www. insize. com

9408-QD100/9408-QA101

AIR GAUGE DISPLAYS INSTRUCTION MANUAL

PLEASE SCAN QR CODE TO WATCH THE OPERATION VIDEO OF PRODUCTS.

VIDEO

INSIZE

1.Overview

9408-QD100 (9408-QA101) Chinese menu electronic pneumatic measuring instrument, the use of embedded microcontroller technology and the design of digital products, is the buoy type pneumatic measuring instrument of the new generation of products. It can be used as a single unit or combined with multiple units to save operating space.

Adopting high brightness liquid crystal display, especially suitable for various production line environments, made the Chinese menu interface, greatly facilitating the operation and human-computer interaction. It can directly display the absolute measurement value of the measured size and the relative measurement value relative to the nominal size value. According to the set workpiece size tolerance limits, indicating the measured workpiece qualified or not. It has the function of storing and querying the measurement data.

With red, green and orange light columns, indicating the results of the measured dimensions and their tolerance zones, which can directly observe the deviation of the measured dimensions within their tolerance zones.

A variety of programs can be pre-set for measuring workpieces of different sizes. Each program can be set up with nominal dimension values, tolerance zone overruns, and standard part dimension values. Measurement methods for inside and outside dimensions can also be selected. All parameter settings have a power-down save function.

The product also has additional functions: input and output signals can be easily formed into a control system; data communication function can make the field of multiple gauges to form a network, through the formation of a special software SPC statistical charts to realize the site of the online quality management, etc.; “peak-peak” measurement function, can be combined with the measurement device The “peak-to-peak” measurement function can be combined with the measurement device to calculate the results of coaxiality, ellipticity, runout, cylindricity, flatness, perpendicularity and other form and position errors by using various mathematical models; up to 60,000 pieces of measurement data can be backed up to a U disk with one key, and the measurement time and results of each piece of data can be recorded in detail, such as the information of the measurement parameter.

2. Product features

Digital pneumatic measuring instrument display compared with the following significant features and superiority.

1) High brightness LCD screen display. Clear, no display angle and light requirements.

2) Chinese menu operation. Intuitive, convenient and quick.

3) Three-color light column indication. The light column can be displayed in green, orange and red, respectively indicating that the measured dimensions are in the state of “qualified”, “alarm” and “exceeded”, which makes it easy to observe the position of the measured dimensions on the tolerance band. The position of the measured dimension on the tolerance band can be easily observed. The indication mode is in the form of point, segment and column.

Note: Press the upper key to switch the indication mode.

4) Digital accurate reading. At the same time as the light column indication, the LCD display directly shows the exact size value of the measurement, and it can display the relative value and absolute value at the same time, and the highest resolution can be up to 0.1μm, which is in the leading position in China.

5) Can be equipped with any size of air probe. The instrument can be applied to any size of air probe from Φ0.5 to Φ2.0. A gauge is compatible with the old-fashioned various multiples of the pneumatic gauge.

6) Extremely high stability. The use of a variety of anti-interference and stabilization techniques, greatly improving the stability and reliability. The instrument adopts waterproof, oil-proof closed structure, and reserved for external expansion keyboard interface, set up in a convenient location for the operation of the expansion of the keyboard, not only to facilitate the operation of the workers and the protection of the body of the instrument. The instrument can be adapted to the harsh environment of the industrial site.

7) Ten sets of programs can be set up to carry out measurements of various specifications. Multiple programs can be set up for a wide range of measured parameters, and there is a function for storing measurement data. Up to ten programs can be set up, corresponding to ten measurement specifications. Setting parameters and calibration values of standard parts are stored in separate programs, which greatly facilitates multi-specification measurements.

8) Grouping function. You can set the group spacing for group selection, and

display the group number at the same time as the measured value.

9) Network data management capability. The data communication function enables multiple gauges on site to form a measurement and control network, collecting and storing measurement data through the server's special SPC management software, forming SPC statistical charts, and realizing networked online quality management.

3. Main technical parameters and conditions of use

3.1 Specification

Code		9408-QD100 (without beep and light alarm)			9408-QA101 (with beep and light alarm)
LED quantity		101 pcs			
LED color		red, orange, green			
LED height		254mm			
Range, resolution and accuracy		range (μm)	resolution (μm)		accuracy (μm)
			LED	display	
		10	0.1	0.1	0.2
		20	0.2	0.1	0.4
		50	0.5	0.1	1
		100	1	0.2	3
Unit		mm, inch			
Air supply		dry and clean, 0.4~0.7MPa			
Data interface		RS232, USB			
Operation temperature	temperature	0~45°C			
	humidity	≤85%			
Power supply		AC185~265V, 50/60Hz			
Dimension (W×D×H)		160×160×490mm			
Weight		2.8kg			

3.2 Resolution and initial clearance

Display range	Resolution (μm/1 light pipe)	Initial clearance
10(μm)	0.1	25-40(μm)
20(μm)	0.2	30-60(μm)
50(μm)	0.5	40-80(μm)
100(μm)	1.0	40-80(μm)

3.3 Conditions of use

(1)power supply：AC185～265V 50HZ/60HZ

(2) power wastage：＜20W

(3) environmental temperature：0～45℃

(4) humidity level：≤85%

(5)air supply：0.4-0.7MPa dry and clean

(6) Keep away from corrosive substances and strong magnetic field, strong electric field and strong vibration.

4. Functional introduction of each part of the product

4.1 Positive over-range indicator

This lamp lights when the measured value is outside the positive range.

4.2 Scale value indication

Range indication	range	Cylindrical scale value
10	(±5μm)	0.1μm/1light
20	(±10μm)	0.2μm/1 light
50	(±25μm)	0.5μm/1 light
100	(±50μm)	1.0μm/1 light

4.3 Light column indication

There are 101 three-color lamps.

Indicates the limit value of each sector and the measured value.

When the measured value is within the “qualified” range, the display is green.

When the measured value is within the “Pass” range, the display is green;

When the measured value is within the range of “Alarm”, the display is orange.

When the measured value is in the “Alarm” range, the display will be orange;

When the measured value is within the range of “exceeded”, the display will turn red.

The display is red.

4.4 Negative over-range indicator

When the measured value is out of the negative range, the lamp lights up.

4.5 Display

Displays the setup parameters and values, and displays the measured value in the measurement state.

4.6 Keypad area

4.7 Magnification knob

4.8 Probe output quick plug connector (with Φ6 tube)

4.9 Power switch

4.10 Fuse

4.11 Power input socket

Power input, AC185 ~ 265V 50HZ/60HZ.

4.12 Power output socket

Power output, AC185～265V 50HZ/60HZ.

Used for multiple electronic column collocation.

4.13 RS232/RS485 interface

4.14 U disk interface

4.15 I/O interface

4.16 Inlet connector (with Φ8 tube)

5. Functional operation description

Turn on the power and press the power switch behind the electronic column, the electronic column firstly enters the self-test state, the light column carries on the three-color change display, the positive and negative over-limit lamps turn on, and at the same time the display shows the product logo. After the self-test is completed, it will automatically enter the measurement state. In the measurement state, press return to enter the main menu interface as shown in Figure (1), you can perform a variety of operations.

The first use of the system parameters should be set first, the parameters

can also be modified at any time in the future use. The instrument is easy to operate, only when the instrument is used for the first time or the gas probe is worn out and needs to be replaced, the manual multiplier function is used to adjust the multiplier to one to one through the multiplier and zero position knob initially, and then the standard correction function is used to use the upper and lower limits of the standard to carry out a precise correction of the multiplier and the zero position.

5.1 the operation process description

5.1.1 Initial use: ①parameter setting → ②multiplier adjustment → ③standard correction → ④measurement

5.1.2 Replacement of the probe or probe wear and tear: ① multiplier adjustment → ② standard parts calibration → ③ measurement

5.1.3 Normal use: ①Standard calibration → ②Measurement

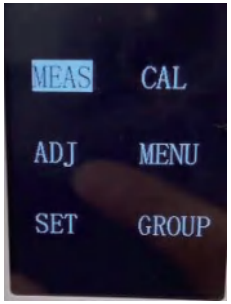


Figure (1)

5.2 Parameter setting

5.2.1 Press the Return key to return to the main menu (Figure (1)). 2.

5.2.2 Under the main menu screen, press “ ⬇ ” to move the cursor to the ”Settings” option on the screen, and then press the “enter” button to enter the ”Settings” menu.

5.2.3 Enter the “Program Selection” (Figure (2)), press the “ ⬇ ”or “ ⬆ ” key, you can select the program 0-9. Press to confirm the selection of the program, and then set the parameters and operations correspond to the program, and at the same time enter the next level of the menu.

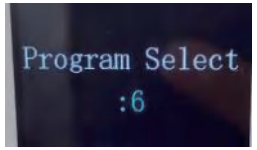


Figure (2)

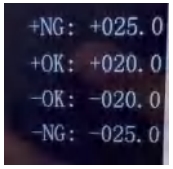
figure(3)

5.2.4 Enter the “Tolerance Nominal Value (i.e. Nominal Dimension)” (Fig. (3)) in mm. press “ ”,” ” to move the cursor (blinking bit); press “ ”, “ ”keys to set the value of the bit in which the cursor is located. The digit bit changes between 0-9, press” ”to increment the digit, press” ”to decrement the digit; press to confirm to enter the next level menu.

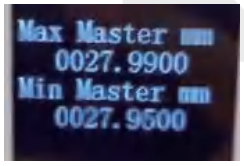
5.2.5 Enter ”Over tolerance upper limit” (Fig. (4)), the unit is μm, and the setting method is the same as “Tolerance value”. Press “ ” to set the sign bit as positive sign”+”and press “ ” to set the negative sign “-“; press “Confirm” to enter “Over tolerance upper limit” (Fig. (4)). “Press to enter to enter the setting of “Lower limit of over-tolerance”;

Note: If the value of “lower limit” is larger than the value of “upper limit”, you will be asked to continue to set the lower limit, and will not enter the next parameter setting until the parameter is set correctly; the software will automatically set the measurement range according to the values of upper and lower limits (±5μm, ±10μm, ±5μm, ±10μm, ±10μm). The software will automatically set the measuring range (±5μm, ±10μm, ±25μm, ±50μm) according to the value of the upper and lower limits of the overshoot, i.e., the range will be selected automatically.

5.2.6 Enter the “Upper limit standard value” (Fig. 5) in mm, set in the same way as “Nominal value of tolerance”. Press to confirm to enter the “lower limit standard value”, set in the same way as the “tolerance nominal value”, press to confirm to enter the next level of the menu.



Figure（4）

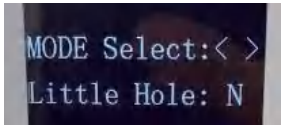


Figure（5）

5.2.7 Enter “Measurement Mode” (Fig. 6), press “ ‘, ’ ‘ to switch between ’Inner Size” and “Outer Size”. “External Dimension”. Press “Confirm” to enter the setting of “Small Hole Measurement”, select “Yes” when the equivalent hole

diameter of the probe is less than Φ0.8, select “No” for others, press “ ‘, ’ ‘ and press ’ ”. Press “ ‘, ’ ” key to switch.

Note: If “No” is selected for small hole probe measurement, the response speed of the gauge will be very slow, while if “Yes” is selected for non-small hole probe measurement, the measured value will be unstable.



Figure（6）

5.2.8 After completing the settings in the "Settings" menu, press Confirm to save the parameters.

Examples of Tolerance Zone Parameter Settings:

(1) For measured dimension 28.3920(-0.0090, +0.0090) (Symmetrical Tolerance):

Range automatically set to: ±10μm (since 18μm < 20μm)
Nominal value: 028.3920 mm
Upper deviation limit: +009.0μm
Lower deviation limit: -009.0μm

(2) For measured dimension 9.0000 (0,+0.0150) (Asymmetrical Tolerance):

Range automatically set to: ±10μm (since 15μm < 20μm)
Nominal value: 009.0000 mm
Upper deviation limit: +015.0μm
Lower deviation limit: +000.0μm

Note:

- The tolerance bar display will automatically adopt a symmetrical distribution (to fully utilize the bar length). The bar cannot be used for direct readings but only indicates the tolerance distribution of the measured value.
- Relative value readings (displayed on the screen) are calculated against the nominal value (e.g., 009.0000 mm). The relative value read from the bar must be adjusted by adding the zero offset (zero offset = center of tolerance zone - nominal value) to obtain the actual relative value.

(3) Geometric tolerance parameters (e.g., runout, coaxiality, etc.)

If the tolerance is 0.05mm ，can be regarded as：$0^{+0.05}_{0}$, Then：

The nominal size value is 000.0000 namely 0mm；Lower limit of overshoot：+000.0 namely 0μm，Upper overshoot limit：+050.0μm

Note: The lower limit of overshoot is meaningless, but must be set to zero. At this time, the light column tolerance displays an automatic symmetrical distribution (effective use of the full section of the light column), and the light column cannot be used to read, but only indicates the tolerance distribution of the test value.

5.3 Magnification adjustment function

During normal use, the magnification changes very little, so it is not necessary to adjust often. Manual adjustment of magnification is required only in the following cases.

1) When first used

2) When the gas probe is worn

3) Replace different kinds of probes (Note: Probes within the range of ±5μm, ±10μm, and ±25μm only need to be corrected after setting parameters)

4) When the instrument is used again after a long period of shelving

In this function, the unit is μm. The upper and lower limit of the standard parts are respectively the upper and lower orange indicating positions in the light column, and the display range of the light column is doubled to facilitate debugging.

The key functions are as follows：

- **“ ⬅ ”key：** Remove the reference point and the actual probe value will be displayed。
- **“ ➡ ” key：** Set the reference point and pull the display value to the lower limit of the standard part。
- “ ⬇ ” **key：** Automatic range selection Manual range setting when measuring requirements are not met。
- **“ESC” key：** The manual power adjustment function is removed。
- **“ENTER” key：** The correction function page is displayed。

The specific steps are as follows:：

① Internal dimension pattern：

1：Put in lower limit standard parts。

2：Right click “ ➡ ” Place the light column in the lower cursor position。

3：Put in the upper standard parts and observe the light column.

4：If the light column indicates near the upper limit cursor, the adjustment is complete. If the light column indicator is not near the upper cursor, adjust the power twist. When insufficient, adjust to: upper limit + insufficient amount X2. If exceeded, adjust to: Upper limit - excess X2. The magnification increases clockwise; Counterclockwise magnification decreases.

5：Repeat steps 1 to 4, repeatedly debugging until the light column is near the upper limit cursor, generally slightly larger than the upper limit, but do not exceed the upper limit cursor 4 light columns. Finally, the locking screw is tightened to lock the magnification twist。

6：Press the Back key to return to the main menu.

② External dimension pattern：

1：Put the upper limit standard parts first.

2：Right click “ ➡ ” Place the light column in the upper cursor position.

3：Put in the lower limit standard parts and observe the light column.

4：If the light column indicates near the lower limit cursor, the adjustment is complete. If the light column indicator is not near the lower limit cursor, adjust the power twist, when insufficient, adjust to: lower limit - insufficient amount X2, when exceeded, adjust to: lower limit + excess amount X2. As the magnification increases in the clockwise direction, the light column goes downward. Counterclockwise magnification decreases and the light column goes upward.

5：Repeat steps 1 to 4, repeatedly debugging until the lower limit standard parts are placed near the lower limit cursor, generally slightly smaller than the lower limit cursor (the light column is below the lower limit cursor), but do not exceed the lower limit cursor 4 light columns. Finally, the locking screw is tightened to lock the magnification twist.

6：Press Return to return to the main menu.

5.4 Standard parts calibration function

For gas measurement projects, the upper and lower limit standard parts are generally used to correct the magnification, and the lower limit standard parts are regarded as zero standard parts. Note that the value of the standard part in the parameter setting must be corresponding, otherwise there will be errors in the measurement results. The standard part with small size is the lower limit standard part.

The unit is μm。

Specific steps are as follows：

1) In the main menu interface, as shown in Figure (1), select "Calibration" and press confirmation to enter the calibration function of standard parts；
2) "Lower limit standard parts" is displayed, indicating that the lower limit is calibrated first, and the lower limit standard parts are placed in the measuring station。
3) At this time, if you press return to exit the correction function, no correction will be performed.
4) Then wait for the indicating value to be stable, press confirm to complete the lower limit correction, and enter the upper limit standard part correction
5) "Upper limit standard parts" is displayed, indicating that the upper limit is reached, and the lower limit standard parts are removed；
6) Place the upper limit standard part in the measuring station。
7) Then wait for the indicating value to stabilize, press the confirm key to complete the upper limit correction. After the correction is complete, it will automatically enter the measurement interface。

Note: If the value shown in the timing is far from the upper and lower limits, the magnification needs to be adjusted first. See (3), manual correction magnification function.

5.5 Measuring function

Figure（7）

After setting, adjusting and correcting, enter the measurement interface

(Figure (7)).

First line: Display the relative value of the measurement (um)

The second line: for the status indicator icon and the absolute value (mm) of the measurement and the determination (acceptable, out-of-tolerance and invalid). The ICONS are automatic manual measurement ( ), USB flash drive ( ) connection indication.

The third line: shows the measurement method and range

Manual automatic measurement function, press " " to switch manually.

Store measurement data. The maximum storage capacity is 60,000 data. When the storage capacity is full, the system prompts you to back up data. If set to automatic measurement mode

( ) Data is automatically stored when a measurement is completed. Data is saved and the measurement data is uploaded through the serial port.

5.6 Grouping function

Figure (8)

After the adjustment and correction is completed, the group measurement interface is displayed, as shown in the figure above.

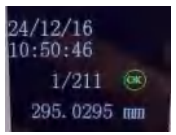
The first line: Group number, displays the current job group number

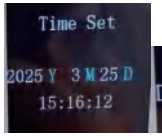
Second line: Show the maximum or minimum value that needs to be recorded (set the "Save" item according to the parameter).

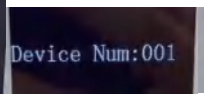
5.7 Query function

Figure (10)

The Query function interface is a selection of functions designed to aid measurement, including Settings such as "Data", "Time", "address" and "format".







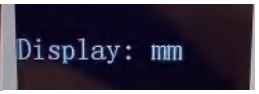


Figure (11) Figure (12) Figure (13) Figure (14)

Enter the "Data" item (Figure (11)), the data item is to query the data stored in the measurement process, display the current data measurement time, serial number and total number of data, data result judgment (qualified or out of tolerance) and the absolute measurement value of the workpiece. Press“⬆” and press“⬇” to view data, “⬅”delete all data, “ ➡”and upload all data through the serial port. Press the "Confirm" key to back up all DATA through the external USB flash drive. The backup path is distinguished by the unique device address (Figure (13)), and the format is :DATA "Address number" // program id.txt. The backup content is the collection time, measurement results and judgment. If backup data already exists on the USB flash drive, delete it before backing up data again.

The time setting item (Figure (12)) is used to record the time during data collection.

The "address" item (Figure (13)) is to number the measuring instrument. When there are multiple measuring instruments in the production line, this device

address is the code to distinguish different devices. (Note: Different meter address codes cannot be set the same, the address code can be set to a number between 1 and 32.)

The Imperial setting item (Figure (14)) switches between "metric" and "Imperial". This setting displays the measurement results on the measurement interface.

6. Common faults and precautions

6.1 Power-on without any display, please check whether the power connection is normal, whether the safety tube is normal.

6.2 Under the adjustment function, the upper and lower limit position indication can not be found, which may be the nominal size or standard part value setting is wrong.

6.3 The reading is abnormally unstable, the measured value is very large, there may be no standard part correction, and it can be normal after standard part correction.

6.4 The power grounding cable must be grounded, otherwise the instrument may not work properly or cause personal injury. Be sure to disconnect the power supply before unplugging the power connection and opening the housing.

6.5 The air source pressure is in the range of 0.40-0.70MPa, and the general pressure is best adjusted to 0.50MPa. If the air source pressure is ＜0.40MPa, its reading will be unstable.

6.6 The air source front stage needs to be configured with air filters. If it is a large three-stage filter, up to three gas coulometers can be brought; Generally, small air filters can only bring one gas coulometer.

6.7 After the magnification is adjusted, be sure to tighten the locking screw to lock the magnification twist, otherwise it will reduce the stability of the instrument.

6.8 If the power knob has been adjusted to the limit, the power is still insufficient, is the initial working gap of the probe is too large, can be changed to a higher range, if not, you must replace the probe. It is strictly prohibited to mobilize the internal working pressure of the instrument, otherwise the instrument will be damaged, and there will be no warranty.

6.9 When the gas probe is worn for a long time, the initial gap becomes larger, and the measurement is still correct after manual adjustment and calibration of standard parts as long as the position error allows. This advantage greatly improves the service life of the gas probe.

6.10 When the display is abnormal, you can shut down the machine and press the up arrow key for a long time to restore the factory Settings.