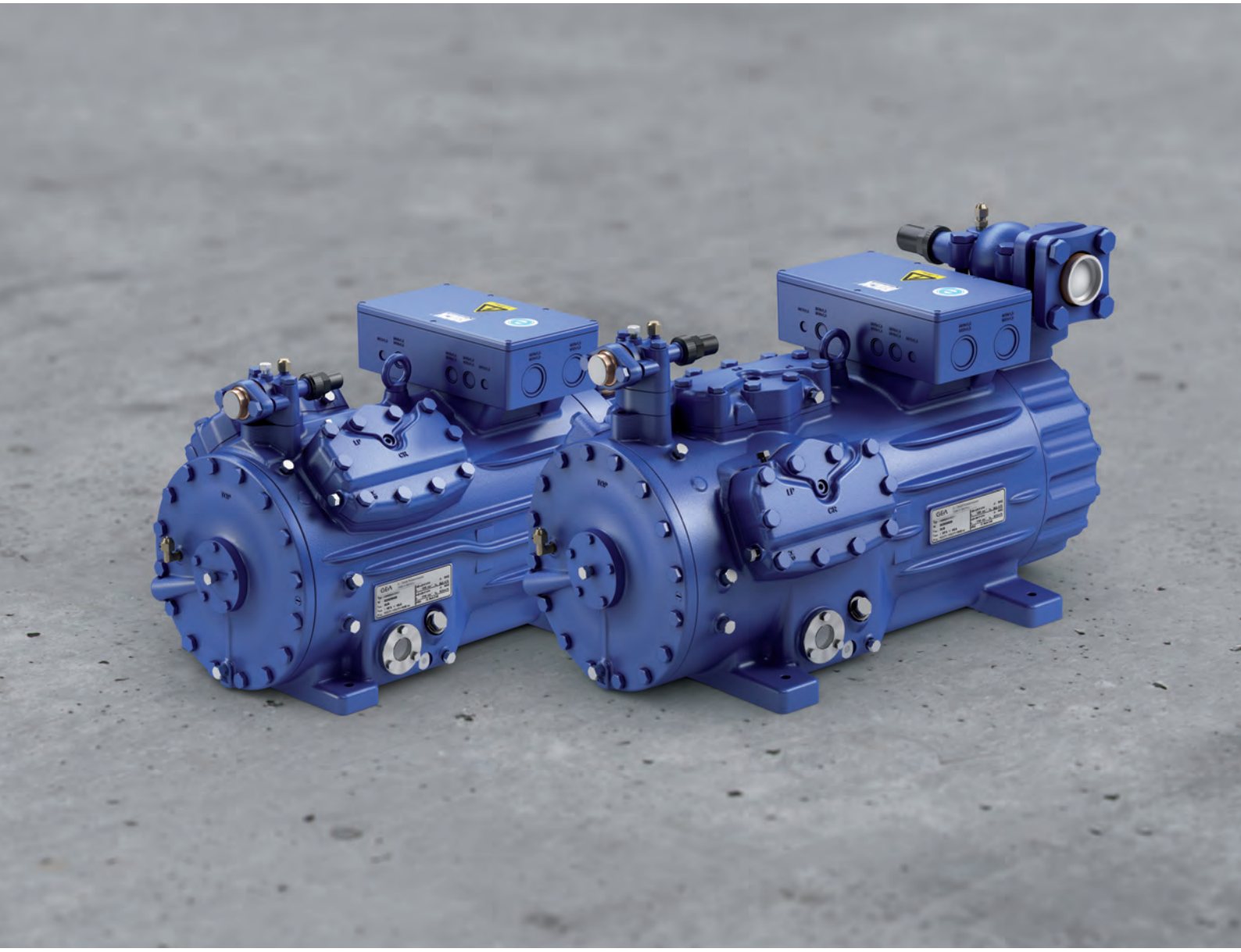


# GEA Bock Compressors HG44e and HG56e

Semi-hermetic GEA Bock Compressors

engineering for a better world

GEA Refrigeration Technologies

# Bock compressors HG44e and HG56e

*Our solutions are customer-oriented and user-friendly, because they are low-priced, energy-efficient, long-lasting and tailored to your individual needs.*

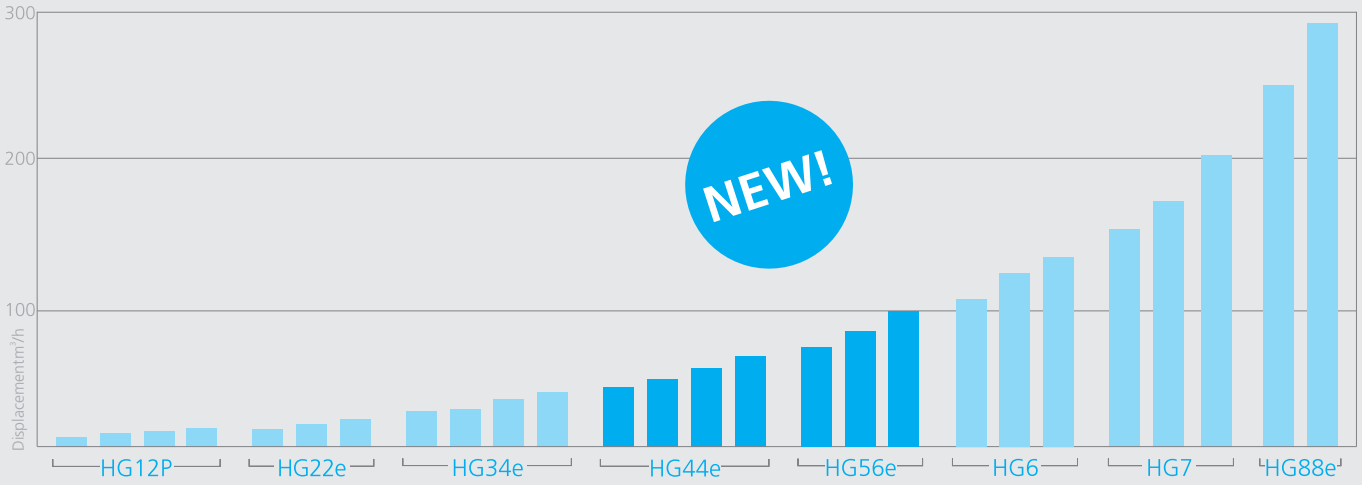
With its GEA Bock HG44e and HG56e compressor ranges, GEA Refrigeration Technologies introduces new, more efficient semi-hermetic compressors to the market – models that replace its HG4 and HG5 ranges. In addition to their uses in the field of refrigeration and air-conditioning, the new compressors are ideally suited for refrigeration in supermarkets. They offer improved efficiency over their predecessors, greater displacement stages, more compact structural design, and a new configuration of connections. These connections match the gas connections normally found in the sector, to ensure that no adaptation work is necessary when the user invests in a replacement compressor. The foot mountings of the new compressor likewise conform to sector standards. In the four-cylinder HG44e range, four model sizes cover the area of maximum displacement from 41.3 $m^3/h$ to 67.0 $m^3/h$. Three six-cylinder HG56e models round the spectrum off toward the top with displacements of 73.8 $m^3/h$ to 100.4 $m^3/h$.

**Special features**

Both new ranges profit from a new and advanced valve plate system, electrical motors from the latest generation, and enhanced gas flow – which increase efficiency and lower energy consumption. In comparison to its predecessors, the GEA Bock HG44e range includes four instead of three model sizes. In addition, the largest version, the HG44e/770-4 compressor, offers with its 67 $m^3/h$, almost 20 % more displacement than the largest HG4 model. As a result, this compressor range demonstrates the greatest power density in the sector. With the GEA Bock HG56e range, six-cylinder models are available throughout, instead of the four-cylinder HG5 versions. In comparison to the four-cylinder compressor models usually found on the market, the increase of the number of cylinders leads to enhanced efficiency and optimized running smoothness. Here as well, the largest compressor – with 100.4 $m^3/h$ displacement – exceeds that of its predecessor by around one-fifth. The GEA Bock oil-pump design, proven over many years, further assures reliable lubrication of all moving parts. The new models furthermore demonstrate excellent service friendliness – for example, simple exchange of the drive motor, as before. With its new GEA Bock HG44e and HG56e compressors, GEA Refrigeration Technologies sets new standards in efficiency and performance.

## The current program

...8 model sizes with 26 capacity stages from 5,4 to 281,3 m³/h (50 Hz)




## Type key

HGX56e / 1155 - 4S

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

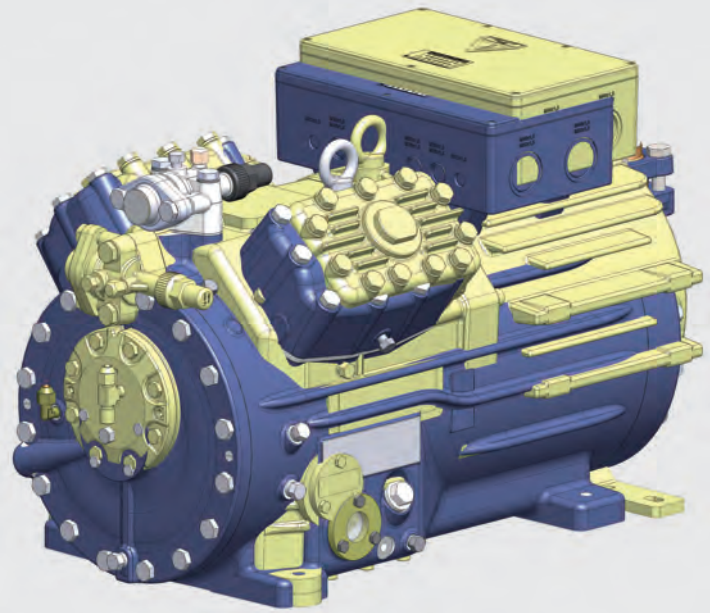
[1] HG = Hermetic Gas-Cooled (suction gas-cooled)

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

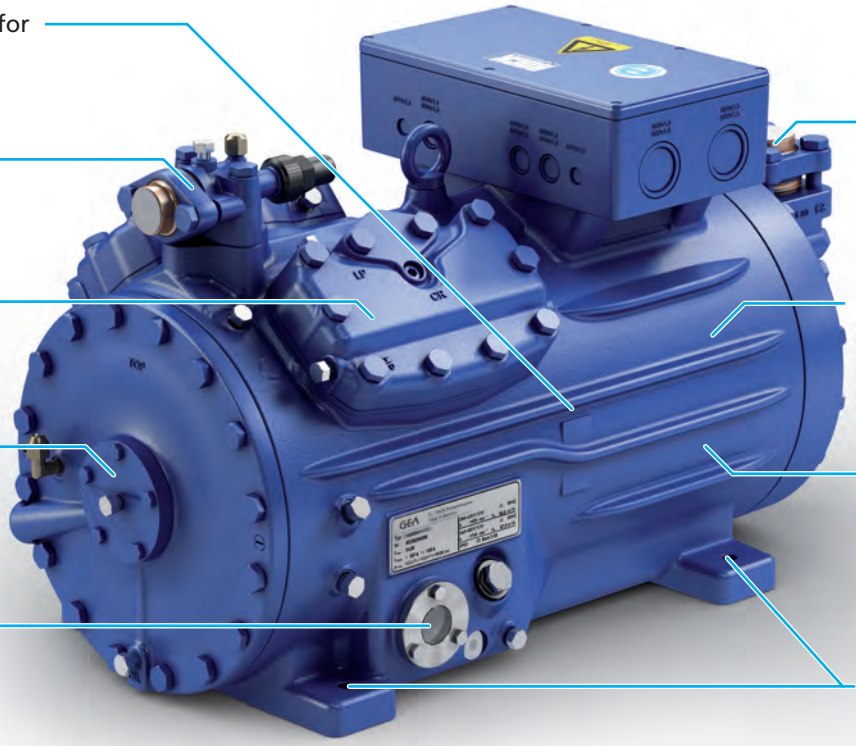
[3] S = More powerful motor e.g. air-conditioning applications

# Special features

## Comparison HG44e vs. HG4



Blue: Bock HG44e
Yellow: Bock HG4




| Length (cm) | Width (cm) | Height (cm) |
|---|---|---|
| -3 | -1 | -2 |



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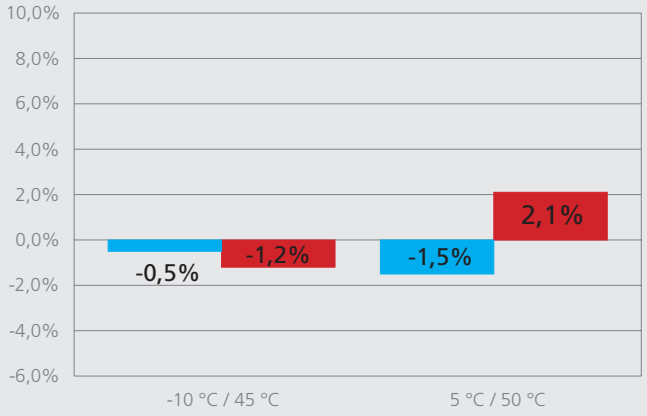
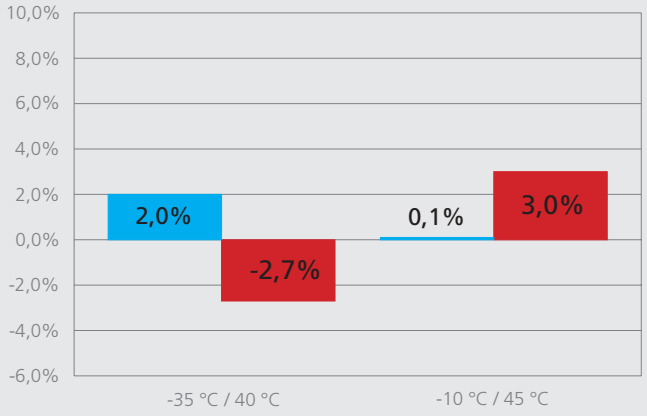
# Special features

## Comparison HGX44e/475-4 vs. competitor

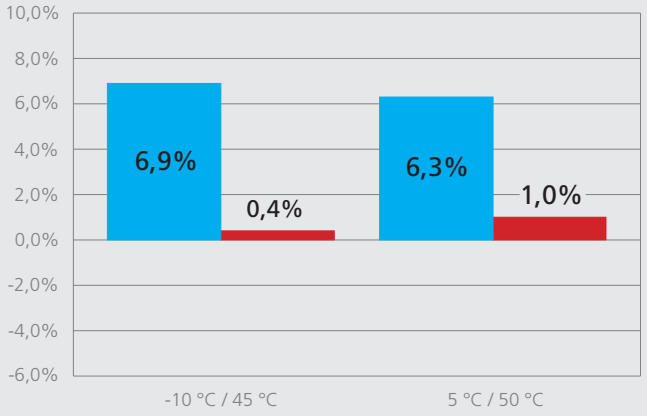
### Refrigerant R134a

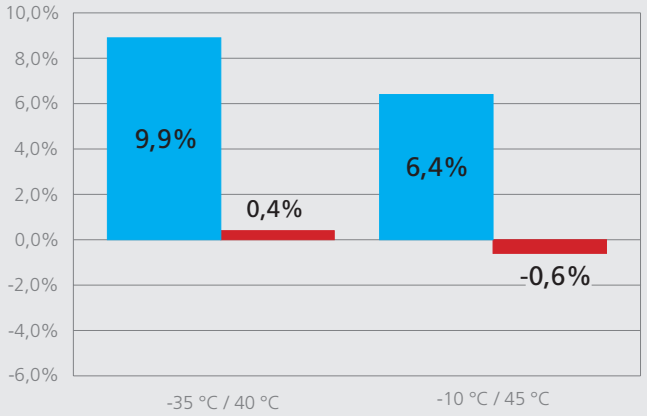



### Refrigerant R404A




## Comparison HGX44e/770-4 S vs. competitor

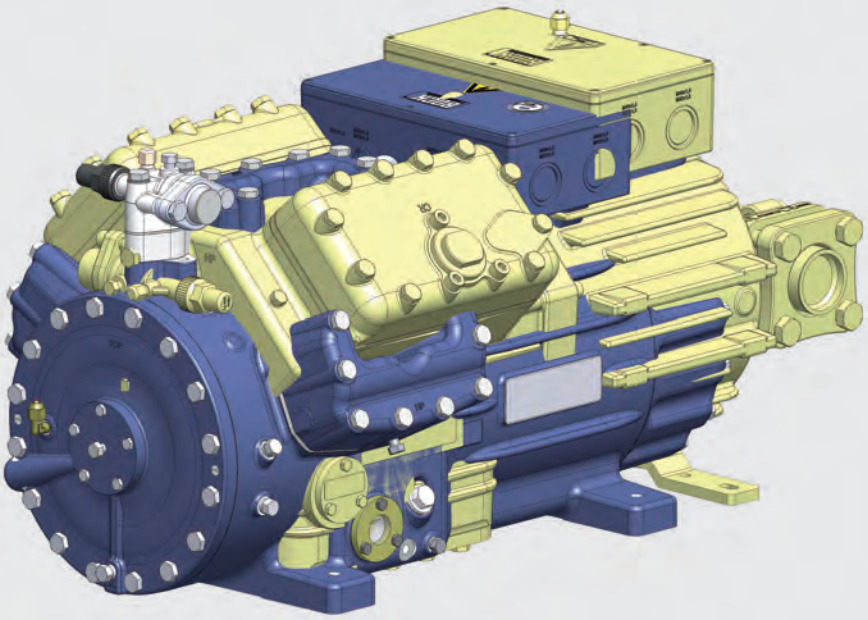



Cooling capacity COP

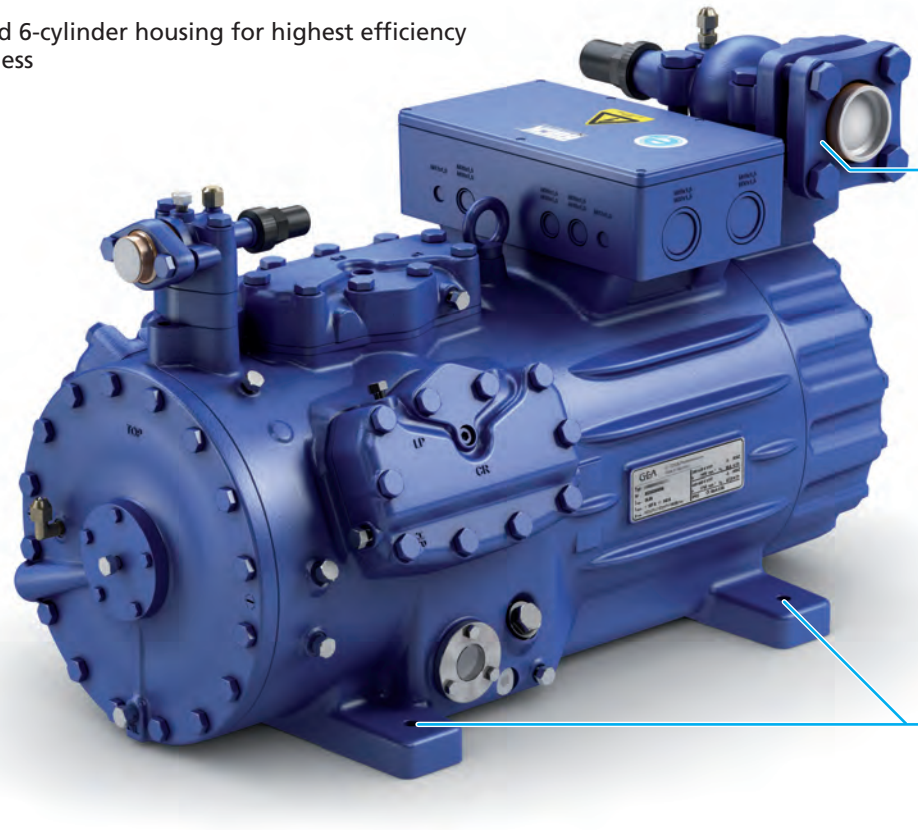
# Special features

## Comparison HG56e vs. HG5



Blue: Bock HG56e
Yellow: Bock HG5

New designed 6-cylinder housing for highest efficiency and smoothness




| Length (cm) | Width (cm) | Height (cm) |
|---|---|---|
| -12,5 | 0 | +3,5 |



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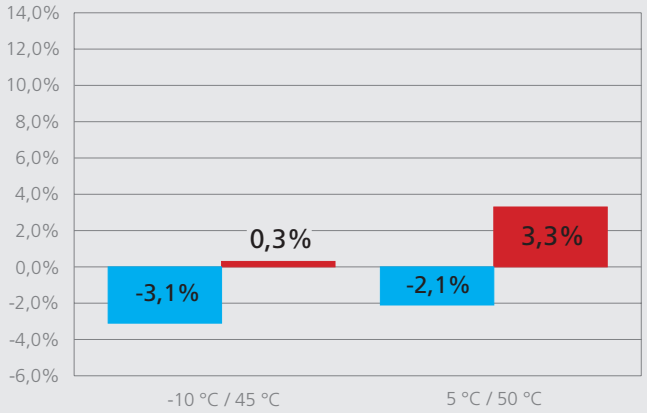
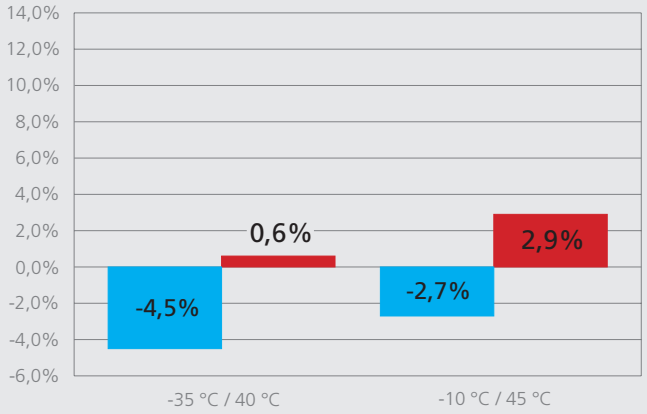
# Special features

## Comparison HGX56e/850-4 vs. competitor

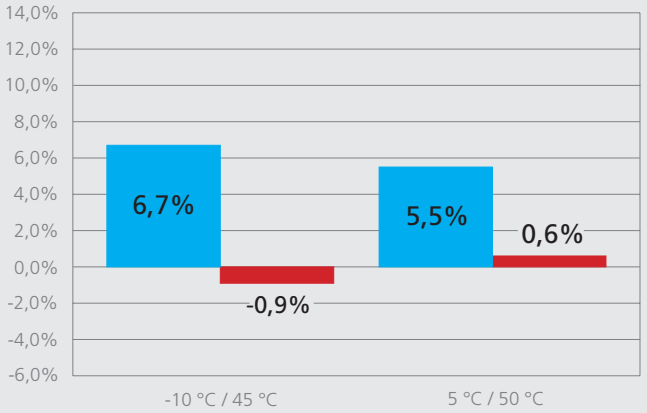
### Refrigerant R134a

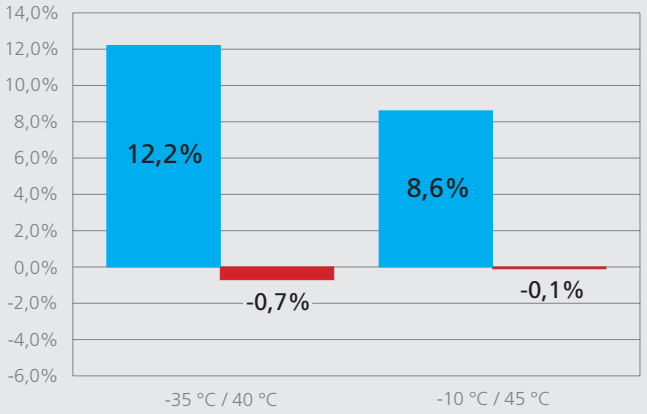



### Refrigerant R404A




## Comparison HGX56e/1150-4 S vs. competitor




Cooling capacity COP

# INT69 G
# Motor Protection

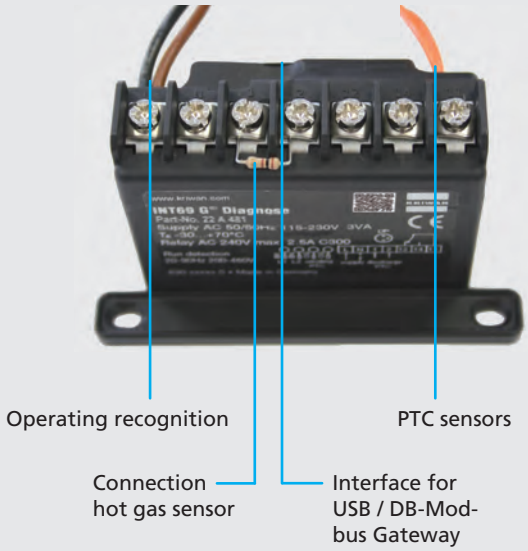
## Electronic Motor Protection GEA Bock INT69 G


### Temperature safety drive for the drive motor

The INT69 G is replacing, in the HG44e/HG56e 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

## INT69 G Diagnose




## Technical data

| Unit designation | INT69 G | ING69 G Diagnose |
|---|---|---|
| Connection voltage | AC 115-230 V - 1 - 50/60 Hz ± 10% 3 VA | AC 115-230 V - 1 - 50/60 Hz ± 10% 3 VA |
| Relay | AC 240 V, 2,5A, C300 | AC 240 V, 2,5A, C300 |
| Dimensions L/W/H | 53 x 33 x 68 mm | 50 x 33 x 68 mm |



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# INT69 G Diagnose Unit
# Motor Protection

**Read facility via INTelligence diagnosis software**

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

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

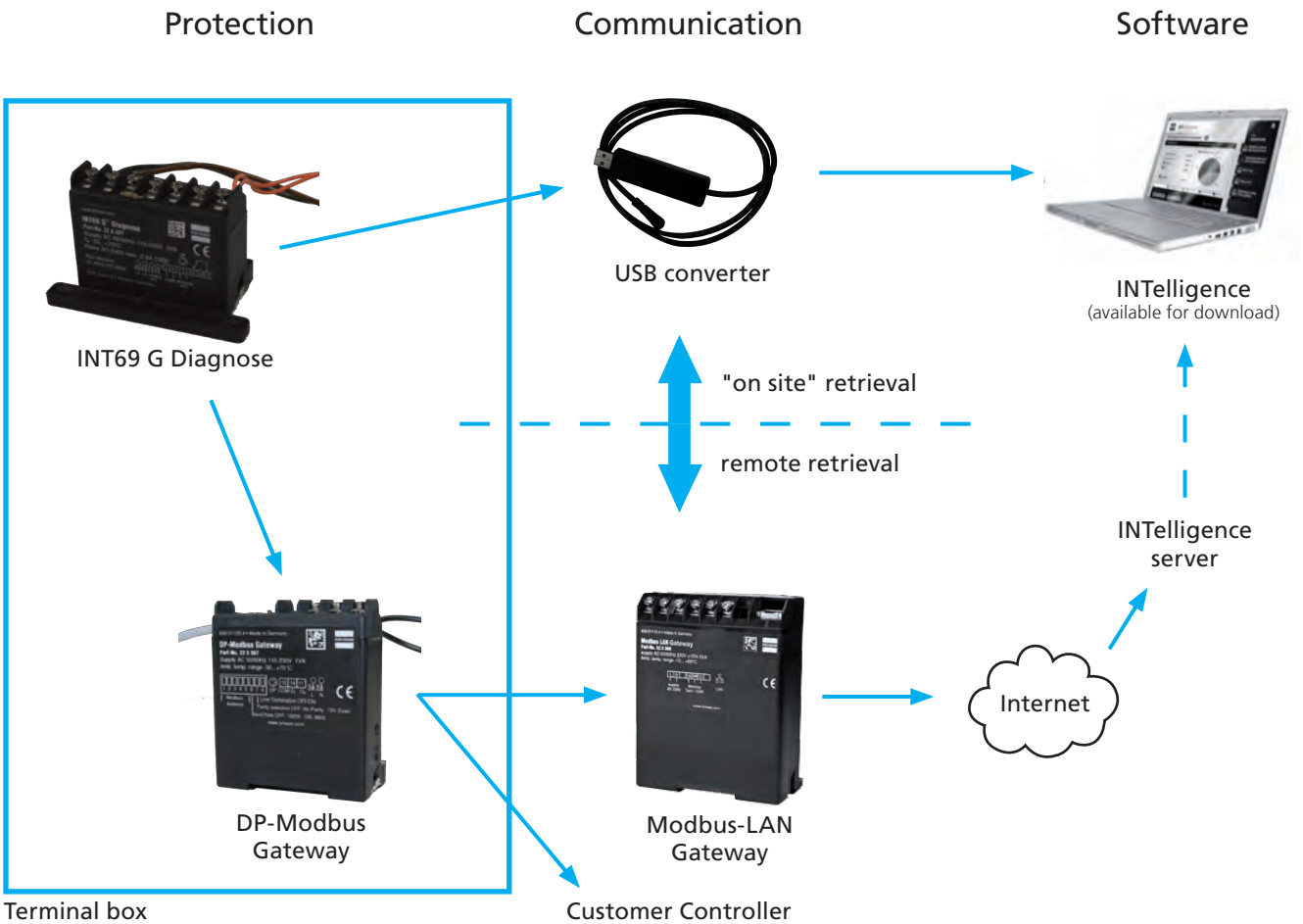
Advantages:

- 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.

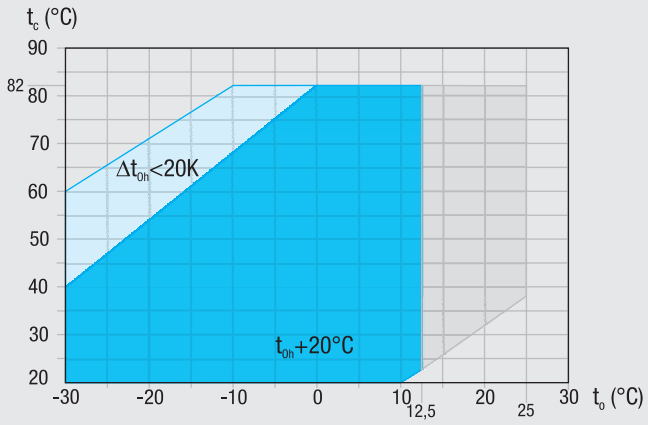
The INTelligence diagnosis software can be downloaded for free at www.kriwan.com.




Further explanation can be found at www.kriwan.com.
In the event of inquiries please contact our Department for Application Technology, phone +49 7022 9454-0.

# Operating limits

## R134a Operating limits




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)[1]: 19/28 bar

[1] LP = low pressure HP = high pressure

## R134a Notes

### Operating limits

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

Restrictions to the operating limits may occur when using the Bock EFC (Electronic Frequency Control).
Further explanation see www.bock.de.

### Performance data

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

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

Conversion factor for 60 Hz = 1,2

Performance data for other operating points, see GEA Bock software.



96321-02.2014-Gb Subject to change without notice

# Performance data

## 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 |
| HGX44e/475-4 | 30 | Q | 39200 | 35700 | 32500 | 29500 | 24100 | 19400 | 15400 | 12100 | 9190 | 6850 | 4920 |
| | | P | 4,71 | 4,75 | 4,76 | 4,74 | 4,62 | 4,41 | 4,13 | 3,79 | 3,42 | 3,03 | 2,63 |
| | 40 | Q | 34500 | 31400 | 28600 | 25900 | 21100 | 16900 | 13400 | 10400 | 7790 | 5670 | 3890 |
| | | P | 5,95 | 5,90 | 5,82 | 5,71 | 5,43 | 5,07 | 4,65 | 4,19 | 3,70 | 3,20 | 2,72 |
| | 50 | Q | 29900 | 27200 | 24700 | 22300 | 18100 | 14400 | 11300 | 8660 | 6430 | 4520 | 2880 |
| | | P | 7,12 | 6,97 | 6,80 | 6,61 | 6,16 | 5,64 | 5,08 | 4,49 | 3,88 | 3,27 | 2,69 |
| | 60 | Q | 25400 | 23000 | 20800 | 18800 | 15100 | 12000 | 9280 | 7000 | 5040 | 3340 | 1840 |
| | | P | 8,16 | 7,91 | 7,65 | 7,36 | 6,74 | 6,06 | 5,35 | 4,62 | 3,89 | 3,17 | 2,49 |
| | 70 | Q | 20800 | 18800 | 16900 | 15200 | 12100 | 9450 | 7210 | 5280 | 3600 | | |
| | | P | 8,99 | 8,65 | 8,28 | 7,90 | 7,10 | 6,26 | 5,40 | 4,52 | 3,66 | | |
| HGX44e/565-4 | 30 | Q | 46600 | 42600 | 38700 | 35200 | 28800 | 23200 | 18500 | 14500 | 11100 | 8310 | 6010 |
| | | P | 5,58 | 5,62 | 5,64 | 5,61 | 5,47 | 5,22 | 4,88 | 4,48 | 4,03 | 3,56 | 3,09 |
| | 40 | Q | 41100 | 37500 | 34100 | 30900 | 25200 | 20300 | 16100 | 12500 | 9480 | 6950 | 4820 |
| | | P | 7,07 | 7,01 | 6,91 | 6,79 | 6,45 | 6,01 | 5,51 | 4,95 | 4,37 | 3,78 | 3,19 |
| | 50 | Q | 35700 | 32500 | 29500 | 26700 | 21700 | 17400 | 13700 | 10600 | 7890 | 5610 | 3640 |
| | | P | 8,49 | 8,31 | 8,10 | 7,87 | 7,33 | 6,71 | 6,03 | 5,31 | 4,58 | 3,86 | 3,17 |
| | 60 | Q | 30400 | 27600 | 25000 | 22600 | 18200 | 14500 | 11400 | 8620 | 6280 | 4240 | 2410 |
| | | P | 9,75 | 9,45 | 9,13 | 8,78 | 8,03 | 7,21 | 6,35 | 5,47 | 4,59 | 3,74 | 2,92 |
| | 70 | Q | 25000 | 22600 | 20400 | 18400 | 14700 | 11600 | 8910 | 6610 | 4590 | | |
| | | P | 10,70 | 10,30 | 9,90 | 9,44 | 8,47 | 7,45 | 6,41 | 5,36 | 4,32 | | |
| HGX44e/665-4 | 30 | Q | 55200 | 50400 | 45800 | 41600 | 33900 | 27300 | 21700 | 16900 | 12900 | 9590 | 6870 |
| | | P | 6,52 | 6,58 | 6,59 | 6,56 | 6,40 | 6,11 | 5,72 | 5,25 | 4,74 | 4,19 | 3,64 |
| | 40 | Q | 48600 | 44200 | 40200 | 36400 | 29600 | 23700 | 18700 | 14500 | 10900 | 7910 | 5400 |
| | | P | 8,24 | 8,17 | 8,06 | 7,91 | 7,52 | 7,03 | 6,44 | 5,80 | 5,13 | 4,44 | 3,76 |
| | 50 | Q | 42100 | 38200 | 34700 | 31300 | 25400 | 20200 | 15900 | 12100 | 8950 | 6260 | 3960 |
| | | P | 9,87 | 9,66 | 9,43 | 9,16 | 8,54 | 7,82 | 7,04 | 6,22 | 5,37 | 4,53 | 3,73 |
| | 60 | Q | 35600 | 32300 | 29200 | 26300 | 21100 | 16700 | 13000 | 9720 | 6970 | 4580 | 2470 |
| | | P | 11,30 | 10,90 | 10,60 | 10,20 | 9,34 | 8,40 | 7,42 | 6,40 | 5,39 | 4,39 | 3,44 |
| | 70 | Q | 29100 | 26300 | 23700 | 21200 | 16900 | 13200 | 9990 | 7280 | 4920 | | |
| | | P | 12,40 | 11,90 | 11,40 | 10,90 | 9,85 | 8,68 | 7,48 | 6,27 | 5,07 | | |
| HGX44e/770-4 S | 30 | Q | 63600 | 58000 | 52800 | 47900 | 39100 | 31600 | 25100 | 19700 | 15100 | 11300 | 8100 |
| | | P | 7,62 | 7,68 | 7,70 | 7,67 | 7,48 | 7,14 | 6,69 | 6,14 | 5,54 | 4,90 | 4,25 |
| | 40 | Q | 56000 | 51100 | 46400 | 42100 | 34200 | 27500 | 21800 | 16900 | 12800 | 9360 | 6460 |
| | | P | 9,63 | 9,54 | 9,42 | 9,24 | 8,79 | 8,21 | 7,53 | 6,78 | 5,99 | 5,19 | 4,40 |
| | 50 | Q | 48700 | 44200 | 40100 | 36300 | 29500 | 23600 | 18600 | 14300 | 10700 | 7510 | 4830 |
| | | P | 11,50 | 11,20 | 11,00 | 10,70 | 9,97 | 9,14 | 8,23 | 7,26 | 6,28 | 5,30 | 4,35 |
| | 60 | Q | 41300 | 37500 | 33900 | 30600 | 24700 | 19600 | 15300 | 11600 | 8390 | 5630 | 3160 |
| | | P | 13,20 | 12,80 | 12,30 | 11,90 | 10,90 | 9,82 | 8,66 | 7,48 | 6,29 | 5,13 | 4,02 |
| | 70 | Q | 34000 | 30700 | 27700 | 24900 | 19900 | 15600 | 12000 | 8810 | 6070 | | |
| | | P | 14,50 | 13,90 | 13,40 | 12,70 | 11,50 | 10,10 | 8,74 | 7,32 | 5,93 | | |

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

This performance data is preliminary data!

Supplementary cooling or reduced suction gas temp.

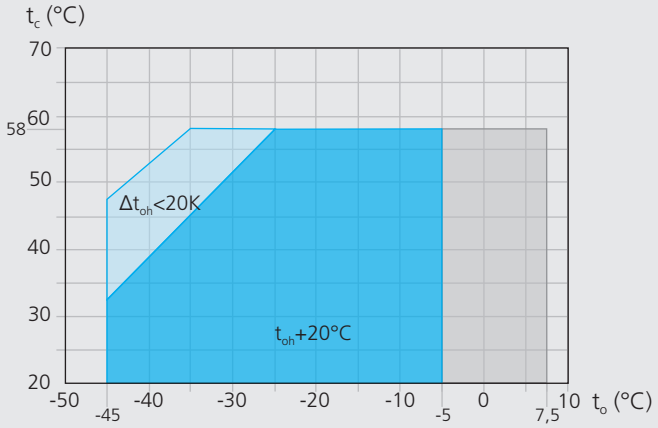
## R134a — Performance data — 50 Hz

| Type | Displacement | Cooling capacity $\dot{Q}_o$ [W] / Drive power $P_e$ [kW] | | | | | |
|---|---|---|---|---|---|---|---|
| | | Normal cooling | | | Air-conditioning | | |
| | | Evaporation temp. -10°C / Cond. temp. +45°C | | | Evaporation temp. +5°C / Cond. temp. +50°C | | |
| | $m^3/h$ (50 Hz) | $\dot{Q}o$ | Pe | COP | $\dot{Q}o$ | Pe | COP |
| HGX56e/850-4 | 73,8 | 22300 | 8,68 | 2,57 | 40100 | 11,7 | 3,43 |
| HGX56e/995-4 | 86,6 | 26000 | 10,0 | 2,60 | 46800 | 13,6 | 3,44 |
| HGX56e/1155-4 | 100,4 | 30200 | 11,7 | 2,58 | 54400 | 15,9 | 3,42 |

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

This performance data is preliminary data!

## R404A/R507 Operating limits




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)[1]: 19/28 bar

[1] LP = low pressure HP = high pressure

## 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 Bock EFC (Electronic Frequency Control).
Further explanation see www.bock.de.

### Performance data

The performance data for R404A/R507 are based on European Standard EN 12900 **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.



96321-02.2014-Gb Subject to change without notice

## R404A/R507 — Performance data — 50 Hz

| Type | Cond. temp. °C | | 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 |
| HGX44e/475-4<br>HGX44e/475-4 S | 30 | Q | 52500 | 48300 | 40500 | 33500 | 27500 | 22400 | 18000 | 14300 | 11100 | 8340 | 6060 | 4110 |
| | | P | 7,73 | 7,85 | 7,94 | 7,80 | 7,52 | 7,10 | 6,57 | 5,94 | 5,26 | 4,54 | 3,81 | 3,11 |
| | 40 | Q | 45200 | 41400 | 34600 | 28300 | 23200 | 18800 | 15000 | 11800 | 9010 | 6670 | 4650 | 2870 |
| | | P | 9,97 | 9,90 | 9,61 | 9,16 | 8,57 | 7,88 | 7,12 | 6,31 | 5,47 | 4,64 | 3,84 | 3,11 |
| | 50 | Q | 37600 | 34300 | 28500 | 23100 | 18800 | 15100 | 12000 | 9260 | 6970 | 5000 | 3270 | |
| | | P | 11,80 | 11,50 | 10,90 | 10,20 | 9,41 | 8,49 | 7,55 | 6,59 | 5,65 | 4,76 | 3,94 | |
| HGX44e/565-4<br>HGX44e/565-4 S | 30 | Q | 62700 | 57700 | 48400 | 39800 | 32800 | 26800 | 21600 | 17200 | 13400 | 10200 | 7470 | 5140 |
| | | P | 9,18 | 9,32 | 9,43 | 9,31 | 8,97 | 8,47 | 7,82 | 7,07 | 6,24 | 5,38 | 4,51 | 3,66 |
| | 40 | Q | 54000 | 49600 | 41400 | 33700 | 27700 | 22500 | 18100 | 14300 | 11100 | 8230 | 5820 | 3680 |
| | | P | 11,80 | 11,70 | 11,40 | 10,90 | 10,20 | 9,42 | 8,49 | 7,51 | 6,50 | 5,50 | 4,55 | 3,67 |
| | 50 | Q | 45100 | 41200 | 34200 | 27500 | 22500 | 18200 | 14500 | 11400 | 8620 | 6270 | 4180 | |
| | | P | 14,00 | 13,70 | 13,00 | 12,30 | 11,20 | 10,10 | 9,01 | 7,85 | 6,72 | 5,64 | 4,66 | |
| HGX44e/665-4<br>HGX44e/665-4 S | 30 | Q | 73100 | 67100 | 56300 | 46500 | 38300 | 31100 | 25000 | 19800 | 15300 | 11600 | 8340 | 5630 |
| | | P | 10,70 | 10,90 | 11,00 | 10,90 | 10,50 | 9,94 | 9,19 | 8,32 | 7,36 | 6,35 | 5,33 | 4,34 |
| | 40 | Q | 62700 | 57400 | 47900 | 39300 | 32200 | 26000 | 20800 | 16300 | 12500 | 9160 | 6360 | 3910 |
| | | P | 13,90 | 13,80 | 13,30 | 12,80 | 12,00 | 11,00 | 9,97 | 8,83 | 7,66 | 6,49 | 5,37 | 4,34 |
| | 50 | Q | 52000 | 47500 | 39300 | 32000 | 26000 | 20900 | 16500 | 12800 | 9570 | 6840 | 4440 | |
| | | P | 16,50 | 16,10 | 15,30 | 14,30 | 13,10 | 11,80 | 10,50 | 9,22 | 7,91 | 6,66 | 5,51 | |
| HGX44e/770-4 S | 30 | Q | 84600 | 77800 | 65300 | 54300 | 44700 | 36500 | 29400 | 23300 | 18100 | 13800 | 10100 | 6840 |
| | | P | 12,40 | 12,60 | 12,80 | 12,60 | 12,10 | 11,50 | 10,60 | 9,62 | 8,51 | 7,34 | 6,16 | 5,02 |
| | 40 | Q | 72600 | 66500 | 55600 | 46100 | 37800 | 30700 | 24500 | 19300 | 14900 | 11100 | 7750 | 4860 |
| | | P | 16,10 | 16,00 | 15,50 | 14,80 | 13,80 | 12,70 | 11,50 | 10,20 | 8,86 | 7,51 | 6,22 | 5,02 |
| | 50 | Q | 60300 | 55100 | 45700 | 37600 | 30700 | 24700 | 19600 | 15300 | 11600 | 8360 | 5530 | |
| | | P | 19,20 | 18,80 | 17,80 | 16,50 | 15,20 | 13,70 | 12,20 | 10,60 | 9,15 | 7,70 | 6,37 | |

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

This performance data is preliminary data!

Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temp.

## R404A/R507 — Performance data — 50 Hz

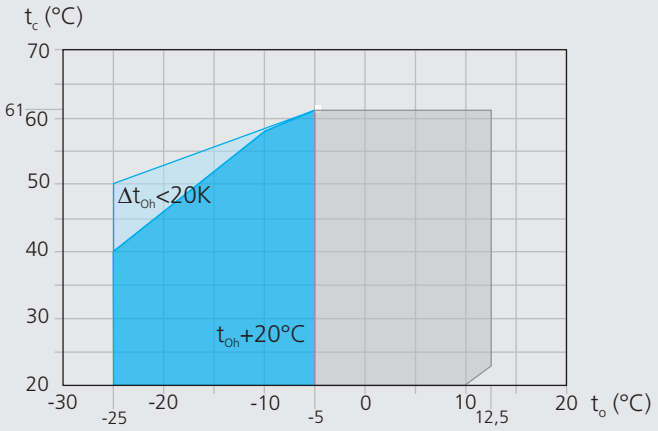
| Type | Displacement m³/h (50 Hz) | Cooling capacity $\dot{Q}_o$ [W] / Drive power $P_e$ [kW] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Deep freezing<br>Evaporation temp. -35°C / Condensing temp. +40°C | | | Normal cooling<br>Evaporation temp. -10°C / Condensing temp. +45°C | | | Air-conditioning<br>Evaporation temp. +5°C / Condensing temp. +50°C | | |
| | | $\dot{Q}o$ | Pe | COP | $\dot{Q}o$ | Pe | COP | $\dot{Q}o$ | Pe | COP |
| HGX56e/850-4 | 73,8 | 12400 | 8,26 | 1,50 | 37700 | 16,0 | 2,36 | | | |
| HGX56e/850-4 S | 73,8 | | | | 38100 | 16,0 | 2,38 | 61200 | 20,6 | 2,97 |
| HGX56e/995-4 | 86,6 | 14300 | 9,69 | 1,48 | 44000 | 18,8 | 2,34 | | | |
| HGX56e/995-4 S | 86,6 | | | | 44300 | 18,7 | 2,37 | 71300 | 24,2 | 2,95 |
| HGX56e/1155-4 | 100,4 | 16600 | 11,1 | 1,50 | 51200 | 21,8 | 2,35 | | | |
| HGX56e/1155-4 S | 100,4 | | | | 51700 | 21,8 | 2,37 | 83400 | 27,9 | 2,99 |

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

This performance data is preliminary data!

# Operating limits

## R407C Operating limits




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)[1]: 19/28 bar

[1] LP = low pressure HP = high pressure

## 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 Bock EFC (Electronic Frequency Control).
Further explanation see www.bock.de.

### Performance data

The performance data for R407C are based on European Standard EN 12900 **50 Hz power supply frequency**.
This signifies: **20 °C suction gas temperature without liquid subcooling.**
Evaporation and condensing temperatures are based on the dew point values (saturated vapour conditions).

Conversion factor for 60 Hz = 1,2

Performance data for other operating points, see GEA Bock software.



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# Performance data

## 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 |
| **HG44e/475-4** | 30 | Q | 56600 | 51700 | 47100 | 42800 | 35200 | 28500 | 22900 | 18100 | 14100 | 10700 |
| HG44e/475-4 S | | P | 7,20 | 7,25 | 7,25 | 7,21 | 7,03 | 6,66 | 6,24 | 5,73 | 5,18 | 4,59 |
| | 40 | Q | 50200 | 45800 | 41700 | 37800 | 30900 | 24900 | 19900 | 15600 | 12000 | 8850 |
| | | P | 9,13 | 9,03 | 8,89 | 8,72 | 8,28 | 7,69 | 7,05 | 6,35 | 5,61 | 4,87 |
| | 50 | Q | 43600 | 39700 | 36000 | 32600 | 26500 | 21200 | 16800 | 13100 | 9850 | 7100 |
| | | P | 10,80 | 10,50 | 10,30 | 10,00 | 9,33 | 8,54 | 7,69 | 6,80 | 5,90 | 5,02 |
| **HG44e/565-4** | 30 | Q | 67400 | 61600 | 56200 | 51100 | 42000 | 33900 | 27300 | 21700 | 17000 | 12900 |
| HG44e/565-4 S | | P | 8,54 | 8,60 | 8,61 | 8,56 | 8,34 | 7,93 | 7,42 | 6,81 | 6,14 | 5,44 |
| | 40 | Q | 60000 | 54700 | 49800 | 45200 | 37000 | 29700 | 23800 | 18700 | 14500 | 10800 |
| | | P | 10,80 | 10,70 | 10,50 | 10,30 | 9,83 | 9,18 | 8,40 | 7,55 | 6,67 | 5,78 |
| | 50 | Q | 52200 | 47500 | 43100 | 39000 | 31800 | 25300 | 20100 | 15700 | 12000 | 8650 |
| | | P | 12,80 | 12,50 | 12,20 | 11,80 | 11,00 | 10,20 | 9,18 | 8,10 | 7,01 | 5,95 |
| **HG44e/665-4** | 30 | Q | 78700 | 71900 | 65500 | 59600 | 48900 | 40000 | 32200 | 25500 | 19800 | 15000 |
| HG44e/665-4 S | | P | 10,00 | 10,00 | 10,00 | 10,00 | 9,76 | 9,23 | 8,65 | 7,95 | 7,17 | 6,36 |
| | 40 | Q | 69800 | 63600 | 57900 | 52500 | 42900 | 34900 | 27900 | 21900 | 16800 | 12400 |
| | | P | 12,70 | 12,50 | 12,30 | 12,10 | 11,50 | 10,60 | 9,77 | 8,80 | 7,78 | 6,75 |
| | 50 | Q | 60600 | 55100 | 49900 | 45200 | 36700 | 29700 | 23500 | 18300 | 13800 | 9890 |
| | | P | 15,10 | 14,70 | 14,40 | 13,90 | 13,00 | 11,80 | 10,60 | 9,43 | 8,18 | 6,96 |
| HG44e/770-4 S | 30 | Q | 92000 | 84000 | 76600 | 69600 | 57100 | 46300 | 37100 | 29300 | 22700 | 17000 |
| | | P | 11,60 | 11,70 | 11,70 | 11,60 | 11,30 | 10,80 | 10,00 | 9,22 | 8,26 | 7,23 |
| | 40 | Q | 81400 | 74200 | 67400 | 61200 | 49900 | 40300 | 32000 | 25000 | 19000 | 13900 |
| | | P | 14,80 | 14,70 | 14,40 | 14,10 | 13,30 | 12,40 | 11,30 | 10,00 | 8,82 | 7,51 |
| | 50 | Q | 70400 | 64000 | 58000 | 52400 | 42500 | 34000 | 26800 | 20600 | 15400 | 10800 |
| | | P | 17,60 | 17,20 | 16,70 | 16,20 | 15,00 | 13,60 | 12,10 | 10,60 | 9,06 | 7,49 |

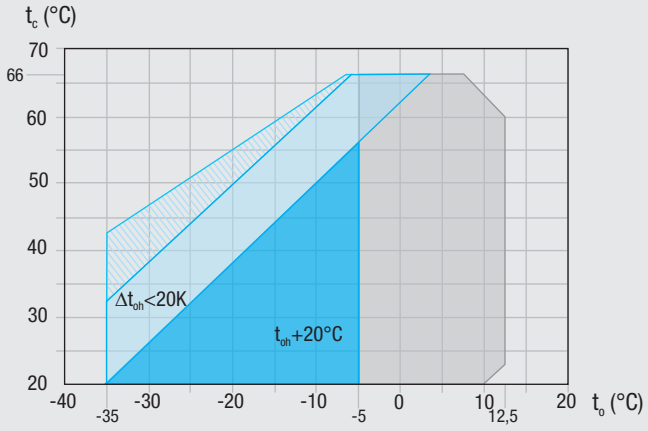
Relating to 20 °C suction gas temperature without liquid subcooling.

This performance data is preliminary data!

Motor version -S- (more powerful motor)

Supplementary cooling or reduced suction gas temp.

## R22 Operating limits




Unlimited application range

Supplementary cooling or reduced suction gas temperature

Supplementary cooling and reduced suction gas temperature

Motor version -S- (more powerful motor)

$t_O$ Evaporation temperature (°C)
$t_C$ Condensing temperatur (°C)
$\Delta t_{Oh}$ Suction gas superheat (K)
$t_{Oh}$ Suction gas temperature (°C)

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

[1] LP = low pressure HP = high pressure

## 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 Bock EFC (Electronic Frequency Control).
Further explanation see www.bock.de.

### Performance data

The performance data for R22 are based on European Standard EN 12900 **50 Hz power supply frequency**.
This signifies: **20 °C suction gas temperature without liquid subcooling**.

Conversion factor for 60 Hz = 1,2

Performance data for other operating points, see GEA Bock software.



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# Performance data

## R22 — 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 | -35 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HG44e/475-4<br>HG44e/475-4 S | 30 | Q | 58200 | 53600 | 49100 | 45000 | 37500 | 30800 | 25100 | 20300 | 16100 | 12500 | 9390 | 6730 |
| | | P | 7,16 | 7,27 | 7,34 | 7,36 | 7,29 | 7,02 | 6,68 | 6,25 | 5,73 | 5,16 | 4,55 | 3,93 |
| | 40 | Q | 52700 | 48300 | 44300 | 40500 | 33600 | 27400 | 22200 | 17800 | 14000 | 10700 | 7780 | 5280 |
| | | P | 9,17 | 9,15 | 9,08 | 8,97 | 8,66 | 8,19 | 7,63 | 6,99 | 6,29 | 5,54 | 4,78 | 4,02 |
| | 50 | Q | 47000 | 43100 | 39300 | 35900 | 29600 | 24000 | 19300 | 15300 | 11800 | 8800 | | |
| | | P | 11,00 | 10,80 | 10,60 | 10,40 | 9,90 | 9,24 | 8,46 | 7,62 | 6,73 | 5,82 | | |
| HG44e/565-4<br>HG44e/565-4 S | 30 | Q | 69400 | 63900 | 58600 | 53700 | 44800 | 36700 | 30000 | 24300 | 19300 | 15100 | 11400 | 8180 |
| | | P | 8,50 | 8,64 | 8,71 | 8,74 | 8,65 | 8,37 | 7,96 | 7,43 | 6,81 | 6,12 | 5,39 | 4,64 |
| | 40 | Q | 62900 | 57700 | 52900 | 48400 | 40200 | 32600 | 26600 | 21300 | 16800 | 12900 | 9460 | 6450 |
| | | P | 10,80 | 10,80 | 10,70 | 10,60 | 10,20 | 9,79 | 9,11 | 8,33 | 7,48 | 6,58 | 5,66 | 4,74 |
| | 50 | Q | 56300 | 51500 | 47100 | 43000 | 35500 | 28600 | 23200 | 18400 | 14300 | 10800 | | |
| | | P | 13,10 | 12,90 | 12,60 | 12,40 | 11,70 | 11,00 | 10,10 | 9,10 | 8,02 | 6,91 | | |
| HG44e/665-4<br>HG44e/665-4 S | 30 | Q | 81000 | 74500 | 68300 | 62600 | 52100 | 43300 | 35300 | 28500 | 22600 | 17500 | 13200 | 9410 |
| | | P | 9,95 | 10,10 | 10,10 | 10,20 | 10,10 | 9,73 | 9,26 | 8,66 | 7,94 | 7,15 | 6,30 | 5,44 |
| | 40 | Q | 73100 | 67100 | 61500 | 56200 | 46600 | 38400 | 31200 | 24900 | 19600 | 14900 | 10900 | 7320 |
| | | P | 12,70 | 12,70 | 12,60 | 12,50 | 12,00 | 11,30 | 10,50 | 9,69 | 8,71 | 7,68 | 6,63 | 5,57 |
| | 50 | Q | 65200 | 59700 | 54600 | 49700 | 41000 | 33600 | 27000 | 21400 | 16500 | 12300 | | |
| | | P | 15,40 | 15,20 | 14,90 | 14,50 | 13,80 | 12,80 | 11,70 | 10,50 | 9,33 | 8,07 | | |
| HG44e/770-4 S | 30 | Q | 93900 | 86300 | 79200 | 72600 | 60500 | 50000 | 40900 | 33000 | 26200 | 20400 | 15400 | 11100 |
| | | P | 11,50 | 11,70 | 11,80 | 11,80 | 11,70 | 11,30 | 10,80 | 10,10 | 9,28 | 8,35 | 7,36 | 6,36 |
| | 40 | Q | 84700 | 77800 | 71300 | 65200 | 54100 | 44500 | 36200 | 29000 | 22800 | 17500 | 12800 | 8710 |
| | | P | 14,80 | 14,80 | 14,60 | 14,50 | 13,90 | 13,20 | 12,30 | 11,30 | 10,10 | 8,97 | 7,74 | 6,51 |
| | 50 | Q | 75600 | 69300 | 63300 | 57800 | 47700 | 39000 | 31500 | 25000 | 19400 | 14500 | | |
| | | P | 17,90 | 17,70 | 17,30 | 16,90 | 16,00 | 14,90 | 13,60 | 12,30 | 10,90 | 9,43 | | |

Relating to 20 °C suction gas temperature without liquid subcooling

This performance data is preliminary data!

Supplementary cooling or reduced suction gas temp.

Motor version -S- (more powerful motor)

Supplementary cooling and reduced suction gas temp.

# Technical data

| Type | Number of cylinders | Displacement 50 / 60 Hz (1450/1740 rpm) | Electrical data | | | | Weight | Connections ④ | | Oil charge |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Voltage ① | Max. working current ② | Max. power consumption ② | Starting current (rotor locked) | | Discharge line DV | Suction line SV | |
| | | m³/h | | A | kW | A | kg | mm l inch | mm l inch | Ltr. |
| | | | | PW 1 + 2 | | PW 1 / PW 1 + 2 | | | | |
| **HG44e/475-4** | 4 | 41,30 / 49,60 | ③ | 19 | 11,0 | 83 / 109 | 164 | 28 / $1^{1}/_{8}$ | 35 / $1^{3}/_{8}$ | 2,3 |
| **HG44e/475-4 S** | 4 | 41,30 / 49,60 | ③ | 23 | 13,1 | 115 / 150 | 168 | 28 / $1^{1}/_{8}$ | 35 / $1^{3}/_{8}$ | 2,3 |
| **HG44e/565-4** | 4 | 49,20 / 59,00 | ③ | 22 | 13,2 | 83 / 109 | 164 | 28 / $1^{1}/_{8}$ | 35 / $1^{3}/_{8}$ | 2,3 |
| **HG44e/565-4 S** | 4 | 49,20 / 59,00 | ③ | 26 | 15,6 | 133 / 171 | 170 | 28 / $1^{1}/_{8}$ | 42 / $1^{5}/_{8}$ | 2,3 |
| **HG44e/665-4** | 4 | 57,70 / 69,20 | ③ | 26 | 15,4 | 115 / 150 | 169 | 28 / $1^{1}/_{8}$ | 42 / $1^{5}/_{8}$ | 2,3 |
| **HG44e/665-4 S** | 4 | 57,70 / 69,20 | ③ | 30 | 18,3 | 133 / 171 | 168 | 28 / $1^{1}/_{8}$ | 42 / $1^{5}/_{8}$ | 2,3 |
| **HG44e/770-4 S** | 4 | 67,00 / 80,40 | ③ | 35 | 21,4 | 133 / 171 | 164 | 28 / $1^{1}/_{8}$ | 42 / $1^{5}/_{8}$ | 2,3 |
| **HG56e/850-4** | 6 | 73,80 / 88,60 | ③ | 38 | 22,6 | 133 / 171 | 194 | 28 / $1^{1}/_{8}$ | 42 / $1^{5}/_{8}$ | 3,0 |
| **HG56e/850-4 S** | 6 | 73,80 / 88,60 | ③ | 43 | 25,3 | 162 / 210 | 211 | 28 / $1^{1}/_{8}$ | 54 / $2^{1}/_{8}$ | 3,0 |
| **HG56e/995-4** | 6 | 86,60 / 103,90 | ③ | 44 | 26,0 | 162 / 210 | 208 | 28 / $1^{1}/_{8}$ | 54 / $2^{1}/_{8}$ | 3,0 |
| **HG56e/995-4 S** | 6 | 86,60 / 103,90 | ③ | 50 | 29,9 | 189 / 246 | 211 | 28 / $1^{1}/_{8}$ | 54 / $2^{1}/_{8}$ | 3,0 |
| **HG56e/1155-4** | 6 | 100,40 / 120,50 | ③ | 51 | 30,4 | 189 / 246 | 212 | 28 / $1^{1}/_{8}$ | 54 / $2^{1}/_{8}$ | 3,0 |
| **HG56e/1155-4 S** | 6 | 100,40 / 120,50 | ③ | 61 | 34,5 | 253 / 330 | 221 | 28 / $1^{1}/_{8}$ | 54 / $2^{1}/_{8}$ | 3,0 |

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

## 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 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

③ 380-420 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: 70% / 30%
- Designs for Y/Δ on request

④ For soldering connections



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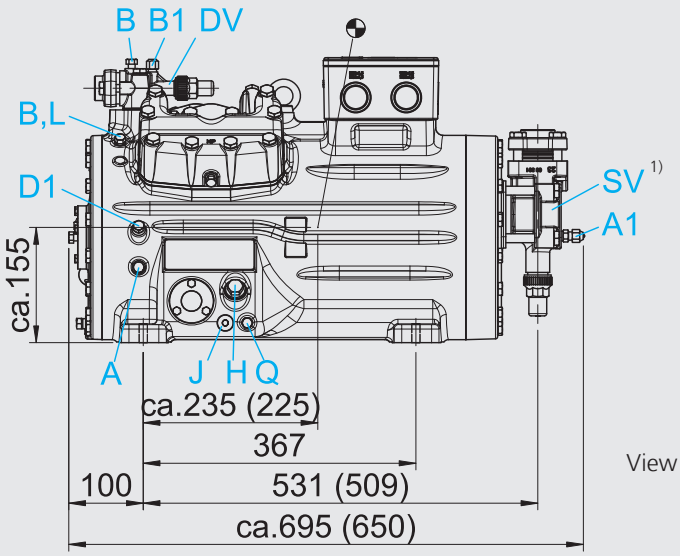
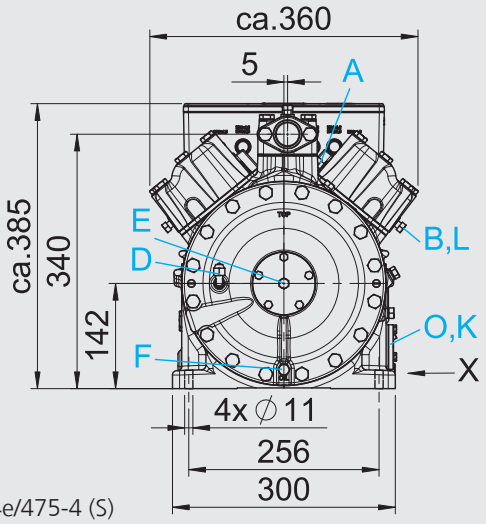
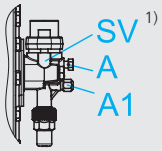
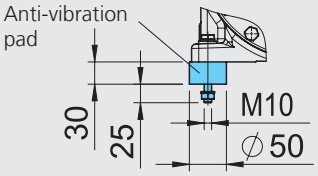
## HG44e



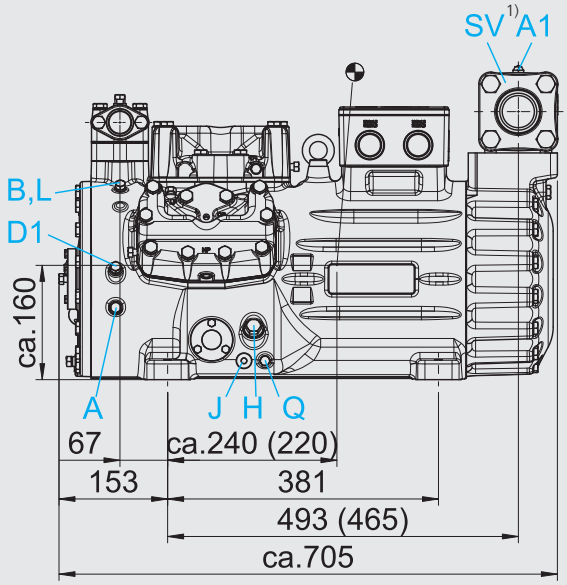

View HG(X)44e/475-4 (S)
HG(X)44e/565-4

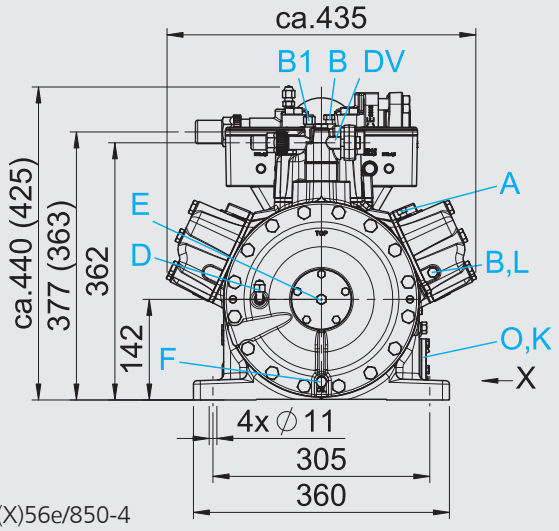


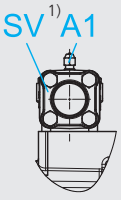

Dimensions in ( ) for HG(X)44e/475-4 (S) + 565-4

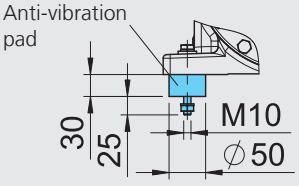
## HG56e




View HG(X)56e/850-4




Dimensions in ( ) for HG(X)56e/850-4

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

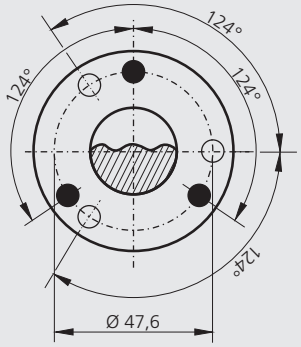
Connections see page 20

## 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)

○ Three-hole connection for oil level regulator make TRAXOIL (3 x M6 x 10 deep)




Dimensions in mm

## Connections

| | | |
|---|---|---|
| SV<br>DV | Suction line<br>Discharge line | please refer to Technical data page 18 |
| A | Connection suction side, not lockable | 1/4 " NPTF |
| A1 | Connection suction side, lockable | 7/16 " UNF |
| B | Connection discharge side, not lockable | 1/8 " NPTF |
| B1 | Connection discharge side, lockable | 7/16 " UNF |
| 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 | 1/8 " NPTF |
| F | Oil drain | 1/4 " NPTF |
| H | Oil charge plug | M 22 x 1,5 |
| J | Connection oil sump heater | Ø 15 mm |
| K | Sight glass | - |
| L | Connection thermal protection thermostat | 1/8 " NPTF |
| O | Connection oil level regulator | 3 x M6 |
| Q | Connection oil temperature sensor | 1/8 " NPTF |



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# Scope of supply

| Scope of supply | HG44e | HG56e |
|---|---|---|
| Semi-hermetic four cylinder reciprocating compressor with drive motor for part winding start<br>380-420 V Y / YY - 3 - 50 Hz<br>440-480 V Y / YY - 3 - 60 Hz<br>Single-section compressor housing with hermetically integrated electric motor | ● | |
| Semi-hermetic six cylinder reciprocating compressor with drive motor for part winding start<br>380-420 V Y / YY - 3 - 50 Hz<br>440-480 V Y / YY - 3 - 60 Hz<br>Single-section compressor housing with hermetically integrated electric motor | | ● |
| Winding protection with PTC resistor sensors and electronic trigger unit INT69 G | ● | ● |
| Oil pump | ● | ● |
| Possibility to connect to oil level controllers makes ESK, AC+R or CARLY | ● | ● |
| Possibility to connect to oil level controllers make Traxoil | ● [1)] | ● [1)] |
| Oil charge:<br>HG: FUCHS Reniso SP46 HGX: FUCHS Reniso Triton SE55 | ● | ● |
| Sight glass | ● | ● |
| Decompression valve | ● | ● |
| Suction and discharge line valve | ● | ● |
| Inert gas charge | ● | ● |
| 4 anti-vibration pads enclosed | ● | ● |

1) Only possible with additional adapter

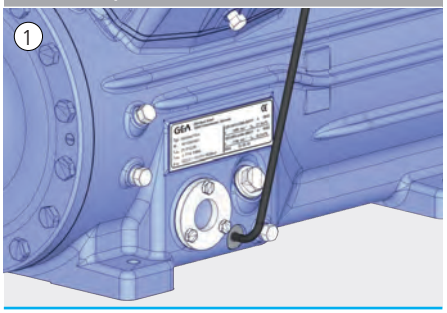
# Accessories

| Accessories | HG44e | HG56e |
|---|---|---|
| ① Oil sump heater 220-240 V - 1 - 50/60 Hz, 160 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 | | ● |
| ④ Start unloader by means of a Bock ES (Electronic Soft Start) 400 V - 3 - 50/60 Hz, IP20, (connection clamps IP00) for installation in switch cabinet | ● [1)] | ● [1)] |
| ⑤ Oil pressure safety switch MP 54 230 V - 1 - 50/60 Hz, IP20 | ● [1)] | ● [1)] |
| ⑥ Oil differential pressure sensor, (Δp-switch Kriwan make) 220-240 V - 1 - 50/60 Hz | ● [1)] | ● [1)] |
| ⑦ INT69 G Diagnose 115 V / 230 V AC, 50/60 Hz, IP00 (INT69 G not applicable) | ● | ● |
| ⑧ DP-Modbus Gateway 115 V / 230 V AC, 50/60 Hz, IP00 incl. adapter cable | ● [1)] | ● [1)] |
| ⑨ Modbus-LAN Gateway 230 V AC, 50/60 Hz, IP00 | ● [1)] | ● [1)] |
| ⑩ USB converter for INT69 G Diagnose | ● [1)] | ● [1)] |
| ⑪ Oil service valve | ● | ● |
| ⑫ Additional fan 230 V D /400 V Y -3- 50 Hz, 120 W, 230-265 V Δ / 400-460 V Y - 3 - 60 Hz, 190 W, IP54 | ● [1)] | ● [1)] |
| ⑬ Cylinder cover prepared for capacity regulator | ● | ● |
| ⑭ Rear bearing flange prepared for oil differential pressure sensor (Δp-switch Kriwan make) | ● | ● |
| ⑮ Connection piece suction and discharge valve in welded construction | ● | ● |
| Special voltage and/or frequency | ● [2)] | ● [2)] |

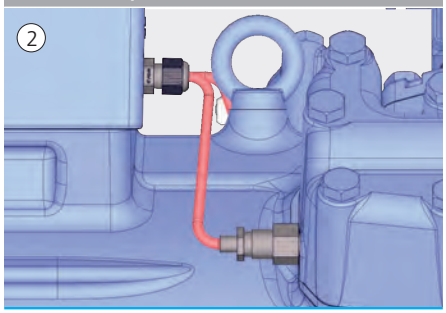
[1)] Enclosed package

[2)] On request

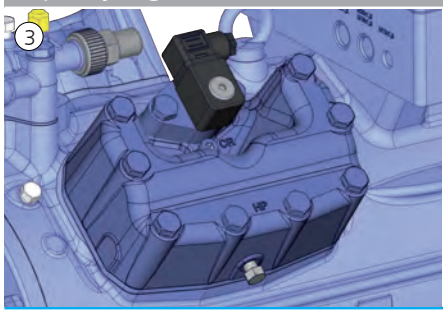
## Oil sump heater




## Thermal protection thermostat



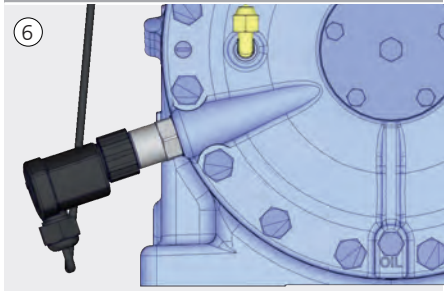

## Capacity regulator




## ESS Electronic Soft Start


## Oil pressure safety switch


## Oil differential pressure sensor






96321-02.2014-Gb Subject to change without notice

# Accessories

## INT69 G Diagnose

⑦

## DP-Modbus Gateway

⑧

## Modbus-LAN Gateway

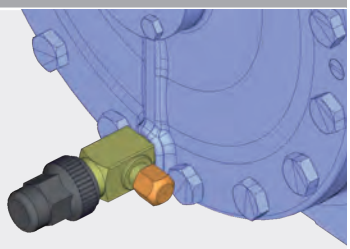
⑨

## USB converter

⑩

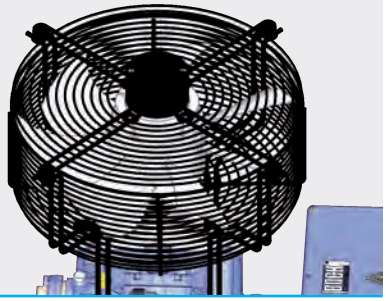
## Oil service valve

⑪



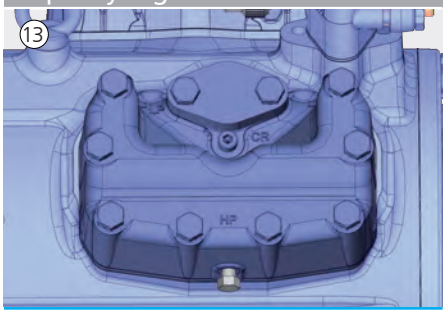
## Additional fan

⑫



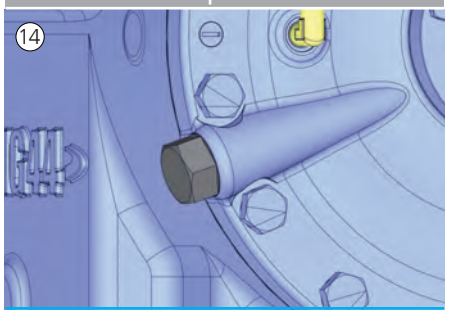
## Cylinder cover prepared for capacity regulator

⑬



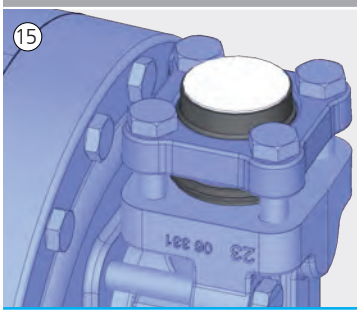

## Rear bearing flange prepared for oil differential pressure sensor

⑭



## Connection piece in welded construction

⑮



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