

User manual

Digital Pressure Gauge

HX601



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, please 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.

② Pay 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 Pls operate in proper environment



 Don't use the product around explosive gas,vapor,or in damp or wet environments.

⑥ The calibration should be carried out under a standard calibration condition

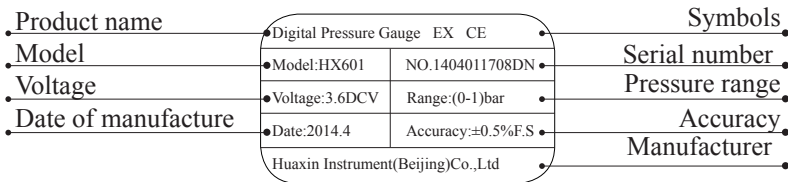
 The calibration should be carried out under a standard calibration condition, such as the standard gauge must be accuracy 3 times of HX601, ambient temperature (20±2)°C .

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



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1.Summary

HX601 digital pressure gauge adopts micro power components and unique software processing technology. Adopting Lithium battery power, it could work 24 hours continuously for one year. With 5-digit large crystal screen, the date could be showed more clearly. Every HX601 has passed the high and lower temperature aging thus to ensure more reliable precision. The compact industrial design and advanced technology makes it an ideal pressure measurement tool.

HX601 is designed to offer a truly compact cost effective digital pressure gauge to cover a widely range of applications. The product has been used in the industries of power, chemical, petrol, metallurgy, metering, etc. It mainly used for calibrating the Precision Pressure Gauge, General Pressure Gauge and so on.

Characteristics

- High Accuracy to 0.05%F.S
- Rang from vacuum to 10000psi /700bar
- Low Power Consumption
- Rugged aluminum alloy cover
- 5 Digit big LCD with high resolution
- Various Pressure Units selectable
- Temperature compensating
- Zero Point, Full Scale calibration function
- White backlight would be turned off automatically after 5s
- Adopt the special software treatment technology, unnecessary to preheat
- RS232 Communication port, which could communicate with the computer
- % indication with bar graph scale scale for visual reference
- Overload alarm function
- Stainless steel bottom connection for robustness
- Dimension: $\Phi 93\text{mm} \times 41\text{mm}$
- Total height: 134(mm)

2. Technical Specification

- **Pressure measurement range**
(-1-700)bar (pls see the selection table)
- **Accuracy**
±0.05%F.S
±0.1%F.S
±0.2%F.S
±0.5%F.S,etc
- **Gauge types**
Gauge pressure
Compound pressure
Absolute pressure
Differential pressure
- **Work medium**
Oil, water&noncorrosive gases
Over pressure alarm
110%Full Scale
- **Display**
5 digits big LCD with backlight
3 readings per second(Default setting)
Numerical display height:14mm
- **Working Environment**
Compensated temperature:
(-10-50)°C
Operating temperature:(-10~50)°C
Relative Humidity: <95%
Storing temperature:(-20-70)°C
Barometric Pressure: (86~106)kPa
- **Pressure connection**
1/4NPT male

M20X1.5

Other connections customized

- **Power**
Battery:A piece of disposable battery
DC3.6V lithium battery
The life of battery:About >1000 hours
The alarm of low battery:A battery icon
- **Housing**
Case material:Aluminium
Wetted parts:316 stainless steel
Dimension:93mmx41mm
Total height:134(mm)
Weight:0.5kg
- **Communications**
RS232
Don't be used in hazardous area.
- **Additional functions**
9 Pressure Units selectable
Zero point,full scale calibration function
Adopting the special software treatment technology,it is unnecessary to preheat
Overload alarm function
Temperature compensating %indication with bar graph scale for visual reference
CE **CE**
EX **Ex**
ISO17025 lab calibration certificate

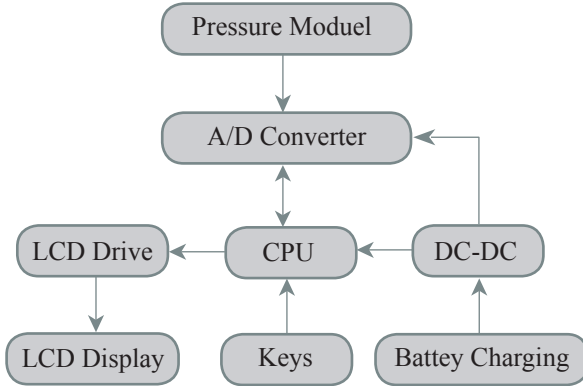
Gauge pressure				
No.	Range (bar)	Accuracy (% FS)	Media	Pressure Type
HX601-1	(-1-0)	0.05,0.1,0.2,0.5	G	G
HX601-2	(0-0.4)	0.05,0.1,0.2,0.5	G	G
HX601-3	(0-0.6)	0.05,0.1,0.2,0.5	G	G
HX601-4	(0-0.7)	0.05,0.1,0.2,0.5	G	G
HX601-5	(0-1)	0.05,0.1,0.2,0.5	G	G,A
HX601-6	(0-1.6)	0.05,0.1,0.2,0.5	G,L	G,A
HX601-7	(0-2)	0.05,0.1,0.2,0.5	G,L	G,A
HX601-8	(0-2.5)	0.05,0.1,0.2,0.5	G,L	G,A
HX601-9	(0-3.5)	0.05,0.1,0.2,0.5	G,L	G,A
HX601-10	(0-4)	0.05,0.1,0.2,0.5	G,L	G,A
HX601-11	(0-6)	0.05,0.1,0.2,0.5	G,L	G,A
HX601-12	(0-7)	0.05,0.1,0.2,0.5	G,L	G,A
HX601-13	(0-10)	0.05,0.1,0.2,0.5	G,L	G,A
HX601-14	(0-16)	0.05,0.1,0.2,0.5	G,L	G,A
HX601-15	(0-20)	0.05,0.1,0.2,0.5	G,L	G,A
HX601-16	(0-25)	0.05,0.1,0.2,0.5	G,L	G
HX601-17	(0-35)	0.05,0.1,0.2,0.5	G,L	G
HX601-18	(0-40)	0.05,0.1,0.2,0.5	G,L	G
HX601-19	(0-60)	0.05,0.1,0.2,0.5	G,L	G
HX601-20	(0-70)	0.05,0.1,0.2,0.5	G,L	G
HX601-21	(0-100)	0.05,0.1,0.2,0.5	G,L	G
HX601-22	(0-160)	0.05,0.1,0.2,0.5	G,L	G
HX601-23	(0-200)	0.05,0.1,0.2,0.5	G,L	G
HX601-24	(0-250)	0.05,0.1,0.2,0.5	G,L	G
HX601-25	(0-350)	0.05,0.1,0.2,0.5	G,L	G
HX601-26	(0-400)	0.05,0.1,0.2,0.5	G,L	G
HX601-27	(0-600)	0.05,0.1,0.2,0.5	G,L	G
HX601-28	(0-700)	0.05,0.1,0.2,0.5	G,L	G

Compound pressure				
No.	Range	Accuracy	Media	Pressure Type
HX601-29	(-0.025-0.025)	0.05,0.1,0.2,0.5	G	D,G
HX601-30	(-0.05-0.05)	0.05,0.1,0.2,0.5	G	D,G
HX601-31	(-0.1-0.1)	0.05,0.1,0.2,0.5	G	D,G
HX601-32	(-0.25-0.25)	0.05,0.1,0.2,0.5	G	D,G
HX601-33	(-1-1)	0.05,0.1,0.2,0.5	G	D,G
HX601-34	(-1-6)	0.05,0.1,0.2,0.5	G,L	G
HX601-35	(-1-10)	0.025,0.05,0.1,0.2,0.5	G,L	G
HX601-36	(-1-25)	0.025,0.05,0.1,0.2,0.5	G,L	G

Remark:G=Gauge pressure A=Absolute pressure D=Differential pressure

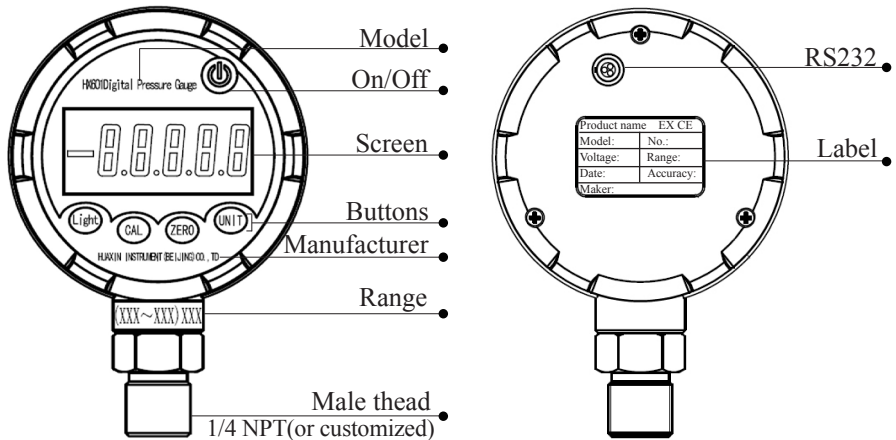
3. Working Principle

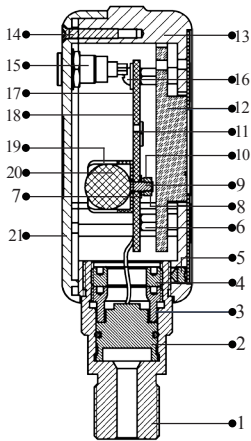
Having applied a pressure to the pressure module it outputs a electrical signal. First the corresponding electrical signal will be amplified .and then it will be converted to digital data by A/D converter. The microprocessor then sequentially collects data and then applies the required processing to the data, the final result will be displayed on the LCD screen.



4. Install Operation

4.1 Basic structure





1.Sensor connector	12.LCD
2.Sensor	13.Front cover
3.Press cover(1)	14.Countersunk head screw M3X10
4.Press cover(2)	15.RS232
5.Jackscrew M5X5	16.Screw M3X6
6.Copper cylinder	17.Insulating matØ3
7.Plain washer Ø3	18.PCB
8.Spring washer Ø3	19.Box of single battery
9.Countersunk head screw M2.5X8	20.Lithium battery 14500
10.Nut M2.5	21.Back cover
11.AD	

4.2 Keys Function Instructions

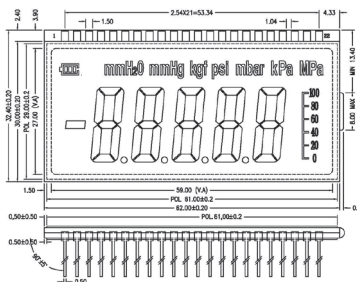
LIGHT Press this key to turn on the white back-light .This product is a low-power consumption gauge,then the back light turns off after 5 seconds.

UNIT Press this key to switch pressure unit from kPa, MPa 、 Pa 、 psi、 kgf、 bar、 mbar、 mmH₂O、 mmHg.

ZERO Press this key to clear pressure value as its value drifts from zero .Then the gauge will be in a zero status when it is started next time.

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)

4.3 Display



The HX601 screen definitions:

- Battery icon:indicates state of charge
- only been seen when there is low power
- Pressure display:displays data and menu
- Units:9 common pressure units
- Bar graph:displays the pressure process

4.4 Pressure measuring method

- (1) Install the pressure gauge on the pressure generator; Check the range of digital pressure gauge before the connection is made.
- (2) Apply pressure to the gauge up to its full scale smoothly, then after maintaining that pressure for 1 to 2 minutes, relieve the pressure until it falls back to zero. Redo the process for three more times before the measurement.
- (3) Press UNIT key to select desired pressure unit.

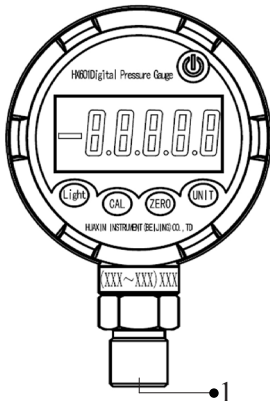
4.5 Installation method



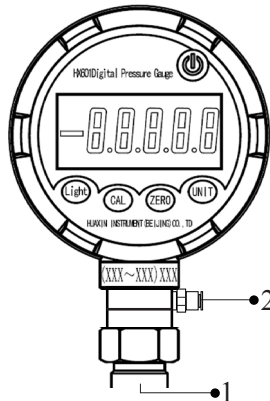
- ① Connect gauge under test and HX601 on the pressure comparator.
- ② According to calibration regulation, make HX601 as standard gauge to finish the whole calibration process.

4.6 The gauge type

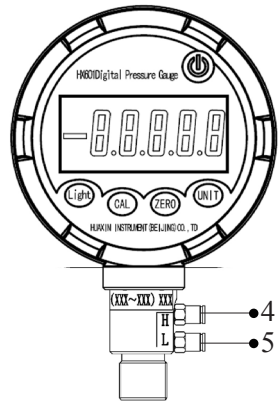
No.1:Gauge Pressure



No.2:Gauge Pressure
Rang: $\leq \pm 100\text{kPa}$



No.3:Differential Pressure





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

4.7 Operation and adjustment

- (1) Install the pressure gauge to pressure generator as a standard gauge; Check the range and accuracy of digital pressure gauge before connection, and make sure it meets the ranges of gauges under test.
- (2) Check the O ring of outputs of pressure generator, if it damages, please change it in time. When you install the standard gauge to pressure comparator, please tighten it by hand or by wrenches.
- (3) Press UNIT to view and select the unit and start to measure.
- (4) Apply pressure to the gauge and make the pressure stay in the range of pressure point as required. After the readings are stable, adjust the gauge under test or compare pressure values.
- (5) Please release the pressure of pressure generator before you remove the instrument.

5. Calibration

- (1)  Check the range of sensor module.
- (2)  Don't press the CAL easily! This key should be used when recalibrate the item.

5.1 The problems in the process of operation

The display value of gauge may be different with the actual ones for the following reasons:

- (1) The install location of pressure gauge.
- (2) The pressure standard of user are different with maker.
- (3) Under the influence of overload, over-temperature, time drift, the sensor performance can be changed.

5.2 The operation items can be calibrated

(1) Two point modification.

Import the low pressure value,press CAL and the cursor blinks.Press ZERO to select the number (1-9),press LIGHT to select the data position. Press ZERO or LIGHT until the display is as following:

kPa
00001

Then enter into interface of low point modification.Press CAL key to confirm it. Import the high pressure value,press CAL key and the curso blinks.Press ZERO or LIGHT until the display is as flowing:

kPa
00002

Then enter into interface of high point modification.Press CAL key to confirm it.

(2) Modify the ranges.

(The ranges of gauge after changing must be in the scope of senor ranges,the accuracy of measurement will be calibrated in the original ranges):

Press CAL and the cursor blinks,refer to “Two points modification” ,press ZERO or LIGHT until the display is as flowing:

kPa
00003

Press CAL key,then enter the interface to set the low limitation.Press ZERO or LIGHT and input the value;Press CAL enter the interface to set the upper limitation. Press ZERO or LIGHT and input the value.

(3) Clear the modification.

Press CAL and the cursor blinks,then press ZERO or LIGHT until the display is as following.

kPa
00004

Press CAL key to confirm the operation.

(4) Modification of pressure points.

Press CAL button and the cursor blinks,refer to “Two points modification” ,press ZERO or LIGHT until the display is as flowing:

kPa
12345

Press the CAL to confirm it, then enter into mode of the first point modification. Apply appropriate pressure to HX601 according hints. Press CAL after it is stable.

5.3 The process of modification

(with 1000kPa, 6 points, for example)

- (1) Relieve the pressure of generator until it falls back to zero, press CAL then the bottom of screen shows “200kPa”;
- (2) Apply pressure to generator up to 200kPa, press CAL after it is stable, then shows is “400kPa”;
- (3) Apply the pressure to generator up to 400kPa, press CAL to confirm after it is stable;
- (4) Apply the full-scale pressure to the gauge. Press CAL after it is stable. The modification is completed.

6. Troubleshooting

6.1. The analysis diagnosis, shooting ways to normal faults

(1) Common fault 1: failure to boot As this issue is encountered, the repair should be carry under the following circumstances:

1>Is the usage time near or above 2 years?

The battery is burning and closing to its life if the usage time is too long, pls open back cover and replace the battery with a new one.

2>Do you always use it in hot and humid environment(HHE)?

HHE can speed up the normal aging process of battery and switch buttons circuit. Open the cover to observe whether the wedding spots begin to oxidize, or rust, then change the battery and reboot. if it still would not work, connect with our after sales for a favor.

3>Do you always use it in the low temperature?

If it works at low temperature circumstance for a long term, that will speed up the consumption of battery and reduce the lifetime. Open the back cover and remove the battery, check its voltage to see if it is below 3.6V, or even 3.3V. As the battery voltage is low, even can not turn on. You need to change the battery.

4>Switch on/off frequently?

This act speed up the abrasion of switch button, it can make bad contact. In this

case, it is necessary to contact supplier.

(2) The normal fault 2: There is battery symbol displayed in the screen after open the product.

This case means the battery is running low, that you need to replace the battery.

(3) The normal fault 3: The displayed value of pressure gauge doesn't match the actual figure, refer "5 Calibration" to deal with it.

6.2. The analysis diagnosis , shooting ways to special faults

(1) Unable to reset.

(2) Unable to calibrate.

(3) There is no change to apply pressure.

(4) The display value of gauge is large when there is no pressure.

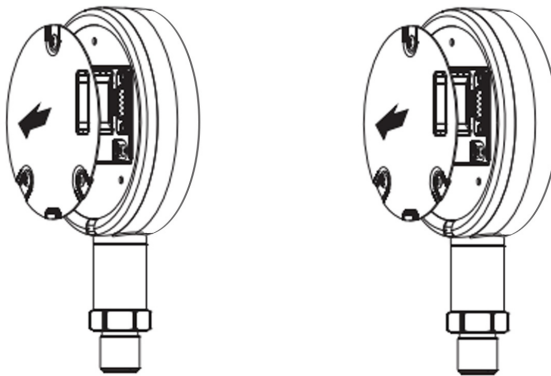
If there are the faults above-mentioned or others, pls connect with supplier.

7. Maintenance




7.1 Battery change

Please turn off the instrument before changing the battery. Open the cover, take out the battery and change new one.

Sees figure:



Replace the battery if the battery icon appears.

-  Remove the HX601 from Ex-hazardous area before opening the cover.
-  Use only the 3.6VDC Li-battery.
-  When replacing the battery ,make sure the positive and negative are in the right direction.

7.2 The maintenance of instrument

- (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 gauge uses one piece of disposable DC3.6V lithium battery as its power supply, when the screen displays the battery symbol, it indicates that the gauge is lack of battery power, replace the battery promptly.
- (3) Don't use the gauge in HHE for a long time.

8.Accessories List

No.	Name	Qty	Unit
①	Test report	1	Copy
②	Packing list	1	Copy
③	Warranty card	1	Copy
④	Operation manual	1	Copy
⑤	Certificate of conformity	1	Copy

9.Standard

Factory produce manometer by the standard Q/CPHXF002-2013.

10.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(-05.-0.5)bar

HS701/HS701-1 (-0.95-6/12)bar

HS703/HS703-1 (-0.95-60)bar

HS720(0-140)bar

HS704 (0-160/250)bar

HS705/HS705A(0-700)bar

HS710/HS710A(0-600/700)bar

HS706(0-1600)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

HS212&S213

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