User manual
Non-invasive Sphygmomanometer Calibrator
ME02

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 qualifiedskilled 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 damage to the instrument.

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

Warning

In order to protect your products, please read this manual carefully before your operation, otherwise it may cause trouble.Huaxin is not liable for any 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 Use the product only as specified

⚠ Any operation not included in the following instructions or outside the specifications must not be attempted.

③ Please use the assorted power adapter

⚠ It's forbidden to charge the tester without the assorted power adapter.

④ No Disassembling

⚠ 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.

⑤ Don't apply pressures greater than range.

⚠ It's forbidden to apply pressures greater than 60kPa,damages due to this reason are not covered under warranty.

⑥ Pay attention to environmental conditions

⚠ Don't keep the unit in the places which are extremely hot,cold,dusty or humid.Ambient temperatures should remain between (0-40)℃ .

⑦ Pay attention to 【Pressure calibration】

⚠ That forbid users calibrate the tester by themselves.

1. Summary

ME02 Non-invasive Sphygmomanometer Calibrator is used for simulating human body blood pressure with output signal stability and good repeatability. It provides static pressure output& measuring, automated leak testing,dynamic blood pressure simulations function .That is used for calibrating sphygmomanometer in metrology body, hospital , the University lab,sphygmomanometer manufacturers and so on.

2. Structure

2.1 Complete Machine

Output

Charging port

USB Port

Power
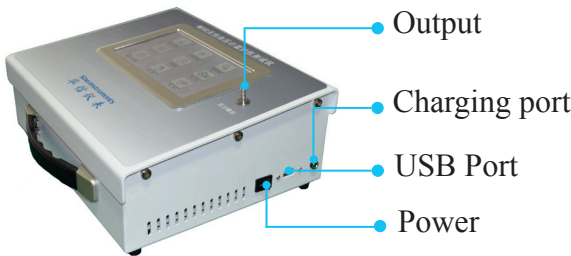
2.2 Standard accessories

NO.	Name	Model	Q'TY	Funtions
1	Turriform adapter	Φ 6 to M20X1.5F	1	Adapter
2	Plug	/	1	Automated leak testing
3	Sphygmomanometer tube	Φ 6	3	Connecting tube
4	Air-capacitor	500ml	1	Calibrating adults sphygmomanometer
5	Air-capacitor	100ml	1	Calibrating newborn sphygmomanometer
6	Omron static pressure adapter	Different thickness	3	Used for Omron static pressure calibration
7	Power adapter	DC 25.2V (2A)	1	Charging
8	Wireless mouse	/	1	Control touch screen
9	Carrying instruments box		1	Portable
10	User manual/test report/certificate of quality/warranty card	/	1	

3. **Technical Specification**

- **Pressure source**
  Generated pressure:(0-60)kPa/(0-450mmHg)
  Control pressure stability:0.05%F.S

- **Static pressure measurement**
  Pressure measuring:(0-60)kPa/(0-450)mmHg
  Accuracy:±0.05%F.S
  Resolution:0.001kPa(0.01mmHg)

- **Dynamic blood pressure simulations**
  Systolic pressure:(2.7-34)kPa / (20-255)mmHg
  Diastolic pressure:(1.3-26.7)kPa/ (10-200)mmHg
  Blood pressure value repeatability:
  less than0.3kPa(2mmHg)
  Heart rate:(30-250)bpm
  Heart rate accuracy:±1%R.D
  Pulse volume:(0.1-2.4)mL

- **Units**
  kPa,mmHg,s

- **Working power**
  DC 25.2V 2A;It's supposed to be in continuous operation
  for 12 hours after fully charging

- **Environmental conditions**
  Calibration temperature:20±2℃
  Operating temperature:(0-40)℃
  Storage temperature:(-10-70)℃

- **Dimension**
  Size:300x250x110mm
  Weight:5.2kgs

4. Operation

4.1 Startup

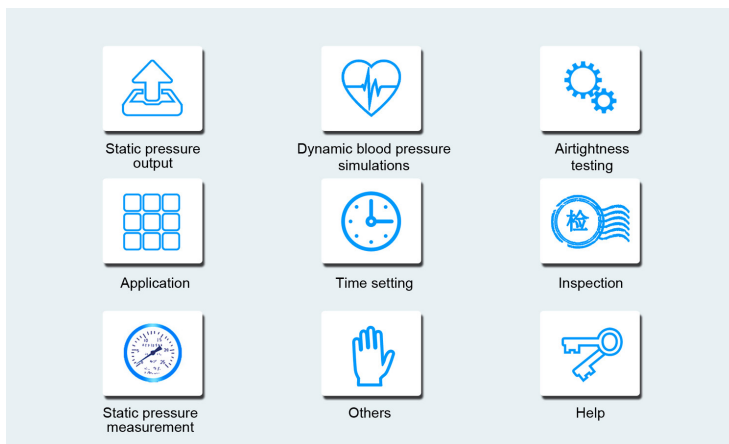Turn the power switch on,the touch screen will display the main menu after a few seconds.See Figure 2.

Figure 2

Main menu:Select icons to jump to corresponding operation interfaces.

➢ 【Static pressure output】:That supports the functions of single points calibration and auto-calibration.

➢ 【Dynamic blood pressure simulation】:There are seven standard modes;User-defined mode;Manufacturer mode.

➢ 【Airtightness testing】:Pressure leak testing.

➢ 【Application】:Preset and save the common use item.

➢ 【Time setting】:Set the current time,update automatically.There is no need to reset after reboot.

➢ 【Inspection】:Provide a convenient to superior calibration department.

➢ 【Static pressure measurement】:The function of measuring pressure.

➢ 【Others】:Testing the pressure relief rate.

➢ 【Help】:Manufacturer information;Operting by touch control/ mouse(Only choose one).

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ⓘ Remark:It can return to main menu interface when you click【Home】
during operation.

4.2 Static pressure output

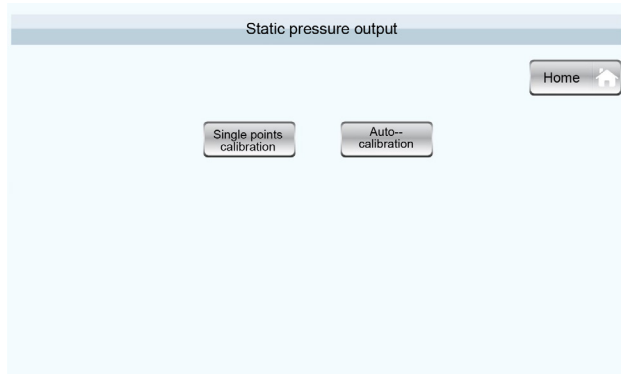Click【Static pressure out】to jump to its interface.See Figure 3.

Static pressure output

Home

Single points
calibration

Auto--
calibration

Figure 3

● Click【Single points calibration】to enter the operating interface to
calibrate single points.

● Click【Auto-calibration】to enter the operating interface of calibrating
automatically.

● Click【Home】to return to main manu.

4.2.1 Single points calibration

By clicking 【Single】 points calibration in the interface of static pressure
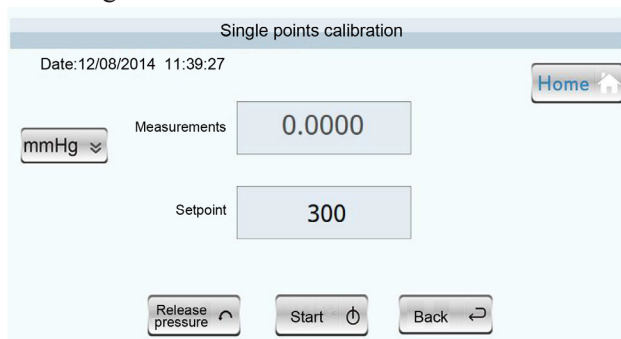output,you will see Figure 4.

Single points calibration

Date:12/08/2014 11:39:27

Home

Measurements   0.0000

mmHg ⩡

Setpoint   300

Release
pressure   Start ⏻   Back ⏎

Figure 4

4

- Click the button of units to switch kPa/mmHg.

- 【Measurements】:Display the current measurement.

- 【Setpoint】:That can be setted.(Default value: 285mmHg) .

- Click【Release pressure】to relief pressure in system.

- Click【Start】to do calibration(the current setpoint).If you need to calibrate other setpoints,please choose【Stop】and reset the setpoints,then click【Start】.

- Click【Back】to return to the interface of static pressure output.

- Click【Home】to return to main menu.

4.2.2 Auto-calibration

Choose Auto-calibration in the interface of static pressure output,then screen displays its menu.See Figure 5.

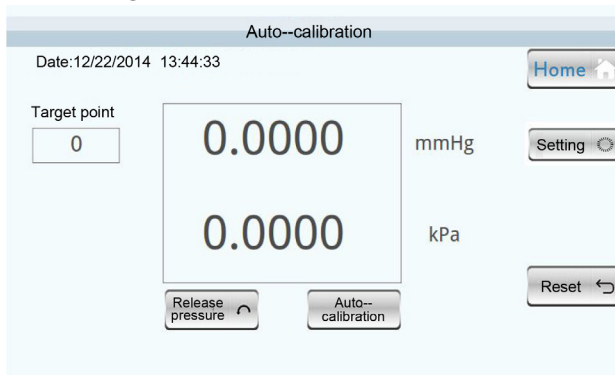Figure 5

- Click【Release】pressure to relief pressure in system.

- Click【Auto-calibration】,that can pressurize automatically to the default target points.It will display【Steady】when the pressure value comes to the range of target points(±0.03kPa/±2.2mmHg).It will calibrate next point after holding pressure at a preset time.

- Click【Stop】to stop the process of calibration.

- Click【Zero】to delete the zero position error of pressure sensor after releasing pressure.

- Click【Setting】to enter the interface of setting target points parameters.

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● 【Target point】:Display the present point that needed to be calibrated.

● Click【Home】to return to main menu.

4.2.2.1 Setting

By clicking【Setting】in the interface of auto-calibration,the screen displays the setting interface.See Figure 6.

Figure 6

● The default target points :60、120、180、240、285(mmHg),Click the font,they will be selected when the color turns blue.

● Click【Setting target points】, its color will turn to white.You can click points values to modify them.

● Setting 【Sphygmomanometer mode】:Pressurize or Depressurize.

● 【Stability time】:(1-60) S optional.

● 【Calibration time】:(1-100) optional.

● Click【Save】to keep the modified parameters, they will be default points after rebooting.

● Click【Back】to return to interface of auto-calibration.

4.3 Dynamic blood pressure simulation

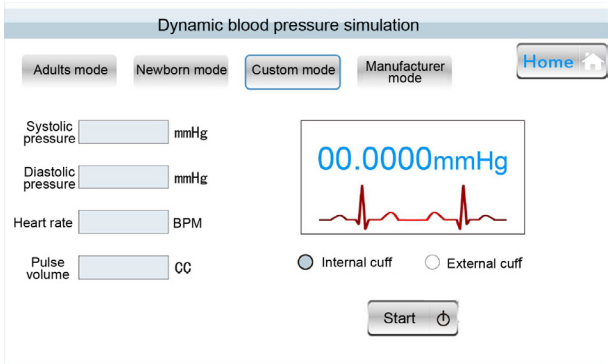Click【Dynamic blood pressure simulation】in main menu to enter its interface.See Figure 7.

Figure 7

> 【Adults mode】:Seven groups default values(60/30,80/50,100/65,120/80, 150/100,200/150,255/195),the default pulse rate is 80bpm,the default pulse volume is 0.70cc,that supports to add and delete data.

> 【Newborn mode】:You can add and delete data.

> 【Custom mode】:Input the user-defined parameters.

> 【Manufacturer mode】:Choose the diffident manufacturers according to the tested devices.

4.3.1 Blood pressure simulation in adults mode

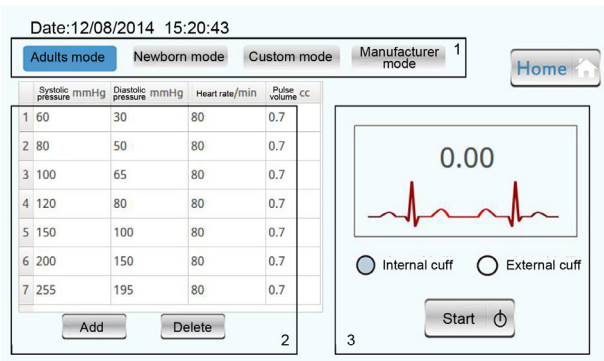The interface of blood pressure simulation in adults mode.See Figure 8.

Figure 8

➢ Area 1:Click buttons to enter the corresponding interfaces.

➢ Area 2:Seven groups default data (60/30,80/50,100/65,120/80,150/100,200/150, 255/195), the default heart rate is 80bpm ,the default pulse volume is 0.70cc.That supports to add and delete data.

➢ Area 3:Display pressure values,choose the cuff ways,start/stop blood pressure simulaton.

Buttons instruction:

➢ 【Add】:Add a group of data.Click it to pop-up dialog box, press 【Confirm】after inputting data.

➢ 【Delete】:Delete date.Choose a group of data in area 2,click【Delete】.

➢ 【Internal/External cuff】:Click it to choose cuff ways.That can turn to blue if selected.

➢ 【Start】:Begin to process blood pressure simulations .The button will become【Stop】after you click on it.Please press【Stop】after calibration. Choose the next group data,then click【Start】to enter other process of calibration.

➢ 【Stop】:Stop blood pressure simulation.

The operation of dynamic blood pressure simulation:

● Choose a group of data in area 2(Color turns to blue),click【Start】in area 3.

● Click【Stop】after calibration finishing.

● If you need to calibrate another group,choose the corresponding data,click【Start】in area 3 and finish it by clicking【Stop】.
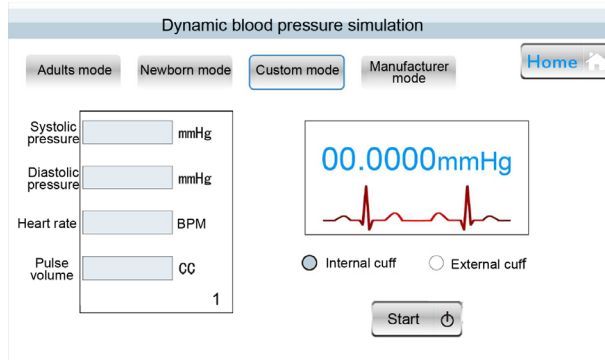
4.3.2 Blood pressure simulation in custom mode

Figure 9

The setting interface of blood pressure simulation in custom mode：

● You can reset systolic pressure,diastolic pressure,heart rate and pulse volume.

 Range:Systolic pressure:(20-255)mmHg

  Diastolic pressure:(10-200)mmHg

 Heart rate:(30-250)bpm

 Pulse volume:(0.10-2.40)cc

 Systolic pressure ＞ Diastolic pressure

● The maximum pulse volume cannot be achieved at the maximum heart rate.

● Click the input box in area 1,that will pop-top corresponding numeric keypads,input numbers and click confirm button.

The display interface of blood pressure simulation in custom mode:

● Display the present setting values of systolic pressure,diastolic pressure,heart rate,pulse volume ,the real time measurements,heartbeat and cuff state.

4.3.3 Manufacturer mode

Choose the corresponding mode in manufacturer mode by different makers of sphygmomanometer in the market.Then click【Setting】and choose 【Adults mode】.Please refer to 4.3.1 The operation of dynamic blood pressure simulations.

4.4 Airtightness testing

Figure 10

➢ 【Stability time】:It's the time after system pressurizing to setpoints.The default time is 60s,click the data to modify it.

➢ 【Measurement time】:It's the time after stablilty time.The default time is 300s,click value to modify it.

➢ 【Setpoint 1】:Target pressure point；The default is 50mmHg,click value to modify.

➢ 【Setpoint 2】:Target pressure point;The default is 250mmHg,click value to modify.

➢ 【Setpoint 3】:Target pressure point;The default is 280mmHg,click value to modify.

ⓘ Remark:The color of setpoint values turns to green after selected.

➢ 【Airtightness value】:Calculated by software.

➢ 【Measurements】:The real measuring values.

➢ 【Starting value】:The starting value after pressure keep stability.

➢ 【Timing】:It will start the time since pressure gets to setpoints Display the real time.

➢ 【Internal/Exteral cuff】:Choose the cuff ways.

➢ 【Release pressure】:Releasing until zero pressure.

➢ 【Start】:Start for calibration.

➢ 【Back】:Return to previous menu.

➢ Click the unit of Airtightness value(mmHg/min),that can switch to kPa.

Operation methods

● Set the stability time, measurement time ,setpoints , the ways of cuff (Internal/External cuff).

● Select【Setpoint】(when the font selected is green),and then click【Start】, the font color of【Start】turns to blue.After counting the airtightness values,【Start】button color turns to white. Testing is finished.

● Click 【Release pressure】 in order to releasing.

● If you want to calibrate the next setpoint, select setpoint,then click 【Start】 button and repeat the above calibration step mentionedn.

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4.5 Application

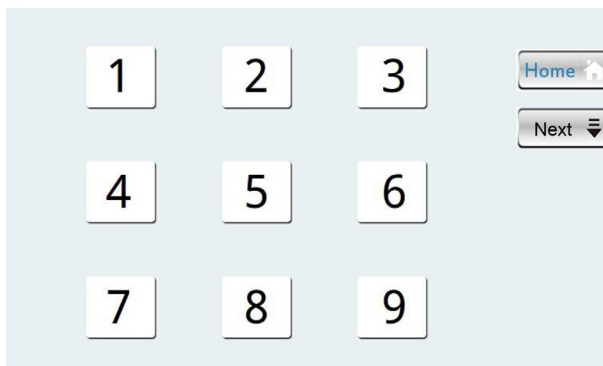Click the【Application】icon in main menu and enter static pressure measurement interface.See Figure 11.

Figure 11

● That can store eighteen groups applications.There are nine application icons in each interface.Click【Next】and enter the next interface.That you select any icon is ok.See Figure 12 below:
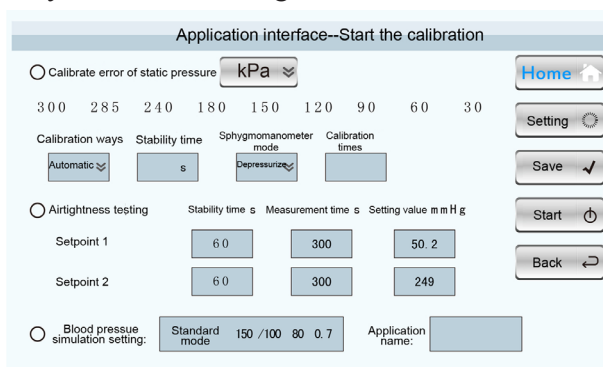

Figure 12

● You may select three different icons once time. Or only choose one.

● According to the different tested demands,users can set all items by the methods of Static pressure measurement,Airtightness setting,click display box of blood pressure simulation setting to input the mode and save it.There is no need to reset it after rebooting.
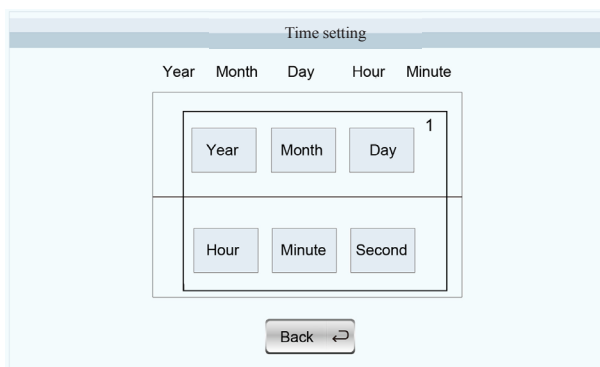
4.6 Setting time

Figure 13

- Click【Year】in area 1,pop up digital keyboard ,input the digit and then click【Confirm】.
- Click【Month】in area1,pop up digital keyboard ,input the digit and then click 【Confirm】.
- Click【Day】in area 1,pop up digital keyboard ,input the digit and then click【Confirm】.
- Click【Hour】in the area,pop up digital keyboard ,input the digit and then click【Comfirm】.
- Click【Minute】in area 1,pop up digital keyboard ,input the digit and then click【Confirm】.
- Click【Second】in area 1,pop up digital keyboard ,input the digit and then click【Conirm】.
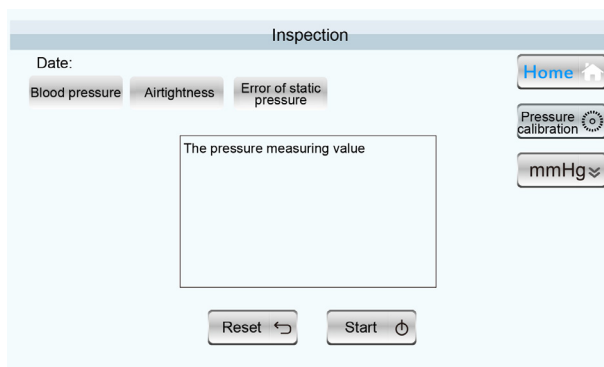- Click【Back】and return the main menu.

4.7 Inspection

Figure 14

Inspection interface

➢ 【Blood pressure range】:The interface operation equals to that of dynamic blood pressure simulations.

➢ 【Airtightness】:The interface operation equals to that of airtightness testing.

➢ 【Error of static pressure】:The interface operation equals to that of static pressure measurement.

➢ 【Home】:Back to main menu.

4.8 Static pressure measurement

Click【Static pressure measurement】icon to enter interface of static pressure measurement.See Figure 15.

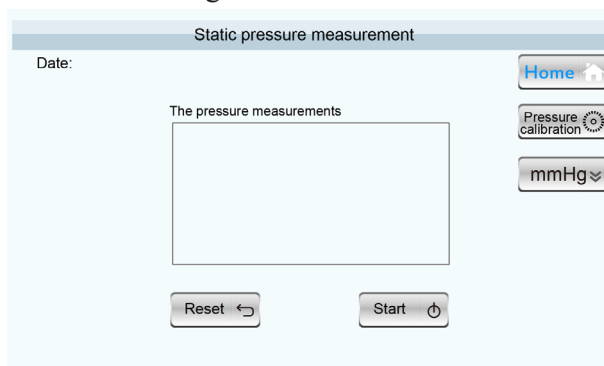Figure 15

➢ 【Reset】:Pressure zeroing .You can press it when 【Start】 button appears.Don't use it when release pressure(there will display button of【Releasing】).The system is in the state of close valve.At this time,clear zero values is not very exact.

➢ Start:Close the valve in system,the standard unit can pressurize to ME02,click 【Start】,the button will display【Releasing】.

➢ 【Home】:Back to the main menu.

➢ 【Pressure calibration】:Enter pressure calibration interface.

➢ 【Units】:Switching units.

Operation methods:

● Enter static pressure measurement interface. Click【start】for measuring.

● After test finished ,click【Releasing】.

● Click 【Home】 to return to the main menu.

4.8.1 Pressure calibration

ⓘRemark:It is forbidden that user calibrate the item by himself .

The calibration should be carried out under a standard calibration condition, such as the standard source must be accuracy 3 times of ME02,ambient temperature (20 ± 2)℃ .

Switch the pressure unit to 【kPa】 and click【Pressure calibration】,the screen will display interface as Figure 16.

Static pressure measurement --pressure calibration

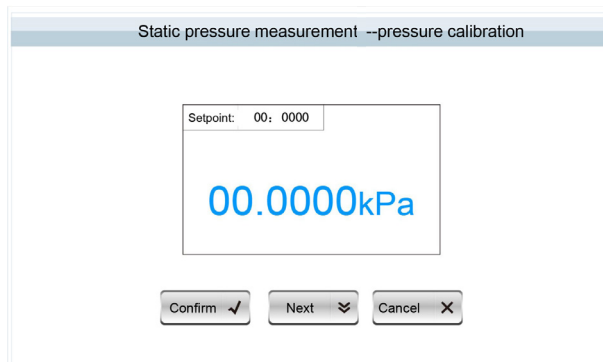Setpoint: 00：0000

00.0000kPa

Confirm ✓   Next �★   Cancel ✗

Figure 16

➢ Do calibration according to setpoints.

➢ The setpoints:（0、10、20、30、40、50、60）kPa .

Calibration methods

● Pressure port connect atmosphere, click【Confirm】then press【Next】.

● When Set point value is 10,input 10kPa by pressure generator,click 【Confirm】and then click【Next】.

● When set point value is 20,input 20kPa by pressure generator,click 【Confirm】and then click next.

● According to the above mentioned step until the set value is 60kPa. When you finish the 60kPa calibration,click【Cancel】and then back to static pressure measurement interface.

4.9 Others

Click the Other icon in the main menu and enter interface of other functions- Pressure relief rate.See Figure 17.
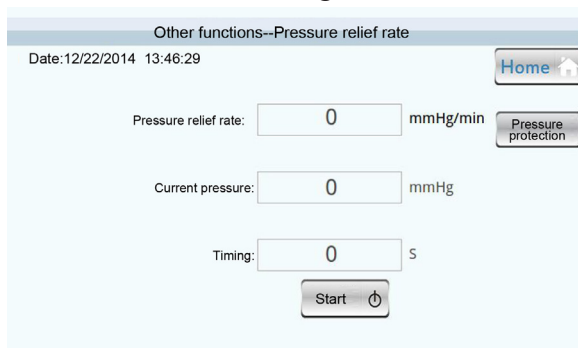

Figure 17

➢ 【Pressure relief rate】:That is counted by software.

➢ 【Current pressure】:Current real pressure values.

➢ 【Timing】:It begin to timing since pressure of the tested device/ME02 depressurizing to 24kPa,record the time until 8kpa.

➢ 【Pressure protection】: The default value is 315mmHg(42kPa),that can be user-defined.The setting range:（0～455）mmHg/（0～60.7）kPa.

➢ 【Home】:Back to main menu.

4.10 Help

Click the Help icon and enter help interface.See Figure 18.

Help

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Web:http://www.sino-instruments.com
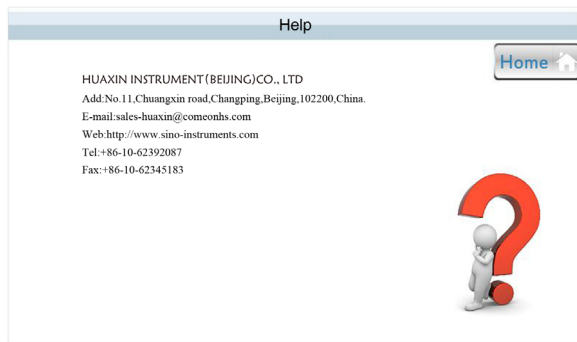Tel:+86-10-62392087
Fax:+86-10-62345183

Home

Figure 18

5 Maintenance

5.1 The maintenance of instrument

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

(2)Do not use the tester around explosive/corrosive gas,vapor,or in damp or wet environments.

5.2 Troubleshooting

(1) Unable to start up
Check the power adaptor if that have DC25V output,if that,please charging and open it.

(2) Having zero values
The temperature changing result in the zero drift, you may press Zero by static pressure measuring interface.

6. Support

The product specifiations 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(0-700)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 & HS213