



Time Electronics
Calibration, Test and Measurement

User Manual

7195 Hydraulic Pressure Calibration Pump

Version 1.3
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Nothing from this manual may be multiplied, or made public in any form or manner, either electronically or hard copy, without prior written consent from Time Electronics Ltd.

This also applies to any schematics, drawings and diagrams contained herein.

This manual provides operating and safety instructions for the Time Electronics product.

To ensure correct operation and safety, please follow the instructions in this manual.

Time Electronics reserves the right to change the contents, specifications and other information contained in this manual without notice.

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1 Introduction



The 7195 benchtop pressure pump is a dual pressure source for hydraulic pressure applications. It is simple operation and achieves high pressure smoothly and easily. For media it uses oil or deionised water, and provides 85% vacuum and positive pressure 700bar (10,000psi). A high-quality screw press is designed for fine pressure adjustment, with adjusting resolution up to 0.001bar.

For calibration applications the double output manifold provides finger-tight connections for a reference gauge and device under test. Further user features include the ergonomic handwheel for coarse pressure adjustment, fine adjust handles, release valve and isolating valve.

The 7195 is comfortable and simple operation, with features that make it ideal for calibrating pressure transducers, gauges, and other pressure instruments. It is also ideal for use as a benchtop gauge comparator.

1.1 Specifications

Media: Oil or deionised water

Generated Pressure Range: 0.85bar vacuum to 700bar pressure (-12.5psi to 10,000psi pressure)

Over Pressure: Up to 1000bar (15,000psi)

Pressure Setting Resolution: 0.001bar (0.015psi)

Material: Ram/adapters: 316 SS. Body: Steel/aluminum. Seals: Buna-N

Pressure Connections: 2 x 1/4" BSP (1/4" NPT, M20 or other if specified)

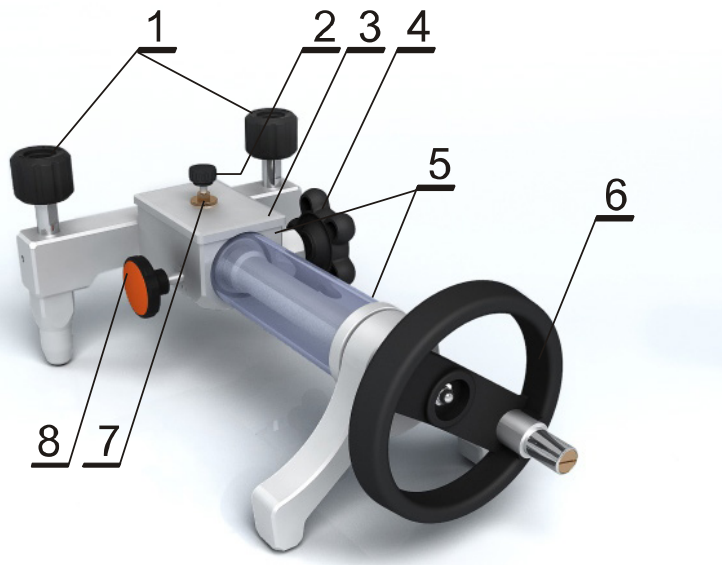
Height: 140mm

Base: 290mm x 198mm

Weight: 3.2kg (7.1 lbs)

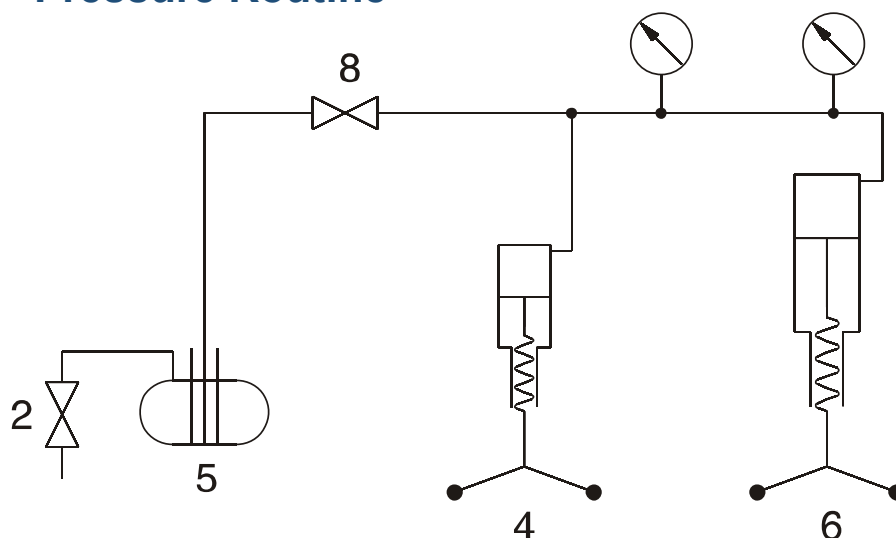
Optional Extras: Digital pressure gauges

2 Controls



1. 1/4" BSP (1/4" NPT, M20 x 1.5 or other if specified)
2. Release Valve
3. Top cover of reservoir chamber
4. Fine Adjust Handles (turn clockwise to increase pressure)
5. Liquid reservoir
6. Coarse adjustment handle
7. Screw for fitting cover
8. Isolating Valve (isolate the DUT from pressurizing system)

2.1 Pressure Routine

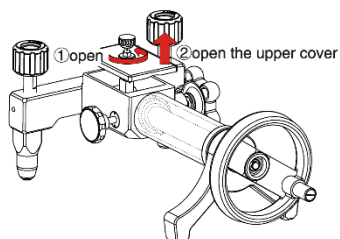


3 Operation

3.1 Preparation & Maintenance

Open the reservoir

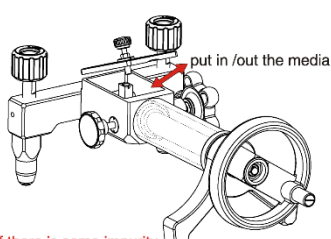
A



It is adequate if the level of media is placed to the 2/3 height of reservoir.

Put in/out the media

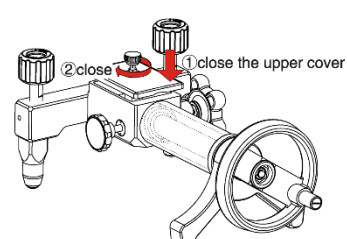
B



If there is some impurity in the reservoir, please clean it.

Lock the reservoir

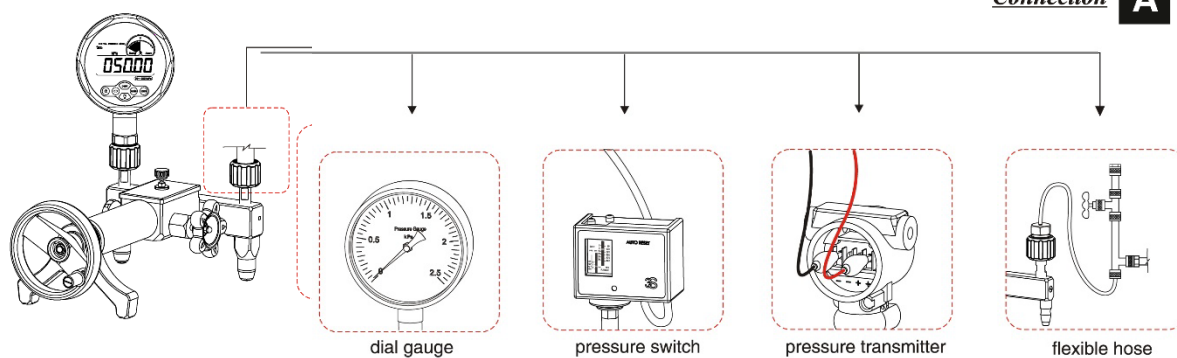
C



3.2 Basic Operation

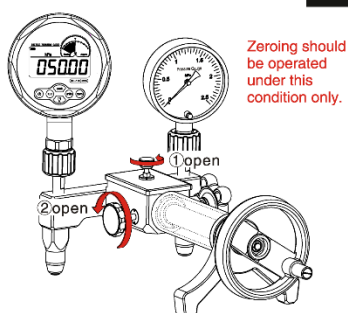
Connection

A



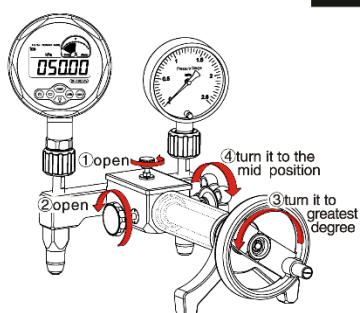
Open to atmosphere

B



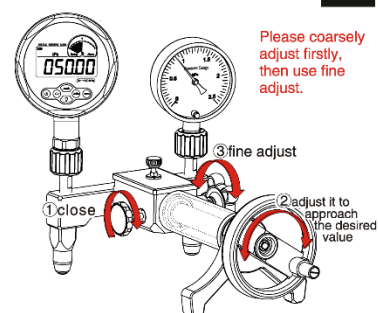
Pressure preparation

C



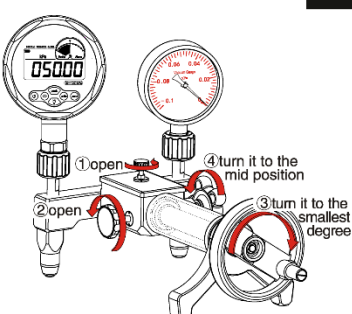
Pressurizing process

D



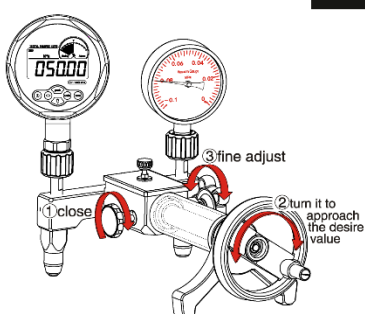
Vacuum preparation

E



Vacuum process

F



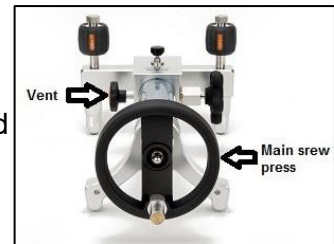
4 Operating Notes, Precautions & Troubleshooting

4.1 Operating Notes/Considerations

To produce stable and high pressure measurements using a hydraulic pump, the gas within the calibration system needs to be removed. Hydraulic test pumps use various types of fluids to generate high pressures. Because gas is much more compressible than liquid, purging most if not all the gas out of the system will allow for maximum pressures to be generated.

The following steps describe the procedure to purge the gas from a 7195 test pump:

1. Ensure the pump, reference standard, and device under test (DUT) are securely connected to the calibration pump.
2. Close the vent valve and screw out the main screw press. You should see a vacuum being pulled on your reference and DUT (assuming the reference and the DUT are able to be used for vacuum measurement).
3. Open the vent valve, wait for the pressure to settle to zero, and screw in the main screw press. As you do this, you may see bubbles emerge in the medium reservoir which is a good indication that gas is being pushed out of the system.
4. Close the vent valve and repeat steps 2 and 3 one or two more times.
5. Close the vent valve and unscrew the main screw press half way out. Then open the vent valve to zero the measurement.
6. Now, you are ready to close the vent valve and generate pressure.



4.2 Notes on Stable Measurements

As pressures are generated to the desired test point it is common to initially observe a fairly rapid decrease in pressure. Initially, you may conclude that this is a pressure leak but what you are likely observing is called the adiabatic effect. This effect is defined as a gain or loss of heat within a system and its environment. When a gas is compressed under adiabatic conditions, its pressure increases and its temperature rises without the gain or loss of any heat. This happens when the screw press of a pump compresses the fluid volume, thus resulting in an increase in pressure but also an increase in the temperature. As the increase in pressure stops the temperature generated from the screw press dissipates. If the volume is held constant and the temperature decreases so also will the pressure decrease. So this initial decrease of pressure is in fact a result of the temperature settling from the adiabatic heating effect generated from the screw press of the pump.

Other sources of instability that also impact the pressure measurement are instabilities in room temperature and changes in volume. Because temperature is a factor of pressure as the entire pressure system changes temperature due to the room temperature changing the true pressure value will also change. The same can also be said of the pressure volume.

With an increase or decrease of pressure volume the true pressure value will see a correlated change. Volume changes with pressure systems are usually not very noticeable except at high pressures. At high pressures, the materials where the pressurized volume is contained will slightly expand causing the volume to expand and the pressure will decrease. This is particularly evident when using flexible hoses at high pressures. Using metal tubing as opposed to flexible hoses will yield higher stability as metal is less likely to allow for the volume to expand when under high pressure.

4.3 Operating Precautions

- Do not exceed the safety pressure limit
- Close the valves and tighten plugs when 7195 is being transported
- Always open the release valve during operation
- Change contaminated media immediately
- Do not allow the media level to drop below the mid line of the reservoir when the 7195 is placed horizontally
- Do not shift the selector to vacuum mode whilst under pressure
- Do not over tighten connectors
- Keep outer threads clean
- Store the pump in a dry and clean environment

4.4 Troubleshooting

Problem	Causes	Solution
Difficult to use coarse adjust	The isolating valve is open	Close isolating valve
	Sealing ring in broken or loose	Replace or tighten sealing ring
	Not enough media in reservoir	Fill with adequate amount of media
	The pump is placed at an angle	Place the pump horizontally for operation
Difficult to use fine adjust	The isolating valve is open	Close isolating valve
	Sealing ring in broken or loose	Replace or tighten sealing ring
	The thread surface is not smooth	Replace seals and tighten
	The connector type is wrong	Use correct connector or adaptor

5 Warranty and Servicing

Warranty

Time Electronics products carry a one-year manufacturer's warranty as standard.

Time Electronics products are designed and manufactured to the highest standards and specifications to assure the quality and performance required by all sectors of industry. Time Electronics products are fully guaranteed against faulty materials and workmanship.

Should this product be found to be defective, please contact us using the below details. Inform us of the product type, serial number, and details of any fault and/or the service required. Please retain the supplier invoice as proof of purchase.

This warranty does not apply to defects resulting from action of the user such as misuse, operation outside of specification, improper maintenance or repair, or unauthorized modification. Time Electronics' total liability is limited to repair or replacement of the product. Note that if Time Electronics determine that the fault on a returned product has been caused by the user, we will contact the customer before proceeding with any repair.

Calibration and Repair Services

Time Electronics offers repair and calibration services for all the products we make and sell. Routine maintenance by the manufacturer ensures optimal performance and condition of the product. Periodic traceable or accredited calibration is available.

Contacting Time Electronics

Online:

Please visit **www.timeelectronics.com** and select Technical Support from the Contact links. From this page you will be able to send information to the Time Electronics service team who will help and support you.

By phone:

+44 (0) 1732 355993

By email:

mail@timeelectronics.co.uk

Returning Instruments

Prior to returning your product please contact Time Electronics. We will issue a return merchandise authorization (RMA) number that is to accompany the goods returning. Further instructions will also be issued prior to shipment. When returning instruments, please ensure that they have been adequately packed, preferably in the original packing supplied. **Time Electronics Ltd will not accept responsibility for units returned damaged.** Please ensure that all units have details of the service required and all relevant paperwork.

Send the instrument, shipping charges paid to:

Time Electronics Ltd

Unit 5, TON Business Park, 2-8 Morley Road,
Tonbridge, Kent, TN9 1RA.
United Kingdom.

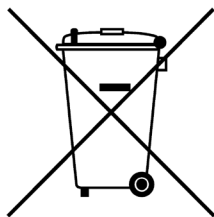
Tel: +44(0)1732 355993

Fax: +44(0)1732 350198

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Disposal of your old equipment



1. When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2002/96/EC.
2. All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities.
3. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health.
4. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or return to Time Electronics.