Sino Instruments
华 信 仪 表

User manual

Digital Pressure Gauge

HS108

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

Warning

In order to protect your Huaxin products,your own and others safety,pls read this manual carefully before your operation,Otherwise it may cause trouble.

① Please don't disassemble & repair the equipment by yourself

Disassembling the inner components may take toll or completely damage the equipment. Only the qualified technician could make a repairment. Any abnormal happened to the equipment pls call our service staff to make a repairment under their instruction.

②Pay attention to the range

To avoid over pressure damages,don't apply pressure that exceeds the limits listed in the pressure specification table.

③ Don't beat and shock

This action might injure the product and influence the performance.

④ Pay attention to the medium of the items

That will damage the items by using the wrong medium.

⑤ Don't immersed in water or exposed to water or getting wet

That will damage the items.and even may cause the fire or an electric shock.

⑥ Only use the special charger or battery

Other power supply will damage to the product,and even may cause the fire or an electric shock.

⑦ The calibration should be carried out under a standard calibration condition

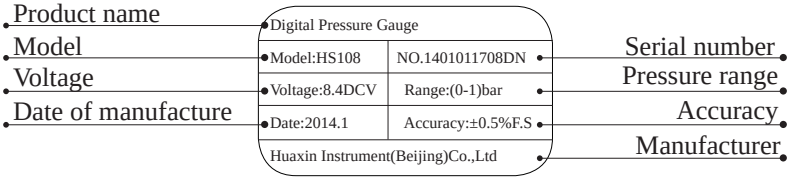
The calibration should be carried out under a standard calibration condition, such as the standard gauge must be accuracy 3 times of HS108, ambient temperature (20±2)℃ .

Symbols

Symbols used on the product and in the menu

Symbol	Meaning	Symbol	Meaning
⚠	Indicates warning	CE	Conforms to European Union directives
ⓘ	Indicates important information	Ex	Conforms to standard of PCEC

Labelling,Safety Marks



1.Summary

HS108 is a high-precision single-range digital pressure gauge, which is composed of high-precision measurement chips, temperature measuring circuit&battery&voltage measuring circuit and intelligent digital pressure module.

Every HS108 pass the high and lower temperature aging,so it could assure the products more accurate and reliable.the product combines a variety of accuracy levels to meet the customer requirments.it provides an accurate,reliable and economic solution for pressure application.

This product can be used for real-time measurement of pressure value and as a pressure reference or in applications where high accuracy measurement is required.

Characteristics

- Pressure range to 2500bar
- High accuracy up to ±0.025%F.S
- Large,easy to read dual display with 6-digit resolution
- White backlight and RS232 communication port
- Various Pressure Units selectable
- Zero Point,Full Scale calibration function
- Max/Min values function
- %Pressure indication with bar graph
- 7.4Vdc rechargeable lithium battery or AC adapter
- Data logging fuction,store measuring value
- Auto Off can be set
- The backlight time is adjustable
- Temperature compensating
- A compact cost effective pressure gauge in various application regions
- Wetted parts:316 Stainless steel
- Dimension:Φ95mmx49mm
- Total height:166(mm)
- Weight:0.75kg

2.Technical Specification

- **Model**
  HS108 Digital Pressure Gauge
- **Accuracy**
  ±0.025% F.S
  ±0.05% F.S
  ±0.1%F.S
- **Gauge types**
  Gauge pressure
  Compound pressure
  Absolute pressure
  Differential pressure
- **Work medium**
  Oil, water&noncorrosive gases
- **Over pressure alarm**
  120%Full Scale
- **Display**
  Description: 6 digits big LCD with blacklight Display rate:Less than 0.025% of full scale is 150ms .More than 0.025% of full scale is 1s
  Numeral display height:16.5mm (0.65")
  %indication with bar graph scale for visual reference
  A battery icon indicates the power
- **Pressure unit**
  psi, bar, mbar, kgf/cm^2,Pa, kPa, MPa, mmH_2O, mmHg
- **Temperature**
  Compensated temperature:
  -10°C to 50°C
- Operating temperature:-10℃ to 50℃
  Humidity: <95%
  Storing temperature:-20°C to 70°C
- **Pressure connection**
  1/4NPT male
  M20×1.5 male
  Other connections customized
- **Power**
  Battery:One piece lithium battery & charger
  Battery life:80 hours
- **Housing**
  Case material:Plastic
  Wetted parts:316 Stainless steel
- Dimension:Φ95mmx49mm
  Total height:166(mm)
  Weight:0.75kg
- **Data storing**
  Storage capacity :
  Calibration record of 30pcs gauge under test
- **Communication**
  RS232
- **Certificate**
  CE . . . . . CE
  EX . . . . . Ex

Gauge pressure

No.	Pressure Range		Accuracy	Media
	(psi)	(bar)		
HS108-1	(0-10)	(0-0.7)	0.025,0.05,0.1	G
HS108-2	(0-15)	(0-1)	0.025,0.05,0.1	G
HS108-3	(0-30)	(0-2)	0.025,0.05,0.1	G,L
HS108-4	(0-60)	(0-4)	0.025,0.05,0.1	G,L
HS108-5	(0-100)	(0-7)	0.025,0.05,0.1	G,L
HS108-6	(0-200)	(0-14)	0.025,0.05,0.1	G,L
HS108-7	(0-300)	(0-20)	0.025,0.05,0.1	G,L
HS108-8	(0-500)	(0-35)	0.025,0.05,0.1	G,L
HS108-9	(0-600)	(0-40)	0.025,0.05,0.1	G,L
HS108-10	(0-1000)	(0-70)	0.025,0.05,0.1	G,L
HS108-11	(0-2000)	(0-140)	0.025,0.05,0.1	G,L
HS108-12	(0-3000)	(0-200)	0.025,0.05,0.1	G,L
HS108-13	(0-5000)	(0-350)	0.025,0.05,0.1	G,L
HS108-14	(0-6000)	(0-400)	0.025,0.05,0.1	G,L
HS108-15	(0-10000)	(0-700)	0.025,0.05,0.1	G,L
HS108-16	(0-15000)	(0-1000)	0.025,0.05,0.1	G,L
HS108-17	(0-24000)	(0-1600)	0.05,0.1	G,L
HS108-18	(0-37000)	(0-2500)	0.05,0.1	G,L

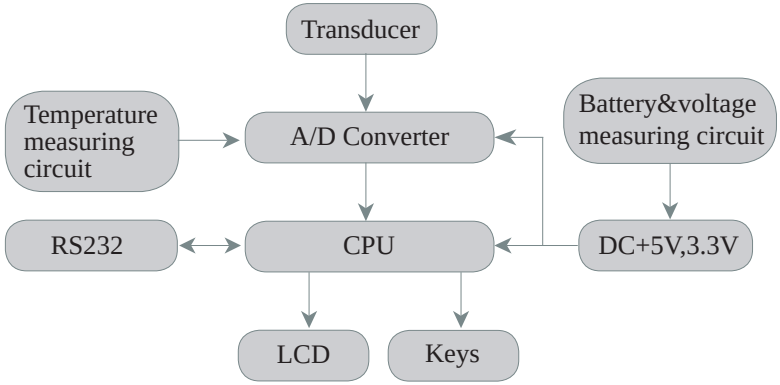
Compound pressure

No.	Pressure Range		Accuracy	Media
	(psi)	(bar)		
HS108-19	(-0.4-0.4)	(-0.025-0.025)	0.025,0.05,0.1	G,L
HS108-20	(-0.8-0.8)	(-0.05-0.05)	0.025,0.05,0.1	G,L
HS108-21	(-1.5-1.5)	(-0.1-0.1)	0.025,0.05,0.1	G,L
HS108-22	(-6-6)	(-0.4-0.4)	0.025,0.05,0.1	G,L
HS108-23	(-15-15)	(-1-1)	0.025,0.05,0.1	G,L

Remark:G=Gas,L=Liquid

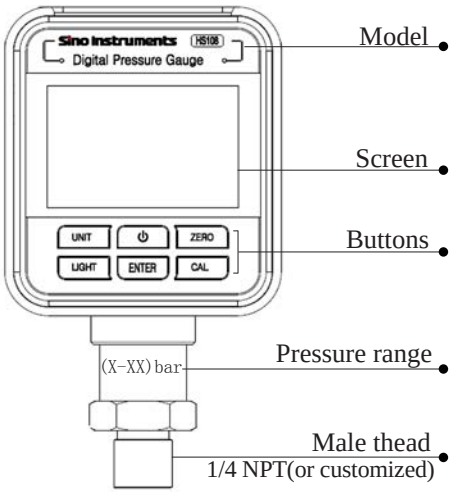
3.Working Principle

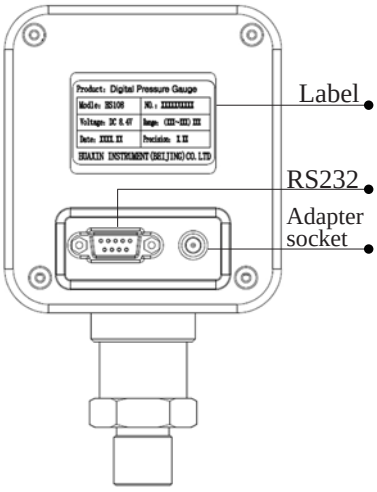
Apply pressure to the pressure transducer,it outputs a electrical signal. First the corresponding electrical signal will be amplified.and then it will be converted to digital data by A/D converter.Then the microprocessor sequentially collects data to modify and correct,the final result will be displayed on the LCD Display.

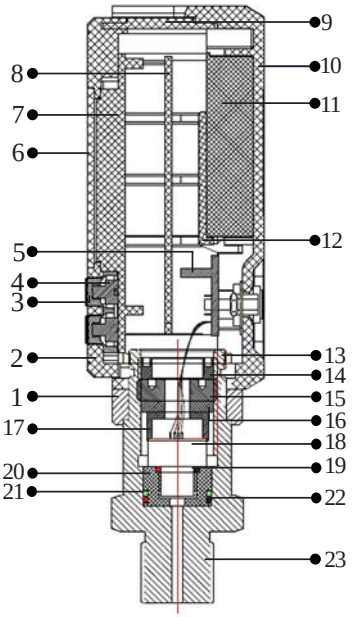


4. Install Operation

4.1 Basic structure







1.Back cover insert	13.Lock nut
2.Front cover	14.Press cover
3.Key-press panel	15.Hole press cover
4.Button switch	16.Support pad for sensor
5.Power strip	17.Reinforcing pad for sensor
6.Front view window	18.Sensor
7.LCD	19.O-ring 9×1.8
8.PCB	20.High pressure sealing
9.Plugging terminal panel	21.Check ring 19
10.Back cover	22.O-ring 16×1.8
11.Li-ion battery pack	23.Sensor connector
12.Cover battery plate	

4.2 Button&terminal Introduction

LIGHT Back light.

UNIT Starting unit is kPa, press this key to switch unit circularly among mmHg、mmH_2O、bar、mbar、psi、kgf/cm^2、MPa and Pa.

ZERO Press this key to clear current value as zero drift value. Then this gauge would be already in a clearing zero status when you start it up again.

CAL Press this key for zero point and full scale calibration and linear revision to insure the accuracy.(ⓘ Do not use the key when there are no necessary calibration equipments available.)

ENTER Confirm key,digital confirm key in menu.

Connection terminals:

RS232 for PC.

DC8.4V Charging input DC8.4V.

4.3 Display

The HS108 screen definitions:

- PC icon:the mark of PC connection
- Battery icon:indicates state of charge
- Voltage area:the current voltage
- Temperature area:current temperature
- Pressure display:displays data and menu.
- Units:9 pressure units selectable
- Bar graph:displays the pressure process

4.4 Installation method

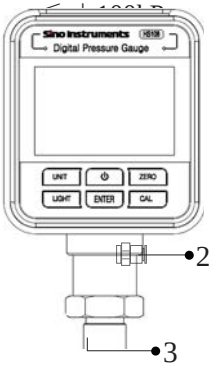
① Connect gauge under test and HS108 on the pressure comparator.

② According to calibration regulation, make HS108 as standard gauge to finish the whole calibration process.

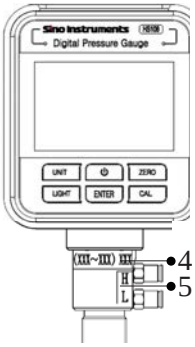
4.5 The gauge type

No.1:Gauge pressure

No.2:Gauge pressure Ra



No.3:Differential pressure



① Connecting pressure generator
② Open to air
③ Connecting pressure generator
④ High pressure
⑤ Low pressure

4.6 The Max/Min valve display

(1) In Measuring interface,press ENTER;enter into basic setting interface of Min value.

(2) Press ENTER again,enter into basic setting interface of Max value.

(3) Press ENTER once more and get back to the Measuring interface.

4.7 Changing the original pressure unit

(1) In Measuring interface,press CAL;enter into the interface of displaying Min value.

(2) Press CAL,enter into the Unit interface.

(3) Press CAL,enter into the Unit choose interface(Unit flashing).

At this time, the unit displayed is client measuring interface unit. maybe that is not match with the unit kPa in above pic.

(4) Press Zero and choose the Unit you need.(if you choose the unit Pa)

ⓘ Remark :Displaying unit,Pa、kPa、MPa.

(5) Press ENTER key,and save the current set.

(6) Press LIGHT three times continuously and back to the measuring interface.

4.8 Temperature modification display

(1)In Measuring interface,Press CAL,enter into basic setting interface.

(2) Press CAL,and enter into the Unit interface.

(3) Press ZERO three times enter into temperature interface below.

(4) Press CAL,enter into data modified interface.The fist character("-") located in activated interface.(No flashing)

(5) If you modify the activated value ,press ZERO and display"-"(flashing).If you do not need modify activated values,please enter into next step directly.

(Minus)

(6) Press CAL,next character located in activated interface. (Flashing)

When decimal point bit flashing, press ZERO for setting decimal point.

When the number flashing, press LIGHT for decreasing number from 9 to 0,press ZERO for increasing number from 0 to 9.

After selecting your number, repeat step(6).

(7) Repeat step (6),until the last bit.

(8) Press ENTERkey,and save the current set.

(9) Press LIGHT twice continuously band back to the measuring interface.

4.9 COM Communication setting

(1) In Measuring interface,press CAL and enter into basic setting interface.

(2) Press CAL,enter into the Unit interfac.

(3) Press ZERO key,and selecting menu,enter into setting interface below.

(4) Press CAL,switching ON/OFF.
ON-1(Automatic)and ON-2(Semi-automatic)

(5) Press LIGHT twice continuously .and back to the measuring interface.

4.10 Digital Display setting

(1)In Measuring interface,Press CAL key,enter into basic setting interface.

(2) Press CAL,enter into the Unit interface.

(3) Press ZERO,and selecting menu, enter into setting interface below.

(4) Press CAL,switching circularly4、5、6 bit.

(5) Press LIGHT twice continuously,and back to the measuring interface.

4.11 Backlight time adjustment

(1)In Measuring interface,press CAL key,enter into basic setting interface.

(2) Press CAL,enter into the Unit interface.

(3) Press ZERO(Press 6times zero),and selecting menu, enter into

(4) Press CAL key,the interface display in cycle:ON/15-S/30-S/45-S/60-S(UNIT:SECOND).

(5) Press LIGHT twice continuously ,and back to the measuring interface.

4.12 The Auto off setting

(1)In Measuring interface,press CAL key,enter into basic setting interface.

(2) Press CAL,enter into the Unit interface.

(3) Press ZERO(Press 7times zero),and selecting menu,enter into

(4) Press CAL key,the interface display in cycle:OFF/15/30/45/60/90/120(UNIT:MINUTE).

(5) Press LIGHT twice continuously ,and back to the measuring interface.

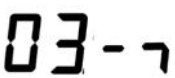
4.13 Displaying speed set

(1))In Measuring interface,press CAL key,enter into basic setting interface.

(2) Press CAL,enter into the Unit interface.

(3) Press ZERO (Press 8times zero), find “speed”.

(4) Press CAL key, and switching 10-T、03-T、02-T、01-T (UNIT:times/s).



(5) Press Light twice continuously.and back to the measuring interface.

4.14 Factory reset

If the items does not work by making a mistake ,that could be factory reset.

(1)In Measuring interface,press CAL key,enter into basic setting interface.

(2) Press CAL,enter into the Unit interface.

(3) Press ZERO button continuously,and then enter into factory reset interface.

(4) Press Enter,enter into restoring interface,after data restoring, that back to restoring to start up layout.

(5) Press Light twice continuously.and back to the measuring interface.

5. Calibration

ⓘ The calibration should be carried out under a standard calibration condition, such as the standard gauge must be accuracy 3 times of HS108, ambient temperature (20±2)℃ .

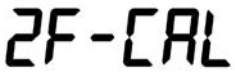
5.1 Pressure Low point, High Point Calibration

(1) Pressure input add low point standard pressure.

(2) Waitting for pressure stability.

(3) In Measuring interface,Press CAL,enter into basic setting interface.

(4) Press ZERO key,enter into pressure low point, high Point calibration Interface.



(5) Press CAL,enter into pressure low point calibration(Press ZERO button,enter into pressure high point calibration)interface.

(6) Press CAL,enter into low point calibration data modify interface.

(7) Refer“4.8(7) step of Temperatue modification displaying”and amend low point pressure data(if the gauge had stored data,that do not amend,you may press CAL directly).

(8) Press CAL input the data ,waiting for standard pressure stability.

(9) Press ENTER,save low point calibration data and return low point calibration interface.

(10) Press ZERO,enter high point calibration interface.

(11) Pressure input add high point standard pressure.

(12) Waitting for pressure stability.

(13) Press CAL,enter into high point calibration data modify interface.

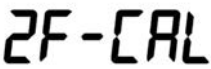
(14) Refer“4.8(7) step of Temperatue modification displaying” and amend high point pressure data（if the gauge had stored data,that do not amend,you may press CAL directly).

(15)Press CAL input data, waiting for standard pressure stability;Press ENTER,save high point calibration data and return high point calibration interface.

(16)Press LIGHT twice continuously. and then back to measuring interface.

5.2 Clear two point modification value

(1) In Measuring interface,Press CAL once time,and then press ZERO once time, that will display below.



(2) Press CAL once time,and then press ZERO twice,that will display below.

(3) Press ENTER once time, the interface have not any change .the clear is over.

(4) Press LIGHT twice,saving and returning measuring interface.

5.3 Clearing clear zero value

(1) In Measuring interface,Press CAL once time,and then press ZERO twice,that will display below.

(2) Press CAL once time,that will display below.

(3) Press ENTER once time,the interface have not any change.the clear is over.

(4) Press LIGHT twice,saving and returning measuring interface.

5.4 Clearing secondary modification sign

(1) In Measuring interface,press CAL once time,and then press ZERO twice, that will display below.

(2) Press CAL once time, that will display below.

(3) Press ZERO once time, that will display below.

(4) Press ENTER once time, the interface have not any change .the clear is over.

(5) Press LIGHT twice， saving and returning measuring interface.

5.5 Clear temperature modification value

(1) In Measuring interface,Press CALonce time,and then press ZERO twice,that will display below.

(2) Press CAL key once time, that will display below.

(3) Press ZERO twice,that will display below.

(4) Press ENTER once time,the interface have not any change.the clear is over.

(5) Press LIGHT twice,saving and returning measuring interface.

6.Maintenance

6.1 Maintenance of instruments

(1) Pay attention to the pressure range selected while measuring.Don't allow it work under over pressure environment;Over pressure alarm limit of the gauge is 1.1 times of the full-scale;

(2) The using environment had to satisfied the manual demand,the user can operate by manual.

(3) Make sure the normal display,the screen shows the upper limit of HS108.if it does not match with the label on the gauge,pls contract with supplier.

(4) HS108 adopt the built-in DC7.4V rechargeable lithium battery. Automatically cut off power if the voltage is very low. Please charge in this case. when the item is charging,that displays red light. once it is completely charged,that displays green light.Please take out the power adapter.

6.2 Attention items

(1) Pls operate under the manual.

(2)⚠ HS108 is high precision measuring instrument, please don't free to beat, shock,disassemble and poke the metal diaphragm of sensor and pressure hole with sharp ware.

(3)⚠Self-disassembling is forbidden.

(4)⚠Please don't use it in high temperature and high humidity environment.With improvement of technology,the products performance will be adjusted without notice.

7.Accessories List

No.	Name	Qty	Unit
①	Test report	1	Copy
②	Packing list	1	Copy
③	Operation manual	1	Copy
④	Certificate of conformity	1	Copy

8.Standard

Factory produce manometer by the standard Q/CPHXF003-2014.

9.Support

The product specifications and other information contained 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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