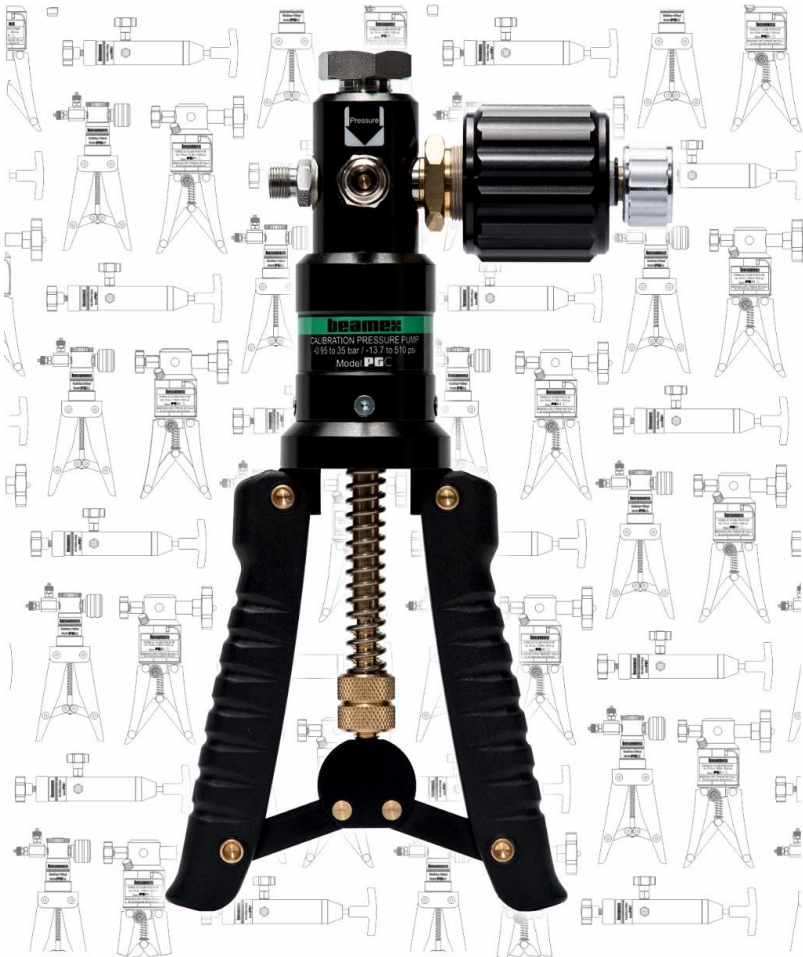




Advanced Test Equipment Corp.  
www.atecorp.com 800-404-ATEC (2832)

INSTRUCTION MANUAL

# BEAMEX® PRESSURE/VACUUM PUMP MODEL PGC



**beamex**



Dear user,

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

The above notwithstanding, we can assume no responsibility for any errors in this manual or their eventual consequences.

We reserve rights to make modifications to this manual without any further notice.

For more detailed technical data about the Instruction manual for PGC Calibration Pressure Pump, please contact the manufacturer.

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BEAMEX OY AB  
Ristisuonraitti 10  
FIN-68600 Pietarsaari  
FINLAND

Tel	+358 - 10 - 5505000
Fax	+358 - 10 - 5505404
E-mail:	sales@beamex.com service@beamex.com
Internet:	<a href="http://www.beamex.com">http://www.beamex.com</a>

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# DESCRIPTION

Beamex® PGC calibration pressure pump is designed to manually generate between -0.95 to 35 bar (approx. -13.7 to 510 psi) of vacuum and pressure for quick and accurate calibration of pressure gauges, transducers and other pressure measurement instruments.

## Standard Accessories

The standard accessory for a stand-alone pump is:

- \* This manual

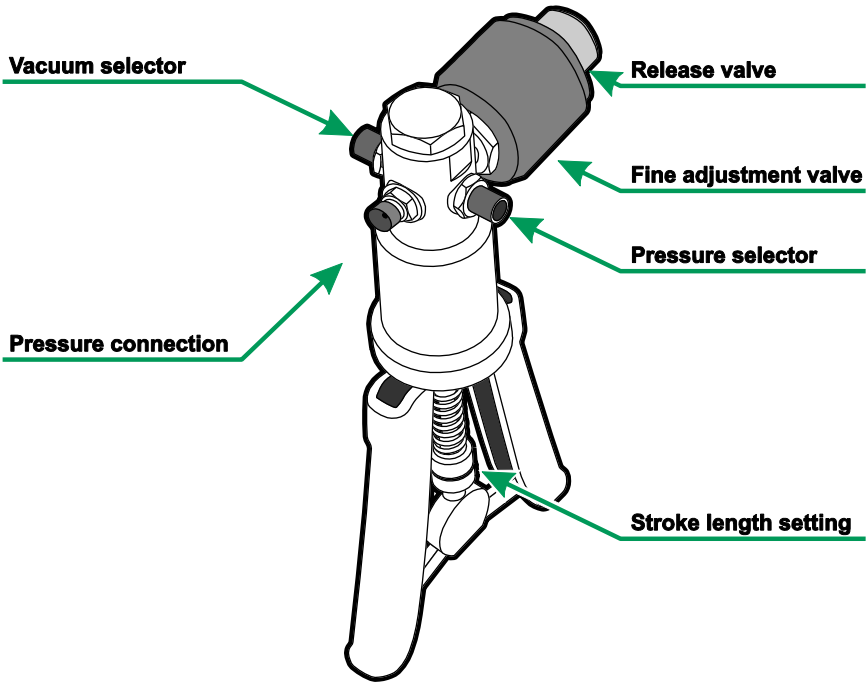
Additionally, for a pump kit:

- \* Connector kit:
  - G 1/8" male, 60° internal cone / G 1/8" male + o-ring  
to replace a Hydrotechnics® connector in Beamex® MC6 Calibrator's internal high pressure modules.
  - G 1/8" male, 60° internal cone / G 1/4" B female + 2 seals.  
An adapter for connecting the pressure measurement T-hose to Beamex' high pressure EXT modules.
  - G 1/8" male, 60° internal cone / G 1/4" NPT male.  
An adapter for connecting the pressure measurement T-hose to the instrument to be calibrated (DUT).
- \* 40 bar measurement T-hose.
- \* Carrying case.

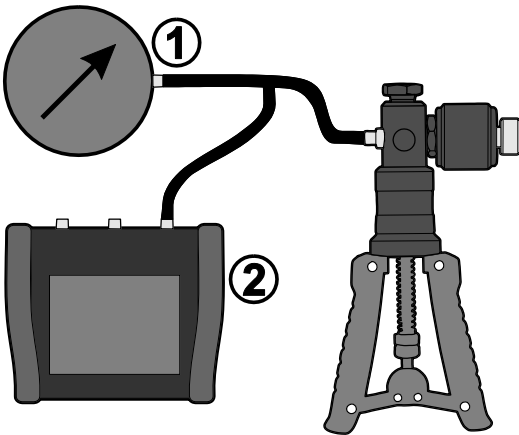
## Optional Accessories

The optional accessories are as follows:

- \* Service seal kit containing a set of seals and gaskets.  
For details, see picture on page 7.
- \* Fine adjustment valve including relief valve and gaskets.
- \* Upper part of pump (cylinder) including pressure/vacuum selector.
- \* Bottom part including handles and piston.



*Presenting PGC.*



- ① Device Under Test (DUT)
- ② Reference measurement

*Connection diagram when calibrating*

# USING THE PUMP

## Preparation

Before applying pressure/vacuum, ensure that the pressure/vacuum selector is according to your calibration needs. If not, check that the release valve is open, and then use a small screw driver to change the setting of the pressure/vacuum selector.

### **IMPORTANT**

**Never change the pressure/vacuum selector's setting when there is pressure or vacuum in the pump/system.**

**Please read all the warnings found on page 9.**

Before doing the connections, check that the pressure hose is intact and the o-rings in it are in place. Use only the pressure measurement T-hose delivered with the pump. Also check that the pump is in working condition.

Use the pressure measurement T-hose to connect the Device Under Test (DUT) and the reference (a calibrator with internal pressure modules or an external pressure module communicating with a calibrator) to the pump. For help on connections, refer to the adjacent connection diagram. Use hand tightening for the connections. Ensure that the measurement range of the connected reference is appropriate.

Note.

It is not recommended to use the plugged connection on top of PGC. Further information in warnings, presented on page 9.

Normally: Check that the thumb nut of the stroke length setting is approx. 1 centimeters from the lowermost position. If you for some reason need to reduce the volume per stroke, raise the thumb nut to squeeze the spring. This can also be done during the calibration run.

Turn the release valve clockwise to close it.

Continue either from chapter **Operation (Pressure)** on page 4 or **Operation (Vacuum)** on page 5.

## Operation (Pressure)

Turn the fine adjustment valve counterclockwise until it is fully open. Approximately halfway, if you do not need to use the full pressure range of the pump.

Pump to raise the pressure close to the next calibration point. Use the fine adjustment to raise the pressure to the calibration point.

Notes.

The maximum pumping pressure is approximately 25-30 bar. The rest of the pressure is done using the fine adjustment valve. The total maximum pressure value depends on the volume of the calibration circuit.

After increasing the pressure, the reading may slightly drop again for about 30 seconds. This is caused by thermodynamic effects, the tube connection and the sealing gaskets. If the pressure does not come to a standstill, check the measuring circuit for tightness.

When the calibration point with the highest pressure value is reached and there is no need for calibration points with decreasing pressure, either

- Open the release valve, close it and start a new calibration repeat, or
- continue to chapter **When Calibration is Done** on page 5.

If there is need for calibration points with decreasing pressure, carefully open the release valve to decrease the pressure. When getting close to the required pressure, close the release valve and use the fine adjustment valve to lower the pressure to the calibration point. Again, wait for approximately 30 seconds for the pressure to stabilize.

When the last calibration point is done, either do another calibration run or continue to chapter **When Calibration is Done** on page 5.

### **WARNINGS!**

**Do not exceed the max. operating pressure of the pump and the hose.**

**If there is a strong counterforce while operating the handles, but no pressure increase is indicated, stop pumping and locate the fault. Always keep a reliable indicator connected to the measurement system.**

A full list of warnings is on page 9.



## Operation (Vacuum)

Turn the fine adjustment valve clockwise until it is fully closed.

Pump to lower the pressure close to the next calibration point. Use the fine adjustment to lower the pressure to the calibration point.

Notes.

After decreasing the pressure, the reading may slightly change for about 30 seconds. This is caused by thermodynamic effects, the tube connection and the sealing gaskets. If the pressure does not come to a standstill, check the measuring circuit for tightness.

When the calibration point with the lowest pressure value is reached and there is no need for calibration points with increasing pressure, either

- Open the release valve, close it and start a new calibration repeat, or
- continue to chapter **When Calibration is Done** on page 5.

If there is need for calibration points with increasing pressure, carefully open the release valve to increase the pressure. When getting close to the required pressure, close the release valve and use the fine adjustment valve to increase the pressure to the calibration point. Again, wait for approximately 30 seconds for the pressure to stabilize.

When the last calibration point is done, either do another calibration run or continue to chapter **When Calibration is Done** on page 5.

## When Calibration is Done

### **IMPORTANT!**

**Open the release valve to remove pressure/vacuum before disassembling the measurement system.**

Disassemble the measurement system and make sure the pump is left in a state that allows easy start the next time the pump is used. (Release valve open, stroke length set to maximum etc.)

# TROUBLESHOOTING/MAINTENANCE

If the pump assembly fails to indicate a pressure increase/decrease after considerable pumping action of the handle, check the following things:

- Assure that the connections between the pump, the hose end and the attached instrument(s) are tight and retry pumping.
- Check that all the unused output connectors are properly plugged. Also check that the release valve is closed.
- Check that the pressure/vacuum selector is not left somewhere in between pressure side and vacuum side. If so, push it in place as needed.

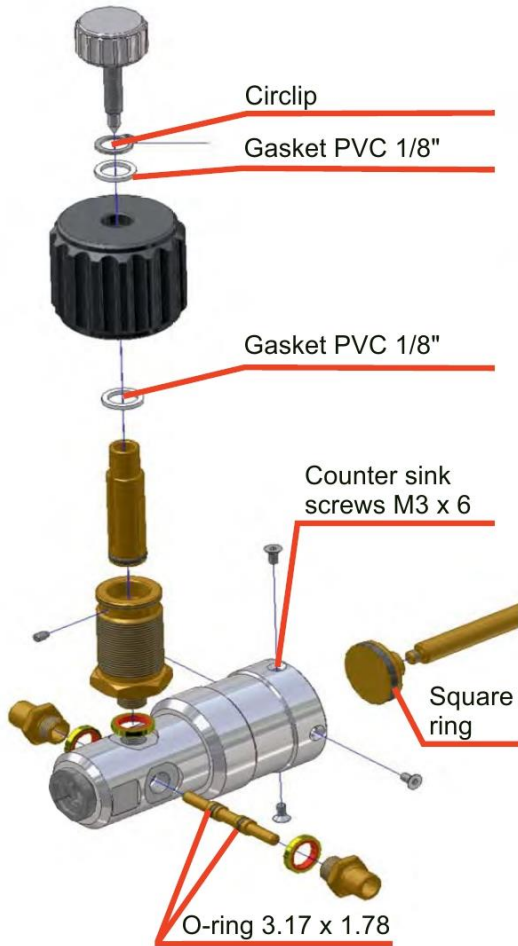
If a pressure increase/decrease still cannot be obtained, it's possible that one or more of the seals in the Pressure Pump is leaking and needs to be replaced.

If the test pump has not been used for a longer period of time, the first lift may be somewhat sluggish. This effect will disappear again during further operation.

**Do not continue pumping if the functionality of the pump is not normal. Locate the fault before you continue using the pump.**

## Seal Replacement

Depending on the frequency of use, the seals will eventually need replacing. The replacement seals are an optional accessory, but the picture on next page presents where the seals go.



# SPECIFICATIONS

## The Pump Unit

<b>Weight</b>		820 g	1.81 lb
<b>Dimensions</b>	Height	220 mm	approx. 8.7"
	Width	120 mm	approx. 4.7"
	Depth	65 mm	approx. 2.6"
<b>Pressure range*</b>		-0.95 to 35 bar	-13.7 to 510 psi
<b>Pressure media</b>			<b><i>Air</i></b>
<b>Output connector</b>			
	<ul style="list-style-type: none"><li>• G 1/8" male, 60° internal cone.</li></ul>		
<b>Material</b>		Aluminium, brass, ABS, NBR	

## The Pressure Measurement T-hose (Part of Pump Kit)

<b>Max. length</b>		<b>1.5 m</b>	<b>4.9 ft</b>	
<b>Connectors</b> (all ends)		G 1/8" female, 60° internal cone.		
<b>External diameter</b>		5 mm	0.2"	
<b>Operating pressure</b>		max. 40 bar	4 MPa	580 psi

# WARNINGS

**Read the instruction manual carefully prior to setting up and using the pressure pump. The pressure built up internally during use can be extremely high.**

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

**Use only the pressure measurement T-hose delivered with the pump, marked with "Max. 40 bar". Other hoses may not withstand the pressure generated with PGC.**

**Use eye shields.**

**Do not connect the pump to an external pressure source.**

**Never change the pressure/vacuum selector's setting when there is pressure or vacuum in the pump/system.**

**Vent external systems before connecting to the pump.**

**Ensure that all connections are made correctly and that the hose and the connectors are undamaged. Do not use faulty hoses or connectors.**

**The environmental conditions may restrict the allowable maximum pressure/vacuum to a lower level than the pump and the hose enable.**

**Always depressurize PGC when it is left on its own.**

**Use only the connector provided with the pump. Impurities from wrong materials may plug the pump.**

**It is not recommended to use the plugged connection on top of PGC. PGC's body is made of Aluminium and the thread may be damaged when using too much force to open/close the connection.**

**No Teflon (PTFE) tape may be used to seal anything in the pump.**

**Do not use PGC in any other way than as described in this manual.**







**BEAMEX OY AB**  
**Ristisuonraitti 10**  
**FIN-68600 PIETARSAARI**  
**FINLAND**

**Phone +358 - 10 5505000**  
**Fax +358 - 10 5505404**  
**E-mail sales@beamex.com**  
**service@beamex.com**

**Internet <http://www.beamex.com>**

Beamex Inc  
2152 NW Parkway  
Suite A  
Marietta, GA 30067  
U.S.A.  
Phone 800 888-9892,  
+1-770-951-1927  
Fax +1-770-951-1928  
E-mail beamex.inc@beamex.com

Beamex Limited  
Newtown Grange Farm Business Park  
Desford Road  
NEWTOWN UNTHANK  
Leicestershire LE9 9FL  
United Kingdom  
Phone 01455 821 920  
Fax 01455 821 923  
E-mail beamex.ltd@beamex.com

Beamex S.A.S.  
253 Boulevard de Leeds  
59777 Lille  
FRANCE  
Phone +33 (0)3 28 53 58 27  
Fax +33 (0)3 28 53 57 50  
E-mail beamex.fr@beamex.com

Representative: