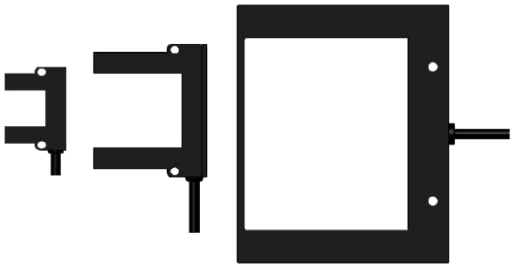
齐力达

计数传感器产品选型手册
Counting Sensor Manual

专利产品，仿冒必究

Patent products, counterfeiting will be prosecuted



锦洪传感技术研发(深圳)有限公司

QILY sensor Technology R&D Co., Ltd

公司介绍

锦洪传感技术研发（深圳）有限公司扎根深圳，核心团队专注深耕传感器领域 20 余年。公司是集工业自动化传感器系列产品及仪器仪表的**研发、制造、销售与技术服务**于一体的技术驱动型企业。

我们专注于**安全光幕、测量光幕、光电传感器、接近传感器、激光位移传感器等核心传感器产品**的研发与创新。紧跟市场前沿技术与应用趋势，依托自身技术优势，持续推出满足市场需求的新产品。同时，公司高度重视**制造能力与质量管控体系**的建设，拥有一支专业的**管理、研发与生产团队**，确保为客户提供**技术先进、性能可靠、品质稳定**的工业自动化解决方案，并可**深度定制**，充分满足客户在安全防护及其他应用场景的特定需求。

公司构建了覆盖全国的客户服务网络，为自动化设备生产厂商等广大客户提供**及时、专业**的售前、售中与售后支持，产品品质深获市场认可。

秉承 **“创新是灵魂，品质是生命”** 的发展理念，我们致力于以**高性价比的产品和卓越的服务**，携手客户共创**互惠互利、合作共赢**的美好未来。

Jinhong Sensor Technology R&D (Shenzhen) Co., Ltd. is rooted in Shenzhen, with a core team dedicated to the field of sensors for over 20 years. The company is a technology driven enterprise that integrates the research and development, manufacturing, sales, and technical services of industrial automation sensor series products and instruments.

We focus on the research and innovation of core sensor products such as safety light curtains, measurement light curtains, photoelectric sensors, proximity sensors, and laser displacement sensors. Keeping up with the forefront of market technology and application trends, relying on our own technological advantages, we continuously launch new products that meet market demand. At the same time, the company attaches great importance to the construction of manufacturing capacity and quality control system, and has a professional management, R&D and production team to ensure that industrial automation solutions with advanced technology, reliable performance and stable quality can be provided for customers, and can be deeply customized to fully meet the specific needs of customers in safety protection and other application scenarios.

The company has established a nationwide customer service network, providing timely and professional pre-sales, in sales, and after-sales support for automation equipment manufacturers and other customers. The product quality has been deeply recognized by the market.

Adhering to the development philosophy of "innovation is the soul, quality is the life", we are committed to working together with customers to create a mutually beneficial and win-win future with high cost-effective products and excellent services.

高速计数传感器介绍

Introduction to high-speed counting sensors

自主研发，拥有自主知识产权及技术专利（专利号：**ZL201921139438.2**）。专利产品，仿冒必究。

Independently developed, with independent intellectual property rights and technical patents (patent number: ZL201921139438.2). Patent products, counterfeiting will be prosecuted.

产品特色 Product Features：

- 全窗口检测，无盲区
- 计数能力： 1000 次/秒 Counting ability: 1000 times/second
- 分辨率： Ø1.8mm
- 检测面：16*16，29*32，70*60 ，Ø17mm
- 便于使用，无需外挂放大器，上电即可使用
- 金属和非金属都可稳定检测到
- 透明与不透明液滴稳定检测，不分材质与颜色
- 实验数据连续检测计数 4000 万次无误检
- 部分型号带有 Teach-in 自动示教功能

Product Features：

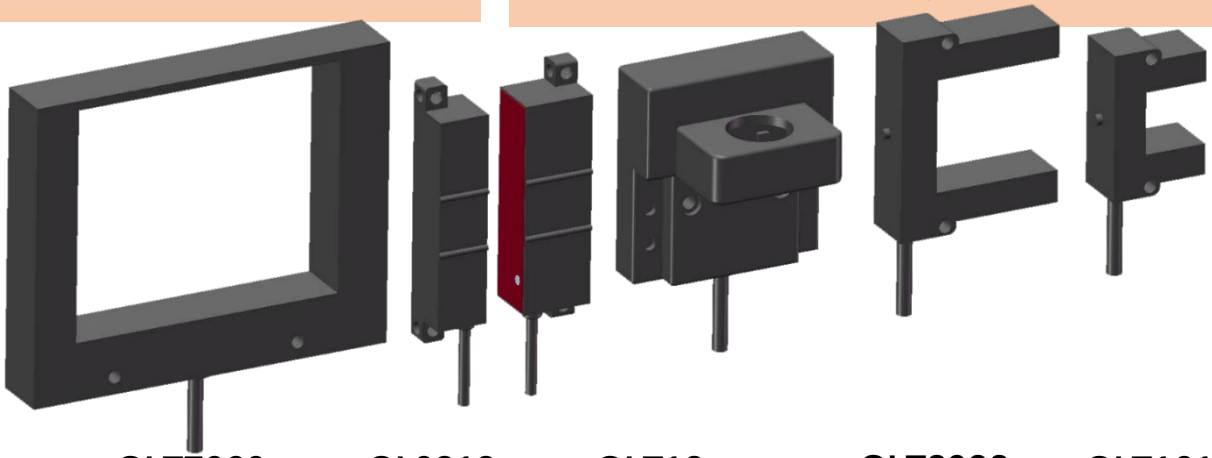
- Full window detection, no blind spots
- Counting ability: 1000 times/second
- Resolution： Ø1.8mm
- Testing surface：16*16，29*32，70*60 ，Ø17mm
- Easy to use, built-in amplifier, can be used when powered on
- Both liquids and solids can be stably detected
- Transparent and opaque droplet stability detection, regardless of material and color
- Continuous detection and counting of experimental data for 40 million times without errors
- Equipped with Teach-in automatic teaching function

应用场合：

- 阀门测漏，输液监控
- 气泡检测
- 液位监测
- 透明或不透明的液滴、液柱检测或计数
- 化妆品、药剂液滴精准配比
- 点数机、包装机计数、药片胶囊计数
- 螺丝、螺母、拉链头、纽扣等小型五金件计数
- IC、电阻、电容计数
- 蚊子等昆虫检测计数，准确率 > 99%

Application scenarios:

- Valve leakage detection
- Infusion monitoring
- Infusion monitor
- Bubble detection
- Liquid level monitoring
- Transparent or opaque droplet or column detection or counting
- Cosmetics and pharmaceutical droplet proportioning equipment
- Counting machines, packaging machines, pill and capsule counting
- Counting of small hardware components such as screws, nuts, zipper heads, buttons, etc
- IC, resistor, capacitor counting
- Mosquito and other insect detection and counting equipment, with an accuracy rate of over 99%



QLT7060　QL0813　QLT18　QLT2932　QLT1616

技术参数 Technical parameters：

型号 Model	QLP1616	QLT1616	QLT2932	QLT7060	QLT18	QL0813
外形 Shape	U 型 Shape	U 型 Shape	U 型 Shape	窗口型 Window type	L 型	分离对射型 Separate Through beam
信号输出 Output	NPN/PNP	NPN/PNP select	NPN/PNP select	NPN/PNP select	NPN/PNP select	NPN
信号状态 Signal status	常开 NO		常开 NO/常闭 NC 切换 Select		常开 NO	
检测范围 Detection range	16*16mm *2	16*16mm	29*32mm	70*60mm	Ø17mm*3	13*300mm
灵敏度调节 Sensitivity Settings	——		按键调节 Key Settings		旋钮调节 Knob setting	
响应时间 response time	1ms	0.5ms	1ms	1.5ms	0.5ms	0.5ms
电源电压 Voltage	4-30V	4-30V	6-30V	12-30V	6-30V	6-30V
耗电流 Current*4 (功率 Power)	19mA (0.5W)	13mA (0.3W)	15mA (0.4W)	15mA (0.4W)	15mA (0.4W)	15mA (0.4W)
检测精度 Accuracy	3mm	1.8mm				
检测对象 Test object	气泡 Bubble	液滴、不间断的液柱、元器件、药粒药丸 Droplets, uninterrupted liquid columns, components, pills, insects				
计数速度 Counting ability	1000 次/分钟 1000 times/minute					
检测方式 Detection method	框内无盲区检测 No blind spot detection within the frame					
光源 Light source	红外 940nm					
保护电路 Protection circuit	电源接反保护、输出短路保护、错接保护					
环境照明度 Illuminance	受光面照明度白炽灯：3,000Lux 以下、太阳光：10,00Lux 以下 Incandescent lamp: below 3000Lux, sunlight: below 10000Lux					
周围温度 Temperature	动作时 Action: -25～+55℃、保存时 Save：-40～+70℃ （不结冰·结露）					
周围湿度 Humidity	动作时 Action:35～85%RH、保存时 Save：35～95%RH （不结露）					
防护结构 protective structure	IP65					
绝缘电阻 insulation resistance	＞20MΩ 以上（DC500V 兆欧表 Megohmmeter）					
耐压 pressure resistance	AC1,000V 50/60Hz 1min					
振动(耐久) Vibration	10～55Hz 复振幅 complex amplitude 1.5mm X、Y、Z 2h					
冲击（耐久）impact	500m/s2 X、Y、Z 3 次 Times					
外壳材料 housing material	PC					
连接方式 connection method	直接电缆 Straight out cable 2m					

1、一些特殊行业计数检测有突出表现，如能识别水滴尾巴，不至于误判。对于电解电容等带插脚的元器件也能智能过滤不误判。Some special industries have outstanding performance in counting and detection, such as being able to identify water droplet tails without misjudging. For components with pins such as electrolytic capacitors, intelligent filtering can also be performed without misjudgment.

2、*1：出厂默认输出：NPN 常开+PNP 常开，其它输出订货时说明。Factory default output: NPN normally open+PNP normally open, please specify other outputs when ordering

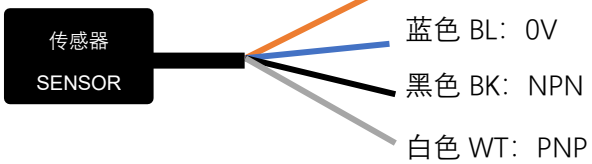
3、*2：管道外径 Ø16 透明管，壁厚小于 2mm. Outer diameter Ø 16 transparent pipe, wall thickness less than 2mm

4、*3： 管道外径 Ø17 透明管，壁厚小于 2mm. Transparent pipe with an outer diameter of Ø 17 and a wall thickness of less than 2mm

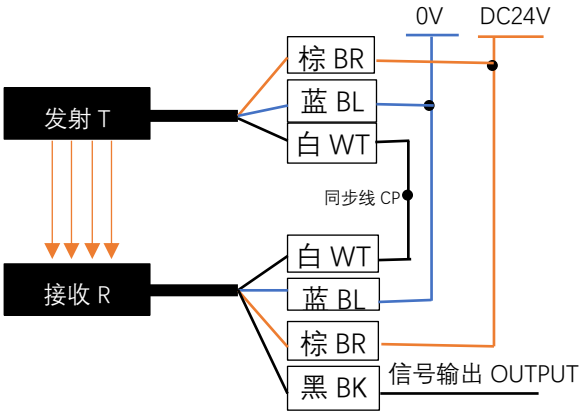
5、*4：该数值是以 24V 供电测试值。功率不变，耗电流根据电压不同而不同，电压高耗电流就低。This value is tested with 24V power supply. The power remains constant, but the current consumption varies depending on the voltage, with higher voltage resulting in lower current consumption.

接线说明 Wiring Instructions：

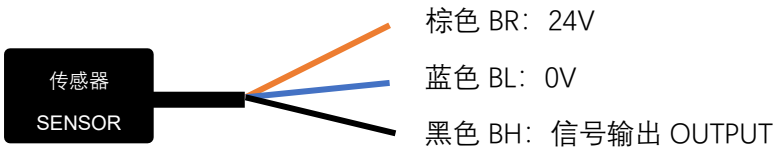
QLP1616



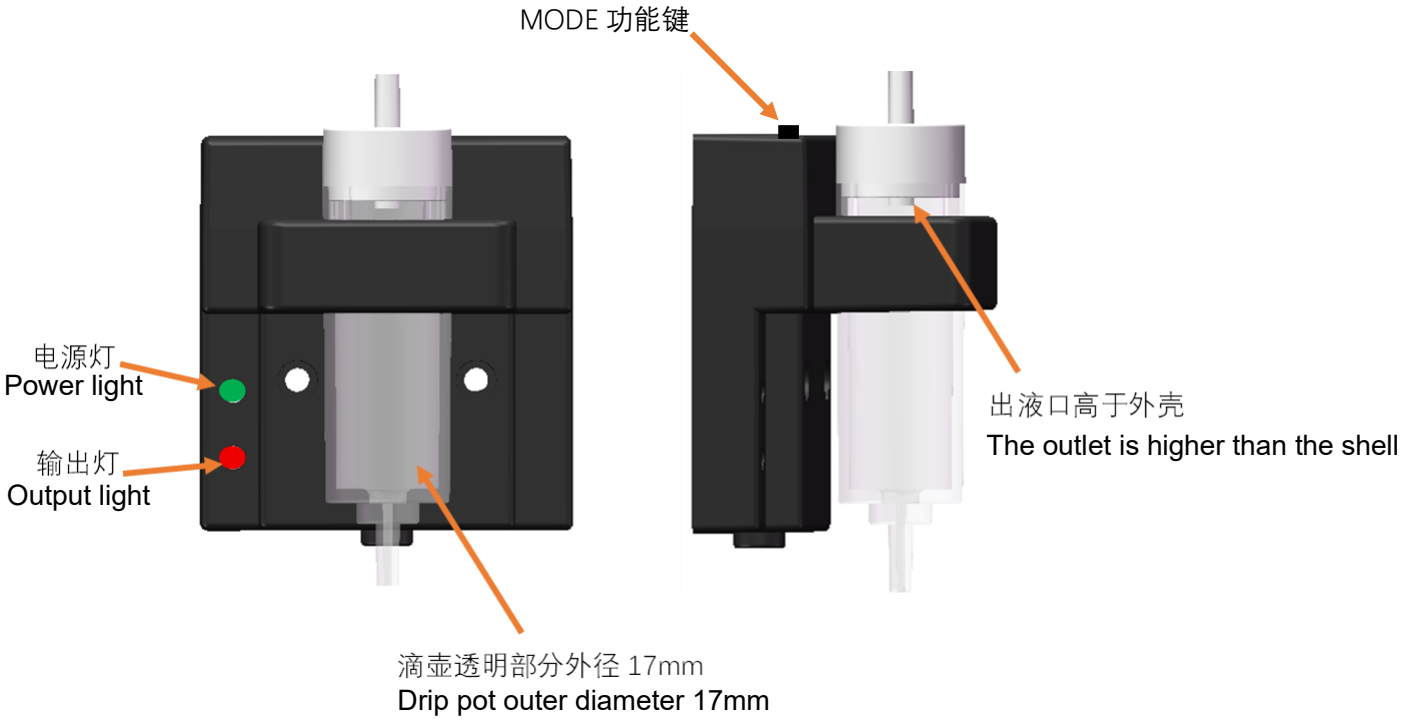
QL0813



QLT1616/QLT2932/QLT18/QLT7060



QLT18：



【MODE】功能键及灵敏度旋钮使用说明
Instructions for using function keys and sensitivity keys

【MODE】功能键使用方法 Function key usage method：

功能 Function	功能键操作 Function key operation	指示灯状态 Indicator light status	备注 Remark
灵敏度自动调节 Sensitivity auto setting	长按 3 秒 Press and hold for 3s	红绿灯交替慢闪 3 秒 The red and green indicator lights alternate and flash slowly for 3s	使用前设定。设定失败红绿灯会交替快闪 3 秒 Pre use settings. The red and green indicator lights for setting failure will flash rapidly alternately for 3s
常开 NO/常闭 NC 切换 Selection	短按 2 次 Short press twice	红灯慢闪 3 秒切换成常闭 Red light flashes slowly for 3s and select NC	出厂默认常开 Factory default NO
NPN/PNP 切换 Selection	短按 3 次 Short press 3 times	绿灯慢闪 3 秒切换成 PNP Green light flashes slowly for 3s to output PNP	出厂默认 Factory default NPN
高/低速模式切换 High/Low Speed Mode Selection	短按 4 次 Short press 4 times	绿灯红灯同时慢闪 3 秒为低速 The slow flashing of green and red lights for 3s is the low-speed mode	出厂默认高速模式。在电磁或电机、变频器等干扰严重的场合调为低速 Factory default high-speed mode. Set to low speed in situations where electromagnetic fields, motors, frequency converters, and other interference are severe
屏蔽两端灯珠 Shield both ends of the LED beams	短按 5 次 Short press 5 times	红灯常亮 3 秒，红绿同时闪 2 次 The red light stays on for 3 seconds, and the red and green flashes twice at the same time	出厂默认不屏蔽。在使用透明管壁厚超过 2mm 时使用
平行光/交叉光检测 Parallel/cross light detection	短按 6 次 Short press 6 times	红灯闪 3 次，然后绿灯闪 2 下，交叉光 The red light flashes 3 times, then the green light flashes 2 times to turn into a cross light	出厂默认平行光检测。被检测对象直径小于 1.8mm 时使用交叉光检测。Factory default parallel light detection. When the diameter of the detected object is less than 1.8mm, cross light detection is used.
取消输出延时 Cancel output delay	短按 7 次 Short press 7 times	绿灯快闪 5 次，红灯快闪 5 次 Green and red lights flash 5 times in sequence	出厂默认输出延时 10ms, 高速计数时取消延时 The factory default output delay is 10ms, and the delay is canceled during high-speed counting
测不间断水流 Measure continuous water flow	短按 8 次 Short press 8 times	红灯亮 3 秒，红绿灯同时闪 3 秒 The red light stays on for 3s, and both the red and green lights flash for 3s	出厂默认此功能不开启 By default, this feature is not enabled at the factory
恢复出厂设置 Restore factory configuration	短按 9 次 Short press 9 times	红绿灯同时亮三秒 The red and green indicator lights are on for3s at the same time	所有功能恢复到出厂设置 All functions are restored to factory settings

使用步骤 Usage steps：

1、 安装好传感器后，通上电源。After installing the sensor, turn on the power supply

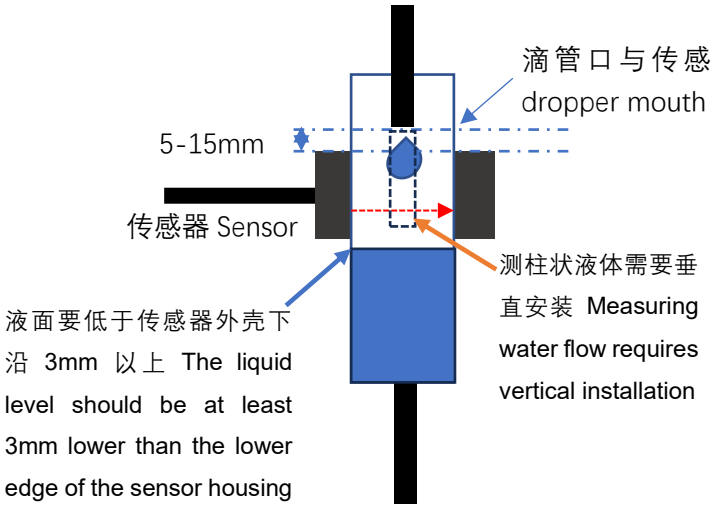
2、 在没有物体通过的情况下长按【MODE】键进行灵敏度设定，以便精准适应当前使用场景。Long press the [MODE] key to set sensitivity without any objects passing through, in order to accurately adapt to the current usage scenario

3、 其他功能根据上表描述选用。Other functions should be selected according to the description in the table above

使用注意事项 Precautions for use

1、传感器测液滴夹管时注意事项 Precautions for sensor clamp tube detection of liquid droplets:

液滴出口与传感器外壳齐平上方建议距离 5-15mm。如果出现滴一次计数两个的情况，增加液滴出口与传感器的距离，此种情况主要是针对出液滴形成很慢的场合。The recommended distance between the droplet outlet and the sensor housing is 5-15mm. If counting two droplets at once occurs, increase the distance between the droplet outlet and the sensor. This is mainly for situations where the droplet formation is very slow.

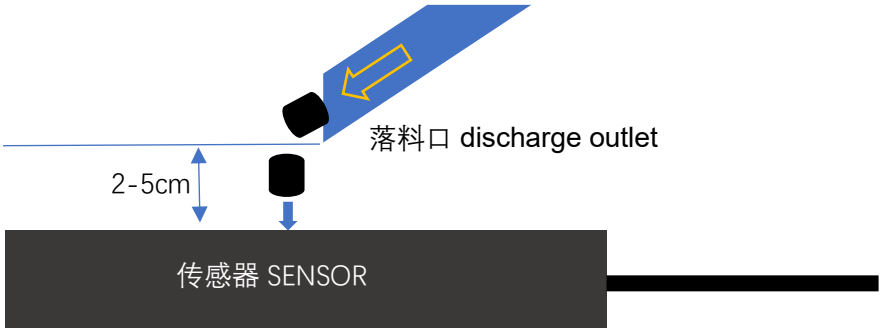


使用传感器测试管内液滴时，管壁要求小于 2mm，且管子要求透明。When using sensors to test liquid droplets inside the tube, the tube wall should be less than 2mm and the tube should be transparent.

- QLT1616 使用管子外径尺寸 Suitable for pipe outer diameter dimensions 15-16mm。
- QLT2932 使用管子外径尺寸 Suitable for pipe outer diameter dimensions 28-29mm。
- QLT18 使用管子外径尺寸 UseSuitable for pipe outer diameter dimensions17-18mm。

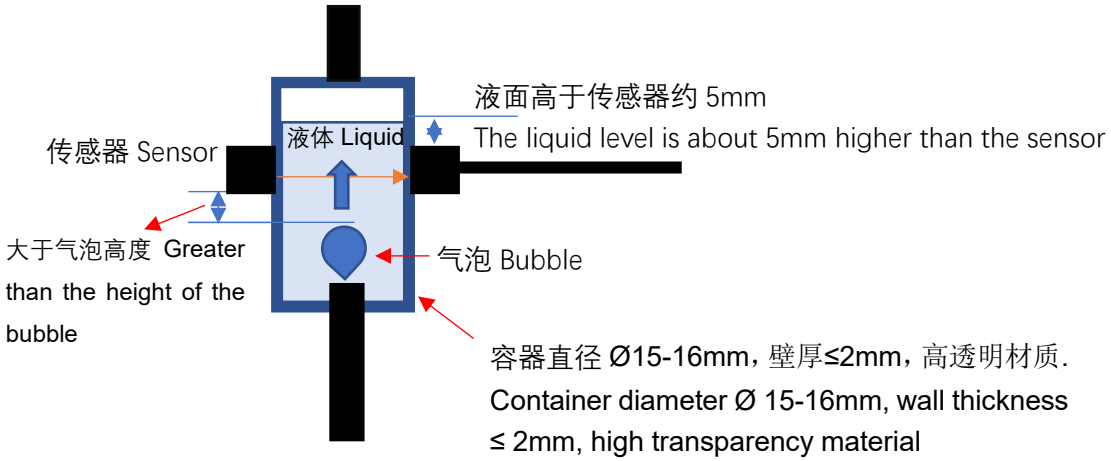
2、传感器测固体物件时使用注意事项 Precautions for using sensors to measure solid objects:

当工件比较小时，落料口和传感器检测面之间的距离需要尽量小，工件越大，距离可以稍远一点，在安装调试阶段需要根据实际情况来调整距离，直至检测稳定。When the workpiece is relatively small, the distance between the feeding port and the sensor detection surface needs to be as small as possible. The larger the workpiece, the farther the distance can be. During the installation and debugging stage, the distance needs to be adjusted according to the actual situation until the detection is stable.



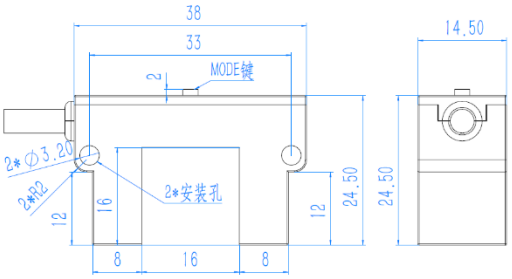
3、QLP1616 气泡检测传感器测气泡时的注意事项 Precautions for measuring bubbles with QLP1616 bubble detection sensor:

- 气泡须大于 3mm，安装传感器时注意传感器下部与气泡顶部（完全脱离气管）的距离大约 3-5mm。根据实际情况调整传感器上下的位置，直至检测稳定。
  The bubble must be larger than 3mm. When installing the sensor, pay attention to the distance between the lower part of the sensor and the top of the bubble (completely detached from the trachea), which is about 3-5mm. Adjust the position of the sensor up and down according to the actual situation until the detection is stable.
- 由下方管路出口往上冒出的气泡才能检测。其他方式的气泡生成无法检测。
  Only bubbles rising from the outlet of the lower pipeline can be detected. Other forms of bubble generation cannot be detected.

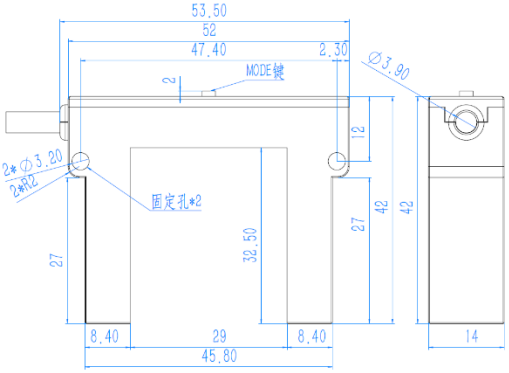


外形尺寸 Size：

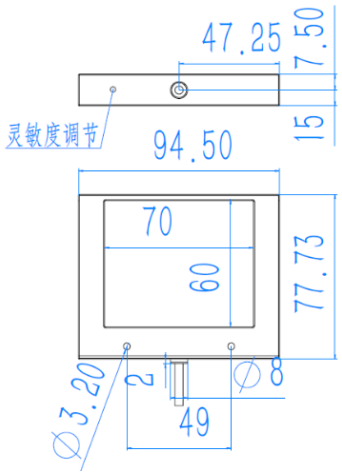
QLP1616/QLT1616:



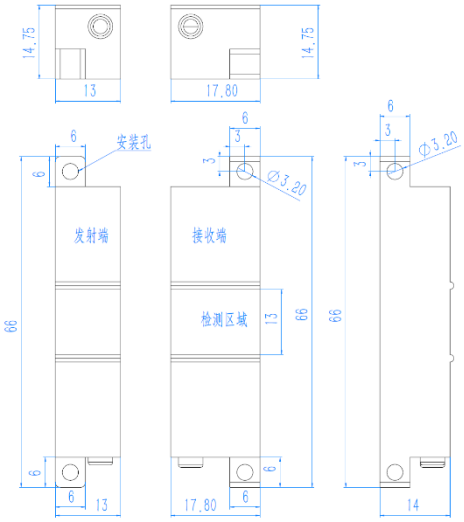
QLT2932:



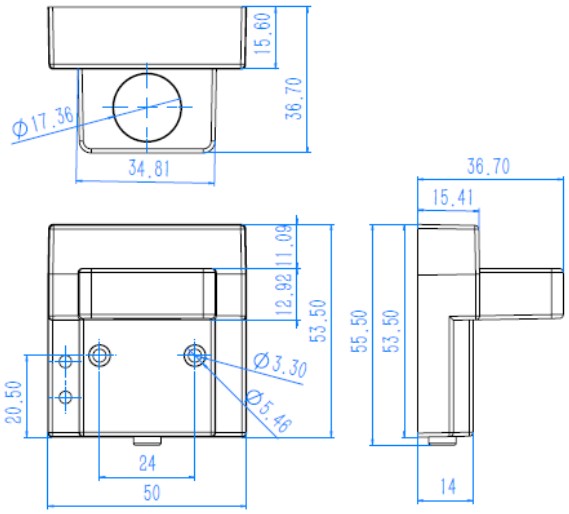
QL7060：



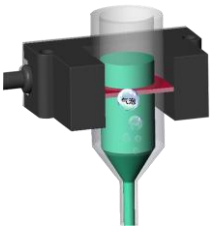
QL0813 分离式：



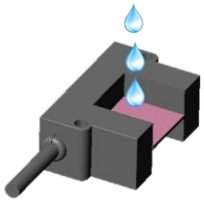
QL18 ：



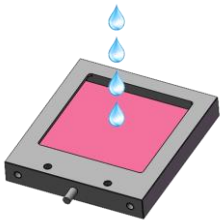
应用案例 Application Cases：



气泡检测
Bubble detection



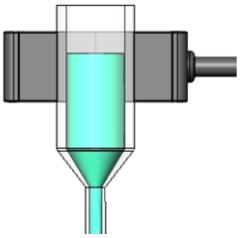
液滴检测
Droplet detection



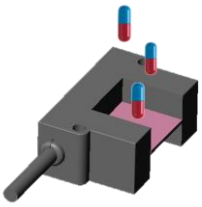
液滴检测
Droplet detection

液柱检测
Liquid column detection

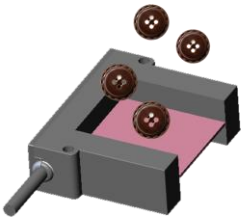
输液监测
Infusion monitoring



液位检测
Liquid detection

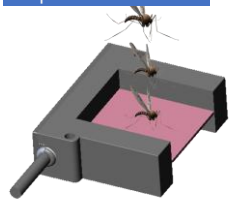


药丸计数
Pill counting

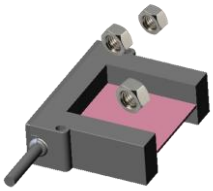


纽扣计数
Button Count

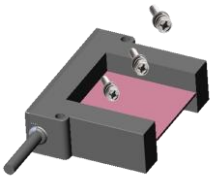
种子计数
Seed Count



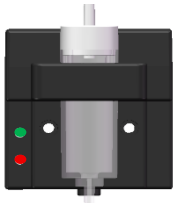
蚊子昆虫计数
Insect Count



螺母计数
Nut count



螺丝计数
screw count



液滴检测
Droplet detection

多功能仪表 QLX72

Multi Functional Instrument QLX72

产品特色：

- 高清液晶 LCD 显示屏
- **控速：**过快或过慢速度限制报警输出，可控制外部设备调速。
- **流量：**可设置液滴体积，流量计算更精准
- **计时：**到达设定值即可停止计数
- **计数：**可设定计数次数，达到即停止计数并输出报警
- **监控：**具备 RS485 通讯，可实现远程监控
- **网络：**具备物联网功能，手机也可监控
- 报警：三组独立报警控制输出，应用更广泛。
- 具备断电保存功能，数据更安全。
- 简单易用，无需复杂设置
- 功能丰富，一机多用
- 220V 或 24V 电源皆可使用

Product Features：

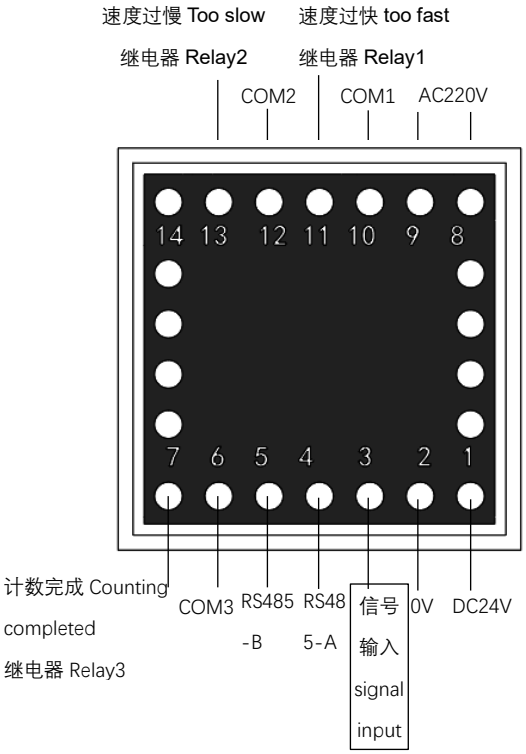
- High definition LCD display screen
- Speed control: Alarm output for speed limit too fast or too slow, which can control the speed of external devices.
- **Flow rate:** droplet volume can be set for more accurate flow rate calculation
- **Timing:** Stop counting when the set value is reached
- **Counting:** The number of counting times can be set to stop counting and output an alarm when reached
- **Monitoring:** Equipped with RS485 communication, remote monitoring can be achieved
- **Network:** Equipped with IoT functionality, mobile phones can also monitor
- **Alarm:** Three independent alarm control outputs, with a wider range of applications.
- Equipped with power-off saving function, data is more secure.
- Easy to use, no need for complex settings
- Rich in functions, one machine with multiple uses
- Both 220V and 24V power supplies can be used

型号 Model：

型号 Model	功能 function	尺寸 Size（mm）
QLX72	1、速度过快/过慢报警 Speed too fast/too slow alarm 2、流量计算与显示 Traffic calculation and display 3、计时功能，达到及时设定停止计数 Timing function, reaching the timing setting to stop counting 4、监控：RS485 远程监控 Monitoring: RS485 remote monitoring	72x72x69
QLX72T	1、速度过快/过慢报警 Speed too fast/too slow alarm 2、流量计算与显示 Traffic calculation and display 3、计时功能，达到及时设定停止计数 Timing function, reaching the timing setting to stop counting 4、监控 Monitoring：RS485 远程监控 RS485 remote monitoring 5、物联网功能 Internet of Things function:互联网监控 Internet monitoring	72x72x69

一、外观尺寸及接线柱定义 Appearance dimensions and terminal definitions

显示主界面 Show main interface



设置界面 Settings interface

接线柱定义 Definition of terminal block:

1: DC24V,最大提供 500mA 电流 Provide a maximum current of 500mA

2: 0V

3: 信号输入口,可自动分辨 NPN,PNP 信号。Signal input port, capable of automatically distinguishing NPN and PNP signals.

4: 485-A

5: 485-B

6: 测量完成继电器 3 输出的公共端,可接 DC 30V(最大 3A) Measure the common terminal of relay 3 output, which can be connected to DC 30V (maximum 3A)

7: 测量完成继电器 3 输出的常开端 Measure the terminal of relay 3 output after completion(NO)

8: AC220V 火线(不分正负) AC220V live wire

9: AC220V 零线(不分正负) AC220V neutral wire

10:速度过快继电器 1 输出的公共端,可接 DC 30V(最大 3A) The common terminal output of relay 1 with excessive speed can be connected to DC 30V (maximum 3A)

11:速度过快继电器 1 输出的常开端 Output terminal of overspeed relay 1（NO）

12:速度过慢继电器 2 输出的公共端,可接 DC 30V(最大 3A) Slow speed relay 2 output common terminal, can be connected to DC 30V (maximum 3A)

13:速度过慢继电器 2 输出的常开端 Slow speed relay 2 output terminal

14:空 Do not use

二、功能说明 Functional Description:

1、**速度 Speed**：取连续 5 次信号触发平均时间计算 Calculate the average time of triggering 5 consecutive signals

2、**流量 Traffic**：显示流量，单位：毫升。Display flow rate per minute, unit: milliliters

3、**计时 Timing**：检测到第一次信号开始计时，累计。Detected the first signal and started timing, accumulated

4、**计数 Count**：累计计数 Cumulative count

5、**液滴体积设置 Droplet volume setting**：点击此按钮，输入每滴体积（出厂默认 0.035 毫升/滴。）。需要人工输入标定的每滴液滴的体积。Click this button and enter the volume per drop (factory default 0.035 milliliters per drop). Manual input is required to calibrate the volume of each droplet.

标定方法 Calibration method：用计数传感器计算 500 滴进入量杯看体积，用体积除于 500 滴就得到每滴液滴的体积，填入每滴体积数值。Calculate the volume of 500 droplets entering the measuring cup using a counting sensor, divide the volume by 500 droplets to obtain the volume of each droplet, and fill in the volume value of each droplet.

6、**计时设置 Timer Settings**：点击此按钮，输入需要计时的值，达到设定值后停止计数。出厂默认为 0，即一直计数。Click this button, enter the value to be timed, and stop counting when the set value is reached. The factory default is 0, which means it counts continuously.

7、**速度限制 Speed limit**：点击此按钮，输入上限速度和下限速度，与【速度】里的值比较。出厂默认位 0，即不进行速度限制。Click this button, enter the upper limit speed and lower limit speed, and compare them with the values in 'Speed'. The factory default is 0, which means there is no speed limit.

速度过慢/快 Too slow/fast speed：当速度高于【速度限制】设置的上限值时，显示“速度过快”并闪烁；当速度低于【速度限制】设置的下限值时，显示“速度过慢”并闪烁；When the speed exceeds the upper limit set by the 'speed limit', it will display 'speed too fast' and flash; When the speed is below the lower limit set by the 'speed limit', it will display 'speed too slow' and flash;

速度过快对应 10 和 11 接线端；过慢报警对应 12 和 13 接线端，过快或过慢都输出继电器信号，方便外部设备控制速度。Excessive speed corresponds to terminals 10 and 11; The slow alarm corresponds to terminals 12 and 13, and outputs relay signals for either too fast or too slow, making it convenient for external devices to control speed.

8、**计数设置 Count setting**：当计数达到设定的值时，就提示“计数完成”并闪烁。出厂默认 0，即一直计数不报警。【计数设置】对应一个接线端子，完成后继电器吸合，方便外部接报警设备。When the count reaches the set value, it prompts "Count Complete" and flashes. The default value at the factory is 0, which means that there will be no alarm when counting continuously. 【 Counting setting 】 Corresponding to one wiring terminal, the relay will be closed after completion, making it convenient to connect external alarm devices.

9、**复位 Reset**：长按此按钮 3 秒，【速度】、【流量】、【计时】、【计数】将同时清零。其它设定值不清零。Press and hold this button for 3 seconds, and the [Speed], [Flow], [Timing], and [Counting] will be reset simultaneously. Other set values are not reset to zero

10、**RS485**：可通过串口将【速度】、【流量】、【计时】、【计数】进行远程显示，并可在远程电脑设定“液滴设置”、“计时设置”、“速度限制”、“复位”等 Speed, flow, timing, and counting can be remotely displayed through a serial port, and settings such as "droplet settings", "timing settings", "speed limit", and "reset" can be set on a remote computer

11、预留物联网卡槽，可通过手机小程序或公众号设定和显示。Reserved IoT card slot, which can be set and displayed through mobile phone applet or official account

12、采用 AC220V 或 DC24V 外部供电，显示器给传感器供电 DC24V。如果外部供电 24V，和传感器一起接到 1 和 2 脚。AC220V or DC24V external power supply, the instrument supplies DC24V power to the sensor. If the external power supply is 24V, connect it to pins 1 and 2 together with the sensor.

■**特别注意 Special attention**：外部供电 24V 时，正负极不能接反，否则会烧毁仪表。When the external power supply is 24V, the positive and negative poles cannot be reversed, otherwise it will burn out the instrument.

三、通讯设置 Communication settings:

485 通讯波特率 communication baud rate:115200,设备地址号 Equipment address number:0x01(如存在多个设备可更改 If there are multiple devices that can be changed)

通讯格式 communication format:

地址号 功能码 寄存器地址高位 寄存器地址低位 4 个字节数据 Address number, function code, register address, high-order register, low order 4 bytes of data CRCL CRCH

功能码为 0x06 时为写数据 When the function code is 0x06, it is for writing data

寄存器地址 register address	十进制地址 Decimal address	字节数 Byte count	备注 Remark
0x01	1	4	不管何数据,都进入设置，即可通过 485 设置参数 Regardless of the data, enter the settings and set the parameters through 485
0x02	2	4	液滴设置,数据为液滴每滴的毫升数,不需要管小数点 Droplet setting, data is the milliliters per droplet, no decimal point is required
0x03	3	4	液滴速度下限 Lower limit of droplet velocity
0x04	4	4	液滴速度上限 Upper limit of droplet velocity
0x05	5	4	计时的次数 The number of times the timer is timed
0x06	6	4	计数的次数 Count the number of times
0x07	7	4	退出设置,自动保存。修改后必须退出设置保存 Exit settings and save automatically. After modification, the settings must be exited and saved
0x08	8	4	非设置界面下复位所有数据 Reset all data in non setting interface

功能码为 0x03 时为读数据 When the function code is 0x03, it is read data

寄存器地址 register address	十进制地址 Decimal address	字节数 Byte count	备注 Remark
0x01	1	4	读液滴速度,注意这个数据需要除以 10 Read the droplet velocity, note that this data needs to be divided by 10
0x02	2	4	读液滴流量,注意这个数据需要除以 10 Read the droplet flow rate, note that this data needs to be divided by 10
0x03	3	4	读计时 Reading timer
0x04	4	4	读计数 Read count
0x05	5	4	读液滴速度是否异常 Check if the droplet velocity is abnormal
0x06	6	4	读液滴是否计数完成 Read whether the count is complete
0x07	7	4	读是否在设置界面，返回大于 0 说明在设置界面 Read whether it is in the settings interface. If it returns a value greater than 0, it indicates that it is in the settings interface

举例 For example:

设置 Setting:

设置液滴的计时的次数为 100 时发送 Send when setting the timing of the droplet to 100 times: 01 06 00 05 00 00 00 64 2A 2C

设置液滴的计时的次数为 100000 时发送 Send when setting the timing of the droplet to 100000 times: 01 06 00 05 00 01 86 A0 18 1F

读取 Read:

读取液滴的计时发送 Timing transmission for reading droplets: 01 03 00 03 00 00 00 02 77 06

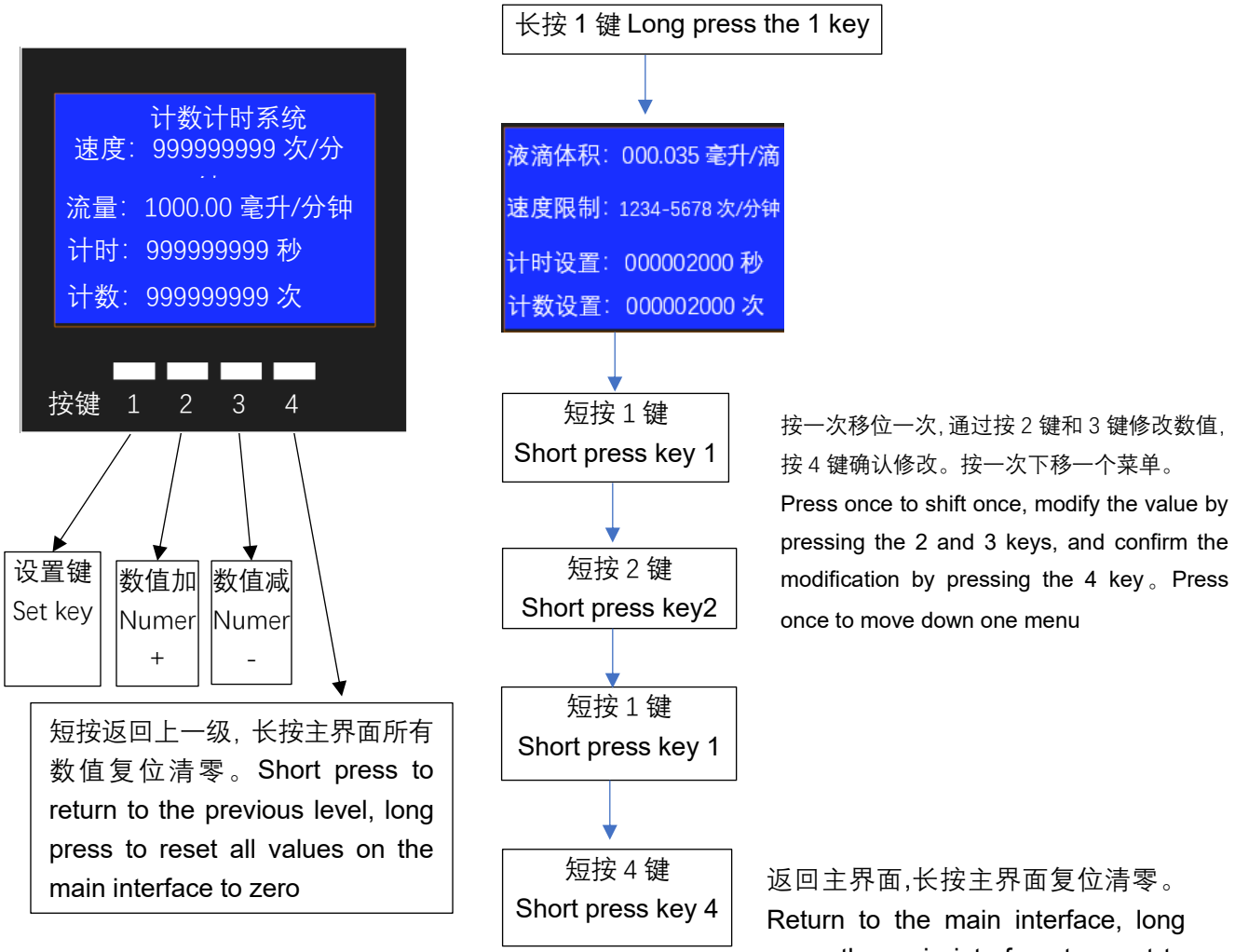
四、按键设置方法 Button usage method：

长按从左算起的第一个按键一秒，即可进入设置界面，进入设置后按第 2,3 个按键上下切换需要设置的参数菜单，再按第 1 个按键确认设置该参数，确认后按千位，百位，十位，个位一一设置参数。具体设置哪一位，该数位闪烁，修改好后再短按第 4 个按键确认修改，再短按第 4 个按键后退回主菜单，自动保存。

系统具备断电自动保存的功能，无论何时断电都会保存当前已经计算的数据，下次上电自动恢复。

Long press the first button from the left for one second to enter the settings interface. After entering the settings, press the second and third buttons to switch up and down to the parameter menu that needs to be set. Then press the first button to confirm setting the parameter. After confirmation, press the thousand, hundred, ten, and individual buttons to set the parameter one by one. Which digit should be set specifically? The digit will flash. After making the changes, press the fourth button briefly to confirm the changes. Press the fourth button briefly again to return to the main menu and save automatically.

The system has the function of automatically saving data in case of power failure. Whenever there is a power failure, the current calculated data will be saved and automatically restored the next time it is powered on.



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