Assembly instructions

HGX12P

CO₂

subcritical

Models:
HGX12P/30-4 CO₂
HGX12P/40-4 CO₂
HGX12P/50-4 CO₂
HGX12P/60-4 CO₂
HGX12P/75-4 CO₂
About these instructions

Read these instructions before assembly and before using the compressor. This will avoid misunderstandings and prevent damage. Improper assembly and use of the compressor can result in serious or fatal injury.

Observe the safety instructions contained in these instructions.

These instructions must be passed onto the end customer along with the unit in which the compressor is installed.

Manufacturer

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1 Safety

1.1 Identification of safety instructions:

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>![DANGER!]</td>
<td>Indicates a dangerous situation which, if not avoided, will cause immediate fatal or serious injury.</td>
</tr>
<tr>
<td>![WARNING!]</td>
<td>Indicates a dangerous situation which, if not avoided, may cause fatal or serious injury.</td>
</tr>
<tr>
<td>![CAUTION!]</td>
<td>Indicates a dangerous situation which, if not avoided, may cause fairly severe or minor injury.</td>
</tr>
<tr>
<td>![ATTENTION!]</td>
<td>Indicates a situation which, if not avoided, may cause property damage.</td>
</tr>
<tr>
<td>![INFO!]</td>
<td>Important information or tips on simplifying work.</td>
</tr>
</tbody>
</table>

1.2 Qualifications required of personnel

WARNING! Inadequately qualified personnel poses the risk of accidents, the consequence being serious or fatal injury. Work on compressors must therefore only be performed by personnel with the qualifications listed below:

- For example, a refrigeration technician, refrigeration mechatronics engineer. As well as professions with comparable training, which enable 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 recognising any potential dangers.

1.3 General safety instructions

WARNING! Refrigerating compressors are pressurised machines and therefore require particular caution and care in handling.
- Risk of burns! Depending on the operating conditions, surface temperatures of over 60 °C on the pressure side or below 0 °C on the suction side can be reached.
- The maximum permissible overpressure must not be exceeded, even for testing purposes.

WARNING! DANGER OF SUFFOCATION!
Never release significant volumes of CO₂ or the entire contents of the system into closed rooms!
1 | Safety

1.4 Intended use

These assembly instructions describe the standard version of the HGX12P -CO₂ manufactured by Bock.

The compressor is intended for use with CO₂ in sub-critical 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!

WARNING! The compressor may not be used in potentially explosive environments!

Commissioning is only permissible 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.
2 | Product description

2.1 Short description

- Semi-hermetic two-cylinder reciprocating compressor with oil pump lubrication.
- Suction gas cooled drive motor.

Dimension and connection values can be found in Chapter 9
2.2 Name plate (example)

Frickenhausen
Germany

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
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<tbody>
<tr>
<td>Typ :</td>
<td>HGX12P/75-4 CO2</td>
<td>Nr. :</td>
<td>AS33567A001</td>
<td>Iₘₐₓ :</td>
</tr>
<tr>
<td>Iₘₐₓ :</td>
<td>10,6/6,1A</td>
<td>Iₖₑₜₜ :</td>
<td>Δ : 45A Y : 26A</td>
<td>pₘₐₓ :</td>
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<tr>
<td>pₘₐₓ :</td>
<td>ND(LP) / HD(HP) = 40/55 bar</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Voltage, circuit, frequency
Displacement
Voltage, circuit, frequency
Displacement
Oil type filled at the factory
Terminal box protection type

Observe the limits of application diagrams!

Fig. 3

1 Type designation
2 Machine number
3 Maximum operating current
4 Starting current (rotor blocked)
5 ND (LP): max. permissible operating pressure (g) Low pressure side
   HD (HP): max. permissible operating pressure (g) High pressure side

50 Hz
60 Hz

2.3 Type key (example)

HG X 12 P / 75- 4 CO2

CO₂ Version
Number of poles
Swept volume
pluscom²)
Numbers of cylinders
Size
Oil charge ²)
Series ¹)

¹) HG - Hermetic Gas-Cooled (suction gas-cooled)
²) X - Ester oil charge
³) Additional declaration for Pluscom compressors
3. Areas of application

3.1 Refrigerants

- CO₂: R744

3.2 Oil charge

- The compressors are filled at the factory with the following oil type: Bock C 85 E (only this oil may be used)

3.3 Limits of application

**ATTENTION!** Compressor operation is possible within the operating limits shown in the diagrams. Please note the significance of the shaded areas. Thresholds should not be selected as design or continuous operation points.
- Max. permissible discharge end temperature 140 °C
- Max. permissible switching frequency 8x /h.
- A minimum running time of 3 min. steady-state condition (continuous operation) must be achieved.

- 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.

---

**Fig. 4**

- tₑ (°C)
- tₑ (°C)
- Unlimited application range
- HGX12P/75-4 CO₂
  - Maximum condensing temperature tₑ = 0°C
  - tₑ Evaporation temperature (°C)
  - tₑ Condensing temperature (°C)
  - Δtₘ Suction gas superheat (K)
  - tₘ Suction gas temperature (°C)

**Max. permissible operating pressure (LP/HP)**: 40/55 bar

1) LP = Low pressure
   HP = High pressure
4 | Compressor assembly

**INFO!** New compressors are factory-filled with inert gas (3 bar nitrogen). 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 Setting up

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

[Fig. 5]

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

[Fig. 6]

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

[Fig. 7]

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

[Fig. 8]

### 4.2 Pipe connections

**ATTENTION!**
- 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).

- 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.

[Fig. 9: graduated internal diameter]
4 | Compressor assembly

4.3 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.

4.4 Laying suction and pressure lines

INFO! Proper layout of the suction and pressure lines directly after the compressor is integral to the smooth running and vibration behaviour of the system.

ATTENTION! Improperly installed pipes can cause cracks and tears which can result in a loss of refrigerant.

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

As short as possible

Rigid fixed point

Fig. 10
4 | Compressor assembly

4.5 Operating the shut-off valves

- Before opening or closing the shut-off valve, release the valve spindle seal by approx. ¼ of a turn counter-clockwise.
- After activating the shut-off valve, re-tighten the adjustable valve spindle seal clockwise.

![Valve spindle seal](Fig. 11)

![Release Tighten](Fig. 12)

4.6 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.

![Connection blocked Service connection closed](Fig. 13)

**Opening the service connection**
Spindle: Turn ½ - 1 turn to the right clockwise.


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

![Connection open Service connection opened](Fig. 14)
5 | Electrical connection

5  Electrical connection

![DANGER!](image)

**DANGER!** High voltage! Risk of electric shock! Only carry out work when the electrical system is disconnected from the power supply!

![INFO!](image)

**INFO!**
- 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 reliefs 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.**

5.1 Information for contactor and motor contactor selection

All protection equipment, switching and monitoring devices must comply with the local safety regulations and established specifications (e.g. VDE) and regulations as well as the manufacturer’s specifications. **Motor protection switch is required!** Motor contactors, feed lines, fuses and motor protection switches must be rated according to the maximum operating current (see name plate). Set the short circuit trigger current at max. 7 times the permissible operating current according to the compressor name plate.
5 Electrical connection

5.2 Connection of the driving motor

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

<table>
<thead>
<tr>
<th>Designation on the name plate</th>
<th>Sticker on the terminal box</th>
</tr>
</thead>
<tbody>
<tr>
<td>∆ / Y</td>
<td></td>
</tr>
</tbody>
</table>

Star-delta start-up is only possible on 230 V voltage supply. Example:

<table>
<thead>
<tr>
<th>230 V ∆</th>
<th>400 V Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct start</td>
<td>Star-delta start</td>
</tr>
<tr>
<td>Direct start only</td>
<td></td>
</tr>
</tbody>
</table>

INFO! The connection examples shown refer to the standard version. In the case of special voltages, the instructions affixed to the terminal box apply.
5.3 Circuit diagramm for direct start 230 V Δ / 400 V Y

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
</table>

**Fig. 15**

Compressor terminal box

- **R1** Cold conductor PTC sensor motor winding
- **R2** Thermal protection thermostat (PTC sensor)
- **F1** Load circuit safety switches
- **F2** Control power circuit fuse
- **F3** Safety chain (high/low pressure monitoring)
- **B1** Release switch (thermostat/pressostat)
- **Q1** Main switch

---

**Compressor terminal box**

- **L1** L1
- **L2** L2
- **L3** N
- **N** PE
- **2.8** 2.8

---

**Fig. 16**

Compressor terminal box

- **M1** Motor
- **R1** Pressure switch
- **R2** Release switch
- **X1** X1
- **X2** X2
- **X3** X3
- **X4** X4
- **X5** X5
- **X6** X6
- **X7** X7
- **X8** X8
- **X9** X9
- **X10** X10
- **X11** X11
- **X12** X12
- **X13** X13
- **X14** X14
- **MP10** Motor protection circuit
S1  Control voltage switch
M1  Compressor motor
K1  Compressor contactor
MP10 Electronic trigger unit MP 10
E   Oil sump heater
X3  Terminal strip in terminal box
XSS Terminal strip in the external switch cabinet
5 | Electrical connection

5.4 Electronic trigger unit MP 10

The compressor motor is fitted with cold conductor temperature sensors (PTC) connected to the electronic trigger unit MP 10 in the terminal box. Readiness to operate is signalled by the H3 LED (green) after the power supply is applied. In the case of excess temperature in the motor winding, the unit switches off the compressor and the H1 LED lights red.

The hot gas side of the compressor can also be protected against overtemperature using a thermal protection thermostat (accessory). The H2 LED (red) is provided for the protection function.

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

INFO! The unit has a restart prevention device. After you have rectified the fault, interrupt the mains voltage. This unlocks the restart prevention device and the LEDs H1 and H2 go out.

5.5 Connection of the trigger unit MP 10

INFO! Connect the trigger unit MP10 in accordance with the circuit diagram. Protect the trigger unit with a delayed-action fuse (F) of max. 4 A. In order to guarantee the protection function, install the trigger unit as the first element in the control power circuit.

Temperature monitoring connections:
- Motor winding: Terminals 1 - 2
- Thermal protection thermostat: Terminals 3 - 4
- Restart prevention: Terminals 5 - 6

ATTENTION!

Terminals 1 - 6 on the trigger unit MP 10 and terminals PTC 1 and PTC 2 on the compressor terminal board must not come into contact with mains voltage. This would destroy the trigger unit and PTC sensors. The supply voltage at L1-N (+/- for DC 24 V version) must be identical to the voltage at terminals 11, 12, 14 and 43.
5 Electrical connection

5.6 Function test of the trigger unit MP 10

Before start-up, troubleshooting or making changes to the control power circuit, check the functionality of the trigger unit:

<table>
<thead>
<tr>
<th>Pos</th>
<th>Procedure</th>
<th>LED H1</th>
<th>LED H2</th>
<th>LED H3</th>
</tr>
</thead>
</table>
| 1   | • Interrupt power supply (L1 or S1)  
    • Release the motor temperature sensor connection (1 or 2)  
    • Release the hot gas temperature sensor (if installed) (3 or 4) | OFF | OFF | OFF |
| 2   | • Restore the power supply (L1 or S1)  
    • Function check of motor temperature sensor: operational  
    • Function check of hot gas temperature sensor: operational | ON | ON | ON |
| 3   | • Interrupt power supply again (L1 or S1)  
    • Reconnect terminals 1 or 2 and/or 3 or 4 | OFF | OFF | OFF |
| 4   | • Restore the power supply (L1 or S1):  
    • MP 10 is operational again | OFF | OFF | ON |

The compressor and the trigger unit MP10 are operational when the H3 LED (green) lights.

5.7 Oil sump heater

In order to avoid damage to the compressor, the compressor is equipped with an oil sump heater as a standard feature.

**ATTENTION! The oil sump heater must generally be connected and operated.**

Connexion: 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.

Electrical data: 110 - 240 V - 1 - 50/60 Hz, 50 - 120 W, PTC-heater adjusting.
6 | Commissioning

6.1 Preparations for start-up

INFO! In order to protect the compressor against inadmissible operating conditions, high-pressure and low-pressure pressostats controls 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!

WARNING! When the compressor is not running, depending on ambient temperature and amount of refrigerant charge, it is possible that the pressure may rise and exceed permitted levels for the compressor. Adequate precautions must be taken to prevent this happening (e.g. using a cold storage medium, a receiver tank, a secondary refrigerant system, or pressure relief devices).

6.2 Pressure strength test

WARNING! The compressor must never be pressurised using oxygen or other technical gases!

The maximum permissible overpressure of the compressor must not be exceeded at any time during the testing process (see name plate data)!

The compressor has been factory-tested for pressure resistance. The following must be observed if the entire plant is subjected to an additional pressure strength test:

- Test the refrigeration circuit according to EN 378-2 or a corresponding safety standard.
- The pressure strength test is best carried out using dry nitrogen (N₂).
- Do not mix any refrigerant with the testing medium (N₂) as this could cause the ignition limit to shift into the critical range.

6.3 Leak test

- Carry out the leak test of the refrigerating system in accordance with EN 378-2 or a corresponding safety standard without including the compressor.

6.4 Evacuation

ATTENTION! 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.
6. Commissioning

- 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 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!

- Make sure that the suction and pressure line shut-off valves are open.

**INFO!** Depending upon design of the CO₂ refrigerant filling bottle (with/without tubing) CO₂ can be filled in liquid after weight or gaseously.

  - Use only high-dried CO₂ quality!

- Filling the liquid refrigerant: It is recommend that the system first be filled at standstill with gas on the high-pressure side up to a system pressure of at least 5.2 bar (if it is filled below 5.2 bar with liquid, there is a risk of dry ice formation. Further filling by system.

  To eliminate the possibility of dry ice formation when the system is operating (during and after the filling process), the shut-off point of the low-pressure switch should be set to a value of at least 5.2 bar.

**WARNING!** Max. permissible pressure at filling under any circumstances do not exceed. In time suitable measures meet (e.g. Printing retaining refrigerant plant or high pressure stage of the cascade operate).

- One after start-up necessarily becoming refrigerant addition can be filled gaseously into the suction face.

**ATTENTION!** Avoid overfilling the machine with refrigerant!

  - Do not charge liquid refrigerant into the suction-side on the compressor.
  - Do not 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 functioning properly.
- Switch on the compressor and let it run for at least 10 minutes.
- The machine should reach a state of equilibrium.
- Check the **oil level**: The oil level must be visible in the sight glass.
- After a compressor is replaced, the oil level must be checked again. If the level is too high, oil must be drained off (danger of oil liquid shocks; reduced capacity of the refrigerating system).

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

6.7 Decompression valves

The compressor is fitted with two decompression valves. One valve each on the suction and discharge side. If excessive pressures are reached, the valves open and prevent further pressure increase.

Thereby CO₂ is blown off to the ambient! (see also Chapter 7.6)!

In the event that a pressure relief valve activates repeatedly, check valve and replace if necessary as during blow-off extreme conditions can occur, which may result in a permanent leak. Always check system for refrigerant loss after activation of decompression valve!

The decompression valves do not replace any pressure switches and the additional safety valves in the system. Pressure switches must always be installed in the system and designed or adjusted in accordance with EN 378-2 or appropriate safety standards.

Failure to observe can result in risk of injury from CO₂ streaming out of the two decompression valves!
6.8 Avoid slugging

ATTENTION! Slugging can result in damage to the compressor and cause refrigerant to leak.

To prevent slugging:
- The complete refrigeration plant 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 superheating at the compressor input should be min. 15 - 20 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 such as the use of liquid traps, solenoid valve in the liquid line, etc. are recommended.

There should be no movement of coolant whatsoever while the compressor is at a standstill.

6.9 Connection of oil level regulator

The connection "O" is provided for installing an oil level regulator. A corresponding adapter must be obtained from the trade.
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-on 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

<table>
<thead>
<tr>
<th>Designation</th>
<th>30-4 CO₂</th>
<th>40-4 CO₂</th>
<th>50-4 CO₂</th>
<th>60-4 CO₂</th>
<th>75-4 CO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set of gaskets</td>
<td></td>
<td></td>
<td>80372</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valve plate kit</td>
<td>80721</td>
<td></td>
<td>80369</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set piston/ connecting rod</td>
<td>80723</td>
<td>80585</td>
<td>80586</td>
<td>80370</td>
<td>80371</td>
</tr>
<tr>
<td>Set connecting rod</td>
<td>80724</td>
<td>80601</td>
<td>80368</td>
<td>80424</td>
<td></td>
</tr>
</tbody>
</table>

**Only use genuine Bock spare parts!**

7.4 Accessories

Available accessories can be found on the Internet at www.bock.de.

7.5 Extract from the lubricants table

For enterprise with CO₂ the oil support C 85 E is necessary!
7 | Maintenance

7.6 Decommissioning

Close the shut-off valves on the compressor. CO₂ does not need to be recycled and can therefore be blown off into the environment. It is essential to ensure good ventilation or conduct the CO₂ into the outdoors to avoid danger of suffocation. When releasing CO₂, avoid a fast drop in pressure to prevent oil from exiting with it. If the compressor is unpressurized, remove the piping on the pressure- and suction-side (e.g. dismantling of the shut-off valve, etc.) and remove the compressor using an appropriate hoist. Dispose of the oil inside in accordance with the applicable national regulations. When decommissioning the compressor (e.g. for service or replacement of the compressor) larger amounts of CO₂ in the oil can be set free. If the decompression of the compressor is not sufficient enough, closed shut-off valves may lead to intolerable excessive pressure. For this reason the suction side (LP) and the high pressure side (HP) of the compressor have to be secured by decompression valves.
<table>
<thead>
<tr>
<th>Type</th>
<th>No. of cylinders</th>
<th>Displacement 50 / 60 Hz (1450 / 1740 1/min)</th>
<th>Electrical data</th>
<th>Weight</th>
<th>Connections</th>
<th>Oil charge</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Discharge line DV</td>
<td>Suction line SV</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Voltage</td>
<td>Max. Operating current</td>
<td>Max. power consumption</td>
<td>Starting current (rotor locked)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>m³/h</td>
<td>A</td>
<td>kW</td>
<td>A</td>
<td>kg</td>
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<td>HGX12P/30-4 CO₂</td>
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<td>2,8 / 3,4</td>
<td>5,9 / 3,4</td>
<td>1,8</td>
<td>40 / 23</td>
<td>53</td>
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<tr>
<td>HGX12P/40-4 CO₂</td>
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<td>3,6 / 4,4</td>
<td>7,3 / 4,2</td>
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<td>43 / 25</td>
<td>53</td>
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<td>HGX12P/50-4 CO₂</td>
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<td>4,5 / 5,4</td>
<td>8,7 / 5,0</td>
<td>2,9</td>
<td>43 / 25</td>
<td>53</td>
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<tr>
<td>HGX12P/60-4 CO₂</td>
<td>2</td>
<td>5,4 / 6,4</td>
<td>9,5 / 5,5</td>
<td>3,2</td>
<td>45 / 26</td>
<td>49</td>
</tr>
<tr>
<td>HGX12P/75-4 CO₂</td>
<td></td>
<td>6,7 / 8,1</td>
<td>10,6 / 6,1</td>
<td>3,6</td>
<td>45 / 26</td>
<td>49</td>
</tr>
</tbody>
</table>

1. Tolerance (± 10%) relative to the mean value of the voltage range.
   Other voltages and types of current on request.
2. 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

09917-01.2011-DGbFEI
9 | Dimensions and connections

<table>
<thead>
<tr>
<th>SV</th>
<th>DV</th>
<th>Description</th>
<th>Dimensions in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>A*</td>
<td></td>
<td>Connection suction side, not lockable</td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td></td>
<td>Connection suction side, lockable</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>Connection discharge side, not lockable</td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td></td>
<td>Connection discharge side, lockable</td>
<td></td>
</tr>
<tr>
<td>D1</td>
<td></td>
<td>Connection oil return from oil separator</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>Connection oil pressure gauge</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td>Oil drain</td>
<td>M8</td>
</tr>
<tr>
<td>H</td>
<td></td>
<td>Oil charge plug</td>
<td>1/4&quot; NPTF</td>
</tr>
<tr>
<td>J</td>
<td></td>
<td>Oil sump heater</td>
<td>Ø 15 mm</td>
</tr>
<tr>
<td>K</td>
<td></td>
<td>Sight glass</td>
<td>1 1/8&quot;- 18 UNEF</td>
</tr>
<tr>
<td>L1</td>
<td></td>
<td>Thermal protection thermostat</td>
<td>1/8&quot; NPTF</td>
</tr>
<tr>
<td>O</td>
<td></td>
<td>Connection oil level regulator</td>
<td>1 1/8&quot;- 18 UNEF</td>
</tr>
<tr>
<td>SI1</td>
<td></td>
<td>Decompression valve HD</td>
<td>1/8&quot; NPTF</td>
</tr>
<tr>
<td>SI2</td>
<td></td>
<td>Decompression valve ND</td>
<td>1/8&quot; NPTF</td>
</tr>
</tbody>
</table>

* = only with additional adapter possible

1) SV 90° rotatable

Fig. 18
DECLARATION OF CONFORMITY CE 09

for using the compressors within the European Union
(in accordance with Low Voltage Directive 2006/95/EC)

We hereby declare that the following refrigerating compressors
Product designation: HGX12P -CO₂
comply with the Low Voltage Directive 2006/95/EC.

Applied harmonised standard:
EN 60034-1, EN 60204-1

DECLARATION OF INSTALLATION

for using the compressors within the European Union
(in accordance with Machinery Directive 2006/42/EC)

The manufacturer: Bock Kältemaschinen GmbH, Benzstraße 7
72636 Frickenhausen, Tel.: 07022/9454-0

hereby declares that the refrigerating compressor HGX12P -CO₂ complies with the basic
requirements of Appendix II 1B of the Machinery Directive 2006/42/EC.

The following harmonised standards have been applied:
EN ISO 12100-1
EN ISO 12100-2
EN 12693
EN 349

A partly completed machine may only be put into operation when it has been established
that the machine, into which the partly completed machine is to be installed, conforms to the

The manufacturer undertakes to transmit electronically the special documentation required by
individual states for partly completed machinery on request.

The special technical documentation required for partly completed machinery has been created
in accordance with Appendix VII Part B.

Person responsible for documentation is: Dr. Harald Kaiser, Benzstraße 7, 72636 Frickenhausen.

Frickenhausen, 29.12.2009

Dr. Harald Kaiser, Technical Director
Dearest customer,

Bock compressors are top-quality, reliable and service-friendly quality products. 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:

by phone: +49 7022 9454-0
via e-mail: mail@bock.de
or on the Internet at: www.bock.de

In addition, for German-speaking countries we have set up a toll-free Bock hotline 00 800 / 800 000 88 from Monday to Saturday between 8 am and 9 pm.

Any suggestions you may have regarding the on-going development of our compressor, equipment and parts programme are welcome at any time.

Yours faithfully

Bock Kältemaschinen GmbH
Benzstraße 7
72636 Frickenhausen
Germany

We also provide information on the Internet at www.bock.de. For example, under the "Documentation" link you will find:

- Technical information
- Product information
- Product brochures
- and much more
Sehr geehrter Kunde,

Bock-Verdichter sind hochwertige, zuverlässige und servicefreundliche Qualitätsprodukte. Um alle Vorteile in vollem Umfange und über den gesamten Einsatzzeitraum Ihrer Kälteanlage nutzen zu können, beachten Sie unbedingt die folgenden Bedienungs- und Wartungshinweise. Bei Fragen zu Montage, Betrieb und Zubehör wenden Sie bitte an unsere Anwendungstechnik oder an den Kältefachgroßhandel bzw. unsere Vertretung. Das Bock-Serviceteam erreichen Sie direkt unter Tel.: +49 7022 9454-0, via e-mail: mail@bock.de oder im Internet: www.bock.de. Für den deutschsprachigen Raum steht darüber hinaus die kostenlose Bock-Hotline 00 800 / 800 000 88 von montags bis samstags zwischen 8 und 21 Uhr zur Verfügung. Für Anregungen zur Weiterentwicklung unseres Verdichter-, Ausrüstungs- und Ersatzteilprogramms sind wir Ihnen jederzeit sehr dankbar.

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72636 Frickenhausen
Germany
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mail@bock.de
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