

深圳市睿联传感科技有限公司

SHENZHEN REALUNION TECHNOLOGY CO., LTD.

SPECIFICATION

(产品规格书)



型号: [LL10AH](#)

光学式管道液体传感器
(Optical pipe liquid sensors)

版本 Version: V1.3

日期 Date : 2025/03/03

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● 修订记录 / Revision History

No.	日期/Date	备注/Remark	修订/Revision
1	20240811	发布版本/MP Version issue	V1.0
2	20240907	修改电压选择型项，将3.3V和5V电压归为一个版本	V1.1
3	20250106	修复图纸细节	V1.2
4	20250303	修改选型表	V1.3

● 应用邻域 / Application

1. 洗地机/ Washing machine:

检测洗地机清水箱是否有水，给予用户提示加水。检测污水箱是否装满，给予用户提示需要倒出污水

Check if there is water in the cleaning tank of the floor scrubber and provide users with a prompt to add water. Check if the sewage tank is full and provide users with a prompt to pour out the sewage

2. 饮品设备/ Beverage equipment:

在出液设备前添加传感器，若管道内检测不到液体，代表此时设备饮料已经使用完了，给用户提示添加材料

Add a sensor before the liquid dispensing device. If no liquid is detected in the pipeline, it means that the device's beverage has been used up and prompts the user to add materials

3. 咖啡机/ Coffee machine:

在咖啡机的出水管进行安装，当水箱的水使用完后进行提示

Install the water outlet pipe of the coffee machine and provide a prompt when the water in the tank is used up

4. 自动添料设备（液体）/ Automatic feeding equipment (liquid):

当材料使用完后需要进行提示或者保护

Prompt or protection is required after the material is used up

需要进行水泵空抽保护，缺液保护的设备都可以使用

Equipment that requires pump vacuum protection and liquid shortage protection can be used

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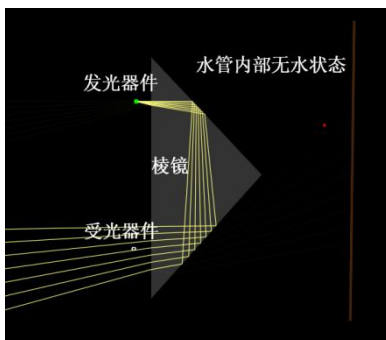
● 原理及优势/ Principle and Advantages

1. 光学式管道液体传感器的原理/ Principle of Optical Pipeline Liquid Sensor

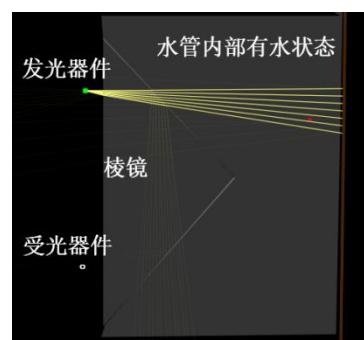
传感器利用光电效应和光的棱镜的折射效应进行检测管道内是否有液体的存在。当管道内没有液体，传感器的红外发光源发出的光照射到棱镜上，会进行反射，光电二极管接受到红外光，当管内有液体时，不会发生反射现象。受光器件便不会发生阻值的变化，由电阻的改变从而引发电压的改变，所以在MCU上检测电压的状态便可以得出管内有没有水。

Sensors use the photoelectric effect and the refractive effect of prisms to detect the presence of liquid in pipelines. When there is no liquid in the pipeline, the infrared light source of the sensor emits light that reflects off the prism. The photodiode receives infrared light and does not reflect when there is liquid inside the tube. The light receiving device will not undergo a change in resistance, and the change in resistance will cause a change in voltage. Therefore, detecting the voltage status on the MCU can determine whether there is water inside the tube.

无水状态光线模拟



有水状态



2. 优势，此传感器体积较小，安装快捷，方便，在检测过程中没有一点机械运动过程，使用寿命长。客户在使用此传感器开发方便，只需一个ADC接口便可。

Advantages: This sensor has a small size, is easy to install, and has no mechanical movement during the detection process. The process has a long service life. Customers can easily develop using this sensor with just one ADC interface.

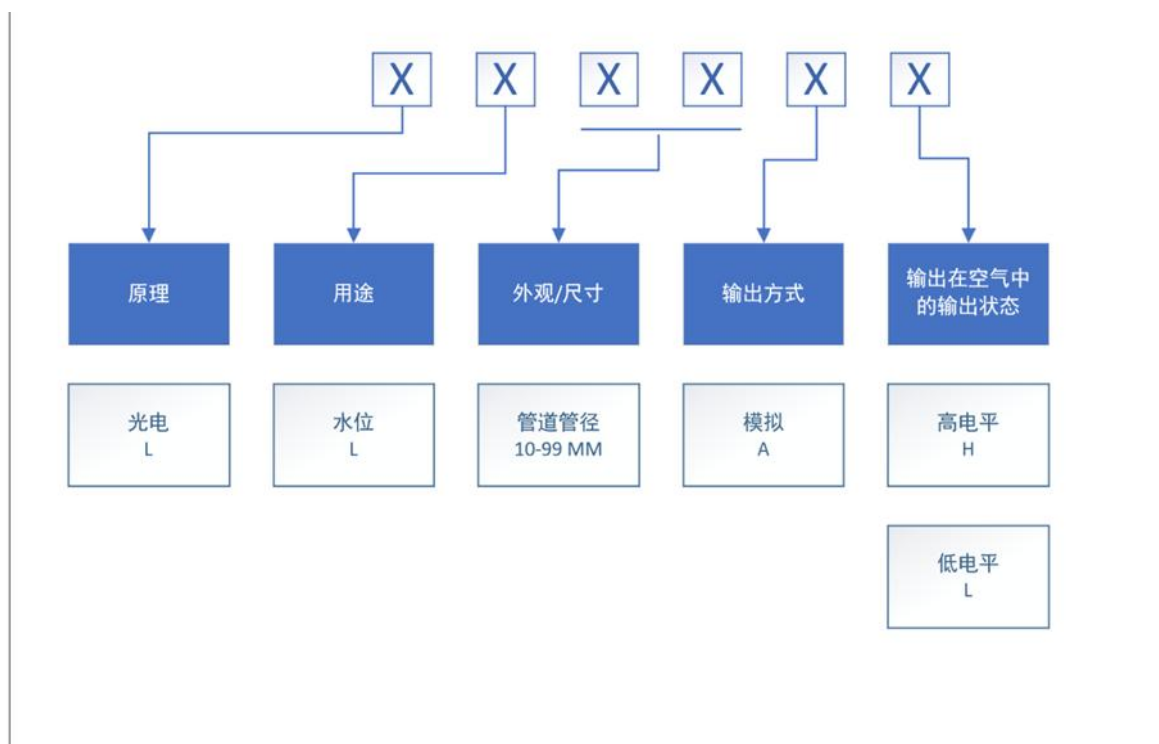
- 选型表 / Selection Table

LL10AH

根据水管的管径大小和主控的供电电压进行选择

Select based on the diameter of the water pipe and the main control power supply voltage

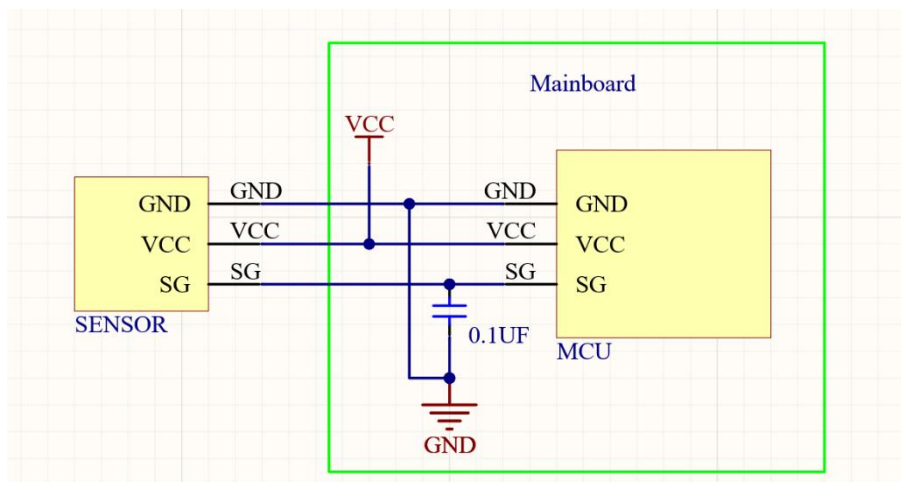
命名规则: (LL10AH)



● 特性/Specification (Ta=25°C)

参数//Parameter	符号/Symbol	值/ value		单位/units
工作电压/Working Voltage	Vdd	3.3	5	V
工作电流/Current	Idd	8	10	mA
输出电流/Output Current	OUT	<10(不可做驱动)	<10(不可做驱动)	mA
在液体中输出电压/in Water Voltage	Vo1	<0.5	<0.7	V
在空气中输出电压/ in Air Voltage	Vo2	>3.0	>4.5	V
输出特性/Output Specification	Os	模拟		-
工作温度/Operating Temperature	Ot	-20 ~ 80(管道无结霜)		°C
存储温度/Storage Temperature	St	-20 ~ +85		°C
工作寿命/ Operating life	OI	>50000		H
耐压力/Pressure resistant	Pr	0.1		MPa

● 推荐应用电路 / Recommended Application Circuit



注意/ attention:

信号线（SG）需要接主板的ADC检测口，当传感器在液体中时，SG输出低电压。当传感器离开液体后，SG输出高电压。

The signal line (SG) needs to be connected to the ADC detection port of the motherboard, and when the sensor is in liquid, the SG output low voltage. When the sensor leaves the liquid, the SG outputs a high voltage.

● 尺寸和推荐安装 / Outline Drawing and Recommended Installation

