

Safety Precautions

To ensure operator safety, use this instrument in conformance with the directions and specifications given in this Users' Manual.

GB

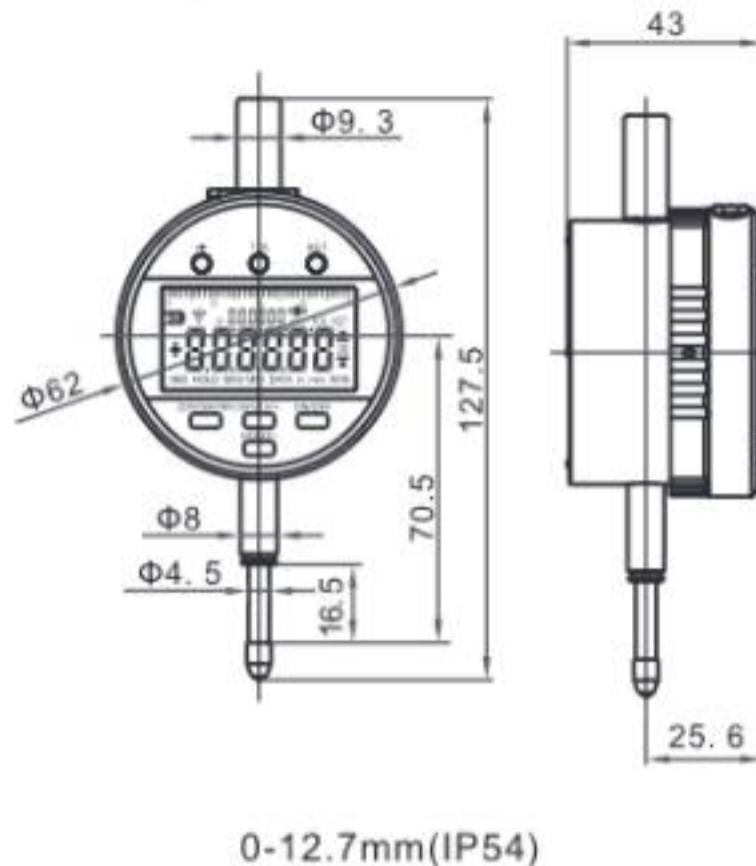


- Do not disassemble, short-circuit, charge, or heat the battery. Otherwise the battery content may leak to come into contact with the eye, or cause battery heating or explosion.
- If a battery is swallowed, immediately consult a doctor.

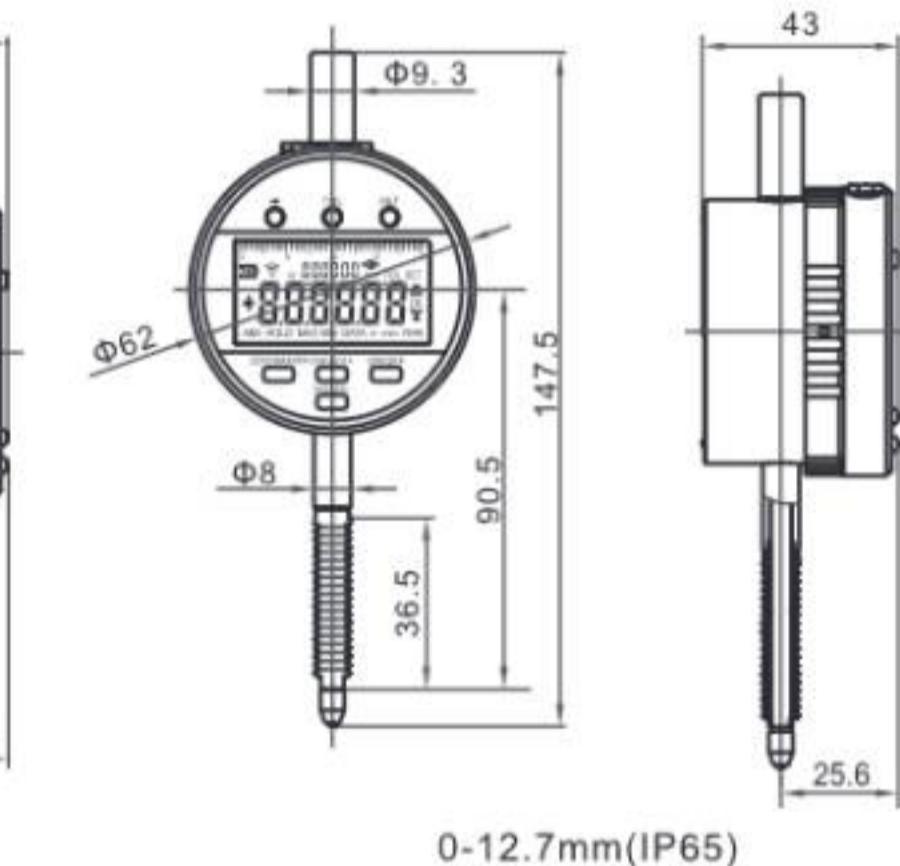
Disposal of Old Electrical & Electronic Equipment (Applicable In the European Union and other European countries with separate collection systems)



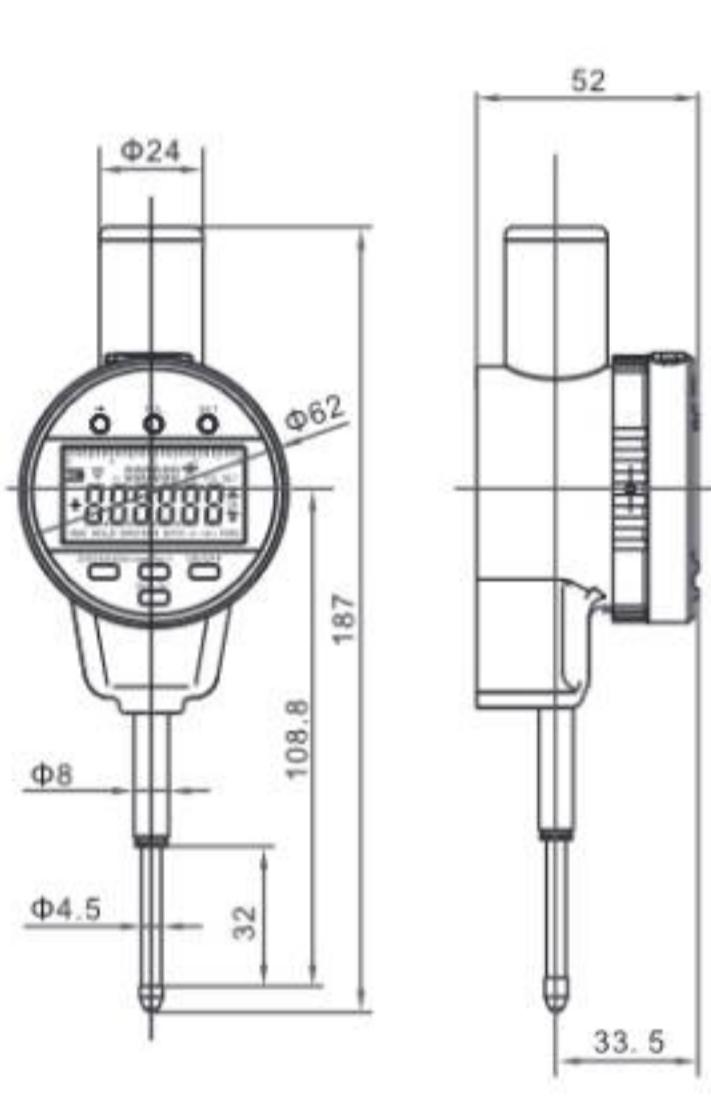
This symbol on the product or on its packaging indicates that this product shall not be treated as household waste. To reduce the environmental impact of WEEE (Waste Electrical and Electronic Equipment) and minimize the volume of WEEE entering landfills, please reuse and recycle. For further information, please contact your local dealer or distributors.

Boundary dimension

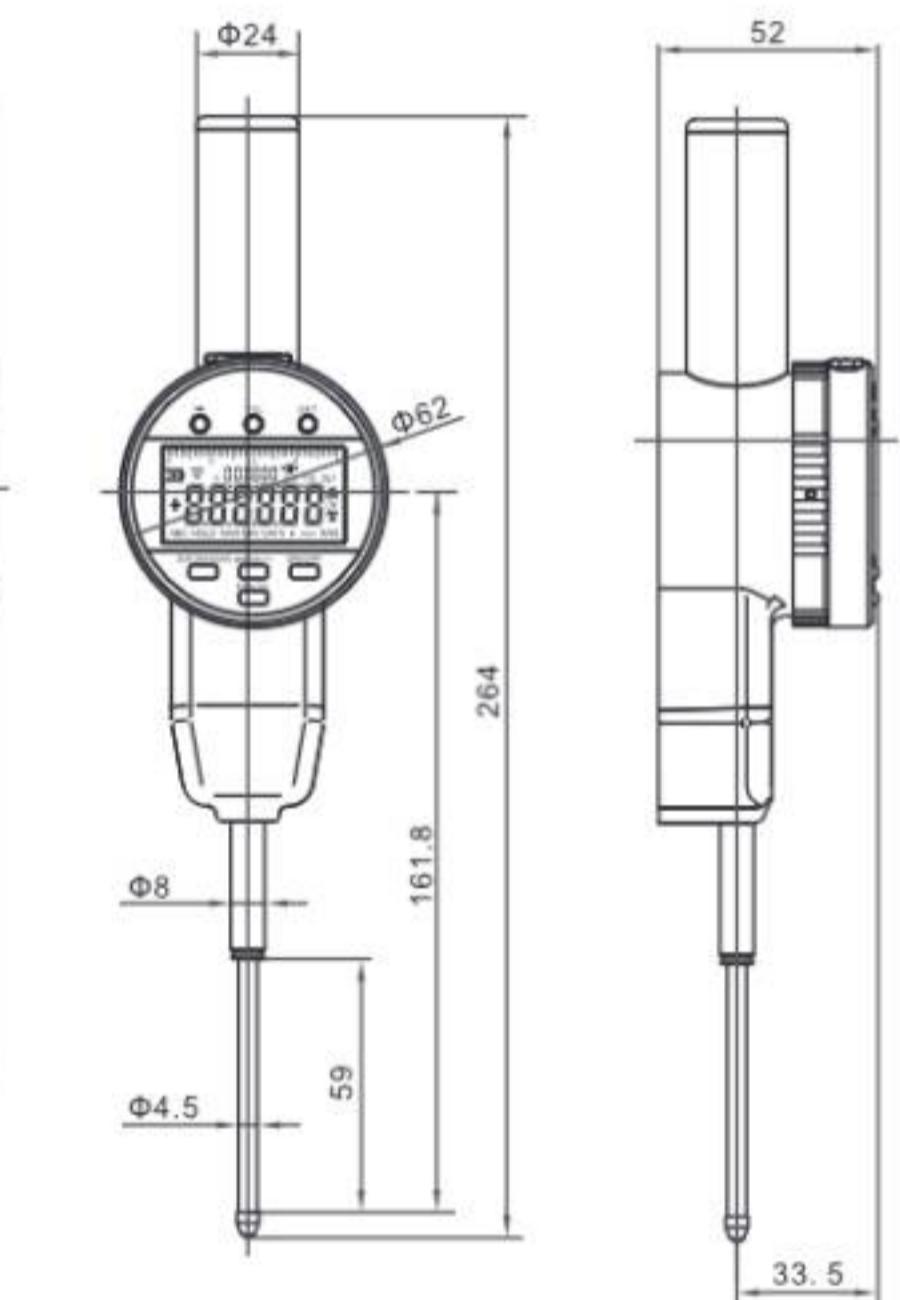
0-12.7mm(IP54)



0-12.7mm(IP65)



0-25.4mm



0-50.8mm

Notice for use

- Please use the original charger for charging, otherwise the product and charger may be damaged. Avoid falling, Avoid impacting, Avoid flooding, Stay away from high temperature, Do not disassemble the raster indicator without permission.
- In case of special situations, please use a non-original charger of 5V/2A or above, otherwise it will cause damages to the product or charger.

Note

- If there is dust or dirt on the measuring rod that affects its movement, please wipe it clean with a dry cloth without oil.
- If serious dirt on the case affects the reading, please use a neutral cleaner to wipe it with a duster cloth, do not use volatile solvents (such as thinner). To prevent damage to the case.
- When not using the charging / data connector, please cover the protective plug to prevent dust and debris from entering.

Technical index

Model	Range (mm)	Accuracy	Resolution	Power supply mode	Charging/communication interface	Waterproof
GS-5331	0-12.7	≤10μm	5μm	3.7V lithium battery	USB Type-C	IP54/IP65
GS-5301		±3 μm	1μm			IP54/IP65
GS-5311		≤3 μm	0.5μm			IP54/IP65
GS-5321		≤14μm	0.2μm			IP54/IP65
GS-5331	0-25.4	≤10μm	5μm			IP54
GS-5301		±3 μm	1μm			IP54
GS-5311		≤3 μm	0.5μm			IP54
GS-5321		≤1.8μm	0.2μm			IP54
GS-5331	0-50.8	≤10μm	5μm			IP54
GS-5301		±3 μm	1μm			IP54
GS-5311		≤3 μm	0.5μm			IP54

Function Introduction

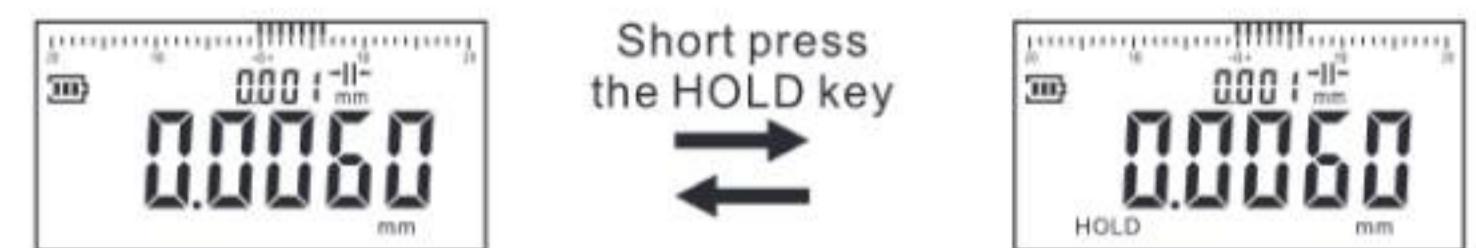
- ON/OFF key: Press this button to start or shut down the machine;
- MM/IN key: Short press this key to convert metric or English units; The LCD displays the mm character to represent the metric unit; The LCD displays the in character to represent the british unit;



long press this key to change the direction of measurement.



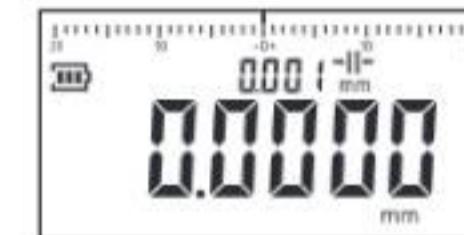
- HOLD key: Short press this key for data retention; The LCD show the HOLD character to indicates that the display data is locked; The LCD does not show the HOLD character to indicate that the display data is unlocked.



Long press this key to set the current analog pointer to zero.



- ZERO/MAX/MIN key: Short press this key to set the LCD data to zero.



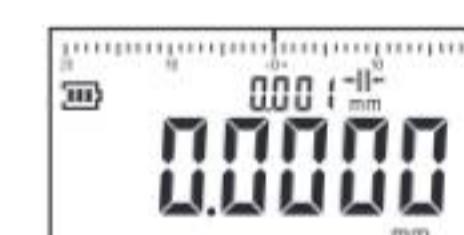
Press this key for a long time to start or exit the maximum value, minimum value, range measurement, etc. The procedures for measurement are as follows:

Press ZERO/MAX/MIN key for a long time to enter the maximum value measurement. LCD displays MAX and RAN character. Press HOLD key again for re-measurement after the ending of this measurement.

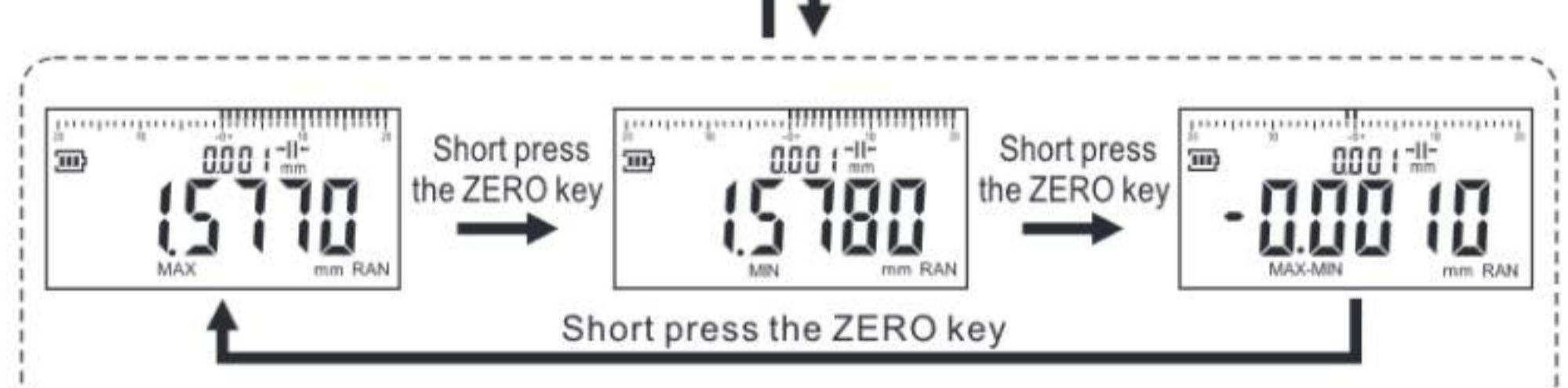
Press ZERO/MAX/MIN key for a short time to enter the minimum value measurement. LCD displays MIN and RAN character. Press HOLD key again for re-measurement after the ending of this measurement.

Press ZERO/MAX/MIN key for a short time to enter the range value measurement. LCD displays MAX-MIN and RAN character. Press HOLD key again for re-measurement after the ending of this measurement.

Press ZERO/MAX/MIN key for a long time to exit measurement.



Long press the ZERO key



- key: Right shift key, available for parameter setting

TOL key:

Short press this key to configure the default value, upper and lower limit parameters. If the upper and lower limit parameters are configured incorrectly, the LCD does not display OK, ▲ and ▼;

Short press this key to configure the default value, upper and lower limit parameters. If the upper and lower limit parameters are configured incorrectly, the LCD does not display OK, ▲ and ▼;

Setting steps:

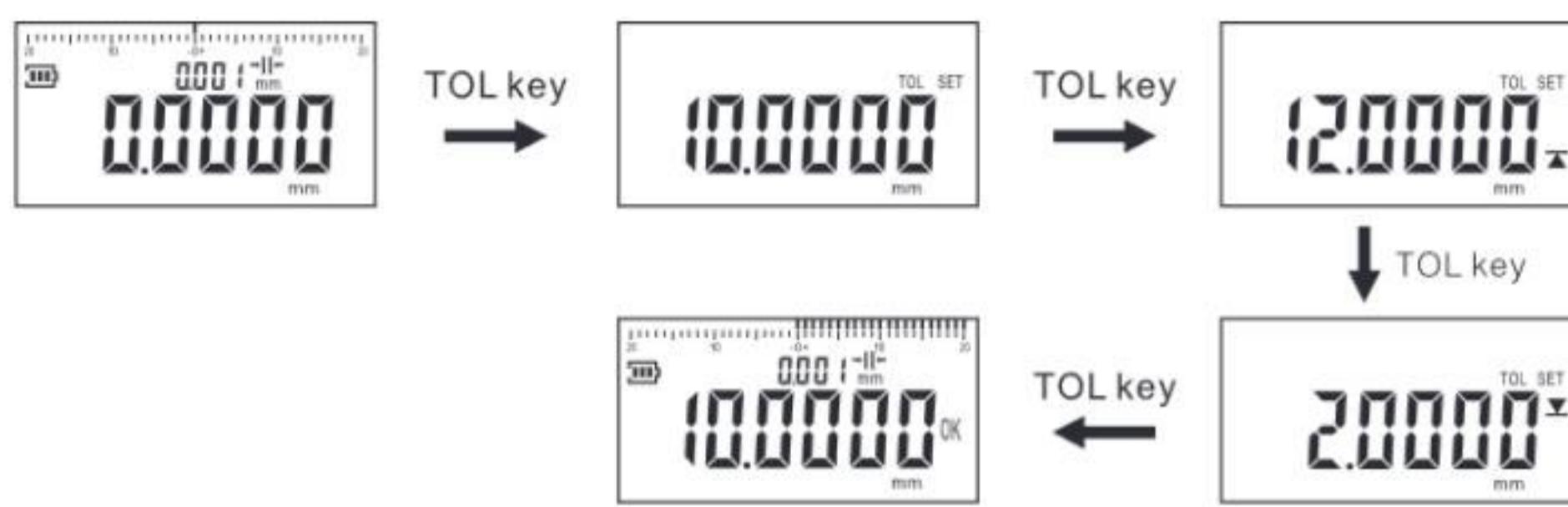
- Press the TOL key to set the default value, The LCD displays SET, TOL characters to set the preset value, upper and lower limit parameters, press → to change flicker bit, and press +/- to change parameters;

- Press TOL once more to set the upper limit, The LCD displays SET, TOL, ▲ characters to set the upper limit, upper and lower limit parameters, press → to change flicker bit, and press +/- to change parameters;

- Press TOL once more to set the lower limit, The LCD displays SET, TOL, ▼ characters to set the lower limit, upper and lower limit parameters, press → to change flicker bit, and press +/- to change parameters;

- Press TOL once more to exit the settings and start measuring;
 - The LCD displays the OK character to indicate that the measured value is qualified;

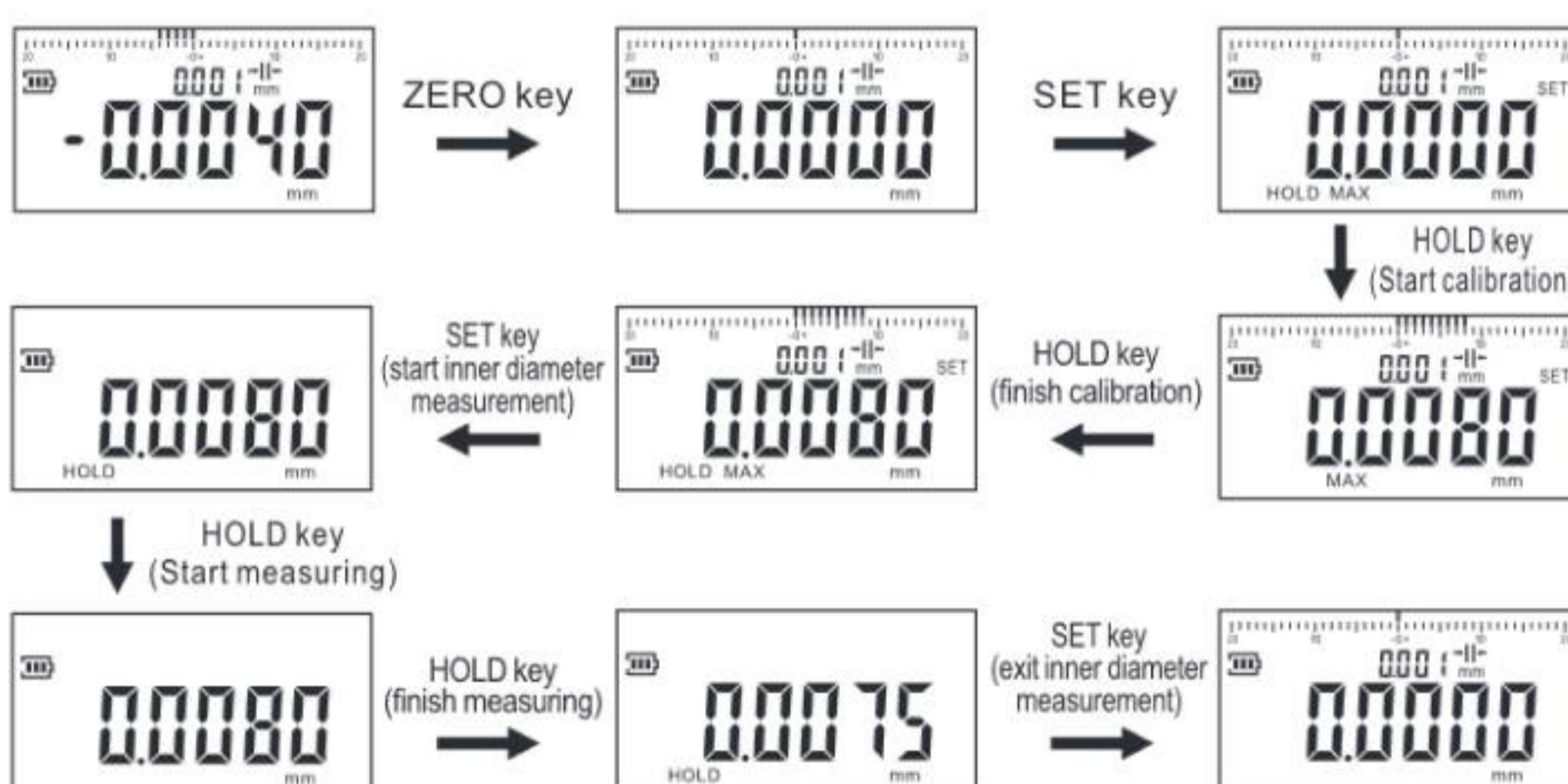
(2) The LCD displays **▲** characters to indicate that the measured value exceeds the upper limit;
 (3) The LCD displays **▼** characters to indicate that the measured value exceeds the lower limit;



SET key:

Press this key to enter the calibration of inner diameter measurement and start inner diameter measurement (Matched measuring rod is required). Internal diameter measurement procedure:

1. In the free state of the product, press ZERO key to set the data to zero;
 Press SET key to enter the calibration interface of ring gauge;
2. Put the product into the calibrating ring gauge and press HOLD once to calibrate the calibrating ring gauge to zero position. The product needs to be shaken substantially, press HOLD once again to end the calibration and press SET once to enter the inner diameter measurement;
3. After taking out the calibrating ring gauge, put the product into the workpiece under test, press HOLD once to start the inner diameter measurement, and then press HOLD once to finish the measurement; Measure the next workpiece according to the above steps.
4. Press SET key again to exit the inside diameter measurement.



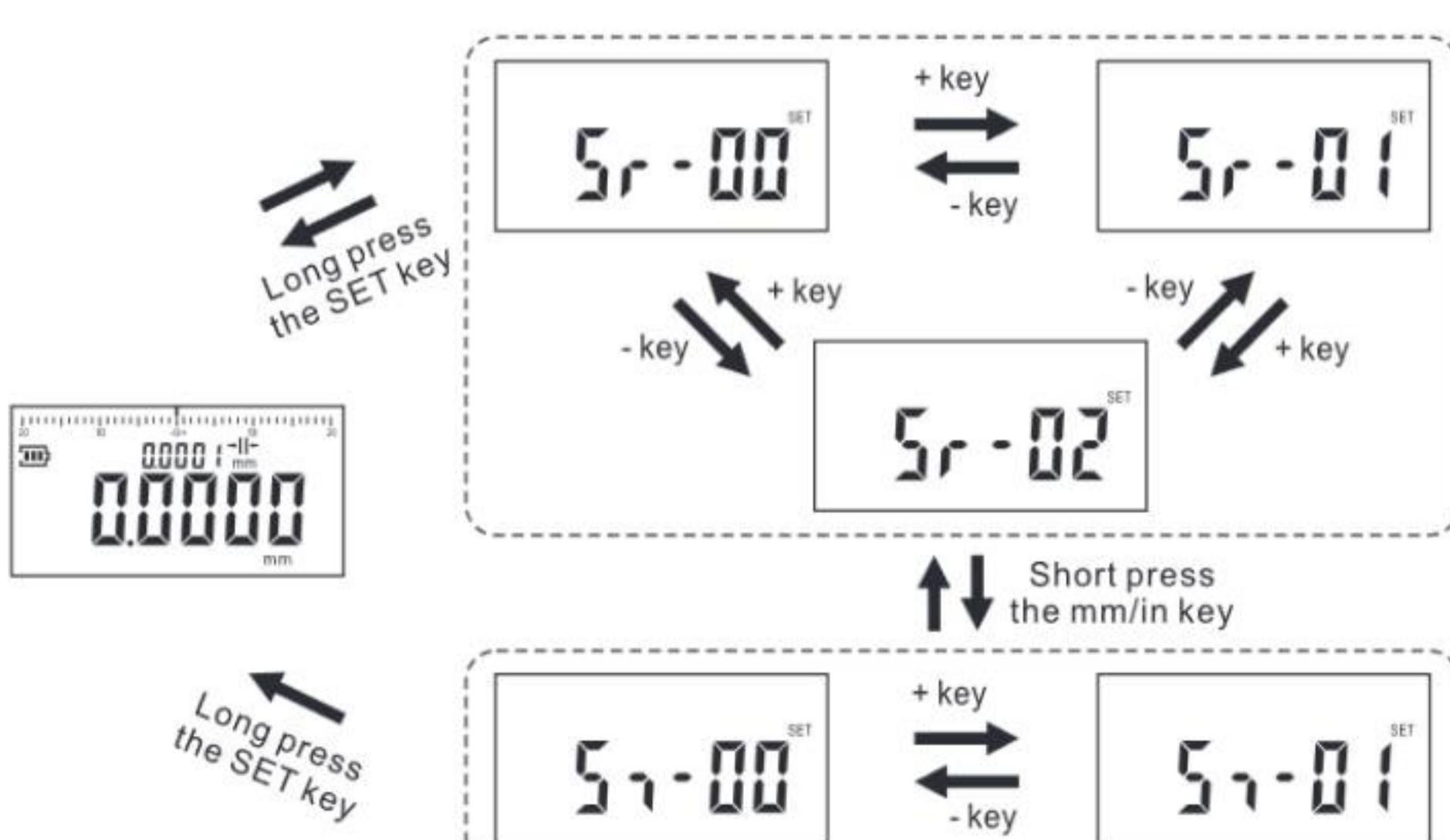
Long press this key to set / exit resolution of analog pointer and auto shutdown time. Parameters can be set by +/- key.

LCD displays **Sr - 00** and SET, sets up the resolution of gauge as 0.01mm

LCD displays **Sr - 01** and SET, sets up the resolution of centimeter gauge: the resolution of high-precision centimeter gauge is 0.005mm, the resolution of other dial gauges is 0.001mm

LCD displays **Sr - 02** and SET character means to set the resolution of high precision ten thousandth indicator to be 0.0002mm, and the resolution of ten thousandth indicator is set to be 0.0005mm. High-precision centimeter gauge and micrometer gauge have no such settings.

When the LCD displays **Sr - 00** and SET characters, it will not shut down automatically; At other time, it can be set automatic shut when there's no operation in 1-99 minutes.



Communication interface protocol

1. Interface Output Description:

Interface name: USB Type-C 16P
 D+ : Data receiving RXD
 Interface pin definition: D- : Data transmission TXD
 GND:ground
 Interface signal: RS232 signal.

2. data frame format: RTU pattern

communication parameters: Baud rate 38400
 Data frame: 1 start bit, 8 data bits, no parity, 2 stop bits.

Read the data of raster indicator:

Host query command		Response of indicator	
01 03 00 00 00 02 C4 0B		01 03 04 01 00 12 39 37 7D	
address code	01H	address code	01
function code	03H	function code	03
first address to access register	00H	length of data word	04
length of data word	00H	data word 1 high 8 bits	01H
CRC(low 8 bits)	C4H	data word 1 low 8 bits	00H
CRC(high 8 bits)	0BH	data word 2 high 8 bits	12H
		data word 2 low 8 bits	39H
		CRC(low 8 bits)	37H
		CRC(high 8 bits)	7DH

Instructions:

1. Example of the host machine and indicator communication, the host issues an 8-byte fetch command, Indicator responds to 9-byte data. The high position is in front, data word 1-2 is the measurement data of indicator.
2. The measured data is 4 bytes, the first byte is the symbol bit, representing the plus-minus sign, and the two and fourth bytes are the hexadecimal measured data.
3. The measured data in the case are converted into decimalism as 4665; the sign bit is 01H, representing a negative number, so the actual displacement length corresponding to the high-precision ten thousandth meter and the ten thousandth meter is -0.4665mm; The corresponding actual displacement length of HP centimeter and micrometer gauges is -4.665mm.
4. The CRC efficacy code of this machine is 16-bit CRC efficacy code, and the polynomial is $X^{16}+X^{15}+X^2+1$. See the appendix for an example of table lookup algorithm.

Reset protocol

Host reset command		Response of indicator	
01 06 08 00 AB 56 74 A4		01 06 08 00 AB 56 74 A4	
address code	01H	address code	01H
function code	06H	function code	06H
first address to access register	08H	first address to access register	08H
reset command sign	00H	reset command sign	00H
CRC(low 8 bits)	ABH	reset command sign	ABH
CRC(high 8 bits)	56H	CRC(low 8 bits)	56H
	74H	CRC(high 8 bits)	74H
	A4H	CRC(high 8 bits)	A4H

1. This command can reset the indicator.

2. The CRC efficacy code of this machine adopts 16-bit CRC efficacy code, and the polynomial is $X^{16}+X^{15}+X^2+1$. See the appendix for an example of table lookup algorithm

Appendix 1: Examples of CRC algorithms

unsigned short CRC(unsigned char frame[],int n)

//The array frame is the object to be checked by CRC, and n is the number of bytes to check

```

int i,j;
unsigned short crc,flag;
crc=0xffff;
for(i=0;i<n;i++)
{
  crc^=frame[i];
  for(j=0;j<8;j++)
  {
    flag=crc&0x0001;
    crc>>=1;
    if(flag)
    {
      crc&=0x7fff;
      crc^=0xa001;
    }
  }
}
return(crc);
}

```

Note: In the MODBUS CRC check code transmission, low bits are the first, high bits are the last.