



GEA Bock ATEX Compressors

Semi-hermetic Compressors in Explosion-risk Environments



GEA Bock - More than a compressor

Over 75 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.

Today, GEA Bock offers as part of GEA Refrigeration Technologies the right compressor for all fields of commercial-, industrial-, rail-, bus- and transport refrigeration.

In this brochure we present you our semi-hermetic compressors especially designed for explosion-risk environments.

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



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. Deviations cannot be ruled out because of the ongoing development process for 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. © GEA Bock GmbH 2013

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
- CO₂ compressors subcritical
- CO₂ 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.

- Single-stage compressors
- NH₃ compressors
- Compressor units for direct drive
- NH₃ Compressor units for direct drive



ATEX compressors

Semi-hermetic compressors for explosion-risk environments

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

Within the European Union, electrical and mechanical machinery operated in explosive atmospheres must comply with the ATEX (ATmospheres EXplosibles) conditions.

The system designer must use correspondingly marked and certified components for these applications.

GEA Bock is the first European manufacturer who offers compressors which are conform to ATEX machine category 2.

Information on the compressors

The models of the HG Series are the basic compressors for ATEX versions.

Detailed descriptions and information on the basic compressor can be found in the brochure "semi-hermetic GEA Bock compressors".



Quality management in accordance with EN13980 monitored by TÜV-SÜD

Differences to standard compressors

Standard hot gas monitoring of all cylinder covers with special thermal protection thermostat

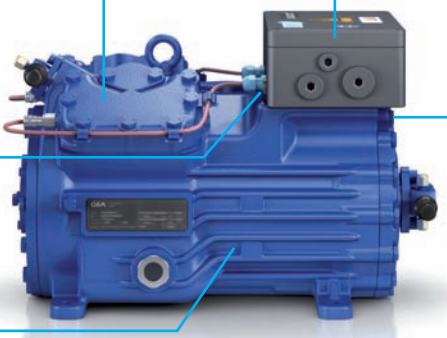
Special ATEX terminal box



Electronic motor protection MP10 **supplied separately** for installation in the switchboard (outside the EX zone)

Special ATEX design of the electrical components

Compressor rated for temperature class T3



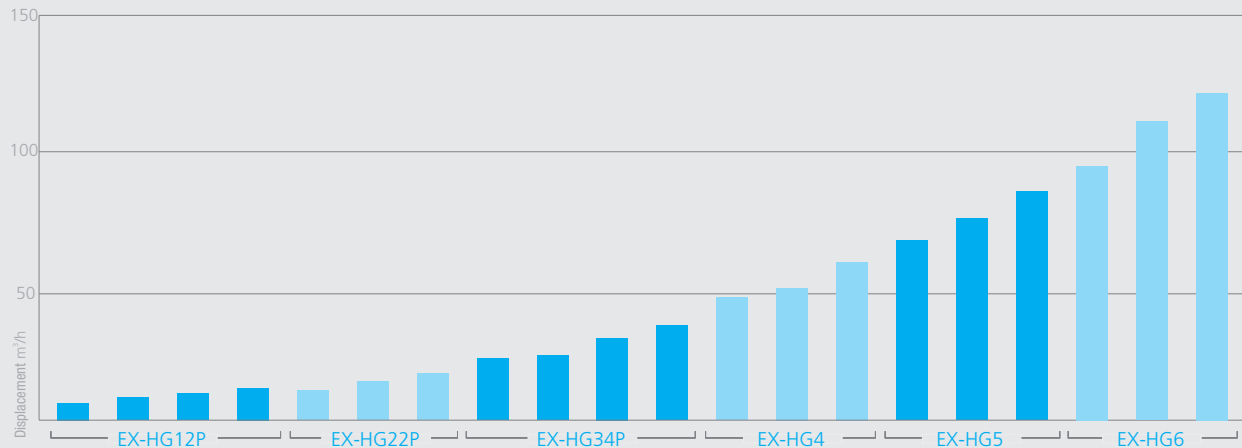
Connection potential balance



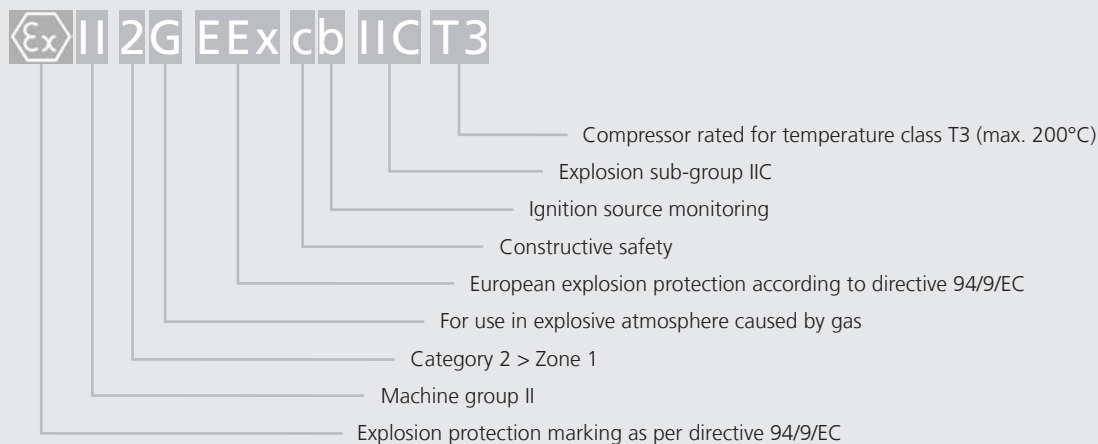
Safety barrier supplied separately for installation in the switchboard (outside the EX zone).

The current program

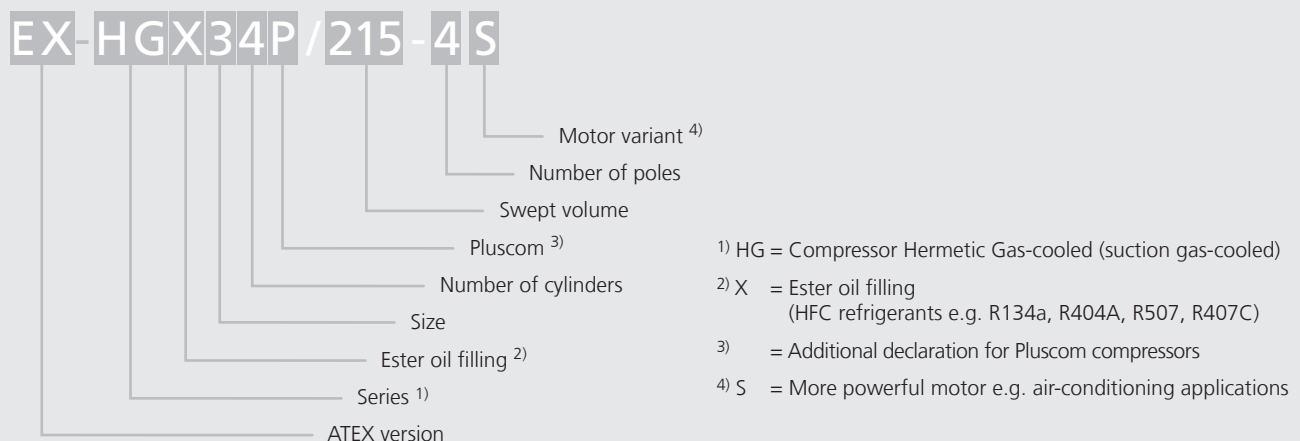
...6 model sizes with 20 capacity stages from 5,4 to 122,4 m³/h (50 Hz)



ATEX classification



Type key - ATEX compressor



General information about ATEX

Explosion protection and ATEX

According to the dictionary, an explosion is a "sudden change in forces based on the expansion efforts of gases and vapours". Explosions are accompanied by an abrupt and usually simultaneous increase in temperature and pressure. Here it is possible to reach values exceeding 2000°C and 10 bar. The Professional Association of the Chemical Industry estimates that in Germany alone, altogether three minor to medium explosions occur every day.

There is an explosion-risk in nearly all process engineering systems: in the chemical and petrochemical industry, in mining, and in crude oil and natural gas production.

In many branches of industry, flammable gases, vapours and mist are generated during manufacturing, processing, transport and storage (e.g. paint shops, refineries, chemicals companies, research establishments, hydrogen production).

An explosive atmosphere normally requires oxygen and flammable substances in a certain ratio to each other. All it then needs for an explosion to occur is a corresponding ignition source. Naked flames, hot surfaces and visible electrical or mechanical sparks immediately come to mind.

But explosions can also be triggered by static discharge (e.g. even tiny quantities of ignition energy from the clothing worn by workers), electrical equalising currents, ultrasonic sound, electromagnetic radiation, shock waves and adiabatic compression.

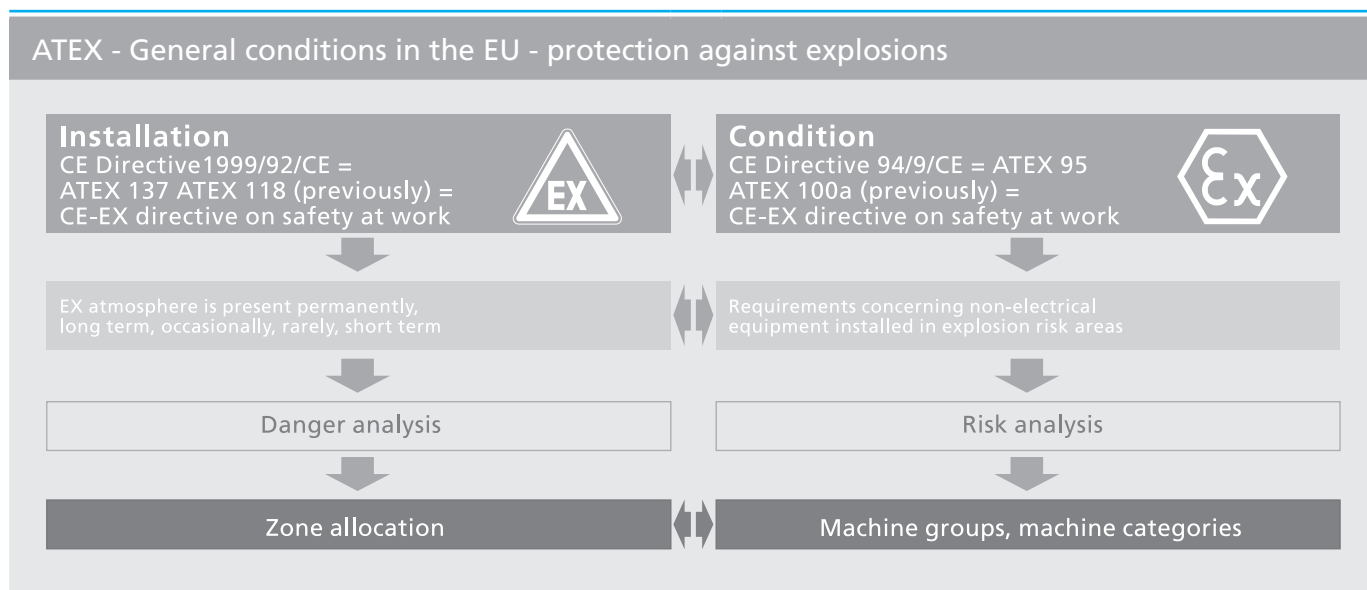
The origins of these regulations to prevent explosion risks date back to the mining industry. With the introduction of electricity, also the electronic protection against explosions started to develop. Today, explosion protection in Europe is regulated by a European directive (ATEX).

What is ATEX?

The so-called ATEX Directive (ATEX is derived from the French *Atmosphères Explosibles*) was drawn up to create uniform minimum standards throughout Europe. In spite of the 7-year transitional phase, when the Directive became a legal requirement as of 1 July 2003, many were still surprised.

ATEX now contains aspects pertaining to dust explosion protection and mechanical explosion protection which were previously neglected in many national regulations.

This is why today even non-electric equipment (mechanical parts) is subject to mandatory testing or at least appraisal.



The ATEX directives

1. EC directive 1999/92/EC (ATEX 137)

It contains "minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres". It stipulates above all the requirements made of workplaces, including:

- Compilation of explosion protection documents with a comprehensive consideration of risks
- Allocation of zones (zone 0, 1, 2, 20, 21, 22) and corresponding marking
- Safety measures
- Requirements made of the employees
- Regulations for work approval and permitting work
- Choice of working equipment

This Directive therefore primarily addresses the machine owners. This ATEX directive came into effect on 28 January 2000. Existing workplaces must fulfill the new regulations at the latest on the expiry of the interim period on 30 June 2006.

2. EC directive 94/9/EC (ATEX 95)

This stipulates the requirements made of the products used in explosion-risk areas. This refers to:

- Machines and protection systems for intended use in explosion-risk atmospheres
- Safety, control and regulating devices contributing to the safe operation of the machines and protection systems
- All electrical, mechanical, hydraulic and pneumatic operating equipment with inherent ignition sources

This directive primarily addresses the manufacturers. It has been a legal requirement since 1st July 2003.

Protection principles

1.

The safest machines are machines which rule out the risk of creating an explosive atmosphere right from the very start. Primary explosion protection means for example using nonflammable substitute substances. Other possibilities include avoiding the generation of corresponding mixtures by suitable ventilation measures or by changing the concentration levels.

2.

Unfortunately, primary explosion protection is frequently not possible. For this reason, in such cases it is necessary to avoid the ignition of an explosive atmosphere as secondary explosion protection. This consists of using corresponding machines, parts and materials, as well as complying with corresponding instructions and procedures for working in such areas.

3.

Finally, the last possibility can then only consist of limiting the effects of an explosion to a harmless level. This can consist of a corresponding encapsulation, for example, or cautious selection of the erection site.

Zone allocation

The obligations of the machine operator include drawing up a so-called explosion protection document, as stipulated in ATEX 137. This also includes an appraisal of the explosion risks. Accordingly, certain zones are to be introduced.

Explosion risk areas are broken down into zones and marked accordingly, depending on the frequency and duration with which explosive atmospheres occur:

Zone 0:

The explosive atmosphere is present constantly, for long periods of time or frequently.

Zone 1:

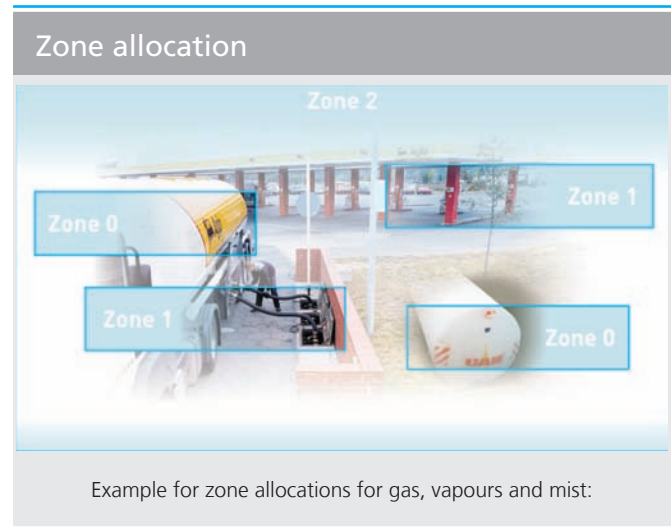
The explosive atmosphere is occasionally present during normal operation.

Zone 2:

The explosive atmosphere is not present during normal operation, or only briefly.

Flammable refrigerants

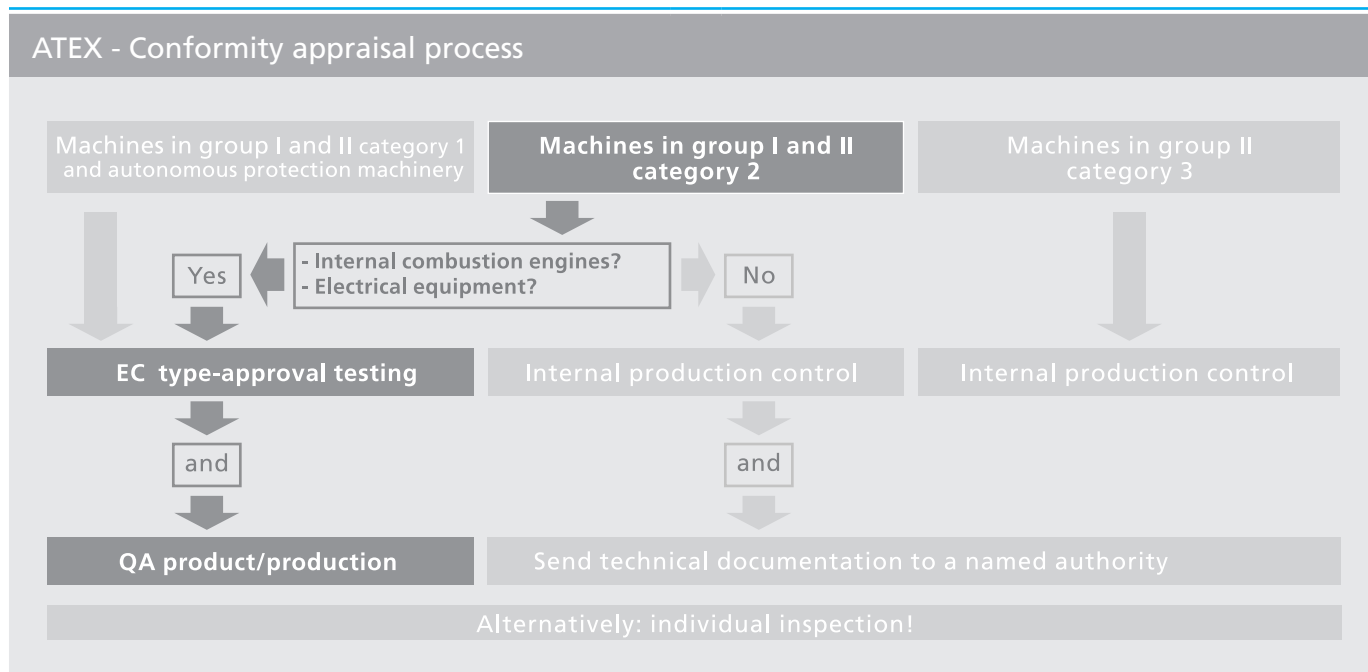
If no particular safety measures are taken for refrigeration- or air-conditioning systems with refrigerants of the safety group A2, or especially with refrigerants of the safety group A3, it is expected that, at least temporarily, an explosive atmosphere can occur at leakage, charging or maintenance. This is why an allocation of zones according to EC directive 1999/92/EC has to be made at the installation site and therefore the compressors have to comply with the EC directive 94/9EC as well.



General measures for explosion-risk areas

- The machine owner must draw up an explosion protection document (ATEX 137)
- The employer must provide employees with adequate, appropriate instructions about explosion protection
- In the case of dangerous work, written work permit must be obtained from the machine owner before commencing
- Explosion-risk areas must be marked with the warning sign at the access points
- Ignition sources (smoking, naked lights, soldering) must be prohibited
- Unauthorised access to the area must be prohibited by clear, indelible warning signs
- Working equipment must comply with the requirements for exprotection
- The tests and inspections prescribed in the explosion protection document and in the operating instructions must be carried out punctually and corresponding records kept
- Machines with faults must not be operated

Conformity appraisal process



What does this mean for refrigerating machines?

Equipment in explosive atmospheres has to comply with ATEX requirements, when operating within the European Union.

According to ATEX requirements all electrical and mechanical equipment must be examined.

All equipment is defined according to Regulation 94/9/EG: machines, resources, stationary and moveable devices, control and plant components, as well as alarm and preventative systems which can, individually or in combination, cause the generation, transfer, accumulation, reading, control and conversion, of energy and/or are intended for processing materials and demonstrate their own potential ignition source which itself could cause an explosion.

Thus almost all components (compressor, evaporator, condenser – but also valves, pressure gauges, sensors...) of a refrigeration plant must be examined and evaluated.

The operator must produce a corresponding zone allocation. This has to be recorded in the explosion protection document.

In addition the important material properties pertinent to explosion protection must also be declared. The outcome of this provides the conditions under which the components can be used (group, category, explosion subgroup, temperature class).

Accordingly the plant operator should only use correspondingly marked and identified components with the necessary documentation (e.g. manufacturer's declaration or declaration of conformity).

The declarations issued by the component manufacturers only refer to the product itself.

It is presumed that the corresponding installation standards, installation and operating instructions (e.g. assembly instruction) are heeded during installation and operation.

Most manufacturers offer series products for a wide range of different applications, so that they can only consider their own product as such.

Interaction with other machinery in the system and with the environment must be taken into consideration by the system designer, particularly with regard to potential ignition sources.

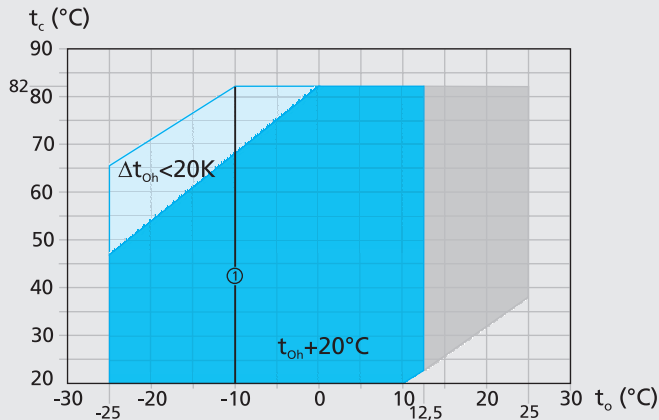
When the results are positive, the system designer must draw up a corresponding declaration for the machine group or system.

The machine owner is responsible for registering the machinery with the supervisory authorities and requesting possibly necessary acceptance.

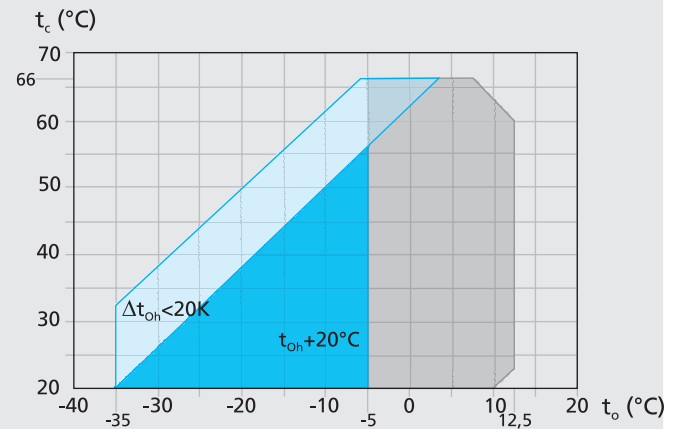


Operating limits

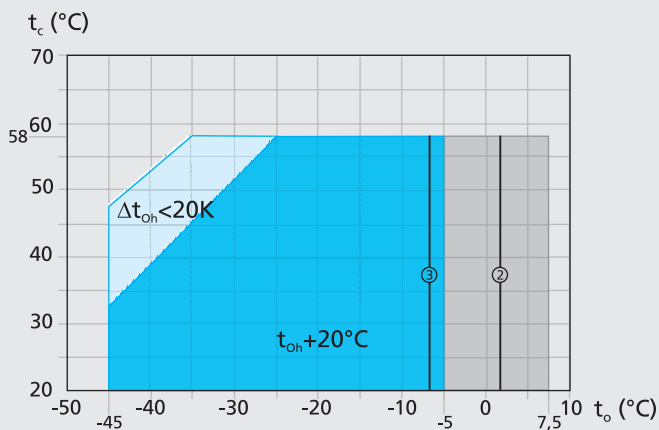
R134a / R600a^①



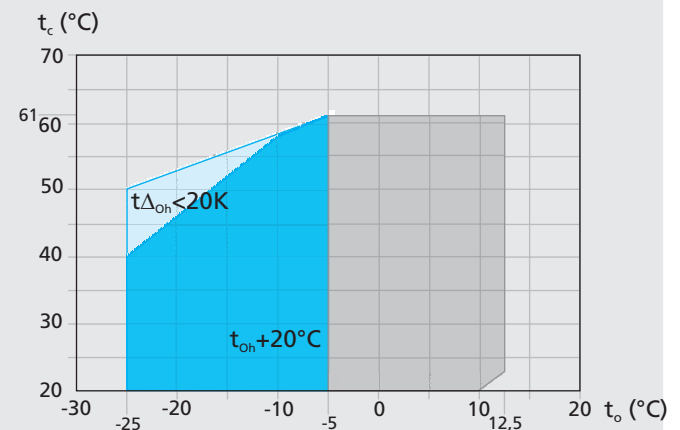
R22 / R290 / R1270



R404A / R507^{②③}



R407C



Diagrams for other areas available on request

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

¹⁾ LP = low pressure HP = high pressure

- ① **Operating limit for R600a**
Min. evaporating temperature $t_o = -10\text{ °C}$
- ② **EX-HGX6/1410-4S**
Max. evaporating temperature $t_o = 2\text{ °C}$
- ③ **EX-HGX6/1410-4**
Max. evaporating temperature $t_o = -7\text{ °C}$

- Unlimited application range
- Reduced suction gas temperature
- Motor version -S- (more powerful motor)

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

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 performance data for the synthetic refrigerants is available in the brochure "semi-hermetic GEA Bock compressors". In addition, performance data for hydrocarbons R290, R600a and R1270 can be found in the brochure "GEA Bock HC Compressors" and on the Internet.

Technical data

EX-HG Type	Number of cylinders	Displacement 50 / 60 Hz (1450 / 1740 rpm) m³/h	Electrical data				Weight kg	Connections ⑤		Oil charge Ltr.
			Voltage	Max. working current	Max. power consumption	Starting current (rotor locked)		Discharge line DV	Suction line SV	
			①	②	②			mm inch	mm inch	
				A	kW	A				
				Y		Y				
EX-HG12P/60-4 S	2	5,40 / 6,40	③	3,9	2,2	23	48	12 1/2	16 5/8	0,8
EX-HG12P/75-4	2	6,70 / 8,10	③	4,1	2,3	23	48	12 1/2	16 5/8	0,8
EX-HG12P/75-4 S	2	6,70 / 8,10	③	4,6	2,6	25	49	12 1/2	16 5/8	0,8
EX-HG12P/90-4	2	8,00 / 9,60	③	4,9	2,8	25	49	12 1/2	16 5/8	0,8
EX-HG12P/90-4 S	2	8,00 / 9,60	③	5,1	2,9	26	49	12 1/2	16 5/8	0,8
EX-HG12P/110-4	2	9,40 / 11,30	③	5,3	3,1	25	48	12 1/2	16 5/8	0,8
EX-HG12P/110-4 S	2	9,40 / 11,30	③	6,1	3,6	26	48	12 1/2	16 5/8	0,8
EX-HG22P/125-4	2	11,10 / 13,30	③	5,4	3,0	40	73	16 5/8	22 7/8	1,0
EX-HG22P/125-4 S	2	11,10 / 13,30	③	6,2	3,6	40	74	16 5/8	22 7/8	1,0
EX-HG22P/160-4	2	13,70 / 16,40	③	6,4	3,7	40	74	16 5/8	22 7/8	1,0
EX-HG22P/160-4 S	2	13,70 / 16,40	③	7,6	4,4	50	75	16 5/8	22 7/8	1,0
EX-HG22P/190-4	2	16,50 / 19,80	③	8,0	4,8	40	74	16 5/8	22 7/8	1,0
EX-HG22P/190-4 S	2	16,50 / 19,80	③	9,4	5,6	50	75	16 5/8	22 7/8	1,0
EX-HG34P/215-4	4	18,80 / 22,60	③	8,1	4,8	50	94	16 5/8	22 7/8	1,3
EX-HG34P/215-4 S	4	18,80 / 22,60	③	10,5	6,0	76	96	16 5/8	22 7/8	1,3
EX-HG34P/255-4	4	22,10 / 26,60	③	9,8	6,0	50	94	16 5/8	28 1 1/8	1,3
EX-HG34P/255-4 S	4	22,10 / 26,60	③	12,2	7,2	76	96	16 5/8	28 1 1/8	1,3
EX-HG34P/315-4	4	27,30 / 32,80	③	12,2	7,4	64	93	22 7/8	28 1 1/8	1,3
EX-HG34P/315-4 S	4	27,30 / 32,80	③	14,7	8,9	76	96	22 7/8	28 1 1/8	1,3
EX-HG34P/380-4	4	33,10 / 39,70	③	15,1	9,3	64	91	22 7/8	28 1 1/8	1,3
EX-HG34P/380-4 S	4	33,10 / 39,70	③	18,0	11,1	76	94	22 7/8	28 1 1/8	1,3

EX-HG Type	Number of cylinders	Displacement 50 / 60 Hz (1450 / 1740 rpm) m³/h	Electrical data				Weight kg	Connections ⑤		Oil charge Ltr.
			Voltage ①	Max. working current ② A	Max. power consumption ② kW	Starting current (rotor locked) A		Discharge line DV mm inch	Suction line SV mm inch	
				* PW 1+2		*PW1 / PW 1+2				
EX-HG4/465-4	4	40,50 / 48,60	④	18	11,0	57 / 75	151	28 1 1/8	35 1 3/8	2,7
EX-HG4/465-4 S	4	40,50 / 48,60	④	27	13,0	82 / 107	154	28 1 1/8	35 1 3/8	2,7
EX-HG4/555-4	4	48,20 / 57,80	④	27	12,9	82 / 107	153	28 1 1/8	35 1 3/8	2,7
EX-HG4/555-4 S	4	48,20 / 57,80	④	34	15,2	107 / 140	156	28 1 1/8	35 1 3/8	2,7
EX-HG4/650-4	4	56,60 / 67,90	④	27	15,7	82 / 107	155	28 1 1/8	42 1 5/8	2,7
EX-HG4/650-4 S	4	56,60 / 67,90	④	34	18,4	107 / 140	158	28 1 1/8	42 1 5/8	2,7
EX-HG5/725-4	4	62,90 / 75,50	④	33	16,5	82 / 107	202	28 1 1/8	42 1 5/8	3,6
EX-HG5/725-4 S	4	62,90 / 75,50	④	37	19,4	107 / 140	205	28 1 1/8	42 1 5/8	3,6
EX-HG5/830-4	4	72,20 / 86,70	④	33	18,9	82 / 107	200	28 1 1/8	42 1 5/8	3,6
EX-HG5/830-4 S	4	72,20 / 86,70	④	49	22,3	126 / 160	207	28 1 1/8	42 1 5/8	3,6
EX-HG5/945-4	4	82,20 / 98,60	④	37	22,6	107 / 140	205	35 1 3/8	54 2 1/8	3,6
EX-HG5/945-4 S	4	82,20 / 98,60	④	49	28,6	126 / 160	209	35 1 3/8	54 2 1/8	3,6
EX-HG6/1080-4	4	93,70 / 112,40	④	47	26,3	149 / 189	221	35 1 3/8	54 2 1/8	3,6
EX-HG6/1080-4 S	4	93,70 / 112,40	④	57	31,0	172 / 212	227	35 1 3/8	54 2 1/8	3,6
EX-HG6/1240-4	4	107,60 / 129,10	④	57	30,5	172 / 212	225	35 1 3/8	54 2 1/8	3,6
EX-HG6/1240-4 S	4	107,60 / 129,10	④	71	36,0	204 / 250	228	35 1 3/8	54 2 1/8	3,6
EX-HG6/1410-4	4	122,40 / 146,90	④	57	35,6	172 / 212	223	35 1 3/8	54 2 1/8	3,6
EX-HG6/1410-4 S	4	122,40 / 146,90	④	71	42,6	204 / 250	226	35 1 3/8	54 2 1/8	3,6

* PW = Part Winding, motors for part winding start

1 = 1. part winding

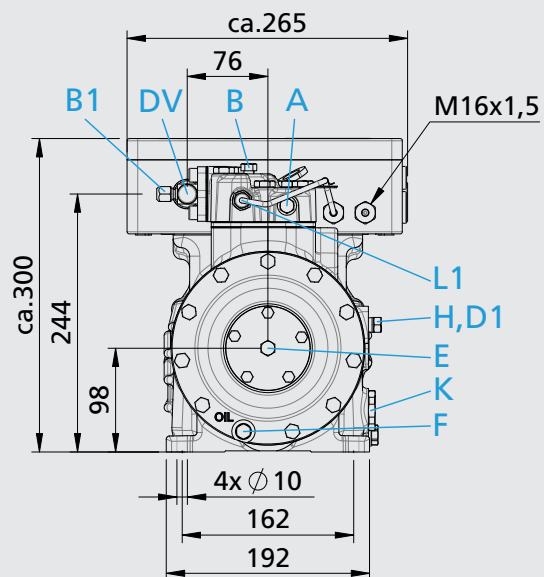
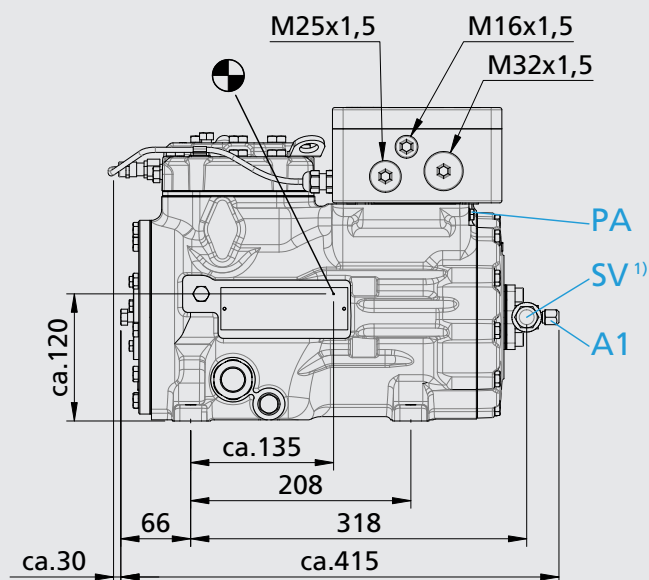
2 = 2. part winding

Explanations:

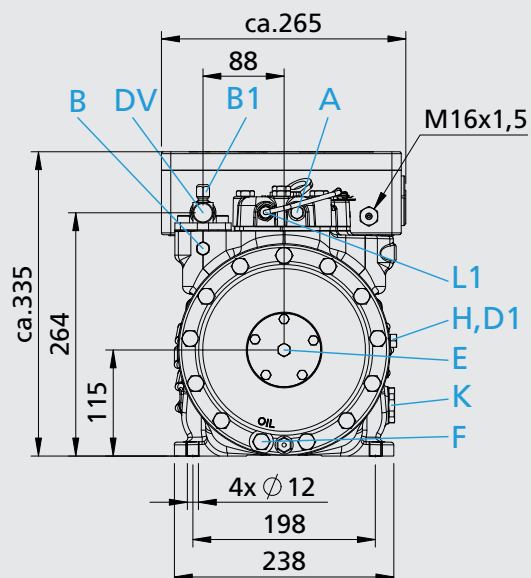
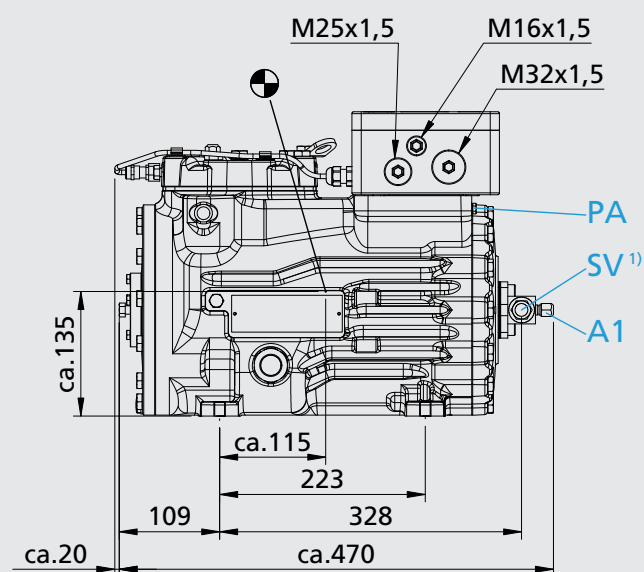
- ① Tolerance ($\pm 10\%$) relates to the mean value of the voltage range. Other voltages and current types on request.
- ② - The specifications for max. power consumption apply for 50 Hz operation. For 60 Hz operation, the specifications have to be multiplied by the factor 1.2.
The max. working current remains unchanged.
- Take account of the max. operating current / max. power consumption when designing contactors, leads and fuses.
Switches: service category AC3
- ③ 380-420 V Y - 3 - 50 Hz PW
440-480 V Y - 3 - 60 Hz PW
- 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 ratio:
EX-HG4, EX-HG5, EX-HG6 = 66% / 33%
- ⑤ For soldering connections

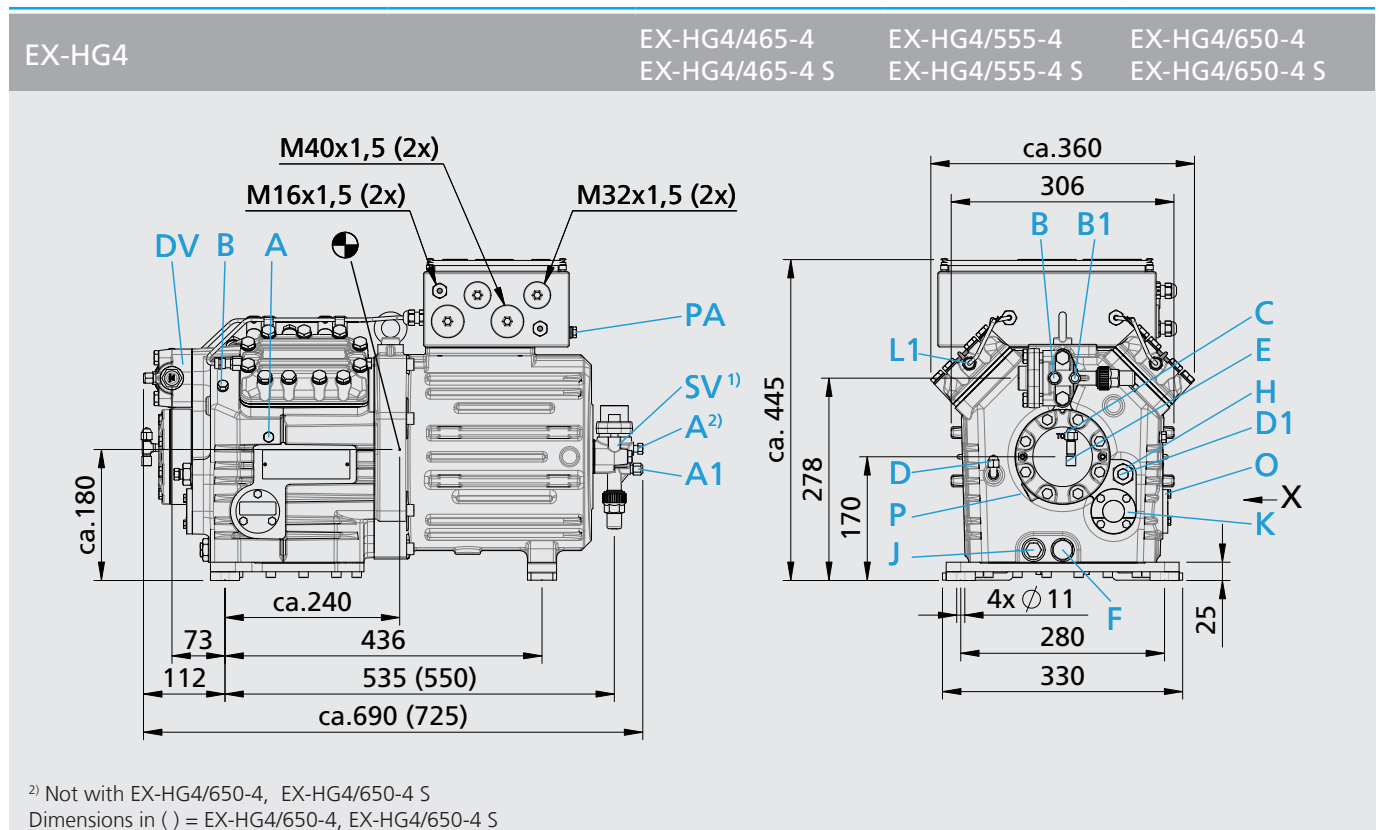
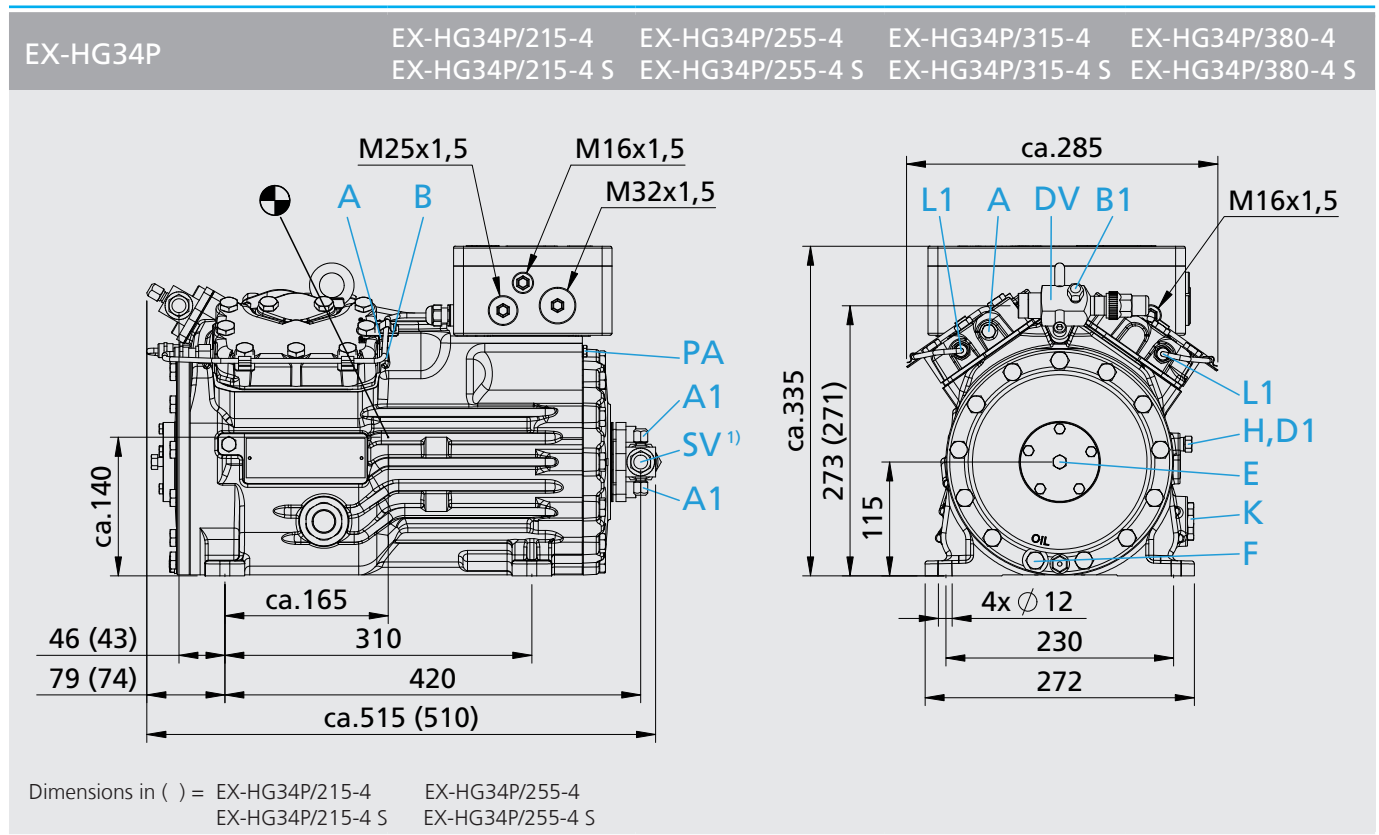
EX-HG12P

EX-HG12P/60-4 S

EX-HG12P/75-4
EX-HG12P/75-4 SEX-HG12P/90-4
EX-HG12P/90-4 SEX-HG12P/110-4
EX-HG12P/110-4 S

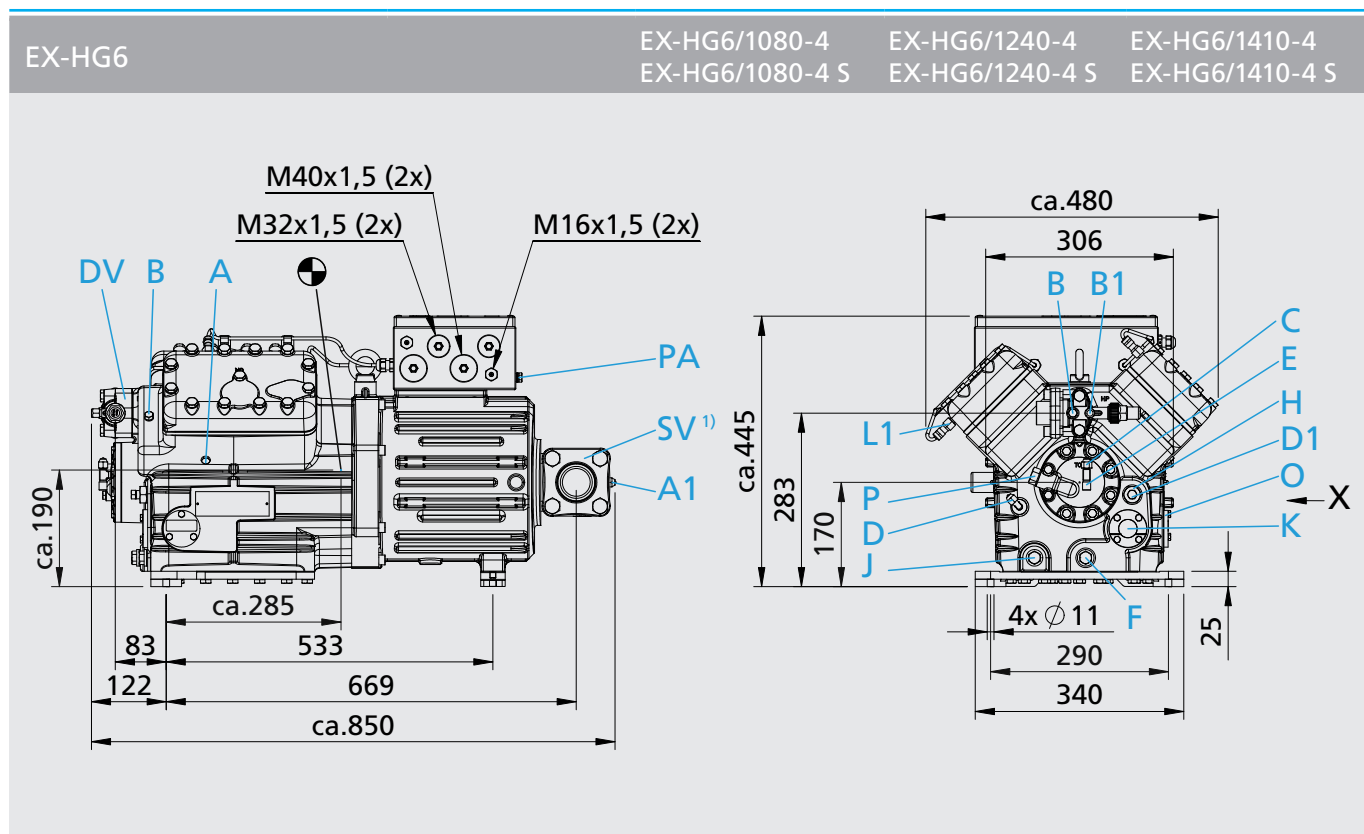
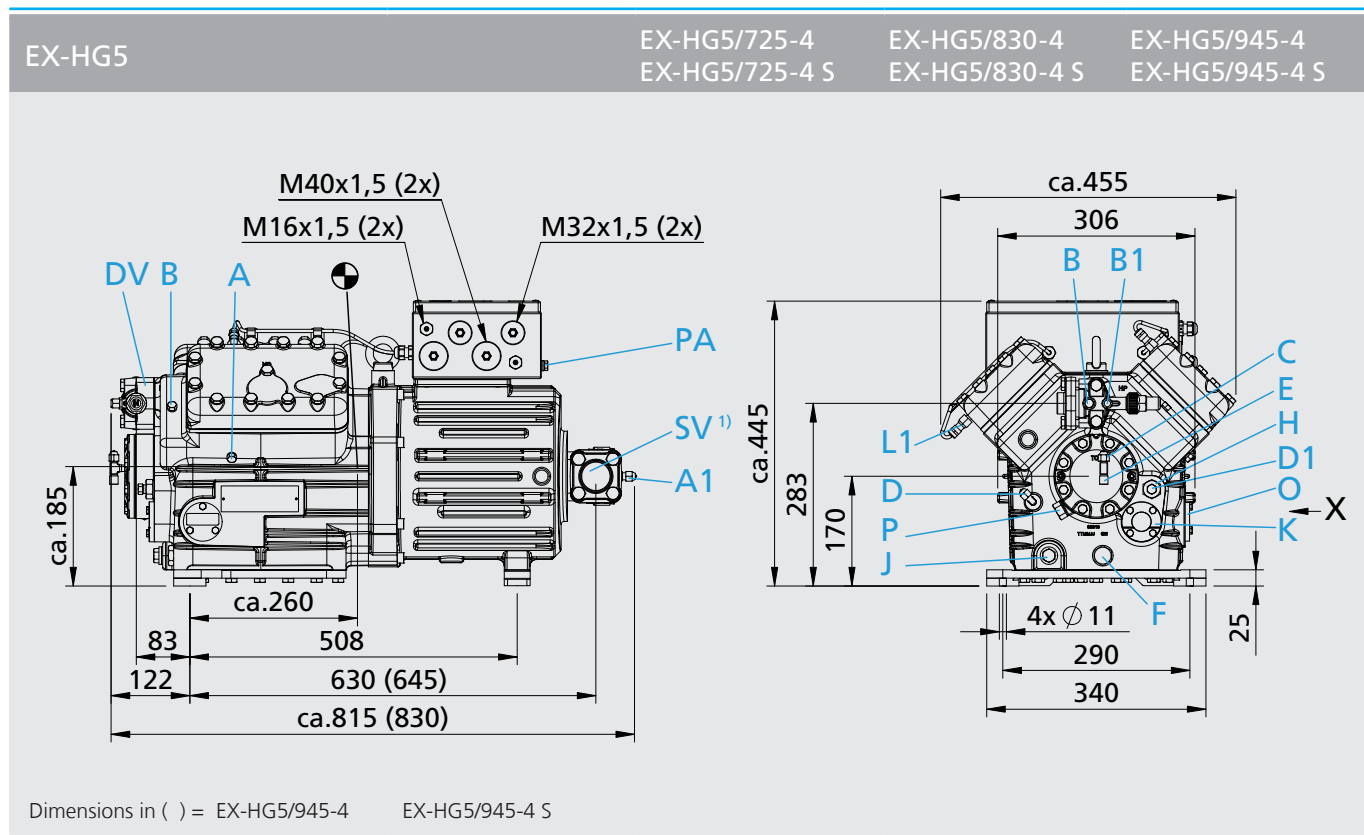
EX-HG22P

EX-HG22P/125-4
EX-HG22P/125-4 SEX-HG22P/160-4
EX-HG22P/160-4 SEX-HG22P/190-4
EX-HG22P/190-4 S



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

- Connections see page 17
 - Dimensions for anti-vibration pad see page 18
 - Dimensions for view X see page 18



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

- Connections see page 17
 - Dimensions for anti-vibration pad see page 18
 - Dimensions for view X see page 18

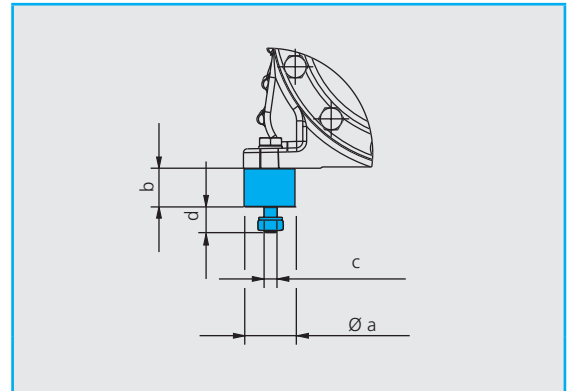
Connections	EX-HG12P	EX-HG22P	EX-HG34P	EX-HG4	EX-HG5	EX-HG6
SV Suction line DV Discharge line	please refer to technical data page 12 and 13					
A Connection suction side, not lockable	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF
A1 Connection suction side, lockable	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF
B Connection discharge side, not lockable	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF
B1 Connection discharge side, lockable	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF	7/16" UNF
C Connection oil pressure safety switch OIL ¹⁾	-	-	-	7/16" UNF	7/16" UNF	7/16" UNF
D Connection oil pressure safety switch LP ¹⁾	-	-	-	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
E Connection oil pressure gauge	1/8" NPTF	1/8" NPTF	1/8" NPTF	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
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
J Connection oil sump heater ¹⁾	-	-	-	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
L1 Thermal protection thermostat	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF	1/8" NPTF
O Connection oil level regulator ¹⁾	-	-	-	①	①	①
P Connection oil differential pressure sensor ¹⁾	-	-	-	M 20 x 1,5	M 20 x 1,5	M 20 x 1,5
PA Connection potential compensation	M 6	M 6	M 6	M 8	M 8	M 8

¹⁾ Operation of this component is permissible only with the appropriate type of protection

① Dimensions for view X see page 18

Dimensions for anti-vibration pad

Type	Ø a mm	b mm	c mm	d mm
EX-HG12P	30	30	M8	20
EX-HG22P	40	30	M10	20
EX-HG34P	40	30	M10	20
EX-HG4	40	30	M10	20
EX-HG5	50	30	M10	25
EX-HG6	50	30	M10	25

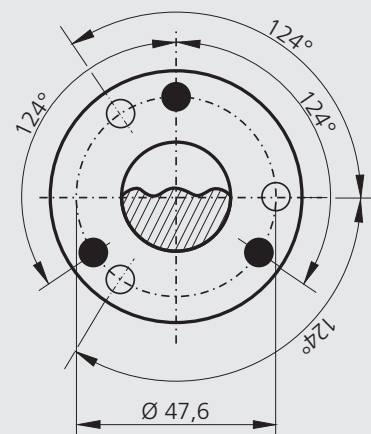


View X

Possibility to connect to oil level regulator

EX-HG 4, 5, 6

- Three-hole connection for oil level regulator make ESK, AC+R, CARLY (3x M6, 10 deep) ¹⁾
- Three-hole connection for oil level regulator make TRAXOIL (3 x M6 x 10 deep) ¹⁾



Dimensions in mm

¹⁾ Operation of these components only with suitable ignition protection.

Scope of supply	EX-HG12P	EX-HG22P	EX-HG34P	EX-HG4	EX-HG5	EX-HG6
Semi-hermetic two cylinder reciprocating compressor with drive motor for direct start 380-420 V Y - 3 - 50 Hz 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 380-420 V Y - 3 - 50 Hz 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				●	●	●
Winding protection with PTC resistor sensors and electronic triggering unit Bock MP10 for installation in switch box (enclosed)	●	●	●	●	●	●
AC double barrier as energy limit in separate electrical circuit to avoid ignition. Suited for installation in switch box (enclosed)	●	●	●	●	●	●
Oil pump	●	●	●	●	●	●
Oil pump cover with screwed connection for differential oil pressure sensor				● ¹⁾	● ¹⁾	● ¹⁾
Connection possibility of oil level controllers makes ESK, AC+R, CARLY	● ^{1) 2)}	● ^{1) 2)}	● ^{1) 2)}	● ¹⁾	● ¹⁾	● ¹⁾
Connection possibility of oil level controllers make Traxoil	● ^{1) 2)}	● ^{1) 2)}	● ^{1) 2)}	● ^{1) 2)}	● ^{1) 2)}	● ^{1) 2)}
Oil charge: HG: FUCHS Reniso SP 46 HGX: FUCHS Reniso Triton SE 55	●	●	●	●	●	●
Sight glass	●	●	●	●	●	●
Decompression valve				●	●	●
Suction and discharge line valve	●	●	●	●	●	●
Thermal protection thermostat (PTC sensor) for each cylinder head	●	●	●	●	●	●
Inert gas charge	●	●	●	●	●	●
4 anti-vibration pads enclosed	●	●	●	●	●	●

¹⁾ Operation of these components only with suitable ignition protection.

²⁾ Only possible with additional adapter.

Accessories	EX-HG12P	EX-HG22P	EX-HG34P	EX-HG4	EX-HG5	EX-HG6
Capacity controller 230 V - 1 - 40-60 Hz, IP65 1 Capacity controller = 50% rest capacity, explosion protection, machine category 2, Directive 94/9/EG			●	●	●	●
Oil sump heater 230 V - 1 - 50/60 Hz, 80 W, explosion protection, machine category 2, Directive 94/9/EG	●	●	●	●		
Oil sump heater 230 V - 1 - 50/60 Hz, 140 W, explosion protection, machine category 2, Directive 94/9/EG					●	●
Special voltage and/or -frequency (on request)	●	●	●	●	●	●



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