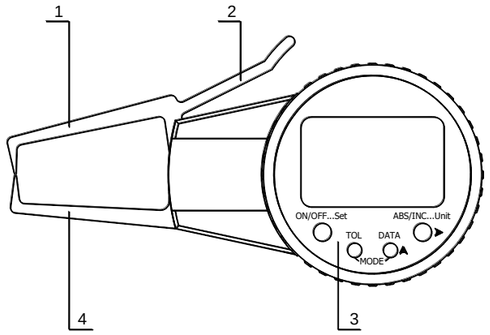
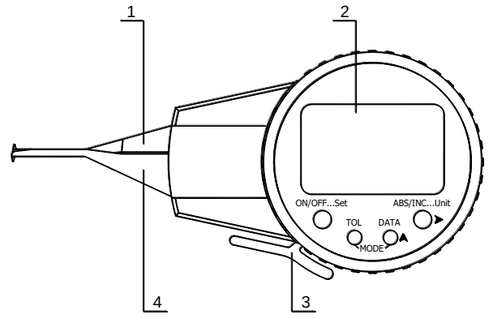
ELECTRONIC CALIPER GAUGE
OPERATION MANUAL

1. Functional elements



Outside caliper gauge

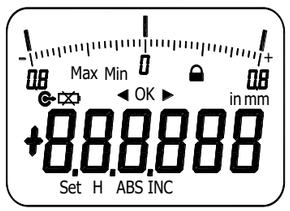
（1）Movable measuring arm
（2）Operating lever
（3）Electronic unit
（4）Fixed measuring arm



Inside caliper gauge

（1）Movable measuring arm
（2）Electronic unit
（3）Operating lever
（4）Fixed measuring arm

2. LCD display



Min ： Find and save the minimum
Max ： Find and save the maximum
H ： Find and save steady value
： Lock saved value and its position
： Data output to PC
： Battery voltage is low
▶ ： Upper tolerance limit
◀ ： Lower tolerance limit
OK ： Within tolerance limits
： Analog display graduation range
in ： Inch measuring mode
mm ： Metric measuring mode
ABS：Absolute measuring mode
INC ： Relative measuring mode
Set ： Set the origin

3. Operation

Two ways of pressing key are used in the following illustration:

(1) Press and release； (2) Press and hold (more than 1 sec.).

3.1 ON/OFF…Set

： **ON/OFF** Power on/off
： **Set** Set the origin

3.2 ABS/INC…Unit and ➤

： **ABS/INC** Absolute/Relative measuring mode conversion
： **Unit** Metric/Inch measuring mode conversion
： ➤ Move flashing digit from left to right during setting

3.3 TOL Set tolerance and tolerance monitoring.

3.4 DATA and ▲

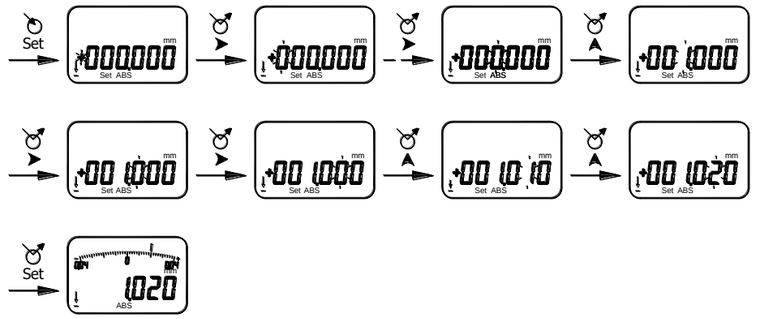
： **DATA** Output the data to PC once, “ ” flashes once.
： **DATA** Output the data to PC continuously and “ ” keeps displaying. Press the key again to stop outputting.
： ▲ The flashing digit plus 1 or ± change during setting.

3.5 MODE Press “**TOL**” key and “**DATA**” key simultaneously: change the measuring mode.

4. Set the origin

a. Press and hold “**Set**” key until “**Set**” appears.
b. Press “ ➤ ” key or “ ▲ ” key to adjust the displayed data until it is desired.
c. Press “**Set**” key at any time, the displayed data will be stored as the origin and enter absolute measuring mode.

For example: set the origin to 1.020mm

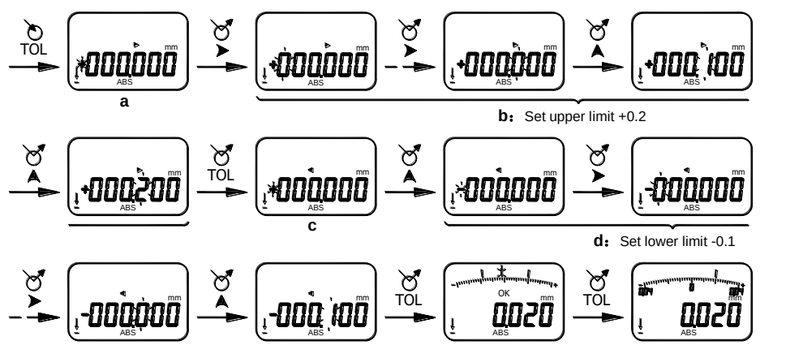


5. Set tolerance and tolerance monitoring.

a. Press “**TOL**” key to set upper limit with “▶ ” displayed.
b. Press “ ➤ ” key or “ ▲ ” key to adjust the displayed data until it is desired.
c. Press “**TOL**” key to set lower limit with “◀ ” displayed.
d. Press “ ➤ ” key or “ ▲ ” key to adjust the displayed data until it is desired.
e. Press “**TOL**” key at any time, the gauge will enter tolerance monitoring measurement.
f. Tolerance monitoring measurement.
g. Press “**TOL**” key again will exit tolerance monitoring measurement.

- **Attention:** Upper limit must > lower limit

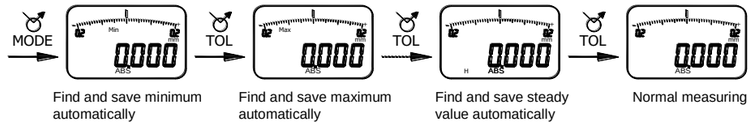
For example: set upper limit +0.2, lower limit -0.1



Tolerance monitoring:

6. Select measuring mode

The gauge has 4 measuring modes. Press “**TOL**” key and “**DATA**” key simultaneously to change measuring mode, “**Min**”, “**Max**”, “**H**” and non-sign will be displayed in turn. You should release operating lever and let measuring arms free when select measuring mode.

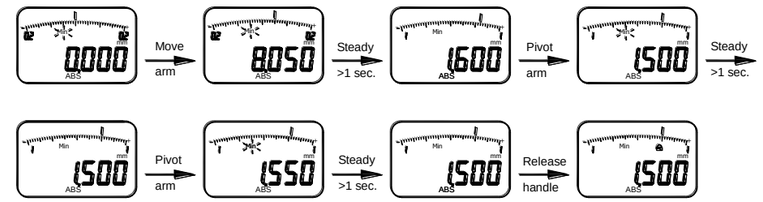


6.1 Normal measuring mode

Displaying value is the distance between caliper’s measuring contacts in this mode.

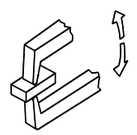
6.2 Find and save the minimum automatically

“**Min**” flashing in this mode. “**Min**” stops flashing when measured value is steady >1 sec, this value and its position will be saved. “**Min**” starts flashing again when pivoting measuring arm. “**Min**” stops flashing when measured value is steady >1 sec. The gauge will find and display the minimum from saved data. After release operating lever and let measuring arms free, the gauge will display “ ” and the minimum, and record its position. You can repeat the above process when moving measuring arm again.



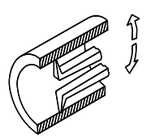
Outside caliper gauge

Measuring thickness or external diameter in “**Min**” mode. Steadily pivot the gauge vertically to find the minimum.



Inside caliper gauge

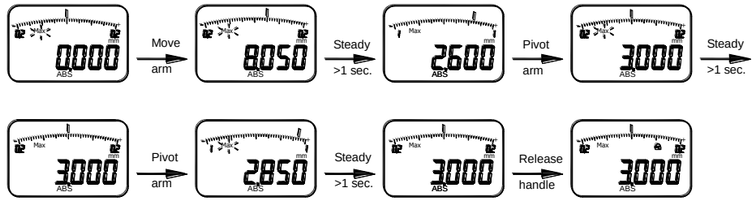
Measuring bore diameter in “**Min**” mode. Steadily pivot the gauge vertically to find the minimum.



6.3 Find and save the maximum automatically

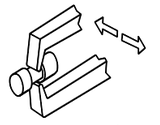
“**Max**” flashing in this mode. “**Max**” stops flashing when measured value is steady >1 sec, this value and its position will be saved. “**Max**” starts flashing again when pivoting measuring arm. “**Max**” stops

flashing when measured value is steady >1 sec. The gauge will find and display the maximum from saved data. After release operating lever and let measuring arms free, the gauge will display "🔒" and the maximum, and record its position. You can repeat the above process when moving measuring arm again.



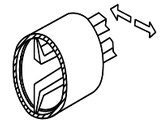
Outside caliper gauge

Measuring external groove diameter in "**Max**" mode. Steadily pivot the gauge horizontally to find the maximum.



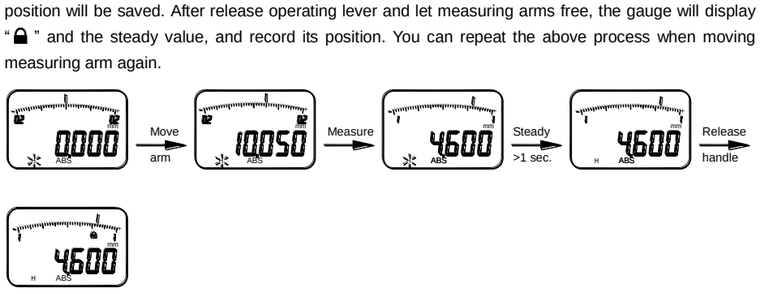
Inside caliper gauge

Measuring internal groove diameter in "**Max**" mode. Steadily pivot the gauge horizontally to find the maximum.

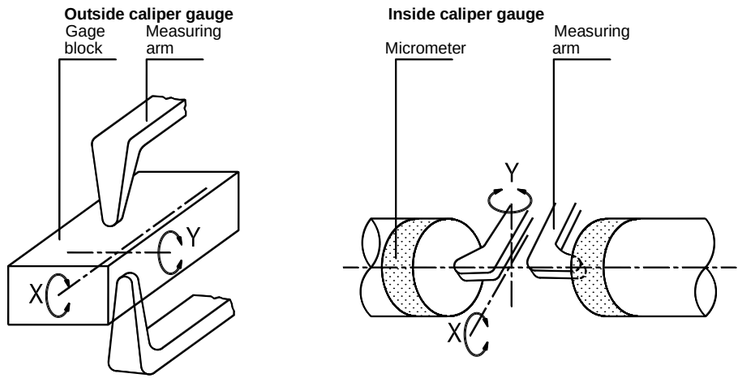


6.4 Find and save steady value automatically

"**H**" flashing in this mode. "**H**" stops flashing when measured value is steady >1 sec, this value and its position will be saved. After release operating lever and let measuring arms free, the gauge will display "🔒" and the steady value, and record its position. You can repeat the above process when moving measuring arm again.



7. Calibrate the origin



Calibrate the origin with gage block (for outside caliper gauge) or outside micrometer (for inside caliper gauge) before measuring. Clean measuring faces of gage block or outside micrometer and measuring contacts of calipers with soft cloth. Pivot caliper gauge according the drawings to find the minimum. Follow chapter **4**, set caliper gauge's origin to actual value of the gage block or the micrometer reading (you must hold caliper gauge steadily when setting). Repeat the above process until origin position's reading not change. If you calibrate the origin for inside caliper with a ring gage, you need to find the maximum in similar way.

- In automatically measuring mode, the origin calibrating will become more convenient and accurate. Follow chapter **6.2**, find the minimum, "🔒" appears on LCD. Then, set the origin. At this time, wherever the measuring arm is the position of the origin is the position of the minimum recorded by gauge. Follow chapter **6.3**, find the maximum, "🔒" appears on LCD. Then, set the origin. At this time, wherever the measuring arm is the position of the origin is the position of the maximum recorded by gauge.

8. Analog display

Analog display in normal measuring mode is the fractional part of displayed value. Its range will change automatically.

a. Resolution: 0.001mm/0.00005in

Analog display range		Digital display range (Fractional part)		Analog display resolution	
mm	in	mm	in	mm	in
±0.02	±0.001	X.000—X.019	X.00000-X.00095	0.001	0.00005
±0.04	±0.002	X.020—X.039	X.00100-X.00195	0.002	0.0001
±0.2	±0.01	X.040—X.199	X.00200-X.00995	0.01	0.0005
±0.4	±0.02	X.200—X.399	X.01000-X.01995	0.02	0.001
±1	±0.1	X.400—X.999	X.02000-X.09995	0.05	0.005
	±0.2		X.10000-X.19995		0.01
	±1		X.20000-X.99995		0.05

b. Resolution: 0.005mm/0.0002in

Analog display range		Digital display range (Fractional part)		Analog display resolution	
Mm	in	mm	in	mm	in
±0.1	±0.004	X.000—X.095	X.0000-X.0038	0.005	0.0002
±0.2	±0.01	X.100—X.195	X.0040-X.0098	0.01	0.0005
±0.4	±0.02	X.200—X.395	X.0100-X.0198	0.02	0.001
±1	±0.1	X.400—X.995	X.0200-X.0998	0.05	0.005
	±0.2		X.1000-X.1998		0.01
	±1		X.2000-X.9998		0.05

9. Power

- Battery is a CR2032, 3V. Replace the battery when display is blurring or "🔋" appears.
- If not used in about 5 minutes, the power will auto-off. The gauge will wake up when pressing "**ON/OFF**" key or moving measuring point.
- Power off the gauge by pressing "**ON/OFF**" key to save battery if not use.

10. Data output

- Data output interface is **RS232C**. The gauge can be connected to PC's serial port by **SPC** cable (Order No. **P1104**) or to PC's **USB** port by **SPC** cable + **USB** to serial port cable (Order No. **P1201**).
- The gauge outputs data once if press the "**DATA**" key shortly, and "🖳" flashes once.
- Press and hold the key (> 1 sec.), the gauge outputs the data to PC continuously and "🖳" keeps displaying. Press the key again to stop outputting.
- **Series port format:**

Baud rate	Start bit	Data bit	Stop bit	Parity	Data logic
1200	1	7	2	none	reverse

- **Data format:**

Order	1	2	3	4	5	6	7	8	9	10
Metric	S	N1	N1	N	·	N	N	N	CR	LF
Inch	S	N	·	N	N	N	N	N	CR	LF

S: Minus or space N1: Minus or space or digit 0-9 N：Digit 0-9

11. Specifications

Resolution: 0.001mm/0.00005in 0.005mm/0.0002in

Measuring range: 0-12.7mm/0-0.5in

Responding speed: 0.35m/s

Power consumption: <=50μA

Operating temperature: 0 ~ 40℃

Storage temperature: -20 ~ 60℃

12. Precautions

- Do not subject the gauge to blows or knocks.
- Do not drop the gauge or apply excessive force to the gauge.
- Do not disassemble the gauge.
- Do not press the key with a pointed object.
- Do not use or store the gauge under direct sunlight, or in an excessively hot or cold environment.
- Do not subject the gauge in strong magnetic fields and high voltage environment.
- Use soft cloth or cotton cleaning the gauge. Do not use any organic solvent such as acetone etc..
- Remove the battery if the gauge not use for a long time.

13. Trouble shooting

Failure	Causes	Repairing
Display "**E 1**"	Measuring value over display range.	Reset the origin or convert to relative measuring mode.
Display "**E 2**"	The origin is too great.	Reset the origin.
Display "**E 3**"	Something wrong with sensor.	1. Reset the battery. 2. Return the gauge for repair.
Display "**E 4**"	Upper limit <= lower limit.	Reset tolerance.
Measuring value is not correct	1. Measuring surfaces are dirty. 2. The origin isn't correct.	1. Clean measuring surfaces. 2. Reset the origin.
Display is confusing or dead	Suffer to strong disturb.	Reset battery.
No display Display is blurring "🔋" appears	Battery voltage under 2.8V.	Replace battery.
The output data is wrong	Battery voltage under 2.8V.	Replace battery.