

User manual
Pneumatic Comparator
HS701



Claim

- The operating instructions are parts of the products and must be kept in the immediate vicinity of the instrument and readily accessible to skilled personnel at any time.
- Skilled personnel must have carefully read and understood the operating instructions prior to beginning any work.
- The manufacturer's liability is void in the case of any damage caused by using the product contrary to its intended use, non-compliance with these operating instructions, assignment of insufficiently qualified skilled personnel or unauthorized modifications to the instrument.
- HUAXIN reserve the rights to change the contents or form of these operating instructions at any time without prior notice having been given.

Safety information

Symbol



.....warns you against actions that can cause injury to people or damage to the instrument.



..... points out useful tips, recommendations and information for efficient and trouble-free operation.

Warning

In order to protect your products, your own and others safety, please read this manual carefully before your operation, otherwise it may cause trouble. Huaxin is not liable for any safety problems or damages caused by misuse or incorrect operation.

① Operate by professional



The system must only be operated by trained and authorised personnel who know the manual and can work according to them.

② Pay attention to Shut-off valve



Please open the shut-off valve to calibrate small range gauge(-0.25-0.25) bar. If the gauge under test is out of this range, you need to close shut-off valve in operation.

③ No disassemble



Disassembling may cause physical injury or equipment damage. Only qualified technicians are allowed to fix the equipment. Please call our service staff for repair instruction and guidance if there would be anything wrong.

④ Don't calibrate oil gauge



The item belongs to non-oil equipment, if you use the item to calibrate oil gauge, there will be oil left behind in the system, and it will not provide pressure anymore. Meanwhile that may pollute air gauge.

⑤ Store the item with pressure



If this equipment will be in idle for a long time, please shut off the relieve valve and provide pressure about 2bar. In order to avoid the air enter into the item inside that will affect the system stability when you use it next time.

⑥ Pay attention to reverse valve



Don't switch the reverse valve (positive/vacuum) when there is pressure inside the system. If you switch the reverse valve when the whole system have pressure, maybe the hand pump will spring up and cause personal hurt.

⑦ Operate reverse valve regularly



If the item left idle, please operate the reverse valve once each month. Or the reverse valve couldn't be use, at this time, please call our service clerk.

Labelling

Huaxin Instrument(Beijing)Co.,Ltd.	•	Manufacturer.	
Model	HS701	•	Model.
Product	Pneumatic comparator	•	Product name.
Range	(-0.95-6)bar	•	Pressure range.
No.	140102799	•	Serial number.
Date	2014.01	•	Date of manufacture.

Claim

Safety

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1. Summary

HS701 Pneumatic comparator is portable structure and designed to generate pressure from vacuum to 6bar. External air capacitor and shut-off valve make the micro pressure calibration more stability. Especially the F-adjust valve design make the minimum pressure adjust get 0.01mbar(1Pa). That is easy to calibrate less than ± 0.25 bar of Micro pressure gauge. The design of reverse valve makes the switch of vacuum and positive pressure more smooth. Two standard pressure outputs are easy to connect gauges under test without using the wrenches. It widely calibrates pressure instruments in field and laboratory.

Functions

HS701 provides pressure measurement for calibrating pressure instruments in field and laboratory. It can be extensively used in power, chemical, petrol, metallurgy, metering, military industry, etc.

Characteristics

- Portable structure
- High stability, simple operation, convenient maintenance.
- Easy to calibrate less than ± 0.25 bar of Micro pressure gauge

2. Technical Specification

Model: HS701 Pneumatic comparator

Generated pressure range: (-0.95~6)bar

Working media: Air

Adjust resolution: 0.01mbar(1Pa).

Material: Stainless Steel/Aluminium for body; Stainless steel for outputs; Buna-N for seals

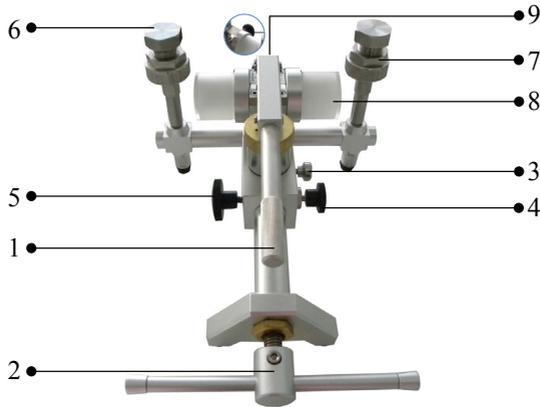
Output interface connection: M20×1.5 Female

Package: Carrying black bag. Specialized cartons and foam wrap (optional)

Weight: 2.2kg

Dimension: 286L×198W×140H (mm)

3. Components



① Hand pump

Turn the hand pump up and down repeatedly to generate pressure. Hand pump will realize prepressing function.

② Lead screw

Increase pressure by turning the lead screw clockwise, decrease pressure by turning the lead screw anti-clockwise.

③ Reverse valve (positive/ vacuum)

Press the button in order to switch between positive pressure and vacuum. (Push the reverse valve is positive pressure calibration, pull for vacuum).

④ Relieve valve

Have to close before pressure generation (clockwise). Slowly open it to release the pressure (anti-clockwise).

⑤ F-adjust valve

To realize the fine adjustment of pressure value (Turning in clockwise to increase pressure).

⑥ Plugs

Tighten it up when not in use.

⑦ Output

There are two outputs. one is designed for standard gauge, the other for gauge under test.

⑧ Air capacitor

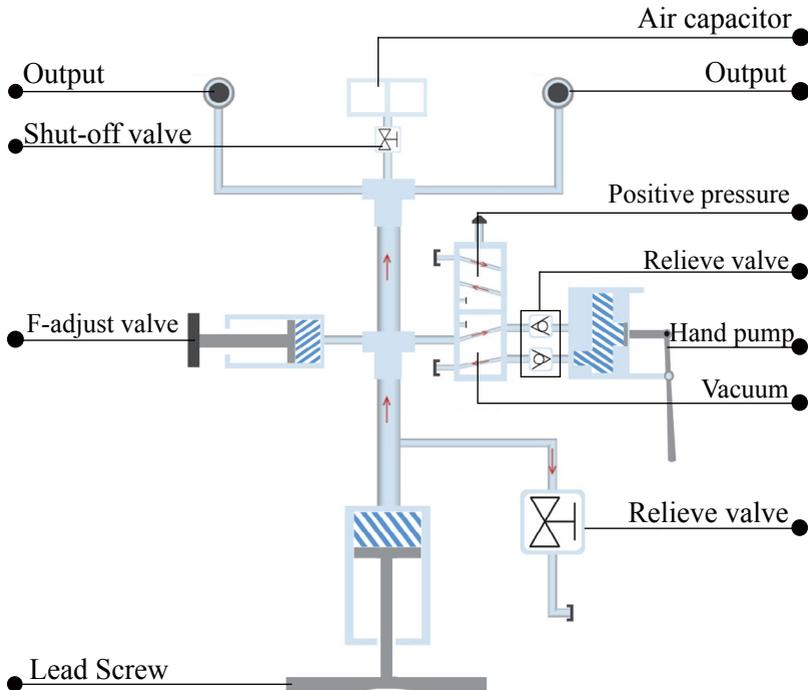
The container of air

⑨ Shut-off valve

Open it to implement caching when calibrate small range gauge.

4. Working principle

HS701 is composed of hand pump, lead screw, F-adjust valve, relieve valve, reverse valve, outputs and shut-off, etc. The pressure gauge can be installed quickly. Push or pull reverse valve to switch positive pressure position and vacuum position. It is easy to prepressurize by running hand pump up and down, then compress the work medium by turning lead screw clockwise (anti-clockwise), that could realize pressure increasing (decreasing) secondary. Adjust the F-adjust valve to reach desired point more accurately.

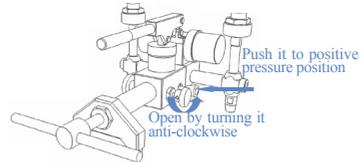


5. Operation

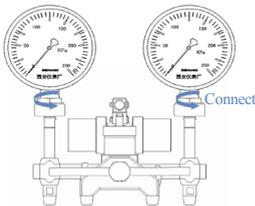
For example(1):

Take pressure gauge 2.5bar(250kPa)as example(The calibration points:0bar, 0.5bar,1bar,1.5bar,2bar,2.5bar)

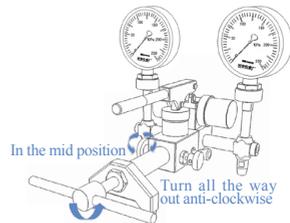
- A** Put HS701 on the level;Turn the relieve valve anti-clockwise to open it and make sure the reverse valve is in positive pressure position.



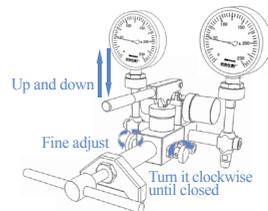
- B** Remove the plugs of outputs.Connect the standard gauge and the gauge under test to the two outputs interfaces separately, it must firm in place. Otherwise, it will be leakage.



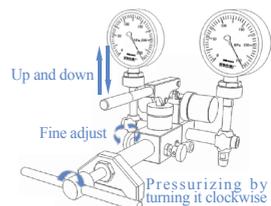
- C** Set F-adjust valve to the mid position,and for lead screw,turn all the way out.



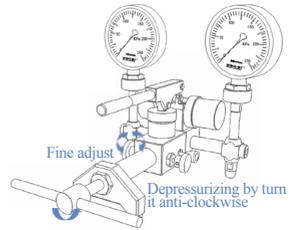
- D** Record 0bar record and close the relieve valve,make sure to close shut-off valve. Providing pressure about 0.4bar by hand pump up and down,then adjust the F-adjust valve to calibration standard point(0.5bar).



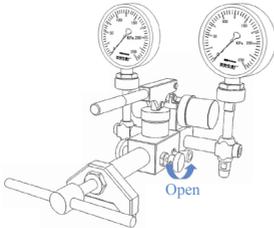
- E** Use the hand pump (or together with lead screw)to make pressure value close to next standard point,and adjust F-adjust valve to get exact values.Pressure rising &stabilize to 1bar,1.5bar,2bar,2.5bar in turn. Meanwhile,record the data.



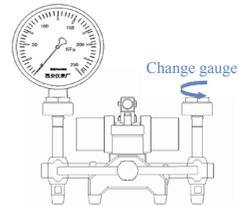
F Loop calibration: Decrease pressure by turning lead screw anti-clockwise (or together with relieve valve), and adjust the F-adjust valve to get exact values. Record the data when the pressure stabilize on 2bar, 1.5bar, 1bar, 0.5bar and so on.



G Finish the loop calibration and open the relieve valve to release the pressure.



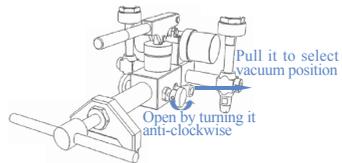
H Change gauge under test and calibration the next one.



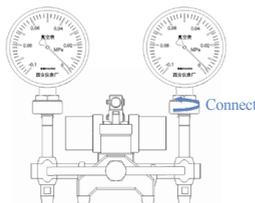
For example(2):

Take vacuum pressure gauge as example (The calibration points: 0bar, -0.2bar, -0.4bar, -0.6bar, -0.8bar, -0.95bar)

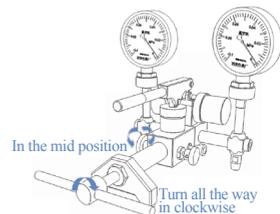
A Put HS701 on the level; Turn the relieve valve anti-clockwise to open it and make sure the reverse valve is in vacuum position.



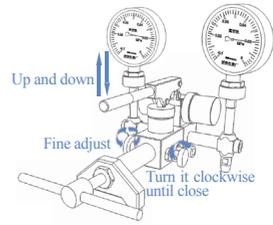
B Remove the plugs of outputs. Connect the standard gauge and the gauge under test to the two output interfaces separately, it must firm in place. Otherwise, it will be leakage.



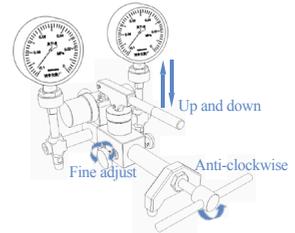
C Set F-adjust valve to the mid position, and for lead screw, turn all the way in.



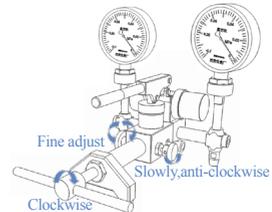
D Record 0bar record and close the relieve valve.make sure to close shut-off valve. Providing pressure by hand pump and lead screw let pressure near -0.2bar,then adjust the F-adjust valve to get exact pressure value.



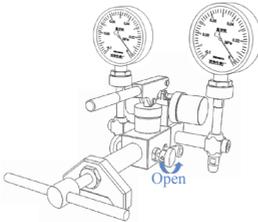
E Use the hand pump lead screw and F-adjust valve to calibrate other calibration points (-0.4bar,-0.6bar,-0.8bar).If the pressure value is up to -0.92bar,please create pressure by turning lead screw anti-clockwise until full scale.



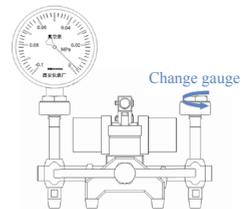
F Loop calibration:Pressurize pressure by turning lead screw clockwise (or together with relieve valve), and adjust the F-adjust valve to get exact values .Record the data when the pressure stabilize on -0.8bar,-0.6bar,-0.4bar, -0.2bar and so on.



G Finish the loop calibration and open the relieve valve to release the pressure.



H Change gauge under test and calibration the next one.



i Remark:

1.Hold the lead screw,turn in and out slowly to complete fine adjustment.

2. Please put on the plugs after all the tests have been finished.
3. Above pictures are just for reference.

NOTES:

1. There must be no pressure in the system when removing pressure gauge.
2. Replace the O-rings regularly.
3. The items is non-oil equipment. please don't mix any liquid.
4. The reverse valve will switch the correct position before the pressure generating. If that, that will leak and do not generate pressure.

6. Troubleshooting

There may be some faults of HS701 mentioned below after long term use, the maintainer can analyse and eliminate problems by these methods. Make sure to release all pressure of system. It is forbidden to disassemble and repair the product with pressure.

Faults	Cause	Solution
Leakage	The reverse valve (positive / vacuum) is not in the right position	Push/pull the reverse valve to the right position
The hand pump is up	There is impurity in the instrument	Disassembling and cleaning
Hand pump couldn't generate pressure	The reverse valve (positive / vacuum) is not in the right position	Push/pull the reverse valve to the right position
The pressure is instability, the standard gauge depressurized quickly	Check the instrument to make sure there is no leakage of working medium. Otherwise the O-ring is damaged or there is connection loosening	Replace O-ring, or reassemble
	Pressurize without gauge under test. If the instrument doesn't leak pressure, this indicates problem with gauge under test. Otherwise there is problem with device or standard gauge. Check the standard gauge and device separately	Replace standard gauge or gauge under test

7. Maintenance

7.1.If this equipment will be in idle for a long time, please turn the lead screw clockwise till it could not move anymore,close the relieve valve and put on the plugs.Provide pressure about 2bar by running the hand pump.

7.2.If HS701 needs to take a long distance transport,please put on all plugs to prevent leakage of air.It is necessary to pack with specialized cartons and foam wrap.

7.3.The items belongs to non-oil equipment,It is forbidden to calibrate oil gauge. Operate the lead screw and hand pump regularly.

8. Support

The product specifications and other information contained in this manual are subject to change without notice,if you have any questions,please call our services hotline:400 611 3558 or Tel:+86-10-62392087

HUAXIN Products series

Digital Pressure Gauge

HX601/HS108

Intelligent Pressure Calibrator

HS602

Pressure Comparator

HS700(-0.5-0.5)bar

HS701(-0.95-6)bar

HS702(-0.95-16/25)bar

HS703(-0.95-40/60)bar

HS720(0-140)bar

HS704 (0-160/250)bar

HS705/HS705A(0-600/700)bar

HS710/HS710A(0-600/700)bar

HS706(0-1600/2500)bar

Electrical Pressure Comparator

HS318L(0-600)bar 5pcs output

HS316L(0-25)bar 5pcs output

HS317L(0-60)bar 5pcs output

HS315(-0.95-0)bar 2pcs output

HS316(0-25)bar 3pcs output

HS318(0-600)bar 3pcs output

Automatic Pressure Calibrator

HS620(-0.1-1)bar, (-0.95-25)bar

Sphygomanometer Calibrator

ME01 & ME02

Temperature Calibrator

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