

Reciprocating Compressor

BOCK UL-HGX22e/UL-HGX34e

Assembly instructions

(Translation of the original instructions)

96546-10.2021-U5

UL-HGX22e/125 ML 2	UL-HGX34e/215 ML 3
UL-HGX22e/125 S 3	UL-HGX34e/215 S 5
UL-HGX22e/160 ML 2	UL-HGX34e/255 ML 4
UL-HGX22e/160 S 3	UL-HGX34e/255 S 6
UL-HGX22e/190 ML 3	UL-HGX34e/315 ML 5
UL-HGX22e/190 S 4	UL-HGX34e/315 S 7
	UL-HGX34e/380 ML 6
	UL-HGX34e/380 S 9

Bock GmbH, Benzstr. 7, 72636 Frickenhausen, Germany

Phone: +49 7022 9454-0, Fax: +49 7022 9454-137

www.bock.de, service@bock.de

BOCK®

colour the world
of tomorrow

Foreword

⚠ DANGER

Risk of accidents.

Refrigerating compressors are pressurized machines and as such call for heightened caution and care in handling.

Improper assembly and use of the compressor can result in serious or fatal injury!

- **To avoid serious injury or death, observe all safety instructions contained in these instructions before assembly and before using the compressor! This will avoid misunderstandings and prevent serious or fatal injury and damage!**
- **Never use the product improperly but only as recommended by this manual!**
- **Observe all product safety labels!**
- **Refer to local building codes for installation requirements!**

Unauthorized changes and modifications to the product not covered by this manual are prohibited and will void the warranty!

This instruction manual is a mandatory part of the product. It must be available to the personnel who operate and maintain this product. It must be passed onto the end customer along with the unit in which the compressor is installed.

This document is subject to the copyright of BOCK GmbH, Germany. The information provided in this manual is subject to change and improvements without notice.

Manufacturer and contact

Bock GmbH
Benzstr. 7
72636 Frickenhausen
Germany

Phone +49 7022 9454-0
Fax +49 7022 9454-137
www.bock.de
service@bock.de

Contents

Page

1	Safety	4
1.1	Identification of safety instructions	4
1.2	General safety instructions	4
1.3	Intended use	5
1.4	Qualifications required of personnel.....	5
2	Product description.....	6
2.1	Short description	6
2.2	Name plate (example)	7
2.3	Type key (example)	7
3	Areas of application	8
3.1	Refrigerants.....	8
3.2	Oil charge	8
3.3	Limits of application.....	8

US

4	Compressor assembly.....	9
4.1	Storage and transport.....	9
4.2	Setting up	9
4.3	Pipe connections.....	10
4.4	Pipes.....	10
4.5	Laying suction and pressure lines.....	10
4.6	Operating the shut-off valves.....	11
4.7	Operating mode of the lockable service connections	12
4.8	Suction pipe filter and filter drier.....	12
5	Electrical connection	13
5.1	General safety.....	13
5.2	Information for contactor and motor contactor selection.....	13
5.3	Connection of the driving motor	14
5.4	Circuit diagramm for direct start 230 V Δ / 400 V Y	16
5.5	Electronic trigger unit INT69 G.....	18
5.6	Connection of the trigger unit INT69 G.....	18
5.7	Function test of the trigger unit INT69 G	19
5.8	Oil sump heater (accessories)	19
6	Commissioning	20
6.1	Preparations for start-up.....	20
6.2	Pressure integrity test.....	20
6.3	Leak test.....	20
6.4	Evacuation	20
6.5	Refrigerant charge	20
6.6	Start-up	21
6.7	Avoiding slugging.....	21
6.8	Connection of oil level regulator	21
7	Maintenance	22
7.1	Preparation	22
7.2	Work to be carried out	22
7.3	Spare parts recommendation/accessories	22
7.4	Lubricants / oils	22
7.5	Decommissioning	22
8	Technical data.....	23
9	Dimensions and connections	25
10	Declaration of incorporation.....	27
11	UL-Certificate of Compliance.....	28
12	Service	29

1| Safety

1.1 Identification of safety instructions



Indicates a dangerous situation which, if not avoided, will cause immediate fatal or serious injury.



Indicates a dangerous situation which, if not avoided, may cause fatal or serious injury.



Indicates a dangerous situation which, if not avoided, may cause fairly severe or minor injury.



Indicates a situation which, if not avoided, may cause property damage.



Important information or tips on simplifying work.

US

1.2 General safety instructions



Risk of accidents.

Refrigerating compressors are pressurized machines and as such call for heightened caution and care in handling.

The maximum permissible overpressure must not be exceeded, even for testing purposes!

Risk of burns!

- Depending on the operating conditions, surface temperatures of over 60°C (140°F) on the discharge side or below 0°C (32°F) on the suction side can be reached.

- Contact with refrigerant must be avoided.

Contact with refrigerant can cause severe burns and skin damage.

1| Safety

1.3 Intended use

⚠WARNING

The compressor may not be used in potentially explosive environments!

- These assembly instructions describe the standard version of the compressor named in the title manufactured by Bock. Bock refrigerating compressors are intended for installation in a machine (within the EU according to the EU Directives 2006/42/EC Machinery Directive, 2014/68/EU Pressure Equipment Directive, outside the EU according to the respective national regulations and guidelines).

Commissioning is permissible only if the compressor has been installed in accordance with these assembly instructions and the entire system into which it is integrated has been inspected and approved in accordance with legal regulations.

The compressors are intended for use in refrigeration systems in compliance with the limits of application.

Only the refrigerant specified in these instructions may be used.

Any other use of the compressor is prohibited!

US

1.4 Qualifications required of personnel

⚠WARNING

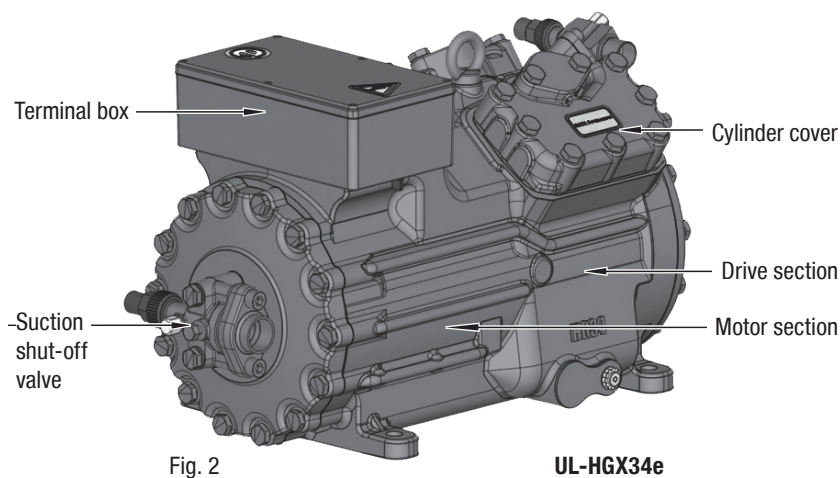
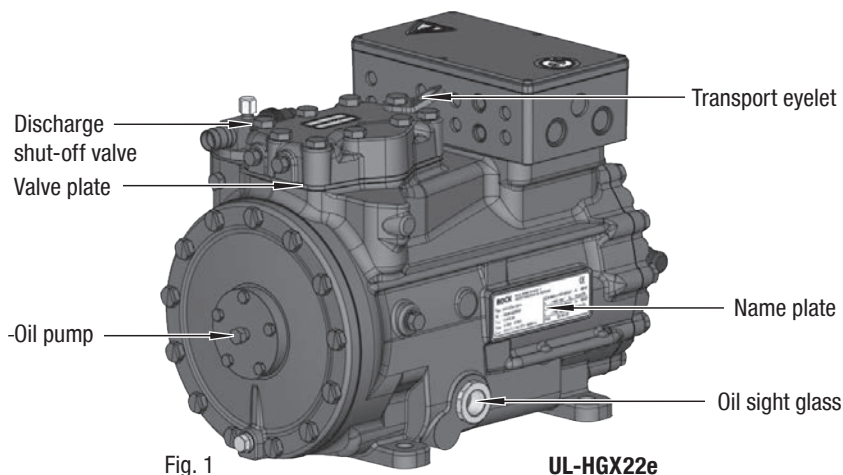
Inadequately qualified personnel poses the risk of accidents, the consequence being serious or fatal injury. Work on compressors is therefore reserved for personnel who are qualified to work on pressurized refrigerant systems:

- For example, a refrigeration technician, refrigeration mechatronic engineer. As well as professions with comparable training that enables personnel to assemble, install, maintain and repair refrigeration and air-conditioning systems. Personnel must be capable of assessing the work to be carried out and recognizing any potential dangers.

2| Product description

2.1 Short description

- **UL-HGX22e:** Semi-hermetic two-cylinder reciprocating compressor with oil pump lubrication.
- **UL-HGX34e:** Semi-hermetic four-cylinder reciprocating compressor with oil pump lubrication.
- Suction gas cooled drive motor.
- The stream of refrigerant sucked out of the evaporator flows over the motor and cools it intensively. In this way, the motor can be kept at a relatively low temperature level, particularly under high loads.



Dimension and connection values can be found in chapter 9.

2| Product description

2.2 Name plate (example)

BOCK		Bock GmbH, Benzstr. 7 72636 Frickenhausen, Germany		C [®] us CE		thermally protected system	
1	Type	: UL-HGX34e/315 ML 5	220-240V Δ / 380-420VY -3- 50HZ		6		
2	No	: AS38125A001	n : 1450 min ⁻¹ \dot{V}_{th} : 665 cfh		7		
3	I _{max}	: 21,1/12,2A	265-290V Δ / 440-480VY -3- 60HZ		8		
4	I _{block}	Δ: 111A : YY: 64A	n : 1740 min ⁻¹ \dot{V}_{th} : 798 cfh		9		
5	p _{max}	: LP/HP = 276/406 psig	IP66 Oil: BOCKlub E55		10		
					11		
					12		
					13		

Fig. 3

1	Type designation	6	Voltage, circuit, frequency
2	Machine number	7	Nominal rotation speed } 50 Hz
3	maximum operating current	8	Displacement
4	Starting current (rotor blocked)	9	Voltage, circuit, frequency
	Y: Part winding 1	10	Nominal rotation speed } 60 Hz
	YY: Part windings 1 and 2	11	Displacement
5	LP: Max. admissible operating pressure	12	Oil type filled at the factory
	(g) Low pressure side	13	Terminal box protection type
	HP: Max. admissible operating pressure (g) High pressure side		

i Observe the limits of application diagrams!

i Electrical accessories can change the IP protection class!

US

2.3 Type key (example)

UL-HG X 34 e / 380 S 9

UL-HG	X	34	e /	380	S	9	
							Engine performance in HP
							Motor variant ³⁾
							Swept volume
							e-series
							Numbers of cylinders
							Size
							Oil filling ²⁾
							Series ¹⁾
							Identification UL compressor

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

2) X - Ester oil charge

3) S - More powerful motor

ML - Motor for normal cooling and deep freezing

3| Areas of application

3.1 Refrigerants

HFC + blends	R134a, R404A/R507
HFC/HFO blends	R448A, R449A, R450A, R513A

More informations about approved refrigerants on Bock compressor selection tool VAP (vap.bock.de).

3.2 Oil charge

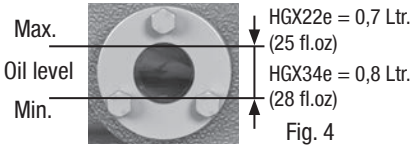
- The compressors are filled at the factory with the following oil type: **BOCK**lub E55



For refilling, we recommend the above oil types.
See also section 7.4.

NOTICE

The oil level must be in the visible part of the sight glass; damage to the compressor is possible if overfilled or under-filled!



3.3 Limits of application

NOTICE

Compressor operation is possible within the operating limits. These can be found in Bock compressor selection tool (VAP) under vap.bock.de. Observe the information given there.

- Permissible ambient temperature: -20°C...+60°C (-4°F...140°F)
- Max. permissible discharge end temperature 140°C (284°F).
- Max. permissible switching frequency 8x/h.
- A minimum running time of 3 min. steady-state condition (continuous operation) must be achieved.

For operation with supplementary cooling:

- Use only oils with high thermal stability.
- Avoid continuous operation near the threshold.
- The suction gas superheat temperature may need to be reduced or set individually when operating near to the threshold.

For operation with frequency converter:

- The maximum current and power consumption must not be exceeded. In the case of operation above the mains frequency, the application limit can therefore be limited.

When operating in the vacuum range, there is a danger of air entering on the suction side. This can cause chemical reactions, a pressure rise in the condenser and an elevated compressed-gas temperature. Prevent the ingress of air at all costs!

Maximum admissible operating pressure (LP/HP)¹⁾:
19/28 bar (276/406 psig)

¹⁾ LP = Low pressure
HP = High pressure

4| Compressor assembly



New compressors are factory-filled with inert gas. Leave this service charge in the compressor for as long as possible and prevent the ingress of air. Check the compressor for transport damage before starting any work.

4.1 Storage and transport



- Storage at $-30^{\circ}\text{C} \dots +70^{\circ}\text{C}$ ($-22^{\circ}\text{F} \dots +158^{\circ}\text{F}$), maximum permissible relative humidity 10% - 95%, no condensation
- Do not store in a corrosive, dusty, vaporous atmosphere or in a combustible environment.



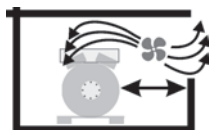
- Use transport eyelet.
- Do not lift manually!
- Use lifting gear!

4.2 Setting up

NOTICE

Attachments (e.g. pipe holders, additional units, fastening parts, etc.) directly to the compressor are not permissible!

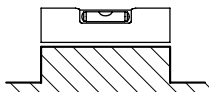
US



- Provide adequate clearance for maintenance work.
- Ensure adequate compressor ventilation.



- Do not use in a corrosive, dusty, damp atmosphere or a combustible environment.



- Setup on an even surface or frame with sufficient load-bearing capacity.
- Single compressor preferably on vibration damper.
- Duplex and parallel circuits always rigid.



- Sun protection: If the compressor is set up outdoors, it has to be protected from direct sunlight.

4| Compressor assembly

4.3 Pipe connections

NOTICE

Damage possible.

Do not solder as long as the compressor is under pressure. Superheating can damage the valve. Remove the pipe supports therefore from the valve for soldering and accordingly cool the valve body during and after soldering. Only solder using inert gas to inhibit oxidation products (scale).

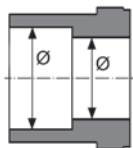


Fig. 5: graduated internal diameter

- The **pipe connections** have graduated inside diameters so that pipes with standard millimetre and inch dimensions can be used.
- The connection diameters of the shut-off valves are rated for maximum compressor output. **The actual required pipe cross section must be matched to the output. The same applies for non-return valves.**

US

4.4 Pipes

- Pipes and system components must be clean and dry inside and free of scale, swarf and layers of rust and phosphate. Only use air-tight parts.
- Lay pipes correctly. Suitable vibration compensators must be provided to prevent pipes being cracked and broken by severe vibrations.
- Ensure a proper oil return.
- Keep pressure losses to an absolute minimum.

4.5 Laying suction and pressure lines

NOTICE

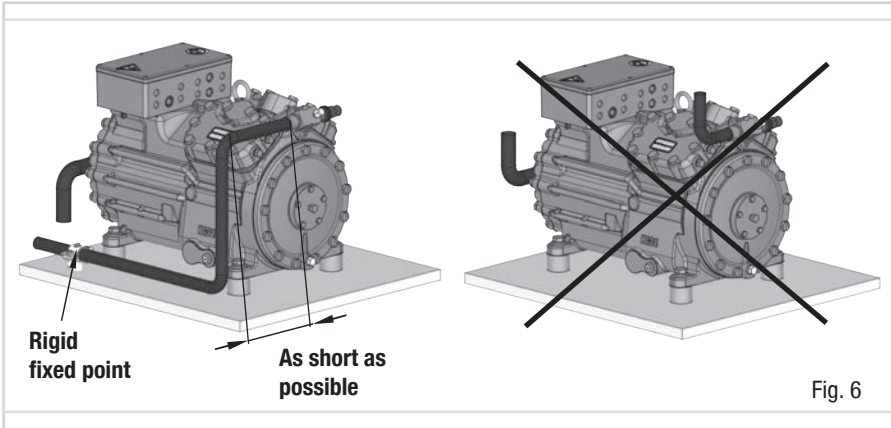
Improperly installed pipes can cause cracks and tears, the result being a loss of refrigerant.



Proper layout of the suction and discharge lines directly after the compressor is integral to the system's smooth running and vibration behavior.

4| Compressor assembly

A rule of thumb: Always lay the first pipe section starting from the shut-off valve **downwards** and **parallel to the drive shaft**.



4.6 Operating the shut-off valves

- Before opening or closing the shut-off valve, release the valve spindle seal by approx. 1/4 of a turn counter-clockwise.
- After activating the shut-off valve, re-tighten the adjustable valve spindle seal clockwise.

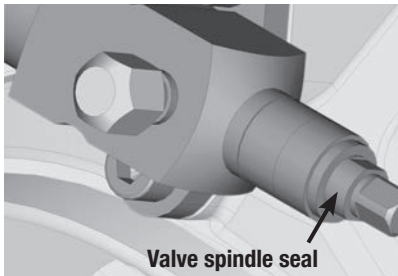


Fig. 7

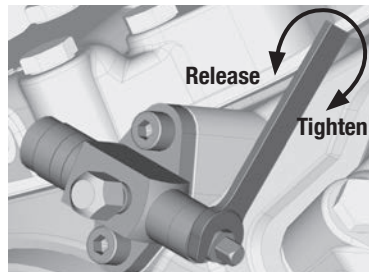


Fig. 8

US

4| Compressor assembly

4.7 Operating mode of the lockable service connections

Opening the shut-off valve:

Spindle: turn to the left (counter-clockwise) as far as it will go.

—> Shut-off valve completely opened / service connection closed.

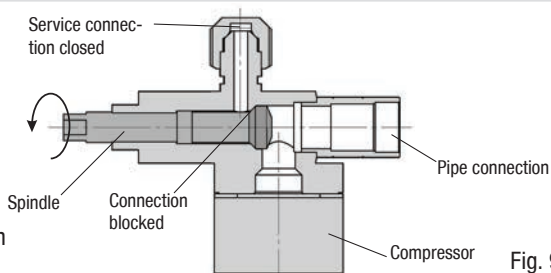


Fig. 9

Opening the service connection

Spindle: Turn $\frac{1}{2}$ - 1 turn to the right clockwise.

—> Service connection opened / shut-off valve opened.

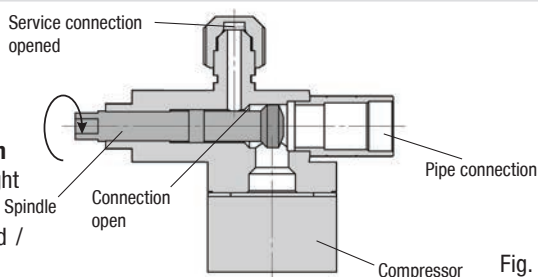


Fig. 10

After activating the spindle, generally fit the spindle protection cap again and tighten with 14-16 Nm (10.3-11.8 lb-ft). This serves as a second sealing feature during operation.

4.8 Suction pipe filter and filter drier

For systems with long pipes and higher degree of contamination, a filter on the suction-side is recommended. The filter has to be renewed depending on the degree of contamination (reduced pressure loss).

Moisture in the refrigeration circuit can lead to crystal and hydrate formation. For this reason, we recommend using a filter drier and a sight glass with a moisture indicator.

5| Electrical connection

5.1 General safety

⚠ DANGER

Risk of electric shock! High voltage!

Only carry out work when the electrical system is disconnected from the power supply!

NOTICE

When attaching accessories with an electrical cable, a minimum bending radius of 3 x the cable diameter must be maintained for laying the cable.



Connect the compressor motor in accordance with the circuit diagram (see inside of terminal box).

- Use suitable cable entry point of the correct protection type (see name plate) for routing cables into the terminal box. Insert the strain relieves and prevent chafe marks on the cables.
- Compare the voltage and frequency values with the data for the mains power supply.

Only connect the motor if these values are the same.

US

5.2 Information for contactor and motor contactor selection

All protection devices and switching or monitoring units must be fitted in accordance with the local safety regulations and established specifications (e.g. OSHA, UL/CSA) as well as with the manufacturer's information. **Motor protection switches are required!** Motor contactors, feed lines, fuses and motor protection switches must be rated on the basis of the maximum working current (see name plate). For motor protection use a current-dependent and time-delayed overload protection device for monitoring all three phases. Set the overload protection device so that it must be actuated within 2 hours, if there is 1.2 times the max. working current.

5| Electrical connection

5.3 Connection of the driving motor

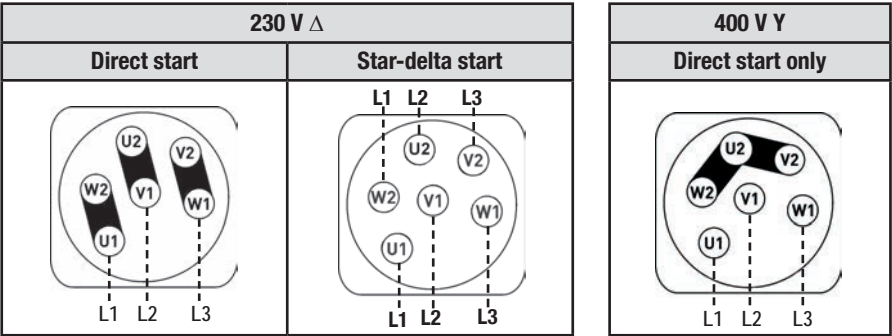
The compressor is designed with a motor for star-delta circuits.

Designation on the name plate
Δ / Y

US

5| Electrical connection

Star-delta start-up is only possible for Δ (230 V) power supply. Example:



INFO

The connection examples shown refer to the standard version. In the case of special voltages, the instructions affixed to the terminal box apply.

5.4 **Circuit diagramm for direct start 230 V Δ / 400 V Y**

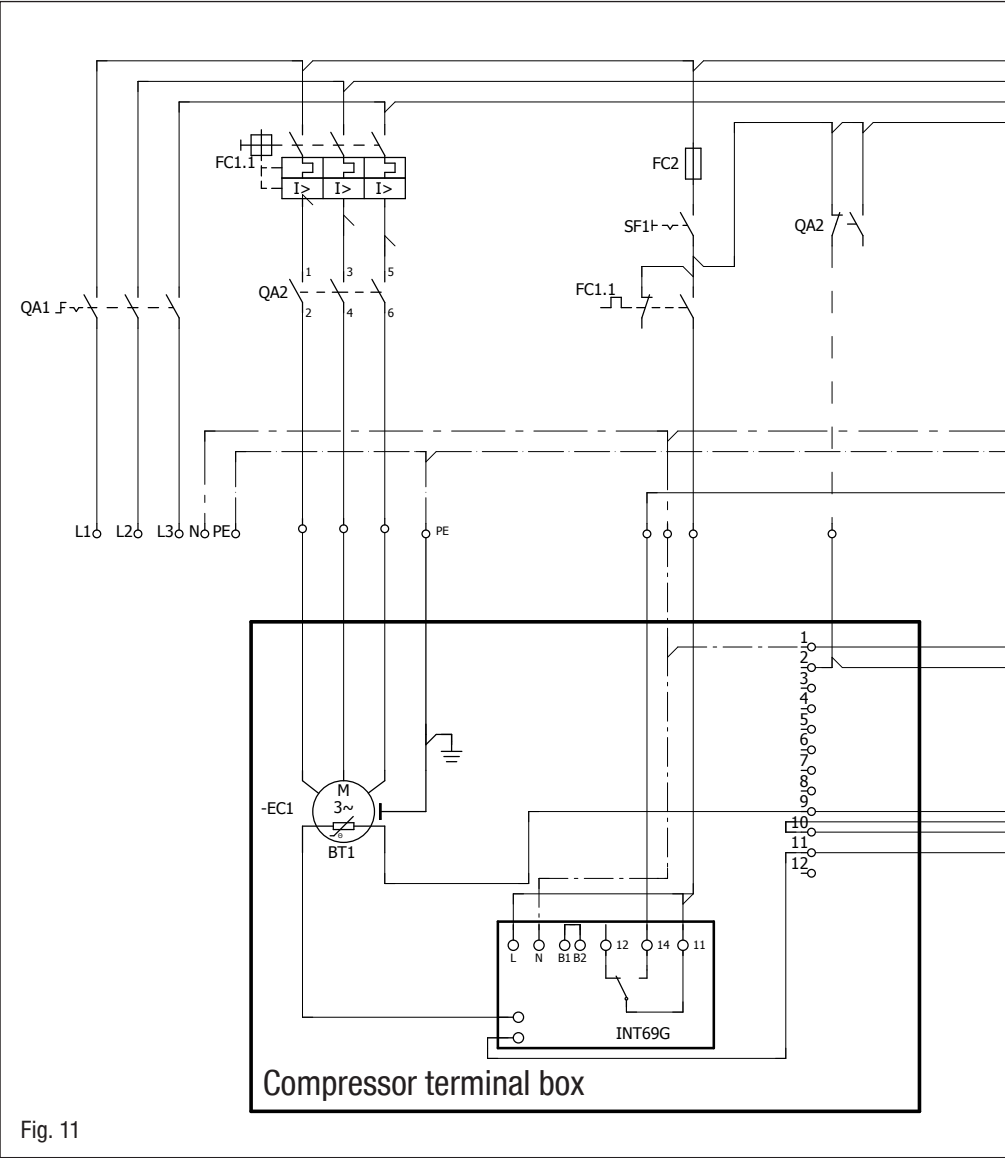
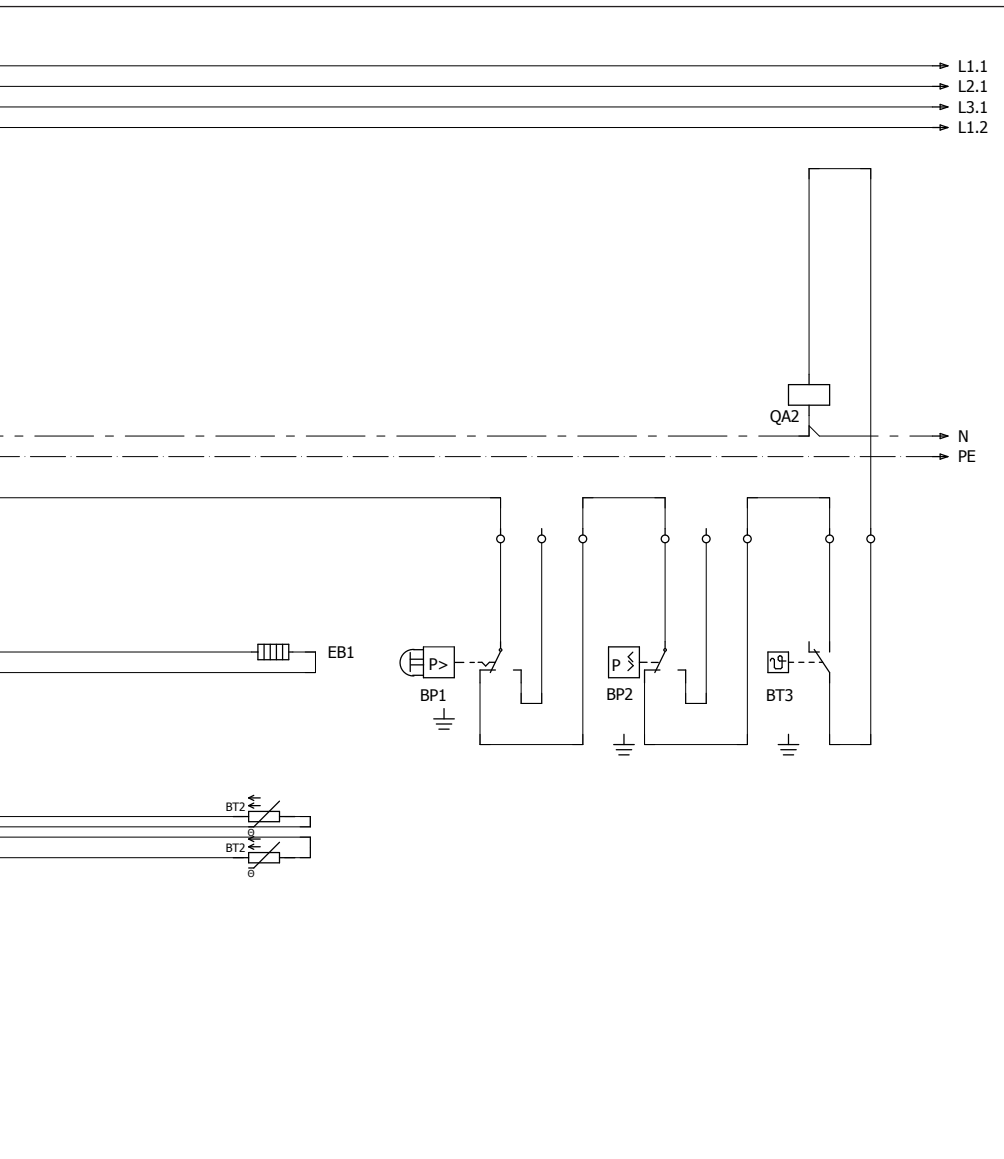


Fig. 11

BT1	Cold conductor (PTC sensor) motor winding
BT2	Thermal protection thermostat (PTC sensor)
FC1	Load circuit safety switches
FC2	Control power circuit fuse
BP1	High pressure safety monitor
BP2	Safety chain (high/low pressure monitoring)
BT3	Release switch (thermostat)



US

QA1	Main switch
SF1	Control voltage switch
EC1	Compressor motor
QA2	Compressor contactor
INT69 G	Electronic trigger unit INT69 G
EB1	Oil sump heater

5| Electrical connection

5.5 Electronic trigger unit INT69 G

The compressor motor is fitted with cold conductor temperature sensors (PTC) connected to the electronic trigger unit INT69 G in the terminal box. In case of excess temperature in the motor winding, the INT69 G deactivates the motor contactor. Once cooled, it can be restarted only if the electronic lock of the output relay (terminals B1+B2) is released by interrupting the supply voltage.

The hot gas side of the compressor can also be protected against overtemperature using thermal protection thermostats (accessory).

The unit trips when an overload or inadmissible operating conditions occur. Find and remedy the cause.



The relay switching output is executed as a floating changeover contact. This electrical circuit operates according to the quiescent current principle, i.e. the relay drops into a the idle position and deactivates the motor contactor even in case of a sensor break or open circuit.

5.6 Connection of the trigger unit INT69 G



Connect the trigger unit INT69 G in accordance with the circuit diagram. Protect the trigger unit with a delayed-action fuse (FC2) of max. 4 A. In order to guarantee the protection function, install the trigger unit as the first element in the control power circuit.

NOTICE

Measure circuit BT1 and BT2 (PTC sensor) must not come into contact with external voltage. This would destroy the trigger unit INT69 G and PTC sensors.

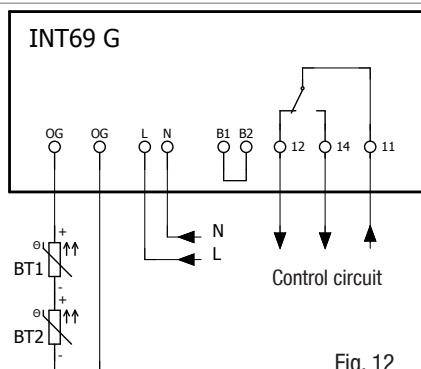


Fig. 12
Terminal box

5| Electrical connection

5.7 Function test of the trigger unit INT69 G

Before commissioning, after troubleshooting or making changes to the control power circuit, check the functionality of the trigger unit. Perform this check using a continuity tester or gage.

Gage state	Relay position
Deactivated state	11-12
INT69 G switch-on	11-14
Remove PTC connector	11-12
Insert PTC connector	11-12
Reset after mains on	11-14

Relay position INT69 G

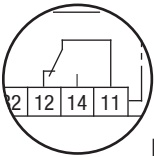


Fig. 13

5.8 Oil sump heater (accessories)

When the compressor is at a standstill, refrigerant diffuses into the lubricating oil of the compressors housing, depending on pressure and ambient temperature. This reduces the lubricating capacity of the oil. When the compressor starts up, the refrigerant contained in the oil evaporates out through the reduction in pressure. The consequences can be foaming and migration of the oil, causing oil shocks under certain circumstances.

Operation: The oil sump heater operates when the compressor is at a standstill. When the compressor starts up, the oil sump heater switches off again automatically.

Connection: The oil sump heater must be connected via an auxiliary contact (or parallel wired auxiliary contact) of the compressor contactor to a separate electric circuit.

El. data: 115 V - 1 - 60 Hz, 65 - 135 W.

NOTICE

Connection to the current path of the safety control chain is not permitted.

US

6| Commissioning

6.1 Preparations for start-up



To protect the compressor against inadmissible operating conditions, high pressure and low pressure pressostats are mandatory on the installation side.

The compressor has undergone trials in the factory and all functions have been tested. There are therefore no special running-in instructions.

Check the compressor for transport damage!

6.2 Pressure integrity test

The compressor has been tested in the factory for pressure integrity. If however the entire system is to be subjected to a pressure integrity test, this should be carried out in accordance with UL 207 or a corresponding safety standard **without the inclusion of the compressor**.

6.3 Leak test

⚠ DANGER

Risk of bursting!

The compressor must only be pressurized using nitrogen (N₂). Never pressurize with oxygen or other gases!

The maximum permissible overpressure of the compressor must not be exceeded at any time during the testing process (see name plate data)! Do not mix any refrigerant with the nitrogen as this could cause the ignition limit to shift into the critical range.

- Carry out the leak test on the refrigerating plant in accordance with UL 207 or a corresponding safety standard, while always observing the maximum permissible overpressure for the compressor.

6.4 Evacuation

NOTICE

Do not start the compressor if it is under vacuum. Do not apply any voltage - even for test purposes (must only be operated with refrigerant).

Under vacuum, the spark-over and creepage current distances of the terminal board connection bolts shorten; this can result in winding and terminal board damage.

- First evacuate the **system** and then include **the compressor in the evacuation process**.
- Relieve the compressor pressure.
- Open the suction and pressure line shut-off valves.
- Evacuate the suction and discharge pressure sides using the vacuum pump.
- At the end of the evacuation process, the vacuum should be < 1.5 mbar (0.02 psig) when the pump is switched off.
- Repeat this process as often as is required.

6.5 Refrigerant charge

⚠ CAUTION

Wear personal protective clothing such as goggles and protective gloves!

6| Commissioning

- Make sure that the suction and pressure line shut-off valves are open.
- With the compressor switched off, add the liquid refrigerant directly to the condenser or receiver, breaking the vacuum.
- If the refrigerant needs topping up after starting the compressor, it can be topped up in vapor form on the suction side, or, taking suitable precautions, also in liquid form at the inlet to the evaporator.

NOTICE

- **Avoid overfilling the system with refrigerant!**
- **To avoid shifts in concentration, zeotropic refrigerant blends must always only be filled into the refrigerating plant in liquid form.**
- **Do not pour liquid coolant through the suction line valve on the compressor.**
- **It is not permissible to mix additives with the oil and refrigerant.**

6.6 Start-up

⚠ WARNING

Ensure that both shut-off valves are open before starting the compressor!

- Check that the safety and protection devices (pressure switch, motor protection, electrical contact protection measures, etc.) are all functioning properly.
- Switch on the compressor and allow to run for a minimum of 10 min.
- **Check the oil level by:** The oil must be visible in the sight glass.

NOTICE

**If larger quantities of oil have to be topped up, there is a risk of oil hammer effects.
If this is the case check the oil return!**

6.7 Avoiding slugging

NOTICE

Slugging can damage the compressor and cause refrigerant to leak.

To prevent slugging:

- The complete refrigeration system must be properly designed.
- All components must be compatibly rated with each other with regard to output (particularly the evaporator and expansion valves).
- Suction gas superheat at the compressor input **should be min. 7 - 10 K.** (check the setting of the expansion valve).
- The system must reach a state of equilibrium.
- Particularly in critical systems (e.g. several evaporator points), measures are recommended such as replacement of liquid traps, solenoid valve in the liquid line, etc.
There should be no movement of coolant whatsoever while the compressor is at a standstill.

US

7| Maintenance

7.1 Preparation

⚠ WARNING

Before starting any work on the compressor:

- Switch off the compressor and secure it to prevent a restart.
- Relieve compressor of system pressure.
- Prevent air from infiltrating the system!

After maintenance has been performed:

- Connect safety switch.
- Evacuate compressor.
- Release switch lock.

7.2 Work to be carried out

In order to guarantee optimum operational reliability and service life of the compressor, **we recommend** carrying out servicing and inspection work at regular intervals:

• Oil change:

- not mandatory for factory-produced series systems.
- for field installations or when operating near the application limit: for the first time after 100 to 200 operating hours, then approx. every 3 years or 10,000 - 12,000 operating hours. Dispose of used oil according to the regulations; observe national regulations.

- **Annual checks:** Oil level, leak tightness, running noises, pressures, temperatures, function of auxiliary devices such as oil sump heater, pressure switch.

7.3 Spare parts recommendation/accessories

Available spare parts and accessories can be found on our compressor selection tool under **vap.bock.de** as well as at **bockshop.bock.de**.

Only use genuine Bock spare parts!

7.4 Lubricants / oils






The oil type filled as standard in the factory is marked on the **name plate**, and this should always be used, even in the case of maintenance units. **Alternative oil types** can vary significantly in quality due to additives or inferior raw materials by the manufacturer. Validation within the compressors entire operating limits can not be guaranteed, if such alternative oil types are used. It is for this reason, that we only recommend the use of oil from Bock! Bock assumes no liability for any damage arising from alternative oil types.

Bock standard oil type: BOCKlub E55

7.5 Decommissioning

Close the shut-off valves on the compressor. Drain the refrigerant (it must not be discharged into the environment) and dispose of it according to the regulations. When the compressor is depressurized, undo the fastening screws of the shut-off valves. Remove the compressor using an appropriate hoist. Dispose of the oil inside in accordance with the applicable national regulations.

8 | Technical data

Sound pressure level 		L / M / H		dB(A)	60 / 59 / 58		61 / 60 / 59		62 / 61 / 59										
Oil charge (sight glass center)				ltr (fl.oz)		0.9 (32)													
Oil charge (ex works)				ltr (fl.oz)		1.1 (39)													
Connections 	Suction line SV			mm (inch)		22 ^(7/8)													
	Discharge line DV			mm (inch)															
Weight				lb		161		161		161		164		161		164			
Electrical data 		Starting current (rotor locked)		Δ / Y		A		69 / 40		69 / 40		69 / 40		87 / 50		69 / 40		87 / 50	
		Max. power consumption 		kW (HP)		3.0 (4,1)		3.6 (4,9)		3.7 (5,0)		4.4 (6,0)		4.8 (6,5)		5.6 (7,6)			
		Max. operating current		Δ / Y		A		9.3 / 5.4		10.8 / 6.2		11.1 / 6.4		13.1 / 7.6		13.8 / 8.0		16.2 / 9.4	
Voltage 				V		220-240 V Δ / 380-420 V Y - 3 - 50 Hz 265-290 V Δ / 440-480 V Y - 3 - 60 Hz													
Displacement (1450, 1740 rpm)		50 Hz 60 Hz		cfh		391 469		391 469		483 579		483 579		584 701		584 701			
No. of cylinders						2													
Type						UL-HGX22e/125 ML 2		UL-HGX22e/125 S 3		UL-HGX22e/160 ML 2		UL-HGX22e/160 S 3		UL-HGX22e/190 ML 3		UL-HGX22e/190 S 4			

① Tolerance (± 10%) relative to the mean value of the voltage range.

② Other voltages and types of current on request.

- The specifications for max. power consumption apply for 60Hz operation.

- Take account of the max. operating current / max. power consumption for design of fuses, supply lines and safety devices. Fuse: Consumption category AC3

③ All specifications are based on the average of the voltage range.

④ For solder connections.

⑤ L = low temperature (-35/40 °C) (-31/104 F), M = normal cooling (-10/5 °C) (14/41 °F), H = air conditioning (5/50 °C) (41/122 °F) sound pressure level measured in low reflection measuring area, measuring distance 1m. Compressor operation at 50 Hz (1450 rpm), refrigerant R404A. Values stated are average values, tolerance ± 2 dB(A).

8 | Technical data

Type	No. of cylinders	Electrical data ③				Weight		Connections ④		Oil charge (ex works)	Oil charge (sight glass center)	Sound pressure level ⑤
		Voltage ①	Max. operating current	Max. power consumption ②	Starting current (rotor locked)	Δ / Y	A	mm (inch)	mm (inch)	ltr (fl.oz)	ltr (fl.oz)	L / M / H dB(A)
UL-HGX34e/215 ML 3	4	220-240 V Δ / 380-420 V Y - 3 - 50 Hz 265-290 V Δ / 440-480 V Y - 3 - 60 Hz	14.0 / 8.1	4.8 (6.5)	87 / 50	Δ / Y	A	mm (inch)	mm (inch)	1.3 (46)	1.1 (39)	62 / 59 / 58
UL-HGX34e/215 S 5			18.3 / 10.5	6.0 (8.2)	132 / 76							62 / 59 / 58
UL-HGX34e/255 ML 4		220-240 V Δ / 380-420 V Y - 3 - 50 Hz 265-290 V Δ / 440-480 V Y - 3 - 60 Hz	17.0 / 9.8	6.0 (8.2)	87 / 50	Δ / Y	A	mm (inch)	mm (inch)	1.3 (46)	1.1 (39)	64 / 62 / 60.5
UL-HGX34e/255 S 6			21.1 / 12.2	7.2 (9.8)	132 / 76							64 / 62 / 60.5
UL-HGX34e/315 ML 5		220-240 V Δ / 380-420 V Y - 3 - 50 Hz 265-290 V Δ / 440-480 V Y - 3 - 60 Hz	21.1 / 12.2	7.4 (10.1)	111 / 64	Δ / Y	A	mm (inch)	mm (inch)	1.3 (46)	1.1 (39)	66 / 64 / 63
UL-HGX34e/315 S 7			25.5 / 14.7	8.9 (12.1)	132 / 76							66 / 64 / 63
UL-HGX34e/380 ML 6		220-240 V Δ / 380-420 V Y - 3 - 50 Hz 265-290 V Δ / 440-480 V Y - 3 - 60 Hz	26.1 / 15.1	9.3 (12.6)	111 / 64	Δ / Y	A	mm (inch)	mm (inch)	1.3 (46)	1.1 (39)	67 / 64.5 / 64
UL-HGX34e/380 S 9			31.2 / 18.0	11.1 (15.1)	132 / 76							67 / 64.5 / 64

① Tolerance (± 10%) relative to the mean value of the voltage range.

② Other voltages and types of current on request.

- The specifications for max. power consumption apply for 60Hz operation.

- Take account of the max. operating current / max. power consumption for design of fuses, supply lines and safety devices.

Fuse: Consumption category AC3

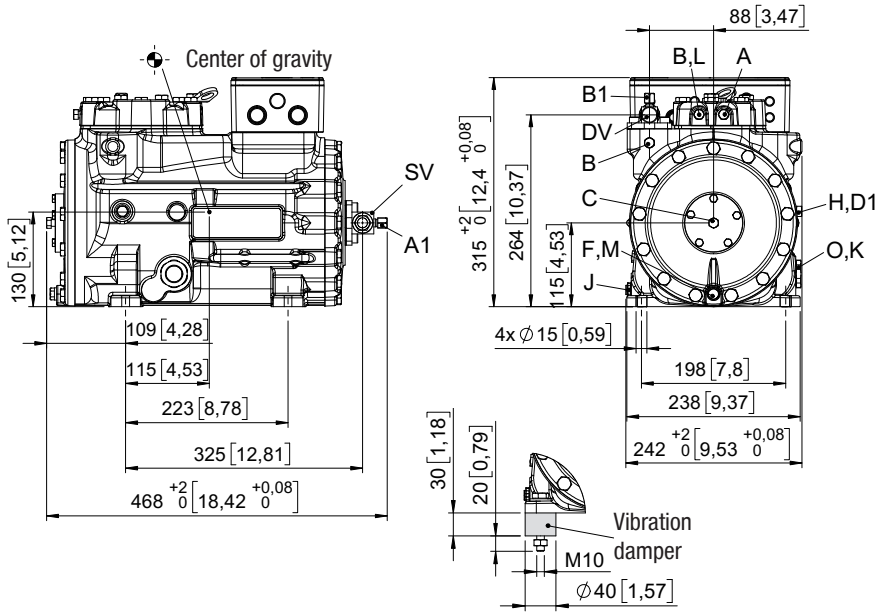
③ All specifications are based on the average of the voltage range.

④ For solder connections.

⑤ L = low temperature (-35/40 °C) (-31/104 °F), M = normal cooling (-10/45 °C) (14/113 °F), H = air conditioning (5/50 °C) (41/122 °F) sound pressure level measured in low reflection measuring area, measuring distance 1m. Compressor operation at 50 Hz (1450 rpm), refrigerant R404A. Values stated are average values, tolerance ± 2 dB(A).

9| Dimensions and connections

UL-HGX22e



SV 90° rotatable

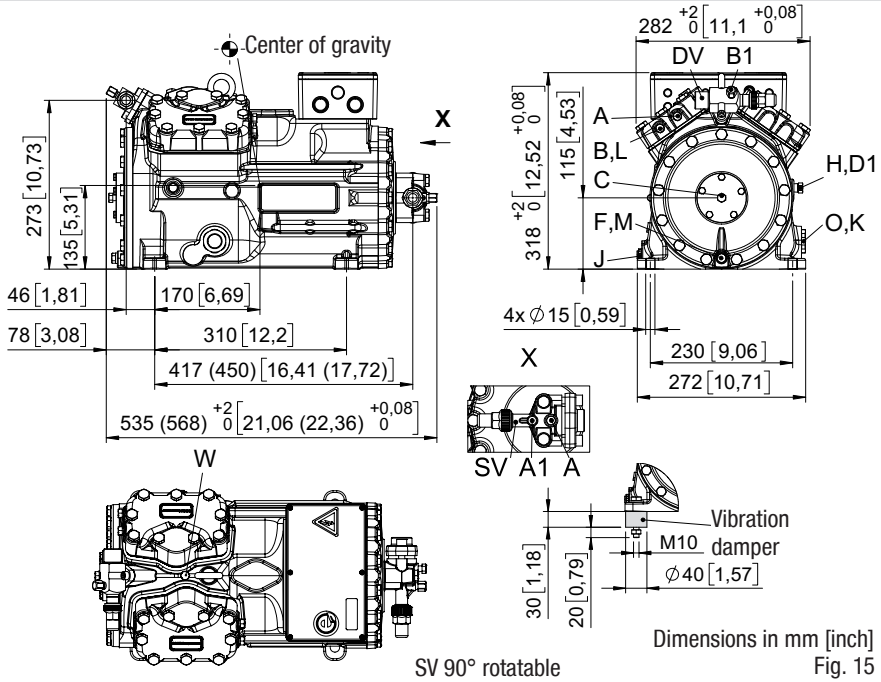
Dimensions in mm [inch]

Fig. 14

SV	Suction line	see technical data, Chapter 8	
DV	Discharge line		
A	Connection suction side, not lockable		1/8" 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
C	Connection oil pressure safety switch		1/8" NPTF
D1	Connection oil return from oil separator		1/4" NPTF
F	Oil drain		M12 x 1.5
H	Oil charge plug		1/4" NPTF
J	Connection oil sump heater		3/8" NPTF
K	Sight glass		1 1/8" - 18 UNEF
L	Connection thermal protection thermostat		1/8" NPTF
M	Oil filter		M12 x 1.5
O	Connection oil level regulator		1 1/8" - 18 UNEF

9| Dimensions and connections

UL-HGX34e



SV	Suction line	
DV	Discharge line	see technical data, Chapter 8
A	Connection suction side, not lockable	1/8" 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
C	Connection oil pressure safety switch	1/8" NPTF
D1	Connection oil return from oil separator	1/4" NPTF
F	Oil drain	M12 x 1.5
H	Oil charge plug	1/4" NPTF
J	Connection oil sump heater	3/8" NPTF
K	Sight glass	1 1/8"- 18 UNEF
L	Connection thermal protection thermostat	1/8" NPTF
M	Oil filter	M12 x 1.5
O	Connection oil level regulator	1 1/8"- 18 UNEF
W	Connection for refrigerant injection	1/8" NPTF

10| Declaration of incorporation

Declaration of incorporation for incomplete machinery in accordance with EC Machinery Directive 2006/42/EC, Annex II 1. B

Manufacturer: Bock GmbH
Benzstraße 7
72636 Frickenhausen, Germany

We, as manufacturer, declare in sole responsibility that the incomplete machinery

Name: Semi-hermetic compressor
Types: HG(X)12P/60-4 S (HC) HG(X)88e/3235-4(S) (HC)
UL-HGX12P/60 S 0,7 UL-HGX66e/2070 S 60
HGX12P/60 S 0,7 LG HGX88e/3235 (ML/S) 95 LG
HG(X)22(P)(e)/125-4 A HG(X)34(P)(e)/380-4 (S) A
HGX34(P)(e)/255-2 (A) HGX34(P)(e)/380-2 (A)(K)
HA(X)12P/60-4 HA(X)6/1410-4
HAX22e/125 LT 2 LG HAX44e/665 LT 14 LG
HGX12e/20-4 (ML/S) CO₂ (LT) ... HGX44e/565-4 (ML/S) CO₂ (LT)
HGX12/20-4 (ML/S/SH) CO₂T..... HGX46/440-4 (ML/S/SH) CO₂ T
HGZ(X)7/1620-4 HGZ(X)7/2110-4

Name: Open type compressor
Types: AM(X)2/58-4 AM(X)5/847-4
F(X)2 F(X)88/3235 (NH3)
FK(X)1 FK(X)3
FK(X)20/120 (K/N/TK)..... FK(X)50/980 (K/N/TK)

Serial number: BC00000A001 – BH99999Z999

complies with the following provisions of the above-mentioned Directive:

According to Annex I, points 1.1.2, 1.1.3, 1.1.5, 1.3.2, 1.3.3, 1.3.7, 1.5.1, 1.5.2, 1.5.13 and 1.7.1 to 1.7.4 (excepted 1.7.4 f) are fulfilled.

Applied harmonised standards, in particular:

EN ISO 12100 :2010 Safety of machinery — General principles for design — Risk assessment and risk reduction
EN 12693 :2008 Refrigerating systems and heat pumps — Safety and environmental requirements — Positive displacement refrigerant compressors

Remarks: We also declare that the special technical documentation for this incomplete machine has been created in accordance with Annex VII, Part B and we obligate to provide these upon reasoned request from the individual national authorities by data transfer.

Commissioning is prohibited until it has been confirmed that the machinery into which the incomplete machine above is to be incorporated complies with the EC Machinery Directive and an EC Declaration of Conformity, Annex II. 1. A exists.

Authorized person for compiling and handing
over technical documentation:

Bock GmbH
Alexander Layh
Benzstraße 7
72636 Frickenhausen, Germany

Frickenhausen, 04th of January 2021



i. A. Alexander Layh, Technical director

US

11| UL-Certificate of Compliance

Dear customer,

the UL-Certificate of Compliance can be downloaded by the following QR-Code:



<https://vap.bock.de/stationaryapplication/Data/DocumentationFiles/UL-Certificateofconformity.pdf>

US

12| Service

Dear customer,

if you have any questions about installation, operation and accessories, please contact our technical service or specialist wholesaler and/or our representative. The Bock service team can be contacted by phone, **+49 (0)7022 9454-0** or via **service@bock.de**

Yours sincerely, Bock GmbH

US



BOCK[®]

Bock GmbH

Benzstraße 7

72636 Frickenhausen

Germany

Phone +49 7022 9454-0

Fax +49 7022 9454-137

www.bock.de