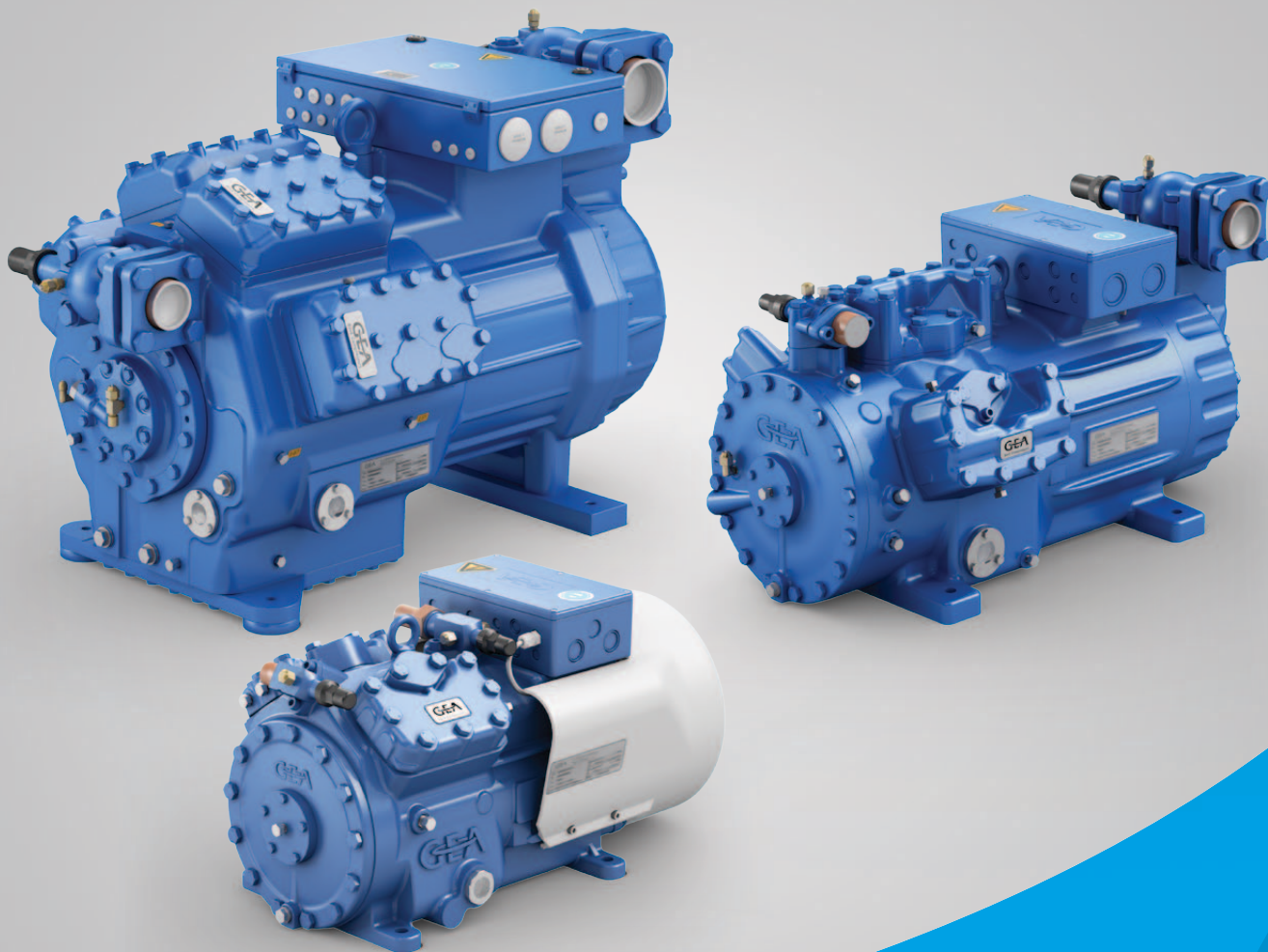




Semi-hermetic GEA Compressors

Single- and two-stage
reciprocating compressors (HG/HA)



gea.com

Your Dealer: Euro-Cold BV | Augsburgstraat 29 3047 AA Rotterdam | +31 10 2380540 | info@eurocold.nl

Advanced competence, in touch with you

In this brochure we present our current program of single-stage and two-stage semi-hermetic GEA compressors. Always close to our customers' market and process requirements, GEA offers the right compressors for refrigeration and air conditioning in all commercial, industrial, and transport sectors.

You will find our semi-hermetic compressors across today's food and beverage industries, spanning the entire cold chain. In addition to many other uses, these compressors are ideally suited for refrigeration in supermarkets and food transport. Likewise, they support state-of-the-art refrigeration and air-conditioning solutions in petrochemical, chemical, pharmaceutical, marine and leisure facility applications.

We develop these compressors as a global refrigeration expert with more than a century of experience. All core components are developed, manufactured, assembled, and tested at our own facilities, always reflecting our enthusiasm for your success. Our worldwide dealer and service network is ready to show you compressors and maintenance solutions for your maximum productivity, wherever you are.

World-leading technology from GEA

GEA is one of the largest suppliers of process technology for the food industry and for a wide range of other industries. As an international technology group, the company focuses on world-leading process solutions and components for sophisticated production processes.

Long-life, energy-efficient GEA solutions ensure both economical savings and reduced ecological footprint, to help you protect the climate and your standing with customers and authorities.

Be inspired by our state-of-the-art products and the entire passion that goes into each of our components.



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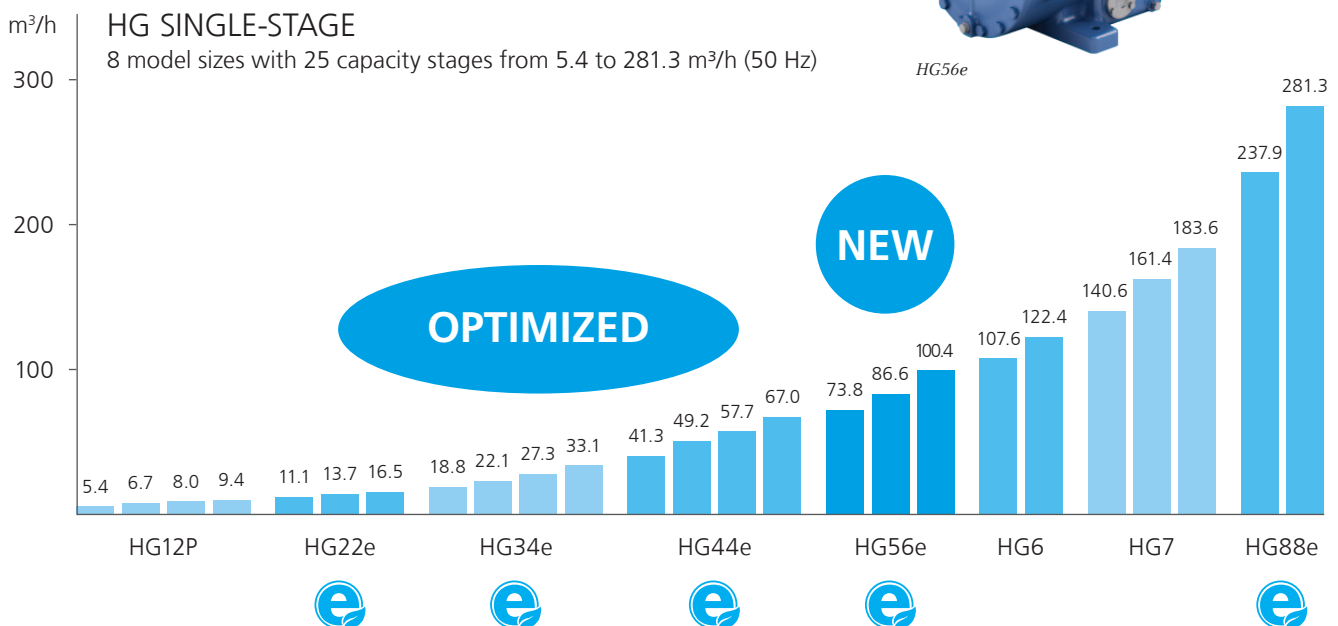
Overview

HG (gas-cooled)

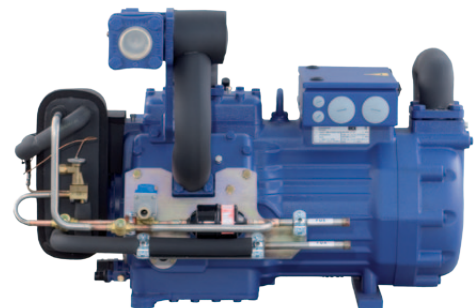
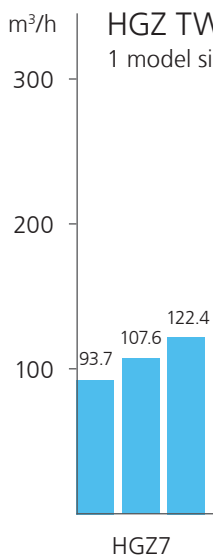
The GEA HG range of semi-hermetic compressors offers traditional suction-gas-cooled compressor technology. These compressors are state of the art, excelling in ease of running, simple maintenance, high efficiency, and reliability.



HG56e



HGZ TWO-STAGE
1 model size with 3 capacity stages from 93.7 to 122.4 m³/h (50 Hz)



HGZ7

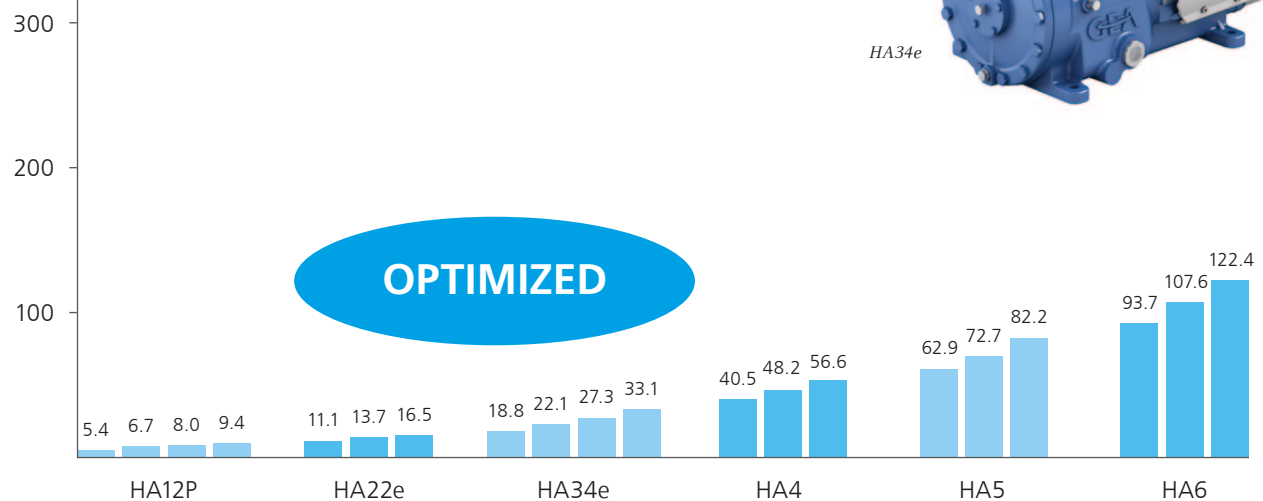
HA (air-cooled)

The GEA 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 GEA 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.

THE CURRENT PROGRAM

6 model sizes with 20 capacity stages from 5.4 to 122.4 m³/h (50 Hz)



HA34e



 = efficiency

Improved HG/HA Series

For new advancements in efficiency, GEA has now updated its entire HG range of semi-hermetic compressors. The new models, marked with the letter “e”, all offer decisive mechanical improvements, a more compact design and easier-to-use connections. Further GEA HA models and other compressor types will be updated in the same way.

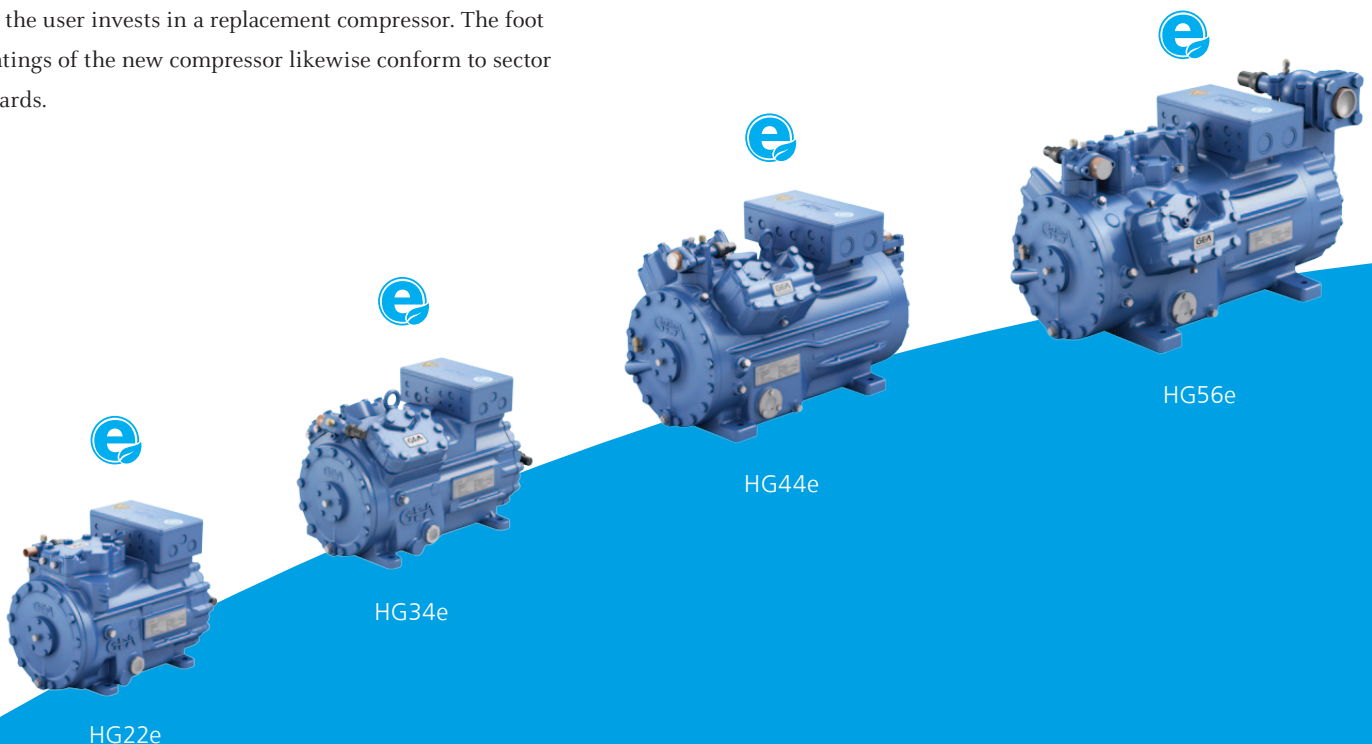
The entire range of gas-cooled commercial GEA compressors, HG22e, HG34e, HG44e and HG88e, is now available in the new, optimized design. In addition to their uses in the fields of refrigeration and air-conditioning, the new compressors are ideally suited for refrigeration in supermarkets. They offer 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.

Optimized range structure

The 6-cylinder model HG56e has been newly developed for all applications formerly covered by 4-cylinder HG5 compressors and the smallest of the HG6 compressors, ensuring more efficient and balanced mechanical operation.



New design housing for maximum gas flow

Optimized valve plate system

Standard-position discharge valve

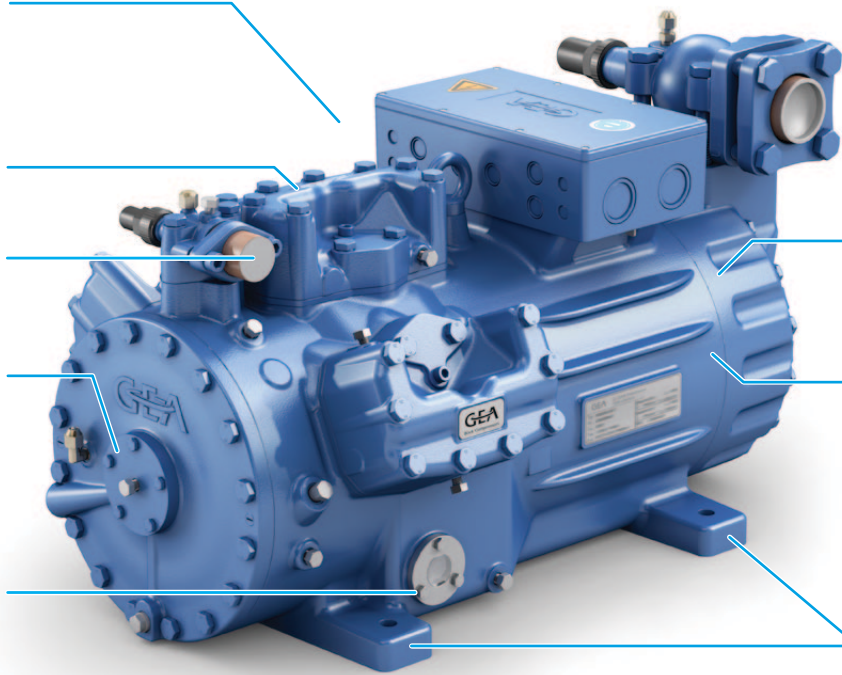
Proven and reliable oil pump lubrication

Standard position sight glass

High efficiency motors of newest generation

Exchangeable motor

Standard footprints



HG88e



HA22e



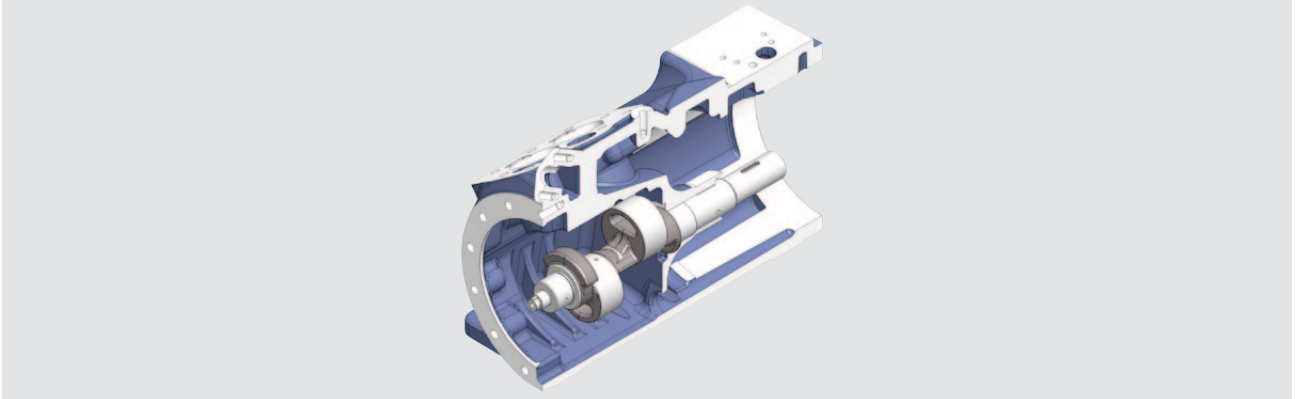
HA34e



HA44

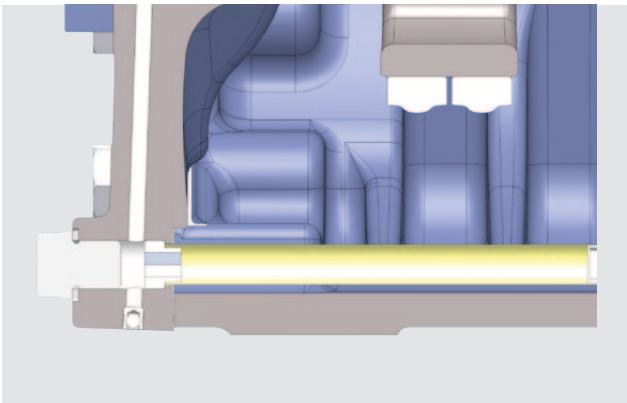
Improved technology

Optimized drive gear

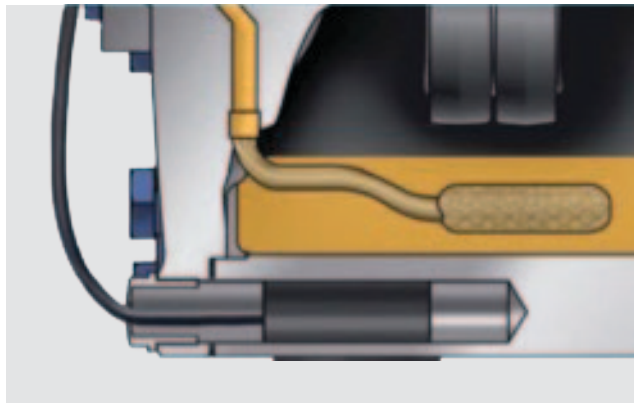


- Optimized drive gear with thrust washer, improving emergency-mode operation and resistance against damage in case of insufficient lubrication

New, easy-to-maintain strainer

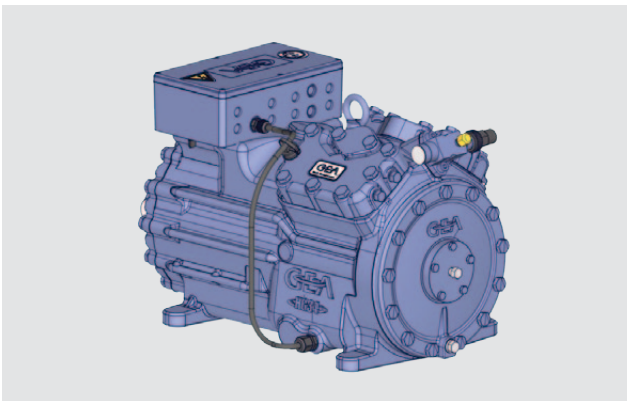


- New, easy-to-remove oil strainer for easier maintenance and increased availability

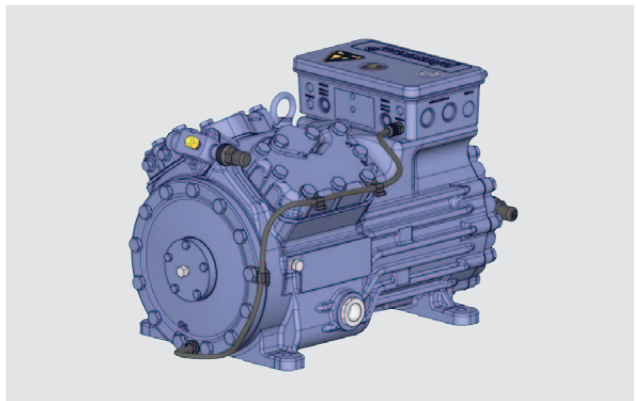


- Former version

Optimized fastening of oil sump heater

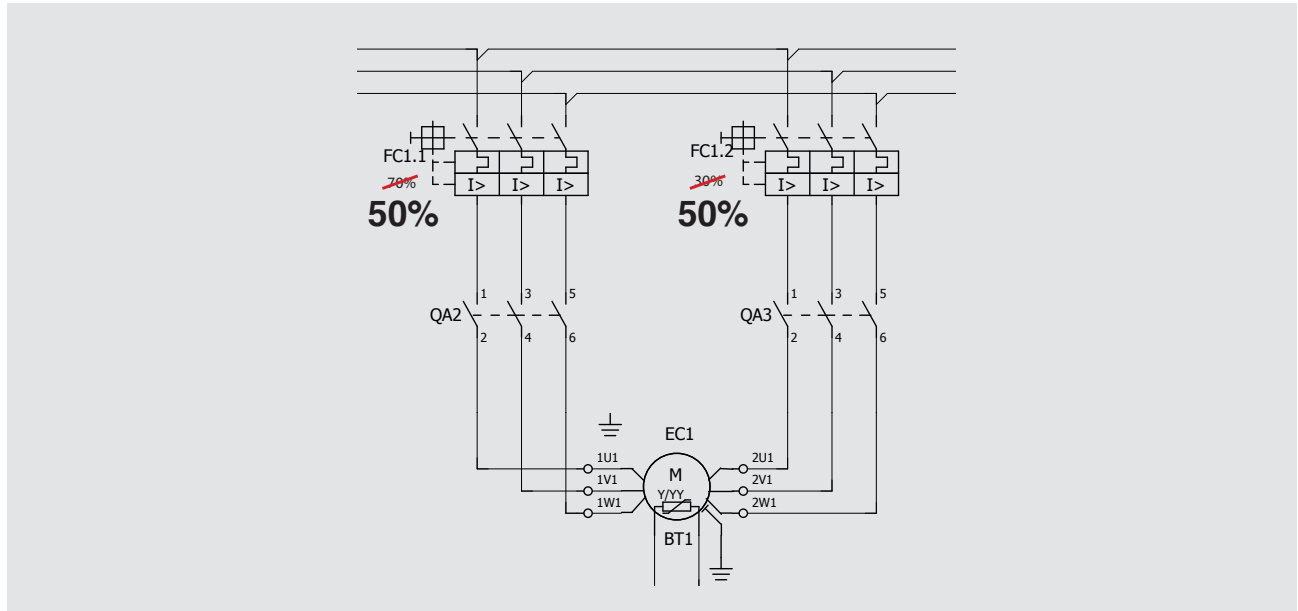


- New, optimized fastening of oil sump heater



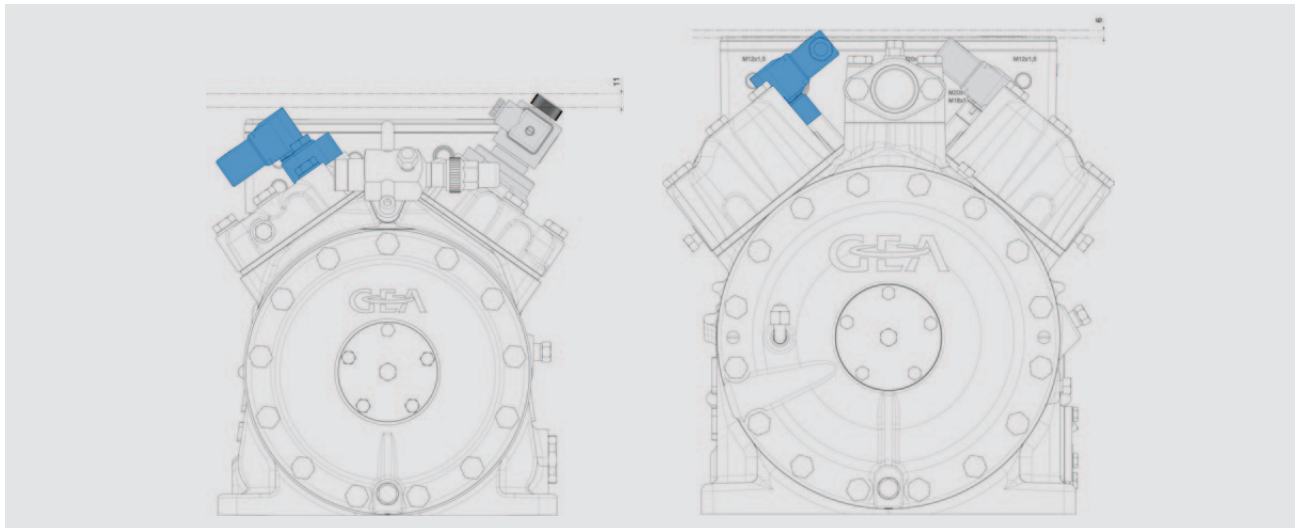
- Former version

New 50/50 winding sectioning



- New 50/50 winding sectioning instead of 70/30 for HG44e, changing starting currents
- HG56e & HG88e state-of-the-art 50/50 performance

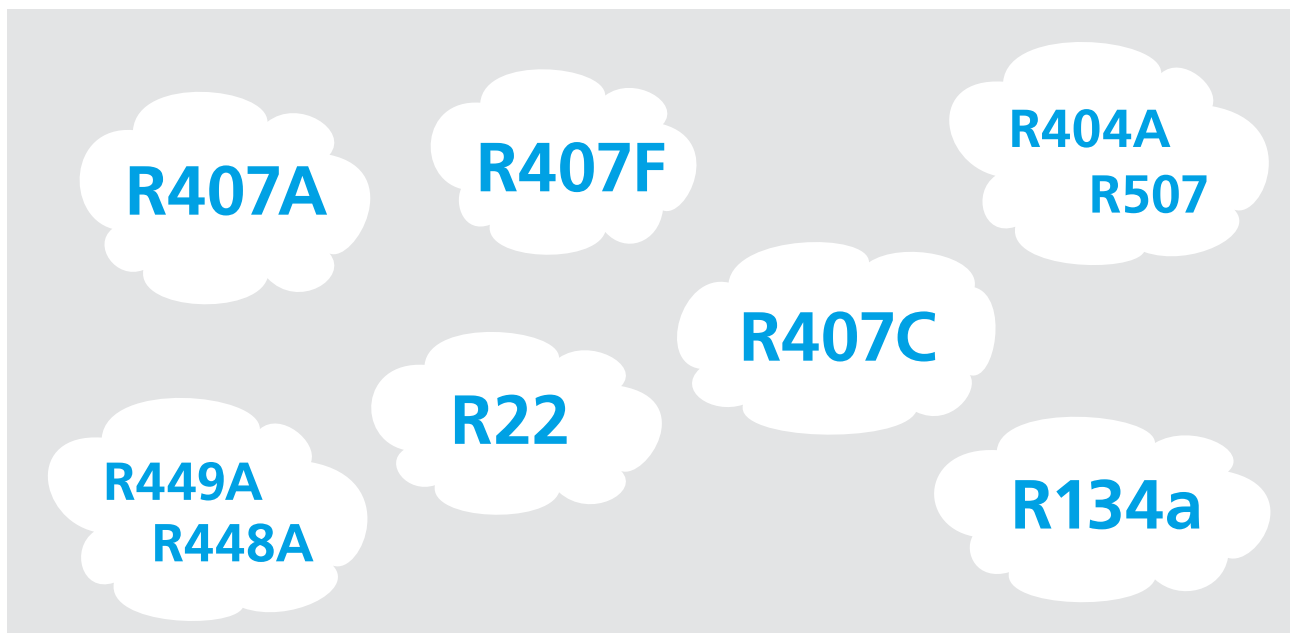
New capacity regulator (CR14 – HG34e/HG44e)



- New capacity regulator with lower height and higher operational safety due to high-pressure control

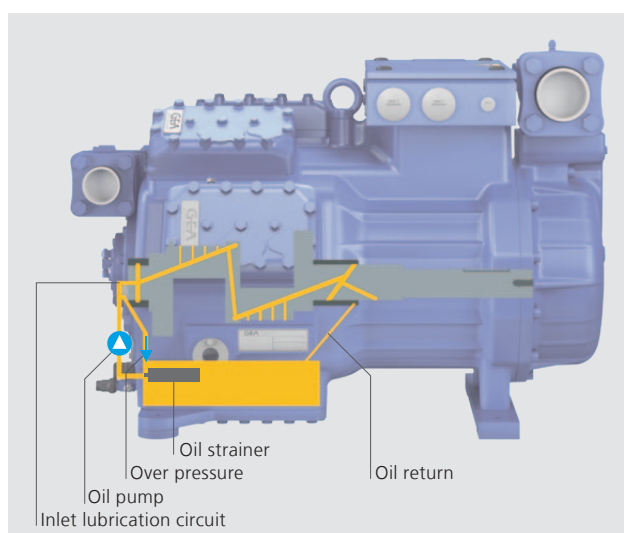
Unique features and advantages

One compressor design for all standard refrigerants



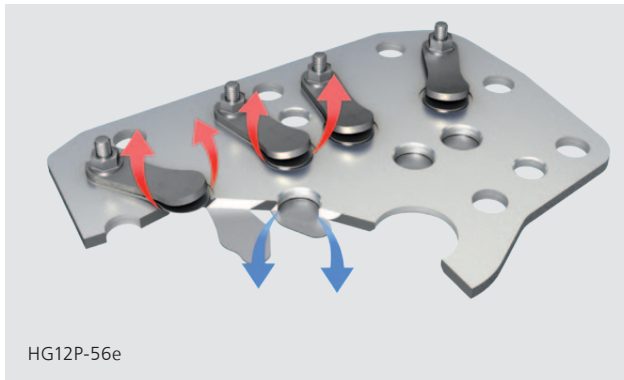
- For air-conditioning, medium and low-temperature application
- Maximum permissible operating pressure: 28 bar

Safe, reliable oil supply



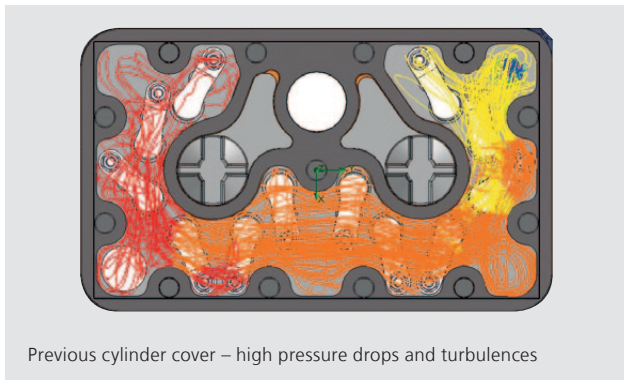
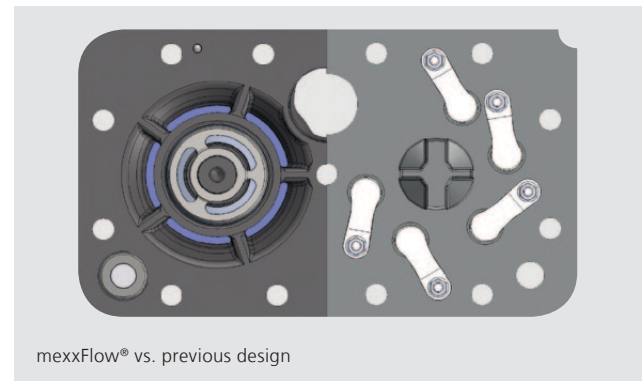
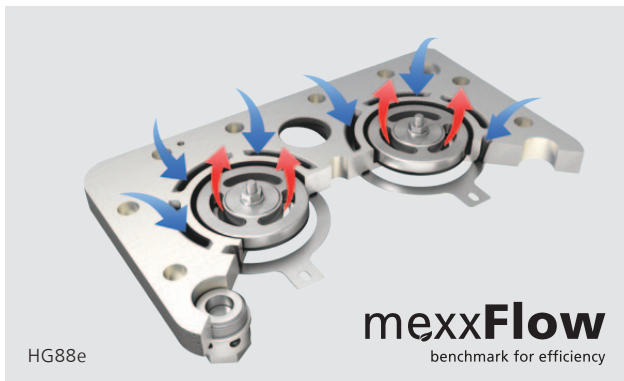
- All compressors with a conventional single circuit lubricating system
- All compressors with oil pump lubrication independent of direction of rotation
- Minimized oil carryover
- Service-friendly oil strainer
- Oil pump lubrication independent of direction of rotation
- Connection possibility for oil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

Standard valve plate design

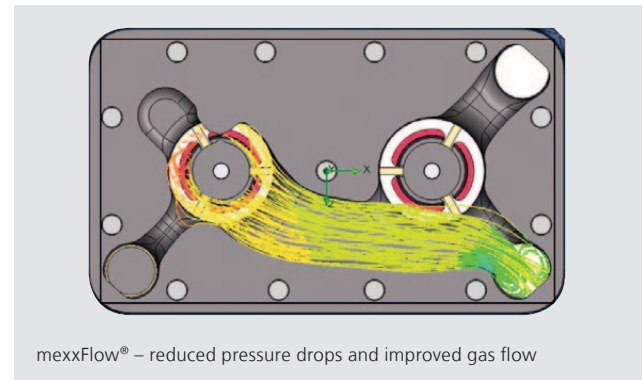


- Valves made of high-quality, impact-resistant spring steel
- Universally proven valve design with suction and discharge finger reed valves

Valve plate innovation: mexxFlow®, only from GEA



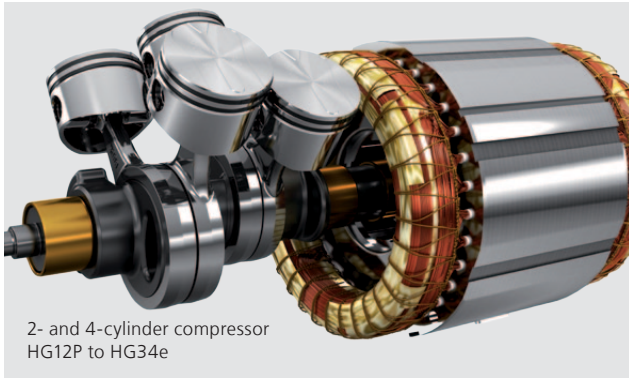
Previous cylinder cover – high pressure drops and turbulences



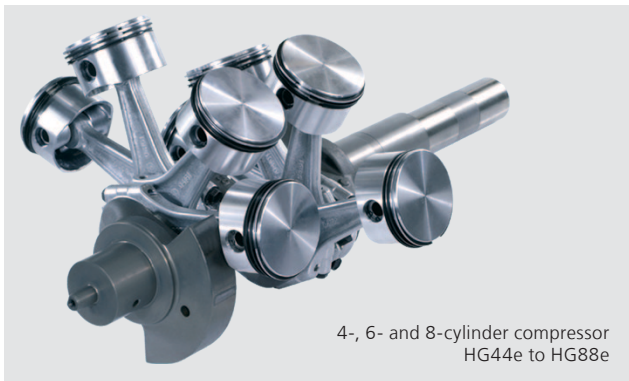
mexxFlow® – reduced pressure drops and improved gas flow

- 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

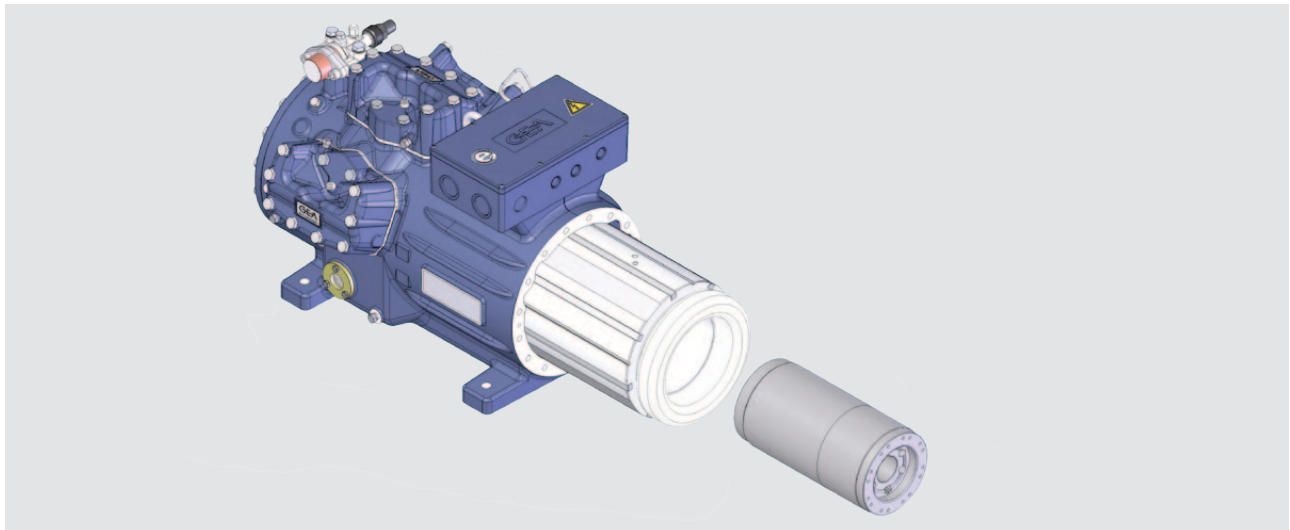


- Solid design of excentric shaft
- High durability due to low-friction sleeve bearings
- Low oil carryover due to aluminium pistons with double ring assembly



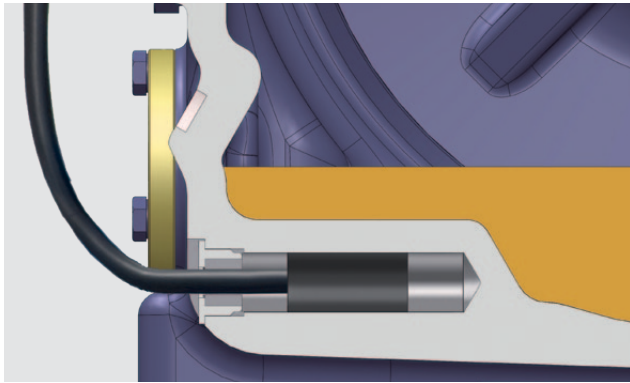
- Solid design of crankshaft
- High durability due to low-friction sleeve bearings
- Aluminium pistons with triple ring assembly, hard-chromium-plated sealing ring, HG44e and HG56e with double ring assembly
- Aluminium connecting rod with high-resistance piston bolt bearings, for HG44e and upwards
-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

Service-friendly design

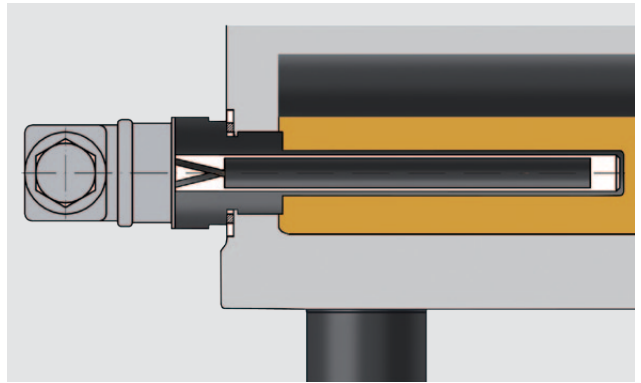


- Built-in motor, easy to replace due to slide fit (not press fit)

Oil sump heater

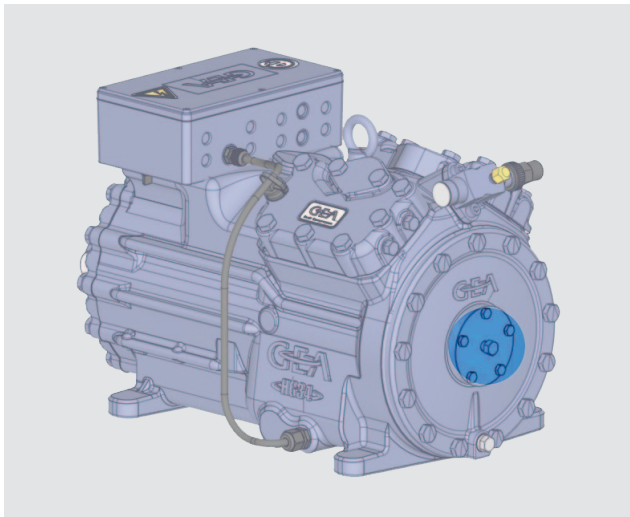


- PTC heater, self-regulating for HG12P up to HG34e
- Constant power for HG44e up to HG56e



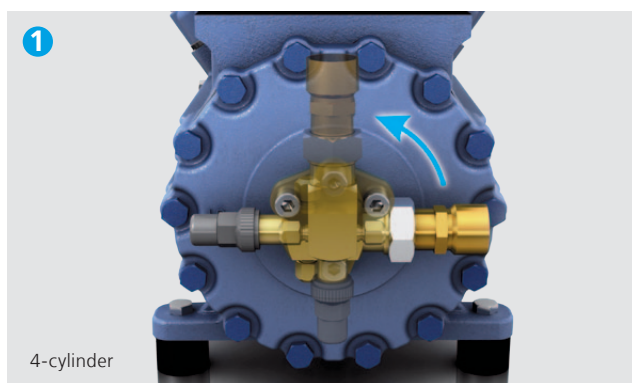
- Standard in 8-cylinder compressors HG88e

Connection plug for oil monitoring with oil pressure safety switch MP55



- For HG12P up to HG34e compressors

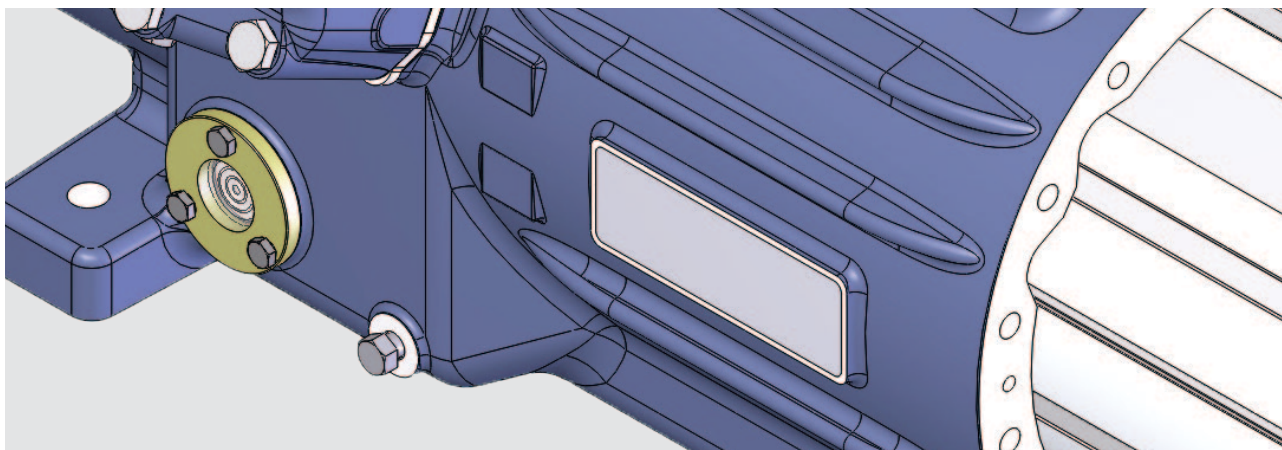
Variable suction line valve position HG



- 1 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°
HG88e	180°	90°

Connection facility oil temperature sensor



- Available for HG44e–HG88e

Electronic motor protection INT69 G



Temperature safety drive for the drive motor

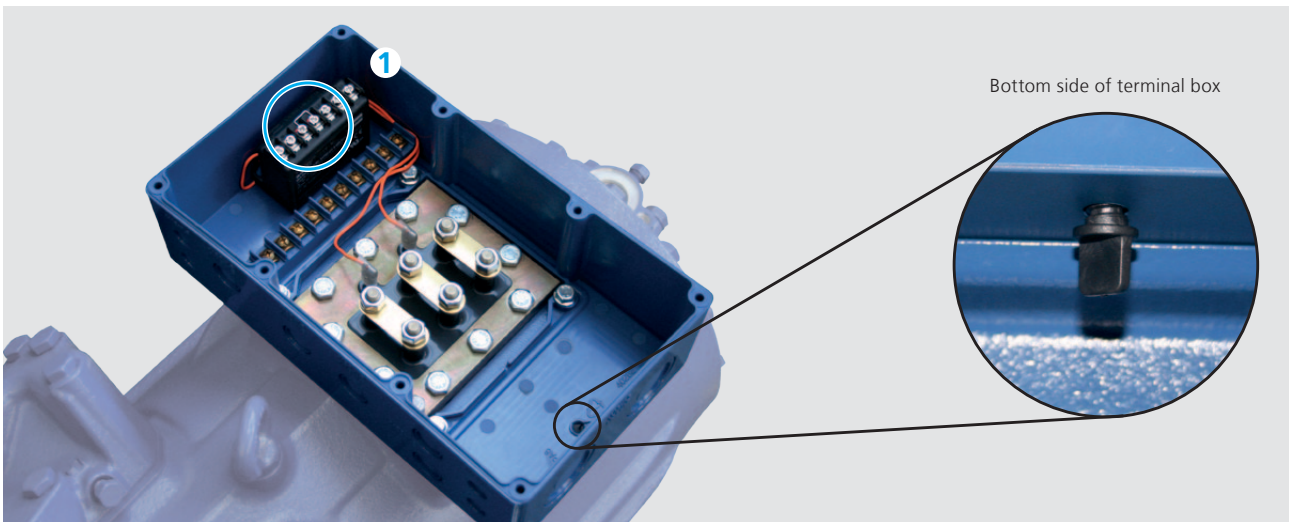
The INT69 G also provides the usual functions, such as:

- 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



Bottom side of 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 HG56e equipped with plug to drain condensed water from the terminal box under unfavorable circumstances (when in use, Ip protection is reduced)



HG semi-hermetic GEA compressors

GEA Bock HG12P – HG88e

HG Semi-hermetic GEA compressors

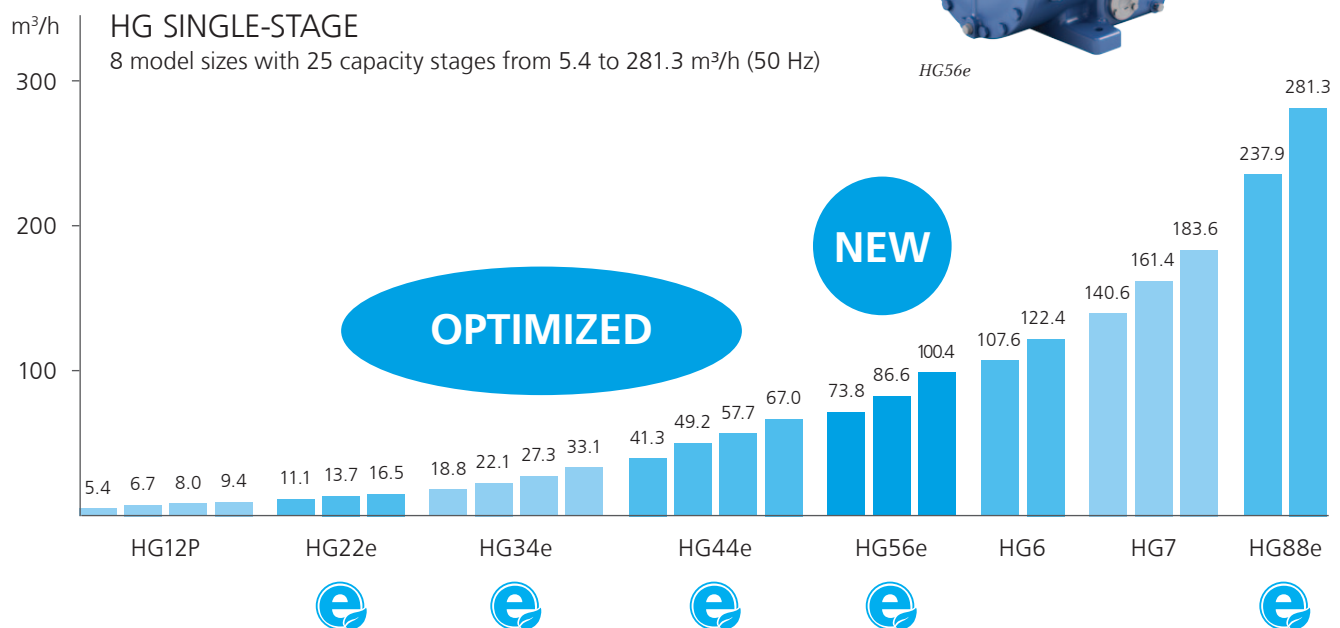
The GEA HG (Hermetic Gas-cooled) range of single-stage, semi-hermetic compressors offers traditional suction-gas-cooled compressor technology. These compressors of the highest quality standard excel in their running comfort, easy maintenance, efficiency and reliability. They are suitable as standard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

Special features:

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



HG56e

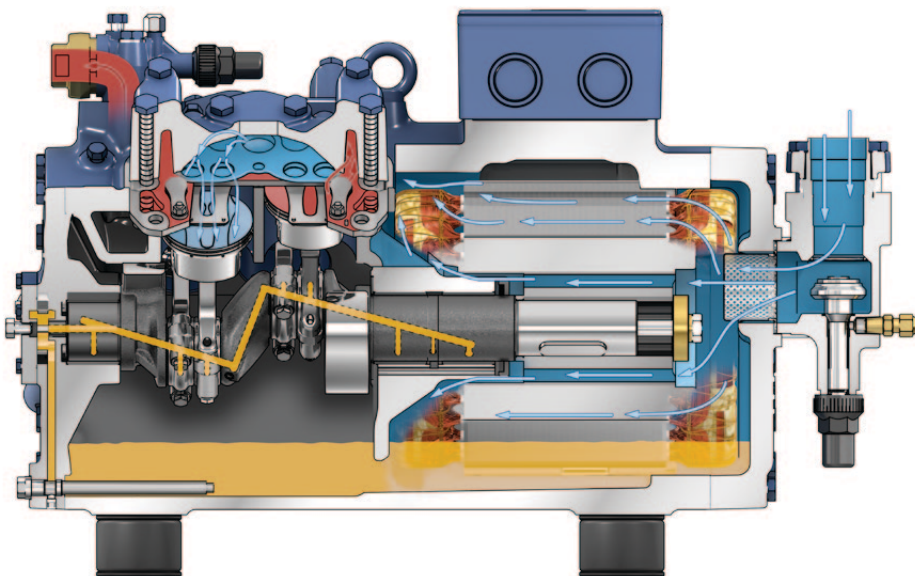


TYPE KEY

HG X 5 6 e / 995 - 4 S

Series¹⁾
 Ester oil filling²⁾
 Size
 Number of cylinders
 Series³⁾
 Swept volume
 Number of poles
 Motor variant⁴⁾

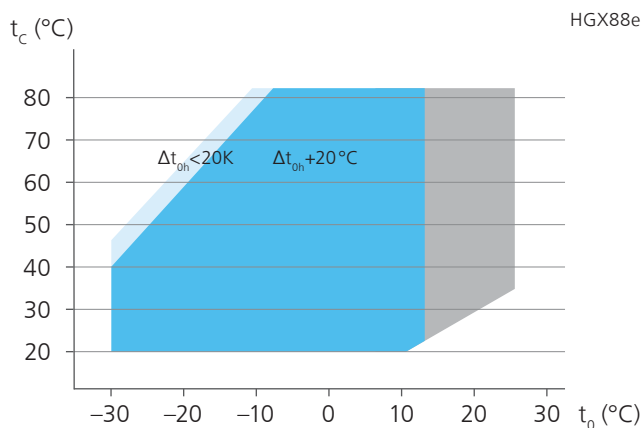
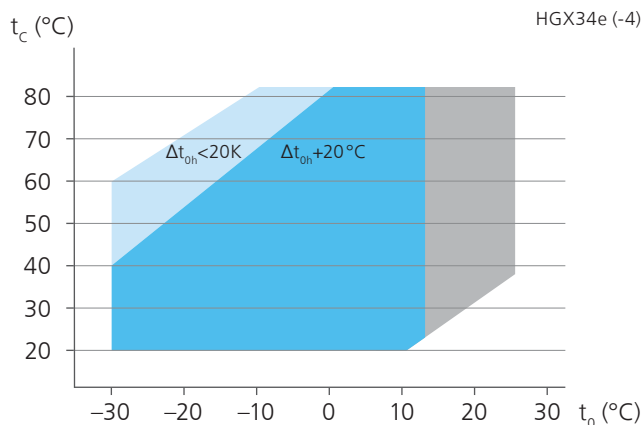
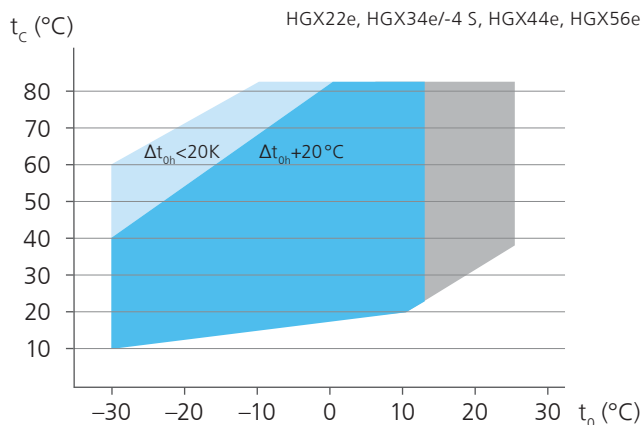
- ¹⁾ HG = Hermetic Gas-Cooled (suction-gas-cooled)
- ²⁾ X = Ester oil filling
(HFC refrigerants e.g. R134a, R404A, R448A, R449A)
- ³⁾ e = Additional marker for e-series compressors
P = Pluscom
- ⁴⁾ S = More powerful motor e.g. for air-conditioning applications



HG44e

OPERATING LIMITS

R134a Operating limits



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

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

- Unlimited application range
- Motor version -S- (more powerful motor)
- Supplementary cooling or reduced suction gas temperature

NOTES

R134a 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.gea.com

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 GEA VAP software (vap.gea.com).

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 GEA compressors can be found at www.asercom.org and www.gea.com.

PERFORMANCE DATA

R134a													50 Hz
Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]					Power consumption P_e [kW]					
			Evaporating temperature °C										
			12,5	10	7,5	5	0	-5	-10	-15	-20	-25	-30
HGX12P/60-4 S	30	Q	4920	4490	4080	3700	3010	2420	1910	1480	1130	836	605
		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
	60	Q	3020	2740	2480	2240	1800	1420	1100	806	558	341	146
		P	1,11	1,08	1,04	0,999	0,910	0,821	0,735	0,657	0,593	0,546	0,521
	70	Q	2450	2220	2010	1810	1450	1130	847	602	381		
		P	1,22	1,17	1,12	1,06	0,956	0,849	0,750	0,664	0,595		
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
	60	Q	3780	3430	3100	2800	2250	1780	1370	1010	697	425	182
		P	1,39	1,35	1,30	1,24	1,13	1,02	0,918	0,821	0,741	0,682	0,651
	70	Q	3070	2780	2510	2260	1800	1410	1060	751	476		
		P	1,53	1,46	1,40	1,33	1,19	1,06	0,937	0,829	0,743		
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
	60	Q	4620	4180	3780	3400	2720	2140	1640	1230	876	592	359
		P	1,82	1,77	1,71	1,65	1,51	1,35	1,20	1,05	0,914	0,790	0,690
	70	Q	3780	3410	3060	2750	2180	1690	1280	937	653		
		P	2,00	1,93	1,84	1,76	1,58	1,40	1,22	1,05	0,903		
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
	60	Q	5290	4800	4350	3920	3160	2490	1920	1420	978	596	255
		P	1,96	1,89	1,82	1,75	1,59	1,43	1,28	1,15	1,03	0,957	0,914
	70	Q	4300	3890	3520	3160	2530	1970	1490	1060	668		
		P	2,15	2,05	1,96	1,86	1,67	1,48	1,31	1,16	1,04		
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
	60	Q	6570	5950	5360	4810	3810	2940	2200	1590	1110	744	504
		P	2,27	2,21	2,13	2,04	1,86	1,66	1,45	1,25	1,07	0,909	0,783
	70	Q	5330	4800	4310	3840	3000	2280	1690	1200	829		
		P	2,48	2,38	2,27	2,16	1,93	1,70	1,47	1,25	1,06		
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
	60	Q	8230	7460	6730	6060	4840	3790	2880	2100	1430	844	335
		P	2,80	2,72	2,63	2,54	2,33	2,11	1,87	1,61	1,34	1,04	0,744
	70	Q	6880	6210	5580	4990	3930	3000	2190	1490	862		
		P	3,09	2,97	2,85	2,72	2,45	2,17	1,87	1,56	1,23		
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
	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

PERFORMANCE DATA

R134a

50 Hz

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]							Power consumption P_e [kW]			
			Evaporating temperature °C										
			12,5	10	7,5	5	0	-5	-10	-15	-20	-25	-30
HGX34e/215-4	30	Q	17200	15700	14400	13000	10600	8450	6590	5000	3670	2610	1800
		P	2,27	2,30	2,32	2,31	2,25	2,14	1,98	1,80	1,59	1,38	1,18
	40	Q	15200	13800	12600	11400	9120	7190	5530	4120	2970	2060	1400
		P	2,87	2,84	2,78	2,72	2,55	2,34	2,11	1,87	1,64	1,42	1,22
	50	Q	13000	11800	10700	9540	7590	5890	4440	3240	2270	1540	1040
		P	3,38	3,27	3,16	3,03	2,76	2,47	2,18	1,90	1,64	1,42	1,24
HGX34e/255-4 ¹⁾	60	Q	10800	9690	8690	7750	6070	4620	3400	2420	1660	1120	784
		P	3,79	3,62	3,45	3,27	2,90	2,54	2,20	1,89	1,61	1,39	1,24
	70	Q	8590	7680	6830	6040	4630	3440	2480	1730	1190		
		P	4,12	3,89	3,66	3,43	2,99	2,56	2,17	1,84	1,56		
	30	Q	20600	18800	17200	15600	12700	10100	7800	5890	4320	3080	2190
		P	2,61	2,67	2,71	2,71	2,66	2,53	2,34	2,12	1,88	1,63	1,41
HGX34e/315-4 ¹⁾	40	Q	18100	16500	15000	13600	11000	8660	6660	4960	3570	2490	1710
		P	3,36	3,35	3,31	3,25	3,08	2,84	2,57	2,27	1,97	1,68	1,43
	50	Q	15600	14200	12900	11600	9310	7280	5540	4070	2880	1960	1330
		P	4,02	3,93	3,83	3,71	3,42	3,08	2,73	2,36	2,01	1,68	1,41
	60	Q	13100	11900	10700	9610	7640	5920	4450	3220	2240	1510	1030
		P	4,56	4,41	4,24	4,06	3,66	3,23	2,80	2,37	1,96	1,61	1,32
HGX34e/380-4 ¹⁾	70	Q	10500	9430	8480	7590	5970	4570	3380	2410	1660		
		P	4,98	4,77	4,54	4,30	3,79	3,28	2,76	2,28	1,83		
	30	Q	25500	23300	21100	19200	15500	12400	9660	7390	5520	4040	2920
		P	3,40	3,43	3,43	3,40	3,29	3,11	2,88	2,61	2,32	2,02	1,72
	40	Q	22300	20300	18500	16700	13500	10700	8260	6260	4620	3320	2330
		P	4,22	4,17	4,10	4,01	3,78	3,49	3,16	2,80	2,43	2,07	1,73
HGX34e/475-4	50	Q	19200	17400	15800	14200	11400	8950	6880	5140	3720	2600	1740
		P	4,97	4,85	4,71	4,55	4,19	3,79	3,36	2,91	2,47	2,04	1,65
	60	Q	16100	14600	13100	11800	9350	7280	5520	4050	2850	1900	1170
		P	5,63	5,44	5,22	5,00	4,51	4,00	3,46	2,93	2,41	1,92	1,47
	70	Q	13100	11800	10600	9390	7380	5660	4200	3000	2010		
		P	6,18	5,91	5,62	5,33	4,71	4,08	3,44	2,82	2,22		
HGX34e/565-4	30	Q	30700	28100	25600	23200	19000	15300	12100	9310	7060	5250	3860
		P	4,27	4,28	4,26	4,22	4,06	3,83	3,53	3,20	2,83	2,46	2,09
	40	Q	27000	24600	22400	20300	16600	13300	10400	8000	6020	4420	3180
		P	5,26	5,19	5,09	4,97	4,67	4,30	3,89	3,46	3,00	2,56	2,13
	50	Q	23200	21200	19300	17400	14100	11300	8760	6670	4940	3540	2450
		P	6,17	6,01	5,83	5,63	5,18	4,69	4,16	3,62	3,07	2,55	2,06
HGX44e/475-4	60	Q	19600	17800	16100	14600	11700	9240	7130	5350	3860	2650	1690
		P	6,97	6,73	6,46	6,18	5,59	4,96	4,31	3,66	3,02	2,42	1,86
	70	Q	16000	14500	13100	11800	9340	7290	5530	4040	2800		
		P	7,65	7,31	6,97	6,60	5,86	5,09	4,32	3,56	2,83		
	30	Q	39200	35700	32500	29500	24100	19400	15400	12100	9190	6850	4920
		P	4,71	4,75	4,76	4,74	4,62	4,41	4,13	3,79	3,42	3,03	2,63
HGX44e/565-4	40	Q	34500	31400	28600	25900	21100	16900	13400	10400	7790	5670	3890
		P	5,95	5,90	5,82	5,71	5,43	5,07	4,65	4,19	3,70	3,20	2,72
	50	Q	29900	27200	24700	22300	18100	14400	11300	8660	6430	4520	2880
		P	7,12	6,97	6,80	6,61	6,16	5,64	5,08	4,49	3,88	3,27	2,69
	60	Q	25400	23000	20800	18800	15100	12000	9280	7000	5040	3340	1840
		P	8,16	7,91	7,65	7,36	6,74	6,06	5,35	4,62	3,89	3,17	2,49
HGX44e/665-4 ¹⁾	70	Q	20800	18800	16900	15200	12100	9450	7210	5280	3600		
		P	8,99	8,65	8,28	7,90	7,10	6,26	5,40	4,52	3,66		
	30	Q	46600	42600	38700	35200	28800	23200	18500	14500	11100	8310	6010
		P	5,58	5,62	5,64	5,61	5,47	5,22	4,88	4,48	4,03	3,56	3,09
	40	Q	41100	37500	34100	30900	25200	20300	16100	12500	9480	6950	4820
		P	7,07	7,01	6,91	6,79	6,45	6,01	5,51	4,95	4,37	3,78	3,19
HGX44e/665-4 ¹⁾	50	Q	35700	32500	29500	26700	21700	17400	13700	10600	7890	5610	3640
		P	8,49	8,31	8,10	7,87	7,33	6,71	6,03	5,31	4,58	3,86	3,17
	60	Q	30400	27600	25000	22600	18200	14500	11400	8620	6280	4240	2410
		P	9,75	9,45	9,13	8,78	8,03	7,21	6,35	5,47	4,59	3,74	2,92
	70	Q	25000	22600	20400	18400	14700	11600	8910	6610	4590		
		P	10,7	10,3	9,90	9,44	8,47	7,45	6,41	5,36	4,32		
HGX44e/665-4 ¹⁾	30	Q	55700	50900	46400	42100	34400	27700	21900	17000	12900	9520	6880
		P	6,61	6,71	6,76	6,76	6,62	6,33	5,92	5,40	4,82	4,20	3,57
	40	Q	49200	44900	40800	37000	30100	24100	18900	14600	10900	7930	5580
		P	8,52	8,45	8,34	8,18	7,76	7,21	6,57	5,86	5,11	4,35	3,61
	50	Q	42600	38800	35200	31800	25700	20400	15900	12100	8940	6360	4310
		P	10,2	10,0	9,73	9,42	8,72	7,92	7,06	6,16	5,26	4,37	3,54
HGX44e/665-4 ¹⁾	60	Q	36000	32700	29500	26600	21300	16800	13000	9700	7030	4850	3110
		P	11,6	11,3	10,8	10,4	9,45	8,42	7,35	6,27	5,22	4,22	3,30
	70	Q	29400	26500	23900	21400	17000	13200	10100	7380	5200		
		P	12,8	12,3	11,7	11,1	9,90	8,64	7,38	6,14	4,95		

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

■ Supplementary cooling or reduced suction gas temperature

¹⁾ Compressors are ASERCOM certified

R134a

50 Hz

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]					Power consumption P_e [kW]					
			Evaporating temperature °C										
			12,5	10	7,5	5	0	-5	-10	-15	-20	-25	-30
HGX44e/770-4	30	Q	63600	58000	52800	47900	39100	31600	25100	19700	15100	11300	8100
		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
HGX56e/850-4	30	Q	41300	37500	33900	30600	24700	19600	15300	11600	8390	5630	3160
		P	13,2	12,8	12,3	11,9	10,9	9,82	8,66	7,48	6,29	5,13	4,02
	40	Q	34000	30700	27700	24900	19900	15600	12000	8810	6070		
		P	14,5	13,9	13,4	12,7	11,5	10,1	8,74	7,32	5,93		
	50	Q	71500	65200	59400	53900	43900	35300	28000	21700	16500	12300	8870
HGX56e/995-4	30	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
	40	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
	50	Q	46000	41800	37900	34200	27600	21900	17100	13000	9440	6520	4060
HGX56e/1155-4	30	Q	37600	34100	30800	27700	22200	17500	13400	9960	7050		
		P	16,7	16,0	15,3	14,6	13,0	11,4	9,77	8,09	6,41		
	40	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
	50	Q	73100	66600	60600	54900	44700	35800	28100	21600	16200	11700	8050
HGX88e/2735-4	30	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
	40	Q	53300	48500	43900	39700	32000	25300	19500	14600	10400	6770	3720
		P	17,4	16,8	16,1	15,5	14,0	12,4	10,8	9,16	7,49	5,88	4,35
	50	Q	43500	39400	35600	32000	25600	20000	15200	11000	7380		
HGX88e/3235-4	30	Q	19,1	18,3	17,5	16,6	14,7	12,8	10,9	8,94	7,02		
		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
HGX88e/3235-4	30	Q	61500	55800	50500	45500	36700	29000	22500	17000	12300	8370	5090
		P	21,3	20,5	19,7	18,9	17,1	15,1	13,2	11,1	9,20	7,29	5,50
	40	Q	50400	45600	41100	37000	29500	23200	17700	13100	9130		
		P	23,5	22,5	21,4	20,3	18,1	15,7	13,3	11,0	8,69		
	50	Q	232000	211000	192000	174000	141000	113000	88900	69000	52500	39100	28500
HGX88e/3235-4	30	Q	205000	186000	169000	153000	123000	98000	76800	59000	44300	32400	22800
		P	37,1	36,5	35,6	34,7	32,5	29,9	27,1	24,1	21,2	18,4	15,8
	40	Q	178000	161000	146000	131000	106000	83500	65000	49600	36900	26400	
		P	43,3	42,0	40,6	39,1	35,9	32,5	29,0	25,4	22,0	18,9	
	50	Q	150000	136000	123000	110000	88000	69400	53800	40800	30000		
HGX88e/3235-4	30	Q	123000	111000	99500	89200	71000	55700	43000	32500			
		P	52,8	50,5	48,1	45,7	40,8	36,0	31,3	26,8			
	40	Q	275000	250000	227000	205000	166000	133000	105000	81300	62100	46600	34500
		P	37,8	37,2	36,4	35,6	33,7	31,4	28,9	26,2	23,4	20,7	18,0
	50	Q	242000	219000	199000	180000	145000	116000	90600	69900	52800	39000	27900
HGX88e/3235-4	30	Q	209000	189000	171000	154000	124000	98200	76700	58700	43800	31500	
		P	51,9	50,2	48,3	46,4	42,5	38,4	34,2	30,1	26,0	22,2	
	40	Q	176000	159000	143000	129000	103000	81200	62900	47600	34800		
		P	57,9	55,5	53,1	50,7	45,7	40,7	35,7	30,9	26,2		
	50	Q	143000	129000	116000	104000	82200	64300	49200	36600			
HGX88e/3235-4	30	Q	62,6	59,7	56,7	53,8	47,8	41,9	36,1	30,5			
		P	62,6	59,7	56,7	53,8	47,8	41,9	36,1	30,5			
	40	Q	209000	189000	171000	154000	124000	98200	76700	58700	43800	31500	
		P	51,9	50,2	48,3	46,4	42,5	38,4	34,2	30,1	26,0	22,2	
	50	Q	176000	159000	143000	129000	103000	81200	62900	47600	34800		
HGX88e/3235-4	30	Q	143000	129000	116000	104000	82200	64300	49200	36600			
		P	62,6	59,7	56,7	53,8	47,8	41,9	36,1	30,5			
	40	Q	209000	189000	171000	154000	124000	98200	76700	58700	43800	31500	
		P	51,9	50,2	48,3	46,4	42,5	38,4	34,2	30,1	26,0	22,2	
	50	Q	176000	159000	143000	129000	103000	81200	62900	47600	34800		
HGX88e/3235-4	30	Q	143000	129000	116000	104000	82200	64300	49200	36600			
		P	62,6	59,7	56,7	53,8	47,8	41,9	36,1	30,5			
	40	Q	209000	189000	171000	154000	124000	98200	76700	58700	43800	31500	
		P	51,9	50,2	48,3	46,4	42,5	38,4	34,2	30,1	26,0	22,2	
	50	Q	176000	159000	143000	129000	103000	81200	62900	47600	34800		
HGX88e/3235-4	30	Q	143000	129000	116000	104000	82200	64300	49200	36600			
		P	62,6	59,7	56,7	53,8	47,8	41,9	36,1	30,5			
	40	Q	209000	189000	171000	154000	124000	98200	76700	58700	43800	31500	
		P	51,9	50,2	48,3	46,4	42,5	38,4	34,2	30,1	26,0	22,2	
	50	Q	176000	159000	143000	129000	103000	81200	62900	47600	34800		
HGX88e/3235-4	30	Q	143000	129000	116000	104000	82200	64300	49200	36600			
		P	62,6	59,7	56,7	53,8	47,8	41,9	36,1	30,5			
	40	Q	209000	189000	171000	154000	124000	98200	76700	58700	43800	31500	
		P	51,9	50,2	48,3	46,4	42,5	38,4	34,2	30,1	26,0	22,2	
	50	Q	176000	159000	143000	129000	103000	81200	62900	47600	34800		
HGX88e/3235-4	30	Q	143000	129000	116000	104000	82200	64300	49200	36600			
		P	62,6	59,7	56,7	53,8	47,8	41,9	36,1	30,5			
	40	Q	209000	189000	171000	154000	124000	98200	76700	58700	43800	31500	
		P	51,9	50,2	48,3	46,4	42,5	38,4	34,2	30,1	26,0	22,2	
	50	Q	176000	159000	143000	129000	103000	81200	62900	47600	34800		
HGX88e/3235-4	30	Q	143000	129000	116000	104000	82200	64300	49200	36600			
		P	62,6	59,7	56,7	53,8	47,8	41,9	36,1	30,5			
	40	Q	209000	189000	171000	154000	124000	98200	76700	58700	43800	31500	
		P	51,9	50,2	48,3	46,4	42,5	38,4	34,2	30,1	26,0	22,2	
	50	Q	176000	159000	143000	129000	103000	81200	62900	47600	34800		
HGX88e/3235-4	30	Q	143000	129000	116000	104000	82200	64300	49200	36600			
		P	62,6	59,7	56,7	53,8	47,8	41,9	36,1	30,5			
	40	Q	209000	189000	171000	154000	124000	98200	76700	58700	43800	31500	
		P	51,9	50,2	48,3	46,4	42,5	38,4	34,2	30,1	26,0	22,2	
	50	Q	176000	159000	143000	129000	103000	81200	62900	47600	34800		
HGX88e/3235-4	30	Q	143000	129000	116000	104000	82200	64300	49200	36600			
		P	62,6	59,7	56,7	53,8	47,8	41,9	36,1	30,5			
	40	Q	209000	189000	171000	154000	124000	98200	76700	58700	43800	31500	
		P	51,9	50,2	48,3	46,4	42,5	38,4	34,2	30,1	26,0	22,2	
	50	Q	176000	159000	143000	129000	103000	81200	62900	47600	34800		
HGX88e/3235-4	30	Q	143000	129000	116000	104000	82200	64300	49200	36600			
		P	62,6	59,7	56,7	53,8	47,8	41,9	36,1	30,5			
	40	Q	209000	189000	171000	154000	124000	98200	76700	58700	43800	31500	
		P	51,9	50,2	48,3	46,4	42,5	38,4	34,2	30,1	26,0	22,2	
	50	Q	176000	159000	143000	129000	103000	81200	62900	47600	34800		
HGX88e/3235-4	30	Q	143000	129000	116000	104000	82200	64300	49200	36600			
		P	62,6	59,7	56,7	53,8	47,8	41,9	36,1	30,5			
	40	Q	209000	189000	171000	154000	124000	98200	76700	58700	43800	31500	
		P</											

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

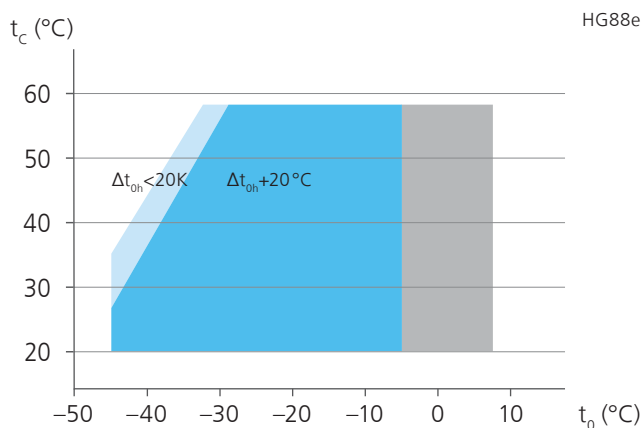
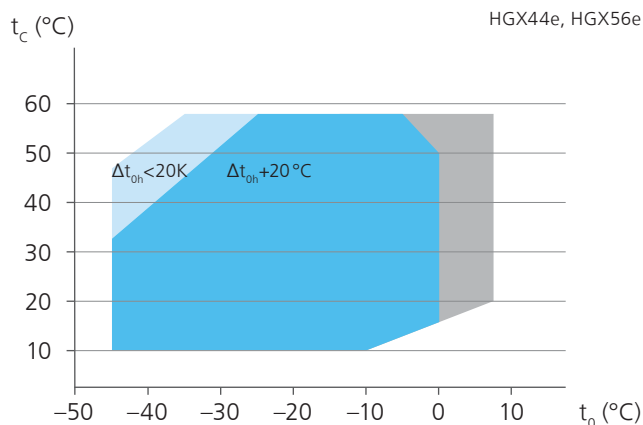
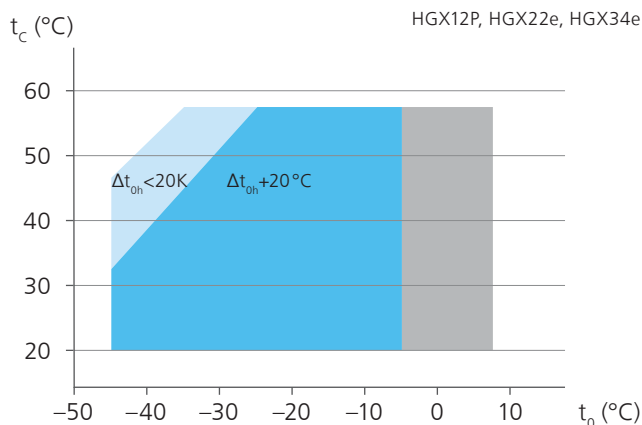
Supplementary cooling or reduced suction gas temperature

1) Compressors are ASERCOM certified



OPERATING LIMITS

R404A/R507 Operating limits



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

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

- Unlimited application range
- Motor version -S- (more powerful motor)
- Supplementary cooling or reduced suction gas temperature

NOTES

R404A/R507 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.gea.com.

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 GEA VAP software (vap.gea.com).

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 GEA compressors can be found at www.asercom.org and www.gea.com.

PERFORMANCE DATA

R404A/R507														50 Hz	
Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]								Power consumption P_e [kW]				
			Evaporating temperature °C												
			7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
HGX12P/60-4 S ¹⁾	30	Q	6540	5990	5000	4110	3340	2670	2100	1610	1210	879	617	415	
		P	1,20	1,21	1,22	1,20	1,15	1,08	1,00	0,908	0,810	0,712	0,618	0,533	
	40	Q	5540	5070	4200	3430	2770	2200	1710	1300	959	685	466	296	
		P	1,48	1,47	1,43	1,36	1,27	1,17	1,06	0,945	0,827	0,713	0,609	0,519	
	50	Q	4540	4130	3400	2750	2200	1730	1330	994	722	503	330		
		P	1,72	1,68	1,59	1,49	1,36	1,23	1,09	0,959	0,825	0,700	0,589		
HGX12P/75-4 ¹⁾ HGX12P/75-4 S ¹⁾	30	Q	8160	7500	6290	5230	4290	3470	2770	2170	1670	1250	911	648	
		P	1,52	1,54	1,55	1,50	1,44	1,36	1,26	1,15	1,03	0,908	0,789	0,680	
	40	Q	6940	6360	5310	4420	3610	2910	2300	1790	1370	1020	734	513	
		P	1,90	1,89	1,83	1,72	1,62	1,50	1,36	1,22	1,08	0,939	0,807	0,689	
	50	Q	5730	5240	4350	3640	2950	2360	1860	1440	1090	805	577		
		P	2,21	2,16	2,05	1,92	1,77	1,62	1,45	1,28	1,12	0,963	0,821		
HGX12P/90-4 ¹⁾ HGX12P/90-4 S ¹⁾	30	Q	9740	8950	7510	6090	5000	4060	3240	2530	1940	1450	1050	731	
		P	1,85	1,86	1,85	1,77	1,68	1,57	1,45	1,32	1,17	1,03	0,888	0,745	
	40	Q	8290	7600	6350	5150	4210	3390	2680	2080	1580	1160	818	550	
		P	2,27	2,24	2,17	2,02	1,87	1,72	1,55	1,38	1,21	1,04	0,876	0,719	
	50	Q	6870	6280	5220	4220	3420	2730	2140	1640	1230	886	611		
		P	2,66	2,60	2,46	2,25	2,05	1,85	1,64	1,44	1,23	1,04	0,857		
HGX12P/110-4 ¹⁾ HGX12P/110-4 S ¹⁾	30	Q	11300	10400	8700	7220	5970	4870	3920	3100	2400	1820	1340	947	
		P	2,16	2,17	2,15	2,15	2,04	1,91	1,76	1,59	1,41	1,22	1,05	0,883	
	40	Q	9590	8800	7370	6130	5040	4100	3280	2570	1980	1480	1070	728	
		P	2,64	2,61	2,52	2,47	2,29	2,10	1,89	1,67	1,45	1,24	1,05	0,877	
	50	Q	7880	7220	6010	5020	4100	3310	2620	2040	1550	1150	804		
		P	3,12	3,05	2,88	2,73	2,49	2,24	1,98	1,73	1,48	1,25	1,05		
HGX22e/125-4 HGX22e/125-4 S ¹⁾	30	Q	13400	12400	10500	8790	7250	5870	4650	3590	2680	1920	1320	857	
		P	2,18	2,22	2,26	2,24	2,16	2,03	1,88	1,69	1,49	1,28	1,07	0,878	
	40	Q	11600	10700	8970	7460	6090	4880	3820	2900	2120	1490	992	640	
		P	2,77	2,75	2,68	2,58	2,41	2,22	2,00	1,76	1,52	1,28	1,06	0,853	
	50	Q	9650	8860	7390	6080	4910	3880	2990	2230	1610	1110	749		
		P	3,26	3,20	3,03	2,84	2,60	2,34	2,07	1,80	1,53	1,27	1,03		
HGX22e/160-4 HGX22e/160-4 S ¹⁾	30	Q	17000	15700	13200	10900	8980	7320	5850	4560	3450	2510	1750	1170	
		P	2,70	2,75	2,78	2,73	2,62	2,47	2,29	2,07	1,84	1,59	1,34	1,08	
	40	Q	14600	13400	11200	9170	7540	6090	4810	3700	2750	1960	1330	851	
		P	3,42	3,40	3,31	3,17	2,96	2,72	2,47	2,19	1,91	1,62	1,34	1,07	
	50	Q	12100	11100	9150	7480	6090	4860	3790	2860	2090	1460	972		
		P	4,01	3,93	3,73	3,51	3,22	2,90	2,58	2,25	1,92	1,60	1,30		
HGX22e/190-4 HGX22e/190-4 S ¹⁾	30	Q	20800	19200	16100	13300	11000	8920	7140	5620	4330	3240	2350	1620	
		P	3,47	3,49	3,47	3,41	3,26	3,07	2,84	2,57	2,29	2,00	1,70	1,41	
	40	Q	17800	16300	13700	11300	9200	7450	5940	4640	3540	2620	1860	1230	
		P	4,29	4,24	4,09	3,93	3,68	3,39	3,08	2,74	2,39	2,03	1,68	1,35	
	50	Q	14800	13500	11300	9150	7460	6000	4750	3680	2780	2020	1390		
		P	5,04	4,92	4,65	4,40	4,06	3,68	3,27	2,85	2,43	2,01	1,61		
HGX34e/215-4 ¹⁾ HGX34e/215-4 S ¹⁾	30	Q	23900	21900	18200	14600	11900	9470	7390	5610	4120	2900	1940	1220	
		P	3,83	3,85	3,84	3,70	3,52	3,26	2,94	2,58	2,21	1,84	1,49	1,18	
	40	Q	20200	18500	15300	12200	9840	7770	5990	4480	3230	2220	1430	851	
		P	4,72	4,65	4,48	4,26	3,94	3,56	3,14	2,70	2,27	1,85	1,47	1,15	
	50	Q	16500	15000	12200	9770	7800	6090	4630	3420	2420	1630	1040		
		P	5,48	5,33	4,99	4,67	4,23	3,75	3,25	2,74	2,26	1,81	1,42		
HGX34e/255-4 ¹⁾ HGX34e/255-4 S ¹⁾	30	Q	28000	25700	21500	17200	14200	11500	9120	7080	5350	3900	2730	1820	
		P	4,57	4,61	4,59	4,44	4,23	3,95	3,61	3,22	2,81	2,39	1,97	1,58	
	40	Q	23800	21800	18100	14500	11800	9460	7430	5680	4210	3010	2050	1320	
		P	5,64	5,58	5,38	5,14	4,76	4,33	3,86	3,37	2,87	2,38	1,92	1,50	
	50	Q	19500	17700	14600	11700	9410	7450	5760	4330	3150	2200	1480		
		P	6,55	6,40	6,02	5,68	5,15	4,58	4,00	3,41	2,84	2,30	1,80		
HGX34e/315-4 ¹⁾ HGX34e/315-4 S ¹⁾	30	Q	33800	31000	26000	21300	17600	14300	11400	8840	6700	4930	3490	2370	
		P	5,86	5,82	5,67	5,47	5,20	4,85	4,43	3,98	3,49	2,99	2,49	2,01	
	40	Q	28700	26300	22000	17900	14700	11900	9350	7220	5400	3880	2650	1690	
		P	7,05	6,92	6,59	6,29	5,83	5,32	4,76	4,18	3,58	2,98	2,40	1,86	
	50	Q	23500	21500	17800	14500	11800	9430	7370	5600	4100	2840	1820		
		P	8,13	7,90	7,39	6,97	6,34	5,67	4,96	4,25	3,54	2,85	2,20		
HGX34e/380-4 ¹⁾ HGX34e/380-4 S ¹⁾	30	Q	40900	37600	31700	25800	21200	17300	13800	10900	8300	6200	4490	3120	
		P	7,20	7,15	6,98	6,84	6,45	5,98	5,46	4,88	4,28	3,67	3,05	2,45	
	40	Q	34600	31800	26700	21600	17700	14300	11400	8850	6730	4960	3510	2340	
		P	8,75	8,59	8,18	7,84	7,25	6,59	5,90	5,18	4,45	3,72	3,00	2,33	
	50	Q	28400	26000	21800	17600	14300	11500	9030	6960	5210	3760	2550		
		P	10,1	9,86	9,23	8,73	7,92	7,08	6,22	5,34	4,47	3,62	2,81		

Relating to 20 °C suction gas temperature without liquid subcooling

■ Supplementary cooling or reduced suction gas temperature

■ Motor version -S- (more powerful motor)

¹⁾ Compressors are ASERCOM certified

PERFORMANCE DATA

R404A/R507

50 Hz

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]								Power consumption P_e [kW]				
			Evaporating temperature °C												
			7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
HGX44e/475-4 HGX44e/475-4 S	30	Q	52500	48300	40200	33500	27500	22400	18000	14300	11100	8340	6060	4110	
		P	7,73	7,85	7,91	7,80	7,52	7,10	6,57	5,94	5,26	4,54	3,81	3,11	
	40	Q	45200	41400	34200	28300	23200	18800	15000	11800	9010	6670	4650	2870	
		P	9,97	9,90	9,62	9,16	8,57	7,88	7,12	6,31	5,47	4,64	3,84	3,11	
	50	Q	37600	34300	28100	23100	18800	15100	12000	9260	6970	5000	3270		
		P	11,8	11,5	11,0	10,2	9,41	8,49	7,55	6,59	5,65	4,76	3,94		
HGX44e/565-4 HGX44e/565-4 S	30	Q	62700	57700	47800	39800	32800	26800	21600	17200	13400	10200	7470	5140	
		P	9,18	9,32	9,45	9,31	8,97	8,47	7,82	7,07	6,24	5,38	4,51	3,66	
	40	Q	54000	49600	40700	33700	27700	22500	18100	14300	11100	8230	5820	3680	
		P	11,8	11,7	11,5	10,9	10,2	9,42	8,49	7,51	6,50	5,50	4,55	3,67	
	50	Q	45100	41200	33400	27500	22500	18200	14500	11400	8620	6270	4180		
		P	14,0	13,7	13,2	12,3	11,2	10,1	9,01	7,85	6,72	5,64	4,66		
HGX44e/665-4 HGX44e/665-4 S	30	Q	73100	67100	56000	46500	38300	31100	25000	19800	15300	11600	8340	5630	
		P	10,7	10,9	11,0	10,9	10,5	9,94	9,19	8,32	7,36	6,35	5,33	4,34	
	40	Q	62700	57400	47500	39300	32200	26000	20800	16300	12500	9160	6360	3910	
		P	13,9	13,8	13,4	12,8	12,0	11,0	9,97	8,83	7,66	6,49	5,37	4,34	
	50	Q	52000	47500	38900	32000	26000	20900	16500	12800	9570	6840	4440		
		P	16,5	16,1	15,4	14,3	13,1	11,8	10,5	9,22	7,91	6,66	5,51		
HGX44e/770-4 HGX44e/770-4 S	30	Q	84600	77800	65300	54300	44700	36500	29400	23300	18100	13800	10100	6840	
		P	12,4	12,6	12,8	12,6	12,1	11,5	10,6	9,62	8,51	7,34	6,16	5,02	
	40	Q	72600	66500	55600	46100	37800	30700	24500	19300	14900	11100	7750	4860	
		P	16,1	16,0	15,5	14,8	13,8	12,7	11,5	10,2	8,86	7,51	6,22	5,02	
	50	Q	60300	55100	45700	37600	30700	24700	19600	15300	11600	8360	5530		
		P	19,2	18,8	17,8	16,5	15,2	13,7	12,2	10,6	9,15	7,70	6,37		
HGX56e/850-4 HGX56e/850-4 S	30	Q	93700	86100	71800	59800	49300	40200	32400	25800	20100	15300	11200	7710	
		P	13,7	13,9	14,1	13,9	13,4	12,6	11,7	10,6	9,38	8,08	6,77	5,49	
	40	Q	80500	73800	61100	50600	41600	33800	27200	21400	16600	12400	8720	5520	
		P	17,7	17,6	17,1	16,3	15,3	14,0	12,7	11,2	9,76	8,27	6,83	5,50	
	50	Q	67000	61200	50100	41300	33800	27300	21800	17000	13000	9410	6280		
		P	21,1	20,6	19,6	18,3	16,8	15,1	13,4	11,7	10,0	8,48	7,00		
HGX56e/995-4 HGX56e/995-4 S	30	Q	111000	102000	85000	70800	58300	47400	38000	29800	22900	17100	12200	8120	
		P	18,6	18,3	17,6	16,7	15,8	14,6	13,4	12,1	10,7	9,21	7,61	5,94	
	40	Q	94300	86600	72100	59800	49000	39600	31500	24500	18500	13400	9110	5480	
		P	22,0	21,5	20,4	19,2	17,8	16,3	14,7	12,9	11,1	9,23	7,23	5,15	
	50	Q	78000	71400	59000	48600	39500	31700	24900	19100	14100	9800	6130		
		P	25,3	24,6	23,1	21,4	19,6	17,6	15,5	13,4	11,1	8,75	6,30		
HGX56e/1155-4 HGX56e/1155-4 S	30	Q	127000	117000	97500	81100	66800	54500	43900	34800	27100	20600	15000	10300	
		P	19,4	19,7	20,0	19,7	19,0	17,9	16,6	15,0	13,2	11,4	9,59	7,80	
	40	Q	109000	99900	83000	68800	56400	45800	36700	28900	22200	16600	11700	7280	
		P	25,1	24,9	24,4	23,2	21,7	19,9	18,0	15,9	13,8	11,7	9,68	7,80	
	50	Q	90600	82800	68200	56200	45800	36900	29300	22900	17300	12500	8270		
		P	29,9	29,2	27,9	26,0	23,8	21,5	19,1	16,6	14,2	12,0	9,91		
HGX88e/2735-4 HGX88e/2735-4 S	30	Q	315000	289000	243000	202000	165000	134000	106000	82700	63200	47300	34600	25000	
		P	52,7	52,1	50,4	48,5	45,4	42,0	38,2	34,3	30,2	26,3	22,4	18,9	
	40	Q	268000	246000	206000	170000	139000	112000	88300	68700	52300	38900	28200		
		P	62,6	61,2	57,9	54,7	50,4	45,8	41,1	36,3	31,6	27,1	22,9		
	50	Q	222000	203000	169000	139000	113000	90300	71200	55100	41800	31000			
		P	71,3	69,1	64,5	60,0	54,6	49,0	43,4	37,9	32,6	27,7			
HGX88e/3235-4 HGX88e/3235-4 S	30	Q	362000	334000	281000	234000	192000	156000	124000	97000	74300	55700	40700	29100	
		P	62,0	61,5	59,8	57,6	54,1	50,0	45,4	40,6	35,7	30,8	26,2	22,0	
	40	Q	310000	285000	239000	198000	162000	131000	104000	80100	60900	45200	32600		
		P	74,4	72,8	69,1	65,2	60,0	54,5	48,7	42,8	37,0	31,5	26,4		
	50	Q	255000	234000	195000	161000	131000	105000	82000	63400	48000	35500			
		P	84,5	82,0	76,5	71,1	64,5	57,7	50,9	44,2	37,8	31,8			

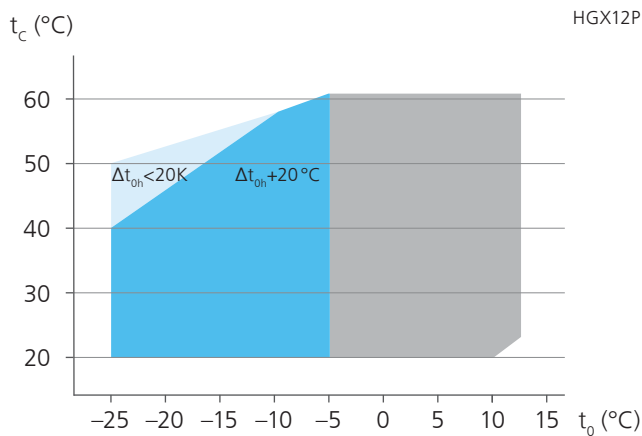
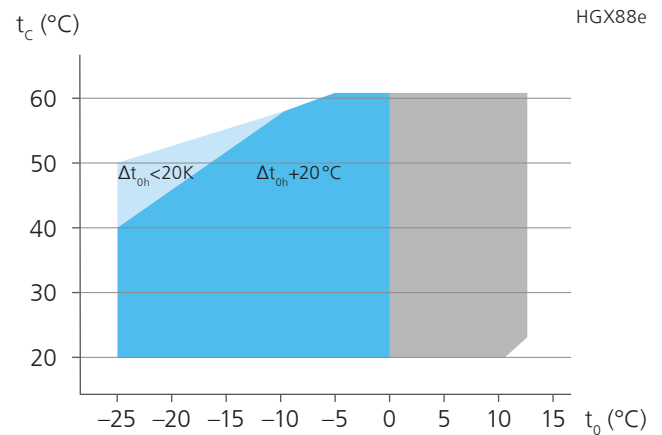
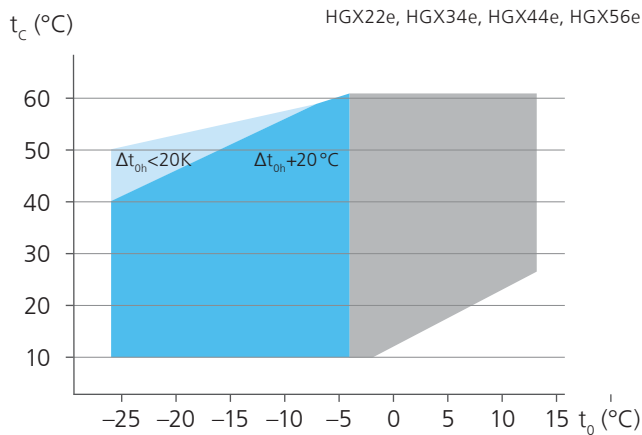
Relating to 20°C suction gas temperature without liquid subcooling

 Supplementary cooling or reduced suction gas temperature

 Motor version -S- (more powerful motor)

OPERATING LIMITS

R407C Operating limits



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

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

¹⁾ LP = low pressure, HP = high pressure

- Unlimited application range
- Motor version -S- (more powerful motor)
- Supplementary cooling or reduced suction gas temperature

NOTES

R407C Notes

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 GEA VAP software (vap.gea.com).

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.gea.com.

PERFORMANCE DATA

R407C												50 Hz
Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]						Power consumption P_e [kW]			
			Evaporating temperature °C									
			12,5	10	7,5	5	0	-5	-10	-15	-20	-25
HGX12P/60-4 S	30	Q P	6780 0,88	6180 0,90	5610 0,92	5080 0,92	4140 0,91	3330 0,88	2650 0,82	2080 0,76	1610 0,69	1230 0,62
	40	Q P	5870 1,16	5340 1,16	4840 1,15	4380 1,13	3560 1,08	2860 1,01	2270 0,92	1780 0,83	1360 0,74	1020 0,66
	50	Q P	5010 1,41	4550 1,39	4120 1,35	3720 1,31	3020 1,22	2420 1,12	1920 1,00	1490 0,90	1130 0,79	827 0,69
HGX12P/75-4 HGX12P/75-4 S	30	Q P	8740 1,12	7960 1,16	7230 1,18	6550 1,18	5340 1,17	4300 1,13	3420 1,06	2680 0,98	2080 0,89	1580 0,79
	40	Q P	7560 1,50	6880 1,49	6240 1,48	5650 1,46	4590 1,39	3690 1,30	2920 1,19	2290 1,07	1760 0,96	1320 0,84
	50	Q P	6450 1,82	5860 1,79	5310 1,74	4800 1,69	3890 1,58	3120 1,44	2470 1,29	1920 1,15	1460 1,01	1070 0,89
HGX12P/90-4 HGX12P/90-4 S	30	Q P	10500 1,34	9490 1,38	8620 1,40	7810 1,41	6360 1,40	5120 1,34	4080 1,26	3200 1,16	2480 1,05	1890 0,95
	40	Q P	9020 1,79	8200 1,78	7440 1,77	6730 1,74	5470 1,66	4400 1,55	3490 1,42	2730 1,28	2090 1,13	1570 1,00
	50	Q P	7690 2,17	6990 2,13	6330 2,08	5720 2,02	4640 1,88	3720 1,72	2940 1,55	2290 1,37	1740 1,21	1280 1,06
HGX12P/110-4 HGX12P/110-4 S	30	Q P	12300 1,58	11200 1,62	10200 1,65	9180 1,66	7480 1,64	6020 1,58	4790 1,48	3760 1,37	2910 1,24	2220 1,11
	40	Q P	10600 2,10	9640 2,10	8750 2,08	7910 2,05	6430 1,95	5170 1,82	4100 1,67	3200 1,50	2460 1,33	1850 1,18
	50	Q P	9040 2,56	8210 2,51	7440 2,45	6730 2,38	5460 2,21	4370 2,02	3460 1,82	2690 1,61	2040 1,42	1500 1,25
HGX22e/125-4 HGX22e/125-4 S	30	Q P	14400 1,78	13100 1,82	11900 1,85	10800 1,87	8790 1,85	7070 1,78	5630 1,67	4420 1,53	3420 1,39	2600 1,25
	40	Q P	12500 2,36	11400 2,35	10300 2,33	9300 2,30	7560 2,19	6060 2,04	4800 1,87	3760 1,68	2890 1,5	2160 1,32
	50	Q P	10700 2,87	9640 2,81	8740 2,75	7910 2,67	6410 2,48	5120 2,27	4050 2,04	3150 1,81	2400 1,59	1760 1,40
HGX22e/160-4 HGX22e/160-4 S	30	Q P	17600 2,18	16000 2,24	14500 2,28	13200 2,30	10700 2,27	8730 2,30	6950 2,16	5470 1,99	4240 1,79	3230 1,61
	40	Q P	15200 2,90	13800 2,90	12500 2,87	11300 2,83	9180 2,69	7500 2,64	5950 2,42	4650 2,18	3580 1,94	2680 1,72
	50	Q P	12900 3,53	11700 3,46	10700 3,38	9590 3,28	7780 3,05	6350 2,93	5020 2,64	3900 2,34	2970 2,06	2180 1,81
HGX22e/190-4 HGX22e/190-4 S	30	Q P	21800 2,67	19900 2,74	18100 2,79	16400 2,81	13300 2,78	10800 2,83	8550 2,65	6700 2,44	5180 2,20	3960 1,98
	40	Q P	18900 3,54	17200 3,54	15600 3,51	14100 3,46	11500 3,29	9220 3,25	7310 2,97	5710 2,68	4390 2,38	3290 2,10
	50	Q P	16100 4,31	14600 4,23	13300 4,13	12000 4,01	9700 3,73	7790 3,60	6170 3,24	4810 2,87	3650 2,53	2670 2,22
HGX34e/215-4 HGX34e/215-4 S	30	Q P	25600 3,45	23300 3,49	21100 3,50	19100 3,48	15600 3,39	12200 3,16	9720 2,94	7650 2,67	5910 2,38	4480 2,09
	40	Q P	22400 4,38	20300 4,33	18400 4,26	16600 4,17	13400 3,94	10400 3,60	8190 3,25	6410 2,89	4920 2,52	3700 2,17
	50	Q P	19100 5,19	17300 5,06	15600 4,91	14100 4,75	11300 4,39	8590 3,98	6820 3,54	5330 3,09	4100 2,66	3100 2,27
HGX34e/255-4 HGX34e/255-4 S	30	Q P	29600 4,30	27000 4,30	24600 4,28	22300 4,23	18300 4,08	14500 3,84	11500 3,54	9040 3,20	7030 2,85	5300 2,48
	40	Q P	26000 5,33	23600 5,24	21500 5,13	19500 5,00	15800 4,71	12300 4,38	9730 3,94	7660 3,50	5940 3,06	4430 2,63
	50	Q P	22200 6,25	20200 6,08	18300 5,89	16500 5,69	13400 5,25	10200 4,83	8080 4,29	6420 3,76	5050 3,26	3820 2,79
HGX34e/315-4 HGX34e/315-4 S	30	Q P	35900 4,95	32700 5,00	29800 5,01	27000 4,99	22100 4,86	17600 4,69	14100 4,34	11100 3,96	8590 3,55	6550 3,11
	40	Q P	31300 6,32	28500 6,25	25900 6,16	23500 6,04	19200 5,72	15100 5,33	12000 4,85	9420 4,33	7260 3,80	5500 3,27
	50	Q P	26800 7,63	24300 7,45	22100 7,24	20000 7,02	16200 6,50	12800 5,87	10200 5,25	7910 4,63	6060 3,99	4550 3,37
HGX34e/380-4 HGX34e/380-4 S	30	Q P	43500 6,40	39600 6,35	36000 6,27	32700 6,17	26700 5,93	21600 5,84	17500 5,38	13900 4,91	10900 4,42	8310 3,90
	40	Q P	38000 7,95	34600 7,78	31400 7,59	28400 7,39	23200 6,94	18700 6,71	15100 6,08	12000 5,45	9320 4,82	7140 4,18
	50	Q P	32200 9,52	29300 9,23	26500 8,92	24000 8,60	19600 7,93	15800 7,49	12800 6,69	10100 5,91	7900 5,13	6070 4,36

Relating to 20°C suction gas temperature without liquid subcooling

Supplementary cooling or reduced suction gas temperature

Motor version -S- (more powerful motor)

R407C

50 Hz

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]						Power consumption P_e [kW]				
			Evaporating temperature °C										
			12,5	10	7,5	5	0	-5	-10	-15	-20	-25	
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	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	
HGX88e/2735-4 HGX88e/2735-4 S	30	Q	323000	295000	269000	244000	201000	163000	130000	103000	79900	61000	
		P	40,60	41,00	41,00	40,80	39,70	37,70	35,00	31,90	28,50	25,00	
	40	Q	286000	260000	237000	215000	176000	142000	113000	87700	67300	50300	
		P	51,80	51,20	50,30	49,20	46,40	43,00	39,10	34,90	30,60	26,40	
	50	Q	248000	225000	204000	185000	150000	120000	94400	73000	55200	40400	
		P	61,20	59,70	58,00	56,10	51,80	47,10	42,10	37,00	32,00	27,30	
HGX88e/3235-4 HGX88e/3235-4 S	30	Q	374000	341000	311000	283000	232000	188000	151000	119000	92500	70500	
		P	48,00	48,40	48,50	48,30	46,90	44,50	41,40	37,80	33,80	29,60	
	40	Q	331000	302000	274000	249000	203000	164000	130000	102000	78000	58300	
		P	61,30	60,50	59,50	58,20	54,90	50,80	46,20	41,30	36,20	31,20	
	50	Q	287000	261000	237000	214000	174000	139000	110000	84800	64200	47000	
		P	72,50	70,70	68,60	66,30	61,30	55,70	49,90	43,80	37,90	32,20	

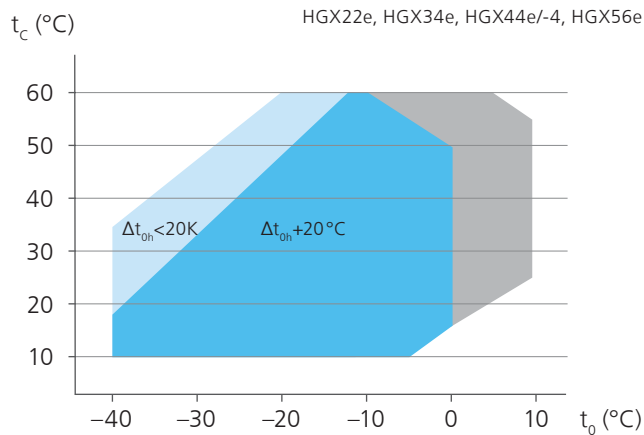
Relating to 20°C suction gas temperature without liquid subcooling

■ Supplementary cooling or reduced suction gas temperature

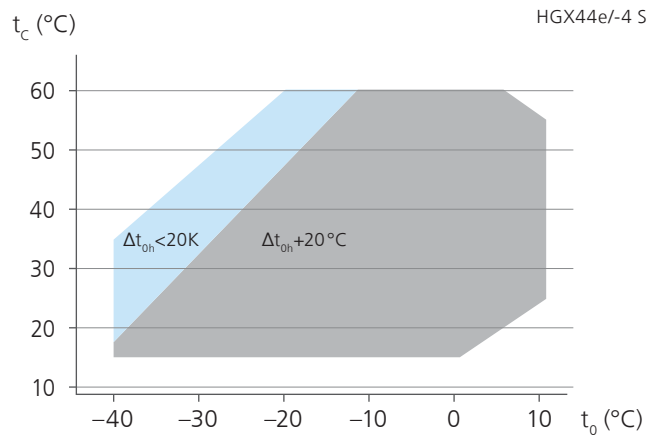
■ Motor version -S- (more powerful motor)

OPERATING LIMITS

R407A Operating limits



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



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

- Unlimited application range
- Motor version -S- (more powerful motor)
- Supplementary cooling or reduced suction gas temperature

NOTES

R407A 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 GEA VAP software (vap.gea.com).

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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 Information about the Association and the constantly updated overview of certified GEA compressors can be found at www.asercom.org and www.gea.com.

PERFORMANCE DATA

R407A														50 Hz
Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]											
			Evaporating temperature °C											
			10	7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40
HGX22e/125-4 HGX22e/125-4 S	30	Q	15200	13800	12600	10200	8240	6580	5180	4000	3030	2220	1570	1030
		P	2,06	2,08	2,09	2,08	2,01	1,90	1,77	1,62	1,46	1,29	1,13	0,992
	40	Q	13300	12000	10900	8810	7090	5630	4400	3370	2520	1830	1250	
HGX22e/160-4 HGX22e/160-4 S		P	2,60	2,57	2,53	2,43	2,29	2,12	1,93	1,74	1,55	1,37	1,20	
	50	Q	11300	10200	9170	7410	5920	4660	3620	2750	2040			
		P	3,08	3,01	2,93	2,74	2,53	2,30	2,07	1,84	1,63			
HGX22e/190-4 HGX22e/190-4 S	30	Q	19300	17500	15900	12600	10200	8120	6450	5060	3920	2960	2130	1360
		P	2,72	2,69	2,66	2,58	2,43	2,30	2,16	2,02	1,87	1,69	1,48	1,22
	40	Q	17000	15400	13900	11100	8860	7060	5580	4350	3310	2400	1580	
HGX22e/190-4 HGX22e/190-4 S		P	3,30	3,23	3,15	3,00	2,79	2,60	2,41	2,21	1,99	1,75	1,48	
	50	Q	14700	13200	11900	9540	7630	6050	4720	3600	2630			
		P	3,86	3,74	3,61	3,40	3,13	2,88	2,62	2,35	2,06			
HGX34e/215-4 HGX34e/215-4 S	30	Q	22500	20500	18600	15300	12600	10200	8100	6400	4970	3760	2750	1870
		P	3,48	3,40	3,32	3,26	3,04	2,82	2,62	2,41	2,20	1,98	1,75	1,49
	40	Q	19600	17800	16200	13400	10900	8760	6980	5490	4240	3180	2270	
HGX34e/255-4 HGX34e/255-4 S		P	4,23	4,10	3,96	3,81	3,50	3,21	2,94	2,67	2,40	2,13	1,86	
	50	Q	16800	15300	13900	11400	9190	7370	5850	4570	3510			
		P	5,00	4,80	4,61	4,35	3,95	3,57	3,22	2,89	2,56			
HGX34e/315-4 HGX34e/315-4 S	30	Q	24600	22400	20400	16500	13300	10600	8200	6230	4590	3270	2220	1430
		P	3,47	3,47	3,44	3,34	3,17	2,94	2,67	2,38	2,08	1,79	1,53	1,31
	40	Q	21500	19500	17600	14100	11300	8800	6740	5020	3620	2500	1640	
HGX34e/315-4 HGX34e/315-4 S		P	4,47	4,36	4,23	3,99	3,64	3,27	2,88	2,50	2,13	1,80	1,52	
	50	Q	18200	16400	14800	11700	9170	7070	5310	3880	2730			
		P	5,37	5,15	4,93	4,55	4,04	3,53	3,03	2,56	2,14			
HGX34e/380-4 HGX34e/380-4 S	30	Q	28900	26500	24100	19600	16000	12800	9990	7640	5670	4050	2760	1790
		P	3,72	3,81	3,86	3,91	3,81	3,60	3,32	2,97	2,60	2,22	1,85	1,53
	40	Q	25000	22800	20800	16800	13600	10900	8440	6400	4690	3290	2180	
HGX34e/380-4 HGX34e/380-4 S		P	4,86	4,85	4,81	4,73	4,44	4,08	3,65	3,19	2,71	2,25	1,82	
	50	Q	20900	19000	17300	13900	11200	8820	6810	5110	3700			
		P	5,89	5,78	5,64	5,42	4,96	4,43	3,87	3,28	2,71			
HGX44e/475-4 HGX44e/475-4 S	30	Q	36600	33300	30200	24400	19700	15700	12300	9450	7100	5180	3630	2400
		P	4,89	4,92	4,92	4,74	4,56	4,29	3,95	3,56	3,13	2,68	2,23	1,80
	40	Q	31700	28800	26100	21000	16900	13400	10400	7920	5870	4180	2790	
HGX44e/475-4 HGX44e/475-4 S		P	6,19	6,12	6,02	5,67	5,30	4,87	4,37	3,84	3,28	2,72	2,17	
	50	Q	26800	24300	21900	17600	14000	11000	8480	6370	4620			
		P	7,41	7,23	7,03	6,50	5,94	5,33	4,67	3,98	3,29			
HGX44e/565-4 HGX44e/565-4 S	30	Q	43800	39900	36200	29300	23900	19200	15200	11900	9030	6720	4830	3290
		P	6,24	6,23	6,19	5,93	5,68	5,33	4,91	4,42	3,89	3,34	2,79	2,25
	40	Q	37900	34500	31300	25300	20500	16500	13000	10100	7560	5510	3790	
HGX44e/565-4 HGX44e/565-4 S		P	7,77	7,64	7,49	7,05	6,59	6,04	5,43	4,77	4,09	3,40	2,72	
	50	Q	32000	29100	26300	21200	17200	13700	10700	8180	6060			
		P	9,22	8,97	8,70	8,08	7,38	6,62	5,81	4,97	4,12			
HGX44e/665-4 HGX44e/665-4 S ¹⁾	30	Q	56800	51900	47300	38700	31500	25300	20000	15600	11900	8840	6390	4420
		P	7,37	7,47	7,51	7,40	7,15	6,75	6,22	5,61	4,95	4,26	3,57	2,92
	40	Q	49700	45300	41200	33500	27100	21700	17100	13200	9960	7310	5130	
HGX44e/665-4 HGX44e/665-4 S ¹⁾		P	9,41	9,35	9,23	8,86	8,33	7,67	6,91	6,09	5,24	4,39	3,57	
	50	Q	42500	38600	35000	28300	22800	18100	14100	10800	8040			
		P	11,2	11,0	10,7	10,1	9,34	8,41	7,42	6,39	5,35			
HGX44e/665-4 HGX44e/665-4 S ¹⁾	30	Q	67800	61900	56400	46000	37500	30200	24000	18800	14400	10800	7830	5480
		P	8,75	8,87	8,92	8,84	8,53	8,04	7,41	6,67	5,87	5,04	4,22	3,44
	40	Q	59400	54200	49300	39900	32400	26000	20600	16000	12200	8970	6380	
HGX44e/665-4 HGX44e/665-4 S ¹⁾		P	11,1	11,1	10,9	10,6	9,95	9,15	8,24	7,25	6,22	5,20	4,22	
	50	Q	51000	46300	42000	33700	27300	21800	17100	13200	9890			
		P	13,4	13,1	12,8	12,1	11,1	10,0	8,85	7,60	6,35			
HGX44e/665-4 HGX44e/665-4 S ¹⁾	30	Q	79000	72100	65700	53800	43800	35200	27800	21600	16500	12300	8820	6070
		P	10,2	10,3	10,4	10,3	10,0	9,45	8,71	7,86	6,93	5,96	5,00	4,09
	40	Q	69000	62900	57100	46500	37700	30100	23700	18300	13800	10100	7030	
HGX44e/665-4 HGX44e/665-4 S ¹⁾		P	13,1	13,0	12,8	12,4	11,6	10,7	9,68	8,53	7,34	6,15	5,00	
	50	Q	58900	53500	48500	39200	31500	25000	19500	14900	11100			
		P	15,7	15,4	15,0	14,2	13,0	11,7	10,3	8,94	7,49			

Relating to 20°C suction gas temperature without liquid subcooling

 Supplementary cooling or reduced suction gas temperature

 Motor version -S- (more powerful motor)
¹⁾ The compressor HGX44e/665-4S is ASERCOM certified

R407A performance data for further HG type series can be viewed via our GEA VAP software (vap.gea.com).

PERFORMANCE DATA

R407A

50 Hz

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]											
			Evaporating temperature °C											
			10	7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40
HGX44e/770-4 HGX44e/770-4 S	30	Q	91500	83600	76200	62700	51100	41100	32600	25400	19500	14600	10600	7340
		P	11,8	12,0	12,0	11,9	11,5	10,9	10,0	9,09	8,01	6,89	5,78	4,73
	40	Q	80000	72900	66300	54400	44100	35300	27900	21600	16400	12100	8530	
HGX56e/850-4 HGX56e/850-4 S		P	15,2	15,1	14,9	14,3	13,4	12,4	11,1	9,86	8,49	7,11	5,78	
	50	Q	68400	62200	56400	46000	37100	29500	23100	17800	13300			
		P	18,3	18,0	17,5	16,4	15,1	13,6	12,0	10,3	8,66			
HGX56e/995-4 HGX56e/995-4 S	30	Q	99300	90700	82500	69100	56300	45400	36000	28100	21600	16200	11800	8220
		P	13,0	13,2	13,2	13,2	12,7	12,0	11,1	10,0	8,82	7,57	6,33	5,16
	40	Q	86800	79000	71800	59900	48700	39000	30900	24000	18200	13500	9570	
HGX56e/1155-4 HGX56e/1155-4 S		P	16,7	16,6	16,4	15,8	14,8	13,7	12,3	10,8	9,35	7,82	6,34	
	50	Q	74300	67500	61100	50700	40900	32700	25700	19800	14900			
		P	20,1	19,7	19,2	18,1	16,6	15,0	13,2	11,4	9,54			
HGX56e/1380-4 HGX56e/1380-4 S	30	Q	116000	106000	96400	79600	65300	52900	42200	33100	25500	19000	13600	9140
		P	15,6	15,6	15,6	15,2	14,6	13,8	12,7	11,5	10,2	8,81	7,32	5,81
	40	Q	103000	93500	85300	70000	57100	45900	36400	28300	21400	15600	10700	
HGX56e/1510-4 HGX56e/1510-4 S		P	19,9	19,6	19,2	18,3	17,1	15,7	14,2	12,5	10,7	8,90	7,02	
	50	Q	88600	80700	73300	59700	48300	38500	30100	23100	17100			
		P	23,8	23,2	22,5	21,0	19,2	17,3	15,2	13,0	10,8			
HGX56e/1770-4 HGX56e/1770-4 S	30	Q	138000	126000	115000	93400	75800	60800	48000	37300	28400	21100	15200	10500
		P	18,6	18,9	19,0	18,8	18,2	17,2	15,9	14,4	12,7	11,1	9,43	7,86
	40	Q	121000	110000	99300	80800	65400	52200	41000	31600	23900	17500	12200	
HGX56e/2000-4 HGX56e/2000-4 S		P	23,9	23,7	23,4	22,6	21,2	19,6	17,7	15,7	13,6	11,5	9,61	
	50	Q	103000	93400	84500	68300	54900	43500	33900	25900	19200			
		P	28,7	28,1	27,4	25,9	23,9	21,6	19,1	16,6	14,1			

Relating to 20°C suction gas temperature without liquid subcooling

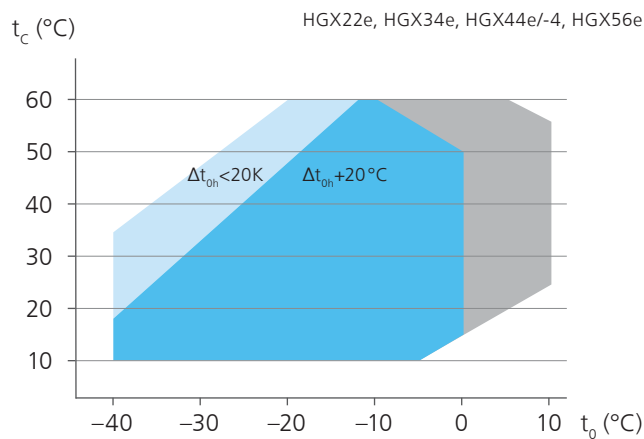
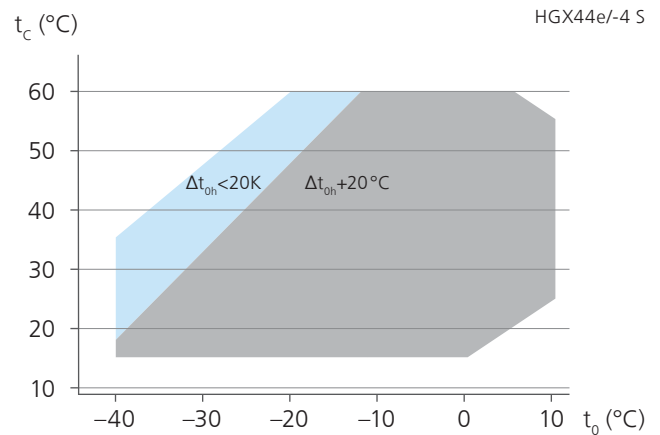
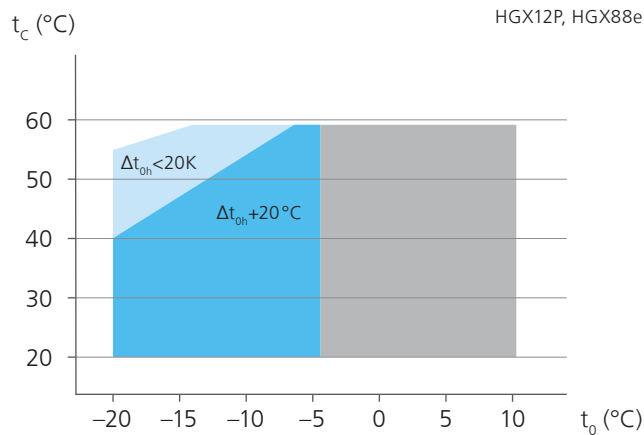
Supplementary cooling or reduced suction gas temperature

Motor version -S- (more powerful motor)

R407A performance data for further HG type series can be viewed via our GEA VAP software (vap.gea.com).

OPERATING LIMITS

R407F Operating limits



t_0 Evaporating temperature (°C)

t_c Condensing temperature (°C)

Δt_{oh} Suction gas superheat (K)

t_{oh} Suction gas temperature (°C)

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

¹⁾ LP = low pressure, HP = high pressure

● Unlimited application range

● Motor version -S- (more powerful motor)

● Supplementary cooling or reduced suction gas temperature

NOTES

R407F 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.gea.com.

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 GEA VAP software (vap.gea.com).

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 GEA compressors can be found at www.asercom.org and www.gea.com.

PERFORMANCE DATA

R407F

50 Hz

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]								Power consumption P_e [kW]			
			Evaporating temperature °C											
			10	7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40
HGX12P/60-4 S	30	Q P	7240 1,10	6570 1,13	5950 1,15	4840 1,15	3890 1,12	3080 1,06	2410 0,982	1850 0,894				
	40	Q P	6290 1,41	5700 1,42	5150 1,40	4180 1,36	3340 1,27	2640 1,17	2040 1,06	1540 0,948				
	50	Q P	5300 1,67	4800 1,64	4330 1,60	3490 1,51	2780 1,38	2170 1,24	1660 1,10	1220 0,963				
HGX12P/75-4 HGX12P/75-4 S	30	Q P	9010 1,39	8200 1,43	7440 1,46	6090 1,46	4950 1,40	3960 1,33	3130 1,23	2430 1,12				
	40	Q P	7850 1,82	7140 1,82	6470 1,80	5290 1,74	4310 1,62	3440 1,49	2690 1,36	2070 1,21				
	50	Q P	6670 2,15	6060 2,11	5490 2,06	4480 1,94	3670 1,78	2910 1,61	2260 1,44	1720 1,27				
HGX12P/90-4 HGX12P/90-4 S	30	Q P	10800 1,71	9780 1,74	8880 1,76	7270 1,75	5760 1,66	4620 1,55	3650 1,43	2840 1,29				
	40	Q P	9380 2,18	8530 2,17	7740 2,14	6320 2,06	5020 1,89	4000 1,73	3140 1,55	2400 1,38				
	50	Q P	7990 2,60	7260 2,55	6580 2,48	5370 2,32	4270 2,09	3370 1,87	2620 1,65	1980 1,44				
HGX12P/110-4 HGX12P/110-4 S	30	Q P	12500 2,01	11300 2,04	10300 2,06	8420 2,03	6830 2,01	5510 1,88	4390 1,73	3440 1,57				
	40	Q P	10900 2,54	9860 2,52	8960 2,50	7330 2,40	5970 2,31	4800 2,11	3790 1,89	2940 1,68				
	50	Q P	9160 3,04	8330 2,98	7560 2,91	6180 2,72	5070 2,54	4040 2,27	3170 2,00	2430 1,74				
HGX22e/125-4 HGX22e/125-4 S	30	Q P	15400 2,25	14100 2,26	12800 2,26	10600 2,22	8560 2,14	6860 2,03	5410 1,89	4190 1,74	3180 1,57	2350 1,39	1690 1,22	1160 1,05
	40	Q P	13600 2,81	12400 2,77	11200 2,72	9180 2,60	7420 2,44	5910 2,26	4630 2,07	3560 1,87	2670 1,66	1940 1,46	1360 1,27	
	50	Q P	11700 3,35	10600 3,25	9580 3,16	7800 2,94	6260 2,71	4950 2,47	3840 2,22	2920 1,97	2160 1,73			
HGX22e/160-4 HGX22e/160-4 S	30	Q P	19600 2,98	17900 2,93	16300 2,88	13100 2,77	10600 2,61	8470 2,46	6740 2,32	5300 2,17	4110 2,01	3120 1,81	2280 1,58	1520 1,30
	40	Q P	17500 3,59	15900 3,49	14400 3,39	11600 3,22	9300 2,99	7440 2,79	5890 2,58	4580 2,37	3490 2,14	2540 1,87	1690 1,57	
	50	Q P	15300 4,20	13800 4,05	12500 3,90	10200 3,67	8140 3,37	6460 3,09	5040 2,80	3820 2,51	2770 2,19			
HGX22e/190-4 HGX22e/190-4 S	30	Q P	22700 3,85	20800 3,73	19000 3,62	15800 3,52	13000 3,27	10600 3,04	8450 2,82	6680 2,60	5200 2,38	3960 2,14	2940 1,88	2100 1,59
	40	Q P	20000 4,64	18300 4,46	16700 4,30	13900 4,12	11400 3,77	9180 3,46	7330 3,16	5770 2,87	4460 2,58	3370 2,29	2450 1,98	
	50	Q P	17400 5,47	15900 5,24	14500 5,02	11900 4,72	9680 4,27	7790 3,85	6180 3,46	4830 3,09	3700 2,72			
HGX34e/215-4 HGX34e/215-4 S	30	Q P	25900 3,62	23600 3,61	21400 3,57	17200 3,48	13900 3,29	11100 3,05	8570 2,77	6520 2,47	4820 2,17	3430 1,88	2320 1,61	1450 1,38
	40	Q P	22700 4,70	20600 4,57	18600 4,43	14800 4,18	11800 3,81	9230 3,41	7080 3,01	5290 2,62	3840 2,24	2680 1,91	1770 1,63	
	50	Q P	19400 5,68	17500 5,45	15700 5,20	12300 4,80	9650 4,26	7460 3,72	5650 3,20	4180 2,72	3020 2,29			
HGX34e/255-4 HGX34e/255-4 S	30	Q P	30300 3,83	27700 3,92	25200 3,98	20500 4,05	16700 3,94	13400 3,73	10500 3,44	8020 3,10	5970 2,72	4280 2,33	2910 1,96	1820 1,61
	40	Q P	26300 5,05	24000 5,04	21800 4,99	17600 4,92	14300 4,62	11400 4,25	8860 3,81	6760 3,34	5000 2,86	3540 2,39	2360 1,94	
	50	Q P	22000 6,15	20000 6,03	18100 5,88	14500 5,67	11700 5,19	9230 4,65	7190 4,07	5470 3,47	4050 2,89			
HGX34e/315-4 HGX34e/315-4 S	30	Q P	38500 5,04	34900 5,07	31700 5,07	25600 4,91	20600 4,72	16400 4,45	12900 4,11	9900 3,71	7460 3,27	5450 2,82	3800 2,36	2430 1,91
	40	Q P	33500 6,44	30400 6,36	27500 6,25	22100 5,90	17700 5,52	14000 5,07	11000 4,57	8350 4,02	6230 3,46	4470 2,89	3000 2,32	
	50	Q P	28500 7,76	25700 7,57	23200 7,35	18500 6,80	14800 6,23	11600 5,59	8990 4,92	6840 4,22	5070 3,51			
HGX34e/380-4 HGX34e/380-4 S	30	Q P	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	3320 2,38
	40	Q P	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	Q P	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			

Relating to 20°C suction gas temperature without liquid subcooling

■ Supplementary cooling or reduced suction gas temperature

■ Motor version -S- (more powerful motor)

R407F

50 Hz

Type	Cond. temp. °C		Cooling capacity Q ₀ [W]							Power consumption P _e [kW]					
			Evaporating temperature °C												
			10	7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40	
HGX44e/475-4 HGX44e/475-4 S	30	Q	58200	53100	48400	39600	32300	26000	20600	16100	12400	9210	6640	4520	
		P	7,56	7,67	7,73	7,62	7,37	6,98	6,45	5,84	5,15	4,43	3,71	3,00	
	40	Q	51000	46500	42400	34500	28100	22600	17900	13900	10500	7620	5210		
		P	9,81	9,74	9,63	9,22	8,67	7,99	7,21	6,36	5,46	4,55	3,65		
	50	Q	43900	40000	36300	29400	23900	19100	15000	11500	8460				
		P	11,8	11,6	11,3	10,6	9,78	8,81	7,76	6,67	5,55				
HGX44e/565-4 HGX44e/565-4 S	30	Q	69400	63400	57800	47100	38500	31000	24700	19400	14900	11200	8120	5600	
		P	9,05	9,18	9,24	9,13	8,84	8,36	7,73	6,99	6,16	5,30	4,42	3,57	
	40	Q	61000	55700	50700	41100	33500	27000	21500	16700	12800	9330	6460		
		P	11,7	11,6	11,5	11,1	10,4	9,61	8,66	7,63	6,54	5,44	4,36		
	50	Q	52600	47900	43600	35100	28600	22900	18100	14000	10400				
		P	14,1	13,8	13,5	12,8	11,8	10,6	9,35	8,02	6,66				
HGX44e/665-4 HGX44e/665-4 S ¹⁾	30	Q	81800	74700	68000	55700	45400	36500	29000	22600	17300	12900	9260	6270	
		P	10,5	10,6	10,7	10,6	10,2	9,72	9,00	8,15	7,20	6,20	5,18	4,19	
	40	Q	71600	65300	59400	48500	39400	31600	25000	19400	14700	10700	7220		
		P	13,6	13,5	13,4	12,8	12,0	11,1	10,0	8,88	7,63	6,36	5,11		
	50	Q	61600	56000	50900	41300	33400	26700	20900	16000	11800				
		P	16,5	16,2	15,8	14,8	13,6	12,3	10,8	9,33	7,78				
HGX44e/770-4 HGX44e/770-4 S	30	Q	93600	85500	77900	64300	52400	42200	33600	26300	20200	15100	10900	7350	
		P	12,1	12,3	12,4	12,3	11,9	11,3	10,4	9,50	8,42	7,29	6,16	5,08	
	40	Q	82000	74900	68200	56100	45700	36700	29100	22600	17100	12500	8480		
		P	15,8	15,7	15,5	14,9	14,0	12,9	11,7	10,3	8,99	7,58	6,20		
	50	Q	70500	64300	58400	47900	38900	31100	24400	18700	13900				
		P	19,2	18,8	18,3	17,2	15,8	14,3	12,7	11,0	9,27				
HGX56e/850-4 HGX56e/850-4 S	30	Q	104000	94600	86300	70700	57800	46600	37100	29100	22400	16800	12200	8390	
		P	13,5	13,7	13,8	13,6	13,2	12,5	11,6	10,4	9,26	7,96	6,64	5,36	
	40	Q	90800	82900	75500	61800	50400	40600	32200	25100	19100	14100	9680		
		P	17,5	17,4	17,2	16,5	15,5	14,3	12,9	11,4	9,82	8,18	6,55		
	50	Q	78100	71200	64700	52700	42900	34400	27200	21000	15600				
		P	21,3	20,8	20,3	19,1	17,5	15,8	13,9	12,0	10,0				
HGX56e/995-4 HGX56e/995-4 S	30	Q	122000	112000	102000	83700	68600	55500	44200	34600	26600	19800	14100	9420	
		P	16,5	16,5	16,4	16,0	15,4	14,5	13,4	12,1	10,7	9,23	7,65	6,04	
	40	Q	108000	98400	89700	73600	60000	48200	38100	29600	22300	16200	11000		
		P	20,9	20,6	20,2	19,3	18,0	16,6	15,0	13,2	11,3	9,38	7,36		
	50	Q	93700	85400	77600	63100	51100	40700	31900	24300	17900				
		P	25,1	24,4	23,8	22,2	20,4	18,4	16,2	13,9	11,4				
HGX56e/1155-4 HGX56e/1155-4 S	30	Q	141000	129000	117000	96000	78300	63100	50200	39300	30100	22500	16300	11100	
		P	18,9	19,2	19,3	19,2	18,6	17,6	16,3	14,8	13,1	11,3	9,59	7,89	
	40	Q	124000	113000	103000	83800	68200	54900	43500	33800	25600	18700	12700		
		P	24,6	24,4	24,1	23,4	22,0	20,3	18,3	16,2	14,0	11,8	9,65		
	50	Q	106000	96600	87800	71500	58000	46400	36500	28000	20700				
		P	29,8	29,2	28,5	27,0	24,9	22,5	19,9	17,2	14,4				
HGX88e/2735-4 HGX88e/2735-4 S	30	Q	346000	315000	287000	235000	191000	153000	121000	93000					
		P	50,1	49,9	49,3	47,5	45,4	41,8	38,0	34,1					
	40	Q	302000	275000	250000	205000	166000	132000	104000	79300					
		P	61,2	60,0	58,5	54,9	51,3	46,4	41,4	36,6					
	50	Q	258000	235000	213000	174000	141000	111000	86300	65800					
		P	70,7	68,5	66,0	60,8	55,8	49,7	43,7	38,1					
HGX88e/3235-4 HGX88e/3235-4 S	30	Q	398000	363000	331000	272000	221000	178000	141000	109000					
		P	58,8	58,7	58,2	56,3	54,0	49,8	45,3	40,6					
	40	Q	349000	318000	290000	238000	193000	154000	121000	92600					
		P	72,7	71,3	69,6	65,4	61,2	55,3	49,2	43,3					
	50	Q	297000	270000	245000	200000	162000	129000	99600	75800					
		P	83,7	81,1	78,3	72,1	66,1	58,7	51,5	44,7					

Relating to 20°C suction gas temperature without liquid subcooling

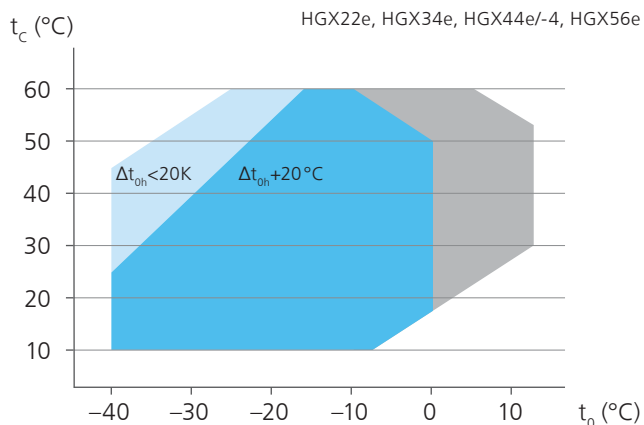
■ Supplementary cooling or reduced suction gas temperature

■ Motor version -S- (more powerful motor)

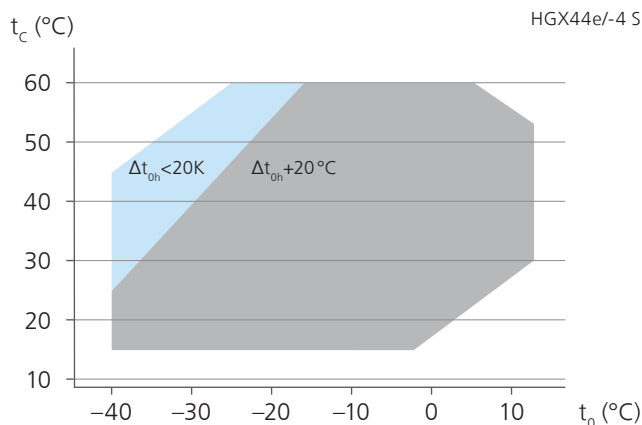
¹⁾ The Compressor HGX44e/665-4S is ASERCOM certified

OPERATING LIMITS

R448A/R449A Operating limits



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



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

¹⁾ LP = low pressure, HP = high pressure

- Unlimited application range
- Motor version -S- (more powerful motor)
- Supplementary cooling or reduced suction gas temperature

NOTES

R448A/R449A 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 GEA VAP software (vap.gea.com).

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 GEA compressors can be found at www.asercom.org and www.gea.com.

PERFORMANCE DATA

R448A															50 Hz
Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]					Power consumption P_e [kW]							
			Evaporating temperature °C												
			12,5	10	7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40
HGX22e/125-4 HGX22e/125-4 S	30	Q	16600	15200	13800	12600	10300	8330	6680	5290	4130	3160	2370	1710	1170
		P	2,00	2,06	2,10	2,12	2,12	2,06	1,96	1,82	1,66	1,48	1,30	1,12	0,958
	40	Q	14500	13200	12000	10900	8870	7170	5730	4510	3500	2660	1950	1370	853
		P	2,64	2,65	2,63	2,60	2,51	2,37	2,19	1,99	1,78	1,56	1,35	1,15	0,987
	50	Q	12400	11200	10200	9180	7470	6010	4770	3730	2870	2150	1540	1010	
		P	3,22	3,16	3,10	3,02	2,83	2,61	2,37	2,11	1,85	1,60	1,37	1,16	
HGX22e/160-4 HGX22e/160-4 S	30	Q	20300	18600	17000	15400	12600	10200	8180	6480	5060	3880	2900	2100	1440
		P	2,94	2,90	2,85	2,79	2,62	2,54	2,41	2,23	2,03	1,80	1,57	1,35	1,15
	40	Q	17700	16100	14700	13400	10900	8760	7000	5520	4290	3260	2400	1670	1050
		P	3,65	3,55	3,45	3,35	3,11	2,92	2,70	2,45	2,18	1,90	1,64	1,39	1,18
	50	Q	15200	13800	12600	11400	9110	7330	5820	4560	3510	2630	1880	1230	
		P	4,34	4,19	4,04	3,88	3,52	3,24	2,93	2,60	2,27	1,96	1,66	1,40	
HGX22e/190-4 HGX22e/190-4 S	30	Q	24500	22400	20500	18700	15400	12700	10300	8260	6570	5170	3980	2980	2110
		P	3,57	3,51	3,45	3,39	3,35	3,14	2,93	2,70	2,47	2,23	1,98	1,72	1,44
	40	Q	21300	19500	17800	16200	13400	11000	8890	7140	5670	4430	3380	2460	1630
		P	4,45	4,33	4,22	4,09	3,95	3,64	3,33	3,03	2,72	2,41	2,10	1,79	1,47
	50	Q	18300	16700	15200	13900	11500	9300	7510	6010	4740	3660	2730	1880	
		P	5,33	5,14	4,96	4,77	4,51	4,09	3,68	3,29	2,90	2,52	2,14	1,78	
HGX34e/215-4 HGX34e/215-4 S	30	Q	27600	25200	23000	20900	16800	13700	10900	8490	6500	4830	3470	2370	1500
		P	3,48	3,49	3,48	3,45	3,36	3,19	2,96	2,70	2,42	2,13	1,84	1,57	1,34
	40	Q	24200	22000	20000	18100	14400	11600	9060	6980	5240	3810	2650	1740	1030
		P	4,58	4,48	4,37	4,24	4,01	3,67	3,30	2,93	2,55	2,19	1,86	1,57	1,33
	50	Q	20600	18600	16800	15100	11900	9380	7280	5520	4080	2920	2010	1320	
		P	5,59	5,38	5,17	4,95	4,57	4,08	3,58	3,10	2,64	2,21	1,85	1,54	
HGX34e/255-4 HGX34e/255-4 S	30	Q	32200	29600	27100	24700	20000	16400	13200	10400	7970	5960	4300	2950	1880
		P	3,59	3,72	3,80	3,86	3,92	3,82	3,63	3,36	3,03	2,67	2,29	1,92	1,58
	40	Q	27900	25600	23400	21300	17200	14000	11200	8720	6660	4930	3490	2310	1370
		P	4,83	4,85	4,84	4,80	4,73	4,46	4,11	3,70	3,26	2,79	2,33	1,89	1,50
	50	Q	23300	21300	19400	17600	14100	11400	9040	7040	5350	3930	2750	1790	
		P	5,95	5,87	5,76	5,63	5,43	4,99	4,49	3,94	3,38	2,81	2,27	1,77	
HGX34e/315-4 HGX34e/315-4 S	30	Q	41100	37500	34100	30900	25000	20200	16200	12800	9840	7440	5470	3850	2510
		P	4,84	4,90	4,92	4,92	4,75	4,58	4,33	4,00	3,62	3,20	2,76	2,31	1,87
	40	Q	35700	32500	29500	26700	21500	17300	13800	10800	8230	6140	4410	2960	1720
		P	6,23	6,18	6,11	6,01	5,67	5,33	4,91	4,43	3,91	3,37	2,82	2,27	1,74
	50	Q	30300	27400	24800	22400	17900	14300	11300	8770	6660	4910	3430	2170	
		P	7,55	7,40	7,22	7,03	6,50	5,98	5,39	4,76	4,09	3,42	2,74	2,09	
HGX34e/380-4 HGX34e/380-4 S	30	Q	48800	44600	40600	37000	30000	24500	19800	15700	12300	9440	7070	5090	3430
		P	6,17	6,20	6,20	6,17	5,95	5,71	5,38	4,97	4,50	3,98	3,44	2,88	2,33
	40	Q	42400	38700	35200	32000	25800	21000	16900	13400	10400	7890	5790	3990	2420
		P	7,82	7,74	7,62	7,48	7,06	6,62	6,09	5,50	4,87	4,20	3,52	2,85	2,19
	50	Q	35900	32600	29600	26900	21600	17500	14000	11100	8530	6410	4590	2990	
		P	9,40	9,19	8,96	8,70	8,08	7,42	6,69	5,92	5,11	4,28	3,46	2,65	
HGX44e/475-4 HGX44e/475-4 S	30	Q	61800	56500	51700	47100	38600	31500	25400	20200	15800	12200	9150	6660	4620
		P	7,17	7,30	7,37	7,39	7,26	7,00	6,62	6,12	5,54	4,89	4,21	3,53	2,85
	40	Q	54300	49600	45200	41100	33500	27300	21900	17300	13500	10300	7590	5340	3430
		P	9,44	9,40	9,30	9,17	8,77	8,23	7,58	6,84	6,05	5,21	4,37	3,55	2,76
	50	Q	46700	42500	38700	35100	28400	22900	18200	14300	11000	8150	5790	3760	
		P	11,5	11,3	11,0	10,7	10,0	9,25	8,33	7,34	6,32	5,28	4,26	3,28	
HGX44e/565-4 HGX44e/565-4 S	30	Q	73700	67500	61700	56200	45900	37500	30300	24200	19000	14700	11200	8160	5710
		P	8,52	8,66	8,75	8,77	8,65	8,35	7,88	7,28	6,58	5,80	4,99	4,16	3,36
	40	Q	64900	59300	54100	49200	40000	32600	26200	20900	16300	12500	9300	6620	4320
		P	11,2	11,1	11,0	10,8	10,4	9,83	9,04	8,15	7,19	6,19	5,18	4,19	3,25
	50	Q	55900	51000	46400	42100	33800	27400	21900	17300	13400	10100	7190	4750	
		P	13,7	13,4	13,1	12,7	12,1	11,0	9,95	8,75	7,52	6,27	5,04	3,87	
HGX44e/665-4 HGX44e/665-4 S ¹⁾	30	Q	87000	79500	72600	66000	53700	43800	35300	28100	22000	16900	12700	9210	6350
		P	9,92	10,1	10,2	10,2	10,1	9,81	9,26	8,57	7,75	6,85	5,90	4,93	3,99
	40	Q	76200	69500	63300	57500	46600	37900	30400	24000	18700	14200	10500	7330	4670
		P	13,0	13,0	12,9	12,7	12,2	11,5	10,6	9,58	8,47	7,30	6,12	4,96	3,86
	50	Q	65400	59500	54000	48800	39300	31700	25200	19800	15100	11300	7930	5120	
		P	16,0	15,7	15,3	14,9	14,1	12,9	11,6	10,2	8,84	7,39	5,97	4,59	

Relating to 20°C suction gas temperature without liquid subcooling

 Supplementary cooling or reduced suction gas temperature

 Motor version -S- (more powerful motor)
¹⁾ The compressor HGX44e/665-4S is ASERCOM certified

PERFORMANCE DATA

R448A

50 Hz

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]								Power consumption P_e [kW]					
			Evaporating temperature °C													
			12,5	10	7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40	
HGX44e/770-4 HGX44e/770-4 S	30	Q	99500	91100	83200	75900	62600	51100	41300	32900	25800	19900	15100	11000	7650	
		P	11,5	11,7	11,8	11,8	11,7	11,3	10,7	9,91	8,96	7,92	6,82	5,71	4,61	
	40	Q	87300	79800	72800	66300	54500	44300	35600	28300	22100	16900	12600	8860	5760	
		P	15,3	15,2	15,0	14,8	14,1	13,3	12,2	11,0	9,79	8,44	7,08	5,74	4,46	
	50	Q	75100	68400	62200	56500	46200	37300	29800	23400	18000	13500	9620	6320		
		P	18,8	18,4	18,0	17,4	16,3	14,9	13,4	11,8	10,2	8,55	6,90	5,31		
HGX56e/850-4 HGX56e/850-4 S	30	Q	110000	101000	92100	83900	69000	56300	45500	36300	28600	22100	16700	12300	8560	
		P	12,7	12,9	13,0	13,1	12,9	12,5	11,8	10,9	9,87	8,72	7,49	6,25	5,04	
	40	Q	96600	88400	80600	73400	60000	48900	39400	31300	24500	18800	14000	9920	6480	
		P	16,8	16,7	16,5	16,3	15,6	14,7	13,5	12,2	10,7	9,29	7,78	6,29	4,87	
	50	Q	83100	75800	69000	62600	50800	41200	32900	25900	20000	15100	10800	7130		
		P	20,6	20,2	19,7	19,1	18,0	16,5	14,8	13,1	11,2	9,41	7,58	5,82		
HGX56e/995-4 HGX56e/995-4 S	30	Q	129000	119000	108000	98500	81100	66400	53800	43000	33900	26200	19800	14400	9760	
		P	15,6	15,8	15,9	15,9	15,6	15,0	14,1	13,1	11,8	10,5	9,08	7,60	6,11	
	40	Q	113000	104000	94300	86000	70500	57600	46600	37100	29100	22300	16500	11400	6880	
		P	20,3	20,1	19,9	19,5	18,7	17,5	16,1	14,6	12,9	11,1	9,34	7,50	5,70	
	50	Q	96900	88500	80700	73300	59800	48700	39200	31000	24000	18000	12700	7940		
		P	24,6	24,2	23,6	22,9	21,5	19,8	17,8	15,8	13,6	11,4	9,22	7,01		
HGX56e/1155-4 HGX56e/1155-4 S	30	Q	150000	137000	125000	114000	93500	76400	61600	49100	38600	29800	22500	16500	11500	
		P	18,0	18,3	18,5	18,5	18,3	17,7	16,7	15,4	13,9	12,3	10,6	8,88	7,17	
	40	Q	132000	120000	110000	99500	81300	66200	53200	42300	33000	25200	18800	13300	8620	
		P	23,8	23,7	23,4	23,1	22,2	20,8	19,2	17,3	15,3	13,1	11,0	8,93	6,93	
	50	Q	113000	103000	93500	84800	68900	55700	44400	34900	26900	20200	14400	9460		
		P	29,2	28,6	27,9	27,2	25,6	23,4	21,1	18,5	15,9	13,3	10,7	8,26		

Relating to 20°C suction gas temperature without liquid subcooling

Supplementary cooling or reduced suction gas temperature

Motor version -S- (more powerful motor)

PERFORMANCE DATA

R449A

50 Hz

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]								Power consumption P_e [kW]					
			Evaporating temperature °C													
			12,5	10	7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40	
HGX22e/125-4 HGX22e/125-4 S	30	Q	16500	15100	13800	12500	10300	8300	6650	5270	4110	3150	2360	1710	1170	
		P	1,99	2,05	2,09	2,11	2,11	2,06	1,95	1,81	1,65	1,47	1,29	1,11	0,956	
	40	Q	14400	13100	11900	10800	8820	7130	5700	4490	3480	2640	1950	1360	850	
		P	2,63	2,63	2,62	2,59	2,50	2,36	2,18	1,98	1,77	1,55	1,34	1,15	0,984	
	50	Q	12300	11100	10100	9110	7420	5960	4740	3710	2850	2130	1530	1010		
		P	3,20	3,14	3,08	3,00	2,82	2,60	2,36	2,10	1,85	1,60	1,36	1,16		
HGX22e/160-4 HGX22e/160-4 S	30	Q	20200	18500	16900	15400	12600	10200	8150	6450	5040	3860	2900	2100	1440	
		P	2,92	2,88	2,83	2,78	2,61	2,53	2,40	2,23	2,02	1,80	1,57	1,35	1,14	
	40	Q	17600	16000	14600	13300	10800	8710	6960	5490	4260	3240	2390	1670	1040	
		P	3,63	3,53	3,44	3,34	3,09	2,91	2,69	2,44	2,17	1,90	1,63	1,39	1,18	
	50	Q	15000	13700	12500	11400	9040	7270	5780	4530	3490	2610	1870	1230		
		P	4,31	4,16	4,01	3,86	3,50	3,22	2,91	2,59	2,26	1,95	1,66	1,40		
HGX22e/190-4 HGX22e/190-4 S	30	Q	24400	22300	20400	18600	15400	12600	10300	8220	6550	5150	3970	2970	2110	
		P	3,55	3,50	3,44	3,37	3,33	3,13	2,91	2,69	2,46	2,22	1,97	1,71	1,44	
	40	Q	21200	19400	17700	16100	13400	10900	8840	7110	5650	4410	3360	2450	1630	
		P	4,43	4,31	4,19	4,07	3,93	3,63	3,32	3,01	2,71	2,40	2,09	1,78	1,47	
	50	Q	18200	16600	15100	13800	11400	9230	7460	5970	4710	3640	2710	1870		
		P	5,29	5,11	4,93	4,74	4,49	4,07	3,67	3,27	2,88	2,51	2,13	1,77		
HGX34e/215-4 HGX34e/215-4 S	30	Q	27400	25100	22800	20800	16800	13600	10800	8460	6470	4820	3460	2360	1500	
		P	3,46	3,47	3,46	3,44	3,35	3,18	2,95	2,69	2,41	2,12	1,84	1,57	1,34	
	40	Q	24000	21800	19800	17900	14300	11500	9010	6940	5210	3790	2640	1730	1030	
		P	4,56	4,46	4,35	4,22	3,99	3,65	3,29	2,91	2,54	2,18	1,85	1,56	1,33	
	50	Q	20400	18500	16700	15000	11800	9320	7230	5480	4050	2900	2000	1310		
		P	5,55	5,35	5,14	4,92	4,55	4,06	3,56	3,08	2,62	2,21	1,84	1,54		
HGX34e/255-4 HGX34e/255-4 S	30	Q	32100	29400	26900	24600	19900	16300	13100	10300	7940	5940	4280	2940	1870	
		P	3,57	3,70	3,79	3,84	3,90	3,81	3,61	3,35	3,02	2,66	2,28	1,91	1,57	
	40	Q	27800	25400	23200	21100	17100	13900	11100	8670	6630	4900	3470	2300	1360	
		P	4,81	4,83	4,82	4,78	4,71	4,44	4,09	3,69	3,24	2,78	2,32	1,89	1,50	
	50	Q	23100	21100	19200	17500	14000	11300	8980	7000	5310	3900	2740	1790		
		P	5,92	5,84	5,73	5,60	5,40	4,96	4,46	3,92	3,36	2,80	2,26	1,76		
HGX34e/315-4 HGX34e/315-4 S	30	Q	40900	37300	33900	30800	24900	20100	16100	12700	9800	7420	5460	3840	2510	
		P	4,81	4,87	4,90	4,90	4,73	4,56	4,31	3,99	3,61	3,19	2,75	2,31	1,87	
	40	Q	35500	32300	29300	26500	21300	17200	13700	10700	8190	6120	4390	2940	1710	
		P	6,19	6,15	6,08	5,98	5,64	5,30	4,89	4,41	3,90	3,36	2,81	2,26	1,73	
	50	Q	30000	27200	24600	22200	17800	14200	11300	8710	6620	4880	3410	2160		
		P	7,50	7,35	7,18	6,99	6,47	5,95	5,36	4,74	4,08	3,40	2,73	2,08		
HGX34e/380-4 HGX34e/380-4 S	30	Q	48500	44300	40400	36800	29900	24400	19700	15700	12300	9410	7050	5080	3420	
		P	6,14	6,17	6,17	6,14	5,92	5,69	5,36	4,95	4,48	3,97	3,43	2,88	2,33	
	40	Q	42100	38400	35000	31800	25700	20900	16800	13300	10400	7860	5760	3970	2410	
		P	7,78	7,70	7,58	7,44	7,03	6,59	6,06	5,48	4,85	4,19	3,51	2,84	2,18	
	50	Q	35600	32400	29400	26600	21400	17400	13900	11000	8480	6370	4560	2980		
		P	9,35	9,14	8,91	8,65	8,04	7,38	6,66	5,89	5,09	4,27	3,45	2,64		
HGX44e/475-4 HGX44e/475-4 S	30	Q	61400	56200	51400	46800	38400	31300	25300	20100	15800	12200	9120	6650	4610	
		P	7,14	7,26	7,33	7,36	7,22	6,98	6,59	6,10	5,52	4,88	4,20	3,52	2,85	
	40	Q	53900	49300	44900	40900	33300	27100	21800	17300	13400	10300	7550	5320	3420	
		P	9,39	9,35	9,26	9,12	8,73	8,19	7,55	6,81	6,02	5,20	4,36	3,54	2,75	
	50	Q	46300	42200	38400	34800	28100	22700	18100	14200	10900	8100	5760	3750		
		P	11,4	11,2	11,0	10,7	10,0	9,21	8,29	7,31	6,29	5,26	4,25	3,27		
HGX44e/565-4 HGX44e/565-4 S	30	Q	73300	67100	61300	55900	45700	37400	30200	24100	19000	14700	11100	8140	5700	
		P	8,47	8,62	8,71	8,73	8,61	8,31	7,85	7,25	6,55	5,78	4,97	4,15	3,35	
	40	Q	64400	58900	53700	48900	39700	32400	26100	20700	16200	12500	9260	6590	4300	
		P	11,1	11,1	10,9	10,8	10,4	9,79	9,01	8,12	7,16	6,17	5,16	4,17	3,24	
	50	Q	55500	50600	46000	41800	33600	27200	21800	17200	13300	9950	7150	4730		
		P	13,6	13,3	13,0	12,7	12,0	11,0	9,91	8,72	7,48	6,24	5,02	3,86		
HGX44e/665-4 HGX44e/665-4 S ¹⁾	30	Q	85400	78200	71400	65100	53500	43600	35200	28000	21900	16900	12700	9180	6340	
		P	9,91	10,0	10,1	10,2	10,1	9,77	9,23	8,54	7,72	6,83	5,88	4,92	3,98	
	40	Q	74900	68400	62400	56700	46300	37600	30200	23900	18600	14200	10500	7310	4660	
		P	13,0	13,0	12,8	12,7	12,2	11,4	10,5	9,54	8,43	7,28	6,10	4,95	3,85	
	50	Q	64200	58500	53200	48200	39000	31500	25100	19600	15100	11200	7890	5090		
		P	16,0	15,7	15,3	14,9	14,0	12,8	11,6	10,2	8,81	7,37	5,95	4,58		

Relating to 20°C suction gas temperature without liquid subcooling

■ Supplementary cooling or reduced suction gas temperature

■ Motor version -S- (more powerful motor)

¹⁾ The Compressor HGX44e/665-4S is ASERCOM certified

PERFORMANCE DATA

R449A

50 Hz

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]								Power consumption P_e [kW]					
			Evaporating temperature °C													
			12,5	10	7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40	
HGX44e/770-4 HGX44e/770-4 S	30	Q	98900	90600	82800	75500	62300	50900	41100	32700	25700	19900	15000	11000	7640	
		P	11,4	11,6	11,8	11,8	11,6	11,2	10,6	9,87	8,93	7,90	6,80	5,69	4,60	
	40	Q	86800	79300	72300	65800	54100	44100	35400	28100	22000	16800	12500	8830	5740	
		P	15,2	15,1	14,9	14,7	14,1	13,2	12,2	11,0	9,75	8,41	7,06	5,72	4,45	
	50	Q	74500	67900	61800	56000	45800	37000	29600	23200	17900	13400	9570	6290		
		P	18,7	18,3	17,9	17,4	16,2	14,8	13,4	11,8	10,1	8,52	6,88	5,30		
HGX56e/850-4 HGX56e/850-4 S	30	Q	110000	101000	91600	83500	68600	56100	45300	36200	28500	22000	16700	12300	8550	
		P	12,6	12,8	13,0	13,0	12,8	12,4	11,7	10,8	9,84	8,69	7,47	6,23	5,03	
	40	Q	96000	87800	80100	72900	59600	48600	39200	31100	24400	18700	13900	9880	6450	
		P	16,7	16,6	16,4	16,2	15,5	14,6	13,4	12,1	10,7	9,26	7,75	6,27	4,86	
	50	Q	82500	75200	68400	62100	50400	40900	32700	25800	19900	15000	10800	7100		
		P	20,5	20,1	19,6	19,0	17,9	16,4	14,8	13,0	11,2	9,38	7,56	5,80		
HGX56e/995-4 HGX56e/995-4 S	30	Q	129000	118000	108000	98000	80700	66100	53500	42800	33800	26200	19800	14400	9740	
		P	15,6	15,7	15,8	15,8	15,5	14,9	14,1	13,0	11,8	10,4	9,06	7,58	6,10	
	40	Q	113000	103000	93700	85400	70100	57300	46300	36900	29000	22200	16400	11400	6860	
		P	20,2	20,0	19,8	19,4	18,6	17,4	16,1	14,5	12,9	11,1	9,31	7,48	5,68	
	50	Q	96100	87800	80000	72800	59400	48400	38900	30800	23900	17900	12600	7900		
		P	24,5	24,0	23,5	22,8	21,4	19,7	17,8	15,7	13,6	11,4	9,19	6,99		
HGX56e/1155-4 HGX56e/1155-4 S	30	Q	149000	136000	125000	114000	93100	76000	61400	48900	38500	29700	22400	16400	11500	
		P	17,9	18,2	18,4	18,5	18,3	17,6	16,6	15,4	13,9	12,3	10,5	8,85	7,15	
	40	Q	131000	120000	109000	98800	80900	65800	52900	42000	32800	25100	18700	13300	8590	
		P	23,7	23,5	23,3	23,0	22,1	20,7	19,1	17,2	15,2	13,1	11,0	8,90	6,91	
	50	Q	112000	102000	92800	84200	68400	55300	44100	34700	26700	20000	14400	9420		
		P	29,0	28,5	27,8	27,0	25,4	23,3	21,0	18,5	15,9	13,2	10,7	8,23		

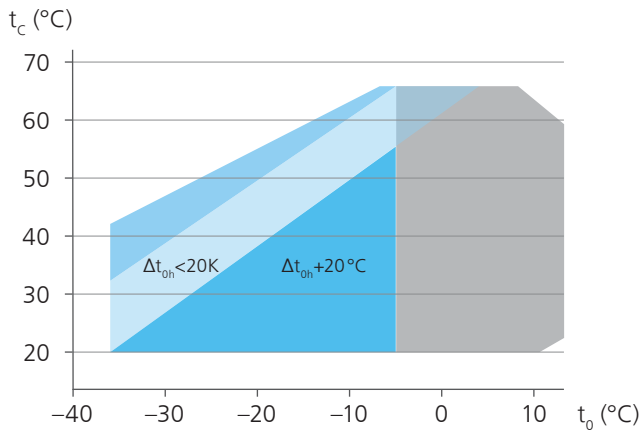
Relating to 20°C suction gas temperature without liquid subcooling

 Supplementary cooling or reduced suction gas temperature

 Motor version -S- (more powerful motor)

OPERATING LIMITS

R22 Operating limits



t_o Evaporating temperature (°C)

t_c Condensing temperature (°C)

Δt_{oh} Suction gas superheat (K)

t_{oh} Suction gas temperature (°C)

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

¹⁾ LP = low pressure, HP = high pressure

- Unlimited application range
- Motor version -S- (more powerful motor)
- Supplementary cooling or reduced suction gas temperature
- Supplementary cooling and reduced suction gas temperature

NOTES

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.gea.com.

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 GEA VAP software (vap.gea.com).

PERFORMANCE DATA

R22

50 Hz

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]						Power consumption P_e [kW]					
			Evaporating temperature °C											
			12,5	10	7,5	5	0	-5	-10	-15	-20	-25	-30	-35
HG12P/60-4 S	30	Q P	7120 0,889	6530 0,911	5980 0,927	5460 0,936	4520 0,939	3710 0,921	3000 0,886	2390 0,837	1870 0,776	1430 0,707	1040 0,632	708 0,553
	40	Q P	6290 1,19	5760 1,19	5270 1,18	4800 1,17	3960 1,13	3230 1,08	2600 1,01	2050 0,936	1570 0,849	1160 0,758	798 0,664	478 0,571
	50	Q P	5500 1,46	5030 1,44	4590 1,41	4170 1,38	3430 1,30	2780 1,21	2210 1,12	1720 1,01	1290 0,906	909 0,795		
HG12P/75-4 HG12P/75-4 S	30	Q P	8890 1,11	8150 1,13	7460 1,15	6820 1,17	5650 1,17	4630 1,15	3750 1,10	2990 1,04	2340 0,970	1780 0,883	1300 0,789	885 0,691
	40	Q P	7860 1,49	7200 1,49	6580 1,48	6000 1,46	4950 1,42	4040 1,35	3240 1,26	2560 1,16	1970 1,06	1450 0,947	997 0,830	597 0,714
	50	Q P	6870 1,83	6280 1,80	5730 1,76	5210 1,72	4280 1,63	3470 1,52	2760 1,40	2150 1,26	1610 1,13	1140 0,993		
HG12P/90-4 HG12P/90-4 S	30	Q P	10600 1,32	9720 1,35	8900 1,38	8130 1,39	6740 1,39	5520 1,37	4470 1,32	3570 1,24	2790 1,15	2120 1,05	1550 0,941	1060 0,825
	40	Q P	9380 1,78	8590 1,77	7850 1,76	7160 1,75	5900 1,69	4810 1,61	3870 1,51	3050 1,39	2340 1,26	1730 1,12	1190 0,990	712 0,852
	50	Q P	8190 2,18	7490 2,15	6830 2,10	6220 2,06	5100 1,94	4140 1,81	3290 1,66	2560 1,51	1920 1,35	1360 1,18		
HG12P/110-4 HG12P/110-4 S	30	Q P	12500 1,55	11500 1,59	10500 1,62	9560 1,64	7920 1,64	6490 1,61	5260 1,55	4190 1,46	3280 1,36	2500 1,23	1820 1,10	1240 0,970
	40	Q P	11100 2,09	10100 2,09	9230 2,08	8410 2,05	6940 1,99	5660 1,89	4550 1,77	3590 1,63	2750 1,48	2030 1,32	1400 1,16	836 1,00
	50	Q P	9630 2,57	8800 2,52	8030 2,48	7310 2,42	6000 2,29	4860 2,13	3870 1,96	3010 1,77	2260 1,58	1600 1,39		
HG22e/125-4 HG22e/125-4 S	30	Q P	15700 1,94	14400 1,97	13200 1,99	12000 2,00	9930 1,98	8150 1,91	6630 1,82	5340 1,69	4250 1,55	3340 1,40	2580 1,25	1960 1,09
	40	Q P	13800 2,54	12700 2,53	11600 2,50	10600 2,47	8740 2,37	7170 2,24	5840 2,08	4700 1,90	3730 1,72	2900 1,52	2200 1,33	1600 1,15
	50	Q P	12000 3,11	11000 3,06	10000 2,99	9120 2,91	7540 2,73	6170 2,53	5010 2,31	4010 2,07	3150 1,83	2400 1,59		
HG22e/160-4 HG22e/160-4 S	30	Q P	19400 2,40	17800 2,44	16300 2,46	14900 2,47	12300 2,44	10100 2,36	8190 2,24	6590 2,09	5240 1,92	4120 1,73	3190 1,54	2420 1,35
	40	Q P	17100 3,13	15600 3,12	14300 3,09	13100 3,05	10800 2,93	8860 2,77	7200 2,57	5790 2,35	4590 2,11	3580 1,88	2720 1,64	1980 1,42
	50	Q P	14800 3,84	13500 3,77	12400 3,69	11300 3,60	9300 3,38	7620 3,13	6180 2,85	4940 2,55	3880 2,26	2960 1,96		
HG22e/190-4 HG22e/190-4 S	30	Q P	23400 2,90	21400 2,94	19600 2,97	17900 2,98	14800 2,94	12200 2,84	9850 2,70	7920 2,52	6300 2,31	4950 2,09	3840 1,86	2910 1,63
	40	Q P	20600 3,78	18900 3,76	17200 3,72	15700 3,67	13000 3,52	10700 3,32	8680 3,09	6980 2,83	5540 2,55	4320 2,27	3280 1,99	2380 1,72
	50	Q P	17800 4,63	16300 4,54	14900 4,44	13600 4,33	11200 4,06	9200 3,76	7450 3,43	5960 3,08	4670 2,72	3560 2,37		
HG34e/215-4 HG34e/215-4 S	30	Q P	26500 3,30	24300 3,35	22200 3,38	20300 3,39	16800 3,35	13900 3,25	11300 3,08	9010 2,88	7160 2,64	5620 2,38	4360 2,12	3310 1,86
	40	Q P	23300 4,31	21400 4,29	19600 4,25	17900 4,19	14800 4,02	12200 3,80	9870 3,53	7930 3,23	6290 2,91	4910 2,58	3730 2,26	2710 1,96
	50	Q P	20200 5,29	18500 5,19	17000 5,07	15500 4,94	12800 4,64	10500 4,29	8480 3,91	6780 3,51	5330 3,11	4060 2,71		
HG34e/255-4 HG34e/255-4 S	30	Q P	31200 3,87	28600 3,94	26200 3,98	23900 3,99	19800 3,94	16300 3,82	13200 3,62	10600 3,37	8440 3,10	6630 2,80	5130 2,49	3890 2,19
	40	Q P	27400 5,06	25100 5,04	23000 4,99	21000 4,92	17400 4,72	14300 4,46	11600 4,14	9330 3,79	7410 3,42	5780 3,03	4390 2,66	3200 2,29
	50	Q P	23700 6,21	21800 6,09	19900 5,96	18200 5,80	15000 5,45	12300 5,04	9970 4,59	7970 4,12	6260 3,64	4770 3,17		
HG34e/315-4 HG34e/315-4 S	30	Q P	38500 4,79	35300 4,87	32300 4,92	29500 4,93	24500 4,87	20100 4,71	16400 4,49	13200 4,19	10500 3,83	8200 3,45	6340 3,07	4800 2,70
	40	Q P	33900 6,26	31100 6,23	28500 6,17	26000 6,09	21600 5,84	17700 5,51	14400 5,13	11600 4,69	9160 4,22	7140 3,74	5420 3,27	3940 2,84
	50	Q P	29400 7,67	26900 7,53	24600 7,37	22500 7,18	18600 6,74	15200 6,23	12400 5,69	9850 5,10	7730 4,50	5890 3,91		

Relating to 20 °C suction gas temperature without liquid subcooling

- Supplementary cooling or reduced suction gas temperature
- Supplementary cooling and reduced suction gas temperature
- Motor version -S- (more powerful motor)

R22

50 Hz

Type	Cond. temp. °C		Cooling capacity Q̇ ₀ [W]					Power consumption P _e [kW]						
			Evaporating temperature °C											
			12,5	10	7,5	5	0	-5	-10	-15	-20	-25	-30	-35
HG34e/380-4 HG34e/380-4 S	30	Q P	46700 5,82	42800 5,92	39100 5,97	35700 5,99	29600 5,91	24300 5,72	19800 5,43	16000 5,06	12700 4,64	9950 4,19	7690 3,73	5830 3,29
	40	Q P	41000 7,60	37600 7,56	34400 7,49	31400 7,39	26100 7,08	21400 6,68	17400 6,21	14000 5,68	11200 5,12	8650 4,54	6560 3,98	4780 3,45
	50	Q P	35500 9,31	32500 9,14	29800 8,93	27200 8,70	22500 8,16	18500 7,56	15000 6,89	12000 6,18	9360 5,46	7120 4,75		
HG44e/475-4 HG44e/475-4 S	30	Q P	58200 7,16	53600 7,27	49100 7,34	45000 7,36	37500 7,29	30800 7,02	25100 6,68	20300 6,25	16100 5,73	12500 5,16	9390 4,55	6730 3,93
	40	Q P	52700 9,17	48300 9,15	44300 9,08	40500 8,97	33600 8,66	27400 8,19	22200 7,63	17800 6,99	14000 6,29	10700 5,54	7780 4,78	5280 4,02
	50	Q P	47000 11,0	43100 10,8	39300 10,6	35900 10,4	29600 9,90	24000 9,24	19300 8,46	15300 7,62	11800 6,73	8800 5,82		
HG44e/565-4 HG44e/565-4 S	30	Q P	69400 8,50	63900 8,64	58600 8,71	53700 8,74	44800 8,65	36700 8,37	30000 7,96	24300 7,43	19300 6,81	15100 6,12	11400 5,39	8180 4,64
	40	Q P	62900 10,8	57700 10,8	52900 10,7	48400 10,6	40200 10,2	32600 9,79	26600 9,11	21300 8,33	16800 7,48	12900 6,58	9460 5,66	6450 4,74
	50	Q P	56300 13,1	51500 12,9	47100 12,6	43000 12,4	35500 11,7	28600 11,0	23200 10,1	18400 9,10	14300 8,02	10800 6,91		
HG44e/665-4 HG44e/665-4 S	30	Q P	81000 9,95	74500 10,1	68300 10,1	62600 10,2	52100 10,1	43300 9,73	35300 9,26	28500 8,66	22600 7,94	17500 7,15	13200 6,30	9410 5,44
	40	Q P	73100 12,7	67100 12,7	61500 12,6	56200 12,5	46600 12,0	38400 11,3	31200 10,5	24900 9,69	19600 8,71	14900 7,68	10900 6,63	7320 5,57
	50	Q P	65200 15,4	59700 15,2	54600 14,9	49700 14,5	41000 13,8	33600 12,8	27000 11,7	21400 10,5	16500 9,33	12300 8,07		
HG44e/770-4 HG44e/770-4 S	30	Q P	93900 11,5	86300 11,7	79200 11,8	72600 11,8	60500 11,7	50000 11,3	40900 10,8	33000 10,1	26200 9,28	20400 8,35	15400 7,36	11100 6,36
	40	Q P	84700 14,8	77800 14,8	71300 14,6	65200 14,5	54100 13,9	44500 13,2	36200 12,3	29000 11,3	22800 10,1	17500 8,97	12800 7,74	8710 6,51
	50	Q P	75600 17,9	69300 17,7	63300 17,3	57800 16,9	47700 16,0	39000 14,9	31500 13,6	25000 12,3	19400 10,9	14500 9,43		
HG56e/850-4 HG56e/850-4 S	30	Q P	104000 12,7	95400 12,9	87600 13,0	80200 13,0	66900 12,9	55000 12,5	45000 11,9	36400 11,1	29000 10,2	22600 9,19	17100 8,10	12300 6,97
	40	Q P	93700 16,3	86000 16,2	78800 16,1	72100 15,9	59900 15,3	49000 14,6	39900 13,6	32000 12,4	25200 11,2	19400 9,88	14200 8,51	9680 7,13
	50	Q P	83700 19,6	76600 19,4	70100 19,0	64000 18,6	52900 17,6	43000 16,5	34800 15,1	27600 13,6	21500 12,0	16100 10,3		
HG56e/995-4 HG56e/995-4 S	30	Q P	122000 14,9	112000 15,1	103000 15,2	93700 15,3	78000 15,1	64700 14,5	52800 13,8	42600 12,9	33800 11,8	26200 10,6	19700 9,42	14100 8,14
	40	Q P	110000 19,1	101000 19,1	91900 18,9	84000 18,7	69700 18,0	57400 16,9	46600 15,7	37300 14,4	29200 13,0	22300 11,4	16300 9,90	11000 8,33
	50	Q P	97500 23,1	89300 22,8	81600 22,4	74400 21,9	61300 20,7	50200 19,0	40400 17,4	32000 15,7	24700 13,9	18400 12,0		
HG56e/1155-4 HG56e/1155-4 S	30	Q P	141000 18,0	130000 18,2	119000 18,4	109000 18,5	90700 18,3	74700 17,7	61000 16,9	49300 15,8	39200 14,4	30500 13,0	23100 11,4	16600 9,89
	40	Q P	128000 23,1	117000 23,0	107000 22,9	97800 22,6	81200 21,8	66500 20,7	54000 19,3	43300 17,7	34100 15,9	26100 14,0	19200 12,0	13100 10,1
	50	Q P	114000 27,9	105000 27,5	95100 27,0	86800 26,4	71700 24,9	58300 23,4	47000 21,4	37300 19,3	28900 17,0	21700 14,7		
HG88e/2735-4 HG88e/2735-4 S	30	Q P	342000 43,7	314000 44,3	288000 44,7	263000 44,7	219000 44,1	181000 42,5	148000 40,3	119000 37,4	94300 34,1	73400 30,5	55300 26,7	39500 23,0
	40	Q P	308000 56,2	282000 55,9	258000 55,3	236000 54,4	196000 52,1	161000 49,1	130000 45,4	104000 41,3	81300 37,0	61700 32,5	44400 28,1	28800 23,8
	50	Q P	274000 67,0	251000 65,8	229000 64,3	209000 62,6	172000 58,8	140000 54,3	113000 49,4	88400 44,2	67600 39,0	49100 33,7		
HG88e/3235-4 HG88e/3235-4 S	30	Q P	396000 51,7	364000 52,4	334000 52,8	305000 52,9	254000 52,1	210000 50,3	171000 47,6	138000 44,1	110000 40,2	85100 36,0	64700 31,7	47300 27,6
	40	Q P	357000 66,6	328000 66,1	300000 65,4	274000 64,4	227000 61,6	186000 58,0	151000 53,6	121000 48,9	94500 43,8	72400 38,8	53400 33,8	37000 29,3
	50	Q P	318000 79,4	291000 77,9	266000 76,1	242000 74,1	199000 69,5	162000 64,2	131000 58,5	103000 52,6	79500 46,6	59300 40,9		

Relating to 20°C suction gas temperature without liquid subcooling

■ Supplementary cooling or reduced suction gas temperature

■ Supplementary cooling and reduced suction gas temperature

■ Motor version -S- (more powerful motor)

TECHNICAL DATA

HG

Type	Number of cylinders	Displacement 50 / 60 Hz (1,450/1,740 rpm) m ³ /h	Voltage ¹⁾	Electrical data			Weight kg	Connections ⁵⁾		Oil charge Ltr.	Frequency range Hz
				Max. working current ²⁾	Max. power consumption ²⁾	Starting current (rotor locked)		Discharge line DV	Suction line SV		
				A (Δ / Y)	kW	A (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)	8.8 / 5.1	2.9	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 / PW 1+2*					
HG44e/475-4	4	41.30 / 49.60	4)	19	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	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	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	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	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	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	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	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)	38	22.6	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)	43	25.3	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)	44	26.0	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)	50	29.9	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)	51	30.4	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)	61	34.5	253 / 330	220.6	35 1 3/8	54 2 1/8	2.7	25-70
HG88e/2735-4	8	237.90 / 285.50	4)	118	63.7	475 / 551	447.6	54 2 1/8	76 3 1/8	9.0	25-60
HG88e/2735-4 S	8	237.90 / 285.50	4)	141	77.5	520 / 605	467.7	54 2 1/8	76 3 1/8	9.0	25-60
HG88e/3235-4	8	281.30 / 337.60	4)	135	74.6	475 / 551	442.1	54 2 1/8	76 3 1/8	9.0	25-60
HG88e/3235-4 S	8	281.30 / 337.60	4)	160	91.0	520 / 605	462.1	54 2 1/8	76 3 1/8	9.0	25-60

* PW = Part Winding, motors for part winding start 1 = 1st part winding 2 = 2nd 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, HG88e = 50 % / 50 %
 - Designs for Y/ Δ on request
- 5) For soldering connections

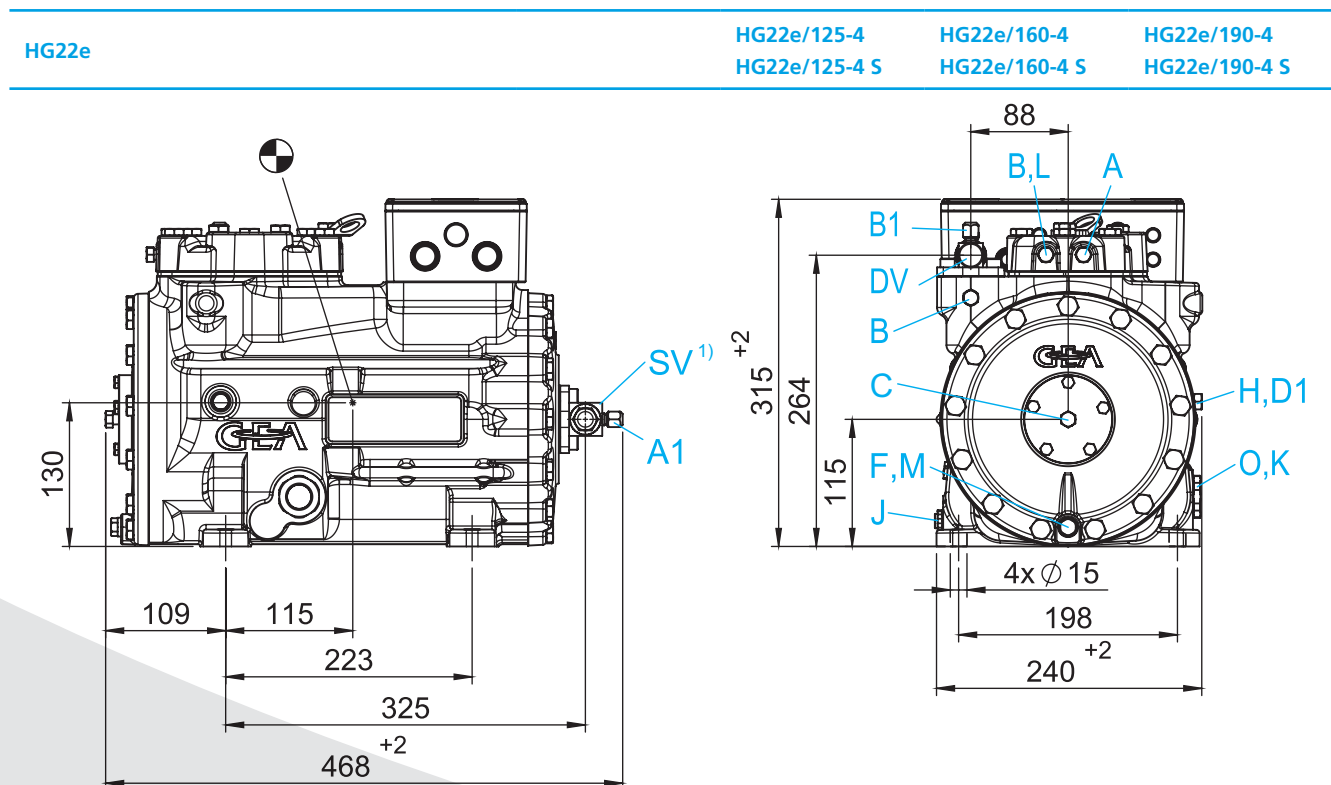
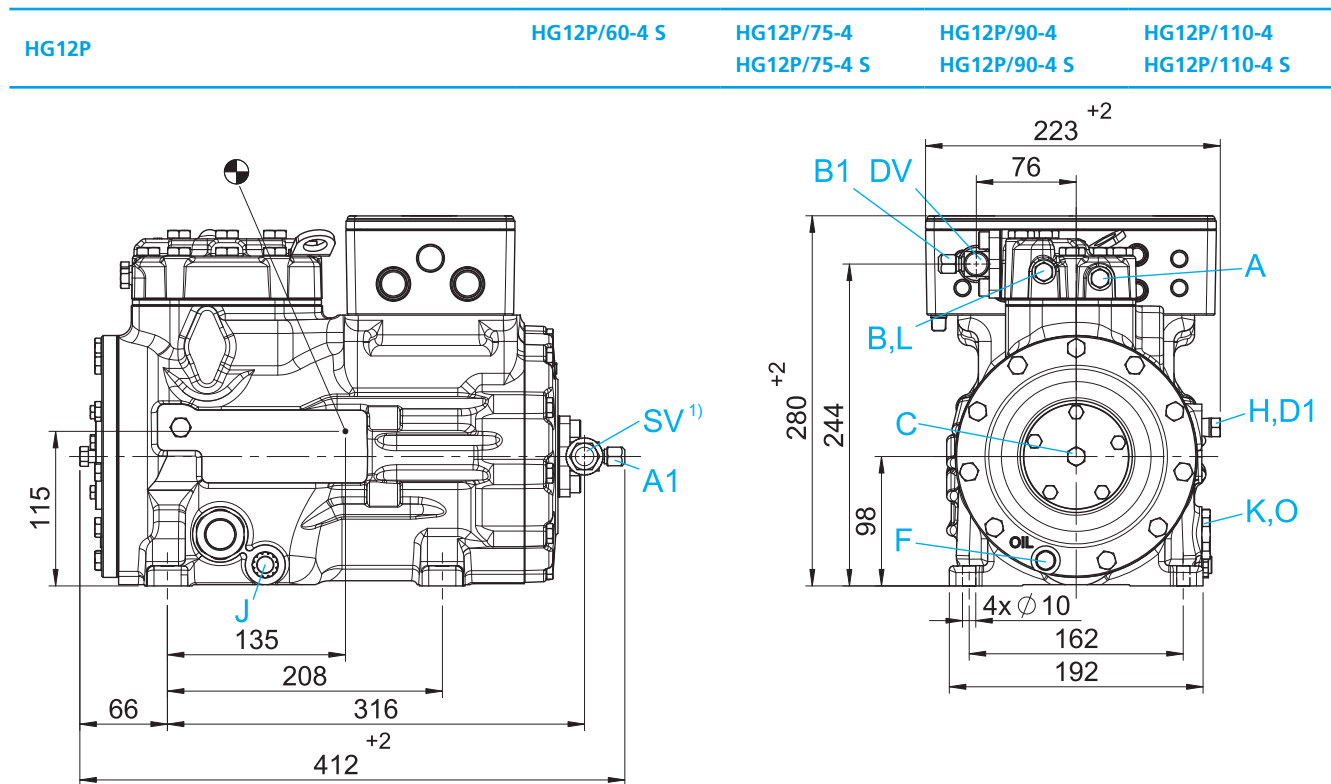
Oil sump heater 110-240 V – 1 – 50/60 Hz (option)

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

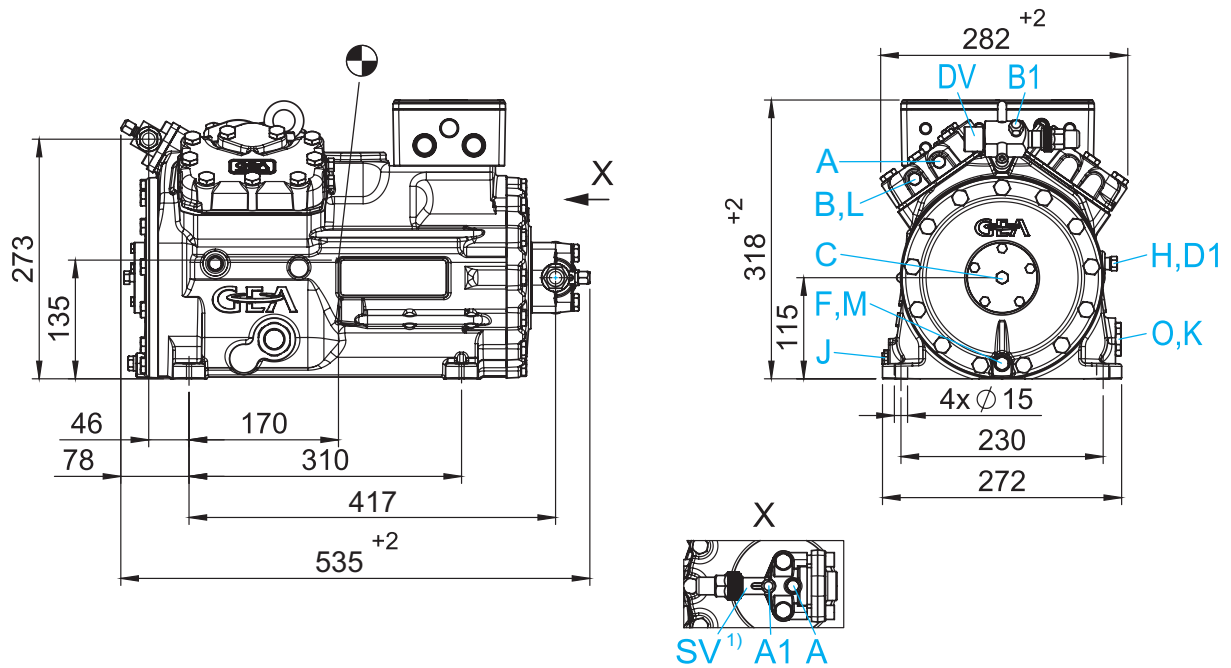
DIMENSIONS AND CONNECTIONS



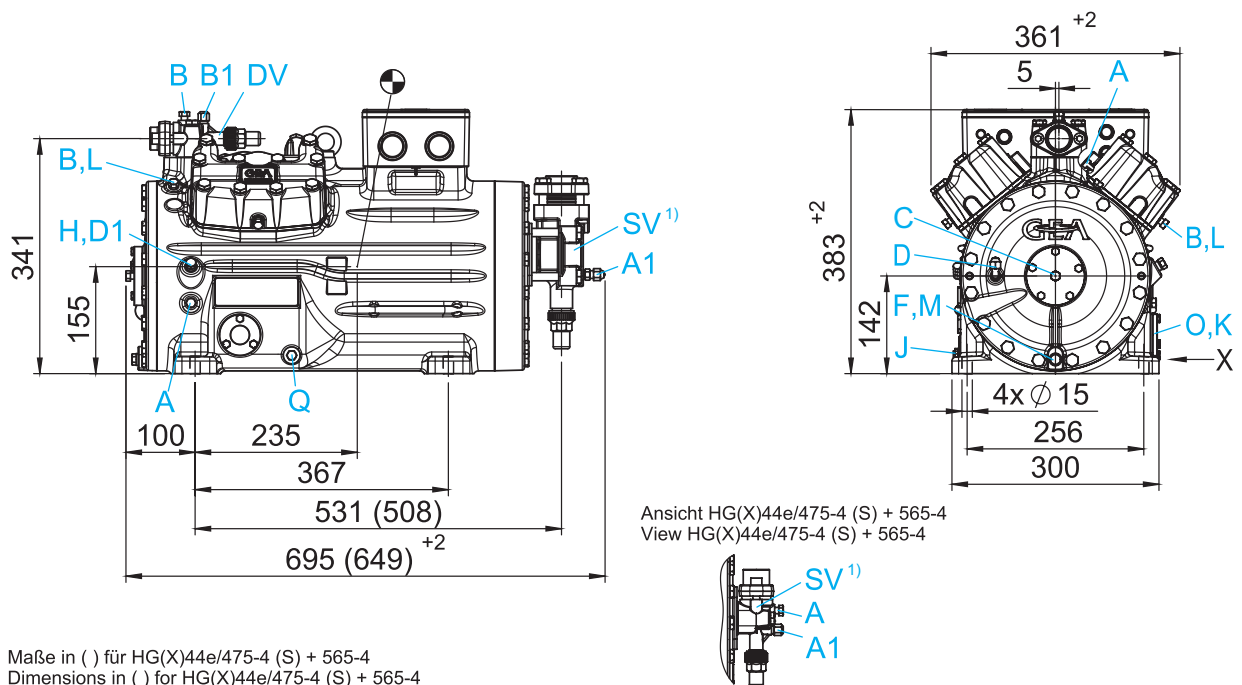
Dimensions in mm
 ● Center of gravity
¹⁾ SV 90° rotatable

Connections see page 52
 Dimensions for anti-vibration pad see page 49

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	HG44e/770-4 HG44e/770-4 S
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Dimensions in mm
 ● Center of gravity
¹⁾ SV 90° rotatable

Connections see page 52
 Dimensions for anti-vibration pad see page 49

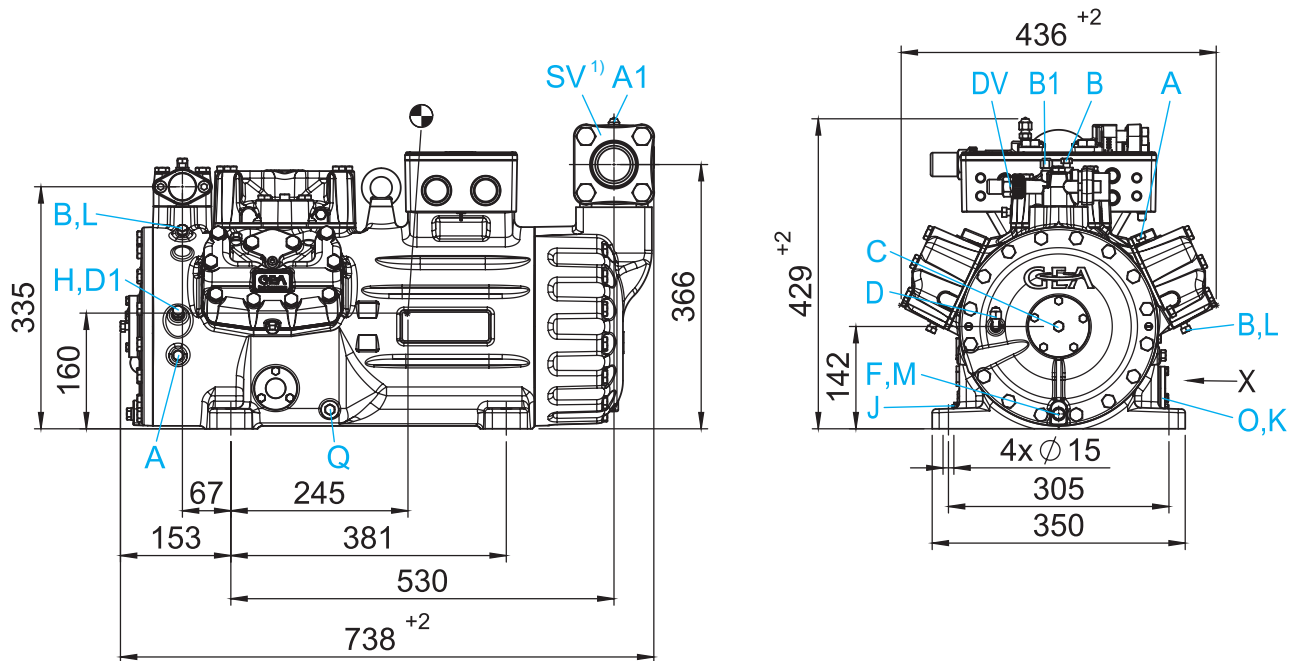
DIMENSIONS AND CONNECTIONS

HG56e

HG56e/850-4
HG56e/850-4 S

HG56e/995-4
HG56e/995-4 S

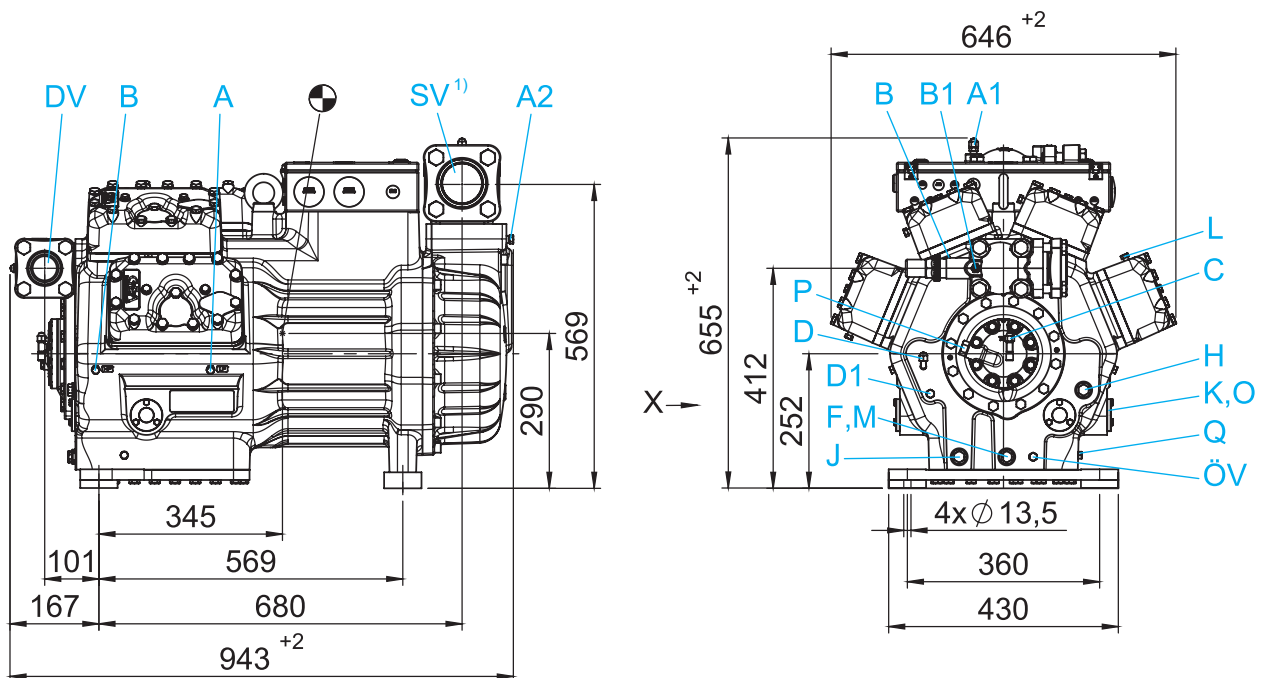
HG56e/1155-4
HG56e/1155-4 S



HG88e

HG88e/2735-4
HG88e/2735-4 S

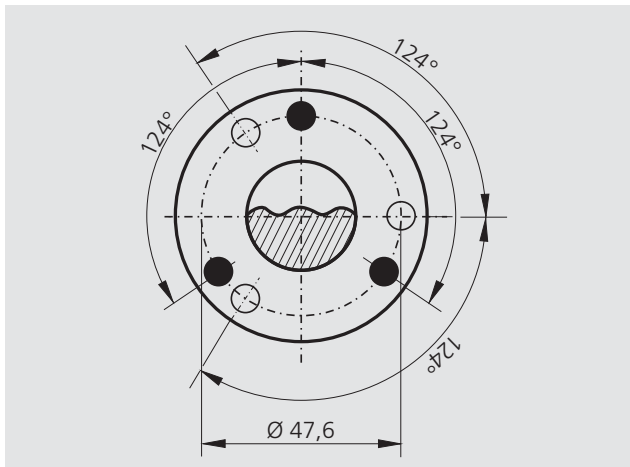
HG88e/3235-4
HG88e/3235-4 S



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

Connections see page 52
 Dimensions for anti-vibration pad see page 49

View X



Dimensions in mm

Possibility to connect to oil level regulator

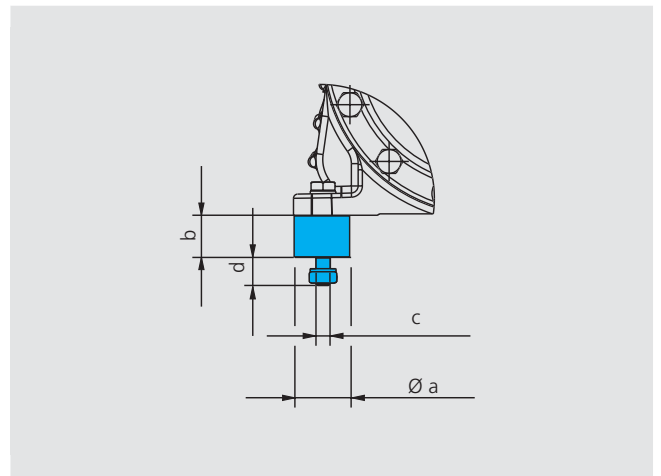
HG44e, HG56e, HG88e

- 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	Ø 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
HG88e	70	45	M12	37

Dimensions in mm



DIMENSIONS AND CONNECTIONS

Dimensions with accessories

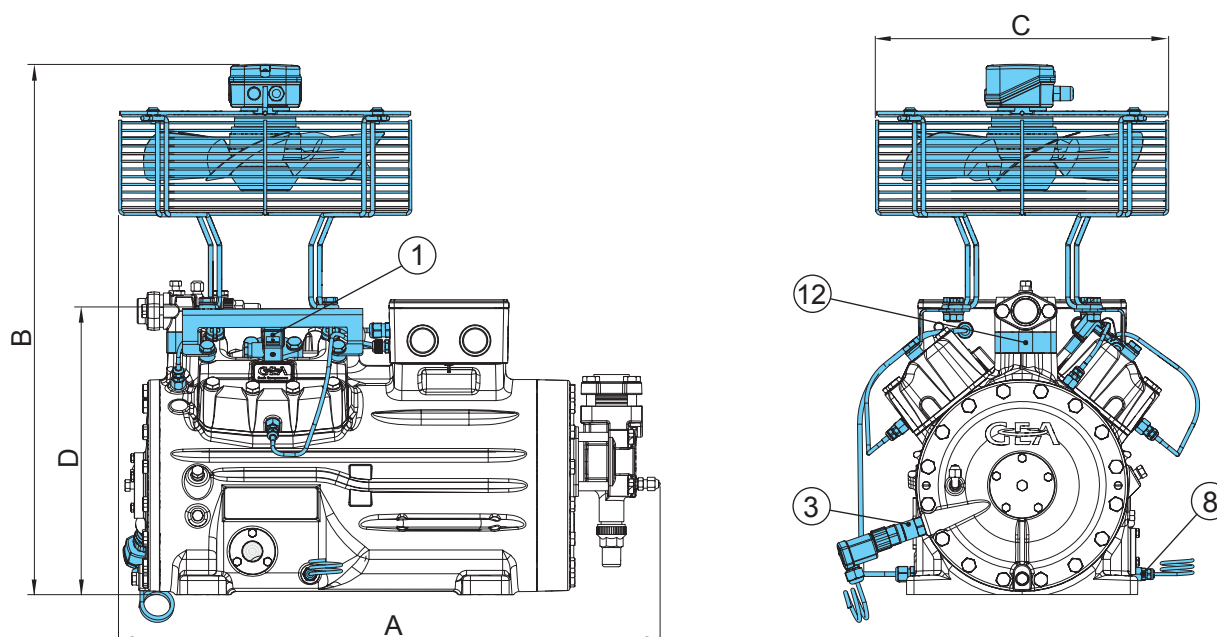
HG12P

HG22e

HG34e

HG44e

HG56e

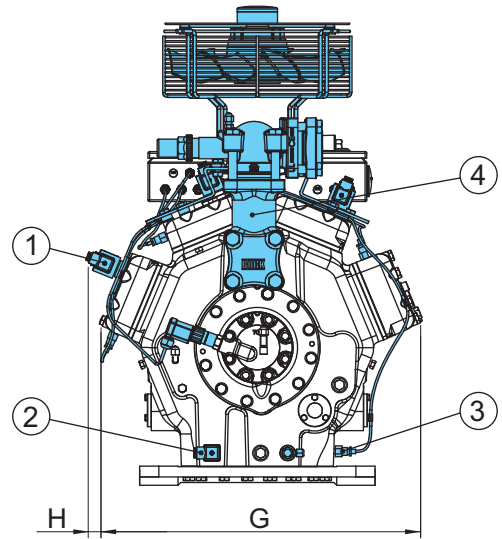
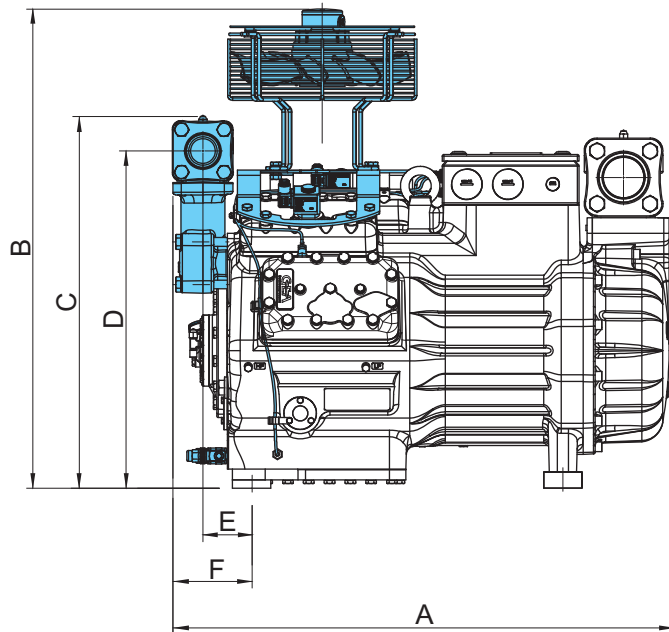


Type	A	B	C	D
HG12P	ca. 460	ca. 500	ca. 315	–
HG22e	ca. 524	ca. 610	ca. 380	–
HG34e	ca. 576	ca. 638	ca. 380	ca. 323
HG44e	ca. 700	ca. 688	ca. 380	ca. 383
HG56e	–	ca. 692	ca. 346	ca. 305

Dimensions in mm

Dimensions with accessories

HG88e



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

DIMENSIONS AND CONNECTIONS

Connections		HG12P	HG22e	HG34e	HG44e	HG56e	HG88e
SV	Suction line	Please refer to technical data page 44					
DV	Discharge line						
A	Connection suction side, not lockable	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
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
B1	Connection discharge side, lockable	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	7/16" UNF
D	Connection oil pressure safety switch LP				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
F	Oil drain plug	M8	M12 x 1,5	M12 x 1,5	M12 x 1,5	M12 x 1,5	M22 x 1,5
H	Oil charge plug	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF	M22 x 1,5
J	Connection oil sump heater	3/8" NPTF	3/8" NPTF	3/8" NPTF	3/8" NPTF	3/8" NPTF	M22 x 1,5
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
L	Connection thermal protection thermostat	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF
M	Oil strainer		M12 x 1,5	M12 x 1,5	M12 x 1,5	M12 x 1,5	M22 x 1,5
O	Connection oil level regulator	1 1/8" – 18 UNEF	1 1/8" – 18 UNEF	1 1/8" – 18 UNEF	1)	1)	1)
ÖV	Connection oil service valve						1/4" NPTF
P	Connection oil pressure differential sensor						M20 x 1,5
Q	Connection oil temperature sensor				1/8" NPTF	1/8" NPTF	1/8" NPTF

1) Dimensions see view X page 49

SCOPE OF SUPPLY & ACCESSORIES

Scope of supply & accessories		HG12P	HG22e	HG34e	HG44e	HG56e	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/Y – 3 – 50 Hz 440–480 V Y/Y – 3 – 60 Hz					●		
Semi-hermetic six-cylinder reciprocating compressor with drive motor for part winding start (50/50) 380–420 V Y/Y – 3 – 50 Hz 440–480 V Y/Y – 3 – 60 Hz						●	
Semi-hermetic eight-cylinder reciprocating compressor with drive motor for part winding start (50/50) 380–420 V Y/Y – 3 – 50 Hz 440–480 V Y/Y – 3 – 60 Hz							●
Special voltage and/or frequency		○ ³⁾	○ ³⁾	○ ³⁾	○ ³⁾	○ ³⁾	○ ³⁾
Winding protection with PTC resistor sensors with electronic triggering unit INT69 G		●	●	●	●	●	●
1 Thermal protection PTC		○ ²⁾	○ ²⁾	○ ²⁾	○ ²⁾	○ ²⁾	○ ²⁾
Oil pump		●	●	●	●	●	●
Oil charge: HG: FUCHS Reniso SP46, HGX: FUCHS Reniso Triton SE55		●	●	●	●	●	●
Inert gas charge		●	●	●	●	●	●
4 anti-vibration pads		● 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⁾
3 Oil differential pressure sensor DELTA-P II 220-240 V - 1 - 50/60 Hz		–	–	–	○ 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⁾
6 Capacity regulator	1 capacity regulator = 50 % residual capacity	–	–	○ ²⁾	○ ²⁾	–	–
	1–2 capacity regulators = 66/33 % residual capacity	–	–	–	–	○ ²⁾	–
	1–3 capacity regulators = 75/50/25 % residual capacity	–	–	–	–	–	○ ²⁾

● Scope of supply (Standard)
○ Accessories
– Not available

¹⁾ Enclosed
²⁾ Mounted
³⁾ On request

SCOPE OF SUPPLY & ACCESSORIES

Scope of supply & accessories		HG12P	HG22e	HG34e	HG44e	HG56e	HG88e
7	1 cylinder cover	—	—	○ ²⁾	○ ²⁾	○ ²⁾	○ ²⁾
	2 cylinder covers	—	—	—	—	○ ²⁾	○ ²⁾
	3 cylinder covers	—	—	—	—	—	○ ²⁾
8	Oil temperature sensor	—	—	—	○ ²⁾	○ ²⁾	○ ²⁾
9	Start unloader by means of ESS (Electronic Soft Start) 400 V – 3 – 50/60 Hz, IP20, (connection clamps IP00) for installation in switch cabinet	—	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	—
10	Connection piece suction and discharge valve in welded construction	—	—	—	○ 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⁾
12	Intermediate flange for discharge line valve on right or left, seen from oil pump	—	—	—	○ ¹⁾	—	—
13	INT69 G Diagnose 115 V / 230 V Ac, 50/60 Hz, IP00 (INT69 G not applicable)	—	○ ²⁾	○ ²⁾	○ ²⁾	○ ²⁾	—
14	INT69 GTML Diagnose 115 V / 230 V Ac, 50/60 Hz, IP00, incl. oil differential pressure sensor INT250, thermal protection thermostat (PTC) per cylinder cover (INT69 G not applicable)	—	—	—	—	—	○ ²⁾
15	DP-modbus gateway 115 V / 230 V Ac, 50/60 Hz, IP00 incl. adapter cable	—	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾
16	modbus-LAN gateway 230 V Ac, 50/60 Hz, IP00	—	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾
17	USB converter for INT69 G Diagnose and INT69 GTML Diagnose	—	○ 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⁾

● Scope of supply (Standard)

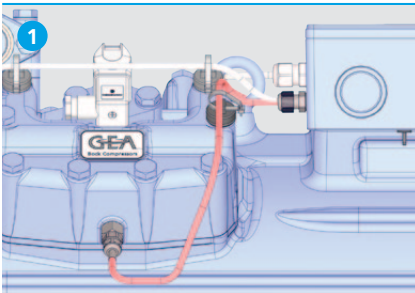
○ Accessories

— Not available

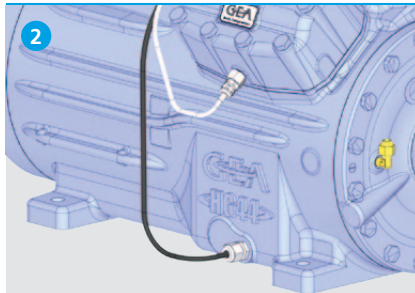
¹⁾ Enclosed²⁾ Mounted³⁾ On request⁴⁾ Only possible with additional adapter

ACCESSORIES

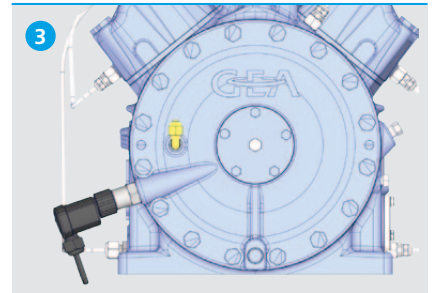
Thermal protection thermostat



Oil sump heater



Oil differential pressure sensor



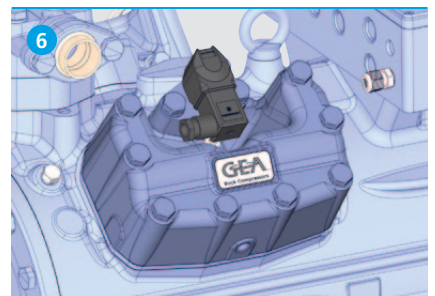
Oil pressure safety switch



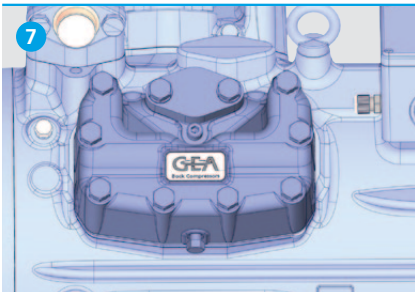
Oil service valve



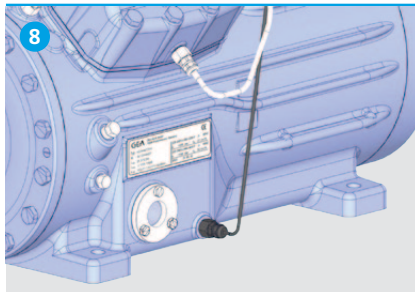
Capacity regulator



Prepared for capacity regulator



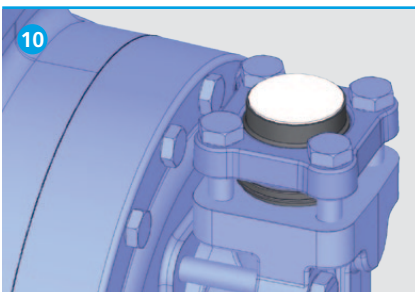
Oil temperature sensor



ESS Electronic Soft Start



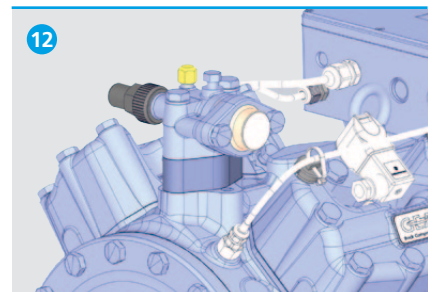
Connection piece in welded construction



Additional fan

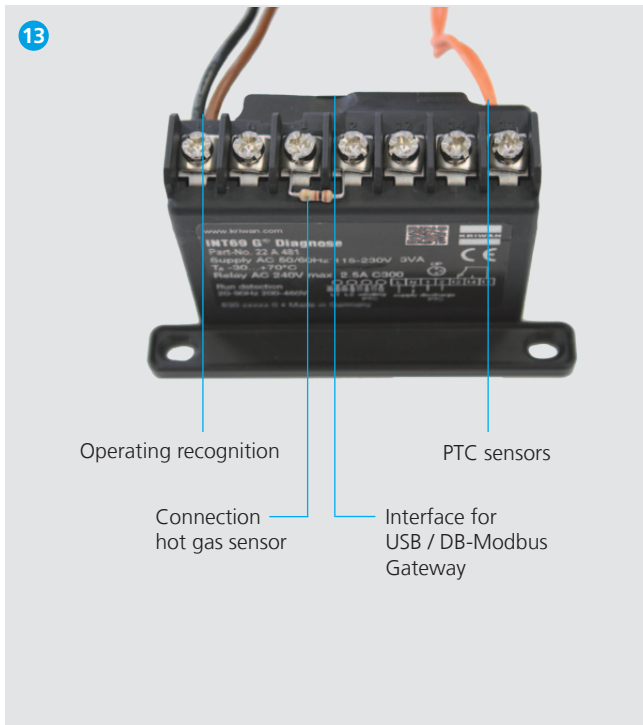


Intermediate flansch for discharge line valve

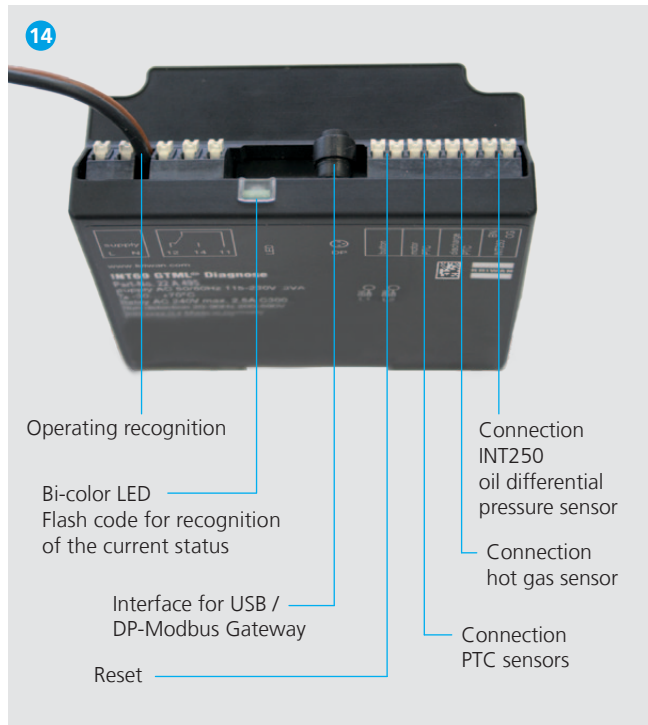


ACCESSORIES

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

INT69 G Diagnose Unit Motor Protection

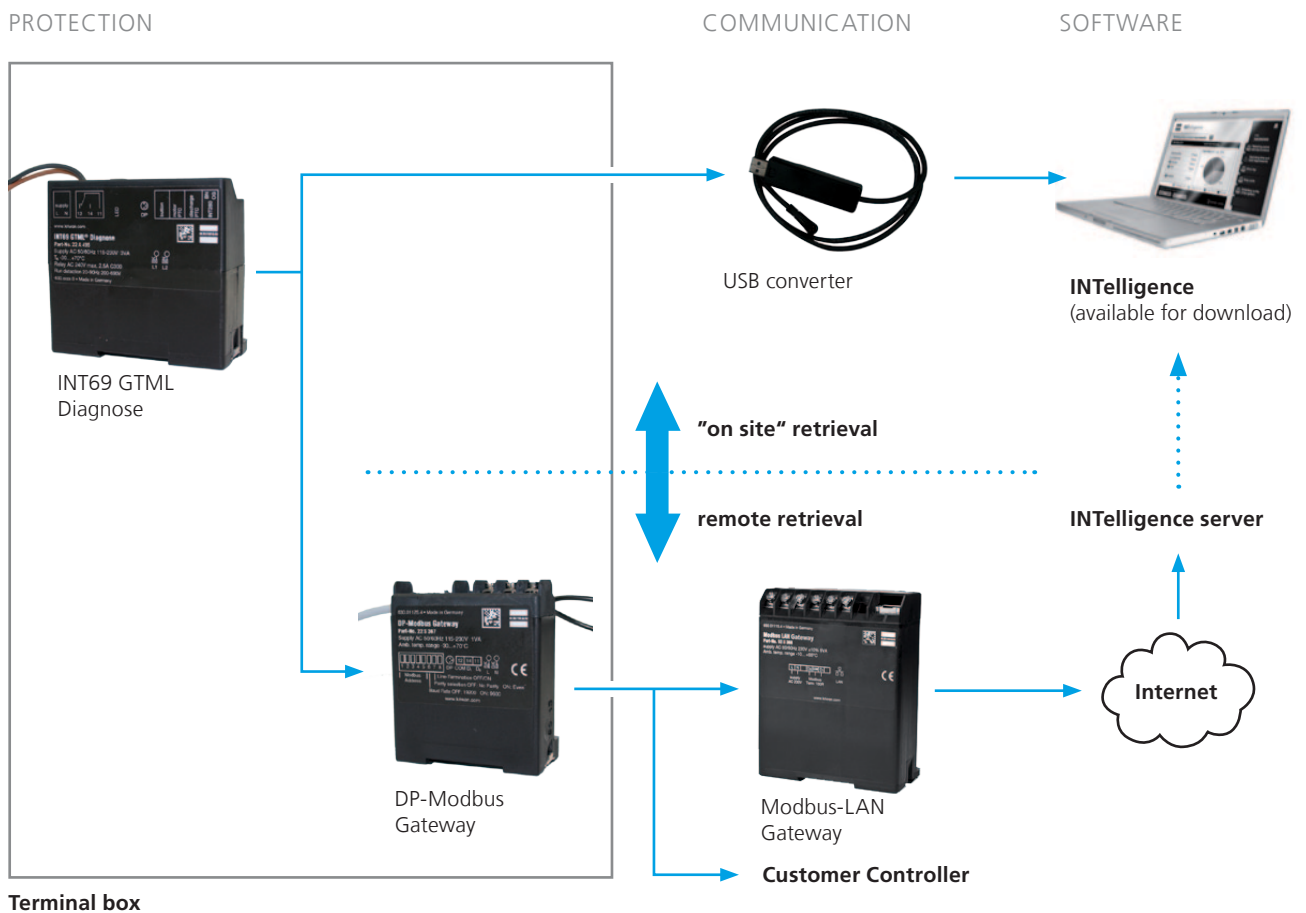
Read facility via INTelligence diagnosis software

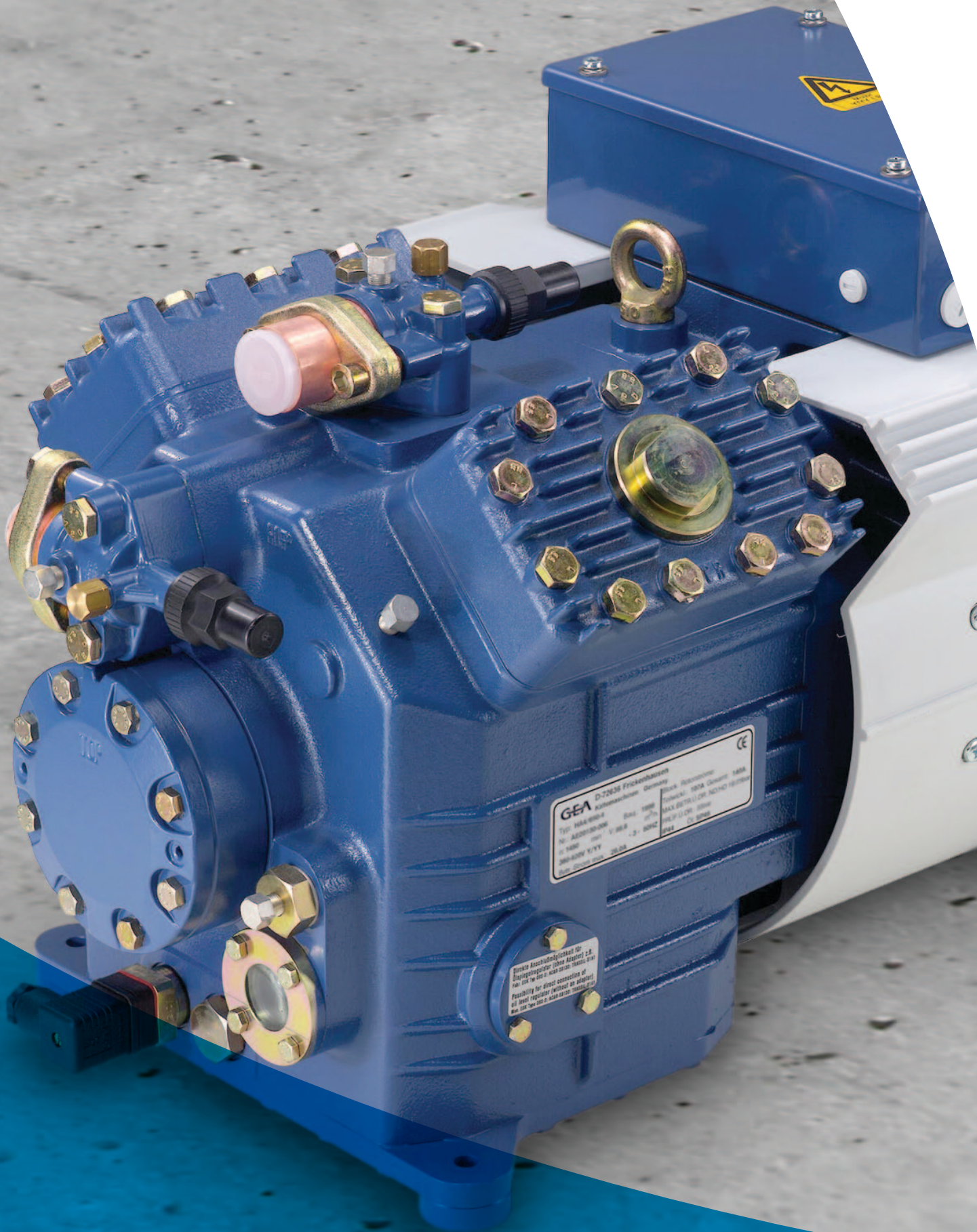
With the INTelligence software, valuable information can be obtained on the status of the compressor and the system. The diagnosis function includes the plausibility checks of the logic sequences, all important operation and error values of the compressor, and it provides clear visualization. Crucial 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.





HA semi-hermetic GEA compressors

GEA Bock HA12P – HA6

HA semi-hermetic GEA compressors

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!

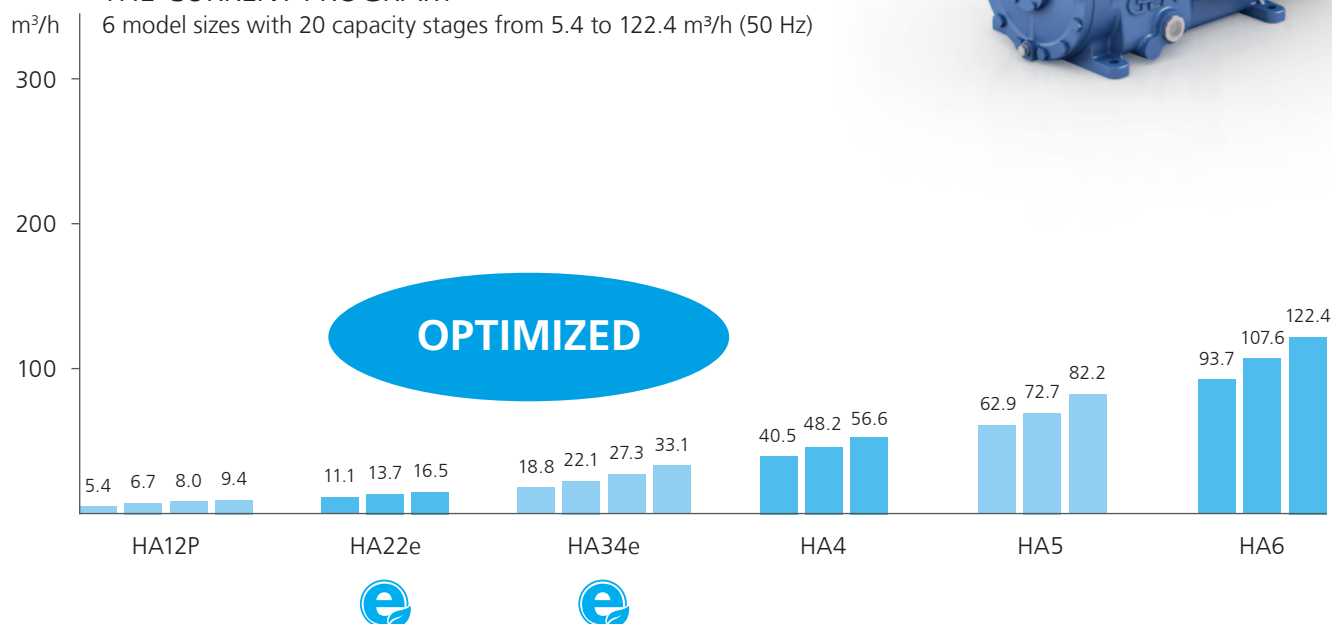
The "HA principle" of air-cooled compressors, specially developed by GEA, is the most efficient semi-hermetic solution for low-temperature applications. It employs a direct-suction compressor combined with an air-cooled drive motor. The suction gas is not heated additionally, but rather fed directly 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.



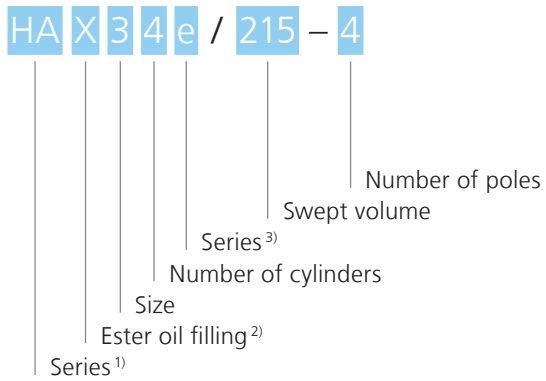
HA34e

THE CURRENT PROGRAM

6 model sizes with 20 capacity stages from 5.4 to 122.4 m³/h (50 Hz)



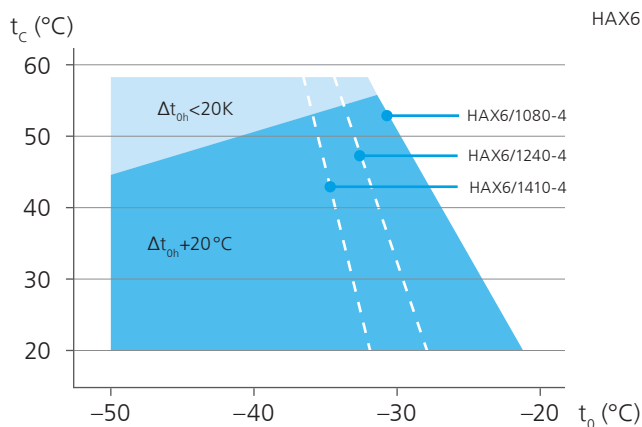
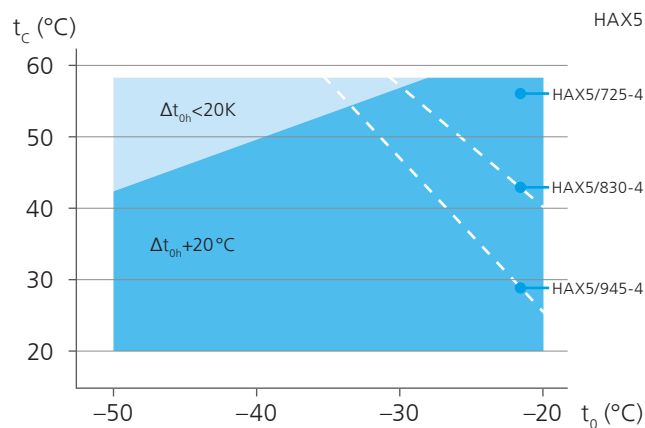
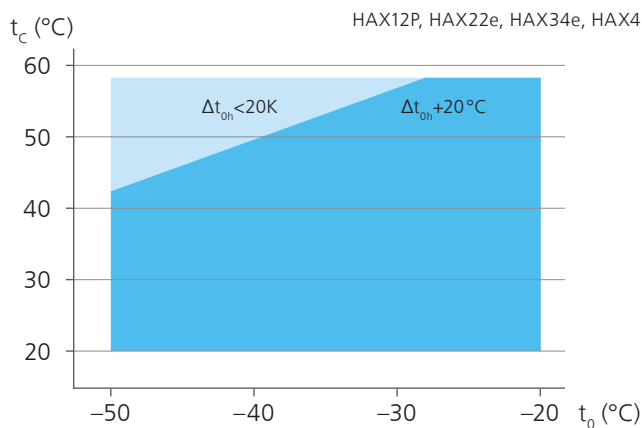
TYPE KEY



- 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

OPERATING LIMITS

R404A/R507 Operating limits



HAX6
 t_o Evaporating temperature (°C)
 t_c Condensing temperature (°C)
 Δt_{oh} Suction gas superheat (K)
 t_{oh} Suction gas temperature (°C)

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

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

¹⁾ LP = low pressure, HP = high pressure

NOTES

R404A/R507 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.gea.com.

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 GEA VAP software (vap.gea.com).

PERFORMANCE DATA

R404A/R507

50 Hz

Type	Cond. temp. °C	Cooling capacity $\dot{Q}_0$ [W]				Power consumption P_e [kW]		
		Evaporating temperature °C						
		-20	-25	-30	-35	-40	-45	
HAX12P/60-4	30	Q	2330	1860	1450	1100	809	574
		P	1,03	0,95	0,86	0,75	0,66	0,56
	40	Q	1960	1540	1190	883	636	435
		P	1,12	1,00	0,88	0,76	0,65	0,54
	50	Q	1590	1230	921	671	466	302
		P	1,17	1,03	0,89	0,75	0,62	0,51
HAX12P/75-4	30	Q	2890	2300	1790	1370	1010	712
		P	1,28	1,17	1,06	0,94	0,81	0,70
	40	Q	2430	1910	1470	1100	789	540
		P	1,38	1,24	1,09	0,95	0,80	0,67
	50	Q	1970	1520	1150	832	578	374
		P	1,46	1,28	1,10	0,93	0,77	0,63
HAX12P/90-4	30	Q	3410	2700	2090	1580	1150	797
		P	1,55	1,43	1,29	1,15	1,00	0,86
	40	Q	2860	2230	1700	1260	890	596
		P	1,67	1,49	1,32	1,15	0,98	0,82
	50	Q	2290	1760	1310	933	634	399
		P	1,75	1,53	1,32	1,12	0,93	0,76
HAX12P/110-4	30	Q	4100	3270	2560	1960	1470	1060
		P	1,77	1,63	1,46	1,28	1,10	0,94
	40	Q	3460	2730	2110	1590	1160	806
		P	1,93	1,73	1,52	1,30	1,09	0,92
	50	Q	2810	2190	1670	1230	866	572
		P	2,04	1,79	1,54	1,30	1,07	0,88
HAX22e/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
	50	Q	3220	2540	1960	1460	1040	690
		P	2,21	1,92	1,64	1,36	1,09	0,83
HAX22e/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
	50	Q	3970	3140	2420	1800	1290	851
		P	2,73	2,37	2,02	1,68	1,35	1,03
HAX22e/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
	50	Q	4800	3800	2930	2180	1550	1030
		P	3,31	2,87	2,45	2,04	1,64	1,24
HAX34e/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
	50	Q	5470	4320	3330	2480	1770	1180
		P	3,77	3,27	2,79	2,32	1,86	1,41
HAX34e/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
	50	Q	6430	5080	3920	2920	2080	1380
		P	4,43	3,84	3,28	2,73	2,19	1,66
HAX34e/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
	50	Q	7930	6270	4830	3600	2570	1710
		P	5,47	4,75	4,05	3,37	2,71	2,06
HAX34e/380-4	30	Q	14200	11400	8910	6850	5130	3730
		P	5,73	5,10	4,51	3,93	3,37	2,82
	40	Q	11900	9440	7370	5610	4130	2920
		P	6,24	5,50	4,78	4,09	3,41	2,74
	50	Q	9600	7590	5850	4360	3100	2060
		P	6,62	5,75	4,90	4,08	3,28	2,49

Relating to 20°C suction gas temperature without liquid subcooling

■ Supplementary cooling or reduced suction gas temperature

PERFORMANCE DATA

R404A/R507

50 Hz

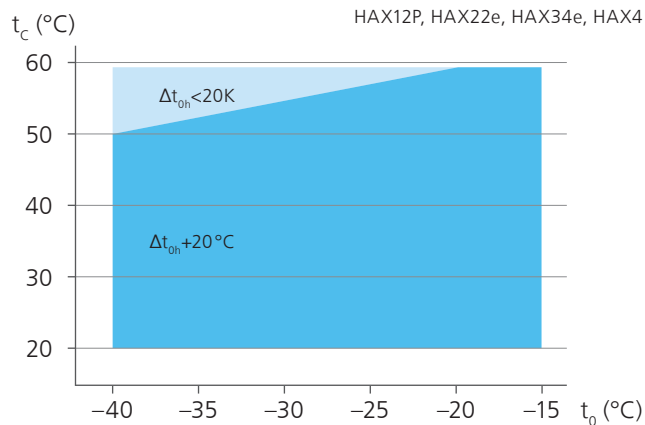
Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]				Power consumption P_e [kW]	
			Evaporating temperature °C					
			-20	-25	-30	-35	-40	-45
HAX4/465-4	30	Q	18700	15100	11900	9100	6800	4890
		P	7,75	6,86	6,00	5,16	4,35	3,56
	40	Q	15700	12600	9760	7430	5450	3810
		P	8,31	7,26	6,25	5,29	4,36	3,46
	50	Q	12900	10200	7830	5880	4230	2850
		P	8,76	7,56	6,41	5,32	4,29	3,29
HAX4/555-4	30	Q	21900	17600	13900	10800	8040	5800
		P	8,84	7,83	6,86	5,92	5,01	4,11
	40	Q	18400	14700	11500	8770	6470	4530
		P	9,45	8,27	7,13	6,04	4,99	3,98
	50	Q	15100	11900	9230	6950	5020	3400
		P	9,95	8,59	7,30	6,07	4,90	3,78
HAX4/650-4	30	Q	25000	20200	16000	12400	9310	6750
		P	9,71	8,62	7,56	6,54	5,54	4,57
	40	Q	21100	16900	13300	10200	7480	5270
		P	10,3	9,09	7,86	6,67	5,52	4,42
	50	Q	17200	13700	10600	8010	5810	3960
		P	10,09	9,45	8,05	6,70	5,42	4,20
HAX5/725-4	30	Q	26900	21500	16800	12800	9410	6650
		P	10,6	9,41	8,19	7,00	5,86	4,75
	40	Q	22700	18000	13900	10500	7570	5190
		P	11,40	9,93	8,51	7,14	5,84	4,59
	50	Q	18500	14600	11200	8270	5880	3900
		P	12,00	10,30	8,71	7,18	5,73	4,36
HAX5/830-4	30	Q	30400	24300	19100	14600	10800	7660
		P	12,00	10,60	9,28	7,95	6,67	5,43
	40	Q	25700	20300	15800	11900	8660	5980
		P	12,80	11,20	9,64	8,11	6,65	5,25
	50	Q			12700	9420	6720	4480
		P			9,87	8,16	6,53	4,99
HAX5/945-4	30	Q		28000	22000	16900	12600	8960
		P		12,20	10,70	9,20	7,73	6,31
	40	Q			18300	13800	10100	7000
		P			11,10	9,38	7,71	6,11
	50	Q				11000	7840	5250
		P				9,43	7,57	5,80
HAX6/1080-4	30	Q		33600	26400	20300	15100	10800
		P		14,70	12,80	11,00	9,28	7,58
	40	Q			21900	16600	12100	8410
		P			13,30	11,20	9,25	7,33
	50	Q			17600	13200	9400	6300
		P			13,60	11,30	9,08	6,96
HAX6/1240-4	30	Q			30500	23400	17400	12500
		P			14,80	12,70	10,70	8,75
	40	Q				19100	14000	9700
		P				13,00	10,60	8,47
	50	Q				15200	10900	7270
		P				13,00	10,40	8,05
HAX6/1410-4	30	Q				26000	19400	13900
		P				14,10	11,80	9,68
	40	Q				21200	15500	10800
		P				14,40	11,80	9,35
	50	Q					12100	8060
		P					11,60	8,89

Relating to 20°C suction gas temperature without liquid subcooling

 Supplementary cooling or reduced suction gas temperature

OPERATING LIMITS

R407F Operating limits



t_0 Evaporating temperature (°C)

t_c Condensing temperature (°C)

Δt_{oh} Suction gas superheat (K)

t_{oh} Suction gas temperature (°C)

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

● Unlimited application range

○ Supplementary cooling or reduced suction gas temperature

¹⁾ LP = low pressure, HP = high pressure

NOTES

R407F 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.gea.com.

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 vapor conditions).

Conversion factor for 60 Hz = 1.2

Performance data for other operating points, see GEA VAP software (vap.gea.com).

PERFORMANCE DATA

R407F		50 Hz						
Type	Cond. temp. °C	Cooling capacity $\dot{Q}_0$ [W]				Power consumption P_e [kW]		
		Evaporating temperature °C						
		-15	-20	-25	-30	-35	-40	
HAX12P/60-4	30	Q P	2960 0,968	2190 0,885	1620 0,793	1200 0,692	867 0,583	563 0,469
	40	Q P	2550 1,07	1840 0,946	1340 0,817	975 0,690	698 0,569	447 0,454
	50	Q P	2170 1,13	1530 0,973	1090 0,822	790 0,686	572 0,567	376 0,466
HAX12P/75-4	30	Q P	3670 1,20	2710 1,09	2010 0,984	1490 0,858	1080 0,724	699 0,583
	40	Q P	3160 1,33	2280 1,17	1660 1,01	1210 0,857	866 0,706	554 0,564
	50	Q P	2690 1,41	1900 1,20	1360 1,02	981 0,851	710 0,704	466 0,579
HAX12P/90-4	30	Q P	4340 1,46	3200 1,33	2360 1,19	1740 1,04	1250 0,889	796 0,721
	40	Q P	3730 1,61	2690 1,41	1940 1,21	1410 1,03	993 0,860	624 0,692
	50	Q P	3160 1,69	2210 1,44	1560 1,22	1120 1,02	797 0,848	512 0,699
HAX12P/110-4	30	Q P	5190 1,65	3840 1,52	2860 1,36	2130 1,18	1550 0,991	1020 0,792
	40	Q P	4480 1,85	3250 1,63	2370 1,41	1740 1,18	1260 0,974	816 0,772
	50	Q P	3830 1,96	2720 1,69	1950 1,42	1430 1,18	1050 0,979	699 0,805
HAX22e/125-4	30	Q P	5960 1,87	4440 1,64	3320 1,42	2480 1,22	1810 1,01	1200 0,808
	40	Q P	5080 2,06	3720 1,76	2740 1,49	2040 1,25	1490 1,02	976 0,806
	50	Q P	4310 2,17	3100 1,82	2260 1,52	1680 1,26	1250 1,03	837 0,824
HAX22e/160-4	30	Q P	7350 2,30	5480 2,02	4100 1,76	3060 1,50	2240 1,25	1480 1,00
	40	Q P	6270 2,55	4590 2,18	3390 1,84	2510 1,54	1830 1,26	1210 1,00
	50	Q P	5320 2,69	3830 2,25	2800 1,88	2080 1,55	1540 1,27	1040 1,01
HAX22e/190-4	30	Q P	8900 2,79	6630 2,45	4960 2,13	3710 1,82	2710 1,51	1790 1,20
	40	Q P	7590 3,08	5560 2,64	4100 2,23	3040 1,87	2220 1,53	1460 1,20
	50	Q P	6440 3,25	4630 2,73	3380 2,28	2510 1,88	1860 1,53	1250 1,23
HAX34e/215-4	30	Q P	10200 3,18	7550 2,79	5640 2,42	4220 2,07	3080 1,73	2040 1,37
	40	Q P	8640 3,51	6330 3,00	4660 2,54	3460 2,13	2530 1,74	1660 1,37
	50	Q P	7330 3,70	5280 3,11	3850 2,59	2860 2,14	2120 1,75	1430 1,40
HAX34e/255-4	30	Q P	12000 3,74	8880 3,28	6640 2,85	4960 2,44	3620 2,03	2400 1,61
	40	Q P	10200 4,13	7440 3,53	5480 2,99	4070 2,50	2970 2,04	1960 1,61
	50	Q P	8620 4,35	6200 3,65	4520 3,05	3360 2,52	2490 2,06	1680 1,64
HAX34e/315-4	30	Q P	14700 4,61	11000 4,05	8190 3,52	6120 3,01	4470 2,51	2960 1,99
	40	Q P	12600 5,10	9180 4,36	6770 3,69	5020 3,09	3660 2,53	2410 1,99
	50	Q P	10700 5,38	7660 4,51	5590 3,76	4150 3,11	3070 2,54	2070 2,03
HAX34e/380-4	30	Q P	17800 5,59	13300 4,90	9910 4,26	7410 3,64	5410 3,03	3580 2,41
	40	Q P	15200 6,17	11200 5,28	8190 4,47	6080 3,74	4430 3,06	2920 2,41
	50	Q P	12900 6,51	9260 5,46	6760 4,56	5020 3,77	3720 3,07	2500 2,46

Relating to 20°C suction gas temperature without liquid subcooling

R407F

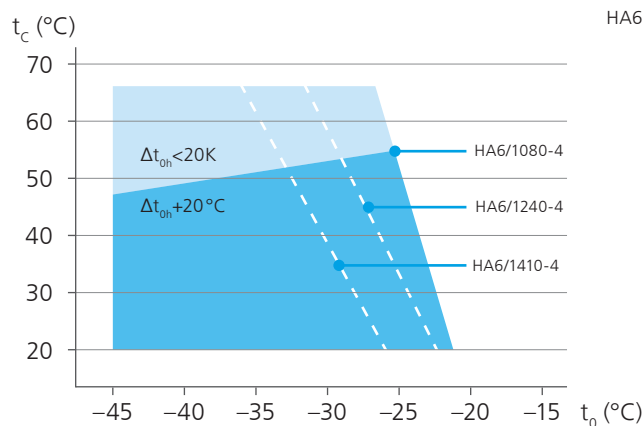
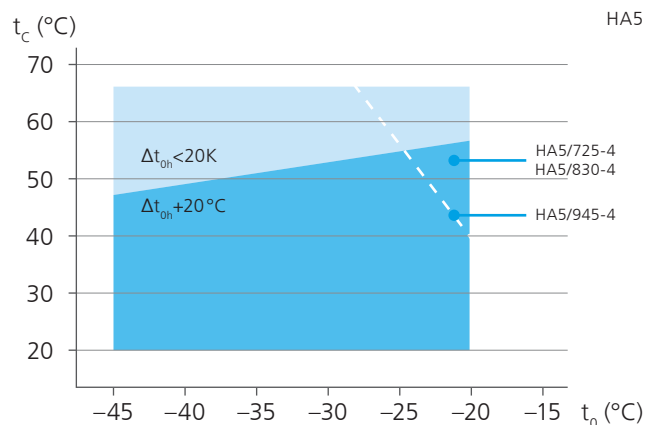
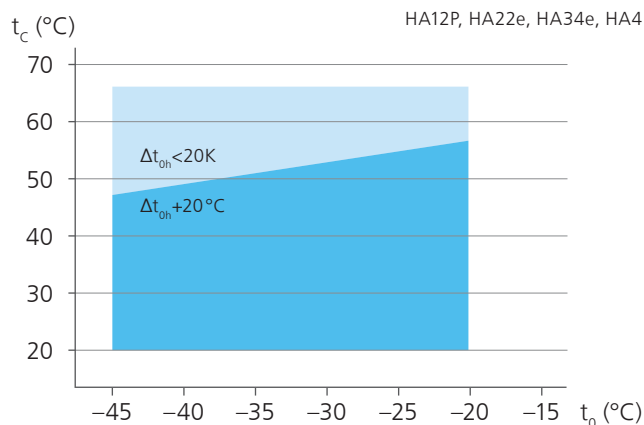
50 Hz

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]				Power consumption P_e [kW]	
			Evaporating temperature °C					
			-15	-20	-25	-30	-35	-40
HAX4/465-4	30	Q	23600	17600	13200	9830	7190	4740
		P	7,60	6,64	5,73	4,85	3,98	3,10
	40	Q	20200	14800	10900	8040	5870	3850
		P	8,26	7,03	5,91	4,89	3,95	3,06
	50	Q	17300	12400	9020	6720	5000	3420
		P	8,65	7,23	6,00	4,93	4,02	3,22
HAX4/555-4	30	Q	27500	20500	15400	11600	8470	5610
		P	8,64	7,56	6,54	5,55	4,57	3,57
	40	Q	23600	17300	12800	9470	6930	4560
		P	9,39	7,99	6,73	5,57	4,51	3,50
	50	Q	20200	14500	10600	7920	5920	4060
		P	9,82	8,21	6,82	5,62	4,58	3,68
HAX4/650-4	30	Q	31400	23500	17700	13300	9760	6500
		P	9,48	8,31	7,20	6,12	5,05	3,96
	40	Q	27000	19800	14600	10900	7990	5280
		P	10,30	8,77	7,40	6,14	4,98	3,88
	50	Q	23100	16600	12200	9100	6820	4690
		P	10,70	9,02	7,50	6,19	5,06	4,07

Relating to 20°C suction gas temperature without liquid subcooling

OPERATING LIMITS

R22 Operating limits



HA6 t_o Evaporating temperature (°C)
 t_c Condensing temperature (°C)
 Δt_{oh} Suction gas superheat (K)
 t_{oh} Suction gas temperature (°C)

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

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

¹⁾ LP = low pressure, HP = high pressure

NOTES

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.gea.com.

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 GEA VAP software (vap.gea.com).

PERFORMANCE DATA

R22

50 Hz

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]				Power consumption P_e [kW]	
			Evaporating temperature °C					
			-20	-25	-30	-35	-40	-45
HA12P/60-4	30	Q P	1830 0,72	1410 0,63	1060 0,53	759 0,43	512 0,27	309 0,23
	40	Q P	1600 0,79	1240 0,68	931 0,57	673 0,46	457 0,35	276 0,24
	50	Q P	1440 0,84	1130 0,73	865 0,62	643 0,51	456 0,40	294 0,30
HA12P/75-4	30	Q P	2270 0,90	1750 0,78	1310 0,66	943 0,53	637 0,41	384 0,28
	40	Q P	1990 0,99	1540 0,85	1160 0,72	837 0,58	569 0,44	344 0,31
	50	Q P	1790 1,04	1410 0,91	1080 0,78	800 0,64	568 0,51	368 0,38
HA12P/90-4	30	Q P	2710 1,05	2090 0,92	1570 0,77	1130 0,62	759 0,47	457 0,32
	40	Q P	2370 1,16	1840 1,00	1380 0,84	997 0,67	677 0,51	408 0,34
	50	Q P	2130 1,22	1670 1,06	1290 0,90	953 0,74	675 0,58	436 0,42
HA12P/110-4	30	Q P	3180 1,25	2450 1,08	1840 0,92	1320 0,74	892 0,57	537 0,39
	40	Q P	2790 1,37	2160 1,19	1620 1,00	1180 0,81	795 0,62	479 0,43
	50	Q P	2510 1,46	1970 1,27	1510 1,08	1120 0,89	793 0,70	512 0,52
HA22e/125-4	30	Q P	3870 1,52	2990 1,32	2240 1,11	1610 0,91	1090 0,69	645 0,48
	40	Q P	3390 1,68	2630 1,45	1980 1,21	1430 0,98	968 0,75	583 0,52
	50	Q P	3050 1,77	2390 1,54	1840 1,31	1370 1,08	965 0,86	624 0,63
HA22e/160-4	30	Q P	4780 1,88	3690 1,63	2760 1,37	1990 1,11	1340 0,86	807 0,59
	40	Q P	4190 2,07	3240 1,79	2440 1,50	1760 1,21	1200 0,93	720 0,64
	50	Q P	3770 2,19	2950 1,91	2270 1,62	1690 1,34	1200 1,05	770 0,78
HA22e/190-4	30	Q P	5780 2,28	4460 1,97	3340 1,66	2410 1,35	1630 1,03	977 0,72
	40	Q P	5070 2,51	3920 2,16	2950 1,81	2130 1,46	1450 1,12	871 0,77
	50	Q P	4560 2,65	3570 2,31	2740 1,96	2040 1,62	1450 1,28	931 0,94
HA34e/215-4	30	Q P	6580 2,59	5080 2,25	3810 1,90	2740 1,54	1850 1,17	1120 0,82
	40	Q P	5770 2,85	4460 2,46	3360 2,07	2430 1,67	1650 1,27	992 0,88
	50	Q P	5190 3,02	4070 2,63	3120 2,23	2320 1,84	1650 1,45	1060 1,07
HA34e/255-4	30	Q P	7740 3,05	5970 2,65	4470 2,23	3220 1,81	2180 1,38	1310 0,96
	40	Q P	6780 3,36	5250 2,90	3950 2,43	2860 1,96	1940 1,50	1170 1,03
	50	Q P	6100 3,55	4780 3,09	3670 2,63	2730 2,17	1930 1,71	1250 1,26
HA34e/315-4	30	Q P	9550 3,77	7370 3,27	5520 2,75	3970 2,23	2680 1,71	1620 1,18
	40	Q P	8370 4,14	6480 3,58	4870 3,00	3520 2,42	2390 1,85	1440 1,27
	50	Q P	7530 4,39	5900 3,82	4530 3,25	3370 2,68	2390 2,11	1540 1,56
HA34e/380-4	30	Q P	11600 4,56	8920 3,95	6680 3,33	4810 2,70	3250 2,07	1960 1,43
	40	Q P	10200 5,02	7840 4,33	5900 3,63	4260 2,93	2900 2,24	1750 1,54
	50	Q P	9110 5,31	7140 4,62	5480 3,93	4080 3,24	2890 2,56	1870 1,88

Relating to 20°C suction gas temperature without liquid subcooling

■ Reduced suction gas temperature

PERFORMANCE DATA

R22

50 Hz

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]				Power consumption P_e [kW]	
			Evaporating temperature °C					
			-20	-25	-30	-35	-40	-45
HA4/465-4	30	Q	16500	13000	9850	7260	5080	3260
		P	5,73	5,32	4,83	4,26	3,58	2,78
	40	Q	14700	11400	8590	6240	4260	2600
		P	6,58	5,98	5,29	4,51	3,60	2,57
	50	Q	12500	9590	7140	5080	3360	1930
		P	7,23	6,42	5,50	4,47	3,32	2,01
HA4/555-4	30	Q	19700	15400	11800	8640	6050	3880
		P	6,83	6,33	5,75	5,07	4,26	3,31
	40	Q	17500	13600	10300	7420	5070	3100
		P	7,83	7,11	6,30	5,36	4,29	3,06
	50	Q	14900	11500	8500	6050	4000	2290
		P	8,61	7,64	6,55	5,33	3,95	2,40
HA4/650-4	30	Q	23100	18100	13800	10200	7100	4560
		P	8,01	7,43	6,75	5,95	5,00	3,88
	40	Q	20500	15900	12000	8710	5950	3640
		P	9,19	8,35	7,39	6,30	5,04	3,59
	50	Q	17500	13400	9970	7090	4690	2690
		P	10,10	8,97	7,69	6,25	4,63	2,81
HA5/725-4	30	Q	25700	20200	15400	11400	7940	5100
		P	8,94	8,29	7,52	6,62	5,56	4,33
	40	Q	22800	17700	13400	9720	6650	4080
		P	10,20	9,31	8,24	7,01	5,61	4,01
	50	Q	19400	14900	11100	7900	5230	3010
		P	11,20	9,99	8,57	6,97	5,18	3,16
HA5/830-4	30	Q	29400	23100	17600	13000	9080	5830
		P	10,20	9,49	8,61	7,58	6,37	4,96
	40	Q	26100	20300	15300	11200	7610	4670
		P	11,70	10,60	9,43	8,03	6,43	4,60
	50	Q	22200	17100	12700	9050	6000	3460
		P	12,90	11,40	9,81	7,98	5,93	3,62
HA5/945-4	30	Q	33500	26300	20100	14800	10400	6720
		P	11,60	10,70	9,78	8,62	7,25	5,64
	40	Q	29600	23000	17400	12700	8670	5400
		P	13,30	12,10	10,70	9,16	7,33	5,23
	50	Q		19400	14400	10300	6780	3970
		P		13,00	11,20	9,12	6,78	4,12
HA6/1080-4	30	Q		29700	22700	16800	11800	7560
		P		11,20	9,89	8,50	7,05	5,53
	40	Q		26100	19700	14300	9820	6080
		P		12,90	11,30	9,62	7,87	6,01
	50	Q		21900	16300	11600	7700	4490
		P		14,30	12,30	10,30	8,24	6,00
HA6/1240-4	30	Q		34100	26000	19200	13500	8720
		P		12,90	11,30	9,76	8,10	6,35
	40	Q			22600	16399	11300	7020
		P			12,90	11,00	9,04	6,89
	50	Q			18700	13300	8810	5180
		P			14,20	11,80	9,46	6,88
HA6/1410-4	30	Q			29600	21900	15400	9980
		P			12,90	11,00	9,21	7,22
	40	Q				18600	12800	8000
		P				12,50	10,20	7,85
	50	Q				15000	9910	5830
		P				13,50	10,70	7,84

Relating to 20 °C suction gas temperature without liquid subcooling

Reduced suction gas temperature

TECHNICAL DATA

HA

Type	Number of cylinders	Displacement 50 / 60 Hz (1,450/1,740 rpm)	Electrical data				Weight	Connections ⁵⁾		Oil charge
			Voltage ¹⁾	Max. working current ²⁾	Max. power consumption ²⁾	Starting current (rotor locked)		Discharge line DV	Suction line SV	
		m³/h	A (Δ / Y)	kW	A (Δ / Y)	kg	mm inch	mm inch	Ltr.	
HA12P/60-4	2	5.40 / 6.40	³	4.7 / 2.7	1.3	40 / 23	52.0	12 I ½	12 I ½	0.8
HA12P/75-4	2	6.70 / 8.10	³	5.5 / 3.2	1.6	40 / 23	53.0	12 I ½	12 I ½	0.8
HA12P/90-4	2	8.00 / 9.60	³	6.3 / 3.7	1.9	43 / 25	53.0	12 I ½	12 I ½	0.8
HA12P/110-4	2	9.40 / 11.30	³	7.0 / 4.1	2.2	43 / 25	53.0	12 I ½	12 I ½	0.8
HA22e/125-4	2	11.10 / 13.30	³	8.1 / 4.7	2.4	69 / 40	80.0	12 I ½	16 I ⅝	0.9
HA22e/160-4	2	13.70 / 16.40	³	9.6 / 5.5	2.9	87 / 50	82.0	12 I ½	16 I ⅝	0.9
HA22e/190-4	2	16.50 / 19.80	³	10.9 / 6.3	3.5	87 / 50	81.0	12 I ½	16 I ⅝	0.9
HA34e/215-4	4	18.80 / 22.60	³	12.1 / 7.0	4.0	87 / 50	98.0	16 I ⅝	22 I 7/8	1.2
HA34e/255-4	4	22.10 / 26.60	³	13.8 / 8.0	4.7	87 / 50	98.0	16 I ⅝	22 I 7/8	1.2
HA34e/315-4	4	27.30 / 32.80	³	17.1 / 9.9	5.8	111 / 64	100.0	16 I ⅝	22 I 7/8	1.2
HA34e/380-4	4	33.10 / 39.70	³	20.2 / 11.7	7.0	111 / 64	100.0	16 I ⅝	22 I 7/8	1.2
				PW 1+2*		PW1 / PW 1+2*				
HA4/465-4	4	40.50 / 48.60	⁴	17	9.1	82 / 107	155.0	28 I 1 ⅛	35 I 1 ¾	3.4
HA4/555-4	4	48.20 / 57.80	⁴	21	10.3	107 / 140	157.0	28 I 1 ⅛	35 I 1 ¾	3.4
HA4/650-4	4	56.60 / 67.90	⁴	22	11.4	107 / 140	156.0	28 I 1 ⅛	35 I 1 ¾	3.4
HA5/725-4	4	62.90 / 75.50	⁴	24	12.5	107 / 140	204.0	28 I 1 ⅛	42 I 1 ⅝	4.5
HA5/830-4	4	72.20 / 86.70	⁴	24	12.9	126 / 160	207.0	28 I 1 ⅛	42 I 1 ⅝	4.5
HA5/945-4	4	82.20 / 98.60	⁴	25	13.3	126 / 160	205.0	28 I 1 ⅛	42 I 1 ⅝	4.5
HA6/1080-4	4	93.70 / 112.40	⁴	32	17.0	156 / 193	223.0	28 I 1 ⅛	42 I 1 ⅝	4.5
HA6/1240-4	4	107.60 / 129.10	⁴	33	17.6	156 / 193	222.0	28 I 1 ⅛	42 I 1 ⅝	4.5
HA6/1410-4	4	122.40 / 146.90	⁴	33	17.7	156 / 193	219.0	28 I 1 ⅛	42 I 1 ⅝	4.5

* PW = Part Winding, motors for part winding start 1 = 1st part winding 2 = 2nd 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: HA4, HA5, HA6 = 66 % / 33 %
• Designs for Y/ Δ on request
- 5) For soldering connections

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

- HA12P, HA22e, HA34e: 50–120 W
- PTC heater, self-regulating, installation in housing bore

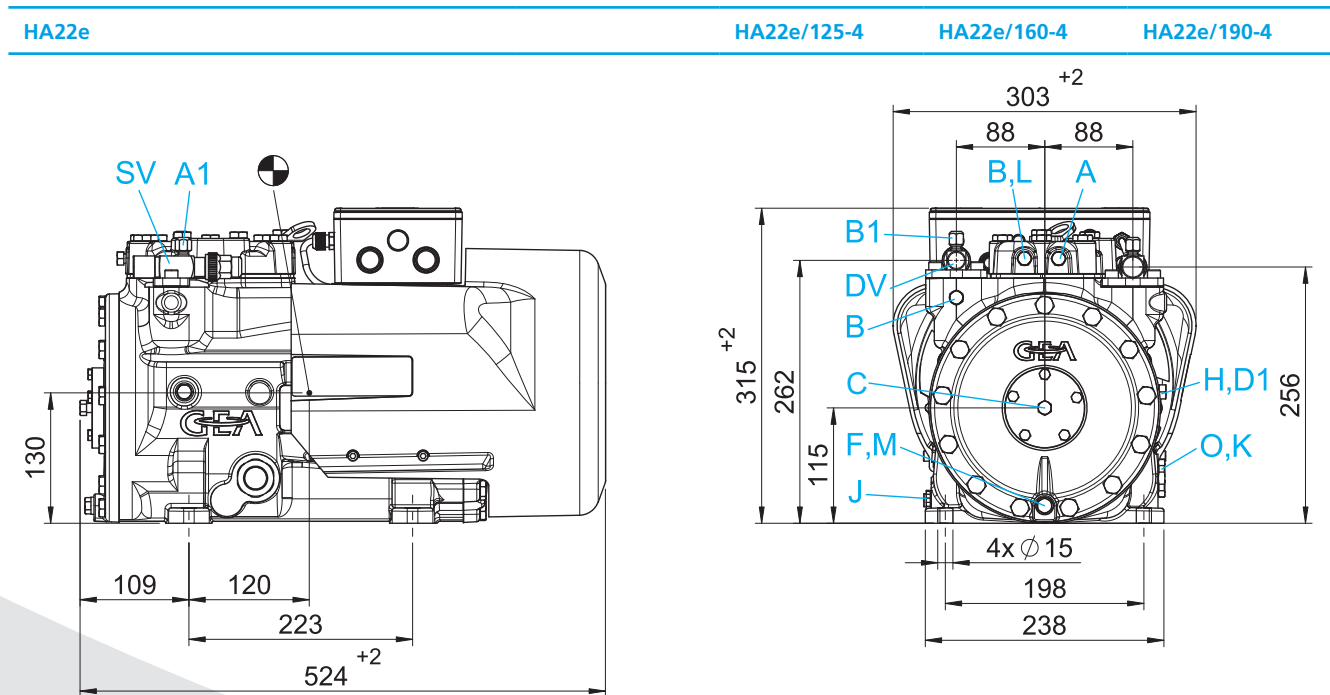
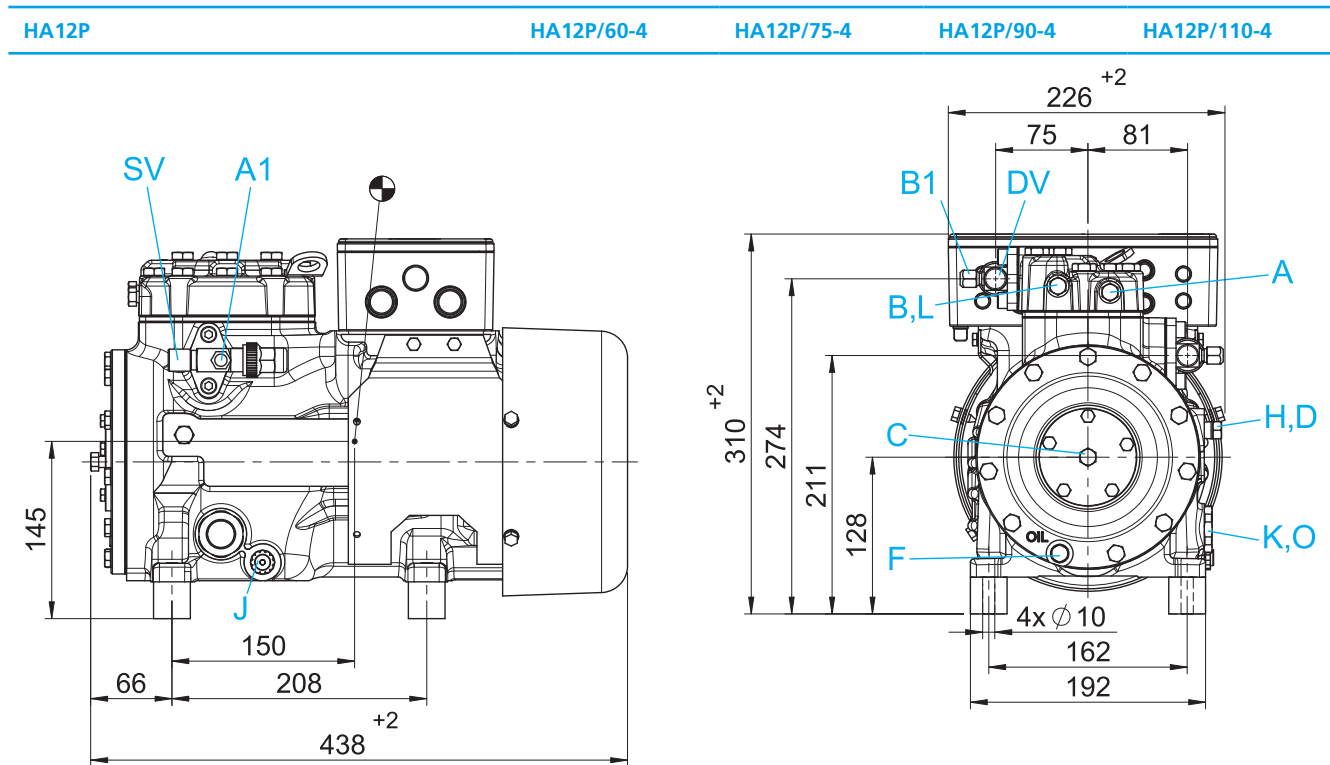
Oil sump heater 230 V – 1 – 50/60 Hz (option)

- HA4: 80 W
- HA5, HA6: 140 W
- Permanently set version, installation in immersion sleeve

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

- HA12P: 40 W / 0.3 A
- HA22e, HA34e: 38 W / 0.17 A
- HA4, HA5, HA6: 140 W / 0.71 A

DIMENSIONS AND CONNECTIONS



Dimensions in mm
 Center of gravity

Connections see page 77
 Dimensions for anti-vibration pad see page 75

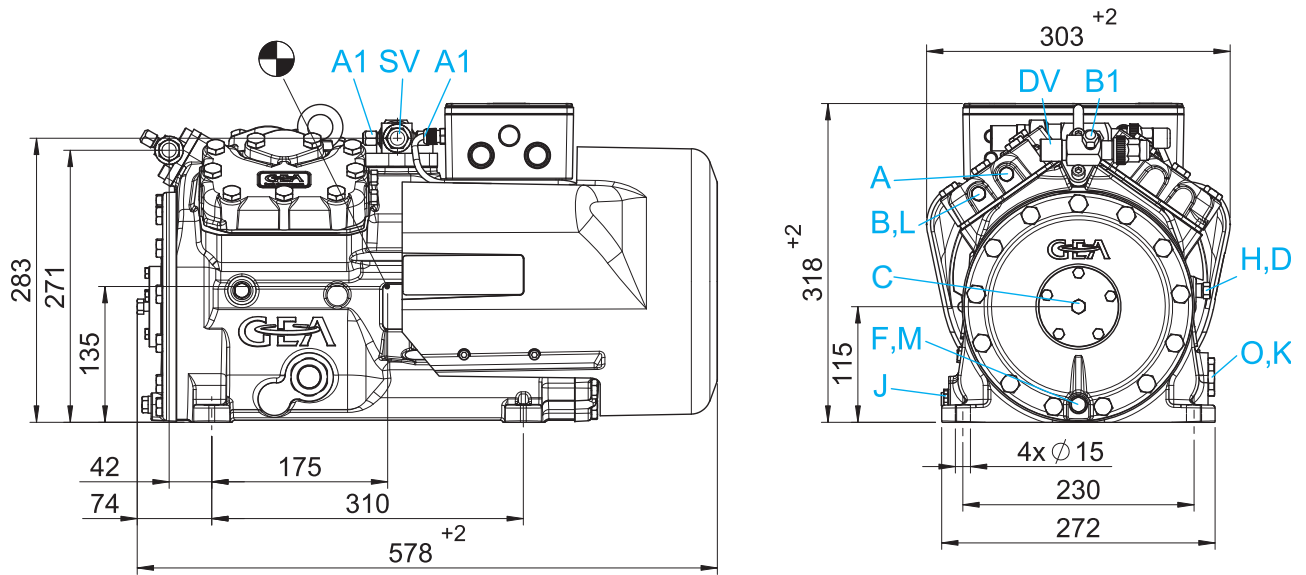
HA34e

HA34e/215-4

HA34e/255-4

HA34e/315-4

HA34e/380-4

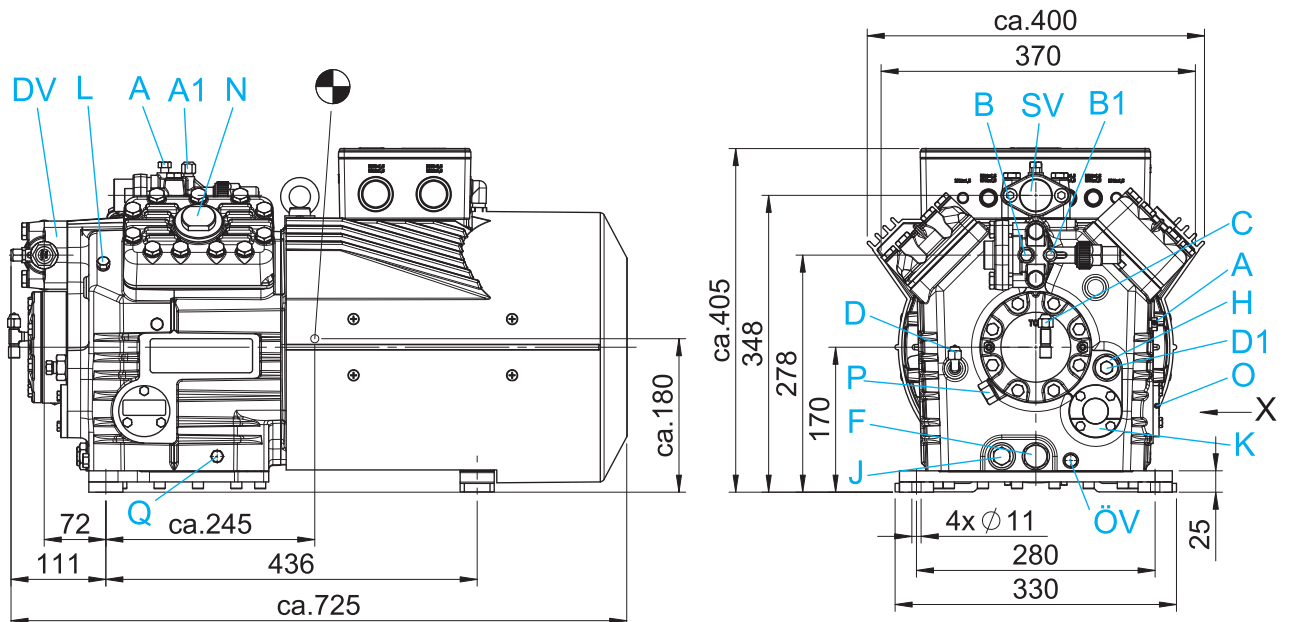


HA4

HA4/465-4

HA4/555-4

HA4/650-4



Dimensions in mm
 ● Center of gravity

Connections see page 77
 Dimensions for anti-vibration pad see page 75

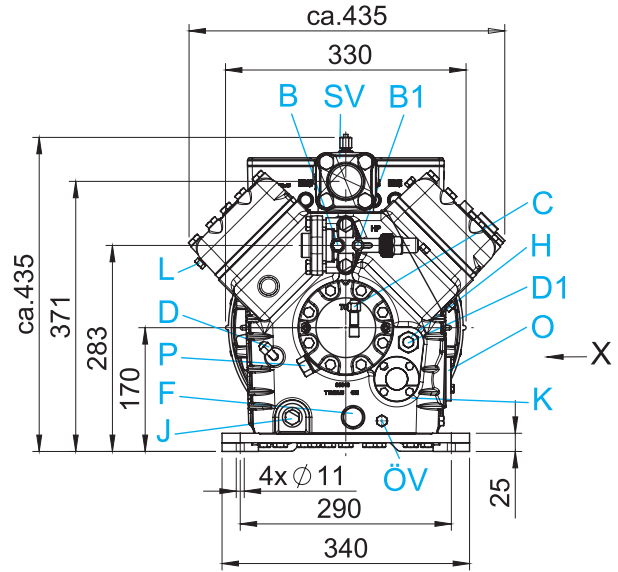
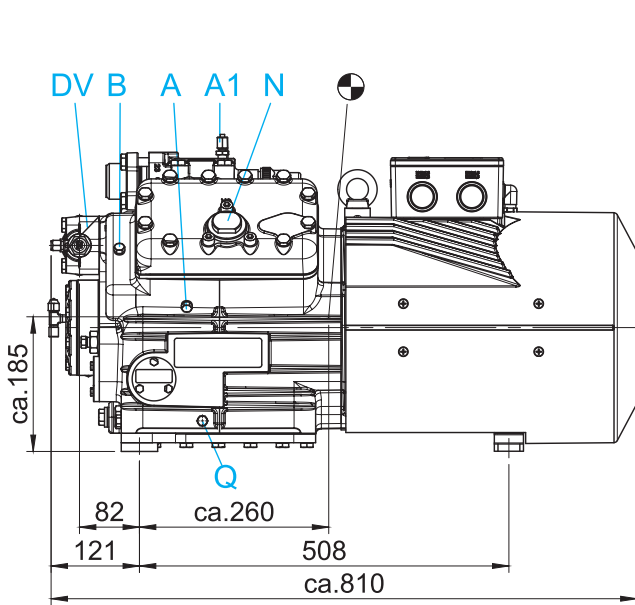
DIMENSIONS AND CONNECTIONS

HA5

HA5/725-4

HA5/830-4

HA5/945-4

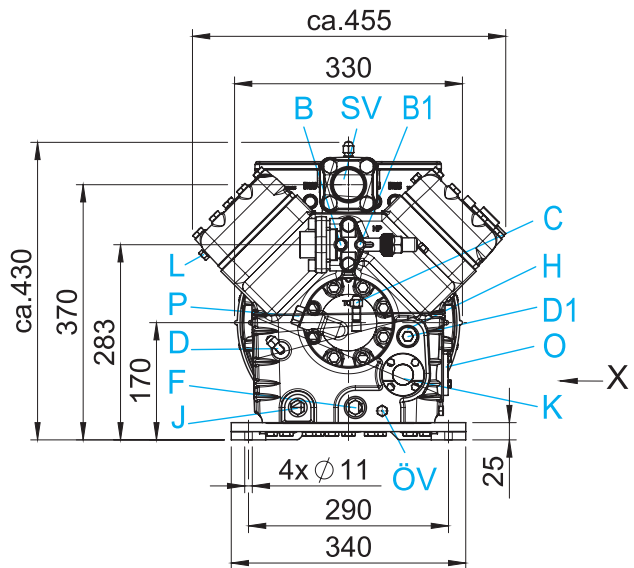
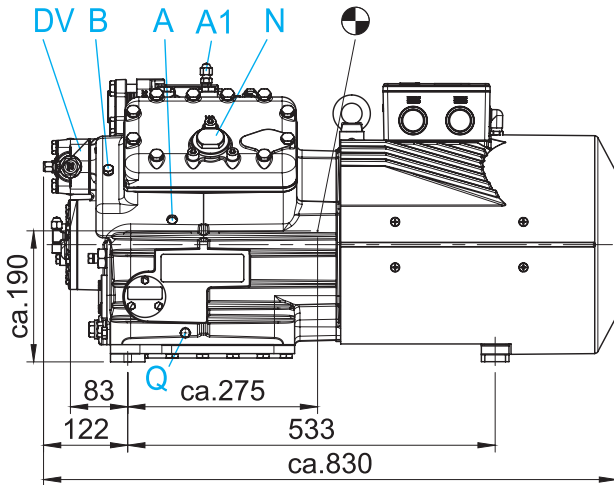


HA6

HA6/1080-4

HA6/1240-4

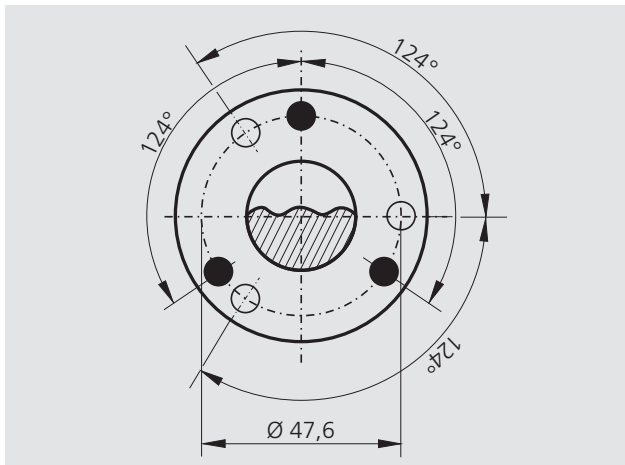
HA6/1410-4



Dimensions in mm
 ● Center of gravity

Connections see page 77
 Dimensions for anti-vibration pad see page 75

View X



Dimensions in mm

Possibility to connect to oil level regulator

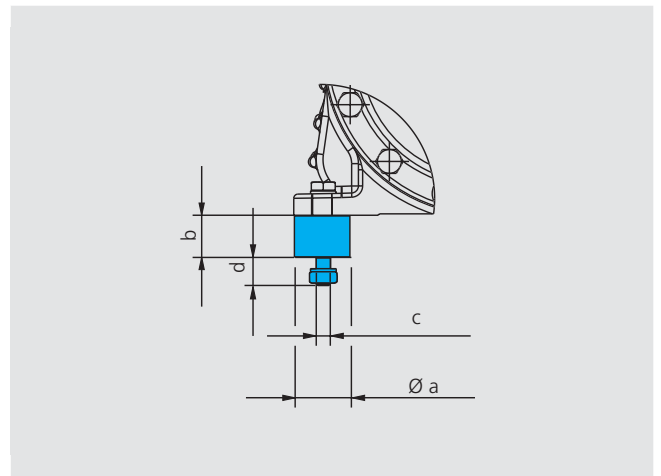
HA4, HA5, HA6

- 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	Ø c	d
HA12P	30	30	M8	20
HA22e	40	30	M10	20
HA34e	40	30	M10	20
HA4	40	30	M10	20
HA5	50	30	M10	25
HA6	50	30	M10	25

Dimensions in mm



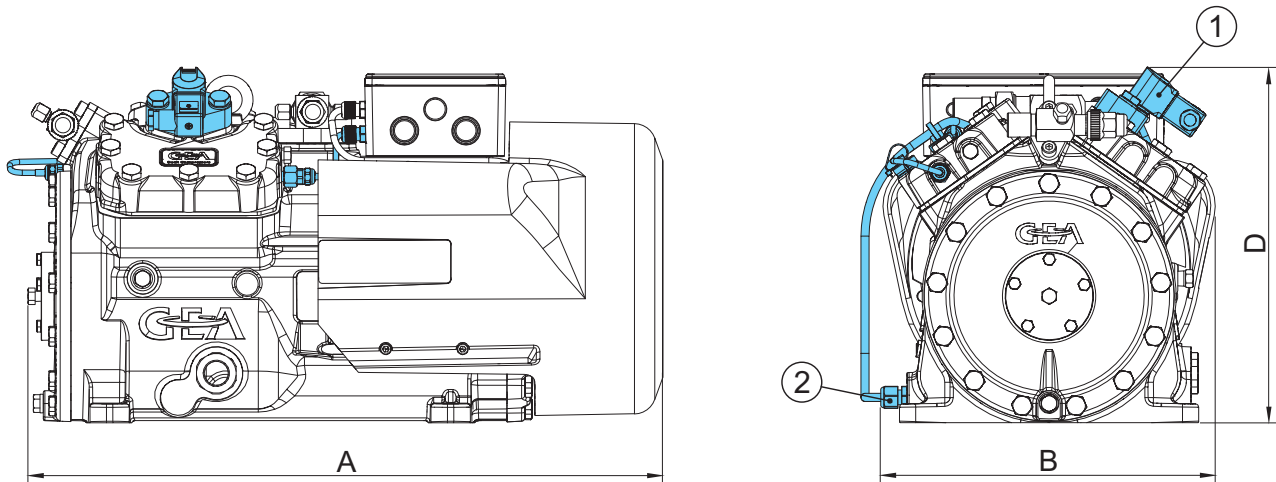
DIMENSIONS AND CONNECTIONS

Dimensions with accessories

HA12P

HA22e

HA34e

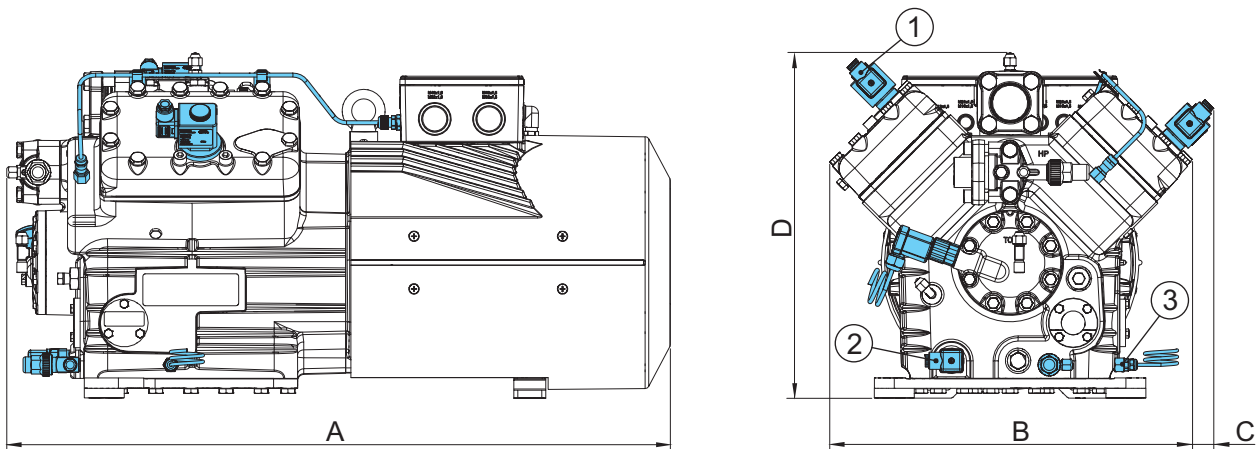


Dimensions with accessories

HA4

HA5

HA6



Type	A	B	C	D
HA12P	ca. 440	ca. 225	–	–
HA22e	ca. 525	ca. 305	–	–
HA34e	ca. 580	ca. 305	–	ca. 325
HA4	ca. 725	ca. 370	ca. 20	ca. 405
HA5	ca. 810	ca. 435	ca. 30	ca. 435
HA6	ca. 830	ca. 455	ca. 30	ca. 430

Dimensions in mm

Connections		HA12P	HA22e	HA34e	HA4	HA5	HA6
SV	Suction line	Please refer to technical data page 71					
DV	Discharge line						
A	Connection suction side, not lockable	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
B	Connection discharge side, not lockable	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
C	Connection oil pressure safety switch HP	1/8" NPTF	1/8" NPTF	1/8" NPTF	7/16" UNF	7/16" UNF	7/16" UNF
D	Connection oil pressure safety switch LP				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
F	Oil drain plug	M8	M 12 x 1,5	M 12 x 1,5	M22 x 1,5	M22 x 1,5	M22 x 1,5
H	Oil charge plug	1/4" NPTF	1/4" NPTF	1/4" NPTF	M22 x 1,5	M22 x 1,5	M22 x 1,5
J	Connection oil sump heater	3/8" NPTF	3/8" NPTF	3/8" NPTF	M22 x 1,5	M22 x 1,5	M22 x 1,5
K	Sight glass	1 1/8" – 18 UNEF	1 1/8" – 18 UNEF	1 1/8" – 18 UNEF	4 hole M6	4 hole M6	4 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
M	Oil strainer	M 12 x 1,5	M 12 x 1,5	M 12 x 1,5			
N	Connection capacity controller				M45 x 1,5	M45 x 1,5	M45 x 1,5
O	Connection oil level regulator	1 1/8" – 18 UNEF	1 1/8" – 18 UNEF	1 1/8" – 18 UNEF	1)	1)	1)
ÖV	Connection oil service valve				1/4" NPTF	1/4" NPTF	1/4" NPTF
P	Connection oil pressure differential sensor				M20 x 1,5	M20 x 1,5	M20 x 1,5
Q	Connection oil temperature sensor				1/8" NPTF	1/8" NPTF	1/8" NPTF

¹⁾ Dimensions see view X page 75

SCOPE OF SUPPLY & ACCESSORIES

Scope of supply & accessories		HA12P	HA22e	HA34e	HA4	HA5	HA6
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 (70/30) 380–420 V Y/Y – 3 – 50 Hz 440–480 V Y/Y – 3 – 60 Hz Motor unit flanged onto the compressor housing					●	●	●
Special voltage and/or frequency		○ ³⁾	○ ³⁾	○ ³⁾	○ ³⁾	○ ³⁾	○ ³⁾
Motor is cooled by an integrated fan with air deflection hood 230 V – 1 – 50/60 Hz, IP44 40 W, 0,30 A		●					
Motor is cooled by an integrated fan with air deflection hood 230 V – 1 – 50/60 Hz, IP44 38 W, 0,17 A			●	●			
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		●	●	●			
Winding protection with PTC resistor sensors with electronic triggering unit MP10					●	●	●
1 Thermal protection PTC		○ ²⁾	○ ²⁾	○ ²⁾	○ 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⁾	● ¹⁾	● ¹⁾	● ¹⁾
Internal safety valve		–	–	–	●	●	●
Suction and discharge line valve		●	●	●	●	●	●
Sight glass		●	●	●	●	●	●
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, 80 W	–	–	–	○ ²⁾	–	–
	220–240 V – 1 – 50/60 Hz, 140 W	–	–	–	–	○ ²⁾	○ ²⁾
3 Oil differential pressure sensor DELTA-P II 220–240 V – 1 – 50/60 Hz		–	–	–	○ ¹⁾	○ ¹⁾	○ ¹⁾
Oil pump cover with screwed connection for differential oil pressure sensor DELTA-P II		–	–	–	●	●	●
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⁾	–	–	–
Oil service valve		–	–	–	○ ²⁾	○ ²⁾	○ ²⁾

● Scope of supply (Standard)
○ Accessories
– Not available

¹⁾ Enclosed
²⁾ Mounted
³⁾ On request

Scope of supply & accessories		HA12P	HA22e	HA34e	HA4	HA5	HA6
5	Capacity regulator 230 V – 1 – 50/60 Hz, IP65 1 capacity regulator = 50 % residual capacity	–	–	○ ²⁾	○ ²⁾	○ ²⁾	○ ²⁾
6	Prepared for capacity regulator (1 cylinder cover)	–	–	○ ²⁾	●	●	●
7	Start unloader 230 V – 1 – 50/60 Hz, IP65, without check valve, including thermal protection thermostat (PTC sensor)	–	–	–	○ ³⁾	○ ³⁾	○ ³⁾
8	Start unloader by means of a ESS (Electronic Soft Start) 400 V – 3 – 50/60 Hz, IP20, (connection clamps IP00) for installation in switch cabinet	–	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾	○ ¹⁾
9	Connection piece suction and discharge valve in welded construction	–	–	–	○ ³⁾	○ ³⁾	○ ³⁾
10	Water-cooled cylinder covers	–	–	–	○ ²⁾	○ ²⁾	○ ²⁾
	Sea water resistant	–	–	–	○ ²⁾	○ ²⁾	○ ²⁾
11	Intermediate adapter for discharge line valve	–	–	–	○ ¹⁾	○ ¹⁾	○ ¹⁾
12	INT69 G Diagnose 115 V / 230 V Ac, 50/60 Hz, IP00 (INT69 G not applicable)	–	○ ²⁾	○ ²⁾	–	–	–
13	DP-modbus gateway 115 V / 230 V Ac, 50/60 Hz, IP00 incl. adapter cable	–	○ ¹⁾	○ ¹⁾	–	–	–
14	modbus-LAN gateway 230 V Ac, 50/60 Hz, IP00	–	○ ¹⁾	○ ¹⁾	–	–	–
15	USB converter for INT69 G Diagnose and INT69 GTML Diagnose	–	○ 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⁾

● Scope of supply (Standard)
○ Accessories
– Not available

¹⁾ Enclosed

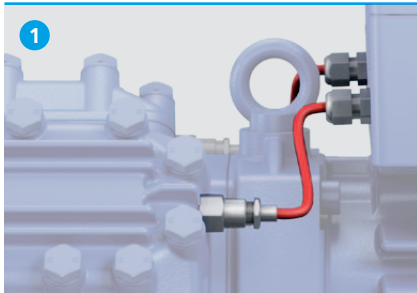
²⁾ Mounted

³⁾ On request

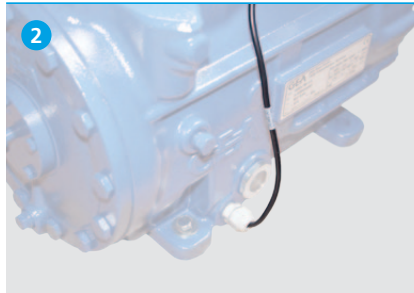
⁴⁾ Only possible with additional adapter

ACCESSORIES

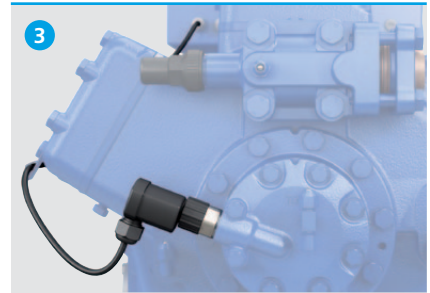
Thermal protection thermostat



Oil sump heater



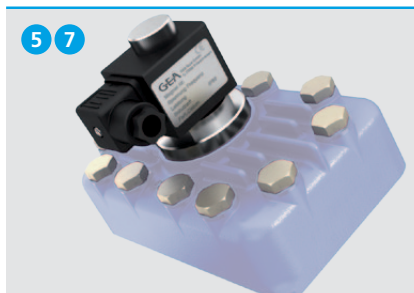
Oil differential pressure sensor



Oil pressure safety switch



Start unloader / Capacity regulator



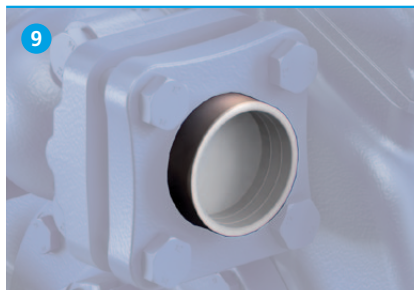
Prepared for capacity regulator



ESS Electronic Soft Start



Connection piece in welded construction



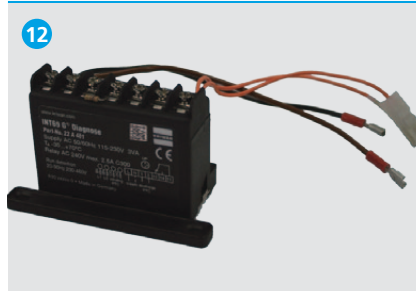
Water-cooled cylinder covers



Intermediate adapter for discharge line valve



INT69 G Diagnose



DP-Modbus Gateway

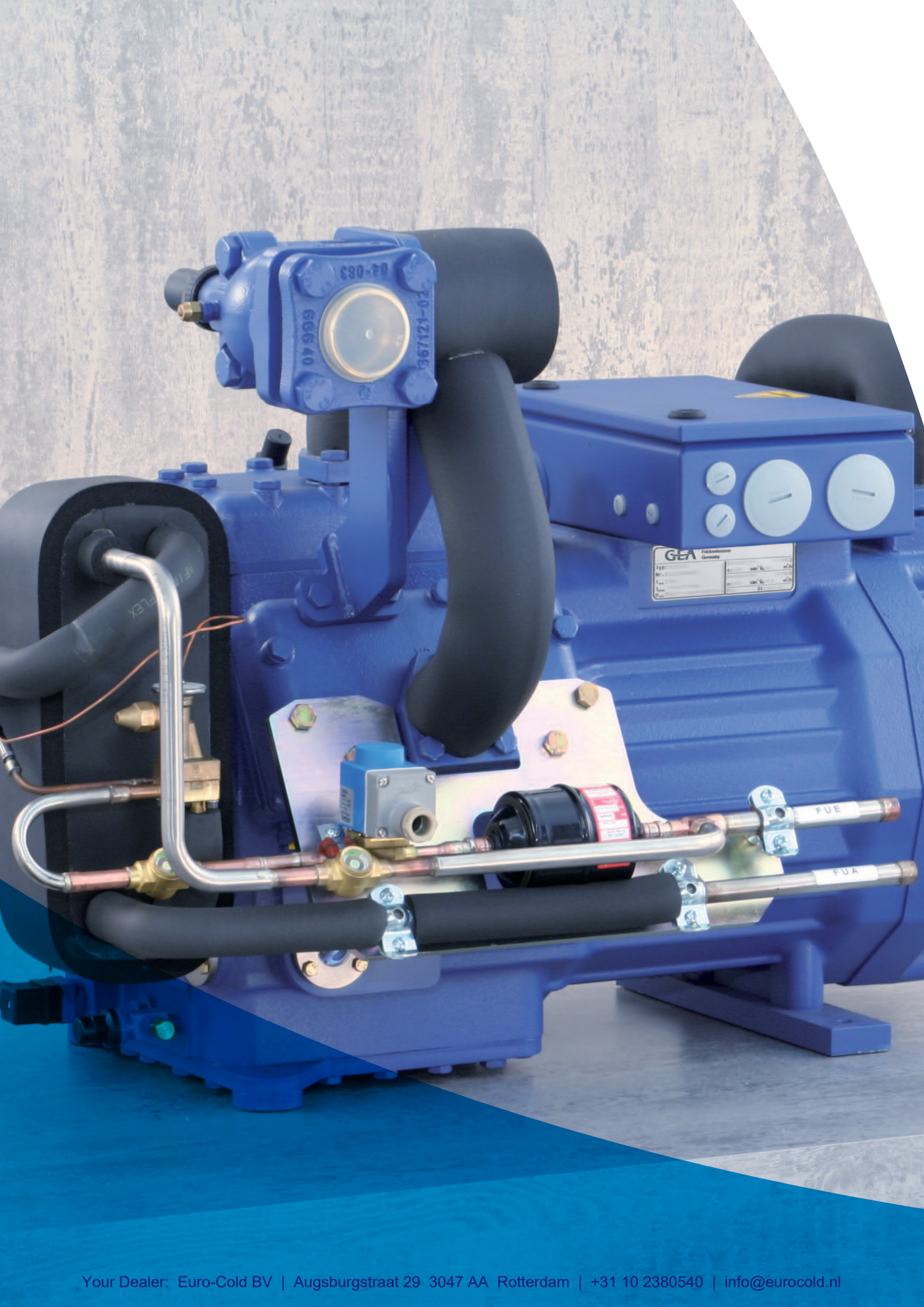


Modbus-LAN Gateway



USB converter





HGZ two-stage semi-hermetic GEA compressors

GEA Bock HGZ7 two-stage

HGZ two-stage semi-hermetic GEA compressors

A two-stage variant based on the GEA 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

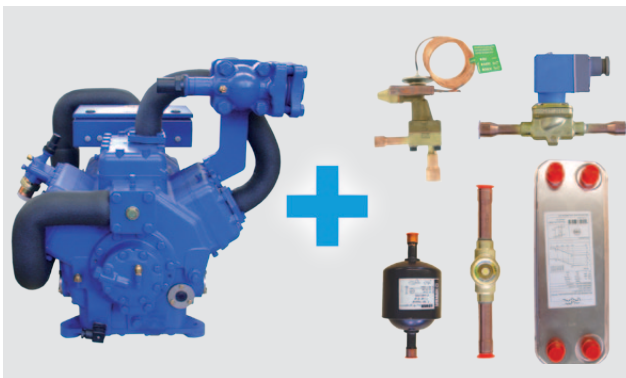
For more information on the HG7 basic compressor see chapter “Single-stage semi-hermetic GEA compressors”, page 17.

Type	Displacement (50 Hz) LP	Displacement (50 Hz) HP
HGZX7/1620-4 R404A/R507 HGZX7/1620-4 R410A HGZ7/1620-4 R22	93.70 m³/h	46.90 m³/h
HGZX7/1860-4 R404A/R507 HGZX7/1860-4 R410A HGZ7/1860-4 R22	107.60 m³/h	53.80 m³/h
HGZX7/2110-4 R404A/R507 HGZX7/2110-4 R410A HGZ7/2110-4 R22	122.40 m³/h	61.20 m³/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 drier mounted directly to the compressor, lined and insulated.

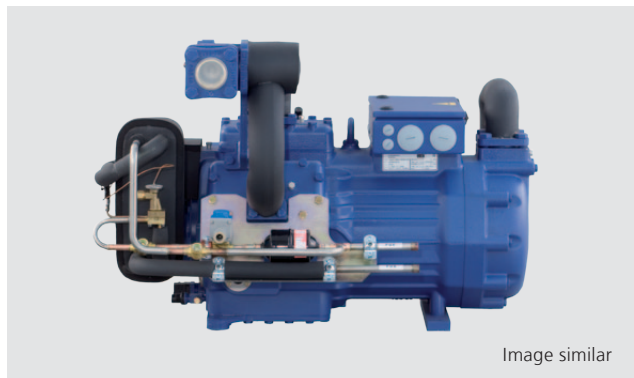
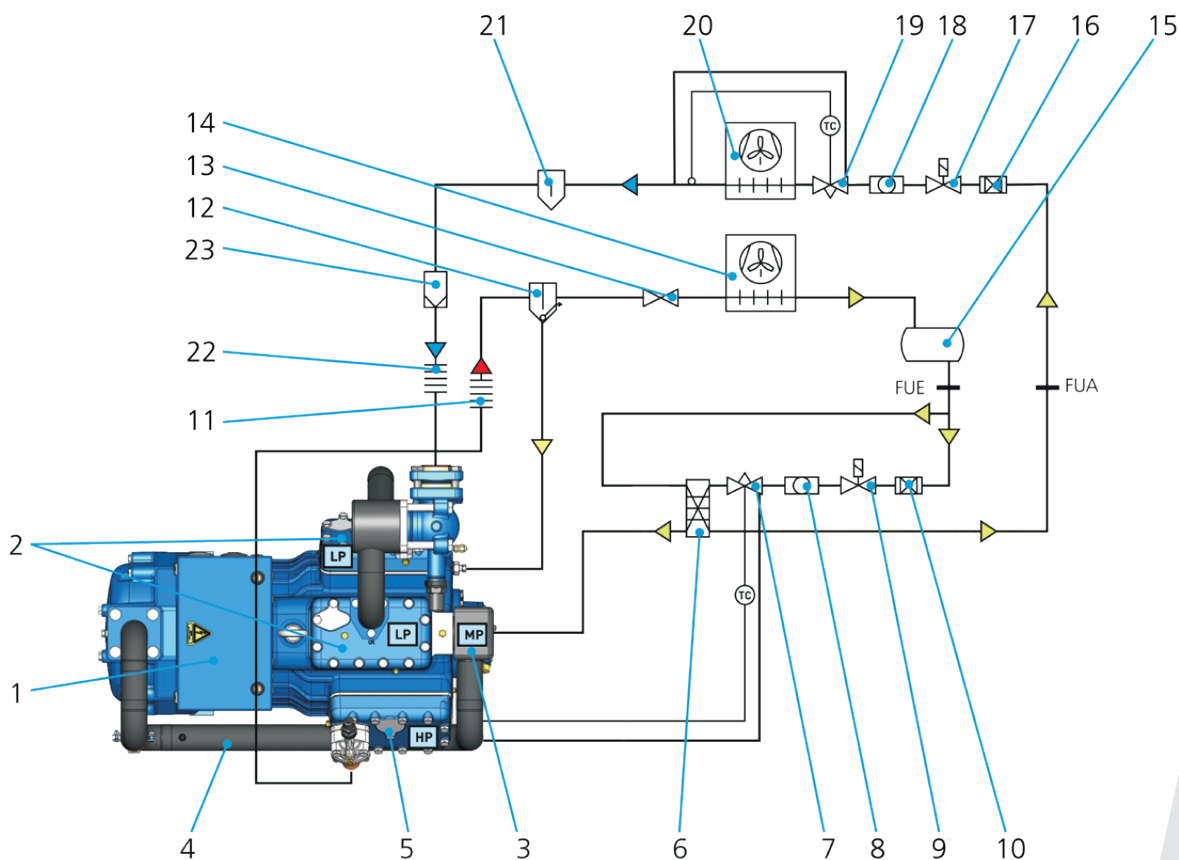


Image similar

SPECIAL 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

HGZ X7 / 2110 – 4 R404A

Series¹⁾
 Ester oil filling²⁾
 Size
 Swept volume
 Number of poles
 Refrigerant³⁾

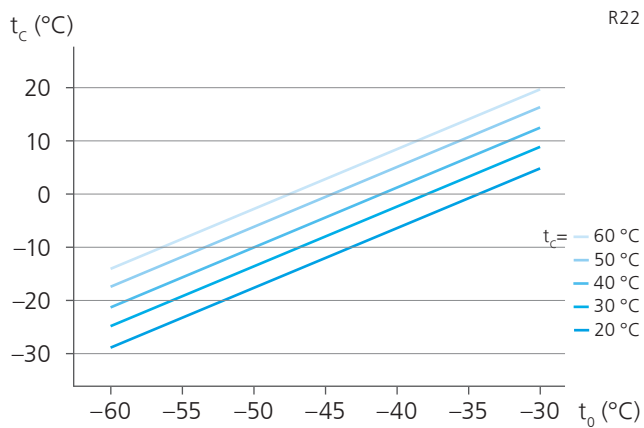
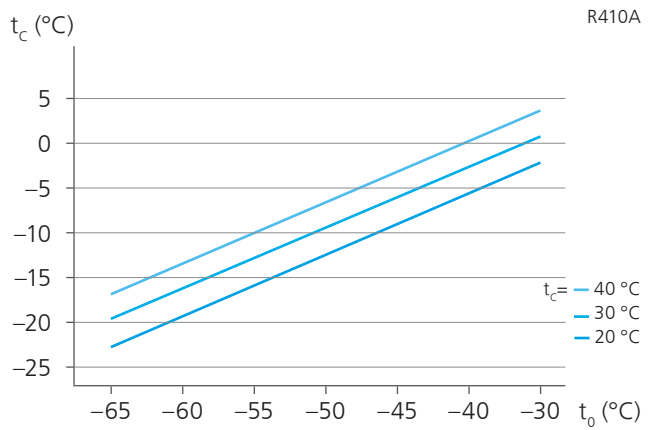
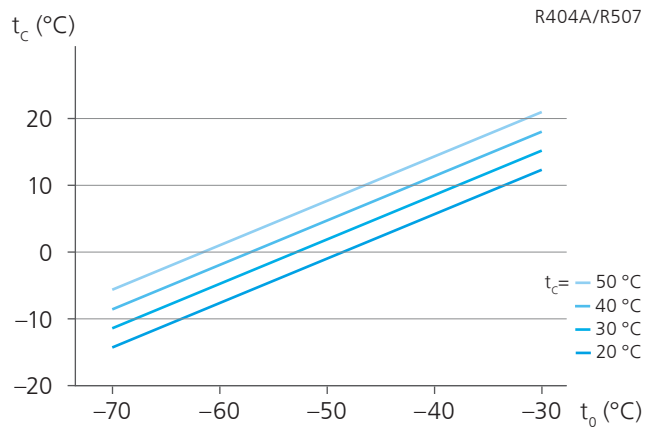
- ¹⁾ HGZ = Hermetic Gas-Cooled (suction-gas-cooled), two-stage
²⁾ X = Ester oil filling (HFC refrigerants R404A, R410A)
³⁾ Possible refrigerants are R404A, R410A, R22

OPERATING LIMITS

Subcooling temperature

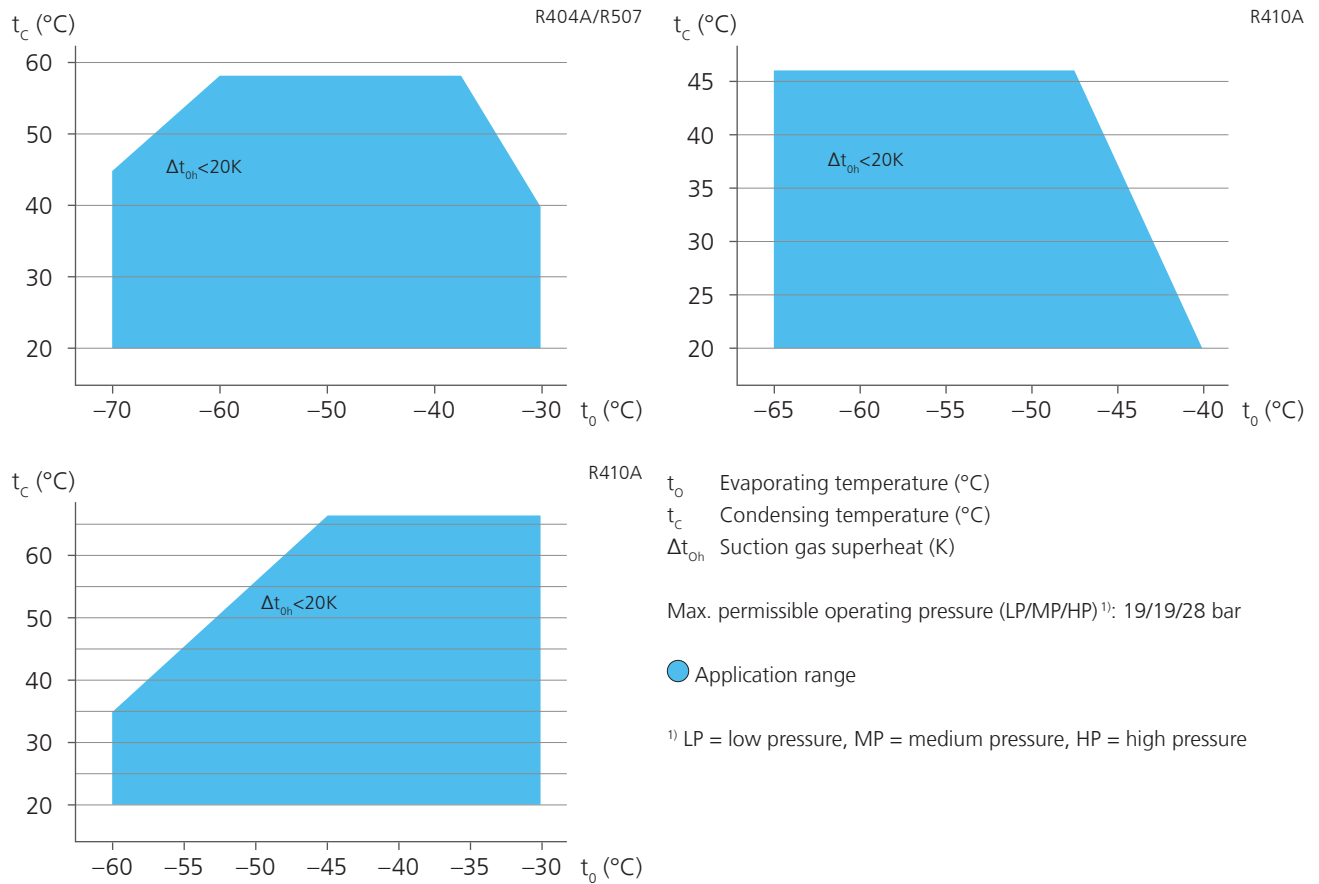
Defined with the help of the diagram by approximately calculating the subcooling temperature arising in the relevant operating conditions (t_o/t_c).

Subcooling temperature calculation diagram for the intermediate cooler outlet



t_u Subcooling temperature at the intermediate cooler outlet
 t_o Evaporation temperature

Operating limits



NOTES

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 GEA VAP software (vap.gea.com).

PERFORMANCE DATA

R404A/R507

50 Hz

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]						Power consumption P_e [kW]		
			Evaporating temperature °C								
			-30	-35	-40	-45	-50	-55	-60	-65	-70
HGZX7/1620-4	30	Q	34869	28471	23098	18628	14936	11899	9394	7296	5482
		P	21,17	19,41	17,63	15,84	14,05	12,31	10,61	8,99	7,46
	40	Q	33437	27315	22181	17910	14380	11467	9047	6997	5192
		P	23,42	21,42	19,40	17,39	15,41	13,48	11,61	9,84	8,17
	50	Q		25860	20950	16866	13484	10680	8332	6315	
		P		23,49	21,24	19,02	16,84	14,72	12,68	10,75	
HGZX7/1860-4	30	Q	40042	32694	26525	21391	17152	13665	10787	8378	6294
		P	24,31	22,29	20,24	18,18	16,14	14,13	12,19	10,32	8,56
	40	Q	38397	31367	25471	20567	16514	13169	10390	8035	5962
		P	26,90	24,60	22,28	19,97	17,70	15,48	13,34	11,30	9,38
	50	Q		29696	24057	19367	15484	12265	9568	7252	
		P		26,98	24,39	21,84	19,33	16,90	14,56	12,35	
HGZX7/2110-4	30	Q	45550	37191	30173	24334	19511	15544	12271	9530	7160
		P	27,66	25,36	23,03	20,69	18,36	16,08	13,86	11,74	9,74
	40	Q	43679	35681	28974	23396	18785	14980	11819	9140	6782
		P	30,60	27,98	25,34	22,72	20,13	17,61	15,17	12,85	10,67
	50	Q		33780	27366	22031	17614	13952	10884	8249	
		P		30,69	27,75	24,84	21,99	19,23	16,57	14,04	

R410A

50 Hz

Type	Cond. temp. °C	Cooling capacity $\dot{Q}_0$ [W]				Power consumption P_e [kW]	
		Evaporating temperature °C					
		-45	-50	-55	-60	-65	
HGZX7/1620-4	30	Q	25354	19967	15285	11396	8385
		P	22,89	20,80	18,67	16,43	14,00
	50	Q		19131	14630	10868	7930
		P		22,87	20,63	18,25	15,68
HGZX7/1860-4	30	Q	29182	22859	17530	13136	9614
		P	26,28	23,89	21,44	18,87	16,08
	40	Q		21959	16774	12508	9101
		P		26,26	23,68	20,96	18,00
HGZX7/2110-4	30	Q	33195	26003	19941	14943	10937
		P	29,90	27,17	24,39	21,46	18,29
	40	Q		24980	19082	14229	10352
		P		29,87	26,94	23,84	20,48

R22

50 Hz

Type	Cond. temp. °C		Cooling capacity $\dot{Q}_0$ [W]					Power consumption P_e [kW]	
			Evaporating temperature °C						
			-30	-35	-40	-45	-50	-55	-60
HGZ7/1620-4	30	Q	29711	24214	19448	15365	11921	9070	6765
		P	18,26	16,81	15,40	14,03	12,70	11,41	10,16
	40	Q	29059	23630	18930	14914	11537	8753	
		P	20,23	18,52	16,86	15,23	13,64	12,10	
	50	Q	28355	22992	18360	14411	11100		
		P	22,30	20,33	18,41	16,53	14,69		
	60	Q	27598	22302	17736	13854			
		P	24,47	22,25	20,07	17,93			
HGZ7/1860-4	30	Q	30088	27881	22408	17669	13664	10393	7855
		P	20,97	19,31	17,69	16,11	14,58	13,10	11,67
	40	Q	33296	27181	21800	17153	13240	10061	
		P	23,23	21,27	19,36	17,49	15,67	13,89	
	50	Q	32434	26411	21122	16567	12746		
		P	25,60	23,35	21,14	18,98	16,68		
	60	Q	31503	25572	20375	15912			
		P	28,09	25,54	23,04	20,59			
HGZ7/2110-4	30	Q	38811	31632	25406	20072	15573	11848	8837
		P	23,86	21,96	20,12	18,33	16,59	14,91	13,27
	40	Q	37960	30868	24729	19483	15071	11433	
		P	26,43	24,20	22,02	19,89	17,82	15,80	
	50	Q	37040	30035	23984	18825	14500		
		P	29,13	26,56	24,05	21,59	19,18		
	60	Q	36050	29133	23169	18097			
		P	31,96	29,06	26,21	23,42			

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

TECHNICAL DATA

HGZ7 Two-Stage Compressors

Type	Number of cylinders	Displacement		Voltage ¹⁾	Electrical data			Weight	Oil charge
		50 Hz (1,450 rpm) LP / HP**	60 Hz (1,740 rpm) LP / HP**		Max. working current ²⁾	Max. power consumption ²⁾	Starting current (rotor locked) ²⁾		
		m ³ /h	m ³ /h		A (Δ / Y)	kW	A (Δ / Y)	kg	Ltr.
					PW 1+2*		PW1 / PW 1+2*		
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 / 296	294	4.5
HGZX7/1860-4 R404A HGZX7/1860-4 R410A HGZ7/1860-4 R22	6	107.60 / 53.80	129.10 / 64.60	³⁾	55	30.0	175 / 296	291	4.5
HGZX7/2110-4 R404A 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 = 1st part winding 2 = 2nd part winding

** LP = low pressure HP = high pressure

Oil sump heater 230V – 1 – 50/60 Hz 140 W (option)

- Permanently set version, installation in immersion sleeve

Explanations

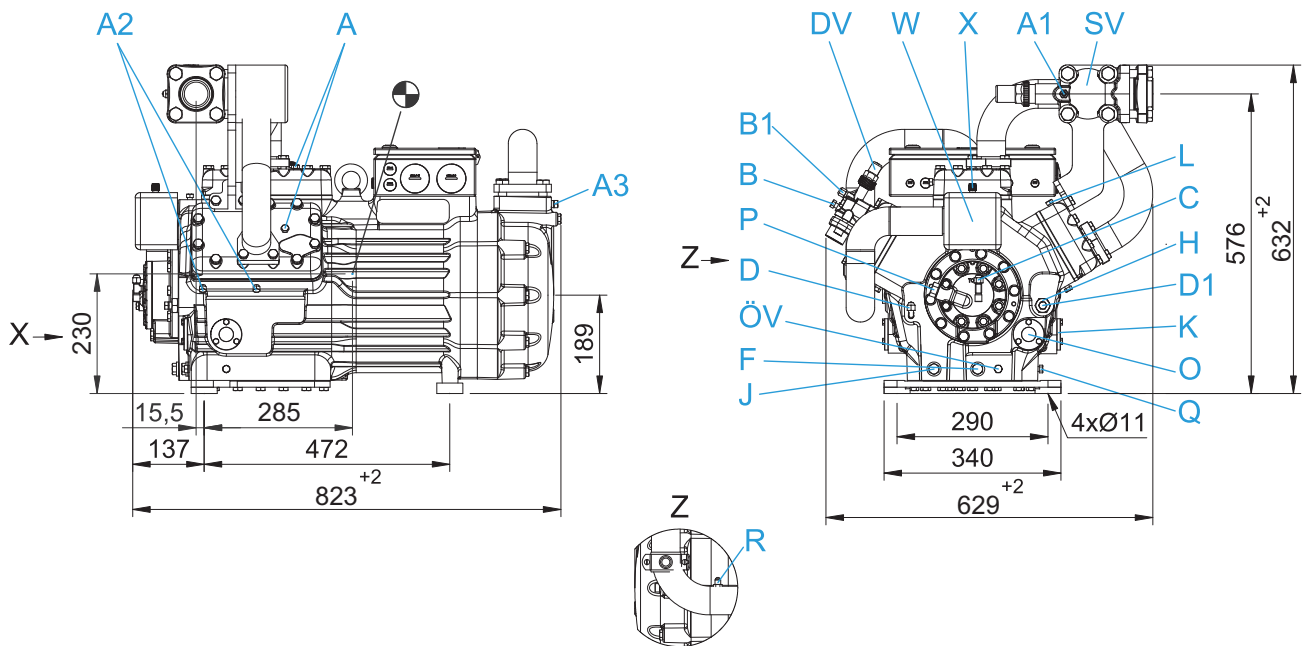
- 1) Tolerance ($\pm 10\%$) relates to the mean value of the voltage range. Other voltages and current types on request.
- 2) • The specifications for max. power consumption apply for 50 Hz operation. For 60 Hz operation, the specifications have to be multiplied by the factor 1.2. The max. working current 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 AND CONNECTIONS

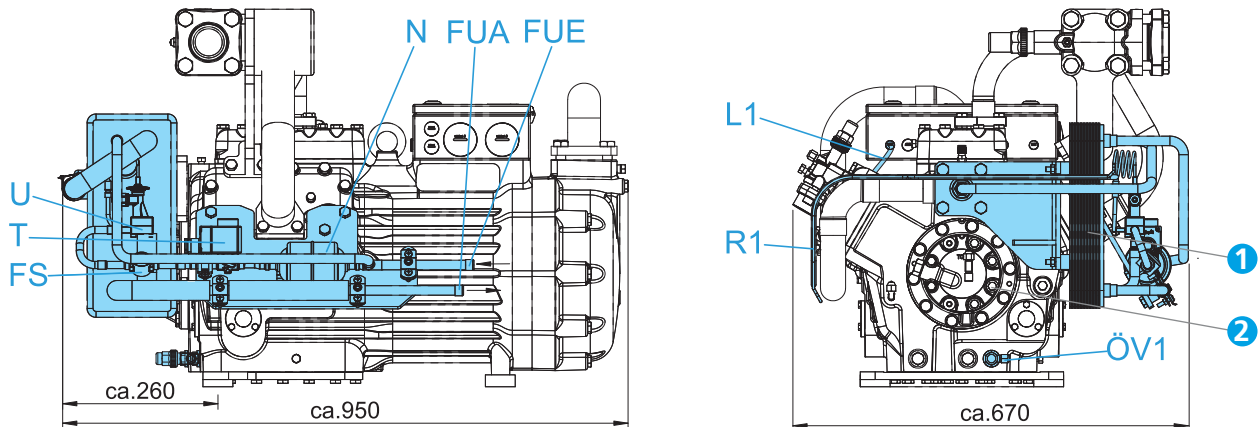
HGZ7 – Series

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 92
 Rigid fixing without anti-vibration pad
 Dimensions for view X see page 93

DIMENSIONS AND CONNECTIONS

Connections – Series

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 OIL	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 1,5
H	Oil charge plug	M22 x 1,5
J	Connection oil sump heater	M22 x 1,5
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 1,5
Q	Connection oil temperature sensor	1/8" NPTF
R	Connection equalizer for injection valve	7/16" UNF
W	Connection refrigerant injection	M22 x 1,5
X	Connection for Schrader valve for intermediate pressure manometer	7/16" UNF

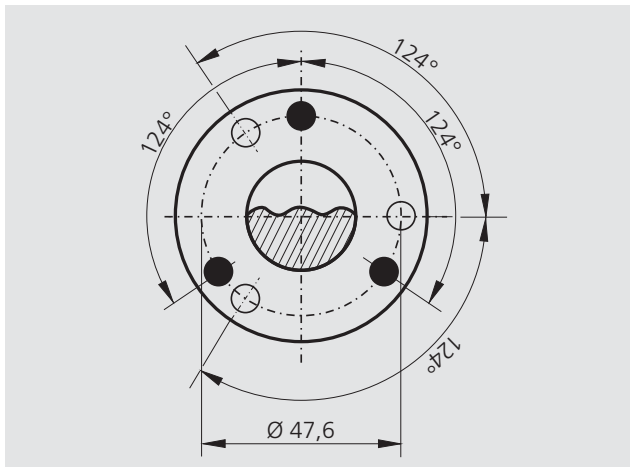
¹⁾ Dimensions see view X page 93

Connections – Option

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

¹⁾ Dimensions see view X page 93

View X



Dimensions in mm

Possibility to connect to oil level regulator

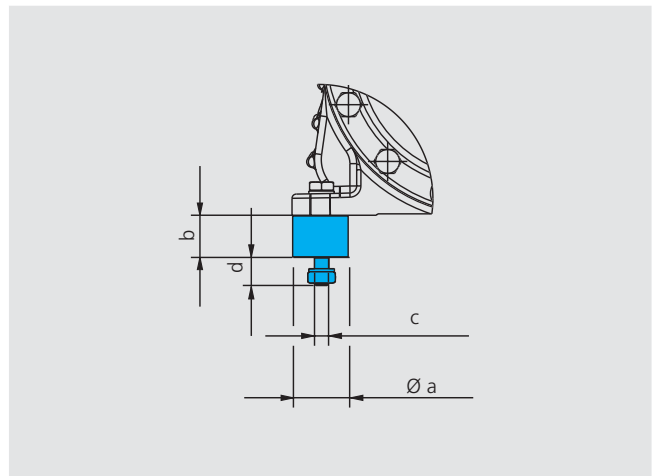
HGZ7

- 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 brand TRAXOIL (3 x M6 x 10 deep)

Dimensions for anti-vibration pad

Type	Ø a	b	Ø c	d
HGZ7	50	30	M10	25

Dimensions in mm



SCOPE OF SUPPLY & ACCESSORIES

Scope of supply & accessories		HGZ7
Semi-hermetic six-cylinder reciprocating compressor with drive motor for part winding start 380–420 V Y/Y – 3 – 50 Hz 440–480 V Y/Y – 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⁾
● Scope of supply (Standard) ○ Accessories – Not available		¹⁾ Enclosed ²⁾ Mounted ³⁾ On request ⁴⁾ Only possible with additional adapter

Intermediate pressure line



Winding protection



Oil pump cover



Direct connection possibility



Sight glasses



Suction line shut-off valve



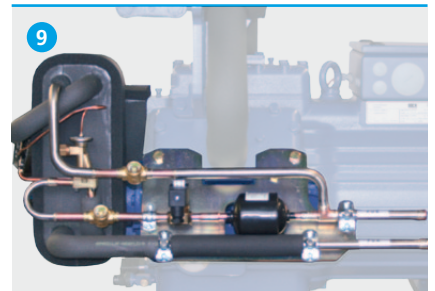
Discharge line shut-off valve



Components enclosed separately



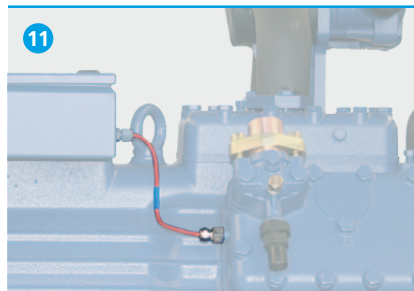
Components mounted directly



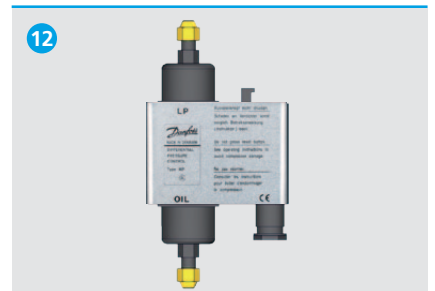
Oil sump heater



Thermal protection thermostat



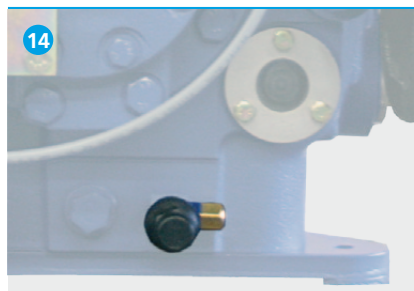
Oil pressure safety switch



Oil differential pressure sensor



Oil service valve



Oil temperature sensor





GEA Service – Because you never stop learning

GEA training and workshops for commercial compressors

For many years, GEA has intensified its commitment in the area of customer training.

We offer a comprehensive array of attractive training events, from two-day practitioners' workshops in Frickenhausen to after-work workshops throughout Germany, regardless of the type of training you are interested in.

Three things are characteristic of all GEA trainings:

- The captivating way the training director Peter Spies carries out the events
- The strong practice orientation of the training events, and
- The fact that all training events from GEA for commercial compressors are offered as a free service

Overview of training events offered:

- GEA Practitioners' Workshop
- Training tailored to your individual needs
- Training for your entire staff
- Training on your premises

For additional questions or advice, please contact our training director:

Peter Spies

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E-Mail: Peter.Spies@gea.com

GEA compressors online



VAP Compressor selection program

The GEA Bock compressor selection software supports you in searching the suitable compressor or condensing unit for your application. On the basis of the entered refrigerating capacity and operating conditions (refrigerant, evaporation and condensing temperature) suitable compressors will be found. Furthermore the software provides additional information on the chosen compressor:

- Operating limits
- Technical data
- Performance data
- Scope of supply and accessories
- Dimensions and connections
- Product image
- Spare part list, drawings, 3D model etc.

The compressor selection program is available as web-based online-version as well as offline-version for installation on the computer.

- Find suitable compressors quickly
- Software update on a daily basis
- For stationary and mobile applications
- All compressors in one version

Here is the direct way to the online-version:

- GEA Bock HG compressors
- GEA Bock F compressors
- GEA Bock FK compressors



SOCIAL MEDIA

GEA is represented in the following social media networks:

LinkedIn

International exchange –

get connected on LinkedIn.

www.linkedin.com/groups/GEA-Food-4225307

Facebook

Please contact us and stay updated

with all the latest news in the transportation industry.

www.facebook.com/GEAtransportation

YouTube

You can find product videos and animations of GEA on YouTube.

www.youtube.com/user/theGEAgroup

Twitter

Follow us on Twitter and be

always up-to-date.

www.twitter.com/GEA_Events





We live our values.

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA is a global technology company with multi-billion euro sales operations in more than 50 countries. Founded in 1881 the company is one of the largest providers of innovative equipment and process technology. GEA is listed in the STOXX® Europe 600 Index. In addition, the company is included in selected MSCI Global Sustainability Indexes.

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