



## **Semi-hermetic GEA Bock Compressors**

Single-stage and Two-stage Reciprocating Compressors HG (HA)

In touch with our customers

## GEA Refrigeration Technologies: Your partner for low temperatures

GEA Refrigeration Technologies, part of the internationally active GEA Group, is a synonym for industrial refrigeration technology. Since the end of the 19th century, it has been our business to cool processes and products, and to control the temperature of goods in transport. You will find our solutions in the food and beverage sector; in the petrochemical, chemical, and pharmaceutical industries; on fishing ships; in natural gas liquefaction; in infrastructure facilities; and in ice factories. We are also at the top with know-how when it comes to refrigeration at leisure facilities. After all, we have been excited about refrigeration for decades now. As a result, our staff enthusiastically goes about its development and production projects – to include preventive and remedial maintenance of your refrigeration systems.

This enthusiasm is highly apparent in the daily work of all companies in our Segment. Whether it's complete systems or individual valves: we have the experience in every section of our company to optimally design, manufacture, and install refrigeration systems. And to take full advantage of this experience, we not only carry out development in our own company: we also manufacture, assemble, and test the core components. A chain is, after all, only as strong as its weakest link: and this also applies equally well to refrigeration technology, cooling processes, and cooling chains.

This makes it all the more important that you have a partner – in GEA Refrigeration Technologies – that has learned to master refrigeration from A to Z. And all of this since 1896, when Willem Grasso founded his refrigeration division. From this history of GEA Refrigeration Technologies, you will profit in the form of technical expertise and top sector know-how.

But we all live in the present and think about the future. We ponder a future in which more and more processes need energy around the world, and fewer natural resources are available. As a result, we have taken it as our goal to create solutions that are not only long-life and cost-effective, but also energy-saving and environment-protecting. We feel obligated to sustainability in many respects. Our objective is to produce longlife and material-saving products over the long run – as well as products that use environmentally benign refrigerants. And we aim to produce efficiently. But our responsibility does not end at the factory gate. As a result, we take great pains to ensure that our systems are energy-efficient and that they protect the climate. With GEA Refrigeration Technologies, you can also count on optimal economy: saving energy indeed means reducing money spent for energy. At the same time, you protect the environment. Thanks to our refrigeration technology, your processes will run more economically and more ecologically. To maintain our standard of living and to assure quality of life for future generations as well.

Our claim of combining economy with saving natural resources is reflected in all components of our company, such as the following: compressors, chillers, heat pumps, ice machines, fittings and valves, control systems, and many, many more. You can find proof of the above throughout the world. Our international corporate network – and above all our reference projects – are spread all over the globe.



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## Disclaimer

This brochure has been produced for you with the greatest of care. Nevertheless it is not possible to rule out mistakes completely. In such cases we cannot assume any liability. The contents correspond to the status on going to print. Illustrations may include optional equipment. Deviations cannot be ruled out because of the ongoing development process of our products.

The details are provided as unbinding general information and cannot substitute detailed, individual consultation. Reprints even only of excerpts only allowed with the explicit approval of GEA Bock GmbH.

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## GEA Bock - More than a compressor

Over 80 years ago, when the refrigeration and air-conditioning industry was still in its infancy, our company's founder, Wilhelm Bock, had a vision: he wanted to build first-class and reliable refrigeration machines. In the following decades Bock developed into one of the world's leading manufacturers of refrigeration and air-conditioning compressors.

As part of the GEA Group AG, GEA Bock offers the right compressor for refrigeration and air conditioning in all commercial, industrial, rail, bus and transport sectors.

That GEA Bock places the highest demands on compressors for energy efficiency shows our EFC system. For many years we offer with the EFC system a solution to reduce the energy consumption by 25 %.

In this brochure we present you our current program of single-stage and two-stage semi-hermetic GEA Bock compressors.

Be inspired. By our new products, our established product series and the entire passion that goes into each of our products.



## Semi-hermetic compressors HG (HA)

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

The HA (Hermetic Air-cooled) range, specially engineered by GEA Bock, is available for deep-freezing applications, in particular for use with the refrigerants R22 and R404A.

- Single-stage
- CO<sub>2</sub> compressors subcritical
- CO<sub>2</sub> compressors transcritical
- R134a compressors
- R407C compressors
- ATEX compressors
- HC compressors
- Aluminium compressors
- 2-pole compressors
- Two-stage compressors
- Duplex compressors
- Compressor units with receiver
- Condenser units air-cooled



## Vehicle compressors FK

GEA Bock vehicle compressors of the FK range are the result of many years of experience in the domain of mobile cooling systems.

The unsurpassed light, compact, robust design and wide r.p.m. range are only some of the outstanding features of this unique product range of two, four and six cylinder compressors. A wide variety of designs can be tailored to suit individual requirements.

The so-called K version is a special innovation with a unique valve plate system for maximum requirements in bus and coach air-conditioning systems.

- Compressors for bus and train air-conditioning
- Compressors for transport refrigeration and other applications



## Open type compressors F

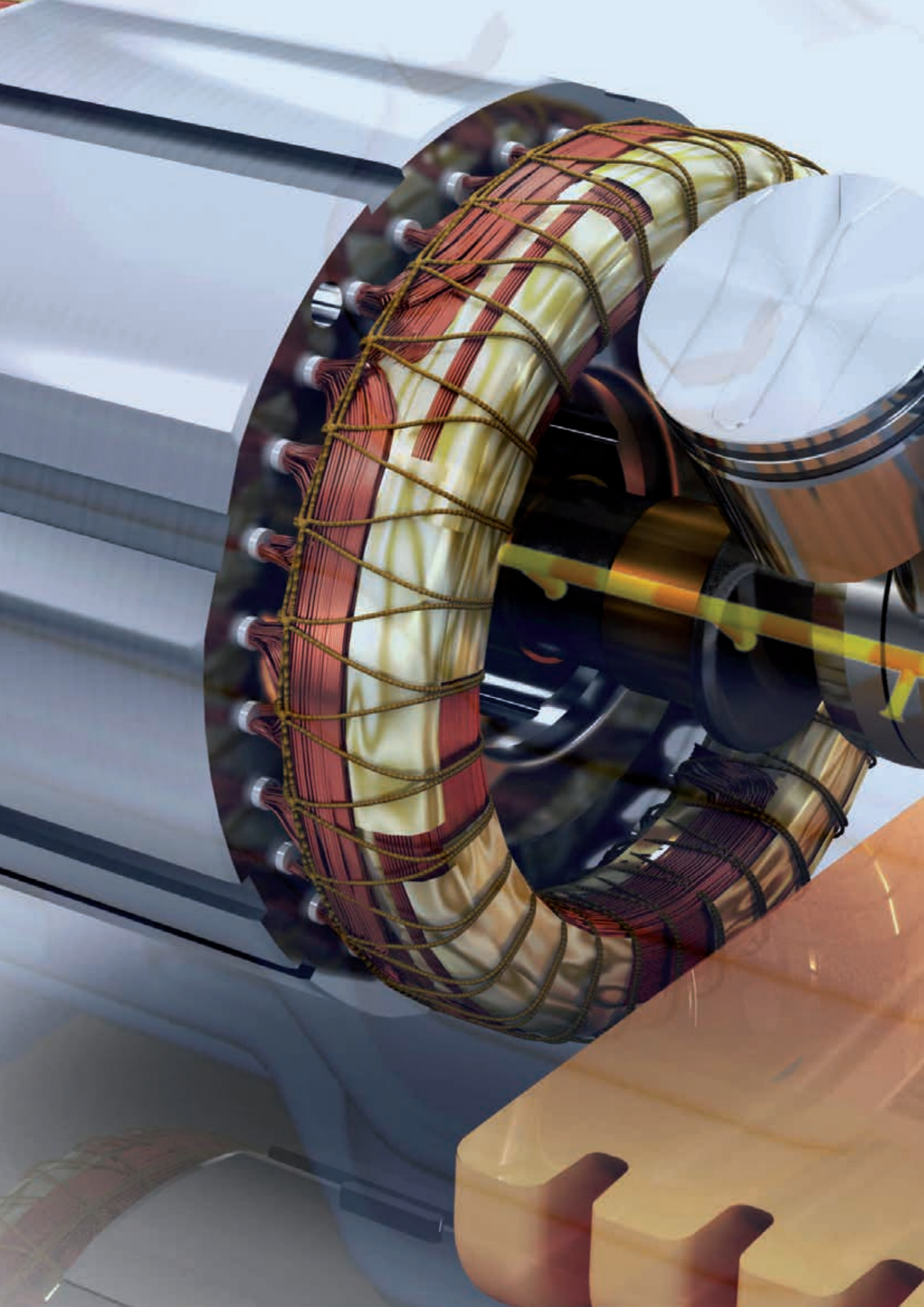
The F model series provides modern open type compressors for separate drive systems (using V belts or direct couplings). Load transfer through a V pair.

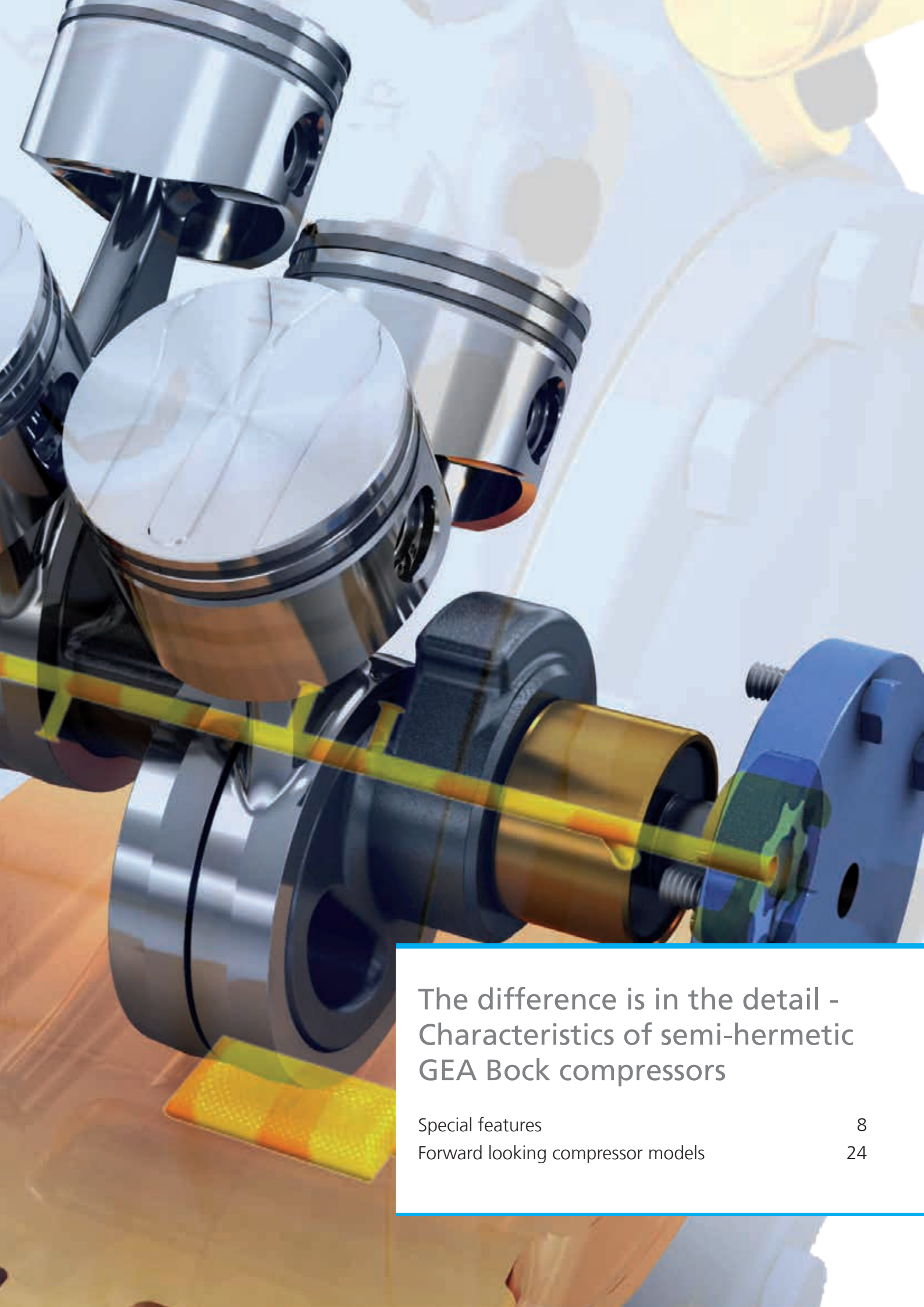
Virtually all drive capacity requirements can be met.

Very compact compressor design, robust and easy to handle. Oil pump lubrication as standard.

- F compressors
- F NH<sub>3</sub> compressors
- Compressor units for direct drive
- NH<sub>3</sub> Compressor units for direct drive







## The difference is in the detail - Characteristics of semi-hermetic GEA Bock compressors

Special features

8

Forward looking compressor models

24

## Universal

- e.g. R134a, R404A, R507, R407C, R22
- One compressor design for all standard refrigerants.
- For air-conditioning applications, normal refrigeration and deep-freezing
- Maximum allowed operating pressure: 28 bar

## High refrigeration capacity combined with minimum power requirement

- Optimized gas flow
- Efficient service valves
- Minimum clearance volume
- Powerful economic drive motors

## Wide range of applications without additional cooling

Deep-freezing range with R404A, R507 also available with suction gas cooling (HG version)

## Stable valve plate design

- Universally proven valve design with intake and discharge finger reed valves clamped on one side
- Valves made of high quality impact-resistant spring steel

## Replaceable motors

The compressors can be repaired in the field as the drive motor can be exchanged.

## Economic capacity control

- Cylinder cover incorporating a connection for capacity control
- Possible control stages:
  - 4 cylinder: 50 %
  - 6 cylinder: 33 % / 66 %
  - 8 cylinder: 25 % / 50 % / 75 %
- Continuously variable speed control (25 - 70 Hz) using a frequency converter.

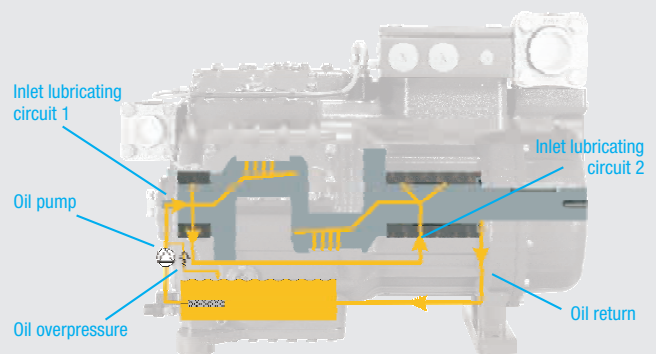
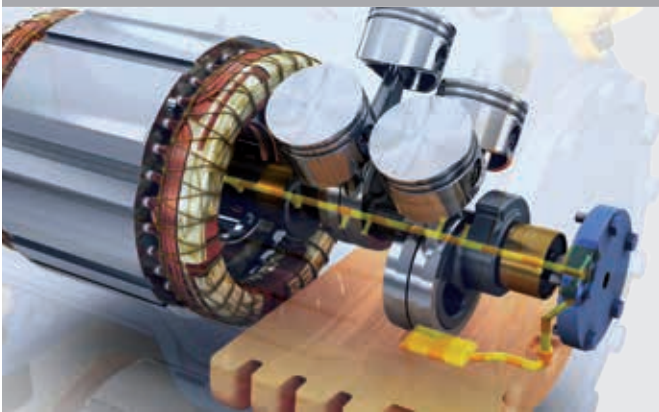
## Minimum space requirement

Particularly low installation height and width

## Quiet and low vibration

- Generously dimensioned crank mechanism
- Optimized mass balance
- Large volume pressure section for pulsation absorption
- 4 cylinder design from as little as 19 m³/h

## Safe, reliable oil supply



- 4 and 6 cylinder with a conventional single circuit lubricating system
- Lubricating system incorporating an oil pump
- Large volume oil sump

- 8 cylinder compressor with a dual circuit lubricating system (two oil circuits), each of the two main bearings supplied as the first lubrication point
- Oil pump lubrication independent of direction of rotation
- Connection possibility for oil pressure monitoring via  $\Delta p$ -oil differential pressure sensor
- Large volume oil sump
- Coupling option for oil level regulator as standard



Wear-resistant durable driving gear



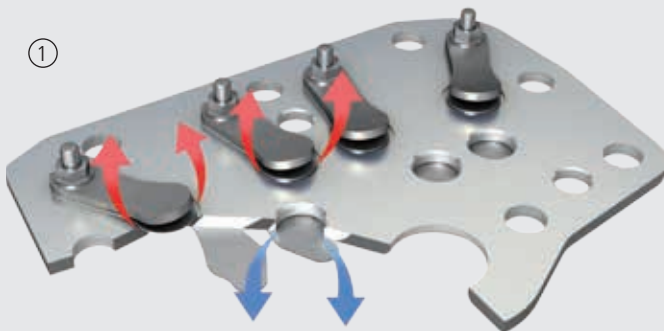
- 2 and 4 cylinder compressor HG(HA)12 to HG(HA)34
- Solid construction and design
- Low friction sleeve bearings
- Aluminium pistons with two ring assembly



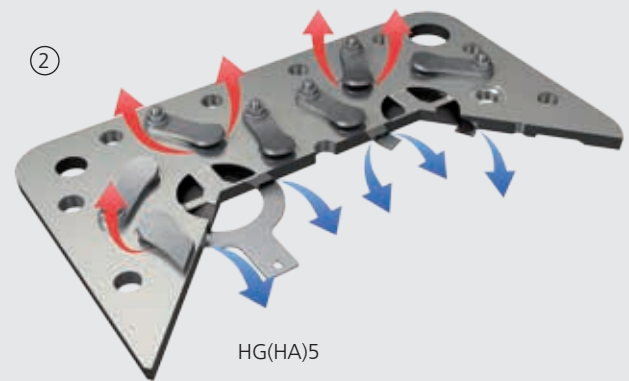
- 4 and 6 and 8 cylinder compressor HG(HA)4 to HG88e
- Solid construction and design
- Surface-hardened crankshaft
- Low friction sleeve bearings
- Aluminium pistons with triple ring assembly, hard-chromium plated sealing ring, HG(HA)4 with double ring assembly
- Aluminium connecting rod with high resistance piston bolt bearings starting from HG(HA)5

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Solid construction and design

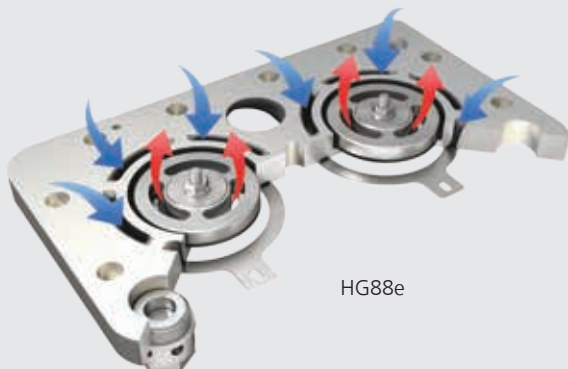


HG(HA)12-34  
HG(HA)4



HG(HA)5

- Valves made of high quality impact-resistant spring steel
- Concentric reed valves on the suction side (2) finger reed valves (1)



HG88e

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, which is specially adapted to the valve plate. Thus, the efficiency of the compressor can be increased considerably.

Variable suction line valve position (HG)

4 cylinder

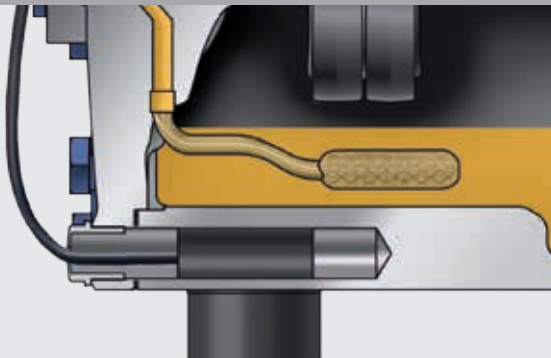


8 cylinder

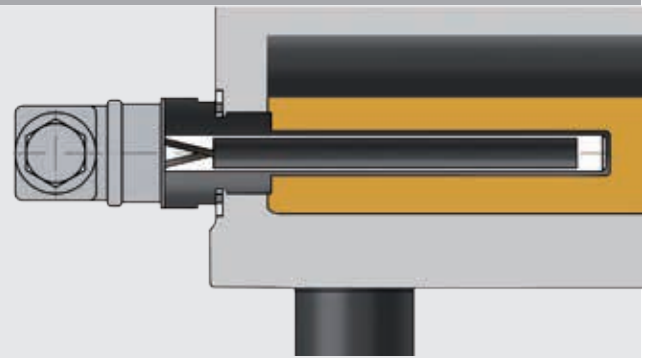


- Shut-off valve rotates through 90° (2 and 4 cylinder) suction cover rotates through 90° (8 cylinder)
- Flexible location for suction line connection

Oil sump heater



- Optional in 2 and 4 cylinder compressors HG(HA)12 up to HG(HA)34
- PTC heater, self-regulating
- Replacement without opening the refrigeration circuit



- Optional in 4- and 6- and 8-cylinder compressors HG(HA)4 up to HG88e
- Immersion case design
- Replacement without opening the refrigerating circuit

Electric switch box



- Robust aluminium construction
- Easy electrical installation due to large internal volume
- Terminal block with cables in glass seal model
- Hinged and removable lifting cover ① with a single quick fastener ②
- Terminal strip for add-on components
- Protection system: IP66



- Easy electrical installation due to large internal volume
- Terminal block with cables in glass seal model
- Hinged lifting cover with a single quick fastener (6 cylinder), ①
- Cover with simple snap closure (8 cylinder) ②
- Insulation between terminal studs
- Protection system: IP65

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# EFC System Electronic Frequency Control

Continuously variable speed control using frequency converter technology.

With the EFC system GEA Bock offers the most efficient means of adapting the capacity of the compressor to current refrigeration plant requirements: "Continuously variable speed control using frequency converter technology".

### 25 % or more energy saving potential!

The EFC system is optionally available for the compressors HG(HA)12P, HG22e, HA22P, HG34e and HA34P.

EFC systems are compactly mounted on the compressor, wired and connected ready for use.

It is activated by a pressure transducer mounted on the suction side. The adjustment range can be set individually.

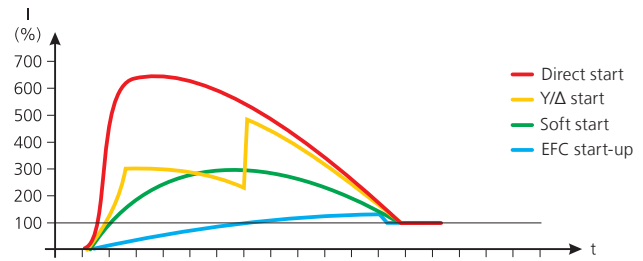
In December 2009, the EFC system received the BMU (German Environment Ministry) Climate Protection Innovation Award in Refrigeration Technology from the German Minister for Environment.



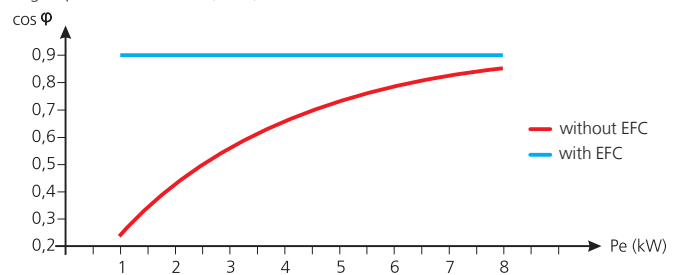
### The advantages of frequency-converter operation:

- Set for immediate connection and optimally programmed with data for the relevant compressor
- Fully variable adjustment of the refrigerating capacity on demand
- No high-energy, high-wear start/stop operation
- **25 % or more energy saving potential!**
- Reduced mechanical compressor load for longer service life
- Always optimum machine pressures and operating conditions
- Lower pressure losses in the heat exchangers
- Lower cooling down and heating up losses throughout the system
- Reduced start-up current at full torque
- Part windings and star-delta circuits no longer required
- Including motor monitoring
- Wired for immediate connection and compactly mounted on the compressor
- No additional wiring required
- Takes up no space in the switchboard
- Needs no screened supply lines to the compressor
- Control module also included for simple adjustment of the EFC system

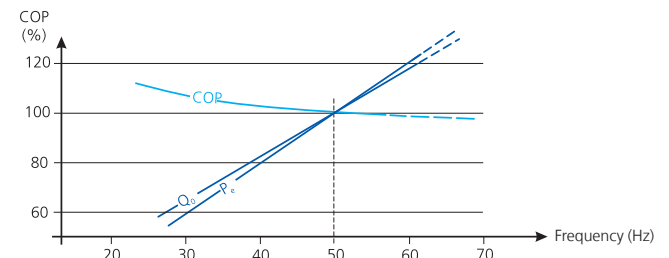
Start-up current with and without EFC



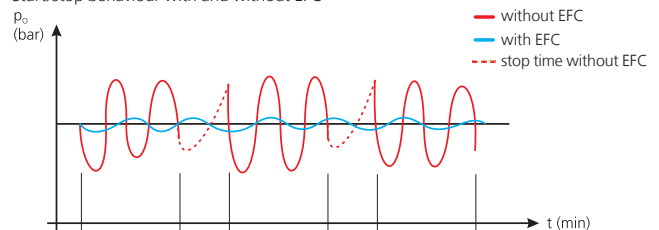
Engine performance factor (cos Φ) with and without EFC



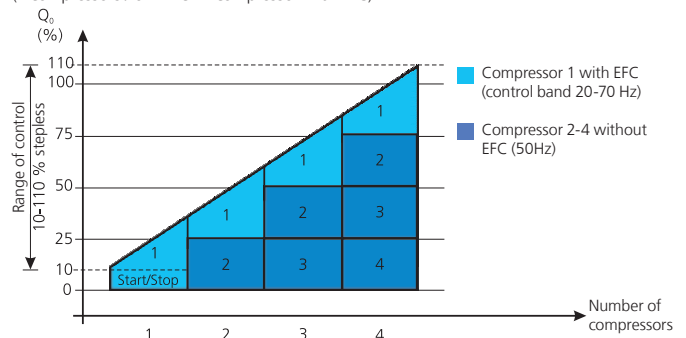
COP behaviour with EFC



Start/stop behaviour with and without EFC



Capacity control in rack operation (4 compressors / of which 1 compressor with EFC)



# EFC System Electronic Frequency Control

## EFC versions

Single compressors



HG12P, HA12P, HG22e, HA22P, HG34e, HA34P

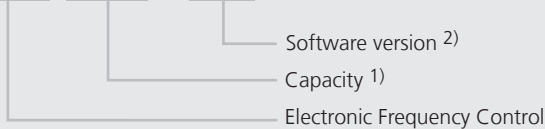
Duplex compressors



DHG12P, DHA12P, DHG22e, DHA22P, DHG34e, DHA34P

## Type key - EFC System

EFC 7,5 / A1



<sup>1)</sup> Capacity - Product selection

Compressor	EFC		
	2,2 kW	4,0 kW	7,5 kW
HG12P, HA12P	●		
HG22e, HA22P		●	
HG34e, HA34P			●

## Scope of supply EFC

- Basic equipment with intermediate adapter mounted on compressor terminal box, programmed and assembled ready for operation
- Pressure transducer for suction pressure based speed control <sup>1)</sup> mounted on the compressor
- Programming and readout hand-held terminal with connecting cable

## <sup>2)</sup> Software version

A1	Control signal 4-20 mA with pressure transducer
A2	Control signal 4-20 mA external (without pressure transducer)
A3	Control signal 0-10 V external (without pressure transducer)
A4	for duplex compressors, control signal 4-20 mA with pressure transducer
A5	for duplex compressors, control signal 4-20 mA external (without pressure transducer)
A6	for duplex compressors, control signal 1-10 V external (without pressure transducer)

# EFC System – Electronic Frequency Control

## Calculations

Calculating the maximum possible frequency of the compressor under specific operating conditions:

The following calculation is used to obtain the maximum possible frequency at the selected operating point:

$$f_{\max} = \frac{P_{\max} \times 50 \text{ Hz}}{P_e}$$

- $f_{\max}$  = Maximum permissible frequency [Hz]
- $P_{\max}$  = Maximum power consumption [kW] (see technical data)
- $P_e$  = Power consumption at the operating point at 50 Hz [kW] (see performance data, compressors)

Calculating the corresponding refrigerating capacity:

Refrigeration capacity can be determined as a function of frequency from the following calculation:

$$\dot{Q}_{0 \text{ operation}} = \frac{f_{\text{operation}} \times \dot{Q}_{0 \text{ 50 Hz}}}{50 \text{ Hz}}$$

- $\dot{Q}_{0 \text{ operation}}$  = Refrigerating capacity at the chosen operating point [W]
- $f_{\text{operation}}$  = Frequency at the chosen operating point [Hz]
- $\dot{Q}_{0 \text{ 50 Hz}}$  = Refrigerating capacity at the operating point at Hz [W] (see performance data, compressors)

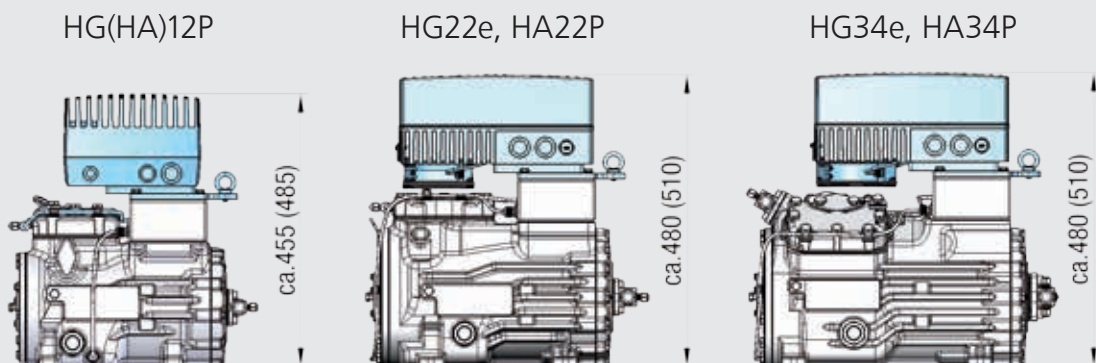
**i** As a rule, the maximum permissible power consumption of the compressor  $P_{\max}$  must not be exceeded. The maximum permissible frequency is always restricted in case of high evaporation temperatures associated with high condensing pressures with refrigerants R404A, R507, R407C, R22, ...  
 For the compressors HG12P/110-4 S, HG22e/190-4 S and HG34e/380-4 S you have to reduce the performance by about 5 Hz.

## Technical data, EFC

Unit designation	EFC 2,2	EFC 4,0	EFC 7,5
Protection	IP 65	IP 54	IP 54
Max. output current under continuous load	6 A	9,5 A	19 A
Max. output power	2,2 kW	4 kW	7,5 kW
Input	AC 400/500 V -3- PE 50/60 Hz		
	5,5/4,5 A	12,3/9,8 A	21,5/17,3 A
Output	AC 400/500 V -3- PE 0/650 Hz		
Permissible control range <sup>1)</sup>	30 - 70 Hz	30 - 70 Hz	25 - 70 Hz

<sup>1)</sup> The specified control ranges may vary depending on the operating condition and system structure.

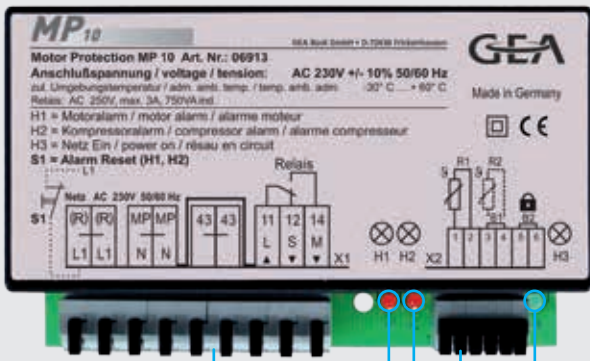
## Dimensional variations with the EFC system



Dimensions in ( ) = HA version

# MP10 – Motor Protection

## MP10 Electronic Motor Protection



**Supply section**  
Cable connections  
with screwless terminals

**Red LED**  
Temperature fault in motor

**Red LED**  
Temperature fault (random  
e.g. heat protection thermostat)

**Green LED**  
Mains supply  
available

**Drive section**  
Cable connections by  
screwless terminals

Temperature safety drive for the drive motor

Standard in all compressors

The exceptional feature is that the monitoring function and mains availability are shown by coloured LED's.

There are no complicated or time-consuming defect locating processes.

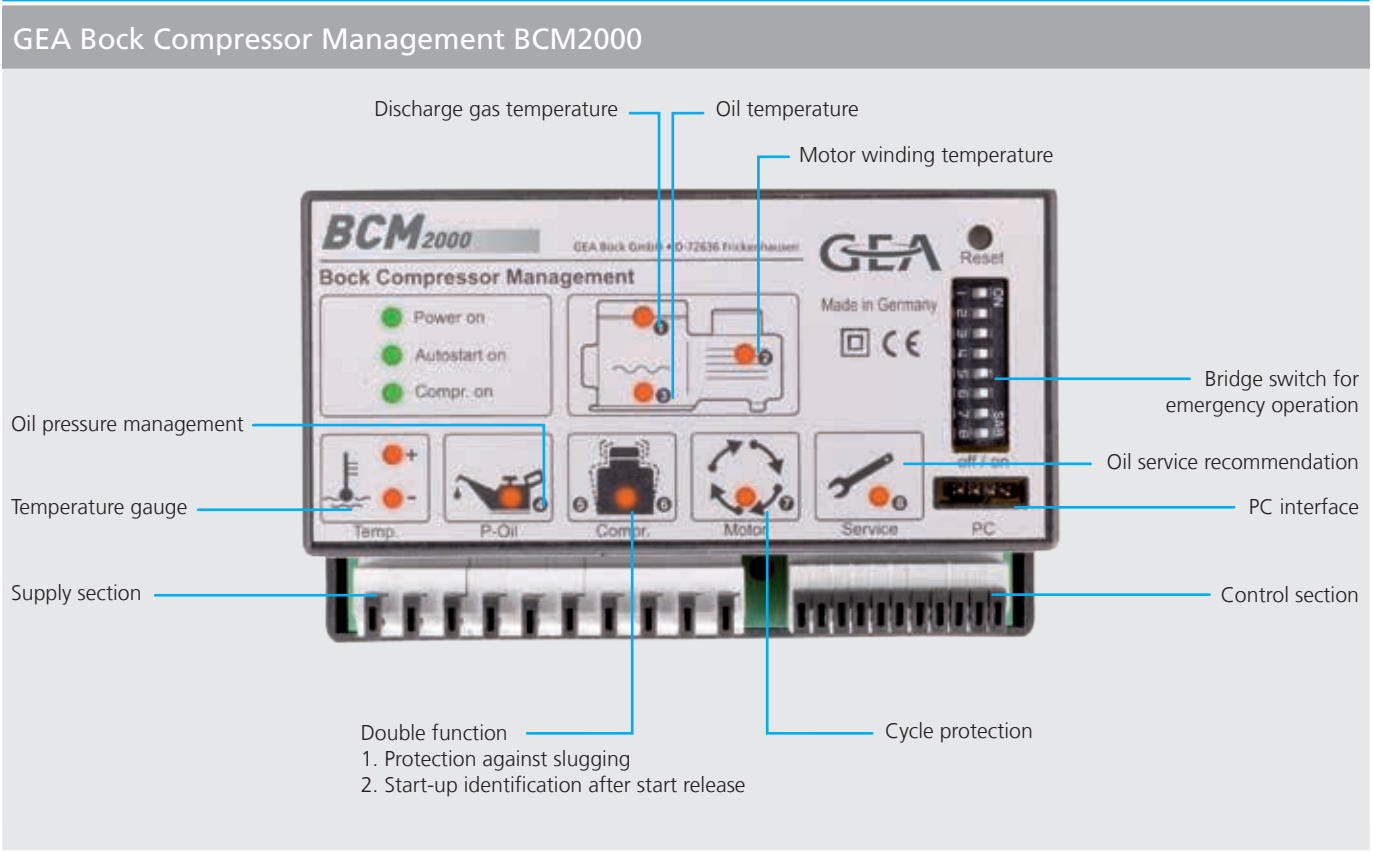
The MP10 also provides the usual functions as standard, e.g. a reconnection preventing device, a reset, free terminals for PTC temperature sensors (e.g. heat protection thermostat) and other useful items.

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## Technical data, MP10

Unit designation	MP10
Connection voltage	AC 230 V - 1 - 50/60 Hz
Relay	AC 250 V, 3 A, 750 VA ind.
Dimensions L/W/H	100 x 60 x 52 mm

# BCM2000 GEA Bock Compressor Management



## Technical data, BCM2000

Unit designation	BCM2000
Connection voltage	AC 230 V - 1 - 50/60 Hz
Relay	AC 250 V, 3 A, 750 VA ind.
Dimensions L/W/H	100 x 60 x 52 mm



## BCM2000 GEA Bock Compressor Management

### Multifunctional management system

Available as an option for HG(HA)4, 5, 6, HG7 and HG88e.

With the BCM2000, GEA Bock ist the first compressor manufacturer who offers a complete management system providing all the main functions for safe compressor operation in a practical compact assembly, user-friendly and economical.

#### Two central functions

- Protection against liquid slugging during start-up through the start-up identification system
- Oil service recommendations (calculation is based on operating data)

#### Other important functions

Monitoring of discharge gas temperature, motor winding temperature, oil temperature as well as oil pressure and cycle protection.

#### Simple and logical operation

- Self-explanatory symbols
- Status is indicated by LED's
- Clearly designed control unit

#### Simple electrical connection

- All monitoring functions are wired ready for operation
- Simple integration of the BCM2000 into the control circuit
- All cable connections have screwless terminals

#### Practical and easily accessible positioning in the compressor connection box

- Installed in place of the usual motor protection unit MP10 (same dimensions)
- Optimal visibility by inspection window in the cover of the connection box, only possible ex-works.

#### Reliable and economical

- Eight monitoring functions in one central unit
- Intelligent monitoring of the various functions including operating hour metering
- Simple recognition of the current status using an optical display
- Each function can be short cut for emergency operation
- Read facility for stored messages for fast and safe error analysis in the event of a fault or breakdown
- Loss-proof error memory even after power failure
- Self-monitoring sensor technology
- Connection facility for external error messages

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## INT69 G

### Motor Protection

#### Electronic Motor Protection INT69 G

PTC sensors  
Connection of up to nine  
PTC sensors possible



#### Temperature safety drive for the drive motor

The INT69 G is replacing, initially in the HG88e and in all future new developments, the MP10 compressors used as standard at GEA Bock.

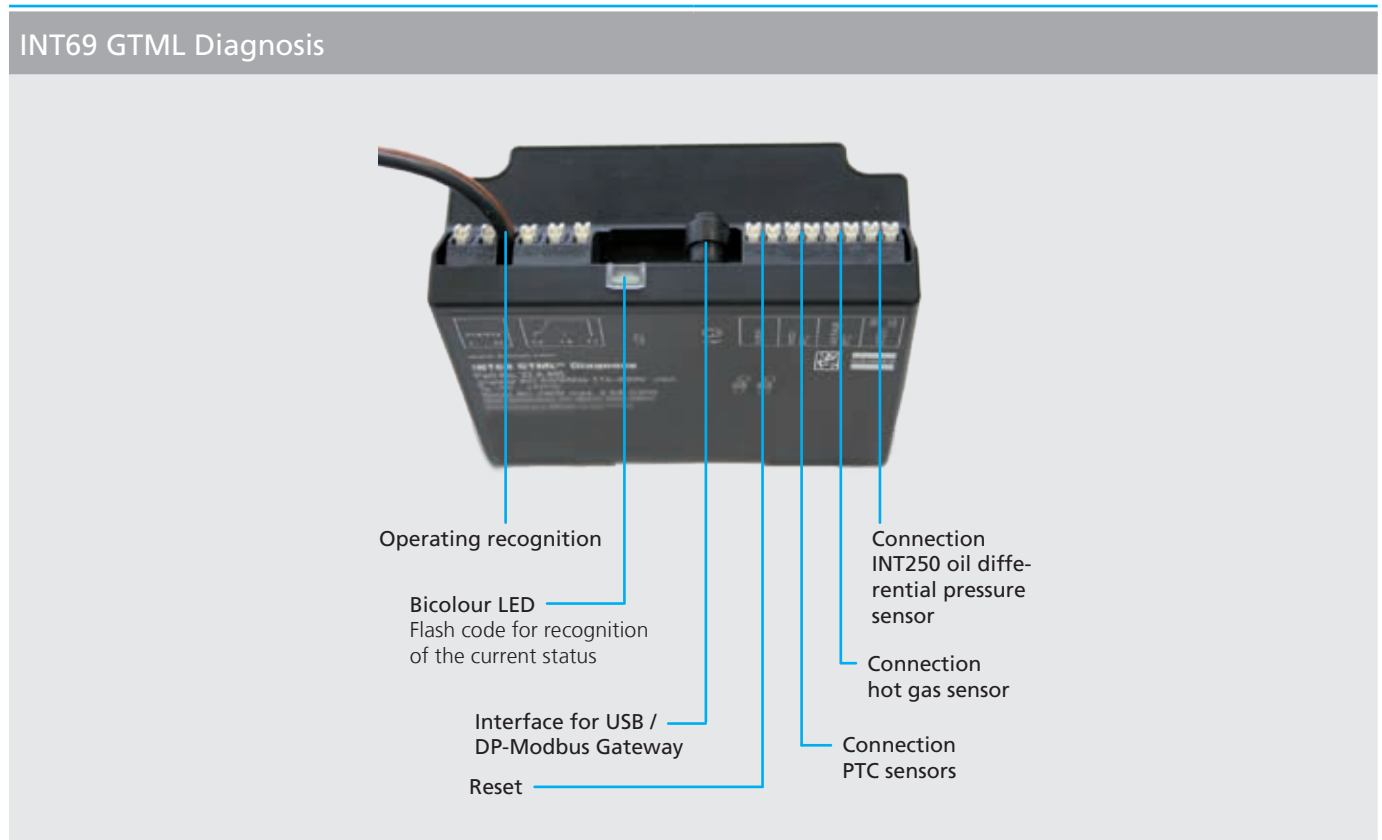
The INT69 G also provides the usual functions, as:

- motor temperature monitoring
- hot gas temperature monitoring
- a reconnection preventing device
- a reset

#### Technical data, INT69 G

Unit designation	INT69 G
Connection voltage	AC 115-230 V - 1 - 50/60 Hz $\pm$ 10% 3 VA
Relay	AC 240 V, 2,5A, C300
Dimensions L/B/H	53 x 33 x 68 mm

## INT69 G Diagnosis Units Motor Protection



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### Technical data, INT69 G Diagnose Units

Unit designation	INT69 GTML Diagnose
Connection voltage	AC 115-230 V - 1 - 50/60 Hz $\pm$ 10% 3 VA
Relay	AC 240 V, 2,5A, C300
Dimensions L/B/H	87 x 40 x 81,5 mm

## INT69 G Diagnose Units Motor Protection

### Multifunctional management system

The KRIWAN Diagnosis units are a further development of the reliable KRIWAN compressor protection units and optionally available for HG88e and all following new developments.

GEA Bock offers with this diagnosis units a complete management system providing all the main functions for safe compressor operation with the possibility of remote access in a practical compact assembly, userfriendly and economical.

The INT69 G Diagnose units automatically saves operational and error data in a non-volatile memory. This data can be retrieved on a PC as needed and analysed for diagnosis.

Both diagnosis units are provided with additional inputs for hot gas sensor. The INT69 GTML Diagnose unit also has inputs for the INT250 oil differential pressure sensor. Its additional flexible-response protective functions help to extend the service life of a refrigeration system.

### Simple electrical connection

- All monitoring functions are wired ready for operation
- Simple integration of the INT69 G Diagnose units into the control circuit
- The cable connections from the INT69 GTML Diagnose units have screwless terminals

### Other important functions

Monitoring of discharge gas temperature, motor winding temperature, oil pressure (only for INT69 GTML Diagnose) and cycle protection.

### Reliable and economical

- Intelligent monitoring of the various functions including operating hour metering
- Simple recognition of the current status using an optical flash code on the INT69 GTML Diagnose units
- Read facility for stored messages for fast and safe error analysis in the event of a fault or breakdown
- Loss-proof error memory even after power failure
- Self-monitoring sensor technology
- Connection facility for external error messages
- USB readout via USB converter
- Remote scanning possible via additional DP-Modbus Gateway / LAN-Gateway

### Read facility via INTspector diagnosis app for android smartphones

The KRIWAN diagnosis app INTspector enables the LED flash code on the INT69 GTML Diagnose unit to be read out and the error code interpreted. The INTspector diagnosis software can be downloaded for free at [www.kriwan.com](http://www.kriwan.com)

Advantages:

- Simple, intuitive use
- Instant diagnosis
- Datasheet retrieval

# INT69 G Diagnose Units 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 provides for its clear visualization.

Crucial evaluation parameters can be configured individually. This allows for a quick analysis and an efficient system management.

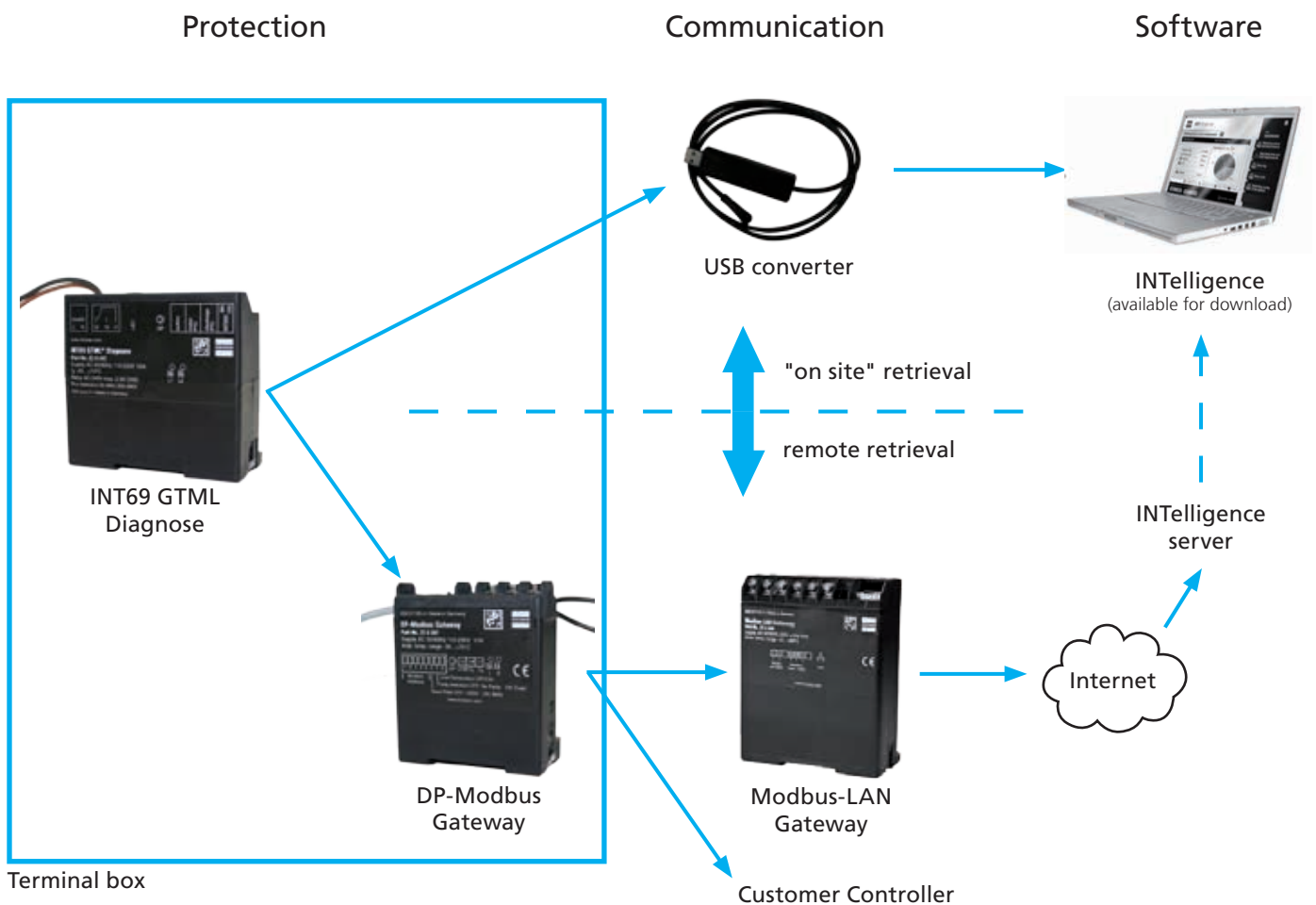
Advantages:

- 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 in a network.

The data are 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](http://www.kriwan.com).



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Further explanation can be found at [www.kriwan.com](http://www.kriwan.com).

In the event of inquiries please contact our Department for Application Technology, phone +49 7022 9454-0.

# ESS System Electronic Soft Start

Start unloader with the ESS (option)



ESS (Electronic Soft Start)

- Unit programmed ready to operate
- Compressor allotment can be set by the potentiometer
- Continuous compressor start-up to nominal speed
- Unit suitable for fitting into a switch cabinet (supplied loose)
- No need for conventional start unloaders
- Voltage AC 400 V - 3 - 50/60 Hz
- Control voltage AC 230V - 1 - 50/60 Hz

## Electronic compressor starter unit

Available as option for:

HG22e, HA22P, HG34e, HA34P

HG(HA)4, 5, 6

HG7

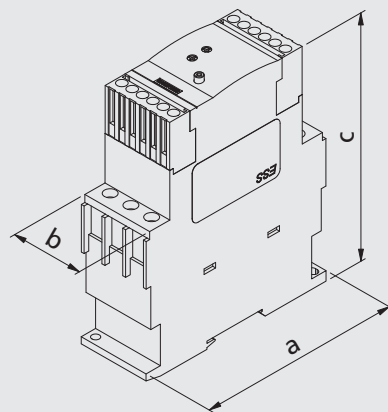
The start process uses an electronic soft start unit, instead of the conventional start unloader through the bypass solenoid valve, non-return valve and star-delta protector combination. This means that the compressor gets up to its nominal speed in a set time and therefore produces much lower power peaks than the classical star-delta start.

The unit is designed to fit into a switch cabinet.

### The advantages:

- Soft compressor start from zero to nominal speed, time controlled and monitored.
- Up to 40 % lower start-up power consumption than when using star-delta start
- No star-delta protection combination needed, no bypass between pressure and suction side needed. No solenoid valve or non-return valve needed.
- No compressor damage resulting from malfunction of the start unloader.

## Dimensions



Dimensions view technical data

## ESS System Electronic Soft Start

### Product selection

Compressor	ESS 25	ESS 38	ESS 63	ESS 72	ESS 106
HG22e, HA22P	•				
HG34e, HA34P	•				
HG4/465-4, HA4/465-4 HG4/465-4 S		• •			
HG4/555-4 HG4/555-4 S, HA4/555-4		•	•		
HG4/650-4 HG4/650-4 S, HA4/650-4		•	•		
HG5/725-4 HG5/725-4 S, HA5/725-4		•	•		
HG5/830-4 HG5/830-4 S, HA5/830-4		•	•		
HG5/945-4, HA5/945-4 HG5/945-4 S			• •		
HG6/1080-4 HG6/1080-4 S, HA6/1080-4			•	•	
HG6/1240-4, HA6/1240-4 HG6/1240-4 S				•	•
HG6/1410-4, HA6/1410-4 HG6/1410-4 S				•	•
HG7/1620-4 HG7/1620-4 S					• •
HG7/1860-4 HG7/1860-4 S <sup>1)</sup>					• •
HG7/2110-4 <sup>1)</sup>					•

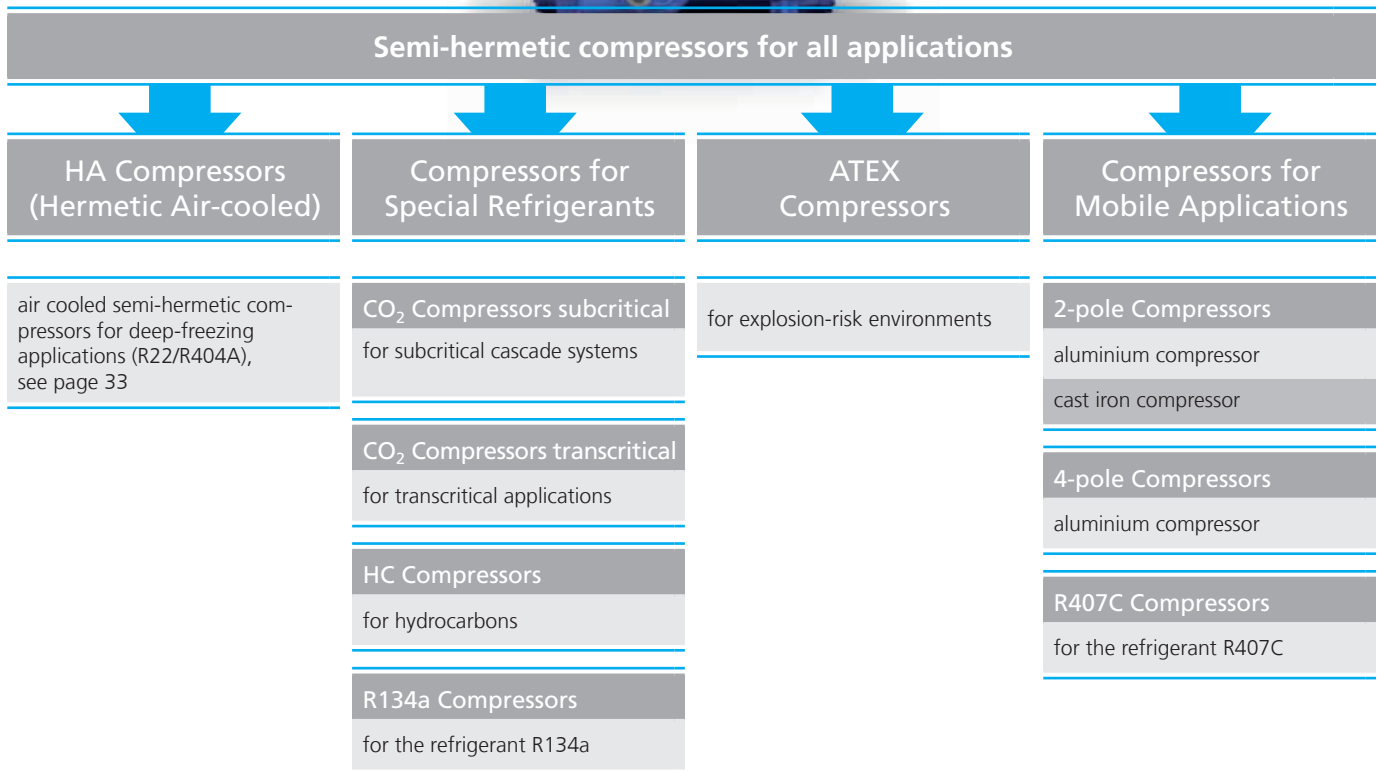
<sup>1)</sup> up to max. +40 °C ambient temperature

### Technical data, ESS

Unit designation	Protection	Max. output current <sup>1)</sup>	Input	Lost heat	Dimensions a / b / c
ESS 25	IP 20 Connectors IP00	25 A	AC 400 V -3- 50/60 Hz	8 W	125 x 45 x 150
ESS 38		38 A		19 W	125 x 45 x 150
ESS 63		63 A		12 W	160 x 55 x 170
ESS 72		72 A		15 W	160 x 55 x 170
ESS 106		106 A		21 W	170 x 70 x 190

<sup>1)</sup> at +50 °C ambient temperature

GEA Bock offers a choice of interesting compressor versions in the established semi-hermetic range for current market trends such as alternative refrigerants, deep-freezing or EX protection.



Available versions	HG12	HG22	HG34	HG4	HG5	HG6	HG7	HG88e
HA compressors	●	●	●	●	●	●		
CO <sub>2</sub> compressors subcritical	●	●	●	●				
CO <sub>2</sub> compressors transcritical			●					
HC compressors	●	●	●	●	●	●	●	●
R134a compressors				●	●	●	●	
ATEX compressors	●	●	●	●	●	●		
2-pole compressors aluminium			●					
2-pole compressors cast iron			●					
4-pole compressors aluminium		●	●					
R407C compressors			●					



## HA System Hermetic Air-cooled

Semi-hermetic air-cooled compressors for deep-freezing (R22/R404A)

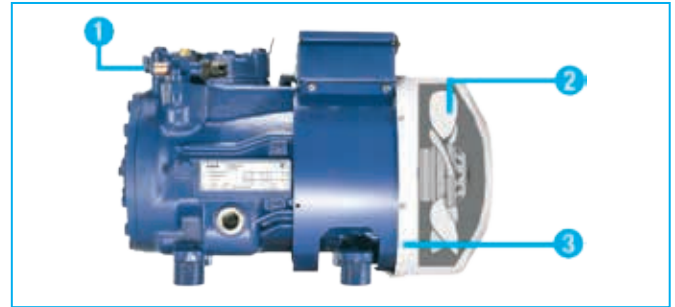
Available for all 2 and 4 cylinder versions.

Increasingly high specifications are being set for all suction gas-cooled semi-hermetic compressors for deep-freezing applications.

Compressors rapidly reach their temperature limits due to the rise in temperature of the suction gas caused by the drive motor. The refrigeration capacity also diminishes. But this does not apply for GEA Bock HA compressors.

The unique "GEA Bock HA principle" prevents this. The drive motor is air-cooled and compressor suction is direct. The suction gas is not heated by the motor, but is fed directly to the compressor without being diverted through the motor. The motor is cooled by a compact integrated ventilation unit. Its precise airflow cools not only the motor but also the compressor and especially the cylinder heads.

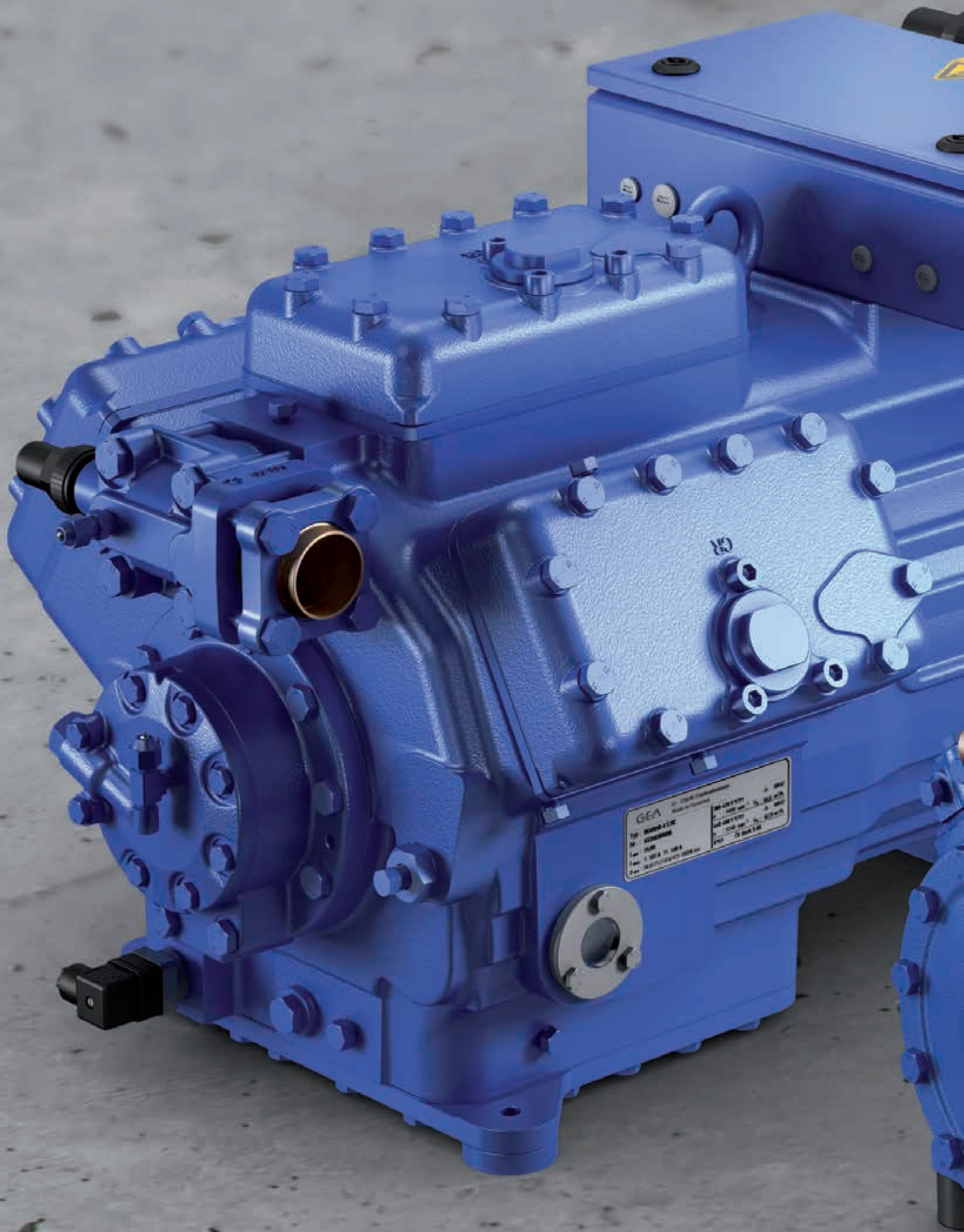
A semi-hermetic compressor with the advantages of an open type.



- ① Suction gas is fed directly into the compressor
- ② The motor is cooled by an integrated ventilation unit
- ③ Cool air is directed over the motor through an air duct hood

This results in a reduced discharge gas temperature and therefore an extended range of applications combined with improved capacity (deep-freezing - e.g. R22, R404A). In addition, the compressor is separate from the motor, which is a particular advantage in the event of a motor burn-out.





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## Single-stage semi-hermetic GEA Bock compressors

At a glance	28
Special features	29
Operating limits and performance data	30
Technical data	52
Dimensions and connections	54
Scope of supply and accessories	65

The GEA Bock semi-hermetic compressor program provides a full performance range of innovative and modern compressor designs in 2, 4, 6 and 8 cylinder constructions. The ideal solution for any kind of application.

### HG (Hermetic Gas-cooled)

Conventional suction gas-cooled compressor design

### HA (Hermetic Air-cooled)

Special GEA Bock design for deep-freezing (R22/R404A) with an air-cooled motor and direct suction at the cylinder.

### All the compressors display the same particularly remarkable features:

- Outstanding running comfort
- High efficiency and reliability to the highest quality standard
- Easy maintenance, e.g. interchangeable motors
- Oil pump lubrication
- MP10 electronic motor protection, especially easy to operate with LED status indicators
- Suitable for conventional and chlorine-free HFC refrigerants

### Available versions:

The GEA Bock semi-hermetic program provides the following product variants:

- Single-stage HG (HA) compressors
- Two-stage HGZ compressors
- Duplex DHG (DHA) compressors
- SHG (SHA) compressor units with receiver
- SHG (SHA) condenser units air-cooled

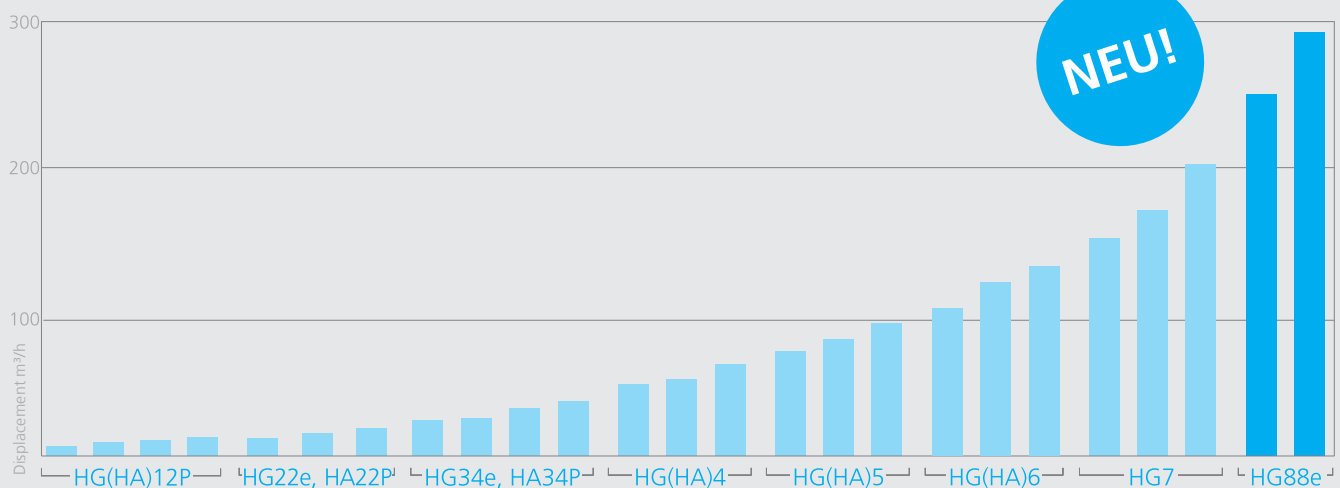
### Forward looking compressor models

GEA Bock offers a choice of interesting compressor versions in the established semi-hermetic range for current market trends such as alternative refrigerants, deep-freezing or EX protection.

- **HA (Hermetic Air-cooled)**, air-cooled compressors for deep-freezing applications
- **CO<sub>2</sub> Compressors (subcritical)**, for subcritical cascade systems
- **CO<sub>2</sub> Compressors (transcritical)**, for transcritical CO<sub>2</sub> applications
- **ATEX (ATmospheres EXplosibles)**, for explosion-risk environments

### The current program

...8 model sizes with 25 capacity stages from 5,4 to 281,3 m<sup>3</sup>/h (50 Hz)

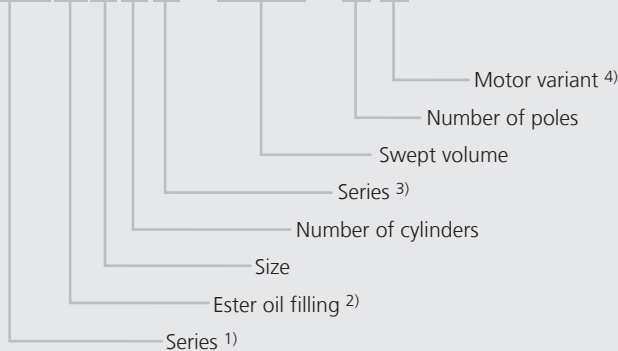




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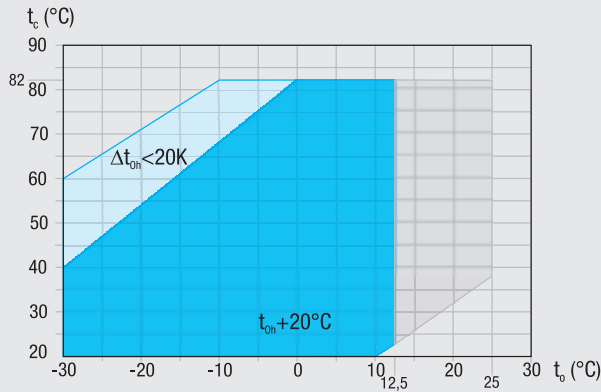
HGX34e / 215 - 4S



- 1) HG = Hermetic Gas-Cooled (suction gas-cooled)  
HA = Hermetic Air-Cooled (for deep-freezing)
- 2) X = Ester oil filling  
(HFC refrigerants e.g. R134a, R404A, R507, R407C)
- 3) e = Additional declaration for e-series compressors  
P = Additional declaration for Pluscom compressors
- 4) S = More powerful motor e.g. air-conditioning applications

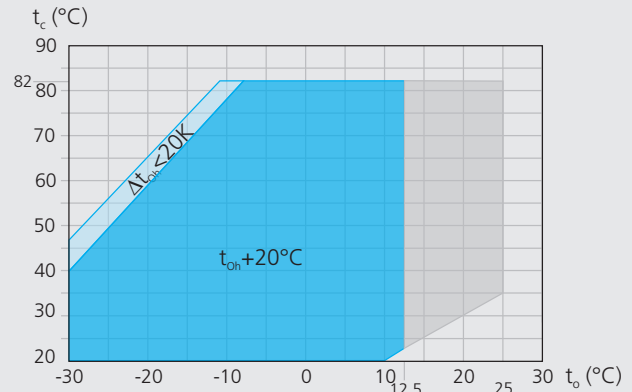
R134a Operating limits

HGX12P / HGX22e / HGX34e  
HGX4 / HGX5 / HGX6 / HGX7



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

HGX88e



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

1) LP = low pressure HP = high pressure

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

R134a Notes

Operating limits

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

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

Further explanation see [www.gea.com](http://www.gea.com)

Performance data

The performance data for R134a are based on ISO-DIS 9309 (DIN 8928) with a 50 Hz power supply frequency. This signifies:

**25 °C suction gas temperature without liquid subcooling.**

For Pluscom compressors and HGX88e operating at 50 Hz already comply with EN 12900. 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 Bock software.

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 Bock compressors can be found at [www.asercom.org](http://www.asercom.org) and [www.gea.com](http://www.gea.com).

R134a		Performance data											50 Hz		
Type	Cond. temp. °C		Cooling capacity $\dot{Q}_o$ [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	4486	4078	3697	3009	2415	1908	1480	1125	836	605		
		P	0,70	0,71	0,71	0,71	0,68	0,65	0,60	0,54	0,49	0,44	0,40		
	40	Q	4254	3874	3518	3185	2585	2066	1622	1246	931	670	455		
		P	0,85	0,84	0,83	0,81	0,77	0,71	0,65	0,59	0,54	0,49	0,45		
	50	Q	3620	3292	2985	2698	2181	1734	1349	1021	742	504	302		
P		0,99	0,97	0,94	0,91	0,85	0,77	0,70	0,63	0,57	0,52	0,49			
HGX12P/75-4	30	Q	6147	5604	5095	4619	3760	3017	2383	1849	1405	1044	756		
		P	0,88	0,89	0,89	0,88	0,85	0,81	0,75	0,68	0,61	0,55	0,50		
	40	Q	5315	4840	4395	3979	3229	2581	2027	1557	1163	837	569		
		P	1,06	1,05	1,04	1,02	0,96	0,89	0,82	0,74	0,67	0,61	0,57		
	50	Q	4523	4113	3729	3371	2725	2166	1686	1276	927	630	377		
P		1,24	1,21	1,18	1,14	1,06	0,97	0,88	0,79	0,71	0,65	0,62			
HGX12P/90-4	30	Q	7295	6663	6069	5511	4501	3623	2869	2229	1696	1259	911		
		P	1,09	1,11	1,12	1,13	1,11	1,06	1,00	0,92	0,83	0,74	0,65		
	40	Q	6377	5811	5280	4782	3883	3104	2437	1872	1402	1016	707		
		P	1,34	1,34	1,32	1,30	1,24	1,16	1,06	0,96	0,85	0,74	0,65		
	50	Q	5481	4981	4513	4075	3286	2606	2025	1535	1127	792	521		
P		1,60	1,57	1,53	1,49	1,39	1,27	1,14	1,01	0,89	0,77	0,67			
HGX12P/110-4	30	Q	8619	7858	7145	6477	5272	4231	3342	2593	1971	1464	1060		
		P	1,23	1,24	1,25	1,24	1,20	1,13	1,05	0,95	0,86	0,78	0,71		
	40	Q	7453	6787	6163	5580	4528	3619	2842	2183	1631	1173	797		
		P	1,49	1,48	1,45	1,42	1,35	1,25	1,14	1,04	0,94	0,85	0,79		
	50	Q	6342	5767	5229	4726	3820	3037	2364	1789	1299	883	528		
P		1,74	1,70	1,65	1,60	1,48	1,36	1,23	1,11	1,00	0,92	0,87			
HGX22e/125-4	30	Q	10200	9270	8440	7660	6220	4960	3860	2930	2160	1550	1090		
		P	1,30	1,35	1,38	1,39	1,39	1,34	1,25	1,14	1,02	0,891	0,765		
	40	Q	8990	8200	7450	6740	5440	4300	3310	2480	1790	1260	860		
		P	1,69	1,70	1,69	1,67	1,59	1,48	1,35	1,20	1,05	0,903	0,769		
	50	Q	7800	7090	6420	5780	4630	3620	2750	2020	1440	978	657		
P		2,02	1,98	1,94	1,88	1,75	1,59	1,41	1,24	1,06	0,908	0,773			
HGX22e/160-4	30	Q	12800	11600	10600	9560	7780	6240	4920	3810	2870	2110	1490		
		P	1,63	1,65	1,66	1,65	1,63	1,59	1,51	1,41	1,29	1,15	0,983		
	40	Q	11200	10200	9200	8330	6750	5390	4230	3240	2410	1730	1160		
		P	2,07	2,05	2,03	2,00	1,92	1,81	1,68	1,53	1,36	1,17	0,962		
	50	Q	9640	8760	7930	7170	5780	4580	3560	2680	1940	1310	783		
P		2,46	2,41	2,36	2,29	2,15	1,99	1,80	1,60	1,38	1,14	0,884			
HGX22e/190-4	30	Q	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		
	40	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		
	50	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					

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

Supplementary cooling or reduced suction gas temp.

R134a		Performance data											50 Hz	
Type	Cond. temp. °C	Q	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 <sup>1)</sup>	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	
	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	
HGX34e/315-4 <sup>1)</sup>	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	
	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	
HGX34e/380-4 <sup>1)</sup>	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	
HGX4/465-4	30	Q	36844	33673	30698	27910	22866	18484	14705	11472	8725	6406	4458	
		P	6,44	6,21	5,98	5,77	5,37	4,98	4,62	4,26	3,89	3,50	3,10	
	40	Q	33160	30273	27568	25038	20475	16524	13128	10228	7765	5682	3920	
		P	7,25	6,97	6,70	6,44	5,94	5,46	4,98	4,52	4,04	3,54	3,02	
	50	Q	28823	26257	23862	21629	17623	14181	11244	8754	6653	4882	3383	
		P	8,09	7,75	7,42	7,10	6,48	5,87	5,28	4,68	4,07	3,44	2,78	
HGX4/555-4	30	Q	43847	40074	36533	33215	27212	21997	17501	13652	10383	7624	5305	
		P	7,66	7,39	7,12	6,87	6,38	5,93	5,50	5,06	4,63	4,17	3,69	
	40	Q	39463	36027	32808	29798	24367	19665	15624	12172	9241	6762	4665	
		P	8,63	8,30	7,98	7,66	7,07	6,49	5,93	5,37	4,80	4,21	3,59	
	50	Q	34302	31248	28398	25741	20973	16876	13381	10418	7917	5810	4026	
		P	9,63	9,23	8,83	8,45	7,71	6,99	6,28	5,57	4,84	4,09	3,30	
HGX4/650-4	30	Q	51459	47031	42875	38981	31937	25816	20539	16023	12186	8948	6226	
		P	8,99	8,67	8,36	8,06	7,49	6,96	6,45	5,94	5,43	4,90	4,33	
	40	Q	46314	42282	38504	34971	28597	23079	18336	14285	10846	7936	5474	
		P	10,13	9,74	9,36	8,99	8,29	7,62	6,96	6,31	5,64	4,95	4,22	
	50	Q	40257	36673	33328	30209	24614	19806	15704	12227	9292	6818	4724	
		P	11,30	10,83	10,37	9,92	9,05	8,20	7,37	6,53	5,68	4,80	3,88	
HGX4/650-4	60	Q	33186	30106	27246	24596	19887	15897	12544	9747	7424	5494	3876	
		P	12,51	11,94	11,38	10,84	9,77	8,72	7,68	6,63	5,56	4,46	3,31	
	70	Q	25002	22478	20158	18031	14315	11250	8754	6745	5142			
		P	13,76	13,08	12,41	11,75	10,45	9,17	7,89	6,60	5,29			

Relating to 25 °C suction gas temperature (HGX34e to 20 °C suction gas temperature) without liquid subcooling

<sup>1)</sup> Compressors are ASERCOM certified




Supplementary cooling or reduced suction gas temp.





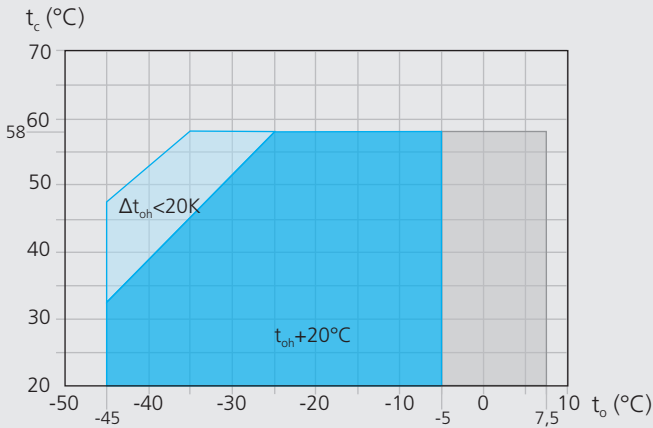
R134a		Performance data											50 Hz	
Type	Cond. temp. °C		Cooling capacity $\dot{Q}_o$ [W]						Power consumption $P_e$ [kW]					
			Evaporating temperature °C											
			12,5	10	7,5	5	0	-5	-10	-15	-20	-25	-30	
HGX7/1860-4	30	Q	139469	127396	116108	105573	86635	70327	56394	44583	34639	26307	19334	
		P	18,89	19,20	19,34	19,32	18,90	18,01	16,78	15,29	13,66	11,98	10,37	
	40	Q	125034	113989	103680	94075	76853	62067	49463	38787	29784	22201	15782	
		P	24,14	24,00	23,72	23,31	22,15	20,62	18,84	16,90	14,91	12,96	11,17	
	50	Q	110190	100194	90887	82236	66775	53557	42327	32832	24817	18027	12208	
		P	28,92	28,36	27,68	26,89	25,05	22,94	20,65	18,31	16,00	13,83	11,91	
60	Q	94985	86063	77780	70105	56451	44847	35037	26768	19786	13835	8662		
	P	33,13	32,18	31,12	29,99	27,51	24,86	22,13	19,42	16,85	14,51	12,50		
70	Q	79471	71645	64409	57733	45932	35987	27643	20646	14742				
	P	36,71	35,38	33,98	32,51	29,45	26,31	23,18	20,16	17,37				
HGX7/2110-4	30	Q	158685	144949	132106	120119	98571	80016	64164	50725	39411	29932	21997	
		P	21,49	21,84	22,00	21,99	21,50	20,49	19,09	17,40	15,54	13,64	11,80	
	40	Q	142261	129694	117965	107037	87442	70618	56278	44131	33888	25259	17956	
		P	27,47	27,31	26,99	26,52	25,20	23,47	21,44	19,23	16,96	14,75	12,71	
	50	Q	125371	113999	103409	93566	75975	60936	48159	37356	28236	20510	13890	
		P	32,90	32,26	31,49	30,59	28,50	26,10	23,50	20,83	18,20	15,74	13,55	
60	Q	108072	97921	88497	79764	64229	51026	39864	30456	22512	15741	9855		
	P	37,70	36,61	35,41	34,12	31,30	28,28	25,18	22,10	19,17	16,50	14,22		
70	Q	90421	81516	73284	65688	52260	40945	31451	23490	16773				
	P	41,77	40,25	38,66	36,99	33,51	29,93	26,37	22,94	19,77				
HGX88e/2735-4	30	Q	232000	211000	192000	174000	141000	113000	88900	69000	52500	39100	28500	
		P	30,10	30,10	29,90	29,50	28,30	26,70	24,70	22,50	20,10	17,70	15,40	
	40	Q	205000	186000	169000	153000	123000	98000	76800	59000	44300	32400	22800	
		P	37,10	36,50	35,60	34,70	32,50	29,90	27,10	24,10	21,20	18,40	15,80	
	50	Q	178000	161000	146000	131000	106000	83500	65000	49600	36900	26400		
		P	43,30	42,00	40,60	39,10	35,90	32,50	29,00	25,40	22,00	18,90		
60	Q	150000	136000	123000	110000	88000	69400	53800	40800	30000				
	P	48,50	46,70	44,80	42,80	38,70	34,50	30,40	26,30	22,60				
70	Q	123000	111000	99500	89200	71000	55700	43000	32500					
	P	52,80	50,50	48,10	45,70	40,80	36,00	31,30	26,80					
HGX88e/3235-4	30	Q	275000	250000	227000	205000	166000	133000	105000	81300	62100	46600	34500	
		P	37,80	37,20	36,40	35,60	33,70	31,40	28,90	26,20	23,40	20,70	18,00	
	40	Q	242000	219000	199000	180000	145000	116000	90600	69900	52800	39000	27900	
		P	45,10	43,90	42,60	41,30	38,30	35,10	31,80	28,40	25,00	21,70	18,60	
	50	Q	209000	189000	171000	154000	124000	98200	76700	58700	43800	31500		
		P	51,90	50,20	48,30	46,40	42,50	38,40	34,20	30,10	26,00	22,20		
60	Q	176000	159000	143000	129000	103000	81200	62900	47600	34800				
	P	57,90	55,50	53,10	50,70	45,70	40,70	35,70	30,90	26,20				
70	Q	143000	129000	116000	104000	82200	64300	49200	36600					
	P	62,60	59,70	56,70	53,80	47,80	41,90	36,10	30,50					

Relating to 25 °C suction gas temperature  
(HGX88e to 20 °C suction gas temperature)  
without liquid subcooling

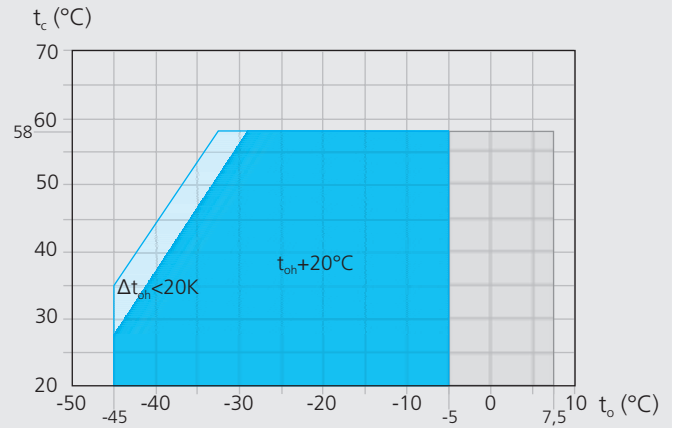
 Supplementary cooling or reduced suction gas temp.

R404A/R507 Operating limits

HGX12P / HGX22e / HGX34e  
HGX4 / HGX5 / HGX6<sup>①</sup> / HGX7

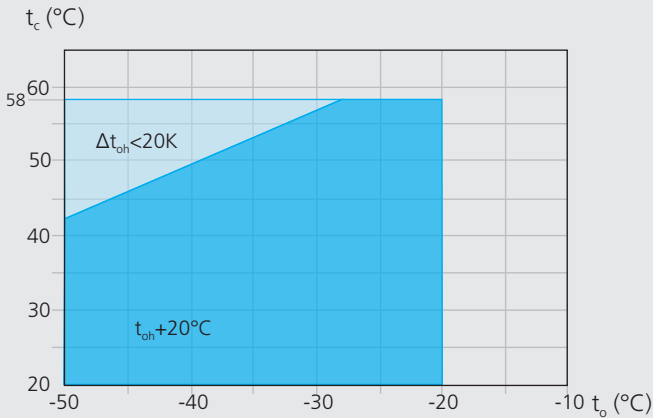


HGX88e

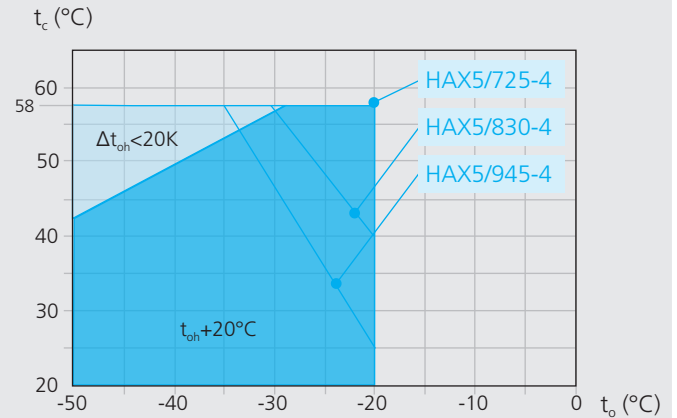


- ① HGX6/1410-4S Maximum evaporating temperature  $t_o = 2\text{ }^\circ\text{C}$
- HGX6/1410-4 Maximum evaporating temperature  $t_o = -7\text{ }^\circ\text{C}$

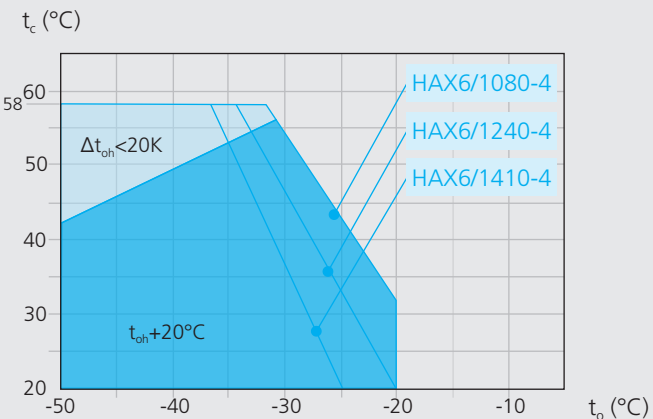
HAX12P / HAX22P / HAX34P / HAX4



HAX5



HAX6



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

<sup>1)</sup> LP = low pressure HP = high pressure

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

- $t_o$  Evaporating temperature ( $^\circ\text{C}$ )
- $t_c$  Condensing temperature ( $^\circ\text{C}$ )
- $\Delta t_{oh}$  Suction gas superheat (K)
- $t_{oh}$  Suction gas temperature ( $^\circ\text{C}$ )

- 1
- 2
- 3
- 4

## R404A/R507 Notes

**Operating limits**

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

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

Further explanation see [www.gea.com](http://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 Bock software.

**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 Bock compressors can be found at [www.asercom.org](http://www.asercom.org) and [www.gea.com](http://www.gea.com).

R404A/R507		Performance data											50 Hz		
Type	Cond. temp. °C	Q	Cooling capacity $\dot{Q}_0$ [W]										Power consumption $P_e$ [kW]		
			Evaporating temperature °C										-40	-45	
			7,5	5	0	-5	-10	-15	-20	-25	-30	-35			
HGX12P/60-4 S <sup>1)</sup>	30	P	6535	5989	4990	4108	3336	2667	2094	1610	1207	878	616	414	
	40	Q	5537	5060	4191	3428	2764	2193	1706	1297	959	684	465	296	
		P	1,49	1,48	1,43	1,37	1,28	1,18	1,06	0,95	0,83	0,71	0,61	0,52	
HAX12P/60-4	30	P							2327	1851	1442	1097	809	573	
	40	Q							1,04	0,95	0,86	0,75	0,66	0,56	
		P								1956	1538	1182	883	635	435
HGX12P/75-4 <sup>1)</sup>	40	Q	8160	7498	6284	5227	4288	3469	2764	2164	1661	1246	911	648	
		P	1,52	1,54	1,55	1,50	1,45	1,37	1,26	1,15	1,03	0,91	0,79	0,68	
	50	Q	6934	6357	5304	4419	3606	2902	2299	1789	1364	1015	734	513	
P		1,91	1,89	1,83	1,73	1,63	1,50	1,37	1,23	1,08	0,94	0,81	0,69		
HAX12P/75-4	40	Q	5729	5238	4345	3632	2945	2355	1855	1435	1087	804	577		
		P	2,21	2,17	2,05	1,92	1,78	1,62	1,45	1,29	1,12	0,96	0,82		
	50	Q								2888	2296	1789	1361	1004	711
P									1,29	1,18	1,06	0,94	0,81	0,70	
HGX12P/90-4 <sup>1)</sup>	40	Q	8288	7600	6344	5145	4202	3381	2676	2075	1571	1155	817	549	
		P	2,27	2,25	2,17	2,02	1,88	1,72	1,56	1,39	1,21	1,04	0,88	0,72	
	50	Q	6863	6276	5212	4219	3418	2727	2137	1640	1226	886	611		
P		2,66	2,60	2,46	2,25	2,06	1,85	1,65	1,44	1,24	1,04	0,86			
HAX12P/90-4	40	Q							3407	2698	2089	1574	1146	796	
		P							1,56	1,43	1,29	1,15	1,00	0,86	
	50	Q							2853	2229	1699	1254	889	596	
P								1,67	1,50	1,33	1,15	0,98	0,82		
HGX12P/110-4 <sup>1)</sup>	40	Q	9738	8948	7500	6085	5000	4052	3231	2529	1937	1446	1047	730	
		P	1,85	1,86	1,86	1,78	1,69	1,58	1,46	1,32	1,18	1,03	0,89	0,75	
	50	Q	9581	8796	7361	6125	5039	4091	3270	2567	1972	1473	1062	728	
P		2,65	2,62	2,53	2,47	2,30	2,10	1,89	1,68	1,46	1,25	1,05	0,88		
HAX12P/110-4	40	Q	7877	7211	6000	5010	4095	3301	2619	2039	1549	1141	803		
		P	3,12	3,05	2,89	2,74	2,50	2,25	1,99	1,73	1,49	1,26	1,05		
	50	Q								4092	3265	2558	1960	1461	1051
P									1,78	1,63	1,46	1,28	1,11	0,94	
HGX22e/125-4	40	Q	11247	10345	8691	7218	5966	4868	3914	3094	2397	1814	1334	946	
		P	2,17	2,18	2,16	2,15	2,05	1,92	1,76	1,59	1,41	1,23	1,05	0,88	
	50	Q	9581	8796	7361	6125	5039	4091	3270	2567	1972	1473	1062	728	
P		2,65	2,62	2,53	2,47	2,30	2,10	1,89	1,68	1,46	1,25	1,05	0,88		
HAX22P/125-4	40	Q	7877	7211	6000	5010	4095	3301	2619	2039	1549	1141	803		
		P	3,12	3,05	2,89	2,74	2,50	2,25	1,99	1,73	1,49	1,26	1,05		
	50	Q								4092	3265	2558	1960	1461	1051
P									1,78	1,63	1,46	1,28	1,11	0,94	
HGX22e/160-4	40	Q	13400	12400	10500	8790	7250	5870	4650	3590	2680	1920	1320	857	
		P	2,19	2,23	2,26	2,24	2,16	2,03	1,88	1,69	1,49	1,28	1,07	0,878	
	50	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		
HAX22P/160-4	40	Q	9650	8860	7390	6080	4910	3880	2990	2230	1610	1110	749		
		P	3,26	3,19	3,03	2,84	2,60	2,34	2,07	1,80	1,53	1,27	1,03		
	50	Q								4728	3791	2981	2291	1715	1247
P									1,92	1,71	1,51	1,32	1,13	0,94	
HGX22e/160-4 S <sup>1)</sup>	40	Q	14500	13400	11200	9170	7540	6090	4810	3700	2750	1960	1330	851	
		P	3,42	3,40	3,30	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	971		
P		4,02	3,94	3,73	3,51	3,22	2,90	2,58	2,25	1,92	1,60	1,30			
HAX22P/160-4	40	Q								5837	4680	3680	2828	2118	1540
		P								2,37	2,11	1,87	1,63	1,40	1,17
	50	Q								4888	3899	3044	2316	1706	1207
P									2,58	2,27	1,98	1,69	1,41	1,14	
50	Q								3964	3134	2414	1799	1281	851	
	P								2,74	2,38	2,03	1,69	1,36	1,03	

Relating to 20 °C suction gas temp. without liquid subcooling

<sup>1)</sup> Compressors (R404A) are ASERCOM certified



Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temp.

R404A/R507		Performance data											50 Hz			
Type	Cond. temp. °C	Q P	Cooling capacity $\dot{Q}_o$ [W]										Power consumption $P_e$ [kW]			
			Evaporating temperature °C													
			7,5	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45		
HGX22e/190-4 HGX22e/190-4 S <sup>1)</sup>	30	Q P	20800 3,46	19200 3,48	16100 3,46	13300 3,41	11000 3,26	8920 3,07	7140 2,84	5620 2,57	4330 2,29	3240 2,00	2350 1,70	1620 1,41		
	40	Q P	17800 4,28	16400 4,23	13700 4,09	11300 3,93	9200 3,68	7450 3,39	5940 3,08	4640 2,74	3540 2,39	2620 2,03	1860 1,68	1230 1,35		
	50	Q P	14800 5,04	13600 4,93	11300 4,66	9150 4,40	7460 4,06	6000 3,68	4750 3,27	3680 2,85	2780 2,43	2020 2,01	1390 1,61			
HAX22P/190-4	30	Q P							7063 2,87	5663 2,55	4453 2,26	3422 1,97	2562 1,69	1863 1,41		
	40	Q P							5915 3,12	4718 2,75	3684 2,39	2802 2,05	2064 1,71	1460 1,37		
	50	Q P							4797 3,31	3792 2,88	2922 2,45	2177 2,04	1550 1,64	1030 1,25		
HGX34e/215-4 <sup>1)</sup> HGX34e/215-4 S <sup>1)</sup>	30	Q P	23900 3,83	21900 3,85	18200 3,84	14600 3,70	11900 3,52	9470 3,26	7390 2,94	5610 2,58	4120 2,21	2900 1,84	1940 1,49	1220 1,18		
	40	Q P	20200 4,72	18500 4,65	15300 4,48	12200 4,26	9840 3,94	7770 3,56	5990 3,14	4480 2,70	3230 2,27	2220 1,85	1430 1,47	851 1,15		
	50	Q P	16500 5,48	15000 5,33	12200 4,99	9770 4,67	7800 4,23	6090 3,75	4630 3,25	3420 2,74	2420 2,26	1630 1,81	1040 1,42			
HAX34P/215-4	30	Q P							8042 3,26	6449 2,91	5071 2,57	3897 2,24	2918 1,92	2122 1,61		
	40	Q P							6735 3,56	5372 3,13	4194 2,73	3190 2,33	2350 1,95	1662 1,57		
	50	Q P							5462 3,77	4317 3,27	3327 2,79	2479 2,33	1765 1,87	1172 1,42		
HGX34e/255-4 <sup>1)</sup> HGX34e/255-4 S <sup>1)</sup>	30	Q P	28000 4,57	25700 4,61	21500 4,59	17200 4,44	14200 4,23	11500 3,95	9120 3,61	7080 3,22	5350 2,81	3900 2,39	2730 1,97	1820 1,58		
	40	Q P	23800 5,64	21800 5,58	18100 5,38	14500 5,14	11800 4,76	9460 4,33	7430 3,86	5680 3,37	4210 2,87	3010 2,38	2050 1,92	1320 1,50		
	50	Q P	19500 6,55	17700 6,40	14600 6,02	11700 5,68	9410 5,15	7450 4,58	5760 4,00	4330 3,41	3150 2,84	2200 2,30	1480 1,80			
HAX34P/255-4	30	Q P							9456 3,84	7582 3,42	5962 3,02	4582 2,64	3430 2,26	2495 1,89		
	40	Q P							7919 4,18	6317 3,68	4932 3,20	3751 2,74	2763 2,29	1955 1,84		
	50	Q P							6422 4,44	5076 3,85	3911 3,28	2915 2,73	2075 2,20	1379 1,67		
HGX34e/315-4 <sup>1)</sup> HGX34e/315-4 S <sup>1)</sup>	30	Q P	33800 5,86	31000 5,82	26000 5,67	21300 5,47	17600 5,20	14300 4,85	11400 4,43	8840 3,98	6700 3,49	4930 2,99	3490 2,49	2370 2,01		
	40	Q P	28700 7,05	26300 6,92	22000 6,59	17900 6,29	14700 5,83	11900 5,32	9350 4,76	7220 4,18	5400 3,58	3880 2,98	2650 2,40	1690 1,86		
	50	Q P	23500 8,13	21500 7,90	17800 7,39	14500 6,97	11800 6,34	9430 5,67	7370 4,96	5600 4,25	4100 3,54	2840 2,85	1820 2,20			
HAX34P/315-4	30	Q P							11674 4,74	9361 4,22	7360 3,73	5657 3,26	4235 2,79	3080 2,33		
	40	Q P							9776 5,16	7798 4,55	6088 3,96	4631 3,38	3411 2,82	2413 2,27		
	50	Q P							7929 5,48	6267 4,75	4829 4,05	3599 3,38	2562 2,71	1702 2,06		
HGX34e/380-4 <sup>1)</sup> HGX34e/380-4 S <sup>1)</sup>	30	Q P	40900 7,20	37600 7,15	31700 6,98	25800 6,84	21200 6,45	17300 5,98	13800 5,46	10900 4,88	8300 4,28	6200 3,67	4490 3,05	3120 2,45		
	40	Q P	34600 8,75	31800 8,59	26700 8,18	21600 7,84	17700 7,25	14300 6,59	11400 5,90	8850 5,18	6730 4,45	4960 3,72	3510 3,00	2340 2,33		
	50	Q P	28400 10,10	26000 9,86	21800 9,23	17600 8,73	14300 7,92	11500 7,08	9030 6,22	6960 5,34	5210 4,47	3760 3,62	2550 2,81			
HAX34P/380-4	30	Q P							14125 5,73	11327 5,11	8906 4,51	6845 3,94	5125 3,38	3726 2,82		
	40	Q P							11829 6,25	9436 5,50	7367 4,79	5604 4,09	4128 3,42	2920 2,75		
	50	Q P							9594 6,63	7583 5,75	5843 4,91	4355 4,09	3100 3,28	2059 2,49		
HGX4/465-4 <sup>1)</sup> HGX4/465-4 S <sup>1)</sup>	30	Q P	49311 9,55	45325 9,44	38018 9,13	31142 8,81	25587 8,32	20747 7,71	16575 7,01	13020 6,24	10035 5,45	7569 4,66	5576 3,91	4005 3,21		
	40	Q P	42248 11,33	38764 11,08	32400 10,52	26283 10,08	21490 9,31	17340 8,45	13783 7,53	10770 6,58	8253 5,64	6183 4,73	4511 3,88	3187 3,13		
	50	Q P	34849 12,97	31886 12,59	26502 11,76	21559 11,12	17526 10,09	14061 9,00	11117 7,89	8643 6,78	6592 5,71	4913 4,70	3560 3,79			
HAX4/465-4	30	Q P							18696 7,76	15000 6,86	11814 6,00	9094 5,17	6798 4,35	4884 3,56		
	40	Q P							15696 8,32	12501 7,27	9756 6,26	7420 5,29	5449 4,36	3802 3,46		
	50	Q P							12819 8,76	10124 7,56	7822 6,42	5870 5,33	4225 4,29	2845 3,30		

Relating to 20 °C suction gas temp. without liquid subcooling

<sup>1)</sup> Compressors (R404A) are ASERCOM certified



Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temp.

R404A/R507		Performance data											50 Hz	
Type	Cond. temp. °C	Q P	Cooling capacity $\dot{Q}_0$ [W]										Power consumption $P_e$ [kW]	
			Evaporating temperature °C										-40	-45
			7,5	5	0	-5	-10	-15	-20	-25	-30	-35		
HGX4/555-4 <sup>1)</sup> HGX4/555-4 S <sup>1)</sup>	30	Q	59014	54222	45450	37853	31129	25259	20184	15848	12194	9164	6702	4751
		P	11,52	11,34	10,89	10,34	9,72	8,99	8,19	7,34	6,47	5,59	4,73	3,93
	40	Q	50452	46260	38616	32112	26279	21212	16857	13155	10050	7484	5401	3743
HAX4/555-4	30	Q								21842	17569	13875	10713	8037
		P								8,84	7,84	6,87	5,93	5,01
	40	Q								18374	14675	11488	8766	6461
HGX4/650-4 <sup>1)</sup> HGX4/650-4 S <sup>1)</sup>	30	Q	70903	65224	54821	44444	36811	30119	24302	19297	15039	11465	8510	6110
		P	14,57	14,19	13,41	12,51	11,70	10,80	9,84	8,84	7,82	6,80	5,80	4,85
	40	Q	60855	55879	46795	37928	31232	25384	20322	15982	12298	9208	6647	4550
HAX4/650-4	30	Q								24978	20136	15945	12352	9304
		P								9,71	8,62	7,57	6,54	5,55
	40	Q								21012	16819	13202	10107	7480
HGX5/725-4 <sup>1)</sup> HGX5/725-4 S <sup>1)</sup>	30	Q	76254	70105	58815	48024	39230	31558	24934	19288	14546	10636	7486	5024
		P	13,31	13,28	13,03	12,99	12,20	11,23	10,13	8,94	7,70	6,47	5,28	4,19
	40	Q	64689	59328	49517	40164	32541	25933	20266	15468	11467	8191	5568	3525
HAX5/725-4	30	Q								26886	21437	16746	12756	9409
		P								10,67	9,42	8,19	7,01	5,86
	40	Q								22619	17905	13864	10437	7565
HGX5/830-4 <sup>1)</sup> HGX5/830-4 S <sup>1)</sup>	30	Q	86623	79925	67508	54430	44830	36400	29056	22717	17300	12722	8900	5752
		P	15,69	15,61	15,23	14,69	13,90	12,93	11,80	10,55	9,21	7,82	6,41	5,01
	40	Q	74069	68151	57216	45580	37311	30078	23798	18389	13769	9854	6561	3809
HAX5/830-4	30	Q								30392	24266	19003	14530	10772
		P								12,06	10,65	9,29	7,96	6,67
	40	Q								25602	20281	15733	11882	8654
HGX5/945-4 <sup>1)</sup> HGX5/945-4 S <sup>1)</sup>	30	Q	99975	91955	77277	63293	52168	42473	34090	26900	20783	15620	11291	7678
		P	18,52	18,31	17,73	17,40	16,27	15,04	13,74	12,35	10,90	9,38	7,80	6,18
	40	Q	84751	77834	65213	52881	43552	35430	28395	22327	17107	12617	8737	5347
HAX5/945-4	30	Q								27994	21989	16866	12548	8959
		P								12,27	10,72	9,21	7,74	6,32
	40	Q									18205	13799	10088	6997
HGX5/1080-4 <sup>1)</sup> HGX5/1080-4 S <sup>1)</sup>	30	Q	113675	104548	87811	72501	59869	48801	39180	30889	23810	17826	12819	8672
		P	22,05	21,89	21,27	20,82	19,21	17,56	15,88	14,16	12,40	10,60	8,76	6,86
	40	Q	96893	88944	74420	61734	50695	41062	32716	25541	19419	14233	9866	6200
HAX5/1080-4	30	Q									12641	9414	6718	4480
		P									9,88	8,16	6,53	4,99
	40	Q									10929	7834	5248	
HGX5/1080-4	30	Q									27994	21989	16866	12548
		P									12,27	10,72	9,21	7,74
	40	Q										18205	13799	10088

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 Relating to 20 °C suction gas temp.  
 without liquid subcooling

<sup>1)</sup> Compressors (R404A)  
 are ASERCOM certified

 Motor version -S-  
 (more powerful motor)

 Supplementary cooling or  
 reduced suction gas temp.

R404A/R507		Performance data											50 Hz	
Type	Cond. temp. °C	Q P	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
HGX6/1240-4 <sup>1)</sup> HGX6/1240-4 S <sup>1)</sup>	30	Q	133368	122554	102765	83399	68935	56229	45169	35643	27538	20744	15146	10634
	40	Q	113720	104299	87122	71042	58440	47422	37874	29684	22741	16931	12143	8265
	50	Q	94323	86295	71734	58323	47668	38420	30468	23698	17998	13257	9362	
HAX6/1240-4	30	Q								38742	30407	23329	17378	12423
	40	Q								17,00	14,83	12,74	10,72	8,75
	50	Q									25193	19081	13958	9695
HGX6/1410-4 <sup>1)</sup> HGX6/1410-4 S <sup>1)</sup>	30	Q			112574	94071	76961	63138	51088	40671	31748	24176	17817	12528
	40	Q			96228	80122	65316	53413	43056	34104	26417	19854	14276	9540
	50	Q			79925	66235	53148	43254	34677	27278	20915	15450	10739	
HAX6/1410-4	30	Q									33768	25918	19311	13807
	40	Q									16,48	14,13	11,86	9,68
	50	Q										21163	15482	10756
HGX7/1620-4 <sup>1)</sup> HGX7/1620-4 S <sup>1)</sup>	30	Q	163130	150297	126636	106031	87518	71107	56728	44306	33770	25047	18065	12751
	40	Q	139724	128531	107945	89756	73736	59585	47232	36603	27628	20232	14343	9890
	50	Q	115792	106272	88826	73671	60144	48254	37928	29093	21678	15609	10816	
HGX7/1860-4 <sup>1)</sup> HGX7/1860-4 S <sup>1)</sup>	30	Q	184191	169853	143432	119116	98208	79858	63906	50195	38563	28854	20907	14563
	40	Q	157436	144933	121960	100333	82508	66907	53368	41734	31846	23543	16668	11061
	50	Q	130989	120333	100832	82100	67304	54394	43213	33601	25399	18448	12589	
HGX7/2110-4 <sup>1)</sup> HGX7/2110-4 S <sup>1)</sup>	30	Q	201969	186202	157288	130628	108549	89073	72027	57236	44527	33724	24655	17144
	40	Q	173523	159904	134971	112651	93282	76227	61312	48362	37205	27665	19568	12741
	50	Q	144329	132872	111953	93475	77007	62564	49972	39055	29641	21555	14623	
HGX88e/2735-4 HGX88e/2735-4 S	30	Q	315000	289000	243000	202000	165000	134000	106000	82700	63200	47300	34600	25000
	40	Q	268000	246000	206000	170000	139000	112000	88300	68700	52300	38900	28200	
	50	Q	222000	203000	169000	139000	113000	90300	71200	55100	41800	31000		
HGX88e/3235-4 HGX88e/3235-4 S	30	Q	362000	334000	281000	234000	192000	156000	124000	97000	74300	55700	40700	29100
	40	Q	310000	285000	239000	198000	162000	131000	104000	80100	60900	45200	32600	
	50	Q	255000	234000	195000	161000	131000	105000	82000	63400	48000	35500		

Relating to 20 °C suction gas temp. without liquid subcooling

<sup>1)</sup> Compressors (R404A) are ASERCOM certified



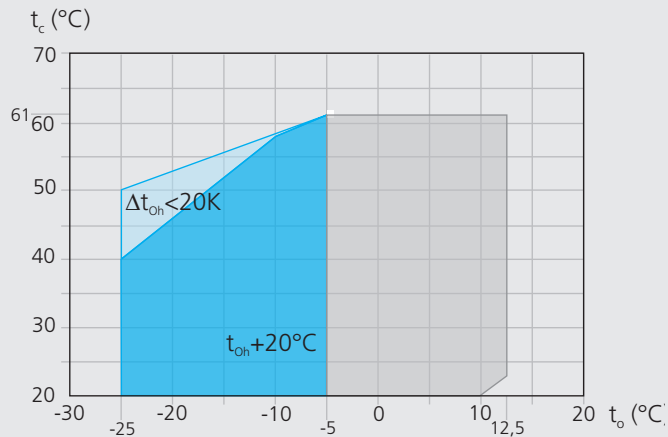
Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temp.



R407C Operating limits

HGX12P / HGX22e / HGX34e  
 HGX4 / HGX5 / HGX6 / HGX7



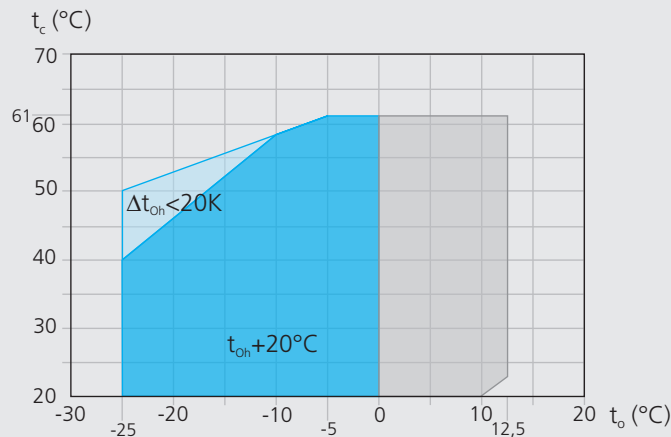
- Unlimited application range
- Supplementary cooling or reduced suction gas temperature
- Motor version -S- (more powerful motor)

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

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

<sup>1)</sup> LP = low pressure    HP = high pressure

HGX88e



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R407C Notes

Operating limits

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

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

Further explanation see [www.gea.com](http://www.gea.com).

Performance data

The performance data for R407C are based on ISO-DIS 9309 (DIN 8928) with a 50 Hz power supply frequency.

This signifies: 25 °C suction gas temperature without liquid subcooling. EN 12900 is already valid for Pluscom compressors, HGX4 and HGX88e operating at 50 Hz. 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 Bock software.





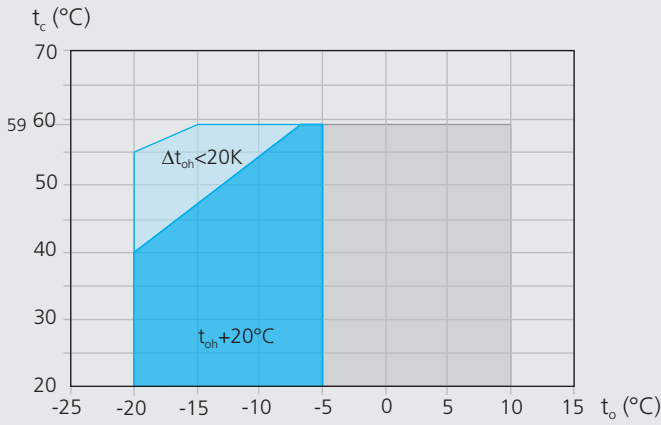
R407C		Performance data										50 Hz	
Type	Cond. temp. °C		Cooling capacity $\dot{Q}_o$ [W]							Power consumption $P_e$ [kW]			
			Evaporating temperature °C										
			12,5	10	7,5	5	0	-5	-10	-15	-20	-25	
HGX7/2110-4 HGX7/2110-4 S	30	Q	230732	210551	191751	174268	143000	116233	93456	74159	57829	43956	
		P	37,54	37,16	36,65	36,00	34,35	32,30	29,93	27,32	24,55	21,70	
	40	Q	204578	186492	169666	154036	126109	102198	81793	64381	49452	36493	
		P	46,72	45,59	44,35	43,01	40,08	36,87	33,47	29,95	26,40	22,90	
	50	Q	178217	162261	147443	133700	109182	88195	70228	54769	41308	29331	
		P	55,02	53,16	51,23	49,23	45,07	40,77	36,39	32,03	27,77	23,68	
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 25 °C suction gas temperature (HGX88e to 20 °C suction gas temperature) without liquid subcooling

Motor version -S- (more powerful motor)
  Supplementary cooling or reduced suction gas temp.

## R407F Operating limits

HGX88e



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

- $t_o$  Evaporation temperature (°C)
- $t_c$  Condensing temperature (°C)
- $\Delta t_{oh}$  Suction gas superheat (K)
- $t_{oh}$  Suction gas temperature (°C)

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

<sup>1)</sup> LP = low pressure HP = high pressure

## R407F Notes

### Operating limits

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

Restrictions to the operating limits may occur when using the EFC (Electronic Frequency Control). Further explanation see [www.gea.com](http://www.gea.com).

### Performance data

The performance data for R407F are based on EN 12900 with a **50 Hz power supply frequency**.

This signifies: **20 °C suction gas temperature without liquid sub-cooling**.

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 Bock software.

R407F		Performance data								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
HGX88e/2735-4 HGX88e/2735-4 S	30	Q P	346000 50,10	315000 49,90	287000 49,30	235000 47,50	191000 45,40	153000 41,80	121000 38,00	93000 34,10
	40	Q P	302000 61,20	275000 60,00	250000 58,50	205000 54,90	166000 51,30	132000 46,40	104000 41,40	79300 36,60
	50	Q P	258000 70,70	235000 68,50	213000 66,00	174000 60,80	141000 55,80	111000 49,70	86300 43,70	65800 38,10
HGX88e/3235-4 HGX88e/3235-4 S	30	Q P	398000 58,80	363000 58,70	331000 58,20	272000 56,30	221000 54,00	178000 49,80	141000 45,30	109000 40,60
	40	Q P	349000 72,70	318000 71,30	290000 69,60	238000 65,40	193000 61,20	154000 55,30	121000 49,20	92600 43,30
	50	Q P	297000 83,70	270000 81,10	245000 78,30	200000 72,10	162000 66,10	129000 58,70	99600 51,50	75800 44,70

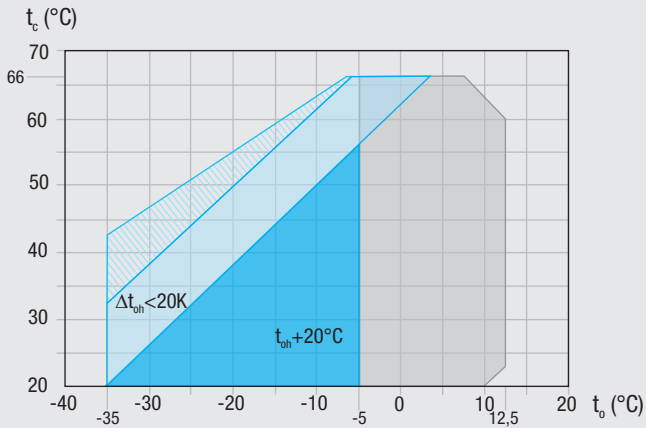
Relating to 20 °C suction gas temp. without liquid subcooling

Motor version -S- (more powerful motor)

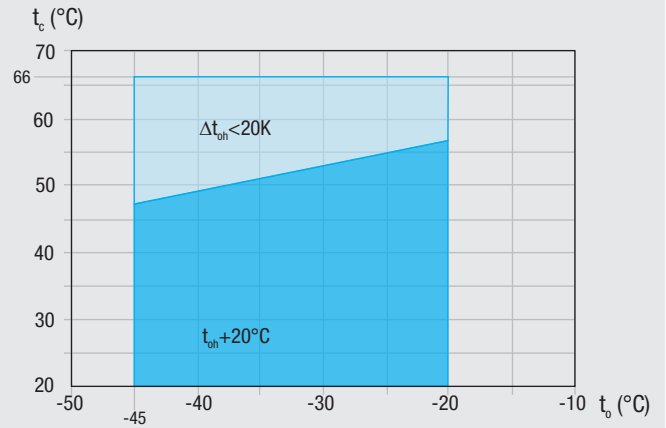
Supplementary cooling or reduced suction gas temp.

R22 Operating limits

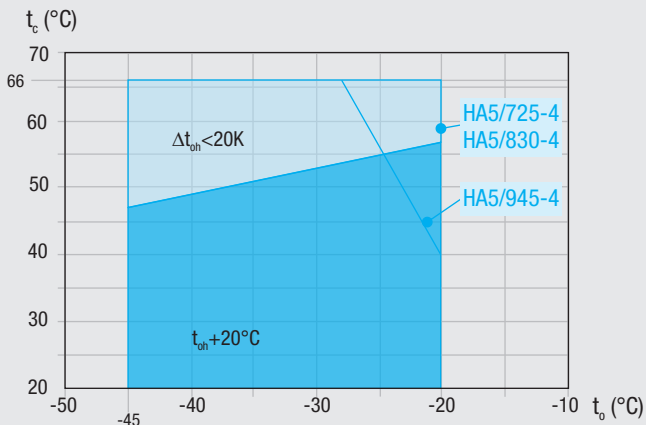
HG12P / HG22e / HG34e /  
HG4 / HG5 / HG6<sup>①</sup> / HG7 / HG88e



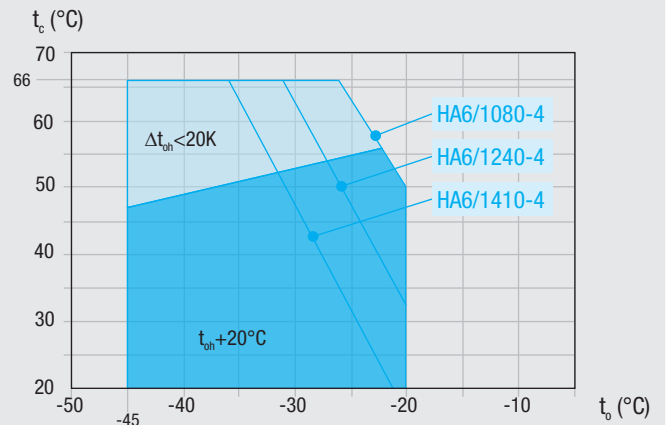
HA12P / HA22P / HA34P / HA4



HA5



HA6



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

<sup>1)</sup> LP = low pressure HP = high pressure

① HG7 „Motor version -S-“  
in the evaporation range of  $t_o = 5\text{ °C}$  bis  $12,5\text{ °C}$   
limited condensing temperature up to  $t_c = 50\text{ °C}$

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

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

## R22 Notes

**Operating limits**

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

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

Further explanation see [www.gea.com](http://www.gea.com).

**Performance data**

The performance data for R22 are based on ISO-DIS 9309 (DIN 8928) with a **50 Hz power supply frequency**.

This signifies: **25 °C suction gas temperature without liquid subcooling**. EN 12900 is already valid for Pluscom compressors and HG88e **operating at 50 Hz**. 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 Bock software.

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R22		Performance data											50 Hz			
Type	Cond. temp. °C	Q P	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	-45	
HG6/1080-4 HG6/1080-4 S	30	Q	129363	119434	110034	101145	84833	70357	57581	46365	36571	28059	20692	14330		
		P	18,28	18,00	17,72	17,43	16,80	16,10	15,29	14,33	13,22	11,91	10,38	8,61		
	40	Q	118019	108844	100169	91976	76968	63681	51978	41719	32765	24979	18221	12352		
HA6/1080-4	30	Q									37747	29595	22620	16702	11720	
		P									12,65	11,26	9,89	8,49	7,05	
	40	Q									33470	26012	19664	14306	9816	
HG6/1240-4 HG6/1240-4 S	30	Q	148504	137106	126315	116111	97384	80768	66101	53225	41982	32211	23754	16451		
		P	20,98	20,66	20,34	20,01	19,29	18,48	17,55	16,45	15,17	13,67	11,92	9,88		
	40	Q	135481	124948	114989	105584	88356	73103	59668	47891	37613	28675	20917	14180		
HA6/1240-4	30	Q										43328	33978	25970	19174	13463
		P										14,52	12,92	11,35	9,75	8,10
	40	Q										38417	29848	22551	16399	11262
HG6/1410-4 HG6/1410-4 S	30	Q	168964	155996	143718	132108	110802	91895	75208	60559	47766	36649	27026	18717		
		P	23,87	23,51	23,14	22,77	21,95	21,03	19,96	18,72	17,26	15,56	13,56	11,24		
	40	Q	154147	142163	130832	120131	100529	83176	67889	54490	42796	32626	23799	16134		
HA6/1410-4	30	Q											38625	29529	21803	15324
		P												14,69	12,90	11,08
	40	Q												25605	18595	12767
HG7/1620-4 HG7/1620-4 S	30	Q	178802	164852	151711	139349	116850	97132	79968	65133	52401	41547	32345	24570		
		P	23,29	24,07	24,65	25,03	25,25	24,85	23,94	22,64	21,04	19,26	17,42	15,60		
	40	Q	163682	150728	138537	127084	106272	88068	72246	58580	46844	36813	28261	20963		
HG7/1860-4 HG7/1860-4 S	30	Q	205257	189244	174158	159966	134139	111504	91800	74770	60154	47694	37131	28205		
		P	26,74	27,64	28,29	28,73	28,98	28,53	27,49	25,99	24,16	22,11	19,99	17,91		
	40	Q	187901	173029	159035	145887	121996	101099	82935	67247	53775	42259	32442	24065		
HG7/2110-4 HG7/2110-4 S	30	Q	169921	156221	143350	131274	109380	90280	73717	59429	47160	36649				
		P	44,49	44,14	43,60	42,90	41,06	38,73	36,05	33,14	30,12	27,12				
	40	Q	233537	215317	198153	182006	152621	126866	104448	85072	68442	54266	42247	32091		
HG88e/2735-4 HG88e/2735-4 S	30	Q	342000	314000	288000	263000	219000	181000	148000	119000	94300	73400	55300	39500		
		P	43,70	44,30	44,70	44,70	44,10	42,50	40,30	37,40	34,10	30,50	26,70	23,00		
	40	Q	308000	282000	258000	236000	196000	161000	130000	104000	81300	61700	44400	28800		
HG88e/3235-4 HG88e/3235-4 S	30	Q	274000	251000	229000	209000	172000	140000	113000	88400	67600	49100				
		P	67,00	65,80	64,30	62,60	58,80	54,30	49,40	44,20	39,00	33,70				
	40	Q	396000	364000	334000	305000	254000	210000	171000	138000	110000	85100	64700	47300		
HA6/1410-4	30	Q														
		P														
	40	Q														

HG Supplementary cooling or red. suction gas temp.  
HA reduced suction gas temp.

Motor version -S-  
(more powerful motor)

Supplementary cooling and  
red. suction gas temp.

Relating to 25 °C suction gas temperature  
(HGX88e to 20 °C suction gas temperature)  
without liquid subcooling

HG	Number of cylinders	Displacement 50 / 60 Hz (1450/1740 rpm)	Electrical data				Weight	Connections ⑥		Oil charge
			Voltage	Max. working current	Max. power consumption	Starting current (rotor locked)		Discharge line DV	Suction line SV	
Type		m³/h		A	kW	A	kg	mm I inch	mm I inch	Ltr.
				Δ / Y		Δ / Y				
HG12P/60-4 S	2	5,40 / 6,40	③	6,8 / 3,9	2,2	40 / 23	48,0	12 I 1/2	16 I 5/8	0,8
HG12P/75-4	2	6,70 / 8,10	③	7,1 / 4,1	2,3	40 / 23	48,0	12 I 1/2	16 I 5/8	0,8
HG12P/75-4 S	2	6,70 / 8,10	③	8,0 / 4,6	2,6	43 / 25	49,0	12 I 1/2	16 I 5/8	0,8
HG12P/90-4	2	8,00 / 9,60	③	8,5 / 4,9	2,8	43 / 25	49,0	12 I 1/2	16 I 5/8	0,8
HG12P/90-4 S	2	8,00 / 9,60	③	9,1 / 5,3	3,0	45 / 26	49,0	12 I 1/2	16 I 5/8	0,8
HG12P/110-4	2	9,40 / 11,30	③	9,2 / 5,3	3,1	43 / 25	49,0	12 I 1/2	16 I 5/8	0,8
HG12P/110-4 S	2	9,40 / 11,30	③	10,6 / 6,1	3,6	45 / 26	49,0	12 I 1/2	16 I 5/8	0,8
HG22e/125-4	2	11,10 / 13,30	③	9,3 / 5,4	3,0	69 / 40	74,0	16 I 5/8	22 I 7/8	1,0
HG22e/125-4 S	2	11,10 / 13,30	③	10,8 / 6,2	3,6	69 / 40	74,0	16 I 5/8	22 I 7/8	1,0
HG22e/160-4	2	13,70 / 16,40	③	11,1 / 6,4	3,7	69 / 40	74,0	16 I 5/8	22 I 7/8	1,0
HG22e/160-4 S	2	13,70 / 16,40	③	13,1 / 7,6	4,4	87 / 50	76,0	16 I 5/8	22 I 7/8	1,0
HG22e/190-4	2	16,50 / 19,80	③	13,8 / 8,0	4,8	69 / 40	74,0	16 I 5/8	22 I 7/8	1,0
HG22e/190-4 S	2	16,50 / 19,80	③	16,2 / 9,4	5,6	87 / 50	75,0	16 I 5/8	22 I 7/8	1,0
HG34e/215-4	4	18,80 / 22,60	③	14,0 / 8,1	4,8	87 / 50	92,0	22 I 7/8	28 I 1 1/8	1,3
HG34e/215-4 S	4	18,80 / 22,60	③	18,3 / 10,5	6,0	132 / 76	97,0	22 I 7/8	28 I 1 1/8	1,3
HG34e/255-4	4	22,10 / 26,60	③	17,0 / 9,8	6,0	87 / 50	92,0	22 I 7/8	28 I 1 1/8	1,3
HG34e/255-4 S	4	22,10 / 26,60	③	21,1 / 12,2	7,2	132 / 76	96,0	22 I 7/8	28 I 1 1/8	1,3
HG34e/315-4	4	27,30 / 32,80	③	21,1 / 12,2	7,4	111 / 64	94,0	22 I 7/8	28 I 1 1/8	1,3
HG34e/315-4 S	4	27,30 / 32,80	③	25,5 / 14,7	8,9	132 / 76	97,0	22 I 7/8	28 I 1 1/8	1,3
HG34e/380-4	4	33,10 / 39,70	③	26,1 / 15,1	9,3	111 / 64	93,0	22 I 7/8	28 I 1 1/8	1,3
HG34e/380-4 S	4	33,10 / 39,70	③	31,2 / 18,0	11,1	132 / 76	96,0	22 I 7/8	28 I 1 1/8	1,3
				*PW 1+2		*PW1 / PW 1+2				
HG4/465-4	4	40,50 / 48,60	④	20	11,8	57 / 75	148	28 / 1 1/8	35 / 1 3/8	2,7
HG4/465-4 S	4	40,50 / 48,60	④	25	14,2	82 / 107	151	28 / 1 1/8	35 / 1 3/8	2,7
HG4/555-4	4	48,20 / 57,80	④	24	14,1	82 / 107	150	28 / 1 1/8	35 / 1 3/8	2,7
HG4/555-4 S	4	48,20 / 57,80	④	30	16,9	107 / 140	153	28 / 1 1/8	35 / 1 3/8	2,7
HG4/650-4	4	56,60 / 67,90	④	29	16,8	82 / 107	152	28 / 1 1/8	42 / 1 5/8	2,7
HG4/650-4 S	4	56,60 / 67,90	④	37	20,9	107 / 140	155	28 / 1 1/8	42 / 1 5/8	2,7
HG5/725-4	4	62,90 / 75,50	④	30	17,2	82 / 107	198	28 / 1 1/8	42 / 1 5/8	3,6
HG5/725-4 S	4	62,90 / 75,50	④	37	21,0	107 / 140	201	28 / 1 1/8	42 / 1 5/8	3,6
HG5/830-4	4	72,20 / 86,70	④	35	20,3	82 / 107	197	28 / 1 1/8	42 / 1 5/8	3,6
HG5/830-4 S	4	72,20 / 86,70	④	42	24,5	126 / 160	203	28 / 1 1/8	42 / 1 5/8	3,6
HG5/945-4	4	82,20 / 98,60	④	42	23,9	107 / 140	201	35 / 1 3/8	54 / 2 1/8	3,6
HG5/945-4 S	4	82,20 / 98,60	④	49	28,6	126 / 160	205	35 / 1 3/8	54 / 2 1/8	3,6
HG6/1080-4	4	93,70 / 112,40	④	48	27,7	149 / 189	218	35 / 1 3/8	54 / 2 1/8	3,6
HG6/1080-4 S	4	93,70 / 112,40	④	59	33,7	172 / 212	223	35 / 1 3/8	54 / 2 1/8	3,6
HG6/1240-4	4	107,60 / 129,10	④	57	32,5	172 / 212	222	35 / 1 3/8	54 / 2 1/8	3,6
HG6/1240-4 S	4	107,60 / 129,10	④	75	41,8	204 / 250	224	35 / 1 3/8	54 / 2 1/8	3,6
HG6/1410-4	4	122,40 / 146,90	④	65	38,3	172 / 212	219	35 / 1 3/8	54 / 2 1/8	3,6
HG6/1410-4 S	4	122,40 / 146,90	④	76	42,3	204 / 250	222	35 / 1 3/8	54 / 2 1/8	3,6
HG7/1620-4	6	140,60 / 168,80	④	72	39,5	223 / 340	278	42 / 1 5/8	54 / 2 1/8	4,5
HG7/1620-4 S	6	140,60 / 168,80	④	83	47,4	268 / 373	299	42 / 1 5/8	54 / 2 1/8	4,5
HG7/1860-4	6	161,40 / 193,70	④	80	45,8	268 / 373	296	42 / 1 5/8	54 / 2 1/8	4,5
HG7/1860-4 S	6	161,40 / 193,70	④	104	56,7	291 / 429	292	42 / 1 5/8	54 / 2 1/8	4,5
HG7/2110-4	6	183,60 / 220,30	④	97	53,1	291 / 429	289	42 / 1 5/8	64 / 2 5/8	4,5
HG7/2110-4 S	6	183,60 / 220,30	④	119	65,6	344 / 500	297	42 / 1 5/8	64 / 2 5/8	4,5
HG88e/2735-4	8	237,90 / 285,50	⑤	118	63,7	475 / 551	447,6	54 / 2 1/8	76 / 3 1/8	9,0
HG88e/2735-4 S	8	237,90 / 285,50	⑤	141	77,5	520 / 605	467,7	54 / 2 1/8	76 / 3 1/8	9,0
HG88e/3235-4	8	281,30 / 337,60	⑤	135	74,6	475 / 551	442,1	54 / 2 1/8	76 / 3 1/8	9,0
HG88e/3235-4 S	8	281,30 / 337,60	⑤	160	91,0	520 / 605	462,1	54 / 2 1/8	76 / 3 1/8	9,0

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

HA	Number of cylinders	Displacement 50 / 60 Hz (1450/1740 rpm)	Electrical data				Weight	Connections ⑥		Oil charge
			Voltage ①	Max. working current ②	Max. power consumption ②	Starting current (rotor locked) ②		Discharge line DV	Suction line SV	
Type		m <sup>3</sup> /h		A	kW	A	kg	mm l inch	mm l inch	Ltr.
				Δ / Y		Δ / Y				
HA12P/60-4	2	5,40 / 6,40	③	4,7 / 2,7	1,3	40 / 23	52,0	12 l 1/2	12 l 1/2	0,8
HA12P/75-4	2	6,70 / 8,10	③	5,5 / 3,2	1,6	40 / 23	53,0	12 l 1/2	12 l 1/2	0,8
HA12P/90-4	2	8,00 / 9,60	③	6,3 / 3,7	1,9	43 / 25	53,0	12 l 1/2	12 l 1/2	0,8
HA12P/110-4	2	9,40 / 11,30	③	7,0 / 4,1	2,2	43 / 25	53,0	12 l 1/2	12 l 1/2	0,8
HA22P/125-4	2	11,10 / 13,30	③	8,1 / 4,7	2,4	69 / 40	80,0	12 l 1/2	16 l 5/8	1,0
HA22P/160-4	2	13,70 / 16,40	③	9,6 / 5,5	2,9	87 / 50	82,0	12 l 1/2	16 l 5/8	1,0
HA22P/190-4	2	16,50 / 19,80	③	10,9 / 6,3	3,5	87 / 50	81,0	12 l 1/2	16 l 5/8	1,0
HA34P/215-4	4	18,80 / 22,60	③	12,1 / 7,0	4,0	87 / 50	98,0	16 l 5/8	22 l 7/8	1,3
HA34P/255-4	4	22,10 / 26,60	③	13,8 / 8,0	4,7	87 / 50	98,0	16 l 5/8	22 l 7/8	1,3
HA34P/315-4	4	27,30 / 32,80	③	17,1 / 9,9	5,8	111 / 64	100,0	16 l 5/8	22 l 7/8	1,3
HA34P/380-4	4	33,10 / 39,70	③	20,2 / 11,7	7,0	111 / 64	100,0	16 l 5/8	22 l 7/8	1,3
				*PW 1+2		*PW1 / PW 1+2				
HA4/465-4	4	40,50 / 48,60	④	17	9,1	82 / 107	155,0	28 / 1 1/8	35 / 1 3/8	2,7
HA4/555-4	4	48,20 / 57,80	④	21	10,3	107 / 140	157,0	28 / 1 1/8	35 / 1 3/8	2,7
HA4/650-4	4	56,60 / 67,90	④	22	11,4	107 / 140	156,0	28 / 1 1/8	35 / 1 3/8	2,7
HA5/725-4	4	62,90 / 75,50	④	24	12,5	107 / 140	204,0	28 / 1 1/8	42 / 1 5/8	3,6
HA5/830-4	4	72,20 / 86,70	④	24	12,9	126 / 160	207,0	28 / 1 1/8	42 / 1 5/8	3,6
HA5/945-4	4	82,20 / 98,60	④	25	13,3	126 / 160	205,0	28 / 1 1/8	42 / 1 5/8	3,6
HA6/1080-4	4	93,70 / 112,40	④	32	17,0	156 / 193	223,0	28 / 1 1/8	42 / 1 5/8	3,6
HA6/1240-4	4	107,60 / 129,10	④	33	17,6	156 / 193	222,0	28 / 1 1/8	42 / 1 5/8	3,6
HA6/1410-4	4	122,40 / 146,90	④	33	17,7	156 / 193	219,0	28 / 1 1/8	42 / 1 5/8	3,6

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

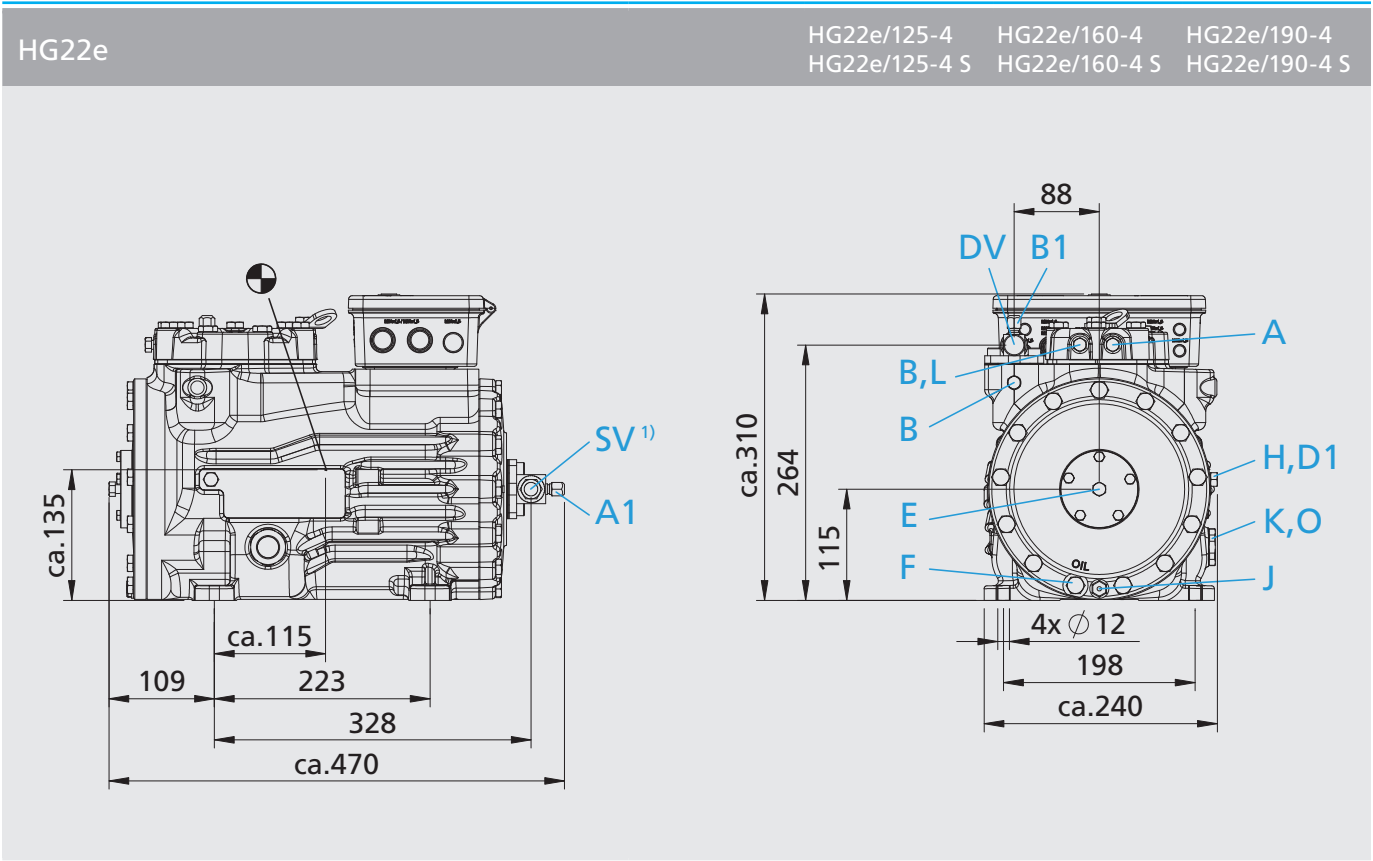
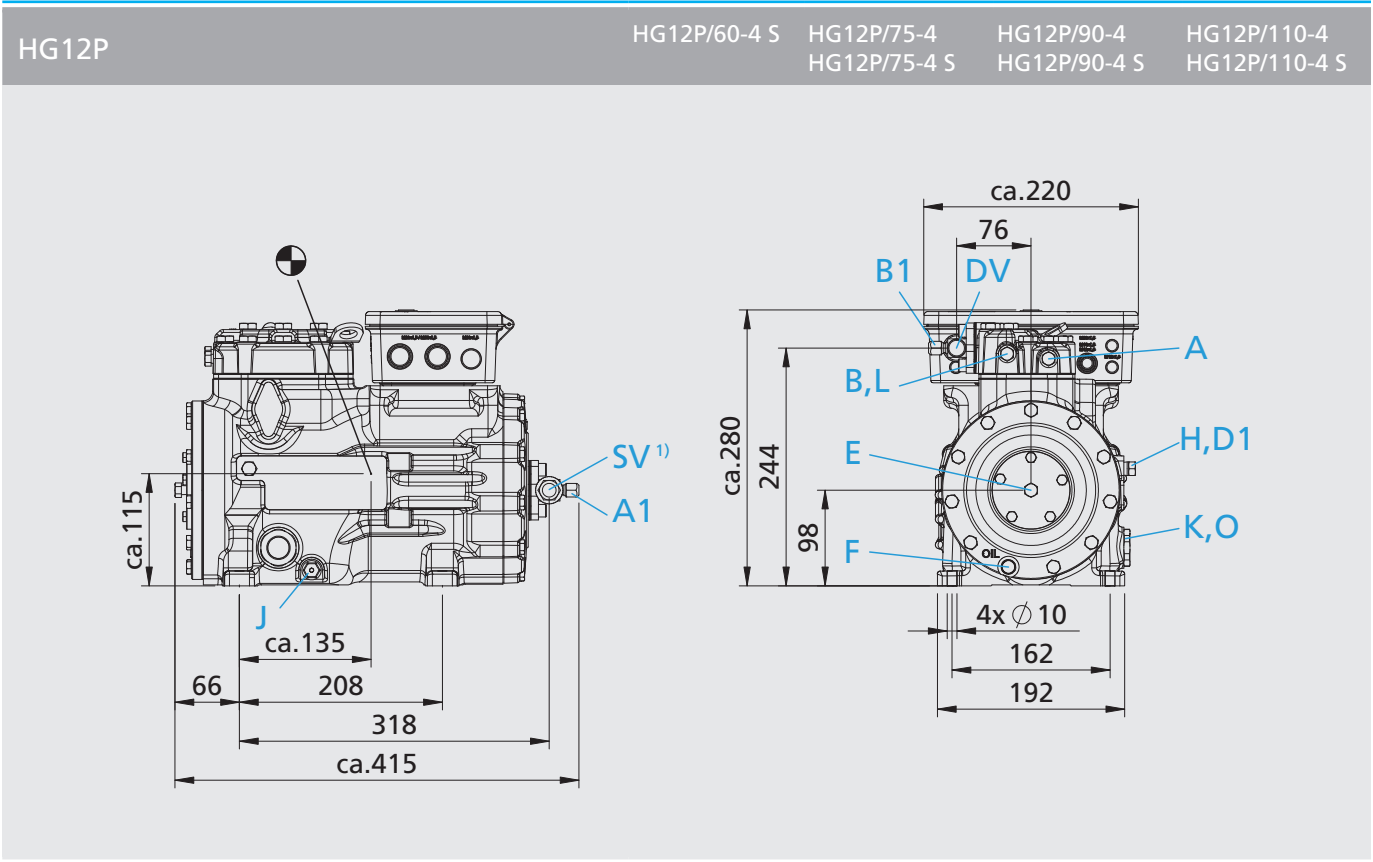
Oil sump heater 110-240 V - 1 - 50/60 Hz (option)  
HG(HA)12, HG(HA)22, HG(HA)34: 50-120 W  
PTC heater, self-regulating, installation in housing bore

Fan motors for the HA version 230 V - 1 - 50/60 Hz  
- HA12P: 40 W / 0,3 A  
- HA22P, HA34P: 72 W / 0,53 A  
- HA4, HA5, HA6: 140 W / 0,71 A

Oil sump heater 230 V - 1 - 50/60 Hz (option)  
- HG(HA)4: 80 W  
- HG(HA)5, HG(HA)6, HG7: 140 W  
- HG88e: 200 W  
Permanently set version, installation in immersion sleeve

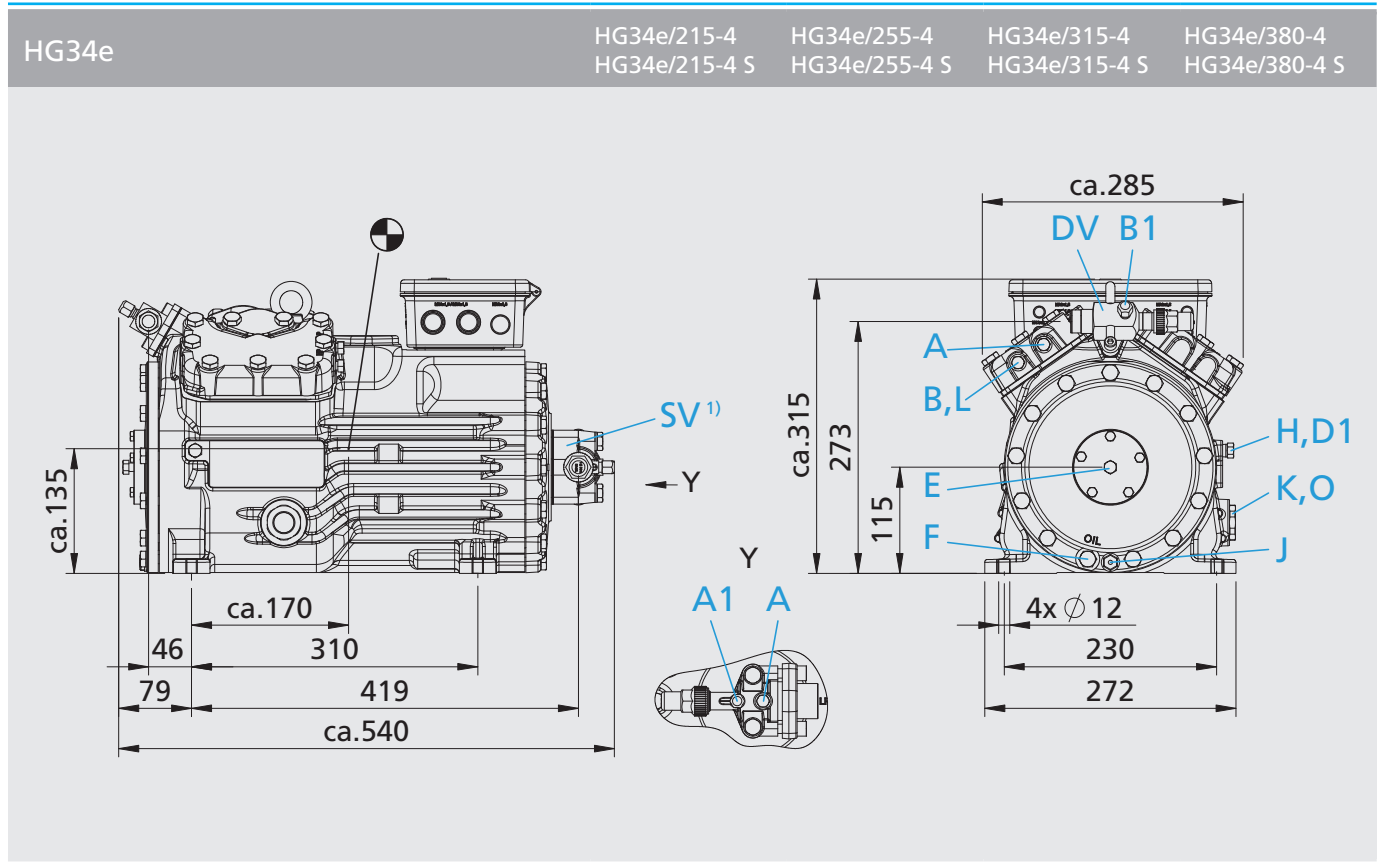
## Explanations:

- 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 50Hz operation. For 60Hz 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  $\Delta$  / 380-420 V Y - 3 - 50 Hz  
265-290 V  $\Delta$  / 440-480 V Y - 3 - 60 Hz
- ④ 380-420 V Y/YY - 3 - 50 Hz PW  
440-480 V Y/YY - 3 - 60 Hz PW  
PW = Part Winding, motors for part winding start (no start unloaders required)  
- Winding ratios: HG(HA)4, HG(HA)5, HG(HA)6 = 66% / 33%  
- Winding ratios: HG7 = 50% / 50%  
- Designs for Y/ $\Delta$  on request
- ⑤ 380-420 V  $\Delta$ /YYY - 3 - 50 Hz PW  
440-480 V  $\Delta$ /YYY - 3 - 60 Hz PW  
PW = Part Winding, motors for part winding start (no start unloaders required)  
- Winding ratios: HG88e = 60% / 40%  
- Designs for Y/ $\Delta$  on request
- ⑥ For soldering connections

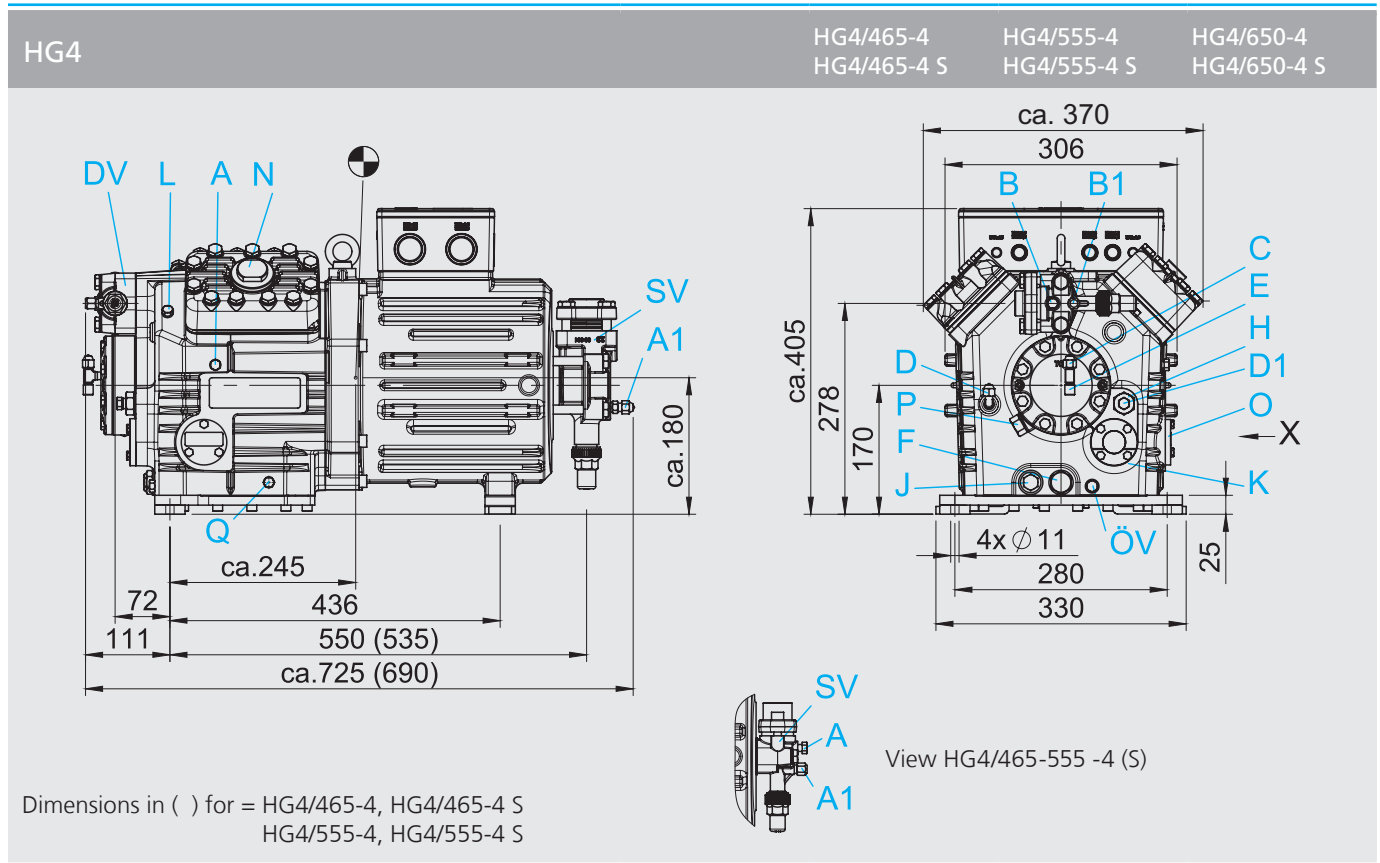


Dimensions in mm  
<sup>1)</sup> SV 90° rotatable  
 ☉ Centre of gravity

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



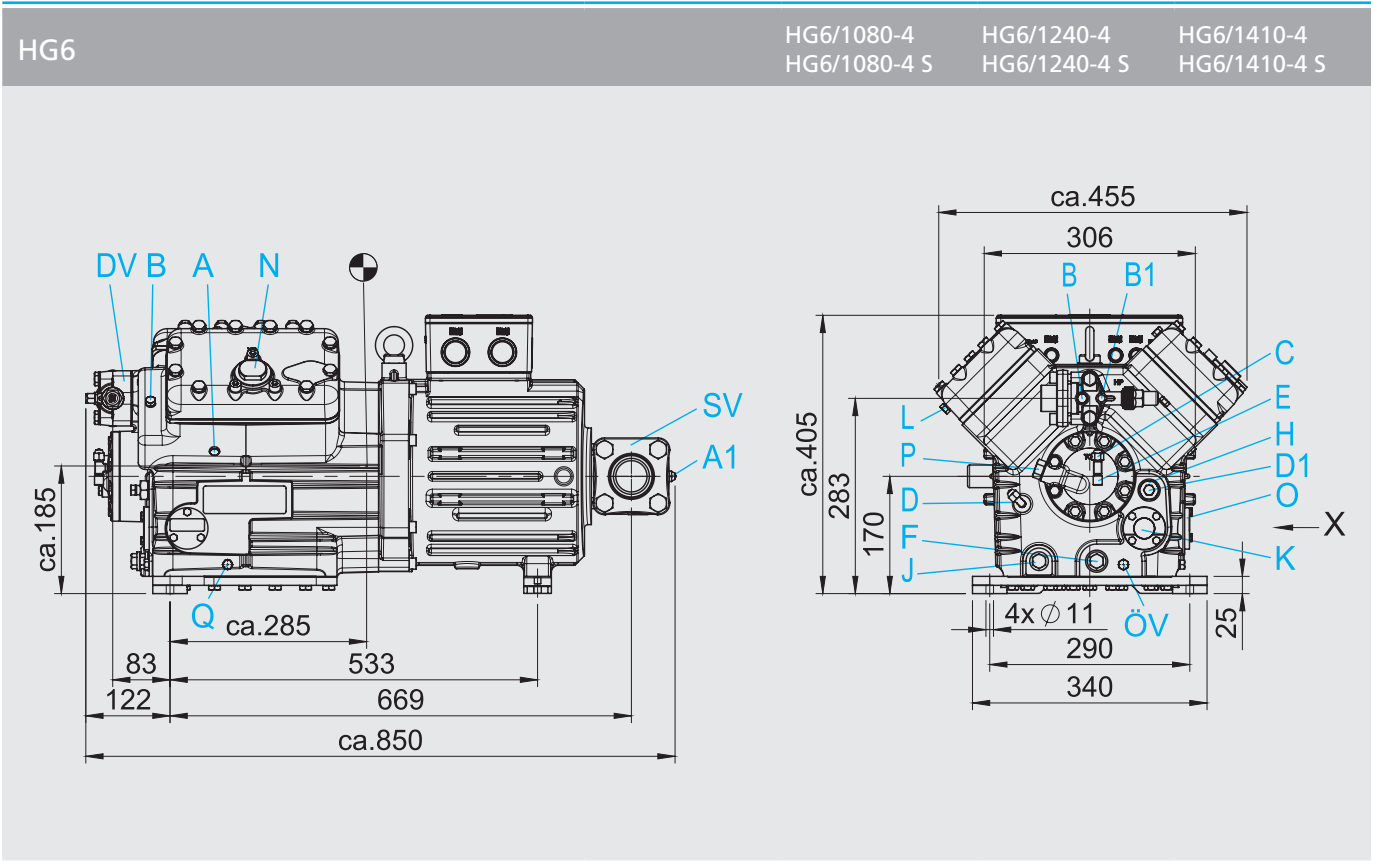
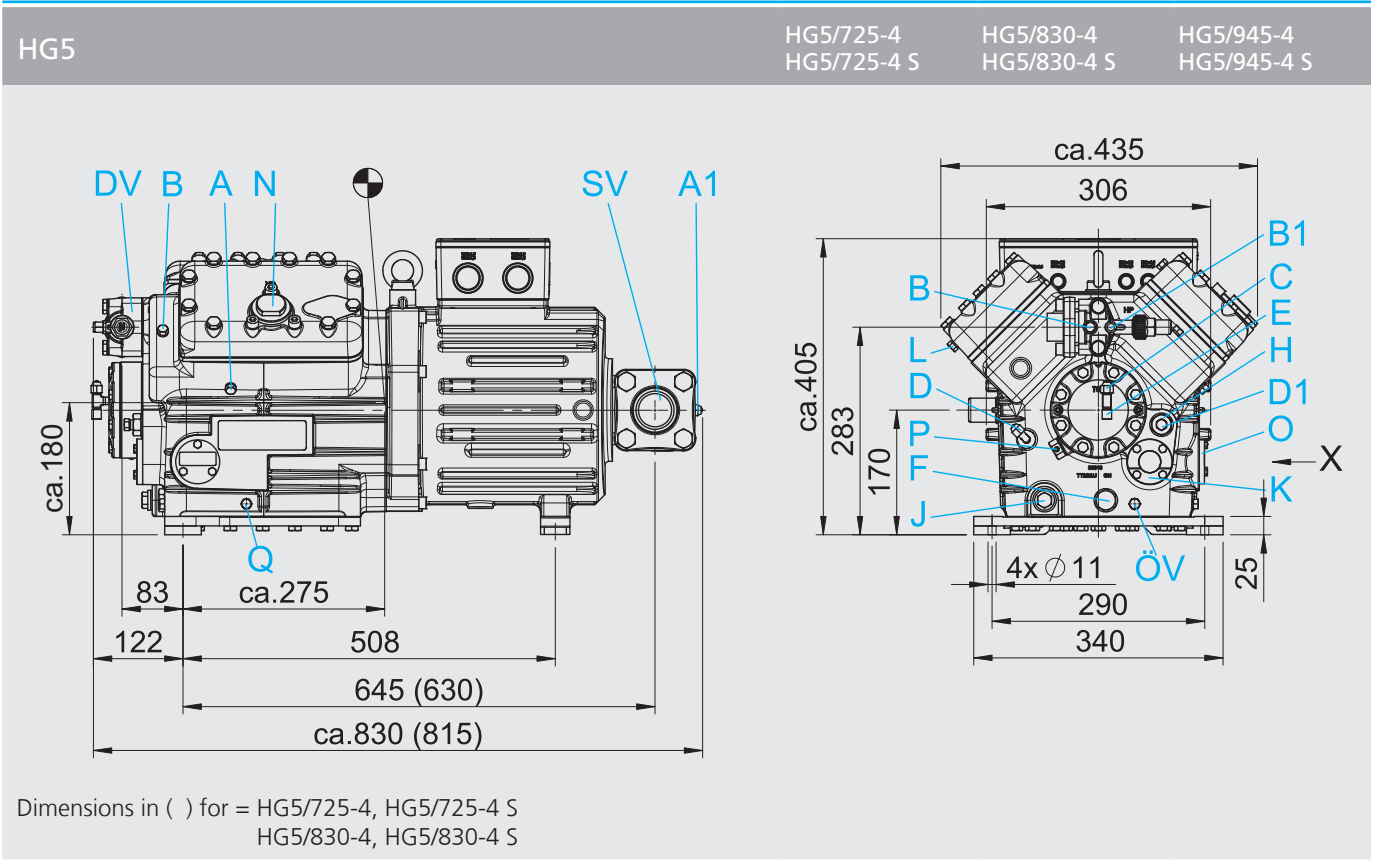
- 1
- 2
- 3
- 4



Dimensions in ( ) for = HG4/465-4, HG4/465-4 S  
HG4/555-4, HG4/555-4 S

Dimensions in mm  
 1) SV 90° rotatable  
 Centre of gravity

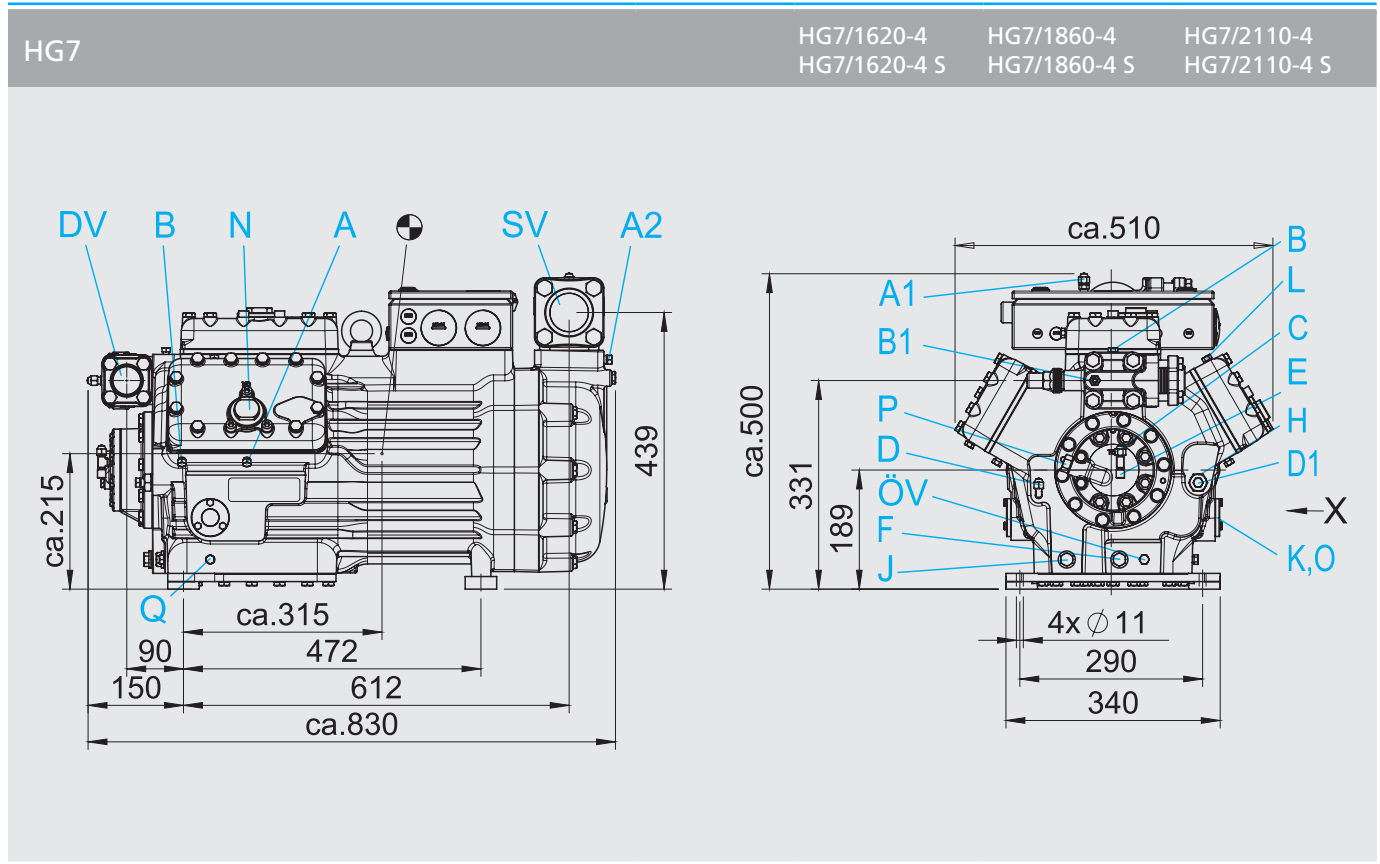
- Connections see page 64  
 - Dimensions for anti-vibration pad see page 61  
 - Dimensions for view X see page 61



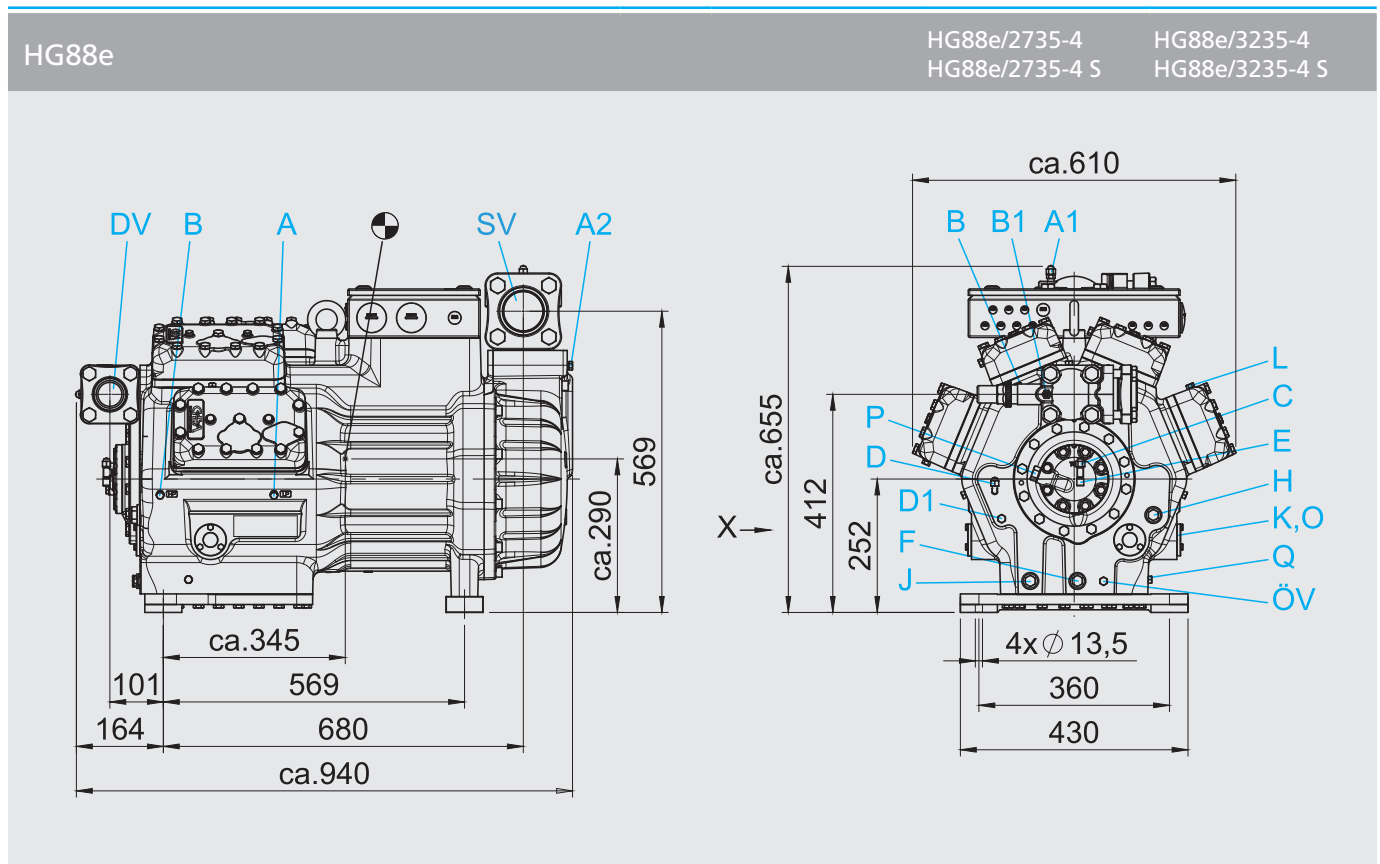
Dimensions in mm  
 1) SV 90° rotatable  
 ● Centre of gravity

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



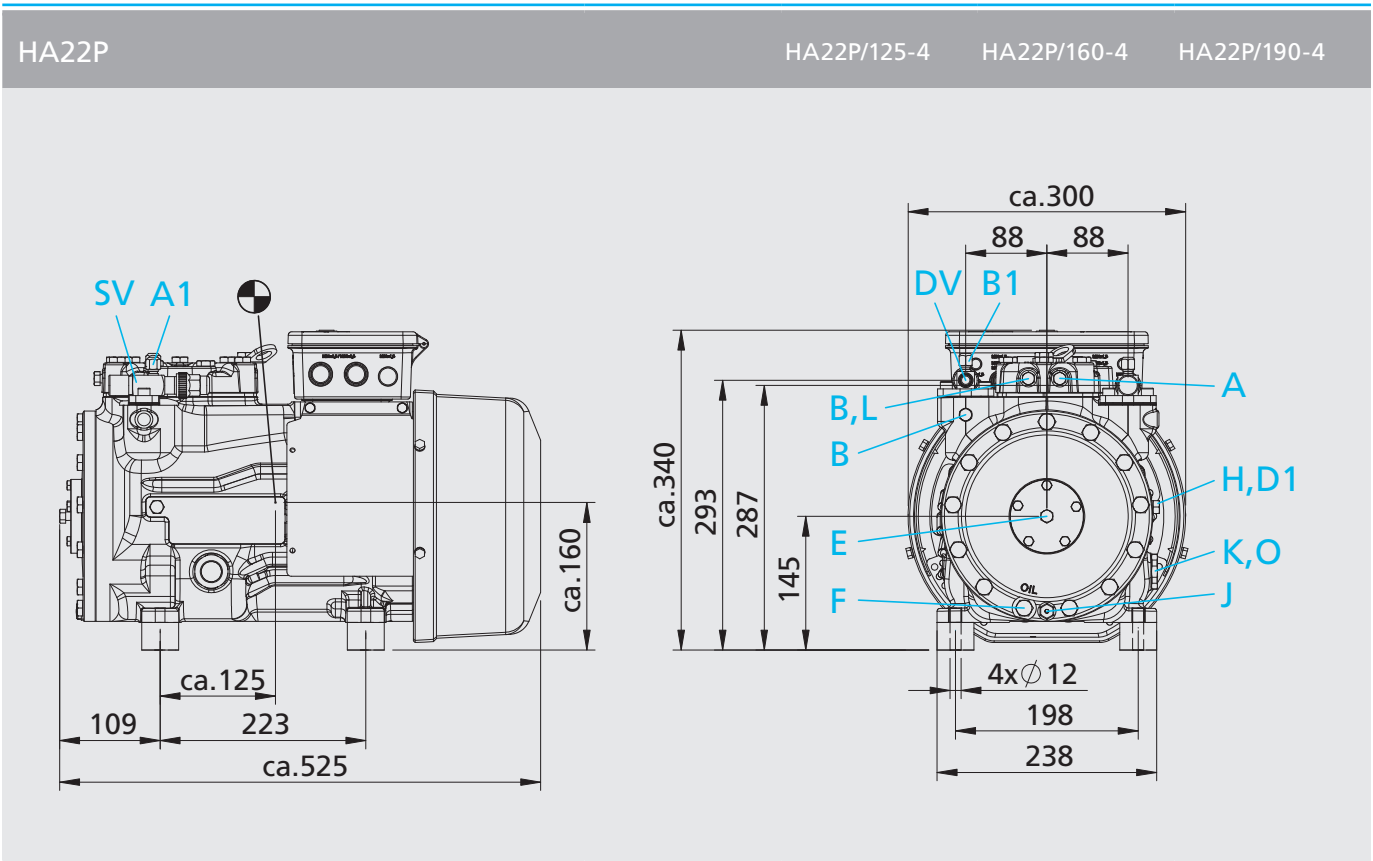
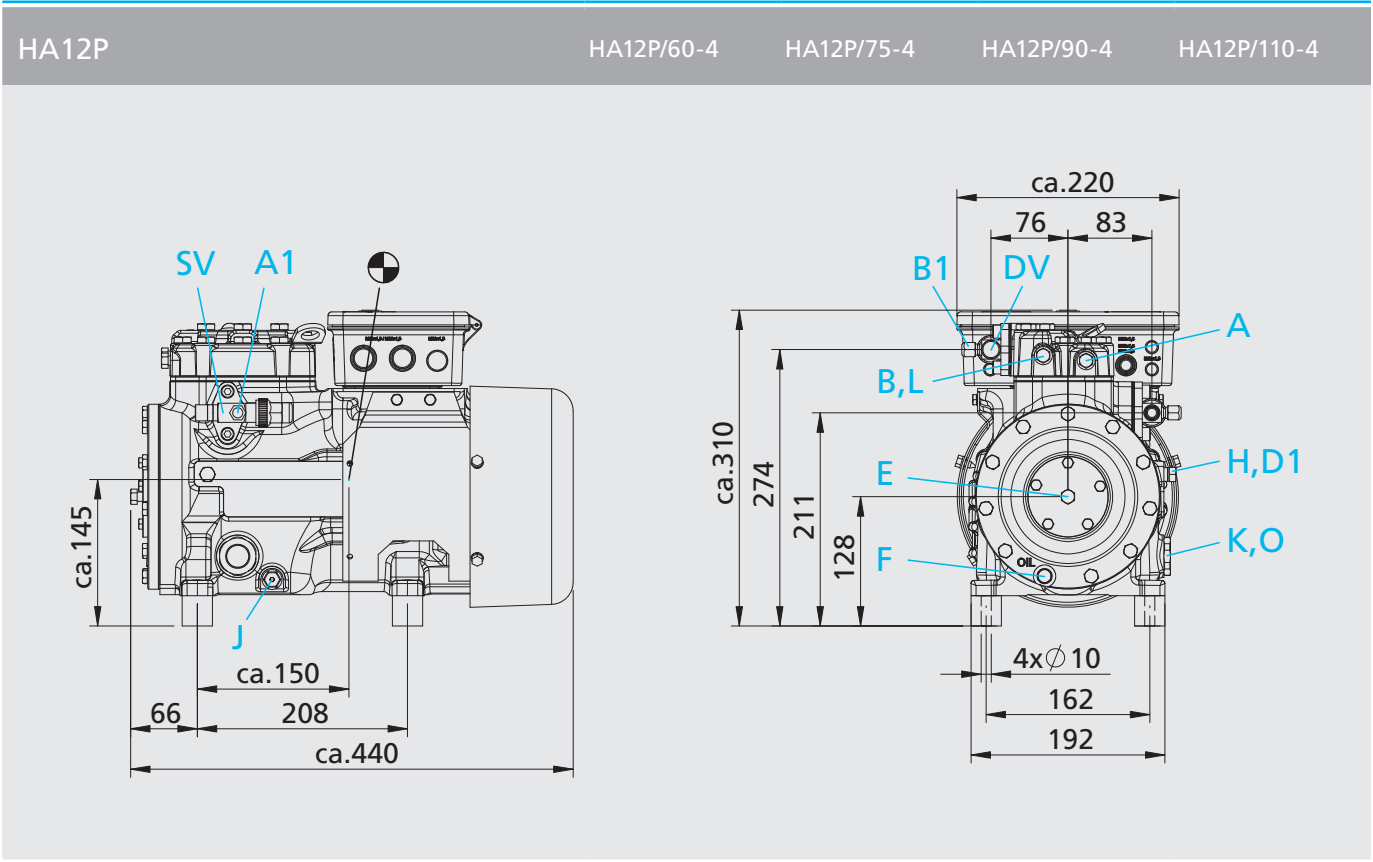


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- 3
- 4



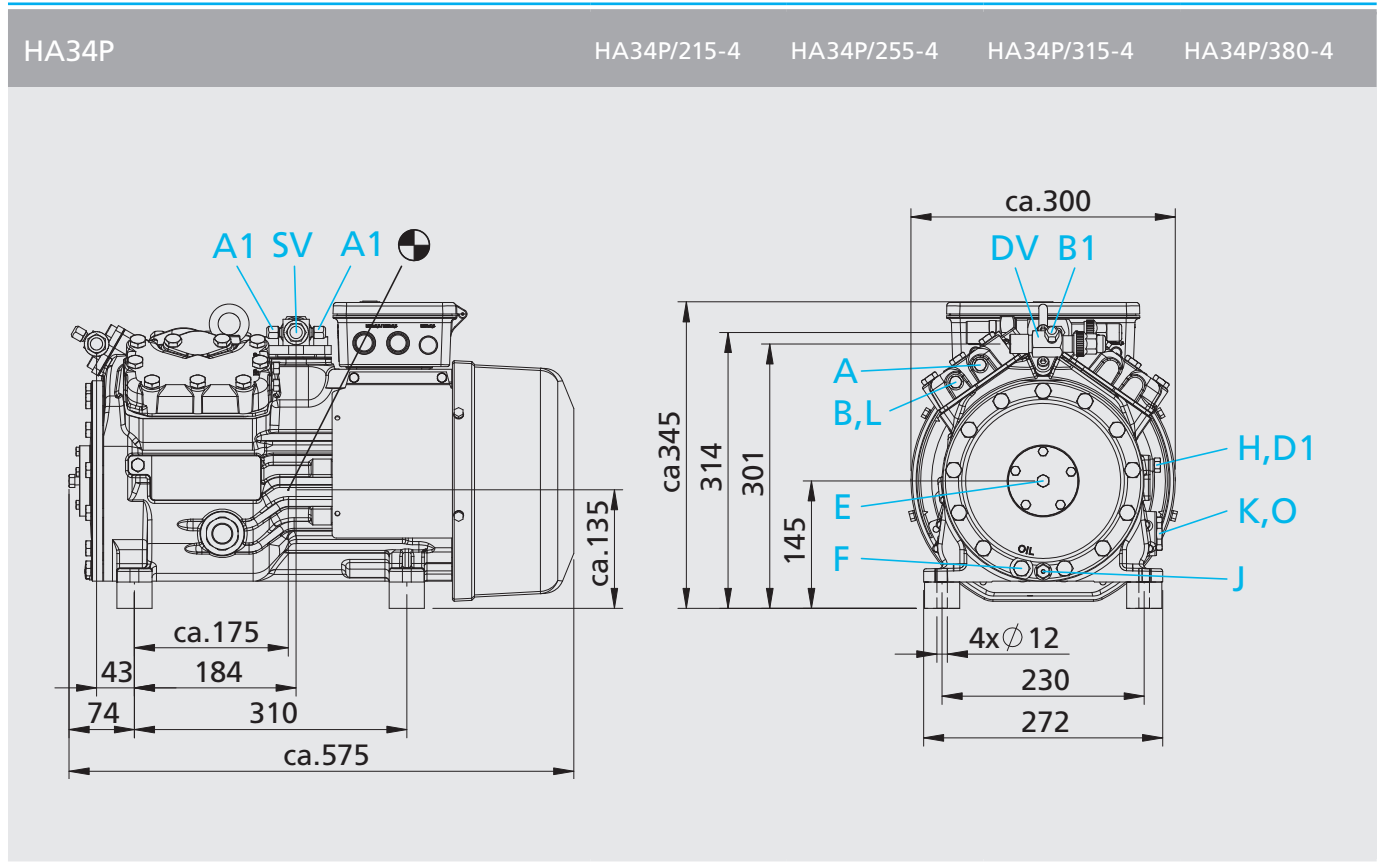
Dimensions in mm  
 1) Suction cover 90° rotatable  
 ☉ Centre of gravity

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

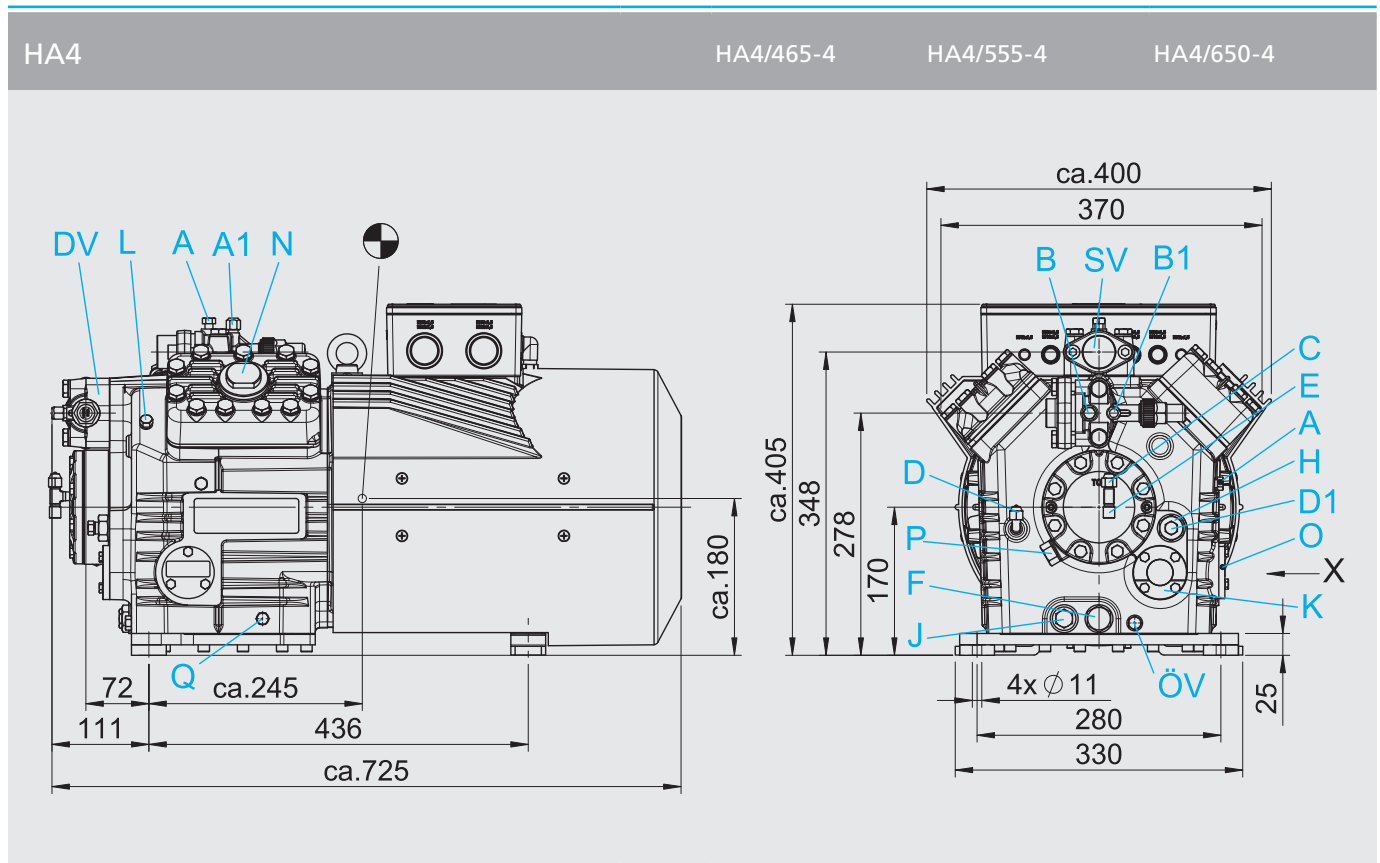


Dimensions in mm  
 ● Centre of gravity

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

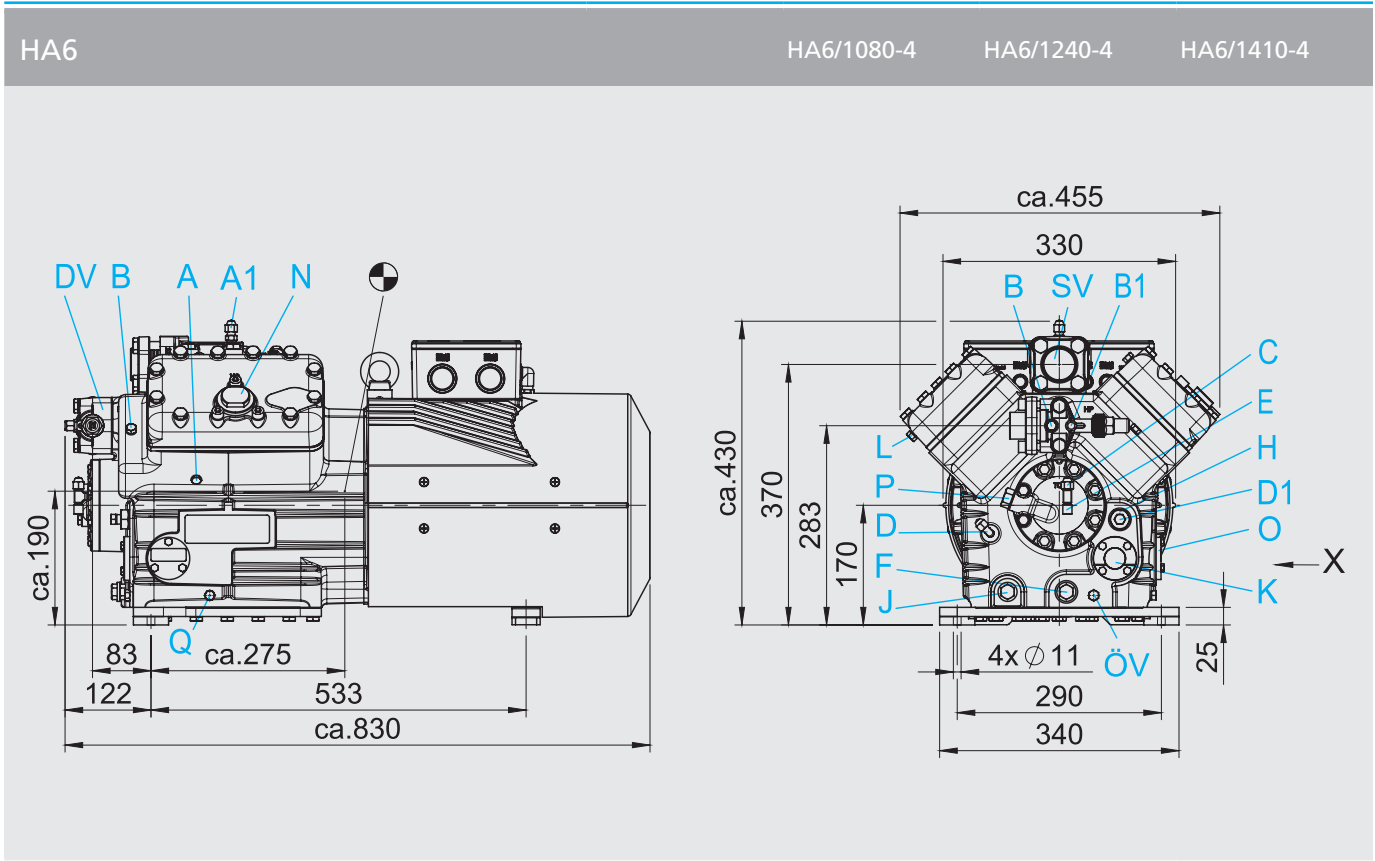
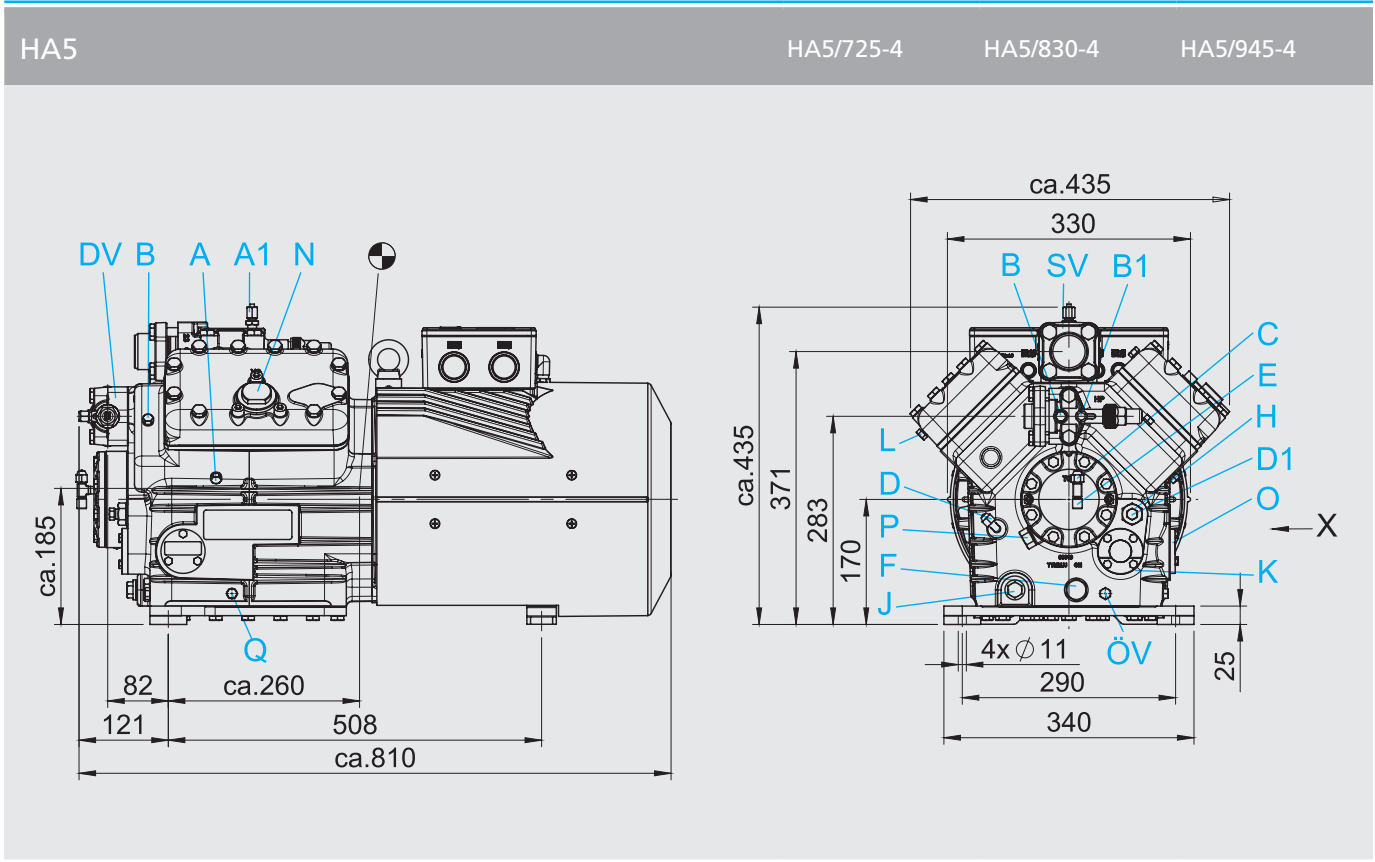


- 1
- 2
- 3
- 4



Dimensions in mm  
 ● Centre of gravity

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



Dimensions in mm  
 ● Centre of gravity

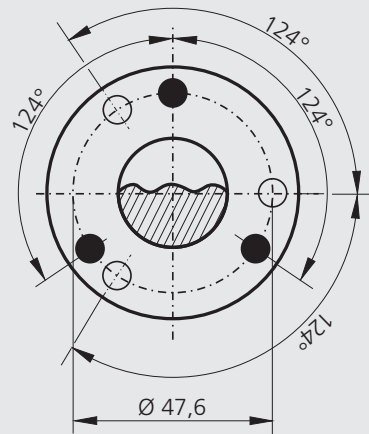
- Connections see page 64
- Dimensions for anti-vibration pad see page 61
- Dimensions for view X see page 61

View X

Possibility to connect to oil level regulator

HG4, HG5, HG6, HG7, HG88e  
HA4, HA5, HA6

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

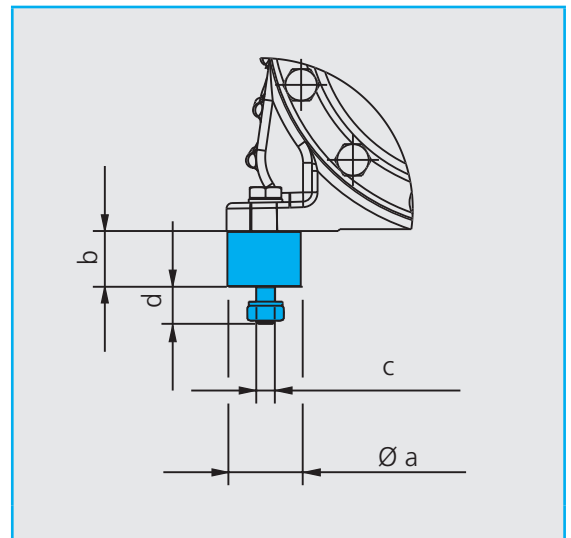


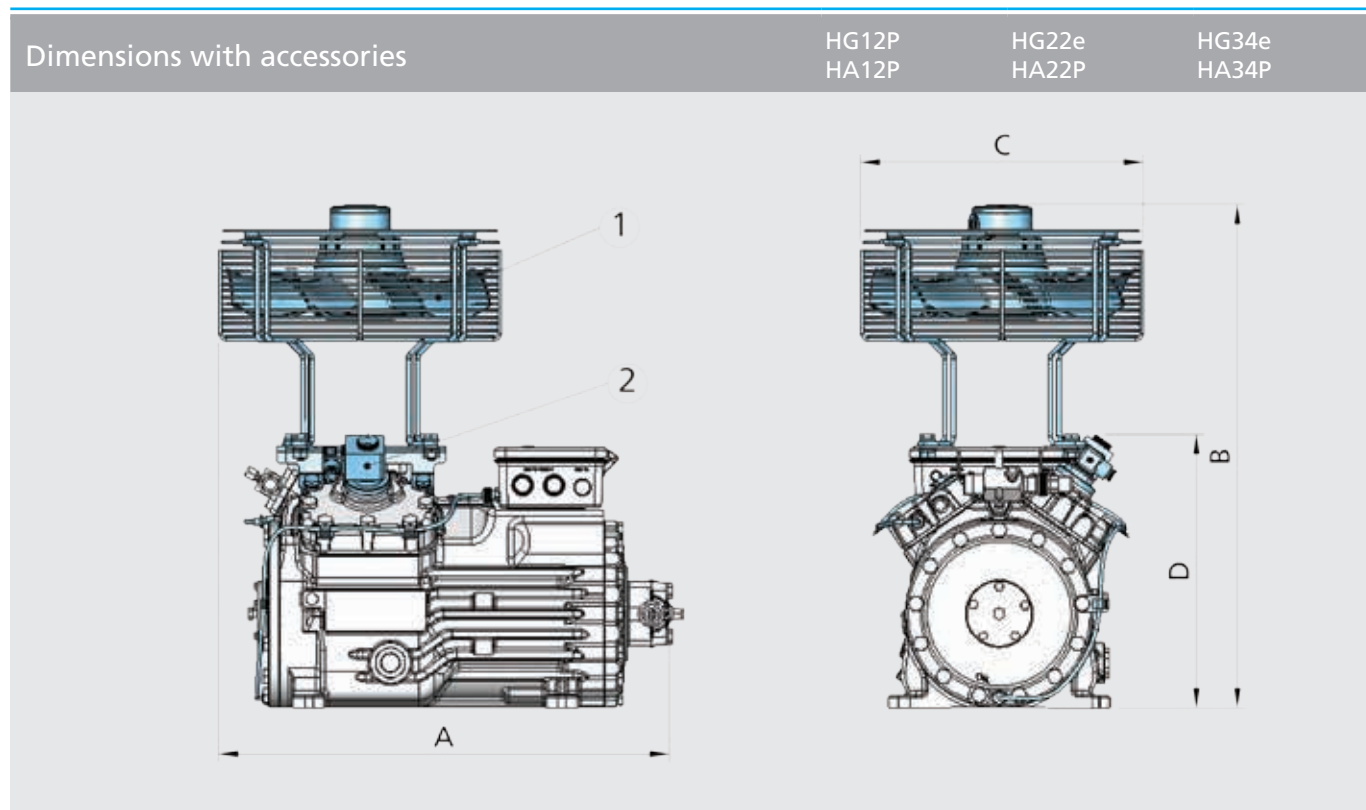
Dimensions in mm

- 1
- 2
- 3
- 4

Dimensions for anti-vibration pad

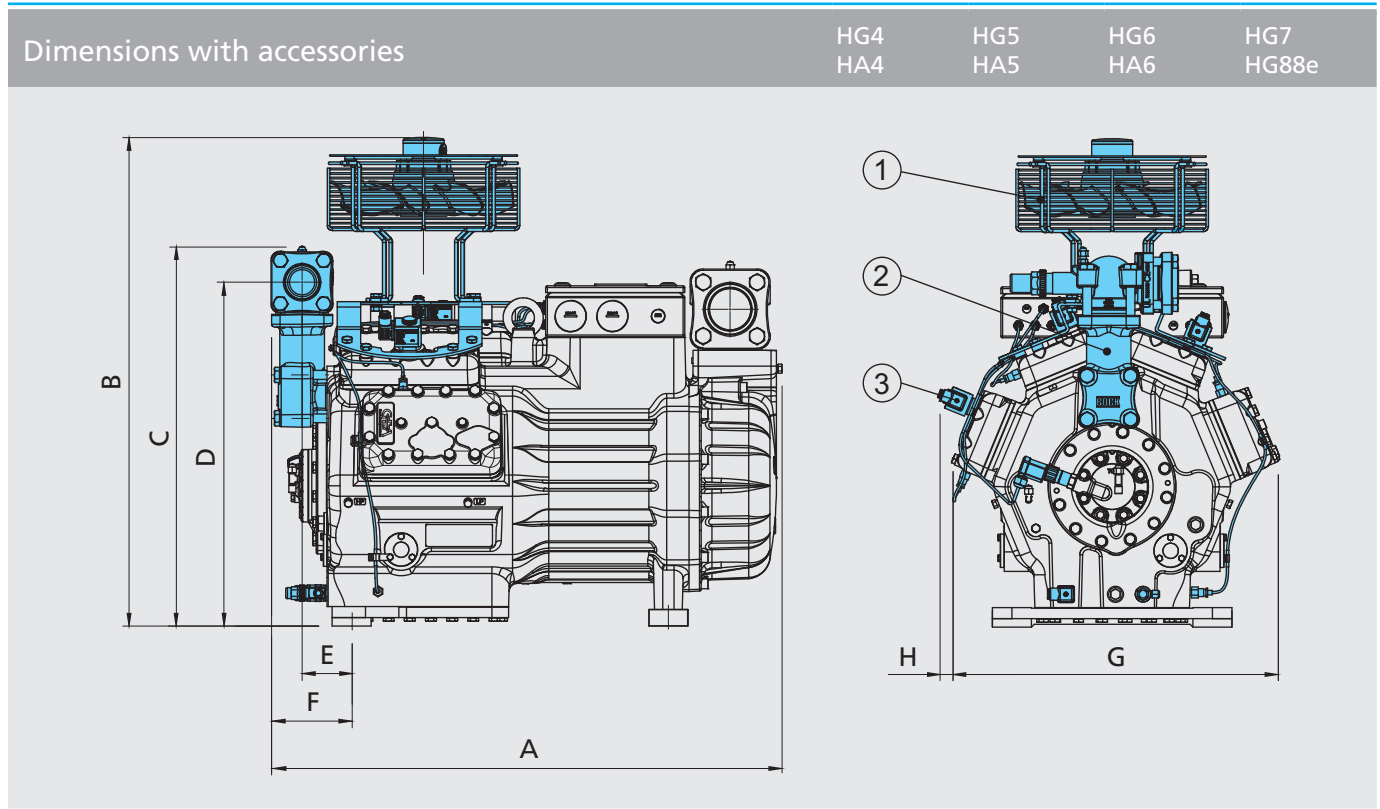
Type	Ø a mm	b mm	c mm	d mm
HG12P, HA12P	30	30	M8	20
HG22e, HA22P	40	30	M10	20
HG34e, HA34P	40	30	M10	20
HG4, HA4	40	30	M10	20
HG5, HA5	50	30	M10	25
HG6, HA6	50	30	M10	25
HG7	50	30	M10	25
HG88e	70	45	M12	37





① Additional fan    ② Capacity regulator

Type	A mm	B mm	C mm	D mm
HG12P	ca. 460	ca. 500	ca. 315	-
HA12P	-	-	-	-
HG22e	ca. 515	ca. 595	ca. 350	-
HA22P	-	-	-	-
HG34e	ca. 570	ca. 620	ca. 350	ca. 340
HA34P	-	-	-	ca. 370



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

Type	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm
HG4/465, HG4/555	ca. 705	ca. 680	ca. 455	416	91	131	ca. 375	ca. 20
HG4/650	ca. 740	ca. 680	ca. 455	416	91	131	ca. 375	ca. 20
HA4	-	-	-	-	-	-	ca. 400	ca. 5
HG5/725, HG5/830	ca. 835	ca. 730	ca. 465	422	101	141	ca. 440	-
HG5/945	ca. 850	ca. 730	ca. 465	422	101	141	ca. 440	-
HA5	-	-	-	-	-	-	ca. 435	-
HG6	ca. 870	ca. 740	ca. 460	421	101	141	ca. 460	-
HA6	-	-	-	-	-	-	ca. 455	-
HG7	ca. 830	ca. 760	ca. 580	520,5	95	150	ca. 510	ca. 15
HG88e	ca. 920	ca. 880	ca. 680	617	90	145	ca. 610	ca. 20

- 1
- 2
- 3
- 4

Connections	HG12P HA12P	HG22e HA22P	HG34e HA34P	HG4 HA4	HG5 HA5	HG6 HA6	HG7	HG88e
SV Suction line DV Discharge line	please refer to Technical data page 52 + 53							
A Connection suction side, not lockable	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF
A1 Connection suction side, lockable	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF
A2 Connection suction side, not lockable	-	-	-	-	-	-	1/4" NPTF	1/4" NPTF
B Connection suction side, not lockable	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF
B1 Connection suction side, lockable	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF
C Connection oil pressure safety switch OIL	-	-	-	7/16" UNF	7/16" UNF	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	7/16" UNF	7/16" UNF
D1 Connection oil return from oil separator	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF
E Connection oil pressure gauge	1/8" NPTF	1/8" NPTF	1/8" NPTF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF
F Oil drain	M 8	M 10	M 10	M 22 x 1,5	M 22 x 1,5	M 22 x 1,5	M 22 x 1,5	M 22 x 1,5
H Oil charge plug	1/4" NPTF	1/4" NPTF	1/4" NPTF	M 22 x 1,5	M 22 x 1,5	M 22 x 1,5	M 22 x 1,5	M 22 x 1,5
J Connection oil sump heater	Ø 15 mm	Ø 15 mm	Ø 15 mm	M 22 x 1,5	M 22 x 1,5	M 22 x 1,5	M 22 x 1,5	M 22 x 1,5
K Sight glass	1 1/8" - 18 UNEF	1 1/8" - 18 UNEF	1 1/8" - 18 UNEF	4 hole M 6	4 hole M 6	4 hole M 6	3 hole M 6	3 hole M 6
L Connection thermal protection thermostat	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF
N Connection capacity controller	-	-	-	M 48 x 1,5	M 45 x 1,5	M 45 x 1,5	M 45 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	①	①
ÖV Connection oil service valve	-	-	-	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF	1/4" NPTF
P Connection oil pressure differential sensor	-	-	-	M 20 x 1,5	M 20 x 1,5	M 20 x 1,5	M 20 x 1,5	M 20 x 1,5
Q Connection oil temperature sensor	-	-	-	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF

① Dimensions see view X page 61



Scope of supply HG	HG12P	HG22e	HG34e	HG4	HG5	HG6	HG7	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 Single-section compressor housing with hermetically integrated electric motor	●	●						
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 Single-section compressor housing with hermetically integrated electric motor			●					
Semi-hermetic four cylinder reciprocating compressor with drive motor for part winding start 380-420 V Y/YY - 3 - 50 Hz 440-480 V Y/YY - 3 - 60 Hz Motor unit flanged onto the compressor housing				●	●	●		
Semi-hermetic six cylinder reciprocating compressor with drive motor for part winding start 380-420 V Y/YY - 3 - 50 Hz 440-480 V Y/YY - 3 - 60 Hz Single-section compressor housing with hermetically integrated electric motor							●	
Semi-hermetic eight cylinder reciprocating compressor with drive motor for part winding star 380-420 V Δ / YYY - 3 - 50 Hz 440-480 V Δ / YYY - 3 - 60 Hz Single-section compressor housing with hermetically integrated electric motor								●
Winding protection with PTC resistor sensors and electronic triggering unit MP10	●	●	●	●	●	●	●	
Winding protection with PTC resistor sensors and electronic triggering unit INT69 G								●
Oil pump	●	●	●	●	●	●	●	●
Oil pump cover with screwed connection for differential oil pressure sensor (Δp-switch Kriwan make)				●	●	●	●	●
Possibility to connect to oil level controllers makes ESK, AC+R or CARLY	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	●	●	●	●	●
Possibility to connect to oil level controllers make Traxoil	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>
Oil charge: HG: FUCHS Reniso SP46 HGX: FUCHS Reniso Triton SE55	●	●	●	●	●	●	●	●
Sight glass	●	●	●	●	●	●		
Two sight glasses							●	
Three sight glasses								●
Prepared for capacity regulator (1 cylinder cover)				●	●	●		
Prepared for capacity regulator (2 cylinder covers)							●	
Decompression valve				●	●	●	●	●
Suction and discharge line valve	●	●	●	●	●	●	●	●
Inert gas charge	●	●	●	●	●	●	●	●
4 anti-vibration pads enclosed	●	●	●	●	●	●	●	●

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<sup>1)</sup> Only possible with additional adapter

Scope of supply HA	HA12P	HA22P	HA34P	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 Single-section compressor housing with hermetically integrated electric motor	●	●				
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 Single-section compressor housing with hermetically integrated electric motor			●			
Semi-hermetic four cylinder reciprocating compressor with drive motor for part winding start 380-420 V Y/YY - 3 - 50 Hz 440-480 V Y/YY - 3 - 60 Hz Motor unit flanged onto the compressor housing				●	●	●
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, 72 W, 0,53 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 and electronic motor protection unit MP10	●	●	●	●	●	●
Oil pump	●	●	●	●	●	●
Oil pump cover with screwed connection for differential oil pressure sensor (Δp-switch Kriwan make)				●	●	●
Possibility to connect to oil level controllers makes ESK, AC+R or CARLY	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	●	●	●
Possibility to connect to oil level controllers make Traxoil	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>
Oil charge: HA: FUCHS Reniso SP46 HAX: FUCHS Reniso Triton SE55	●	●	●	●	●	●
Sight glass	●	●	●	●	●	●
Prepared for capacity regulator (1 cylinder cover)				●	●	●
Decompression valve				●	●	●
Suction and discharge line valve	●	●	●	●	●	●
Inert gas charge	●	●	●	●	●	●
4 anti-vibration pads enclosed	●	●	●	●	●	●

<sup>1)</sup> Only possible with additional adapter

Accessories HG + HA	HG12P HA12P	HG22e HA22P	HG34e HA34P	HG4 HA4	HG5 HA5	HG6 HA6	HG7	HG88e
① Oil sump heater 110-240 V - 1 - 50/60 Hz, 50-120 W, PTC heater, self-regulating	●	●	●					
Oil sump heater 220-240 V - 1 - 50/60 Hz, 80 W				●				
Oil sump heater 220-240 V - 1 - 50/60 Hz, 140 W					●	●	●	
Oil sump heater 220-240 V - 1 - 50/60 Hz, 200 W								●
② Thermal protection thermostat (PTC)	●	●	●	●	●	●	●	●
③ Capacity regulator 230 V - 1 - 50/60 Hz, IP65 1 Capacity regulator = 50% residual capacity			●	●	●	●		
Capacity regulator 230 V - 1 - 50/60 Hz, IP65 1-2 Capacity regulators = 66/33% residual capacity							●	
Capacity regulator 230 V - 1 - 50/60 Hz, IP65 1-3 Capacity regulators = 75/50/25% residual capacity								●
④ Start unloader 230 V - 1 - 50/60 Hz, IP65, without check valve, including thermal protection thermostat (PTC sensor)				●	●	●	●	
⑤ 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		● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1) 2)</sup>	
⑥ Oil pressure safety switch MP 54 230 V - 1 - 50/60 Hz, IP20				● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>
⑦ Oil differential pressure sensor ( $\Delta p$ -switch Kriwan make) 220-240 V - 1 - 50/60 Hz				● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>	● <sup>1)</sup>
⑧ Oil service valve				●	●	●	●	●
⑨ Oil temperature control (NTC)								● <sup>1)</sup>
⑩ Cylinder cover prepared for capacity regulator			●					
⑪ Additional fan 230 V $\Delta$ / 400 V Y - 3 - 50 Hz, 120 W, 230-265 V $\Delta$ / 400-460 V Y - 3 - 60 Hz, 190 W, IP54, Voltage range $\pm$ 10%	● <sup>1) 3)</sup>	● <sup>1) 3)</sup>	● <sup>1) 3)</sup>	● <sup>1) 3)</sup>	● <sup>1) 3)</sup>	● <sup>1) 3)</sup>	● <sup>1)</sup>	● <sup>1)</sup>
⑫ Continuously variable speed control by means of a EFC (Electronic Frequency Control), for single compressors, compactly built onto compressor and connected ready-to-operate, with pressure transducer, control signal 4-20 mA	●	●	●					
Continuously variable speed control by means of a EFC (Electronic Frequency Control), for single compressors, compactly built onto compressor and connected ready-to-operate, without pressure transducer, control signal 4-20 mA or 0-10 V	●	●	●					
⑬ GEA Bock Compressor Management BCM2000 including oil pressure control ( $\Delta p$ -switch Kriwan make) ⑦, oil temperature control (NTC) ⑨, thermal protection thermostat (PTC) per cylinder cover 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)								●
⑮ DP-Modbus Gateway 115 V / 230 V AC, 50/60 Hz, IP00 incl. adapter cable								●
⑯ Modbus-LAN Gateway 230 V AC, 50/60 Hz, IP00								● <sup>1)</sup>
⑰ USB converter for INT69 G Diagnose and INT69 GTML Diagnose								● <sup>1)</sup>
⑱ Water-cooled cylinder covers				●	●	●	●	
Sea water resistant water-cooled cylinder covers				●	●	●	●	
⑲ Intermediate adapter for discharge line valve				● <sup>3)</sup>	● <sup>3)</sup>	● <sup>3)</sup>	●	●
⑳ Connection piece suction and discharge valve in welded construction				● <sup>4)</sup>	● <sup>4)</sup>	● <sup>4)</sup>	● <sup>4)</sup>	●
Special voltage and/or frequency	● <sup>4)</sup>	● <sup>4)</sup>	● <sup>4)</sup>	● <sup>4)</sup>	● <sup>4)</sup>	● <sup>4)</sup>	● <sup>4)</sup>	● <sup>4)</sup>

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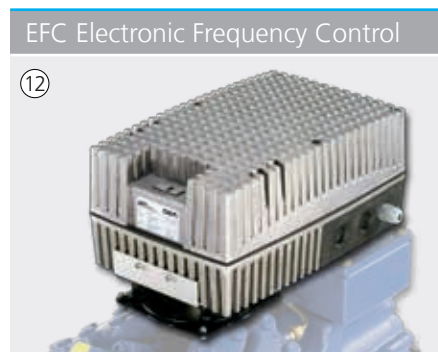
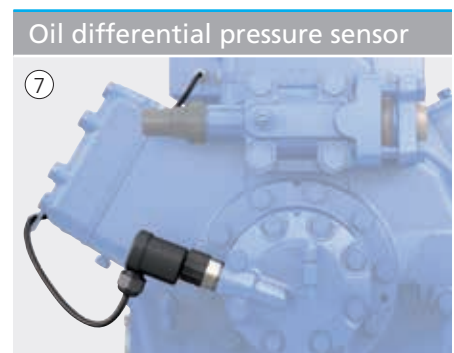
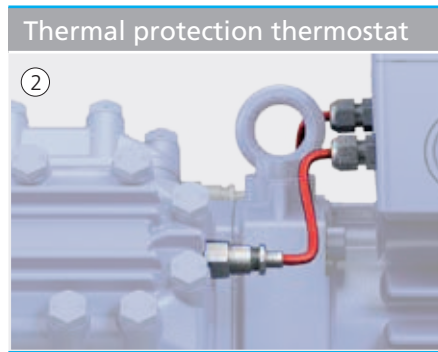
<sup>1)</sup> Enclosed package

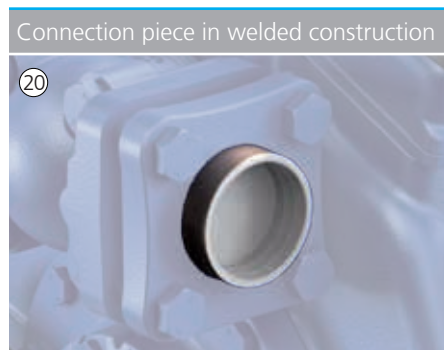
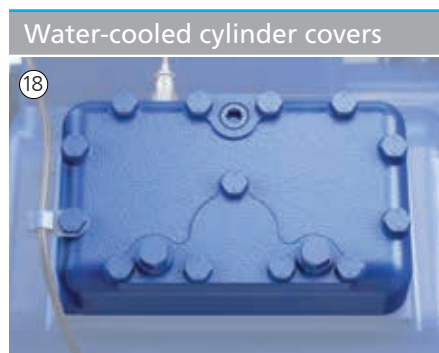
<sup>2)</sup> Not available HG7/2110-4 S

<sup>3)</sup> Only available for HG compressors

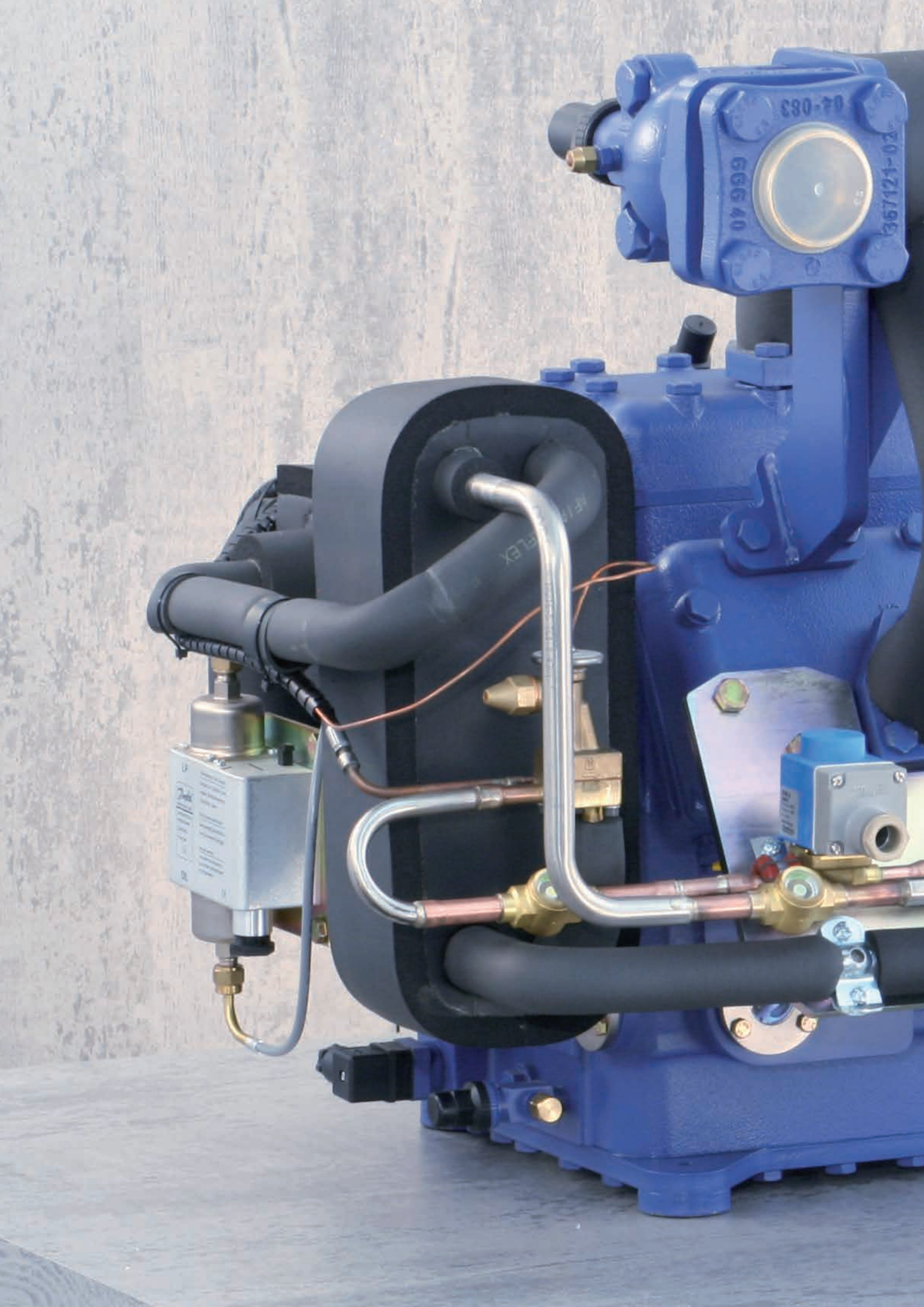
<sup>4)</sup> On request

Pictures of accessories see page 68-69





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## Two-stage semi-hermetic GEA Bock compressors

At a glance	72
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Operating limits and performance data	74
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Dimensions and connections	79
Scope of supply and accessories	82

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

### The two stage system consists of:

- Liquid subcooler
- Reinjection valve
- Solenoid valve
- Sight glass
- Filter drier

### Available models

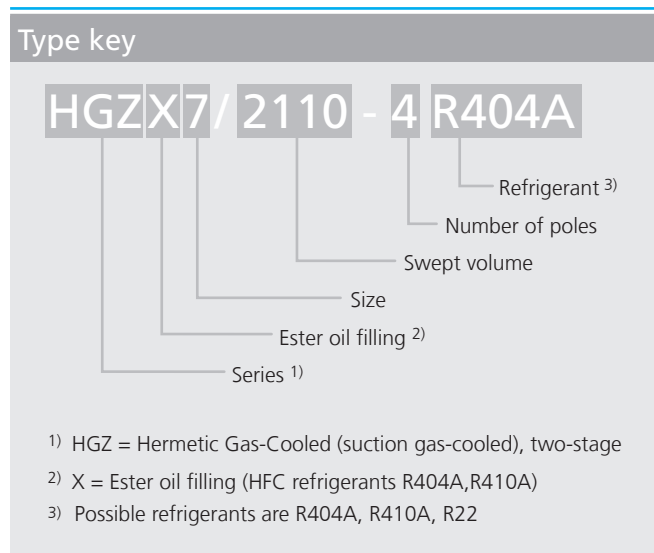
for refrigerants R404A, R410A, R507, R22

Type	Displacement (50 Hz) LP / HP
HGZX7/1620-4 R404A/R507	
HGZX7/1620-4 R410A	93,70 m <sup>3</sup> /h / 46,90 m <sup>3</sup> /h
HGZ7/1620-4 R22	
HGZX7/1860-4 R404A/R507	
HGZX7/1860-4 R410A	107,60 m <sup>3</sup> /h / 53,80 m <sup>3</sup> /h
HGZ7/1860-4 R22	
HGZX7/2110-4 R404A/R507	
HGZX7/2110-4 R410A	122,40 m <sup>3</sup> /h / 61,20 m <sup>3</sup> /h
HGZ7/2110-4 R22	

### Special features:

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

Further information on the HG7 basic compressor see chapter "Single-stage semi-hermetic GEA Bock compressors" from page 28.



### The two possible designs of the HGZ7:

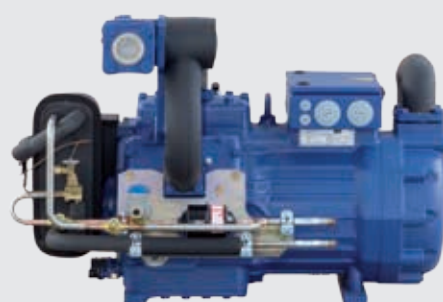
#### Design: everything enclosed separately

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



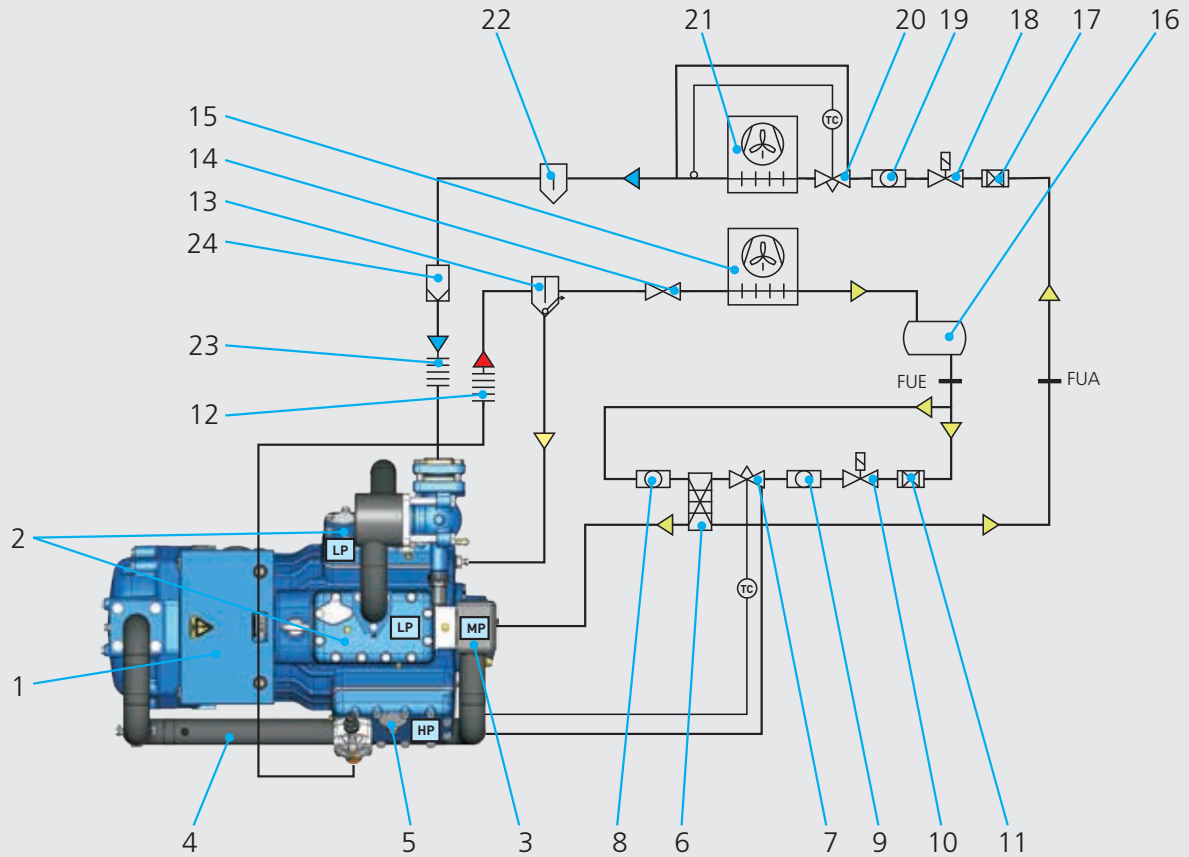
#### Design: mounted directly to the compressor

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





Refrigeration circuit with two-stage compressor  
Schematic diagram



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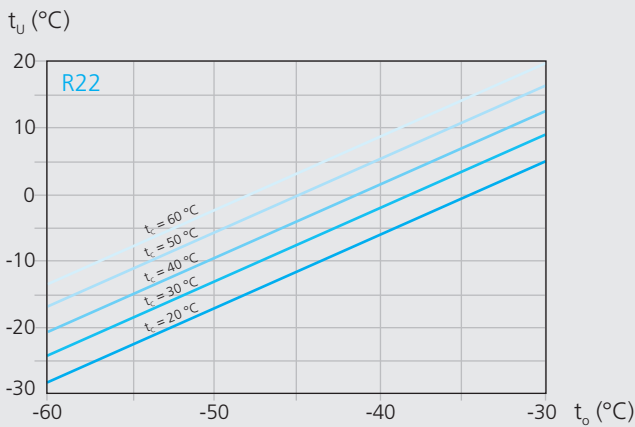
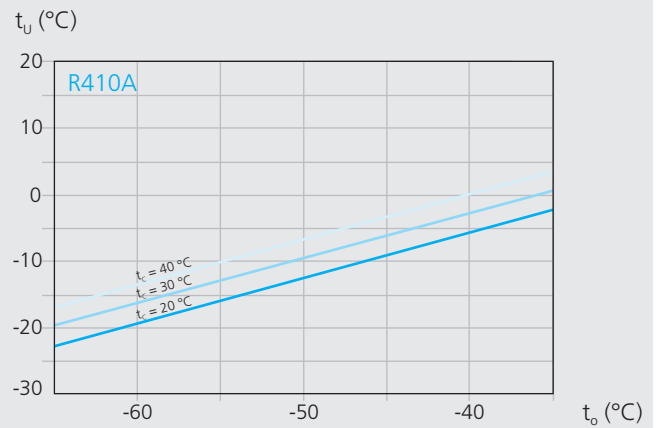
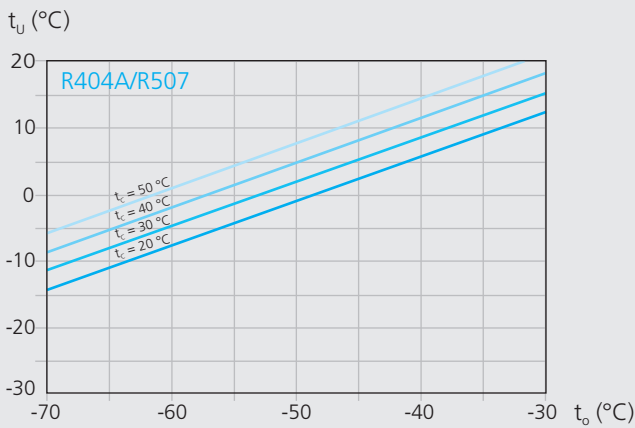
Explanations

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>1 Compressor</li> <li>2 Cylinder LP-stage</li> <li>3 Intermediate pressure chamber MP</li> <li>4 Intermediate pressure line MP</li> <li>5 Cylinder HP-stage</li> <li>6 Subcooler*</li> <li>7 Reinjection valve*</li> <li>8 Sight glass 1*</li> <li>9 Sight glass 2*</li> <li>10 Solenoid valve*</li> <li>11 Filter drier*</li> <li>12 Vibration damper, pressure line</li> <li>13 Oil separator</li> <li>14 Non-return valve</li> <li>15 Condenser</li> <li>16 Refrigerant receiver</li> </ul> | <ul style="list-style-type: none"> <li>17 Filter drier</li> <li>18 Solenoid valve</li> <li>19 Sight glass</li> <li>20 Expansion valve (evaporator)</li> <li>21 Evaporator</li> <li>22 Liquid separator</li> <li>23 Vibration damper, suction line</li> <li>24 Filter suction line</li> </ul> <p>LP = Low pressure<br/>                 MP = Medium pressure<br/>                 HP = High pressure<br/>                 FUE = Liquid subcooler, inlet<br/>                 FUA = Liquid subcooler, outlet</p> <p>* Components for subcooling system not supplied as standard</p> |
|---|---|

Subcooling temperature

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

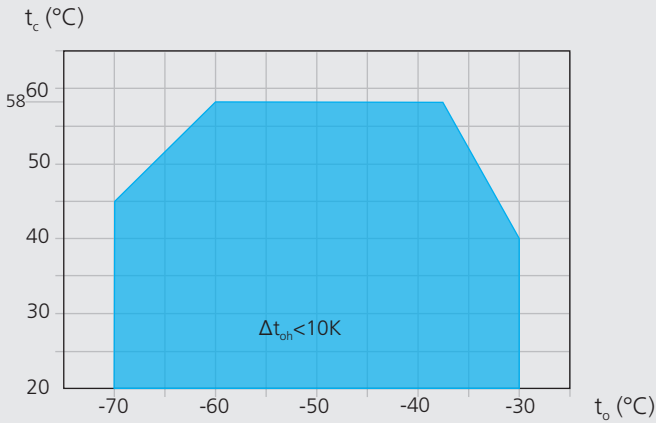
Subcooling temperature calculation diagram for the intermediate cooler outlet



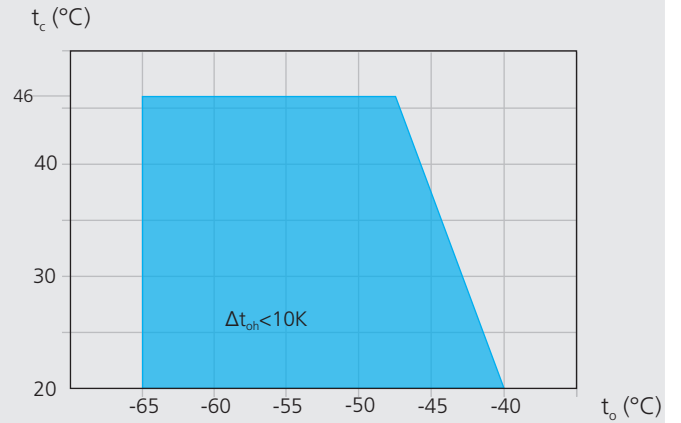
$t_u$  = Subcooling temperature at the intermediate cooler outlet (FUA)  
 $t_o$  = Evaporation temperature

Operating limits

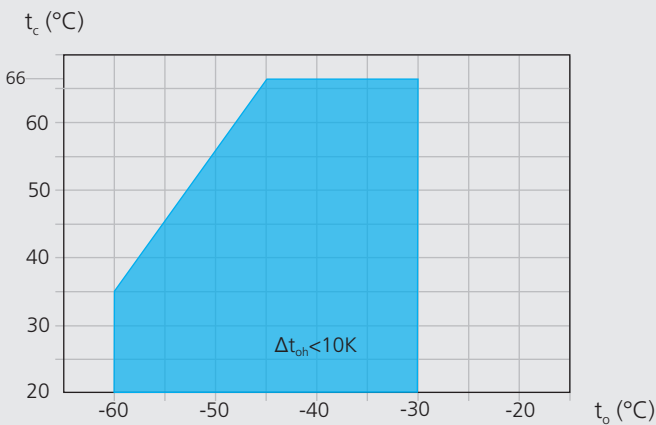
R404A/R507



R410A



R22



Application range

$t_o$  Evaporating temperature (°C)

$t_c$  Condensing temperature (°C)

$\Delta t_{oh}$  Suction gas superheat (K)

Max. permissible operating pressure (LP/MP/HP)<sup>1)</sup>: 19/19/28 bar

<sup>1)</sup> LP = low pressure MP = medium pressure HP = high pressure

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Notes

Operating limits

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

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 Bock software

R404A/R507		Performance data									50 Hz
Type	Cond. temp. °C		Cooling capacity $\dot{Q}_o$ [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		Performance data							50 Hz
Type	Cond. temp. °C		Cooling capacity $\dot{Q}_o$ [W]					Power consumption $P_e$ [kW]	
			Evaporating temperature °C						
			-35	-40	-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	
	50	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	
	50	Q			24980	19082	14229	10352	
		P			29,87	26,94	23,84	20,48	

R22		Performance data								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

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HGZ  Type	Number of cylinders	Displacement				Voltage  ①	Electrical data			Weight  kg	Oil charge  Ltr.
		50 Hz (1450 rpm)		60 Hz (1740 rpm)			Max. working current  ②	Max. power consumption  ②	Starting current (rotor locked)  ②		
		LP	HP	LP	HP						
m <sup>3</sup> /h		m <sup>3</sup> /h		A	kW	A					
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	185 / 278	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	185 / 278	291	4,5
HGZX7/2110-4 R404A HGZX7/2110-4 R410A HGZ7/2110-4 R22	6	122,40 / 61,20		146,90 / 73,50		③	65	36,0	191 / 286	289	4,5

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

LP = low pressure  
HP = high pressure

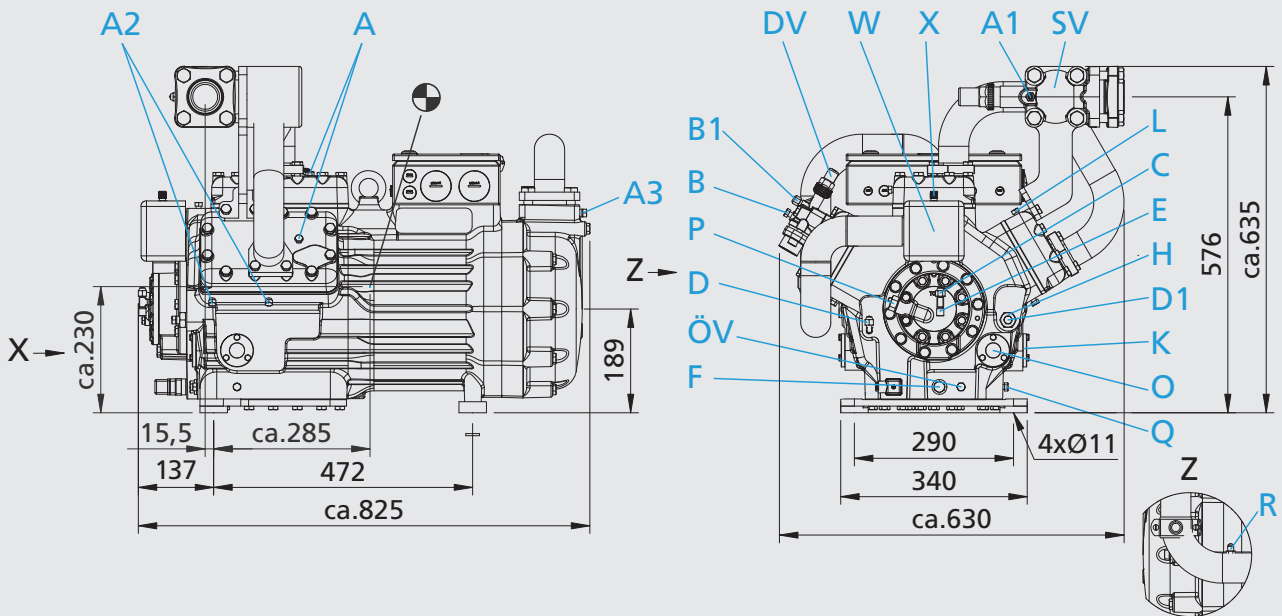
Oil sump heater 230V -1- 50/60 Hz 140 W (option)  
Permanently set version, installation in immersion sleeve

Explanations:

- ① Tolerance (± 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 Δ/ YYY - 3 - 50 Hz PW  
440-480 V Δ/ YYY - 3 - 60 Hz PW  
PW = Part Winding, motors for part winding start (no start unloaders required)  
Winding ratios: 60% / 40%

HGZ7 - Series

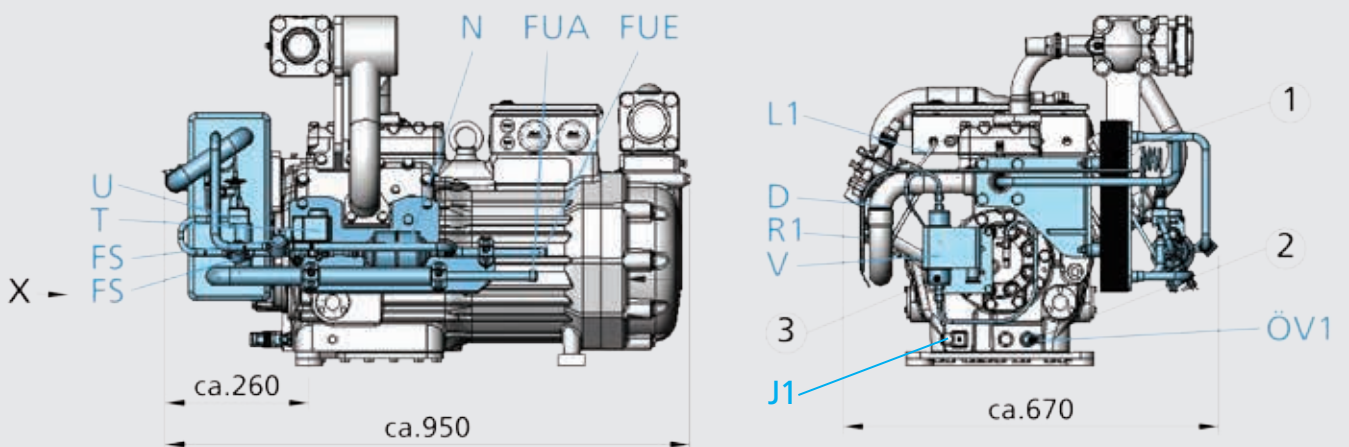
Liquid subcooler with accessories supplied separately



- 1
- 2
- 3
- 4

HGZ7 - Option

Liquid subcooler with complete accessories directly mounted onto the compressor



① Liquid subcooler with accessories

② Oil service valve

③ Oil pressure safety switch

Dimensions in mm  
 ● Centre of gravity

- Connections see page 80  
 - Rigid fixing without anti-vibration pad  
 - Dimensions for view X see page 81

Connections		
DV	Discharge line	Ø 35 mm / 1 3/8 " "
SV	Suction line	Ø 54 mm / 2 1/8 " "
FUE	Liquid subcooler IN	Ø 16 mm - 5/8 " "
FUA	Liquid subcooler OUT	Ø 16 mm - 5/8 " "
A	Connection suction side, not lockable	1/8 " NPTF
A1	Connection suction side, lockable	7/16 " UNF
A2	Connection intermediate pressure, 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
E	Connection oil pressure gauge	7/16 " UNF
F	Oil drain	M 22 x 1,5
FS	Sight glass Liquid line	Ø 12 mm
H	Oil charge plug	M 22 x 1,5

Connections		
J1	Oil sump heater	M 22 x 1,5
K	Sight glass	3 hole M 6
L	Connection thermal protection thermostat	1/8 " NPTF
L1	Thermal protection thermostat	1/8 " NPTF
N	Filter drier	Ø 12 mm
O	Connection oil level regulator	①
ÖV	Connection oil service valve	1/4 " NPTF ①
ÖV1	Oil service valve	7/16 " UNF
P	Connection oil pressure differential sensor	M 20 x 1,5
Q	Connection oil temperature sensor	1/8 " NPTF ①
R	Connection equalizer for injection valve	7/16 " UNF
R1	Equalizer for injection valve	Ø 6 mm
T	Solenoid valve	Ø 12 mm
U	Reinjection valve - dependent on refrigerant	Ø 12 mm
V	Oil pressure safety switch MP 54	-
W	Connection refrigerant injection	M 22 x 1,5
X	Connection for Schrader valve for intermediate pressure manometer	7/16 " UNF

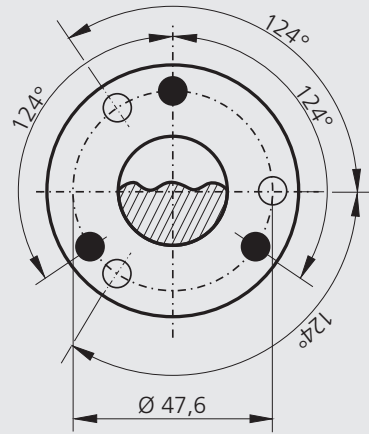
① Dimensions see view X see page 81



View X

Possibility to connect to oil level regulator

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



Dimensions in mm

1

2

3

4

Scope of supply

Semi-hermetic six cylinder reciprocating compressor with drive motor for part winding start  
 380-420 V  $\Delta$ YYY - 3 - 50 Hz  
 440-480 V  $\Delta$ YYY - 3 - 60 Hz  
 Single-section compressor housing with hermetically integrated electric motor

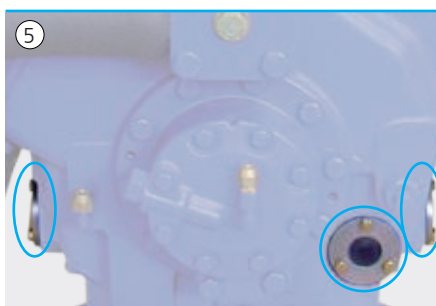
Cylinder design in W form, LP/HP stage ratio 2:1

- 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 ( $\Delta p$  switch Kriwan make)
- ④ Direct connection possibility for oil level regulators ESK, AC+R or CARLY

Oil charge:  
 HGZ: FUCHS Reniso SP46  
 HGZX: FUCHS Reniso Triton SE55

- ⑤ Three sight glasses
- Decompression valve
- ⑥ Suction and discharge line shut off valve
- ⑦ Inert gas charge

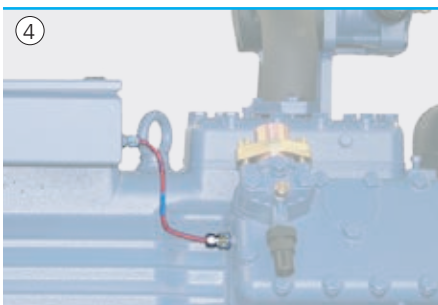
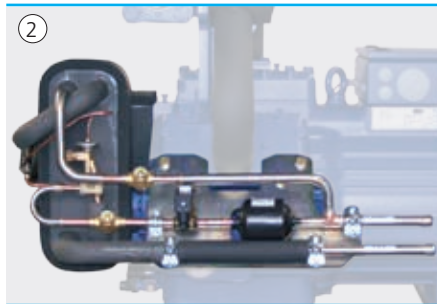
4 anti-vibration pads enclosed



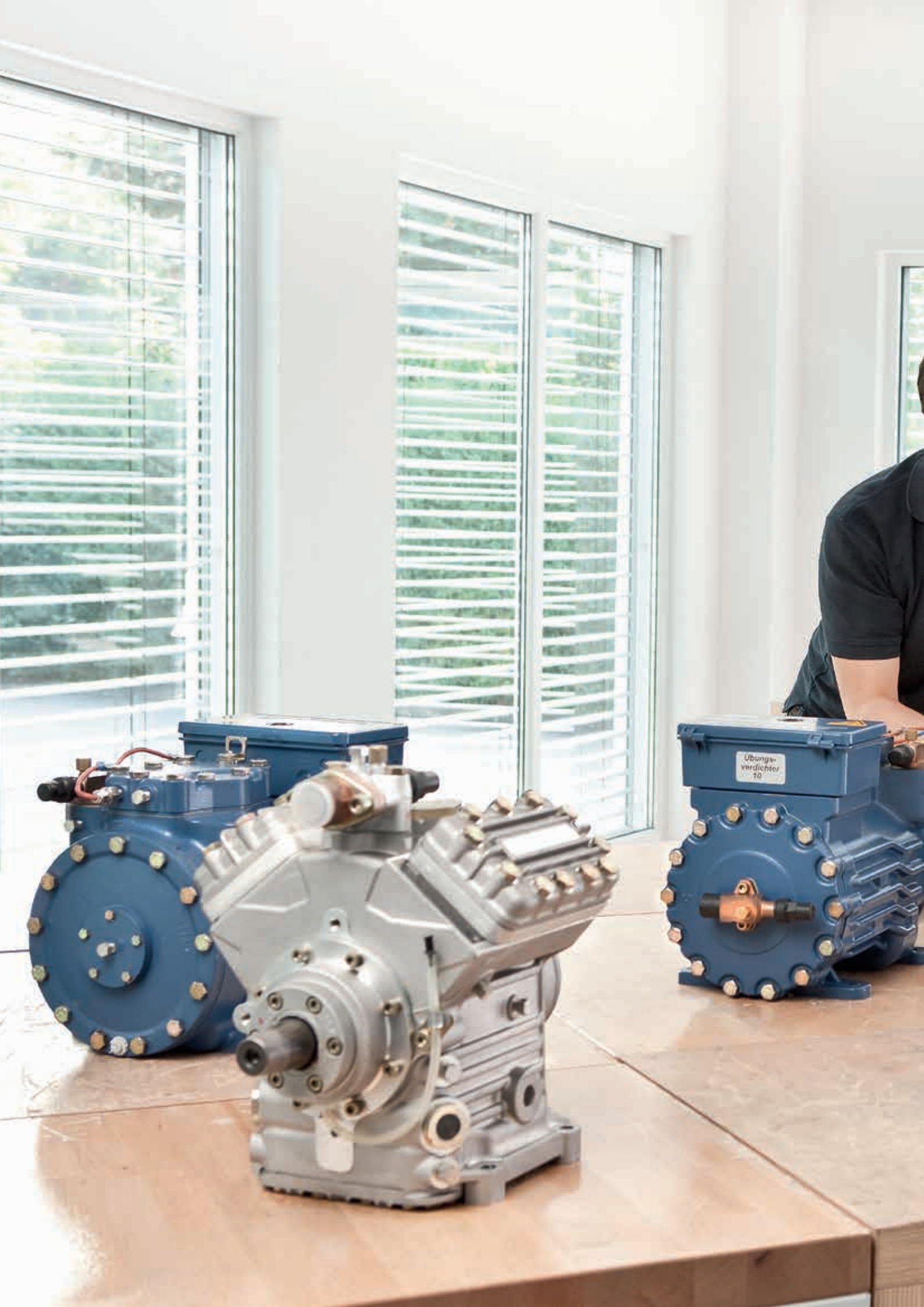
Accessories

- ① Liquid subcooler, reinjection valve, solenoid valve 230 V - 1 - 50/60 Hz, two sight glasses, filter drier, supplied separately for individual, external installation. Assembly is for the function of the compressor mandatory.
- ② Liquid subcooler, reinjection valve, solenoid valve 230 V - 1 - 50/60 Hz, two sight glasses, filter drier, directly mounted onto the compressor, fully assembled and insulated with pipes ready for connection
- ③ Oil sump heater 220-240 V - 1 - 50/60 Hz, 140 W
- ④ Thermal protection thermostat (PTC sensor) 230 V - 1 - 50/60 Hz
- ⑤ Oil pressure safety switch MP 54, 230 V - 1 - 50/60 Hz, IP20 <sup>1)</sup>
- ⑥ Oil differential pressure sensor ( $\Delta p$ -switch Kriwan make) 220-240 V - 1 - 50/60 Hz <sup>1)</sup>
- ⑦ Oil service valve
- ⑧ GEA Bock Compressor Management BCM2000 including oil pressure control ( $\Delta p$ -switch Kriwan make) ⑥, oil temperature control (NTC), thermal protection thermostat (PTC) per cylinder cover ④  
Special voltage and/or frequency (on request)

<sup>1)</sup> enclosed package



- 1
- 2
- 3
- 4





## Service - Made by GEA Bock

Training and workshops  
GEA Bock on the Internet

86  
87

### Because you're never done learning - GEA Bock training and workshops on compressors

Many years ago, GEA Bock intensified its commitment in the area of customer training.

And so we offer a comprehensive array of attractive training events, from two-day practitioners' workshops in Frickenhausen to afterwork workshops throughout Germany. Regardless of the type of training you are interested in.

Three things are characteristic of all GEA Bock training:

- The captivating way that 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 Bock are offered as a free service

#### Overview of training events offered:

- GEA Bock 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

Telephone +49 70 22 / 94 54-157

Fax +49 70 22 / 94 54-137

Email: [Peter.Spies@gea.com](mailto:Peter.Spies@gea.com)





- 1
- 2
- 3
- 4



*We live our values.*

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA Group is a global engineering company with multi-billion euro sales and operations in more than 50 countries. Founded in 1881, the company is one of the largest providers of innovative equipment and process technology. GEA Group is listed in the STOXX® Europe 600 index.

## **GEA Refrigeration Technologies**

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