44e/475-4	30	Q	16200	12600	9450	6870	4740
		P	5.77	5.16	4.52	3.86	3.20
	40	Q	13800	10500	7720	5400	3480
		P	6.19	5.39	4.58	3.77	2.97
	50	Q	11400	8450	6000	3950	2240
		P	6.44	5.46	4.47	3.51	2.58
HA44e/565-4	30	Q	20100	15700	11900	8720	6120
		P	7.03	6.31	5.55	4.77	3.98
	40	Q	17300	13300	9880	7050	4690
		P	7.60	6.67	5.72	4.77	3.83
	50	Q	14500	11000	7910	5390	3290
		P	7.99	6.85	5.72	4.60	3.52
HA44e/665-4	30	Q	22700	17700	13500	9940	7020
		P	8.04	7.16	6.26	5.33	4.41
	40	Q	19600	15100	11300	8070	5430
		P	8.73	7.60	6.47	5.34	4.25
	50	Q	16400	12400	9040	6240	3890
		P	9.23	7.85	6.49	5.18	3.92

Relating to 20 °C suction gas temperature without liquid subcooling

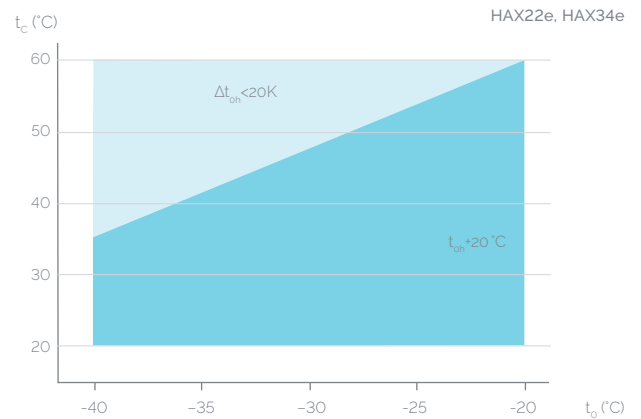
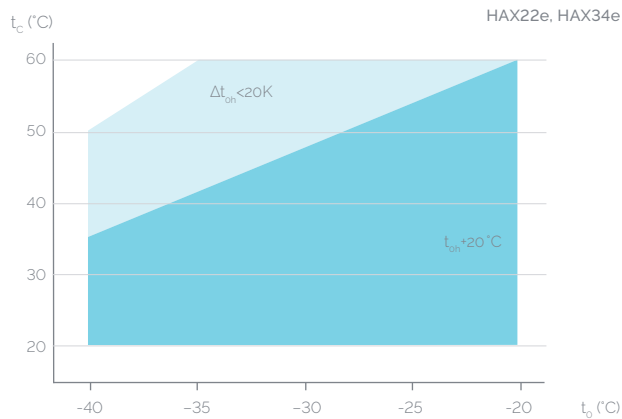
 Reduced suction gas temperature

vap.bock.de 

HA semi-hermetic compressors

Operating limits

R407A



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

● Unlimited application range
● Reduced suction gas temperature

Max. permissible operating pressure (LP/HP)¹⁾: 19/28 bar
¹⁾ LP = low pressure, HP = high pressure

Notes

Operating limits

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

Restrictions to operating limits may occur when using a frequency converter. For further explanations consult www.bock.de.

Performance data

The performance data for R407A are based on European Standard EN 12900 with a 50 Hz power supply frequency. This signifies: 20 °C suction gas temperature without liquid subcooling.

Evaporation and condensing temperatures are based on the dew point values (saturated vapour conditions).


Conversion factor for 60 Hz = 1.2
 Performance data for other operating points, see BOCK VAP software (vap.bock.de).

HA semi-hermetic compressors

Performance data

Type		Cooling capacity Q_o [W]					Power consumption P_e [kW]	
		Evaporating temperature °C						
Cond. temp. °C		-20	-25	-30	-35	-40		
HA22e/125-4	30	Q P	4090 165	3120 148	2330 130	1680 112	1140 0.95	
	40	Q P	3460 176	2600 153	1900 130	1310 108	804 0.88	
	50	Q P	2830 181	2070 153	1450 126	923 100	454 0.77	
HA22e/160-4	30	Q P	5110 198	3890 177	2870 154	2030 132	1350 110	
	40	Q P	4330 2.10	3230 1.82	2310 154	1550 1.27	920 1.00	
	50	Q P	3530 2.16	2550 1.82	1730 1.48	1060 1.15	503 0.84	
HA22e/190-4	30	Q P	6160 2.41	4750 2.15	3610 1.88	2670 1.62	1880 1.36	
	40	Q P	5330 2.59	4060 2.25	3020 1.92	2150 1.59	1400 1.29	
	50	Q P	4440 2.70	3310 2.28	2370 1.87	1560 1.48	844 1.12	
HA34e/215-4	30	Q P	6700 2.51	5120 2.25	3790 1.97	2680 1.68	1770 1.39	
	40	Q P	5630 2.69	4200 2.33	3000 1.97	2000 1.60	1170 1.24	
	50	Q P	4540 2.78	3260 2.32	2200 1.87	1310 1.42	561 1.00	
HA34e/255-4	30	Q P	8160 3.05	6290 2.71	4710 2.37	3390 2.01	2310 1.66	
	40	Q P	6920 3.28	5240 2.85	3820 2.40	2640 1.96	1660 1.54	
	50	Q P	5680 3.43	4190 2.89	2940 2.35	1900 1.83	1030 1.33	
HA34e/315-4	30	Q P	10300 3.76	7850 3.33	5850 2.88	4180 2.42	2810 1.97	
	40	Q P	8630 4.04	6500 3.48	4710 2.91	3220 2.35	1990 1.80	
	50	Q P	7060 4.21	5180 3.51	3600 2.83	2280 2.16	1200 1.52	
HA34e/380-4	30	Q P	12500 4.64	9590 4.10	7220 3.55	5230 2.98	3540 2.42	
	40	Q P	10600 5.03	8010 4.35	5870 3.65	4060 2.95	2480 2.26	
	50	Q P	8690 5.28	6420 4.44	4500 3.60	2860 2.76	1390 1.95	
HA44e/475-4	30	Q P	15800 5.69	12200 5.08	9080 4.44	6510 3.78	4400 3.11	
	40	Q P	13400 6.08	10100 5.28	7350 4.46	5050 3.64	3160 2.84	
	50	Q P	11000 6.30	8090 5.31	5650 4.32	3620 3.35	1940 2.41	
HA44e/565-4	30	Q P	19600 6.94	15200 6.22	11400 5.45	8280 4.66	5710 3.88	
	40	Q P	16800 7.48	12800 6.54	9430 5.58	6630 4.63	4310 3.69	
	50	Q P	14100 7.83	10500 6.69	7490 5.54	5000 4.42	2940 3.34	
HA44e/665-4	30	Q P	22200 7.93	17200 7.05	13000 6.14	9450 5.21	6560 4.29	
	40	Q P	19000 8.58	14600 7.44	10800 6.30	7600 5.18	5000 4.09	
	50	Q P	15900 9.03	11900 7.65	8570 6.29	5800 4.97	3490 3.72	

Relating to 20 °C suction gas temperature
without liquid subcooling

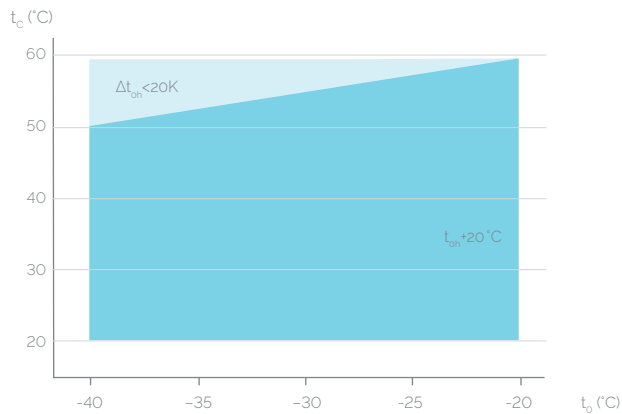
 Reduced suction gas temperature

vap.bock.de 

HA semi-hermetic compressors

Operating limits

R407F



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

- Unlimited application range
- Reduced suction gas temperature

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

¹⁾ LP = low pressure, HP = high pressure

Notes

Operating limits

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

Restrictions to operating limits may occur when using a frequency converter. For further explanations consult www.bock.de.

Performance data

The performance data for R407F are based on European Standard EN 12900 with a 50 Hz power supply frequency. This signifies: 20 °C suction gas temperature without liquid subcooling.

Evaporation and condensing temperatures are based on the dew point values (saturated vapour conditions).

Conversion factor for 60 Hz = 1.2
Performance data for other operating points, see BOCK VAP software (vap.bock.de).

HA semi-hermetic compressors

Performance data

R407F 50 Hz			Cooling capacity Q_o [W]		Power consumption P_e [kW]		
Type	Cond. temp. °C		Evaporating temperature °C				
			-20	-25	-30	-35	-40
HA22e/125-4	30	Q	4300	3270	2420	1730	1190
		P	172	154	135	117	100
	40	Q	3670	2740	1990	1380	912
		P	184	160	137	115	0.96
	50	Q	3030	2220	1570	1060	669
		P	190	162	135	111	0.90
HA22e/160-4	30	Q	5370	4060	2980	2110	1420
		P	2.06	1.84	1.61	1.38	1.17
	40	Q	4590	3400	2440	1660	1060
		P	2.20	1.91	1.62	1.36	1.11
	50	Q	3790	2750	1900	1230	722
		P	2.28	1.93	1.59	1.29	1.02
HA22e/190-4	30	Q	6490	4990	3750	2740	1960
		P	2.52	2.24	1.96	1.70	1.45
	40	Q	5660	4280	3160	2260	1580
		P	2.72	2.36	2.02	1.70	1.41
	50	Q	4770	3540	2550	1780	1210
		P	2.84	2.41	2.01	1.65	1.33
HA34e/215-4	30	Q	7030	5370	3970	2820	1910
		P	2.67	2.37	2.06	1.75	1.45
	40	Q	5930	4440	3180	2150	1330
		P	2.86	2.47	2.07	1.68	1.32
	50	Q	4800	3480	2360	1450	726
		P	2.94	2.45	1.97	1.51	1.09
HA34e/255-4	30	Q	8540	6570	4920	3560	2480
		P	3.25	2.87	2.48	2.09	1.73
	40	Q	7270	5510	4040	2840	1880
		P	3.49	3.00	2.52	2.06	1.64
	50	Q	6000	4450	3170	2120	1290
		P	3.63	3.05	2.48	1.94	1.46
HA34e/315-4	30	Q	10800	8160	6000	4240	2860
		P	4.03	3.53	3.03	2.54	2.09
	40	Q	9110	6770	4860	3320	2120
		P	4.33	3.69	3.07	2.49	1.97
	50	Q	7460	5410	3760	2450	1450
		P	4.50	3.73	3.01	2.35	1.78
HA34e/380-4	30	Q	13100	9990	7400	5280	3580
		P	4.97	4.36	3.74	3.14	2.57
	40	Q	11200	8350	6030	4140	2630
		P	5.38	4.61	3.85	3.13	2.47
	50	Q	9190	6700	4650	3010	1720
		P	5.64	4.71	3.82	3.00	2.25
HA44e/475-4	30	Q	17000	13000	9640	6910	4670
		P	5.99	5.34	4.65	3.95	3.25
	40	Q	14500	11000	7980	5560	3570
		P	6.42	5.59	4.75	3.93	3.13
	50	Q	11900	8800	6260	4170	2460
		P	6.68	5.67	4.69	3.75	2.87
HA44e/565-4	30	Q	21100	16200	12100	8770	6050
		P	7.30	6.52	5.72	4.89	4.05
	40	Q	18200	13900	10300	7270	4850
		P	7.88	6.91	5.94	4.99	4.06
	50	Q	15200	11400	8270	5730	3640
		P	8.28	7.13	6.01	4.94	3.94
HA44e/665-4	30	Q	23900	18300	13800	10100	6950
		P	8.35	7.42	6.45	5.47	4.49
	40	Q	20600	15700	11700	8350	5620
		P	9.07	7.90	6.73	5.60	4.53
	50	Q	17200	13000	9480	6650	4310
		P	9.59	8.19	6.86	5.60	4.45

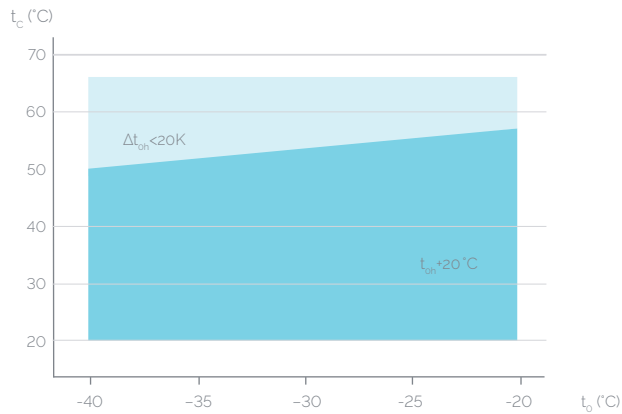
Relating to 20 °C suction gas temperature without liquid subcooling



HA semi-hermetic compressors

Operating limits

R22



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

- Unlimited application range
- Reduced suction gas temperature

Max. permissible operating pressure (LP/HP)¹⁾: 19/28 bar
¹⁾ LP = low pressure, HP = high pressure

R22 Notes

Operating limits

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

Restrictions to operating limits may occur when using a frequency converter. For further explanations consult www.bock.de.

Performance data

The performance data for R22 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 results in significant differences compared to specifications with liquid undercooling and/or suction-gas temperatures. A comprehensive modification to 20 °C suction gas temperature will follow at a later date.

Conversion factor for 60 Hz = 1.2


Performance data for other operating points, see BOCK VAP software (vap.bock.de).

HA semi-hermetic compressors

Performance data

R22 50 Hz			Cooling capacity Q_o [W]			Power consumption P_e [kW]	
Type	Cond. temp. °C		Evaporating temperature °C				
			-20	-25	-30	-35	-40
HA22e/125-4	30	Q	4270	3360	2590	1930	1390
		P	173	158	142	126	109
	40	Q	3710	2890	2190	1600	1100
		P	186	167	147	127	107
	50	Q	3180	2440	1820	1290	836
		P	196	173	149	125	103
HA22e/160-4	30	Q	5330	4180	3200	2370	1680
		P	2.07	1.89	1.70	1.50	1.29
	40	Q	4650	3600	2700	1950	1310
		P	2.23	2.00	1.75	1.50	1.26
	50	Q	3980	3040	2230	1540	960
		P	2.35	2.06	1.77	1.48	1.19
HA22e/190-4	30	Q	6400	5080	3960	3010	2230
		P	2.52	2.29	2.06	1.82	1.57
	40	Q	5670	4460	3430	2560	1840
		P	2.74	2.45	2.15	1.86	1.57
	50	Q	4950	3840	2910	2120	1450
		P	2.92	2.56	2.21	1.86	1.52
HA34e/215-4	30	Q	6950	5450	4180	3100	2200
		P	2.65	2.41	2.15	1.89	1.62
	40	Q	6030	4660	3490	2500	1670
		P	2.87	2.55	2.22	1.88	1.54
	50	Q	5110	3870	2800	1900	1140
		P	3.04	2.63	2.21	1.80	1.41
HA34e/255-4	30	Q	8420	6640	5130	3850	2780
		P	3.22	2.90	2.58	2.24	1.91
	40	Q	7340	5720	4350	3190	2220
		P	3.49	3.09	2.68	2.27	1.86
	50	Q	6290	4840	3600	2560	1680
		P	3.71	3.21	2.72	2.23	1.77
HA34e/315-4	30	Q	10600	8310	6380	4750	3410
		P	3.92	3.55	3.15	2.75	2.35
	40	Q	9240	7150	5390	3910	2690
		P	4.29	3.79	3.28	2.78	2.29
	50	Q	7890	6010	4420	3090	1990
		P	4.56	3.94	3.32	2.73	2.16
HA34e/380-4	30	Q	12900	10200	7830	5880	4250
		P	4.82	4.35	3.86	3.36	2.85
	40	Q	11300	8780	6650	4850	3350
		P	5.31	4.70	4.08	3.45	2.84
	50	Q	9670	7400	5460	3820	2430
		P	5.68	4.92	4.17	3.43	2.71
HA44e/475-4	30	Q	16600	13100	10100	7510	5390
		P	5.88	5.35	4.77	4.17	3.56
	40	Q	14600	11300	8550	6220	4270
		P	6.40	5.69	4.95	4.19	3.44
	50	Q	12600	9580	7070	4940	3150
		P	6.79	5.89	4.98	4.08	3.19
HA44e/565-4	30	Q	20500	16200	12500	9420	6850
		P	7.15	6.51	5.82	5.10	4.37
	40	Q	18100	14200	10900	7970	5590
		P	7.83	6.98	6.11	5.23	4.34
	50	Q	15800	12200	9120	6520	4330
		P	8.35	7.31	6.26	5.21	4.18
HA44e/665-4	30	Q	23200	18400	14300	10800	7850
		P	8.17	7.39	6.57	5.72	4.86
	40	Q	20500	16100	12300	9120	6450
		P	8.99	7.97	6.92	5.87	4.84
	50	Q	17900	13900	10500	7520	5070
		P	9.65	8.38	7.12	5.88	4.68

Relating to 20 °C suction gas temperature without liquid subcooling

 Reduced suction gas temperature

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HA semi-hermetic compressors

Technical data

HA

Type	Number of cylinders	Displacement		Electrical data						Weight	Connections ⁵⁾				Oil charge	Frequency range
		m ³ /h		Voltage ¹⁾	Max. Working current ²⁾		Max. Power consumption ²⁾	Starting current (rotor locked)			Discharge line DV		Suction line SV			
		50 Hz 1450 rpm	60 Hz 1740 rpm		Δ	Y		Δ	Y		mm	inch	mm	inch		
HA22e/125-4	2	11.10	13.30	³⁾	8.1	4.7	2.4	69	40	75.5	12	1/2	16	5/8	0.9	30-70
HA22e/160-4	2	13.70	16.40	³⁾	9.6	5.5	2.9	87	50	77.5	12	1/2	16	5/8	0.9	30-70
HA22e/190-4	2	16.50	19.80	³⁾	10.9	6.3	3.5	87	50	76.5	12	1/2	16	5/8	0.9	30-70
HA34e/215-4	4	18.80	22.60	³⁾	12.1	7.0	4.0	87	50	94.0	16	5/8	22	7/8	1.2	25-70
HA34e/255-4	4	22.10	26.60	³⁾	13.8	8.0	4.7	87	50	93.5	16	5/8	22	7/8	1.2	25-70
HA34e/315-4	4	27.30	32.80	³⁾	17.1	9.9	5.8	111	64	96.5	16	5/8	22	7/8	1.2	25-70
HA34e/380-4	4	33.10	39.70	³⁾	19.4	11.2	6.4	132	76	96.0	16	5/8	22	7/8	1.2	25-70
					PW 1+2*			PW1/PW1+2*								
HA44e/475-4	4	41.30	49.60	⁴⁾	15.2	7.6	7.6	87	149	174.0	28	1 1/8	35	1 3/8	2.3	25-70
HA44e/565-4	4	49.20	59.00	⁴⁾	18.3	9.4	9.4	101	174	178.5	28	1 1/8	35	1 3/8	2.3	25-70
HA44e/665-4	4	57.70	69.30	⁴⁾	20.3	11.0	11.0	101	174	173.5	28	1 1/8	35	1 3/8	2.3	25-70

*PW = Part Winding, motors for part winding start

1 = first part winding

2 = second part winding

Explanations

- 1) Tolerance ($\pm 10\%$) relates to the mean value of the voltage range. Other voltages and current types on request.
- 2) • The specifications for max. power consumption apply for 50 Hz operation. For 60 Hz operation, the specifications have to be multiplied by the factor 1.2. The max. working current remains unchanged.
 - Take account of the max. operating current / max. power consumption when designing contactors, leads and fuses. Switches: Service category AC3

- 3) 220 – 240 V Δ / 380 – 420 V Y - 3 - 50 Hz,
265 – 290 V Δ / 440 – 480 V Y - 3 - 60 Hz
- 4) PW = Part Winding, motors for part winding start (no start unloaders required)
 - Winding ratios: HA44e = 50 % / 50 %
 - Designs for Y/ Δ on request
- 5) For soldering connections

Oil sump heater 110-240 V - 1 - 50 / 60 Hz (option)

- HA22e, HA34e: 50-120 W
- PTC heater, self-regulating, installation in housing bore

Fan motors for the HA version 230 V - 1 - 50/60 Hz

- HA22e, HA34e: 38 W / 0.17 A
- HA44e: 140 W / 0.71 A

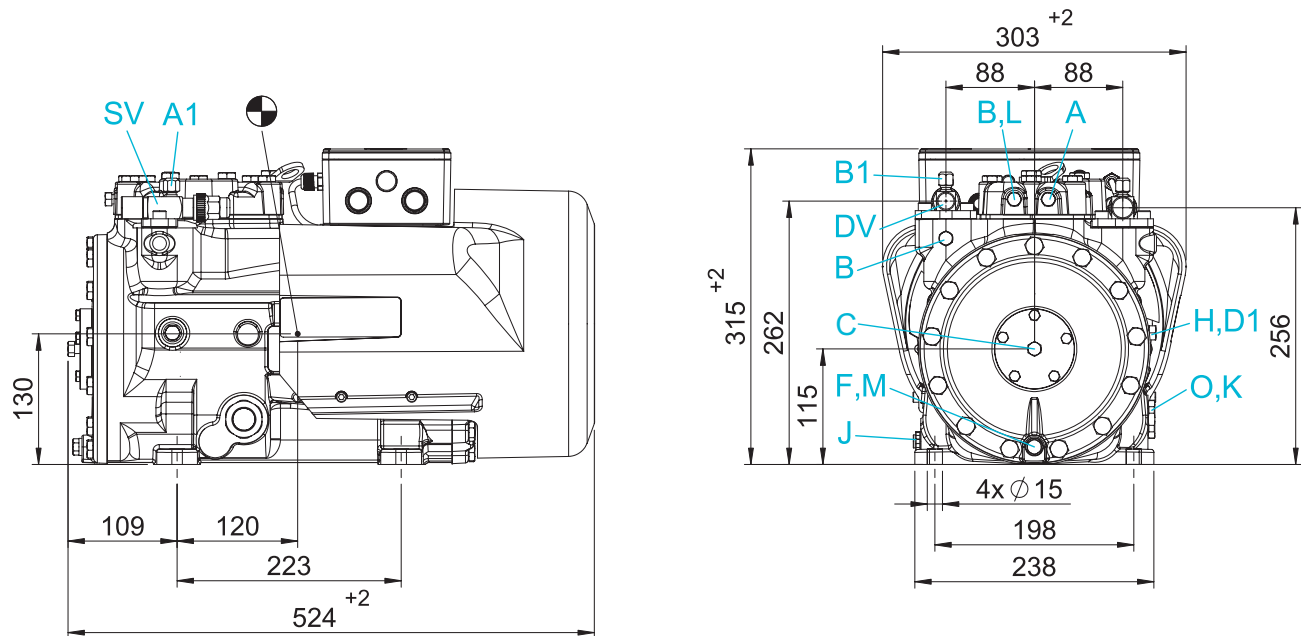
Oil sump heater 230 V - 1 - 50 / 60 Hz (option)

- HA44e: 160 W
- Permanently set version, installation in immersion sleeve

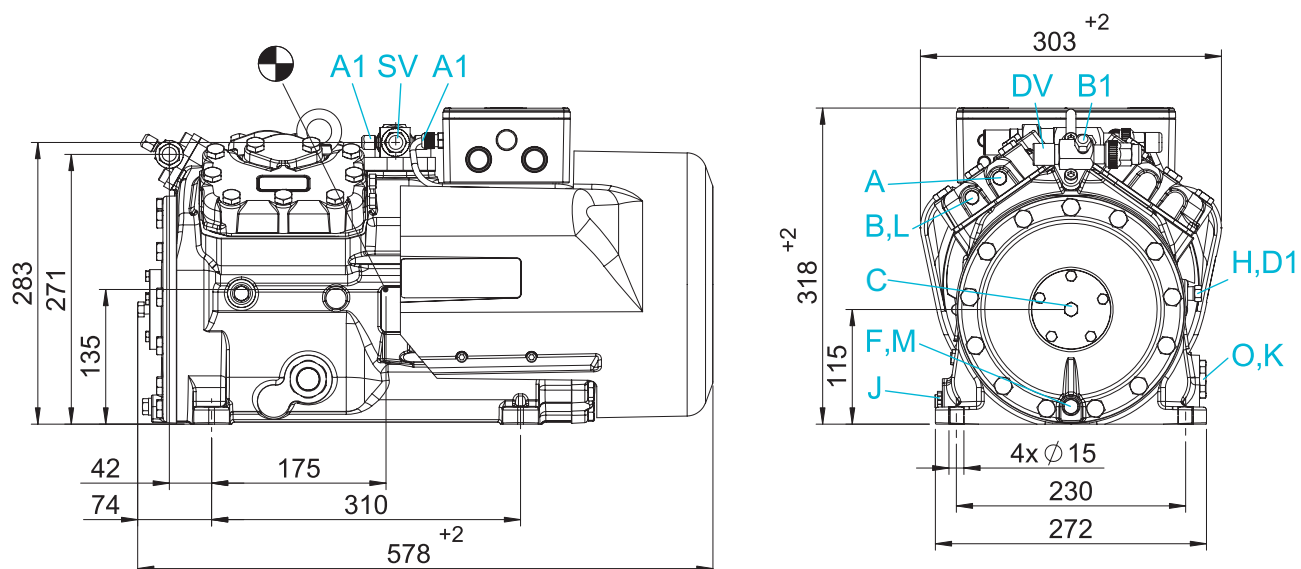
HA semi-hermetic compressors

Dimensions and connections

HA22e » HA22e/125-4 » HA22e/160-4 » HA22e/190-4



HA34e » HA34e/215-4 » HA34e/255-4 » HA34e/315-4 » HA34e/380-4



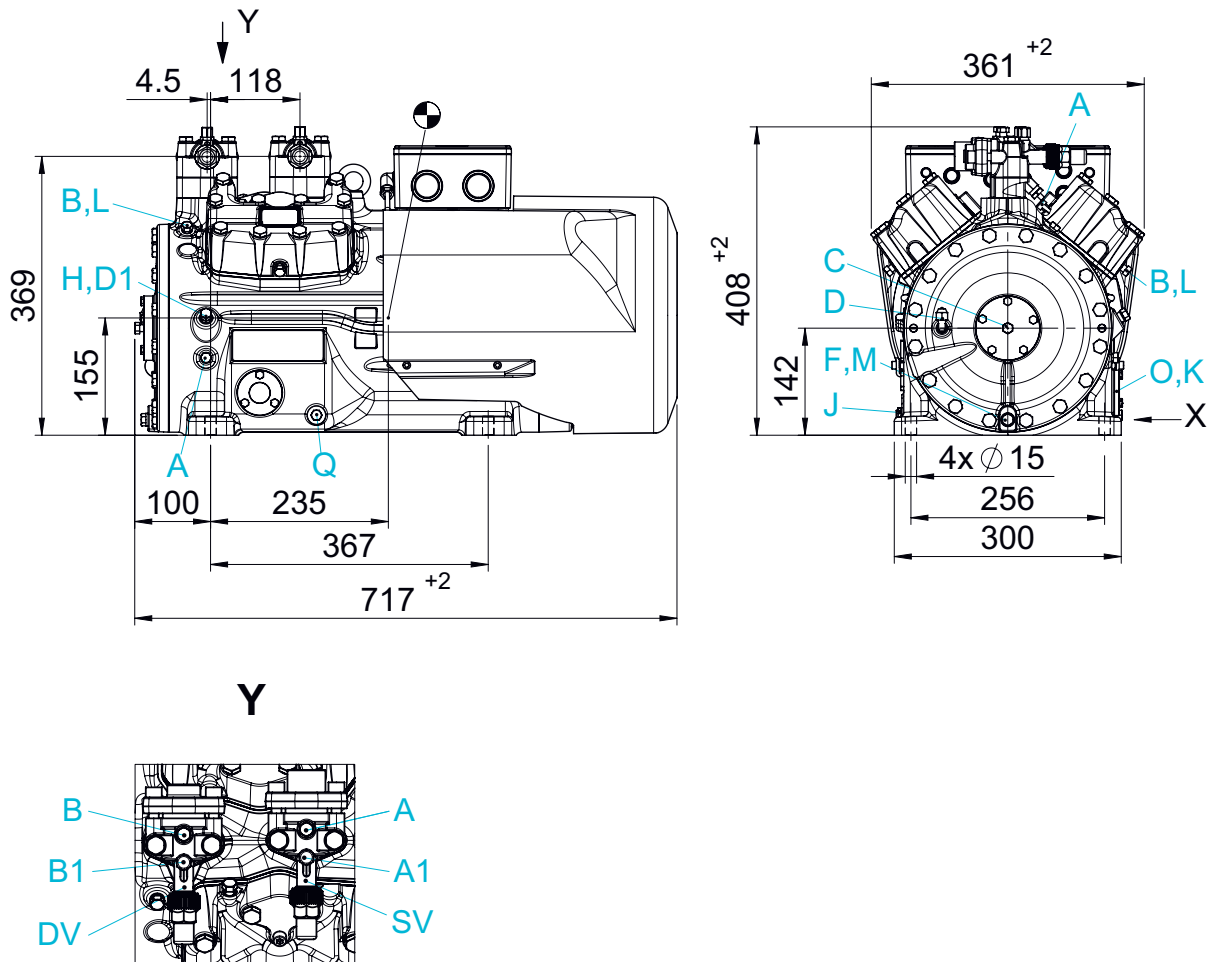
Dimensions in mm
 ● Center of gravity

Connections see page 93
 Dimensions for anti-vibration pad see page 91
 Dimensions for view X see page 91

HA semi-hermetic compressors

Dimensions and connections

HA44e » HA44e/475-4 » HA44e/565-4 » HA44e/665-4



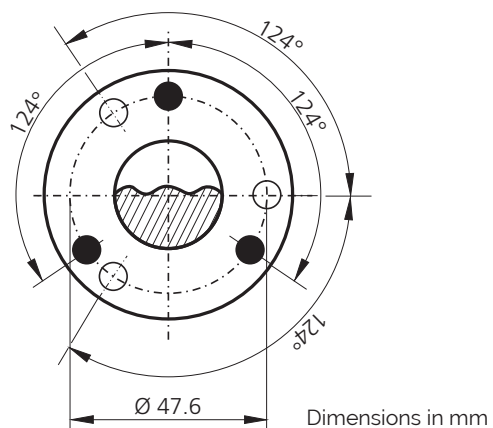
Dimensions in mm
 ⊕ Center of gravity

Connections see page 93
 Dimensions for anti-vibration pad see page 91
 Dimensions for view X see page 91

HA semi-hermetic compressors

Dimensions and connections

View X



Possibility to connect to oil level regulator

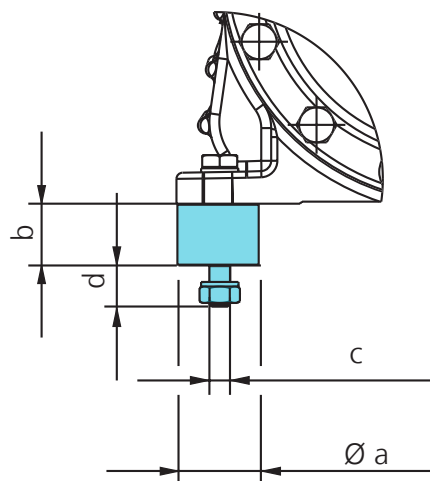
HA44e

- Three-hole connection for oil level regulator of brands ESK, AC+R, CARLY (3 x M6 x 10 deep)
- Three-hole connection for oil level regulator of brand TRAXOIL (3 x M6 x 10 deep)

Dimensions for anti-vibration pad

Type	Ø a	b	c	d
HA22e	40	30	M10	20
HA34e	40	30	M10	20
HA44e	50	30	M12	25

Dimensions in mm

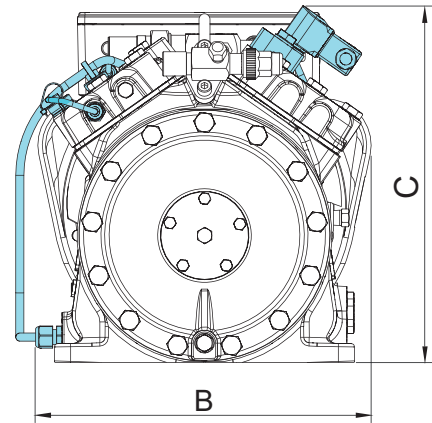
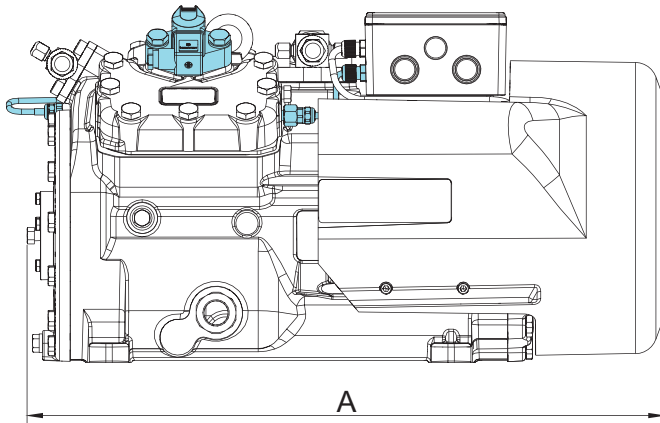


HA semi-hermetic compressors

Dimensions and connections

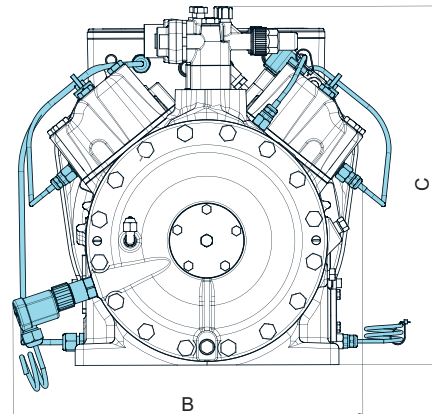
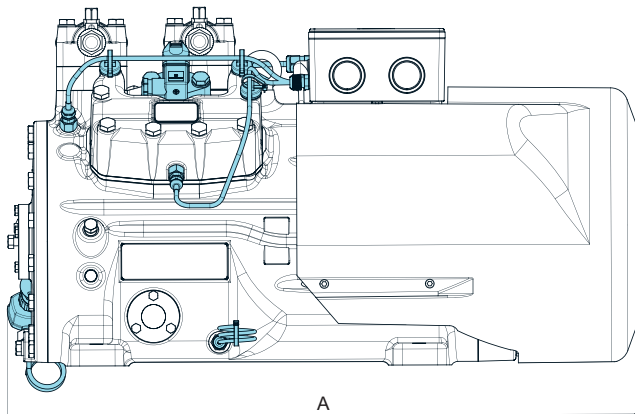
HA22e HA34e

Dimensions with accessories



HA44e

Dimensions with accessories



Type	A	B	C
HA22e	ca. 525	ca. 305	ca. 315
HA34e	ca. 600	ca. 305	ca. 325
HA44e	ca. 720	ca. 400	ca. 410

Dimensions in mm

HA semi-hermetic compressors

Connections

HA22e HA34e HA44e		HA22e	HA34e	HA44e
Connections				
SV	Suction line	Please refer to technical data page 88		
DV	Discharge line			
A	Connection suction side, not lockable	1/8" NPTF	1/8" NPTF	1/8" NPTF
A1	Connection suction side, lockable	7/16" UNF	7/16" UNF	7/16" UNF
B	Connection discharge side, not lockable	1/8" NPTF	1/8" NPTF	1/8" NPTF
B1	Connection discharge side, lockable	7/16" UNF	7/16" UNF	7/16" UNF
C	Connection oil pressure safety switch HP	1/8" NPTF	1/8" NPTF	1/8" NPTF
D	Connection oil pressure safety switch LP	-	-	7/16" UNF
D1	Connection oil return from oil separator	1/4" NPTF	1/4" NPTF	1/4" NPTF
F	Oil drain plug	M12 x 1.5	M12 x 1.5	M12 x 1.5
H	Oil charge plug	1/4" NPTF	1/4" NPTF	1/4" NPTF
J	Connection oil sump heater	3/8" NPTF	3/8" NPTF	3/8" NPTF
K	Sight glass	1 1/8" - 18 UNEF	1 1/8" - 18 UNEF	3 hole M6
L	Connection thermal protection thermostat	1/8" NPTF	1/8" NPTF	1/8" NPTF
M	Oil strainer	M12 x 1.5	M12 x 1.5	M12 x 1.5
O	Connection oil level regulator	1 1/8" - 18 UNEF	1 1/8" - 18 UNEF	3 hole M6
Q	Connection oil temperature sensor	-	-	1/8" NPTF

HA semi-hermetic compressors

Scope of supply and accessories

	HA22e	HA34e	HA44e
Semi-hermetic two-cylinder reciprocating compressor with drive motor for direct start 220 – 240 V Δ / 380 – 420 V Y - 3 - 50 Hz 265 – 290 V Δ / 440 – 480 V Y - 3 - 60 Hz	●	–	–
Semi-hermetic four-cylinder reciprocating compressor with drive motor for direct start 220 – 240 V Δ / 380 – 420 V Y - 3 - 50 Hz 265 – 290 V Δ / 440 – 480 V Y - 3 - 60 Hz	–	●	–
Semi-hermetic four-cylinder reciprocating compressor with drive motor for part winding start (50/50) 380 – 420 V Y/YY - 3 - 50 Hz 440 – 480 V Y/YY - 3 - 60 Hz	–	–	●
Special voltage and/or frequency	○ ³⁾	○ ³⁾	○ ³⁾
Motor is cooled by an integrated fan with air deflection hood 230 V - 1 - 50 / 60 Hz, IP44 38 W, 0.17	●	●	–
Motor is cooled by an integrated fan with air deflection hood 230 V - 1 - 50 / 60 Hz, IP44 140 W, 0.71 A	–	–	●
Winding protection with PTC resistor sensors with electronic triggering unit INT69 G	●	●	●
1 Thermal protection PTC	○ ²⁾	○ ²⁾	○ ²⁾
Oil pump	●	●	●
Oil charge: HA: FUCHS Reniso SP46, HAX: FUCHS Reniso Triton SE55	●	●	●
Inert gas charge	●	●	●
4 anti-vibration pads	● ¹⁾	● ¹⁾	● ¹⁾
Internal safety valve	–	–	●
Suction and discharge line valve	●	●	●
Sight glasses	●	●	●
2 Oil sump heater	110 – 240 V - 1 - 50 / 60 Hz, 50 – 120 W, PTC heater, self-regulating	○ ²⁾	–
	220 – 240 V - 1 - 50 / 60 Hz, 160 W	–	○ ²⁾
Rear bearing flange prepared for oil differential pressure sensor	–	–	○ ²⁾
3 Oil differential pressure sensor DELTA-P II 220 – 240 V - 1 - 50 / 60 Hz	–	–	○ ¹⁾
4 Oil pressure safety switch	230 V - 1 - 50/60 Hz, IP20 MP54	–	○ ¹⁾
	230 V - 1 - 50/60 Hz, IP20 MP55	● ¹⁾	–
6 Capacity regulator 230 V - 1 - 50 / 60 Hz, IP65 1 capacity regulator = 50% residual capacity	–	○ ²⁾	○ ²⁾

¹⁾ Enclosed ²⁾ Mounted ³⁾ On request
⁴⁾ Only possible with additional adapter

● Scope of supply (standard)
○ Available accessories

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● Pictures see page 67/68

HA semi-hermetic compressors

Scope of supply and accessories

	HA22e	HA34e	HA44e
7 Prepared for capacity regulator (1 cylinder cover)	–	○ ²⁾	○ ²⁾
8 Oil temperature sensor	–	–	○ ²⁾
Start unloader by means of ESS (Electronic Soft Start)			
9 400 V - 3 - 50 / 60 Hz, IP20, (connection clamps IPOO) for installation in switch cabinet	● ¹⁾	● ¹⁾	● ¹⁾
12 Intermediate flange for discharge line valve on right or left, seen from oil pump	–	–	○ ¹⁾
13 INT69 G Diagnose 115 / 230 V Ac, 50 / 60 Hz, IPOO (INT69 G not applicable)	○ ²⁾	○ ²⁾	○ ²⁾
15 DP – modbus gateway 115 / 230 V Ac, 50 / 60 Hz, IPOO incl. adapter cable	○ ¹⁾	○ ¹⁾	○ ¹⁾
16 Modbus – LAN gateway 230 V Ac, 50 / 60 Hz, IPOO	○ ¹⁾	○ ¹⁾	○ ¹⁾
17 USB converter for INT69 G Diagnose and INT69 GTML Diagnose	○ ¹⁾	○ ¹⁾	○ ¹⁾
Connection for oil level regulator of brands ESK, AC+ R or CARLY	● ⁴⁾	● ⁴⁾	●
Connection for oil level regulator of brand Traxoil	● ⁴⁾	● ⁴⁾	● ⁴⁾

¹⁾ Enclosed ²⁾ Mounted ³⁾ On request
⁴⁾ Only possible with additional adapter

● Scope of supply (standard)
 ○ Available accessories

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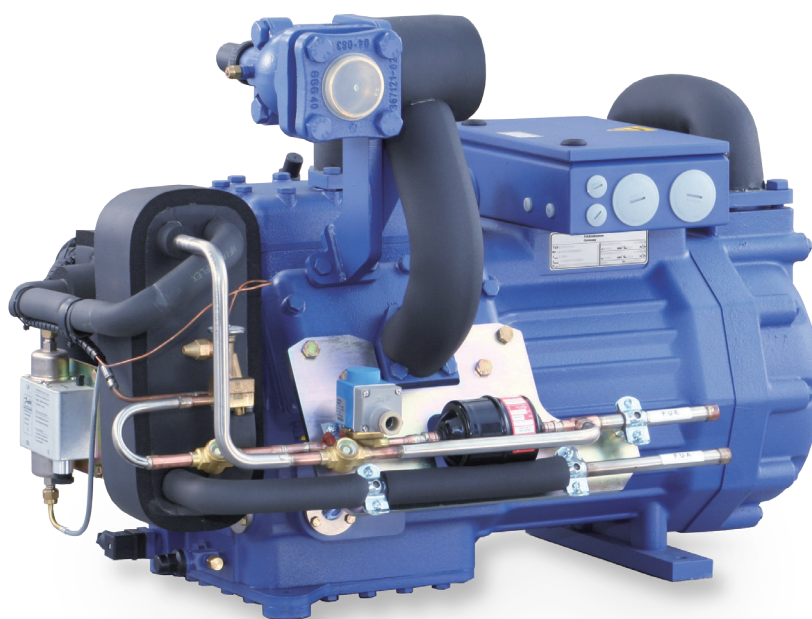
● Pictures see page 67/68



Bock HGZ semi-hermetic compressors

- 98** At a glance
- 100** Operating limits and performance data
- 104** Technical data
- 104** Dimensions and connections
- 107** Scope of supply & accessories

Bock HGZ7 two-stage



Bock HGZ two-stage semi-hermetic compressors

A two-stage variant based on the Bock HG semi-hermetic 6-cylinder range is available for extended use in the domain of deep-freezing.

The two stage system consists of:

- Liquid subcooler
- Re-injection valve
- Solenoid valve
- Sight glass
- Filter drier

Special features:

- 6-cylinder design
- LP/HP stage ratio 2:1
- 2-stage operation with liquid subcooler
- Re-injection valve adapted to refrigerant and application
- Extremely reliable and economic compressor design

For more information on the HG7 basic compressor see chapter "Single-stage semi-hermetic BOCK compressors".

Type	Displacement (50 Hz) LP	Displacement (50 Hz) HP
HGZ7/1620-4 R448A/R449A HGZX7/1620-4 R404A/R507 HGZX7/1620-4 R410A HGZ7/1620-4 R22	93.70 m ³ /h	46.90 m ³ /h
HGZ7/1860-4 R448A/R449A HGZX7/1860-4 R404A/R507 HGZX7/1860-4 R410A HGZ7/1860-4 R22	107.60 m ³ /h	53.80 m ³ /h
HGZ7/2110-4 R448A/R449A HGZX7/2110-4 R404A/R507 HGZX7/2110-4 R410A HGZ7/2110-4 R22	122.40 m ³ /h	61.20 m ³ /h

The two possible designs of the HGZ7

Design version: everything enclosed separately

Medium-pressure mixed line mounted on the compressor. Insulated, liquid subcooler, expansion valve, solenoid valve, sight glass, filter drier, everything enclosed separately for individual, external mounting.

Design version: mounted directly to the compressor

Liquid subcooler, expansion valve, solenoid valve, sight glass, filter dryer mounted directly to the compressor, lined and insulated.

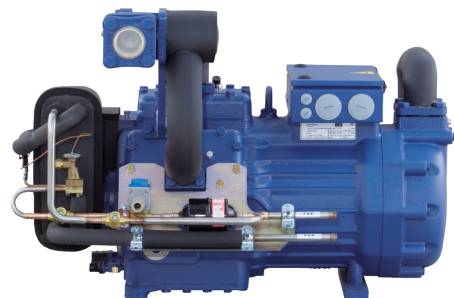
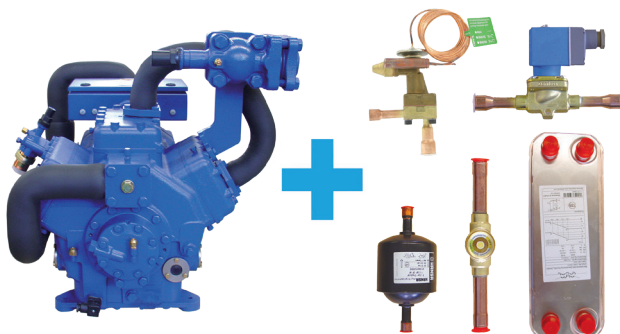
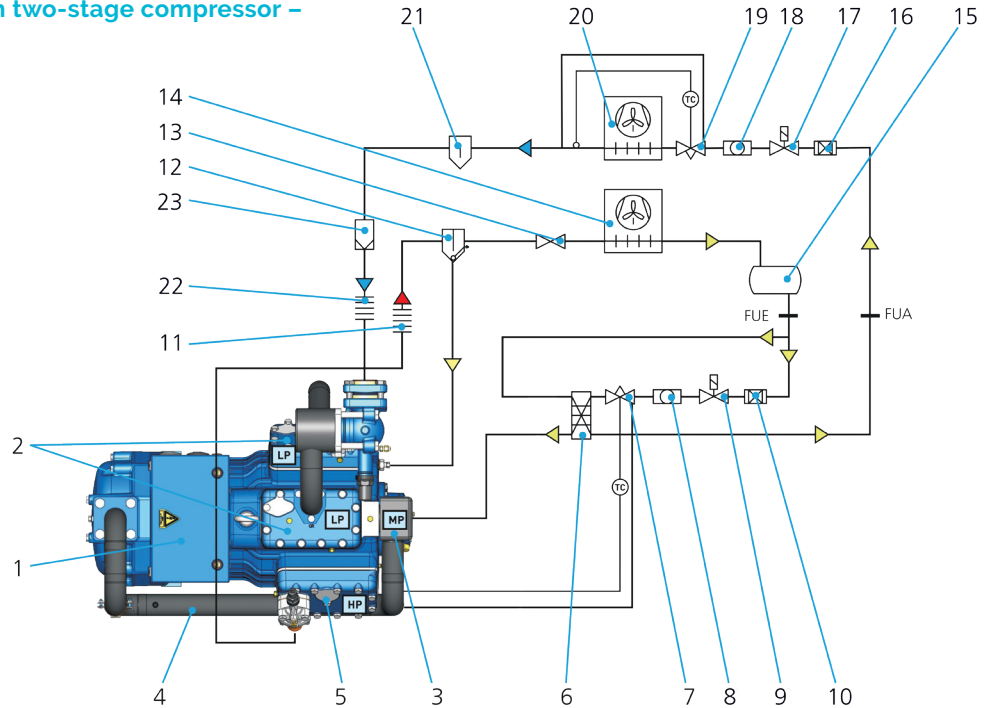


Image similar

HGZ two-stage semi-hermetic compressors

Spezial features

Refrigeration circuit with two-stage compressor – Schematic diagram



Explanations

- | | | |
|-------------------------------------|-------------------------------------|------------------------------------|
| 1) Compressor | 11) Vibration damper, pressure line | 21) Liquid separator |
| 2) Cylinder LP-stage | 12) Oil separator | 22) Vibration damper, suction line |
| 3) Intermediate pressure chamber MP | 13) Non-return valve | 23) Filter suction line |
| 4) Intermediate pressure line MP | 14) Condenser | |
| 5) Cylinder HP-stage | 15) Refrigerant receiver | |
| 6) Subcooler* | 16) Filter drier | |
| 7) Re-injection valve* | 17) Solenoid valve | |
| 8) Sight glass* | 18) Sight glass | |
| 9) Solenoid valve* | 19) Expansion valve (evaporator) | |
| 10) Filter drier* | 20) Evaporator | |
- LP = Low pressure
MP = Medium pressure
HP = High pressure
FUE = Liquid subcooler, inlet
FUA = Liquid subcooler, outlet

* Components for subcooling system not supplied as standard

Type key

HGZX7 / 2110 - 4R404A

- Refrigerant ³⁾
- Number of poles
- Swept volume
- Size
- Ester oil filling ²⁾
- Series ¹⁾

- ¹⁾ HGZ = Hermetic Gas-Cooled (suction-gas-cooled), two-stage
- ²⁾ X = Ester oil filling (HFC refrigerants R404A, R410A)
- ³⁾ e = Possible refrigerants are R404A, R410A, R22

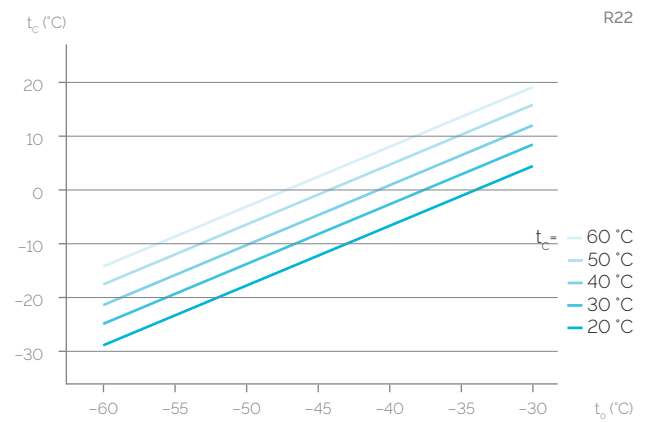
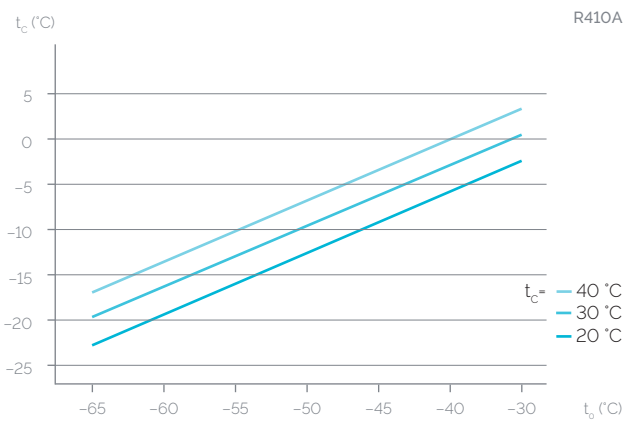
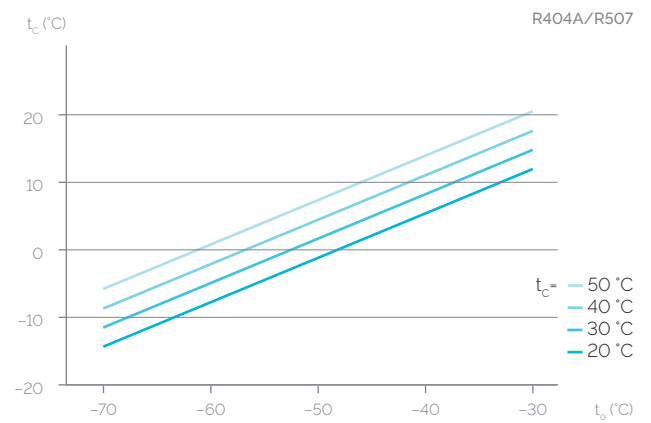
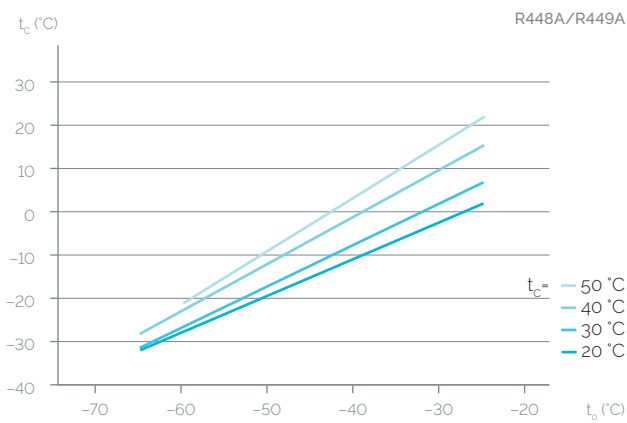
HGZ two-stage semi-hermetic compressors

Operating limits

Subcooling temperature

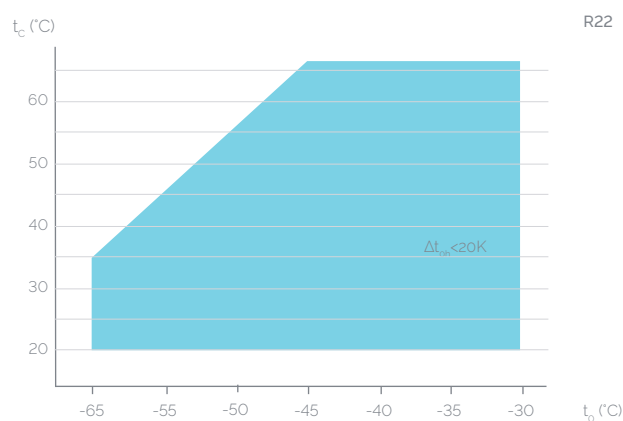
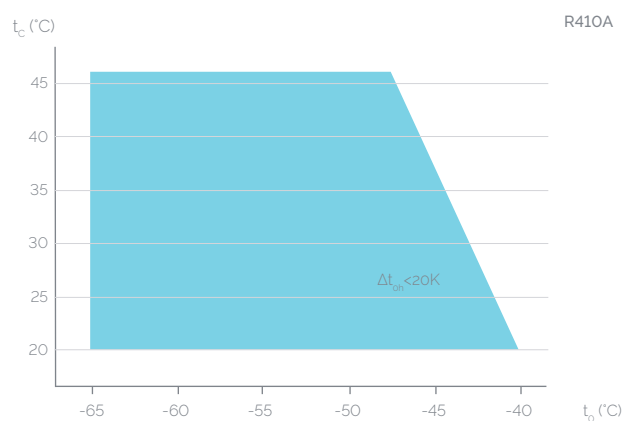
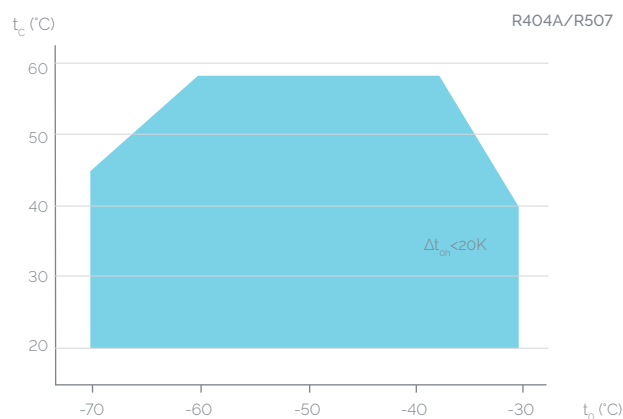
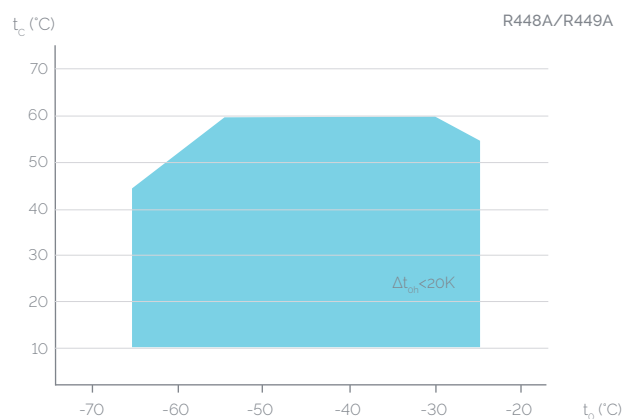
Defined with the help of the diagram by approximately calculating the subcooling temperature arising in the relevant operating conditions (t_o/t_c).

Subcooling temperature calculation diagram for the intermediate cooler outlet



HGZ two-stage semi-hermetic compressors

Operating limits



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

● Application range

Max. permissible operating pressure (LP/HP)¹⁾: 19/28 bar
¹⁾ LP = low pressure, HP = high pressure

Notes

Operating limits

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

Performance data

The stated performance values are based on 10 K suction gas superheat with liquid subcooling, operating at 50 Hz.

Performance data were compiled for R404A and R507. The base values are the data for R404A.

Conversion factor für 60 Hz = 1.2
 Performance data for other operating points, see BOCK VAP software (vap.bock.de).

HGZ two-stage semi-hermetic compressors

Performance data

R448A | 50 Hz

Type		Cooling capacity Q_0 [W]						Power consumption	
		Evaporating temperature °C						P_e [kW]	
Cond. temp. °C		-30	-35	-40	-45	-50	-55	-60	
HGZX7/1620-4	30	Q P	30500 1710	25000 1550	19900 1390	15500 1230	11700 1080	8650 951	6420 8.32
	40	Q P	28900 1910	23700 1720	19000 1540	14900 1360	11400 1200	8460 1040	6360 9.06
	50	Q P	27000 2100	22300 1900	18000 1700	14200 1510	10900 1320	8260 1150	6330 9.95
HGZX7/1860-4	30	Q P	35100 1970	28700 1780	22900 1590	17800 1410	13500 1240	9930 1090	7370 9.56
	40	Q P	33100 2190	27200 1980	21800 1770	17100 1570	13000 1380	9720 1200	7300 10.40
	50	Q P	31000 2420	25600 2180	20600 1960	16300 1730	12500 1520	9480 1320	7270 11.40
HGZX7/2110-4	30	Q P	39900 2240	32600 2020	26000 1810	20200 1610	15300 1410	11300 1240	8380 10.80
	40	Q P	37700 2490	31000 2250	24800 2020	19400 1780	14800 1560	11100 1360	8310 11.80
	50	Q P	35200 2750	29100 2490	23500 2230	18500 1970	14200 1730	10800 1500	8260 13.00

R449A | 50 Hz

Type		Cooling capacity Q_0 [W]						Power consumption	
		Evaporating temperature °C						P_e [kW]	
Cond. temp. °C		-30	-35	-40	-45	-50	-55	-60	
HGZX7/1620-4	30	Q P	30500 1700	24900 1540	19900 1380	15500 1230	11700 1080	8660 949	6430 8.31
	40	Q P	28800 1900	23700 1720	19000 1540	14900 1360	11400 1190	8470 1040	6370 9.05
	50	Q P	26900 2090	22200 1890	17900 1700	14100 1500	10900 1320	8260 1150	6340 9.93
HGZX7/1860-4	30	Q P	35000 1960	28600 1770	22900 1590	17800 1410	13500 1240	9950 1090	7390 9.55
	40	Q P	33000 2180	27200 1970	21800 1760	17100 1560	13000 1370	9730 1190	7320 10.30
	50	Q P	30800 2400	25500 2180	20600 1950	16200 1730	12500 1510	9490 1320	7280 11.40
HGZX7/2110-4	30	Q P	39800 2230	32500 2020	26000 1810	20200 1600	15300 1410	11400 1240	8400 10.80
	40	Q P	37600 2480	30900 2240	24800 2010	19400 1780	14800 1560	11100 1360	8330 11.80
	50	Q P	35100 2740	29000 2480	23400 2220	18500 1960	14200 1720	10800 1500	8280 12.90

R404A/R507 | 50 Hz

Type		Cooling capacity Q_0 [W]						Power consumption			
		Evaporating temperature °C						P_e [kW]			
Cond. temp. °C		-30	-35	-40	-45	-50	-55	-60	-65	-70	
HGZX7/1620-4	30	Q P	34869 2117	28471 1941	23098 1763	18628 1584	14936 1405	11899 1231	9394 1061	7296 8.99	5482 7.46
	40	Q P	33437 2342	27315 2142	22181 1940	17910 1739	14380 1541	11467 1348	9047 1161	6997 9.84	5192 8.17
	50	Q P	- -	25860 2349	20950 2124	16866 1902	13484 1684	10680 1472	8332 1268	6315 10.75	- -
HGZX7/1860-4	30	Q P	40042 2431	32694 2229	26525 2024	21391 1818	17152 1614	13665 1413	10787 1219	8378 10.32	6294 8.56
	40	Q P	38397 2690	31367 2460	25471 2228	20567 1997	16514 1770	13169 1548	10390 1334	8035 11.30	5962 9.38
	50	Q P	- -	29696 2698	24057 2439	19367 2184	15484 1933	12265 1690	9568 1456	7252 12.35	- -
HGZX7/2110-4	30	Q P	45550 2766	37191 2536	30173 2303	24334 2069	19511 1836	15544 1608	12271 1386	9530 11.74	7160 9.74
	40	Q P	43679 3060	35681 2798	28974 2534	23396 2272	18785 2013	14980 1761	11819 1517	9140 12.85	6782 10.67
	50	Q P	- -	33780 3069	27366 2775	22031 2484	17614 2199	13952 1923	10884 1657	8249 14.04	- -

HGZ two-stage semi-hermetic compressors

Performance data

R410A | 50 Hz

Type		Cooling capacity Q_o [W]					Power consumption P_e [kW]	
		Evaporating temperature °C						
Cond. temp. °C		-45	-50	-55	-60	-65		
HGZX7/1620-4	30	Q P	25354 22.89	19967 20.80	15285 18.67	11396 16.43	8385 14.00	
	50	Q P	- -	19131 22.87	14630 20.63	10868 18.25	7930 15.68	
HGZX7/1860-4	30	Q P	29182 26.28	22859 23.89	17530 21.44	13136 18.87	9614 16.08	
	50	Q P	- -	21959 26.26	16774 23.68	12508 20.96	9101 18.00	
HGZX7/2110-4	30	Q P	33195 29.90	26003 27.17	19941 24.39	14943 21.46	10937 18.29	
	50	Q P	- -	24980 29.87	19082 26.94	14229 23.84	10352 20.48	

R22 | 50 Hz

Type		Cooling capacity Q_o [W]					Power consumption P_e [kW]	
		Evaporating temperature °C						
Cond. temp. °C		-30	-35	-40	-45	-50	-55	-60
HGZX7/1620-4	30	Q P	29711 18.26	24214 16.81	19448 15.40	15365 14.03	11921 12.70	6765 10.16
	40	Q P	29059 20.23	23630 18.52	18930 16.86	14914 15.23	11537 13.64	- -
	50	Q P	28355 22.30	22992 20.33	18360 18.41	14411 16.53	11100 14.69	- -
	60	Q P	27598 24.47	22302 22.25	17736 20.07	13854 17.93	- -	- -
HGZX7/1860-4	30	Q P	30088 20.97	27881 19.31	22408 17.69	17669 16.11	13664 14.58	10393 13.10
	40	Q P	33296 23.23	27181 21.27	21800 19.36	17153 17.49	13240 15.67	10061 13.89
	50	Q P	32434 25.60	26411 23.35	21122 21.14	16567 18.98	12746 16.68	- -
	60	Q P	31503 28.09	25572 25.54	20375 23.04	15912 20.59	- -	- -
HGZX7/2110-4	30	Q P	38811 23.86	31632 21.96	25406 20.12	20072 18.33	15573 16.59	11848 14.91
	40	Q P	37960 26.43	30868 24.20	24729 22.02	19483 19.89	15071 17.82	11433 15.80
	50	Q P	37040 29.13	30035 26.56	23984 24.05	18825 21.59	14500 19.18	- -
	60	Q P	36050 31.96	29133 29.06	23169 26.21	18097 23.42	- -	- -

* Performance data 50 Hz relative to 10 K suction gas superheat with liquid subcooling

vap.bock.de



HGZ two-stage semi-hermetic compressors

Technical data / Dimensions and connections

HGZ7

Two-Stage Compressors

Type	Number of cylinders	Displacement				Voltage ¹⁾	Electrical data				Weight kg	Oil charge Ltr.	
		50 Hz (1450 rpm)		60 Hz (1740 rpm)			Max. Working current ²⁾	Max. Power consumption ²⁾	Starting current (rotor locked)				
		m ³ /h		m ³ /h					A	A			A
		LP**	HP**	LP**	HP**				Δ / Y	Δ			Y
						PW1+2'		PW1/ PW1+2'					
HGZ7/1620-4 R448A/R449A HGZX7/1620-4 R404A HGZX7/1620-4 R410A HGZ7/1620-4 R22	6	93.70	46.90	112.50	56.20	³⁾ 50	27.0	175	269	294	4.5		
HGZ7/1860-4 R448A/R449A HGZX7/1860-4 R404A/R507 HGZX7/1860-4 R410A HGZ7/1860-4 R22	6	107.60	53.80	129.10	64.60	³⁾ 55	30.0	175	269	291	4.5		
HGZ7/2110-4 R448A/R449A HGZX7/2110-4 R404A/R507 HGZX7/2110-4 R410A HGZ7/2110-4 R22	6	122.40	61.20	146.90	73.40	³⁾ 68	36.0	232	357	289	4.5		

'PW - Part Winding, motors for part winding start 1 - first part winding 2 - second part winding ** LP - low pressure HP - high pressure

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

- Permanently set version, installation in immersion sleeve

Explanations

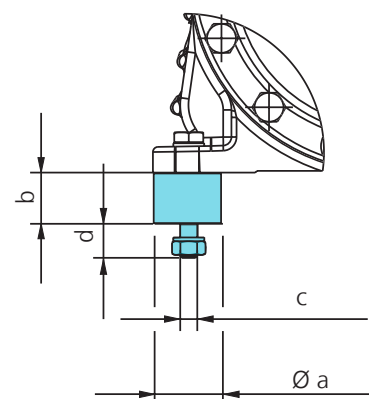
- 1) Tolerance ($\pm 10\%$) relates to the mean value of the voltage range. Other voltages and current types on request.
- 2) • The specifications for max. power consumption apply for 50 Hz operation. For 60 Hz operation, the specifications have to be multiplied by the factor 1.2. The max. working current remains unchanged.
 - Take account of the max. operating current / max. power consumption when designing contactors, leads and fuses. Switches: Service category AC3

- 3) 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: 50% / 50%

Dimensions for anti-vibration pad

Type	Ø a	b	c	d
HGZ7	50	30	M10	25

Dimensions in mm

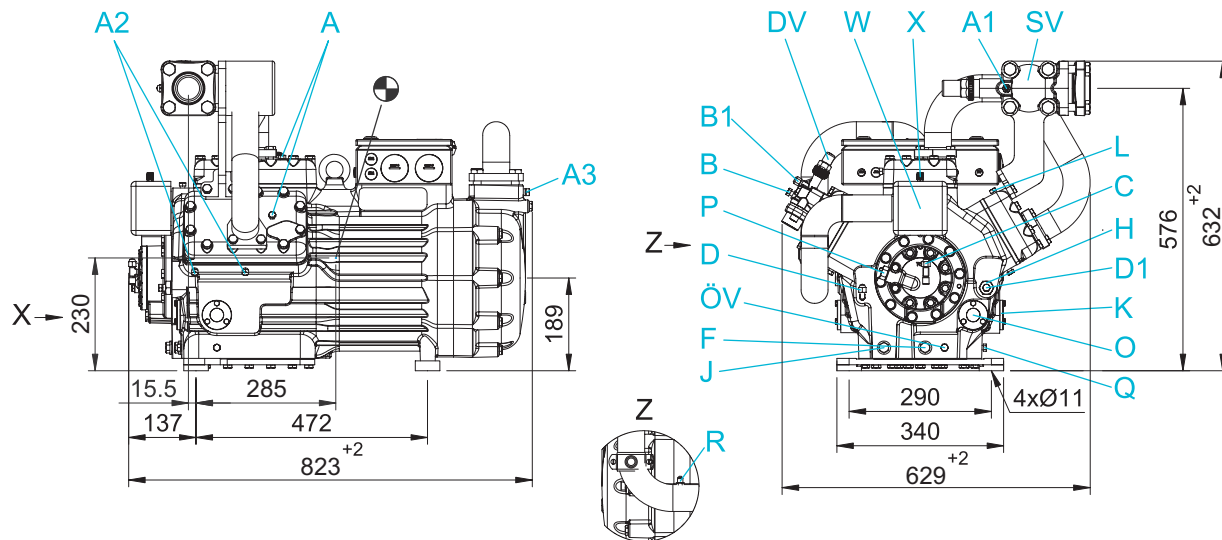


HGZ two-stage semi-hermetic compressors

Dimensions and connections

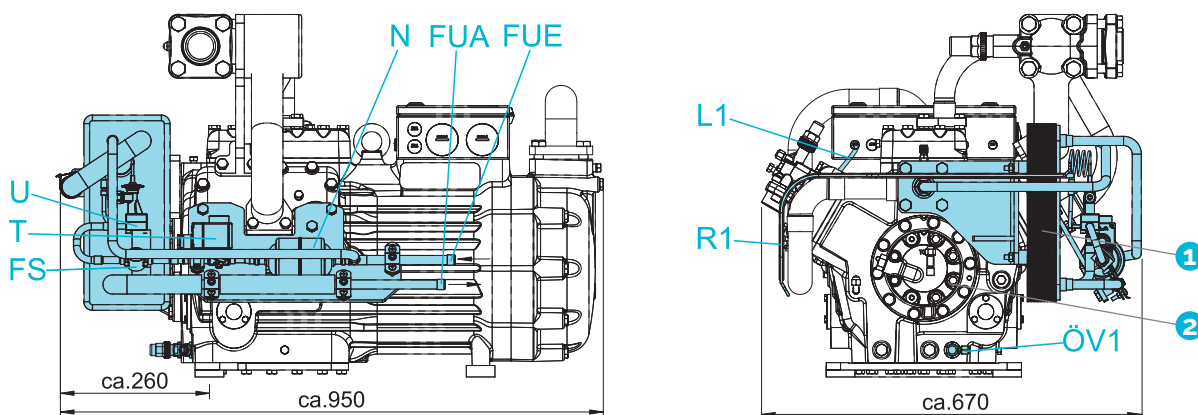
HGZ7 - Series

Liquid subcooler with accessories supplied separately



HGZ7 - Option

Liquid subcooler with complete accessories directly mounted onto the compressor

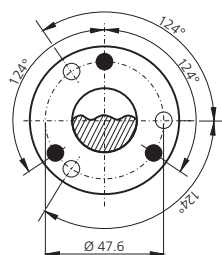


- 1 Liquid subcooler with accessories 2 Oil service valve

Dimensions in mm
 Center of gravity

Connections see page 109
 Rigid fixing without anti-vibration pad
 Dimensions for view X see below

View X



Possibility to connect to oil level regulator

HGZ7

- Three-hole connection for oil level regulator of brands ESK, AC+R, CARLY (3 x M6 x 10 deep)
- Three-hole connection for oil level regulator of brand TRAXOIL (3 x M6 x 10 deep)

Dimensions in mm

HGZ two-stage semi-hermetic compressors

Dimensions and connections

Connections – Series		HGZ7
SV	Suction line	Ø 54 mm 2 1/8"
DV	Discharge line	Ø 35 mm 1 3/8"
A	Connection suction side, not lockable	1/8" NPTF
A1	Connection suction side, lockable	7/16" UNF
A2	Connection suction side, not lockable	1/8" NPTF
A3	Connection intermediate pressure, 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 HP	7/16" UNF
D	Connection oil pressure safety switch LP	7/16" UNF
D1	Connection oil return from oil separator	1/4" NPTF
F	Oil drain plug	M22 x 15
H	Oil charge plug	M22 x 15
J	Connection oil sump heater	M22 x 15
K	Sight glass	3 hole M6
L	Connection thermal protection thermostat	1/8" NPTF
O	Connection oil level regulator	¹⁾
ÖV	Connection oil service valve	1/4" NPTF
P	Connection oil pressure differential sensor	M20 x 15
Q	Connection oil temperature sensor	1/8" NPTF
R	Connection equalizer for injection valve	7/16" UNF
W	Connection for refrigerant injection	M22 x 15
X	Connection for Schrader valve for intermediate pressure manometer	7/16" UNF

¹⁾ Dimensions see view X page 105

Connections – Option		HGZ7
FUE	Liquid subcooler	Ø 16 mm 5/8"
FUA	Liquid subcooler	Ø 16 mm 5/8"
FS	Sight glass liquid subcooler	Ø 12 mm
L1	Thermal protection thermostat	1/8" NPTF
N	Filter drier	Ø 12 mm
ÖV1	Oil service valve	7/16" UNF
R1	Equalizer for injection valve	Ø 6 mm
T	Solenoid valve	Ø 12 mm
U	Re-injection valve – dependent on refrigerant	Ø 12 mm

HGZ two-stage semi-hermetic compressors

Scope of supply and accessories

	HGZ7
Semi-hermetic six-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 Single-section compressor housing with hermetically integrated electric motor	●
Special voltage and/or frequency	● ³⁾
Cylinder design in W form, LP/HP stage ratio 2:1	●
1 Intermediate pressure line mounted and insulated	●
2 Winding protection with PTC sensors and MP10 electronic motor protection	●
Oil pump	●
3 Oil pump cover with screw connection for oil differential pressure sensor DELTA-P II	●
4 Direct connection possibility for oil level regulators ESK, AC+R or CARLY	●
Direct connection possibility for oil level regulators Traxoil	● ⁴⁾
Oil charge	HGZ: FUCHS Reniso SP46 HGZX: FUCHS Reniso Triton SE55
5 Two sight glasses	●
Internal safety valve	●
6 Suction line Shut-off valve	●
7 Discharge line Shut-off valve	●
Inert gas charge	●
4 anti-vibration pads	●
8 Liquid subcooler, re-injection valve, solenoid valve 230 V - 1 - 50 / 60 Hz, sight glass, filter drier, supplied separately for individual, external installation. Assembly is mandatory for the function of the compressor.	● ¹⁾
9 Liquid subcooler, re-injection valve, solenoid valve 230 V - 1 - 50 / 60 Hz, sight glass, filter drier, directly mounted onto the compressor, fully assembled and insulated with pipes ready for connection.	● ²⁾
10 Oil sump heater 220 – 240 V - 1 - 50 / 60 Hz, 140 W	● ²⁾
11 Thermal protection thermostat (PTC sensor) 230 V - 1 - 50 / 60 Hz	● ²⁾
12 Oil pressure safety switch MP 54, 230 V - 1 - 50 / 60 Hz, IP20	● ¹⁾
13 Oil differential pressure sensor DELTA-P II, 220 – 240 V - 1 - 50 / 60 Hz	● ¹⁾
14 Oil service valve	● ²⁾
15 Oil temperature sensor	● ²⁾

¹⁾ Enclosed ²⁾ Mounted ³⁾ On request
⁴⁾ Only possible with additional adapter

● Scope of supply (standard)
○ Available accessories



HGZ two-stage semi-hermetic compressors

Accessories

Intermediate pressure line



Winding protection



Oil pump cover



Direct connection possibility



Sight glasses



Suction line shut-off valve



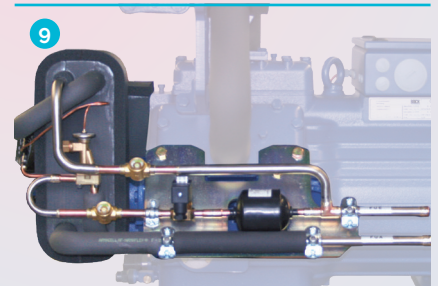
Discharge line shut-off valve



Components enclosed separately



Components mounted directly



HGZ two-stage semi-hermetic compressors

Accessories

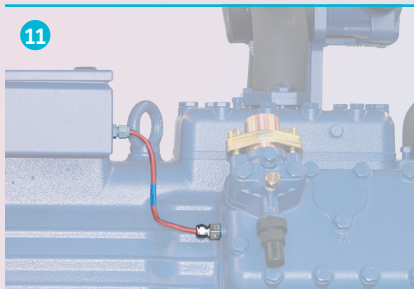
Oil sump heater

10



Thermal protection thermostat

11



Oil pressure safety switch

12



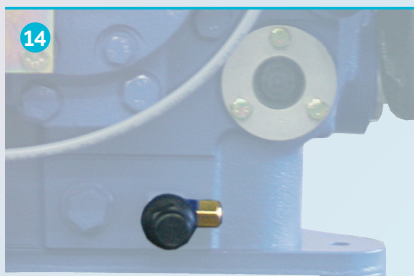
Oil differential pressure sensor

13



Oil service valve

14



Oil temperature sensor

15



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BOCKCO₂Tool

The strengths of the **BOCKCO₂Tool** based on Excel: Support for the selection of CO₂ compressors, e.g. by displaying the system schematic as RI flow diagram and refrigeration circuit in log-p-h-diagram, as well as selecting compressors in rack systems and for special CO₂ systems such as booster systems.

>> **Usage on request:** vap@bock.de

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The BOCK compressor selection program (VAP) is the perfect tool, to find suitable compressors or condensing units for your stationary or mobile application: Simply enter cooling capacity and operating conditions and the suitable components will be displayed immediately. In addition, the tool provides you with further information, e.g. application limits, performance data, dimensions and connections, scope of delivery, accessories, 3 D compressor models and much more.

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