

PGC

Calibration Pump

-0.95 ... 35 bar (-13.7 ... 510 psi)



Dear user,

We have made every effort to ensure the accuracy of the contents of this User Manual. Should any errors be detected, we would greatly appreciate to receive suggestions to improve the quality of the contents of this User Manual.

For more detailed technical data about the Beamex PGC Calibration Pump -0.95 ... 35 bar (-13.7 ... 510 psi), please contact the manufacturer.

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Prologue

Thank you for buying Beamex **PGC** Calibration Pump.

The **PGC** calibration pump -0.95 ... 35 bar (-13.7 ... 510 psi) is a hand-operated device designed to generate both pressure and vacuum using air as the pressure medium. With a simple pressure/vacuum selector, you can quickly switch between generating pressure or vacuum. The PGC pump also allows you to accurately fine-tune the generated pressure.

Typographical Conventions

The following typographical conventions apply to the **PGC** User Manual:

Bold text is typically used in cases like:

- User manual sections
- **PGC** related keywords



Note: This is a note. Notes typically provide important information to consider and remember.



Tip: This is a tip. Tips offer useful advice or practical information related to the current topic.



Caution: This is a caution. Cautions highlight situations that could result in damage to the calibrator if not observed. Always read cautions carefully and follow the instructions.



Warning: This is a warning. Warnings indicate situations that could cause serious injury or damage if not followed. Always read warnings carefully and comply with them to ensure safety.

Unpacking and Inspection

At the factory, each new **PGC** passes a careful inspection. It should be free of scrapes and scratches and in proper operation condition upon receipt. However, the receiver should inspect the unit for any damage that may have occurred during transportation. If there are signs of obvious mechanical damage, the package contents are incomplete, or the **PGC** does not operate according to specifications, contact the purchasing sales office as soon as possible.

If you need to return the device to the factory for any reason, use the original packing whenever possible. Be sure to include a detailed description of the reason for the return.

The **PGC** is available in two different configurations, each with its own delivery contents:

PGC Calibration Pump -0.95 ... 35 bar (-13.7 ... 510 psi), pump only

- **PGC** pump
- User manual

PGC Calibration Pump -0.95 ... 35 bar (-13.7 ... 510 psi), complete kit

- **PGC** pump
- 40 bar (600 psi) pressure T-hose set 1,5 m with 1/4" and 1/8" NPT fittings and seals
- Bx G1/8" male to G1/8" male and G1/4" B female pressure fitting set for connecting Beamex 40 bar hoses to internal and external pressure modules
- User manual
- Hard case for **PGC**

Options, Accessories and Spare Parts

All accessories and spare parts are available at <https://shop.beamex.com/>.

Feedback

We want to improve our products and services constantly. Therefore we'd like to know your opinion of the product you use. Please spend a moment of your valuable time by giving us feedback about the product.

Address: **Beamex Oy Ab**

Quality Feedback

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Safety Precautions and Warnings



Warning: Read and fully understand this user manual and all related safety instructions before operating the **PGC** pump. The built-up pressure inside the pump during use can be extremely high.

Do not exceed the maximum operating pressure of the device and the hose.



Warning: Only personnel with good experience and knowledge of pressure media, pressure instruments, and pressure connections are allowed to work with the **PGC** pump. Incorrect use may result in damage to the pump, the connected instrument and/or personal injury.



Warning: Only use the device for the purposes and in the environments specified in the user manual.



Warning: Always wear protective glasses.



Warning: Ensure that all connections are correctly made and that the hose and connectors are not damaged. Do not use faulty hoses or connectors.



Warning: Only use original Beamex pressure hoses marked with "Max. 40 bar". Other hoses may not withstand the pressure generated by the **PGC** pump.



Warning: Never exceed the maximum pressure of the connected devices. The maximum pressure of Beamex modules is stated on the module's sticker.



Warning: Do not connect the pump to any external pressure source.



Warning: Process instruments may contain moisture and dirt, which can enter the **PGC** and cause serious internal corrosion. Therefore, it is extremely important to vent the external systems (and flush them if needed) before connecting them to the **PGC**. The Beamex Vent Valve for 40 bar / 580 psi pressure hoses can be used to vent the system.



Warning: Never change the pressure/vacuum selector setting while there is pressure or vacuum in the pump or system.



Caution: Only use original Beamex pressure fittings. Impurities from incompatible materials may clog the pump.



Caution: Never use the same hose for both gases and liquids.



Warning: Immediately replace the hose if it shows any damage, kinks, cracks in the outer shell, or bent connectors.



Tip: Beamex recommends replacing all pressure hoses every five years, even if no damage is visible.



Warning: Always depressurize the system before opening or connecting any pressure fittings or connectors. Use correct valves to vent the system safely. Ensure that all connections are properly made and that the hose, connectors, and pressure fittings are intact.



Warning: Always depressurize the **PGC** pump before leaving it unattended.



Warning: Environmental conditions may limit the allowable maximum pressure or vacuum to level lower than what the pump and the hose support.



Warning: It is not recommended to use the plugged connection on top of the **PGC** pump. The **PGC** body is made of aluminum, and the thread may be damaged if excessive force is used to open or close the connection.



Warning: Do not use Teflon (PTFE) tape to seal any parts of the pump.

Specifications

The Pump	
Pressure Range	-0.95 ... 35 bar (-13.7 ... 510 psi)
Pressure Connections	<p><u>On the side:</u> G1/8" female port with pre-installed Bx G1/8" male fitting for connecting a Beamex 40 bar / 600 psi hose</p> <p><u>At the top:</u> Plugged G3/8" B female port</p>
Pressure Medium	Air
Weight	820 g / 1.81 lb
Dimensions	
Height	220 mm / 8.7"
Width	120 mm / 4.7"
Depth	65 mm / 2.6"
Material	Aluminum, brass, ABS, NBR
Storage temperature	-20 ... 60°C / -4 ... 140°F
Operating temperature	0 ... 50°C / 32 ... 122°F

The 40 bar (600 psi) T-hose	
Length	1.5 m / 59.05"
Internal diameter	2 mm / 0.08"
Outer diameter	5 mm / 0.2"
Working pressure	40 bar / 600 psi
Bursting pressure	80 bar / 1200 psi
Smallest bending radius	20 mm / 0.78"
	Below -20 °C (-4 °F): 30 mm / 1.18"
Connectors (all ends)	Bx G1/8" female
Operating temperature range	-40 ... 100 °C / -40 ... 212 °F

About PGC

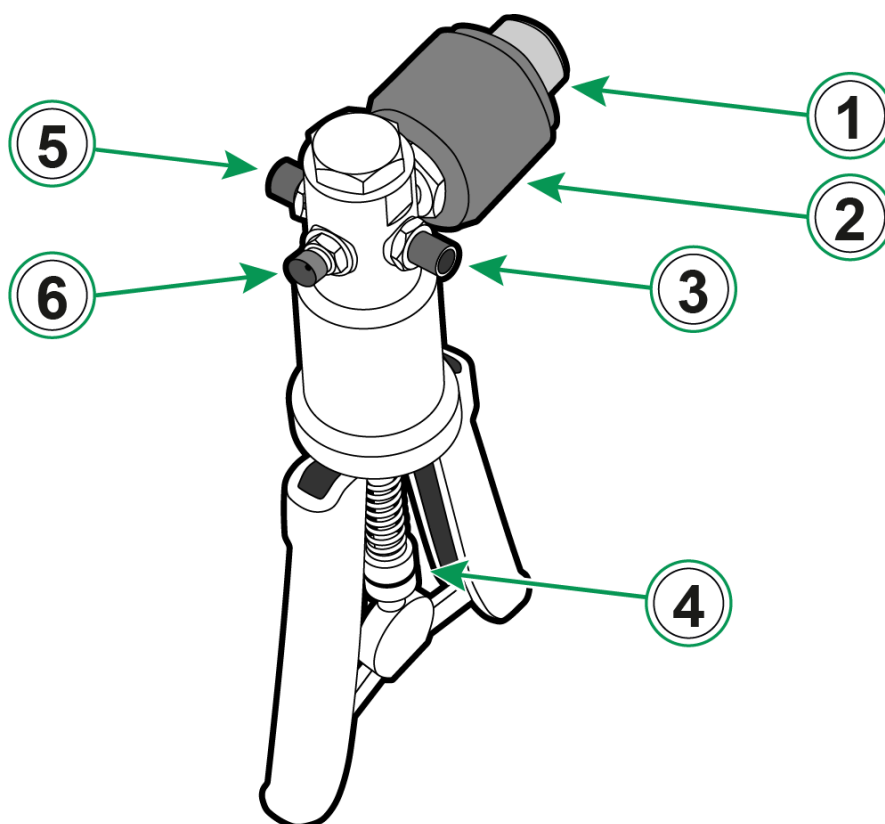


Figure 1: PGC overview

Legend:

1. Release valve
2. Fine adjust
3. Selector - pressure position
4. Stroke length setting
5. Selector - vacuum position
6. Pressure connection

Operating instructions

Preparation

1. Check that the pressure hose is intact and that the O-rings inside it are properly in place.



Warning: Use only the pressure T-hose supplied by Beamex.

2. Connect the pressure hose to the Bx G1/8" fitting and to the DUT (Device Under Test).
3. Use the pressure measurement T-hose to connect both the DUT and the reference (either a calibrator with internal pressure modules or an external pressure module communicating with a calibrator) to the pump. Tighten all connections by hand only. Ensure that the measurement range of the connected reference is appropriate for the application.



Warning: It is not recommended to use the plugged connection on top of the **PGC** pump.

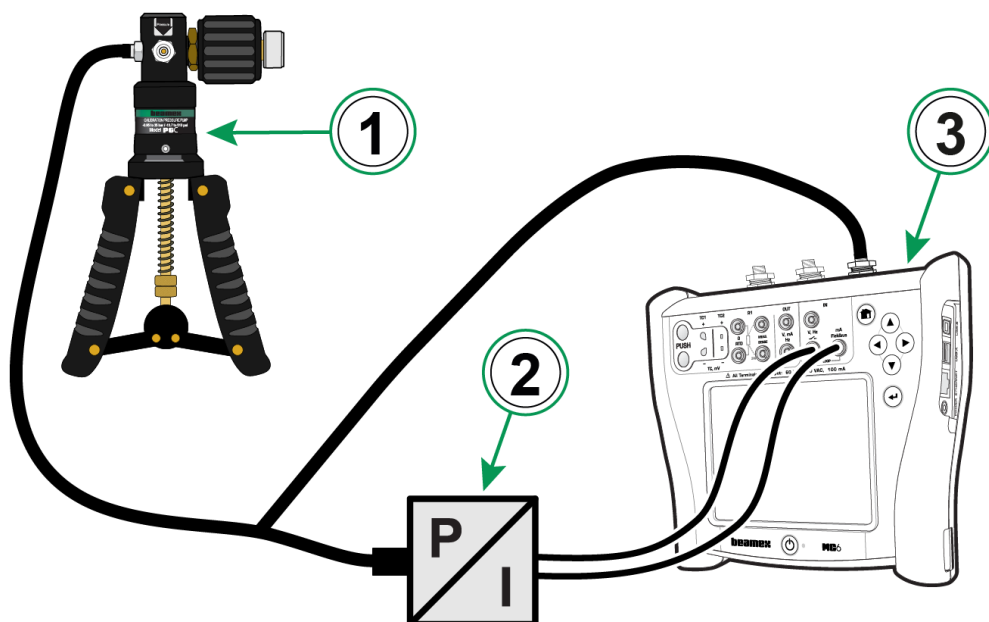


Figure 2: PGC connected to the reference (MC6 calibrator) and DUT

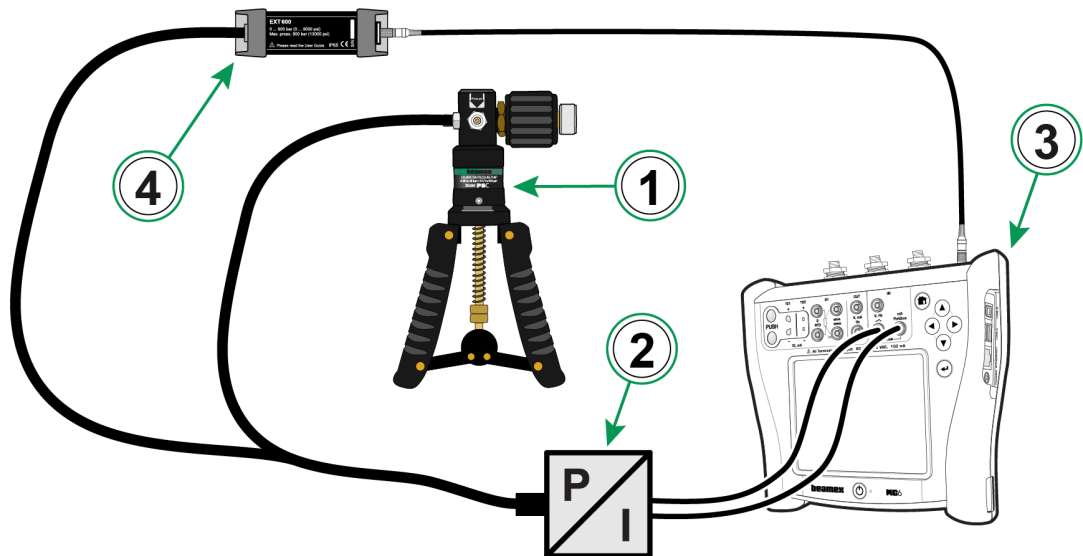


Figure 3: PGC connected to the reference (MC6 calibrator) and DUT

Legend:

- a. **PGC** pump
- b. Device Under Test (DUT)
- c. Reference measurement (MC6 calibrator)
- d. EXT External pressure module

4. To adjust the handle spread, first loosen the lower nut. Then, turn the upper nut to set the desired spring tension. Once the adjustment is complete, tighten the lower nut against the upper one.



Tip: Normally, the lower nut is located about 1 centimeter from the lowermost position.



Note: You can adjust the handles also during the calibration run.

Continue the calibration from either chapter [Pressure Calibration](#) or chapter [Vacuum Calibration](#).

Pressure Calibration



Note: Make sure you have completed the preparation steps in the chapter [Preparation](#).

To calibrate, follow these steps:

1. Check that the release valve is open.
2. Use a small screwdriver to switch the pressure/vacuum selector to the pressure position.



Warning: Never change the pressure/vacuum selector setting while there is pressure or vacuum in the pump or system.

3. Rotate the fine adjust counterclockwise approximately halfway.
4. Turn the release valve clockwise to close it.
5. Pump to raise the pressure close to the next calibration point. Then use the fine adjust to precisely raise the pressure to the calibration point.



Note: The maximum pressure achievable by pumping is approximately 20-25 bar. Any additional pressure must be generated using the fine adjust. The total maximum pressure depends on the volume of the calibration circuit.



Note: After increasing the pressure, the reading may slightly drop for about 30-60 seconds. This is due to thermodynamic effects, as well as the hose connections and the sealing gaskets. If the pressure does not stabilize, check the calibration circuit for leaks.

6. When the highest calibration point has been reached and no further calibration points at decreasing pressure are required, open the release valve, then close it, and begin a new calibration repeat.
7. If calibration points at decreasing pressures are required, carefully open the release valve to reduce the pressure. As you approach the desired pressure, close the release valve and use the fine adjust to lower the pressure precisely to the calibration point. Wait approximately 30-60 seconds for the pressure to stabilize.
8. When the last calibration point is completed, either begin a new calibration run or disassemble the measurement system. Leave the release valve open to ensure the pump is ready for next use.



Caution: Before disassembling the measurement system, open the release valve to remove any remaining pressure or vacuum.



Warning: Do not exceed the maximum operating pressure of the pump and the hose.



Warning: If you encounter strong resistance while operating the handles but see no corresponding pressure increase, stop pumping immediately and identify the cause of the issue. Always keep a reliable pressure indicator connected to the measurement system.

Vacuum Calibration



Note: Make sure you have completed the preparation steps in the chapter [Preparation](#).

To calibrate, follow these steps:

1. Check that the release valve is open.
2. Use a small screwdriver to switch the pressure/vacuum selector to the vacuum position.



Warning: Never change the pressure/vacuum selector setting while there is pressure or vacuum in the pump or system.

3. Rotate the fine adjust clockwise until it is fully closed.
4. Turn the release valve clockwise to close it.
5. Pump to lower the pressure close to the next calibration point. Then use the fine adjust to precisely lower the pressure to the calibration point.



Note: After decreasing the pressure, the reading may slightly change for about 30-60 seconds. This is due to thermodynamic effects, as well as the tube connections and the sealing gaskets. If the pressure does not stabilize, check the calibration circuit for leaks.

6. When the lowest calibration point has been reached and no further calibration points at increasing pressure are required, open the release valve, then close it, and begin a new calibration repeat.

7. If calibration points at increasing pressure are required, carefully open the release valve to raise the pressure. As you approach the desired pressure, close the release valve and use the fine adjust to increase the pressure precisely to the calibration point. Wait approximately 30-60 seconds for the pressure to stabilize.
8. When the last calibration point is completed, either begin a new calibration run or disassemble the measurement system. Leave the release valve open to ensure the pump is ready for next use.



Caution: Before disassembling the measurement system, open the release valve to remove any remaining pressure or vacuum.



Warning: If you encounter strong resistance while operating the handles but see no corresponding pressure change, stop pumping immediately and identify the cause of the issue. Always keep a reliable pressure indicator connected to the measurement system.

Troubleshooting

If repeated pumping does not result in a pressure change, the following should be examined:

- Check that the connections between the pump, the hose end, and the Device Under Test are secure. Then retry pumping.
- Ensure that all unused pressure ports are properly plugged and that the release valve is closed.
- Make sure that the pressure/vacuum selector is not left in between the pressure and vacuum positions. If it is, push it fully into the correct position.

If a pressure increase or decrease still cannot be achieved, it may indicate that one or more seals in the pump are leaking and require replacement.



Note: If the pump has not been used for a long time, the first stroke may feel slightly sluggish. This effect typically disappears with continued operation.



Warning: If the pump does not operate as expected, stop pumping immediately. Identify and resolve the issue before resuming operation.

Leak Test

If you suspect the pump is leaking, you can test it by following these steps:

PRESSURE

1. Generate pressure up to 25 bar using the handles.
2. Increase the pressure to 28 bar using the fine adjust.
3. Hold this pressure for 1 minute. During this time, the pressure must not drop by more than 0.09 bar.

VACUUM

1. Generate a vacuum down to -0.85 bar.
2. Hold this pressure for 1 minute. During this time, the pressure must not drop by more than 0.02 bar.

Maintenance

Depending on the frequency of use, the seals will eventually need to be replaced. The figure below presents all the seals and O-rings that may need to be changed.

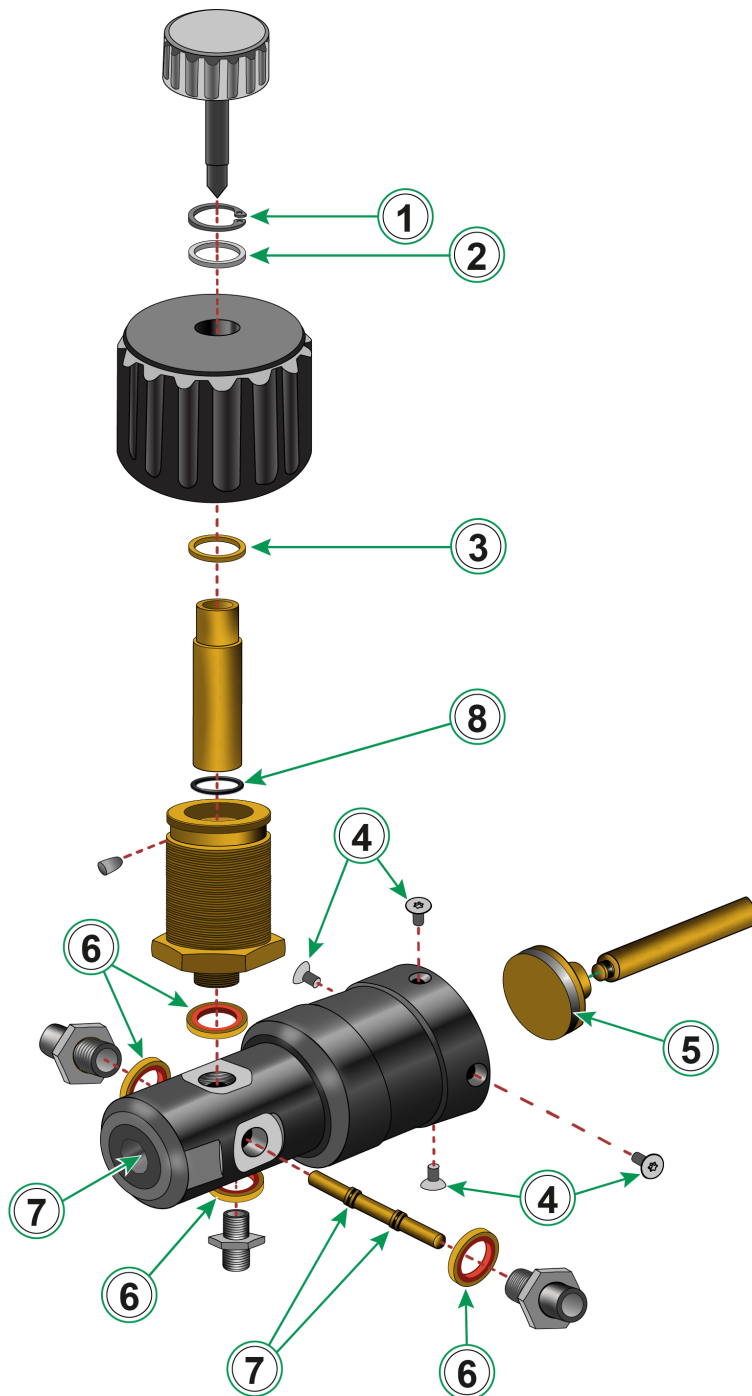


Figure 4: Location of the seals

Legend:

1. Lock ring
2. Gasket PVC 1/8"
3. Brass washer 1/8"
4. Cylinder mounting screws M3 x 6 (4 pcs)
5. Piston seal (square ring)
6. Bonded seal G1/8" (4 pcs)
7. O-ring 3.17 x 1.78 (3 pcs)
8. O-ring 8 x 2.5

If the pump is damaged, you can choose to repair it yourself or send it to Beamex Service.

All spare parts are available at <https://shop.beamex.com/>.



Note: When sending the **PGC** for service or reconditioning, place it in its original packaging as received from Beamex.



Caution: Always depressurize the **PGC** pump before leaving it unattended.

Disposal

Incorrect disposal may pose a risk to the environment. Follow country-specific regulations to dispose of instrument components and packaging materials in a sustainable manner.