

MANUAL



Nagman[®]
COMPARISON TESTERS
GCH SERIES

BRIEF PROFILE



An ISO 9001-2015 certified Instrumentation company (since 1972) serving Industries in India & Worldwide thro' the Manufacture & Supply of World-Class Calibration Instruments & Systems like Temperature, Pressure & Signal Calibrators, Black Body Calibration Sources, Pneumatic & Hydraulic Hand Pumps, Dead Weight & Comparison Testers, Calibration Test Benches, etc.

Dear User,

*Thank you for selecting **Nagman's Comparison Tester** and becoming a proud owner of this Calibration Instrument.*

We have strived hard to ensure the accuracy of the contents of this manual. We would appreciate any suggestions/feedback to correct any errors noticed and to improve the quality of contents of this Manual

Specifications are subject to change owing to continuous development and we reserve rights to effect Changes / Modifications to this Manual.

Read the Instructions before starting to use the Product.

Wishing you for a long association with us.

For any service related issues, please contact service@nagman.com

VERSION CONTROL

Version No.	Updated on	Updated by
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1. INTRODUCTION

Nagman's Pressure Comparison Tester – GCH Series
– ideal for checking Pressure Measuring Instruments
against Master Test Gauges, Indicators or
Transducers.

It is designed for Testing Pressure Measuring
Instruments against Master Test Instruments.

This cost effective instrument provides precise
control for Calibration requirements.

2. SPECIFICATION

Ranges	Upto 1200 / 1400 /1700 /2000 bar
Pump	Screw Pump
Medium	Oil (Option : Water)
Pressure generation	Priming Pump for initial pressures & Screw RAM Pump for high pressures
Test Port connection	½” BSP (F) Swivel
Weight	19 Kgs. Approx.
Dimension	530 × 480 × 2330 mm (L × D × H)

3. STANDARD DELIVERY & OPTIONAL ACCESSORIES

Standard Delivery

- Basic Unit (Hydraulic Hand Pump)
- Hydraulic Oil : 500 ml
- Set of Seals
- Conformance Certificate
- Instruction Manual

Optional Accessories

- Analog / Digital Pressure Gauges
- Distilled Water
- Right Angled & 2 Gauge Adaptors
- Set of Adaptors
 - $\frac{1}{8}$ " BSP(F) X $\frac{1}{4}$ " BSP (M) } BSP
 - $\frac{1}{2}$ " BSP(F) X $\frac{1}{4}$ " BSP (M) } BSP
 - $\frac{3}{8}$ " BSP(F) X $\frac{1}{4}$ " BSP (M) } BSP
 - $\frac{1}{8}$ " NPT(F) X $\frac{1}{4}$ " BSP (M) } NPT
 - $\frac{1}{4}$ " NPT(F) X $\frac{1}{4}$ " BSP (M) } NPT
 - $\frac{1}{2}$ " NPT(F) X $\frac{1}{4}$ " BSP (M) } NPT
 - $\frac{3}{8}$ " NPT(F) X $\frac{1}{4}$ " BSP (M) } NPT

4. PARTS IDENTIFICATION



1. Leveling Adjustment Legs
2. Reservoir Tank
3. Reservoir Needle Valve
4. Test Ports
5. Isolating Valve
6. Priming Pump
7. Screw RAM





5. CONNECTION DIAGRAM



1. Master / Reference Measurement
2. Unit Under Test

Note : Accessories viz. Gauge / Indicator / Adaptors shown in photo are not part of standard supply.

6. SAFETY INSTRUCTIONS

S. No.	Symbol	Description
1		Read the user manual before operating the instrument.
2		Warning - conditions that may pose hazards to the user.
3		Caution-conditions that may damage the instrument.
4		Special Information



- Do not leave the unit in open condition when not in use. Dust may get accumulated in the Unit.
- Use correct matching adapters in the test ports.
- It is not advisable to use hydraulic oil operated comparison tester for water gauges, by replacing / refilling with water & vice versa, as it would damage the inner seals and critical parts.

If you cannot generate the desired pressure it may be due to the reasons listed below:



- (i) Either the system has too much air trap in it
- (ii) The volume being pressurized is too large
(Eg: Using large hoses / extending at test ports to connect Master / Test Gauges)

7. OPERATING INSTRUCTIONS

- Open the reservoir needle valve and isolating valve of the pressure comparison tester. At this position turn the RAM hand wheel counter-clockwise until the RAM hand wheel till end of the thread.
- Connect the gauge to be tested into one of the test ports using appropriate gauge adaptor. Tighten the adapter onto the gauge using thread sealant (like nylon washer, bonded seal or Teflon tape)
- Connect the Master test gauge using the appropriate gauge adaptor into the other port using thread sealant (like nylon washer, bonded seal or Teflon tape).
- Whenever you connect a new gauge, air bubbles may be introduced into the comparison tester and cause problems during calibration. Check whether the reservoir is full & the reservoir needle valve is in open position, then turn the RAM hand wheel counter-clockwise until it stops at the full out position. If air bubble is present in the system, the test fluid level in the reservoir will drop as it flows into the comparator. By moving the Ram handle wheel clockwise you can see the trapped air coming out of the fluid in the reservoir. If necessary repeat this step until all trapped air has been removed. Ensure that reservoir does not empty.

- Now operate the priming pump, if air bubble is present in the system, the test fluid level in the reservoir will drop as it flows into the comparator. If necessary repeat this step until all trapped air has been removed. Ensure the reservoir does not empty.

Calibration :

- Close the reservoir needle valve and apply the minimum pressure through the priming pump (Max upto 30 bar) then close the isolating valve of the priming pump. To increase the pressure above 30 bar operate the Ram handle clockwise so that the needle of the gauge being tested on the first major graduation mark (or first calibration point). Hold the pressure for 10-15 minutes, then compare the pressure on the gauge to be tested to the pressure displayed on the master gauge.
- Normally, pressure will drop initially, at each ascending pressure point is reached. This is due to residual trapped air, first heated by compression, then cooled. Hence allow sufficient time so that the compressed pressure will attain at the same temperature of the ambient environment. An equal and opposite effect happens when reducing pressure – the pressure will rise as each new lower pressure is achieved. Wait for these thermal effects to get stabilized and allow sufficient time for the calibration.

- Once the calibration is completed, release the RAM fully out (anti-clockwise) and then open the isolating valve of the priming pump and also open the needle valve of the reservoir. Now remove the Master / Test units.

8. TROUBLESHOOTING / MAINTENANCE

Unable to do priming :

- Ensure that the reservoir needle valve is closed.
- Ensure that there is sufficient fluid in the reservoir.
- Ensure that the isolating valve is open.

Pressure not developing :

- a. Ensure for the correct position of reservoir needle valve and the isolating valve during priming.
- b. Ensure that the instruments under test (Master / Test Gauges) is not leaking.
- c. Ensure that there is no leak while applying pressure. If there is any traces of fluids at ports appears, replace the seal. Check sealing faces are clean and undamaged before re-assembly.

If any traces of fluids found near the RAM, replace the 'O' ring in the RAM spindle by following below instructions.

- Unscrew the collar nut and take out the RAM spindle.
- Check the 'O' ring present in the quill which is in the end of the RAM spindle.
- If the 'O' ring is damaged, replace with the new one.
- Re-assemble the parts in the reversed order.

Maximum pressure is not attained even though the RAM screw is turned fully in:

Airlock may occur in the priming pump. Release the air lock by following below instructions:

- Ensure correct level of oil in the reservoir.
- Remove the priming pump along with the pulling rod assembly by loosening the lock nut and stud nut (which in turn consists of 'O' rings- 2 Nos) and Teflon bush.
- Pour the fluid in the vertical sleeve of the priming pump.
- Re-assemble the parts in the reversed order.
- Perform the priming operation.

Maintenance:

- Comparison tester is made of low maintenance parts. Most of the maintenance requirement will arise only due to external sources like dirt particles, impurities in oil (accumulated in Master / Test Gauges) etc., Routine maintenance entails that the equipment is kept free from dirt and dust.

- Change the oil if it becomes discolored.

Returning Instrument for Service

When returning the instrument to the manufacturer for service, please provide complete information about the problems faced for clear analysis of the problem. The calibrator should be returned in the original packing.

Nagman's liability ceases if :

- Parts are replaced / repaired using spare parts which are not identical to those recommended by the manufacturer.
- Non-original parts are used in any way when operating the instrument.

Nagman's liability is restricted to errors that originated from the factory.

For more details, write to :

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