米朗 MIRAN®

中国工信部高精度传感器一条龙应用计划示范项目

国家级专精特新“小巨人”企业，国家级高新技术企业

中国工业强基重点产品，中国工信部传感器一条龙应用计划示范企业

超声波位移传感器
Ultrasonic Displacement Sensor








超声波位移传感器
Ultrasonic Displacement Sensor

- Demonstration project of one-stop application plan for high-precision sensors of Ministry of Industry and Information Technology of China
- National level specialized and special new "little giant" enterprise, national level high-tech enterprise
- Key products of strong industrial base in China, demonstration enterprise of sensor one-stop application plan of Ministry of Industry and Information Technology of China

MCSB系列超声波位移传感器

MCSB Series Ultrasonic Displacement Sensor

产品概述 Product Overview

米朗超声波位移传感器是一种振动频率高于声波的机械波，由换能晶片在电压的激励下发生振动，利用超声波的特性研制而成的传感器。它具有频率高、波长短、绕射现象小，特别是方向性好、能够成为射线而定向传播等特点。

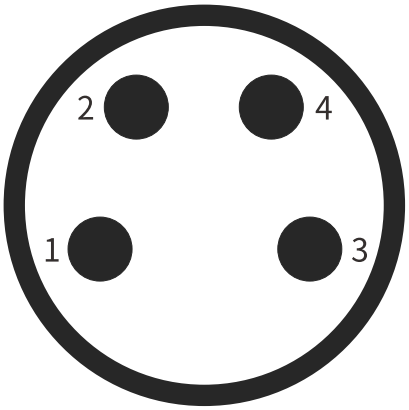
超声波测距一般采用飞行时间法TOF(Time of Flight)。传感器到障碍物的距离S=vt/2。根据超声波发射和接收之间的飞行时间原理进行测量，利用声波介质对被检测物进行非接触式无磨损的检测，对透明或有色物体，金属或非金属物体，固体、液体、粉状物质均能检测。其检测性能不受工件颜色、材质、透明度的影响，包括烟尘环境和雨天。可广泛应用在物位（液位）监测，机器人防撞，各种超声波接近开关，以及防盗报警等相关领域，工作可靠，安装方便，防水型，发射夹角较小，灵敏度高，方便与工业显示仪表连接。

Miran ultrasonic displacement sensor is a kind of mechanical wave whose vibration frequency is higher than that of sound wave. It is developed by using the characteristics of ultrasonic wave and vibrates under the excitation of voltage. It has the characteristics of high frequency, short wavelength, small diffraction phenomenon, especially good directivity, and can become a ray and directional propagation.

Ultrasonic ranging generally adopts the Time of Flight (TOF) method. Distance from sensor to obstacle S=vt/2.According to the principle of time of flight between ultrasonic transmission and reception, the acoustic medium is used for non-contact non-wear detection of the detected object, transparent or colored objects, metal or non-metal objects, solid, liquid, powder substances can be detected. Its detection performance is not affected by the color, material, transparency of the workpiece, including dust environment and rainy days. It can be widely used in level (liquid level) monitoring, robot collision prevention, various ultrasonic proximity switches, as well as anti-theft alarm and other related fields, reliable work, easy installation, waterproof type, small launch Angle, high sensitivity, convenient connection with industrial display instruments.

接线方式 Mode Of Connection

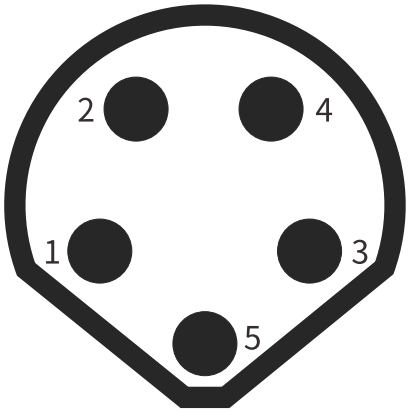
模拟量信号
Analog signal



①棕线 Brown line
②白线 White line
③蓝线 Blue line
④黑线 Black Line

M8四芯插头，从针的方向看
M8 four-pin plug from the direction of the needle

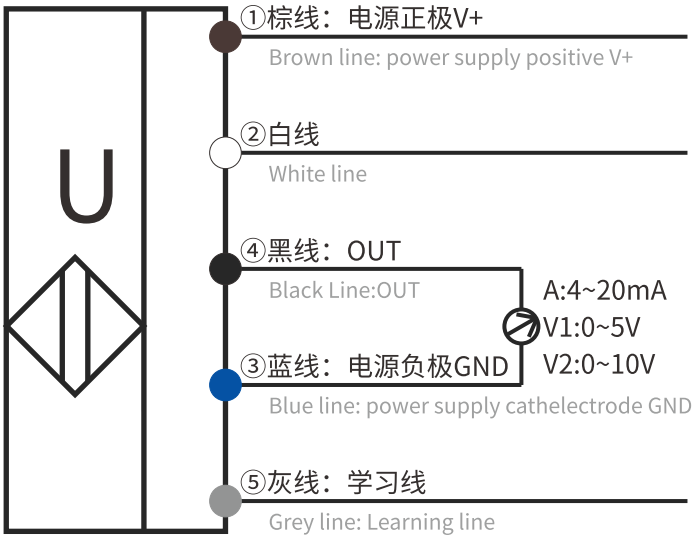
RS485、开关量信号
Rs485, Switching Quantity Signal



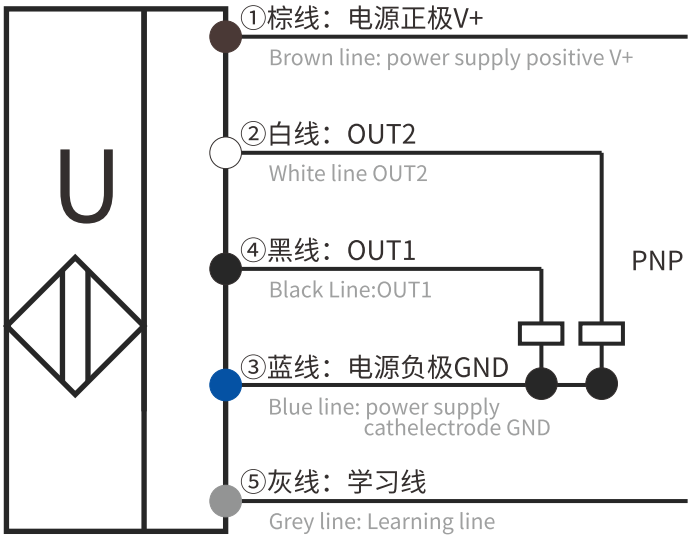
①棕线 Brown line
②白线 White line
③蓝线 Blue line
④BK黑线 Black Line
⑤灰线 Grey line

M8五芯插头，从针的方向看
M8 five-pin plug from the direction of the needle

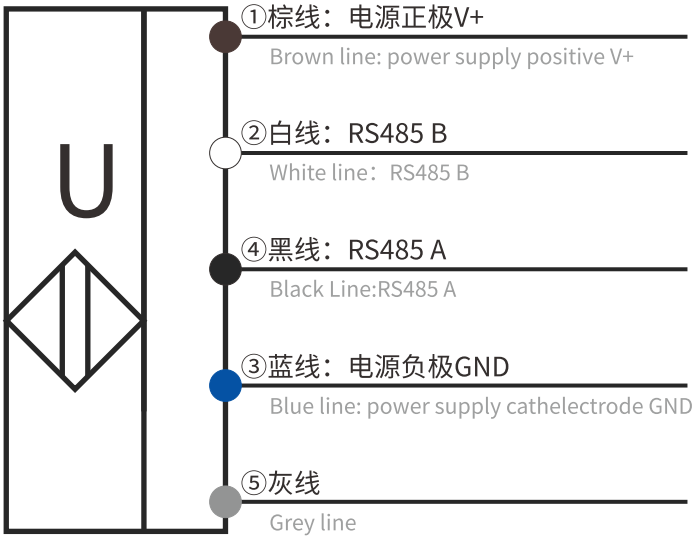
模拟量信号输出
Analog signal output



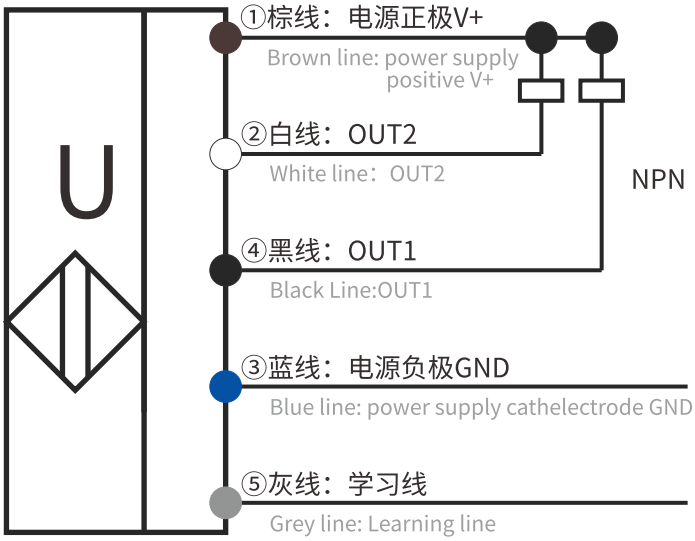
开关量PNP信号输出
Switching quantity PNP signal output



数字量信号输出
Digital signal output



开关量NPN信号输出
Switching quantity NPN signal output



注：开关量信号输出接线图中的"▭"表示负载；电路中的负载是指连接在电路中的电源两端的电子元件，负载可以是电阻、灯泡、电动机等设备。

Note: The "▭" in the switching signal output wiring diagram represents the load; The load in the circuit refers to the electronic components connected to both ends of the power supply in the circuit, and the load can be a resistor, a light bulb, a motor and other equipment.

性能参数 Performance Parameters

电气指标Electrical indicators

产品型号 Product model	A1/A2/B/C/D/E	A2	A2	A2
量程 Range	1000mm	2000mm	3000mm	4000mm
测量范围 Measurement range	70～1070mm	100～2100mm	150～3150mm	250～4250mm
盲区 Blind area	70mm	100mm	150mm	250mm
换能器频率 Transducer frequency	200KHz	175KHz	112KHz	75KHz
响应时间 Response time	50ms	80ms	120ms	150ms
分辨率 Resolution ratio	0.13mm(max)/15bit			
波束角 Field angle	10~15°			
重复精度 Repeatability	±0.1%FS			
线性度 Linearity	±0.2%FS			
温度漂移 Temperature drift	＜±1.5%FS			
工作电压 Working voltage	15~30VDC			
波纹电压 Ripple voltage	5%			
工作电流 Working current	空载＜30mA No load < 30mA			
过载保护 Overload protection	开关量输出每路200mA Switching output 200mA per channel			
输出方式 Output mode	0~5V/0~10V/4~20mA/RS485/PNP/NPN			
工作温度 Operating temperature	-20°C~+60°C			
储藏温度 Storage temperature	-40°C~+85°C			
防护等级 Level of protection	IP67			
壳体材料 Case material	黄铜镀镍/铝合金 Brass plated nickel/aluminum alloy			
标准检测板 Standard test board	300X300mm			
线长 Wire length	默认2米 Default 2 m			

产品命名规则 Product Naming Rules

MCSB □□□□ – □ – □ – □

– □

C：防水接头出线 The waterproof connector is routed
P：航空插头出线 Aviation plug out

– □

A1：长螺纹电子仓 Long thread electronic chamber
(最大量程1000mm;直径18mm) (Maximum range 1000mm; Diameter 18mm)
A2：长螺纹电子仓 Long thread electronic compartment
(最大量程4000mm;直径30mm) (Maximum range 4000mm; Diameter 30mm)
B： 短螺牙型短电子仓Short screw type short electronic bin
(最大量程1000mm;尺寸L42mm*W40mm*H38mm)
(Maximum range 1000mm; Size L42mm*W40mm*H38mm)
C： 支架型短电子仓 Bracket type short electronic bin
(最大量程1000mm;尺寸L42mm*W60mm*H37mm)
(Maximum range 1000mm; Size L42mm*W60mm*H37mm)
D： U型支架型短电子仓 U-bracket type short electronic warehouse
(最大量程1000mm;尺寸L42mm*W51mm*H37mm)
(Maximum range 1000mm; Size L42mm*W51mm*H37mm)
E： 垂直安装型电子仓 Vertically mounted electronic bin
(直径18mm;最大量程1000mm;尺寸L42mm*W40mm*H38mm)
(Diameter 18mm; Maximum range 1000mm; Size L42mm*W40mm*H38mm)

– □

A：4-20mA输出 output
R：RS485输出 output
1N：1路NPN输出 Route 1 NPN output
2PC：2路PNP常闭输出 2 PNP normally closed outputs
2NC：2路NPN常闭输出 2 NPN normally closed outputs
V1：0-5V输出 output
V2：0-10V输出 output
1P：1路PNP输出 Route 1 PNP output
2PO：2路PNP常开输出 2 PNP normally open outputs
2NO：2路NPN常开输出 2 NPN normally open outputs

□□□□

检测量程(mm) Detection range(mm)
最大量程范围内任意可选 Optional within the maximum range

MCSB

米朗超声波位移传感器 Miran ultrasonic displacement sensor

注1：量程1米及1米以内时，A1/B/C/D/E型电子仓盲区默认70mm，如需加长盲区，下单时需备注。
Note 1:When the measuring range is 1 meter and less than 1 meter, the default blind area of A1/B/C/D/E electronic bin is 70mm. If the blind area needs to be extended, please note when placing an order.

注2：量程2米及2米以内时，A2型电子仓盲区默认100mm，量程3米及3米以内时，A2型电子仓盲区默认150mm，量程4米及4米以内时，A2型电子仓盲区默认250mm，如需加长盲区，下单时需备注。
Note 2: When the measuring range is less than 2 meters and 2 meters, the default A2 electronic compartment blind area is 100mm, when the measuring range is less than 3 meters and 3 meters, the default A2 electronic compartment blind area is 150mm, when the measuring range is less than 4 meters and 4 meters, the default A2 electronic compartment blind area is 250mm, if you need to extend the blind area, please note when ordering.

注3：盲区范围生产时默认都会加上，因此选型量程时，无需再加上盲区范围。
Note 3: The blind zone range is added by default during production, so there is no need to add the blind zone range when selecting the range.

例如 (such as)：
MCSB800-V2-A1-C
表示米朗超声波位移传感器，检测量程800mm，测量范围70-870mm，0-10V信号输出，A1型长螺纹电子仓，防水接头出线。
Millan ultrasonic displacement sensor, measuring range 800mm, measuring range 70-870mm, 0-10V signal output, A1 long thread electronic warehouse, waterproof connector outlet.

MCSB2000-A-A2-C
表示米朗超声波位移传感器，检测量程2000mm，测量范围100-2100mm，4-20mA信号输出，A2型长螺纹电子仓，防水接头出线。
Millan ultrasonic displacement sensor, measuring range 2000mm, measuring range 100-2100mm, 4-20mA signal output, A2 long thread electronic warehouse, waterproof connector outlet.

产品实物图 Product drawing



A1：长螺纹电子仓

（最大量程1000mm，直径18mm）

A1: Long threaded electronic bin

(Maximum range 1000mm,Diameter 18mm)



A2：长螺纹电子仓

（最大量程4000mm，直径40.2mm）

A2: Long threaded electronic bin

(Maximum range 4000mm,Diameter 40.2mm)



A2：长螺纹电子仓

（最大量程2000mm，直径30mm）

A2: Long threaded electronic bin

(Maximum range 2000mm,Diameter 30mm)



A2：长螺纹电子仓

（最大量程3000mm，直径30mm）

A2: Long threaded electronic bin

(Maximum range 3000mm,Diameter 30mm)



B：短螺牙型短电子仓

（最大量程1000mm）

B: Short screw type short electronic chamber

(Maximum range 1000mm)

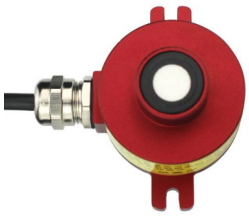


C：支架型短电子仓

（最大量程1000mm）

C: Bracket type short electronic bin

(Maximum range 1000mm)



D：U型支架型短电子仓

（最大量程1000mm）

D: U-bracket type short electronic warehouse

(Maximum range 1000mm)



E：垂直安装型电子仓

（最大量程1000mm）

E: Vertically mounted electronic bin

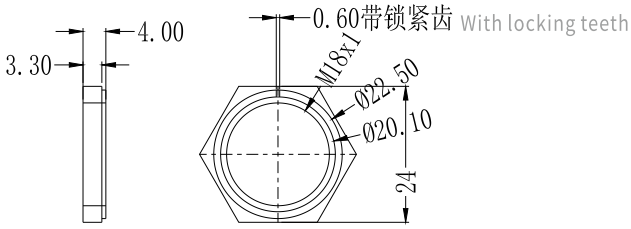
(Maximum range 1000mm)

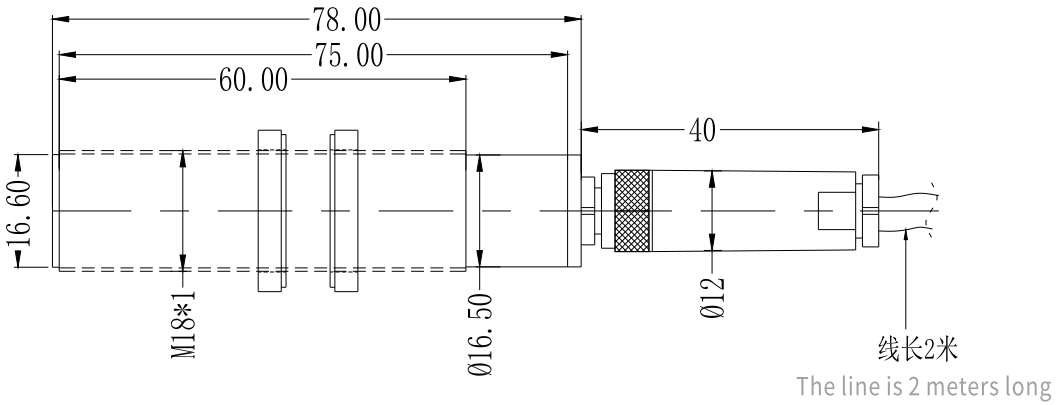
产品尺寸图 Product Dimension Diagram

A1型尺寸:L78mm*W18mm*H18mm(最大量程:1000mm)

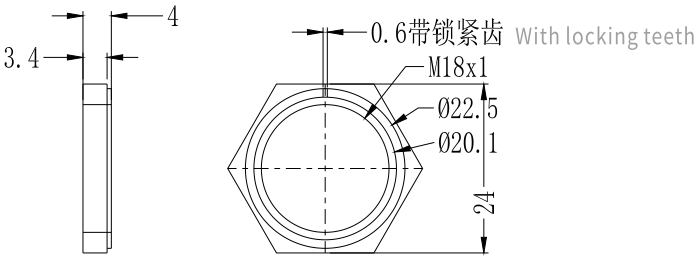
A1-type size: L78mm * W18mm * H18mm(Maximum range: 1000mm)

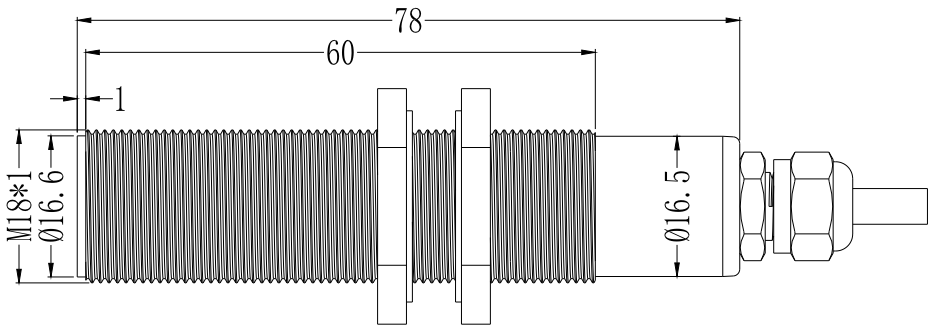










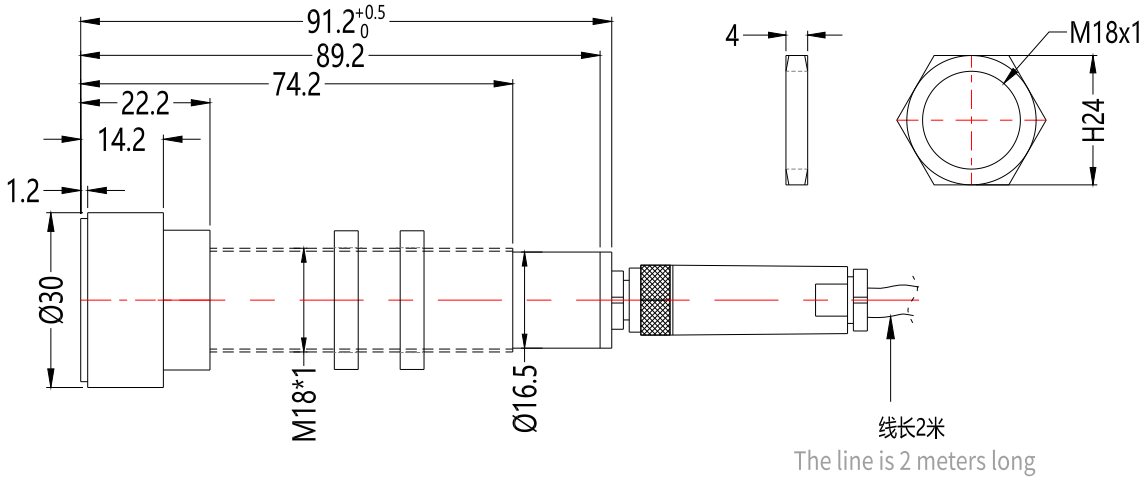


A2型尺寸：L91.2mm*W18mm*H30mm(最大量程：2000-3000mm)

A2-type size: L91.2mm * W18mm * H30mm(Maximum range: 2000-3000mm)



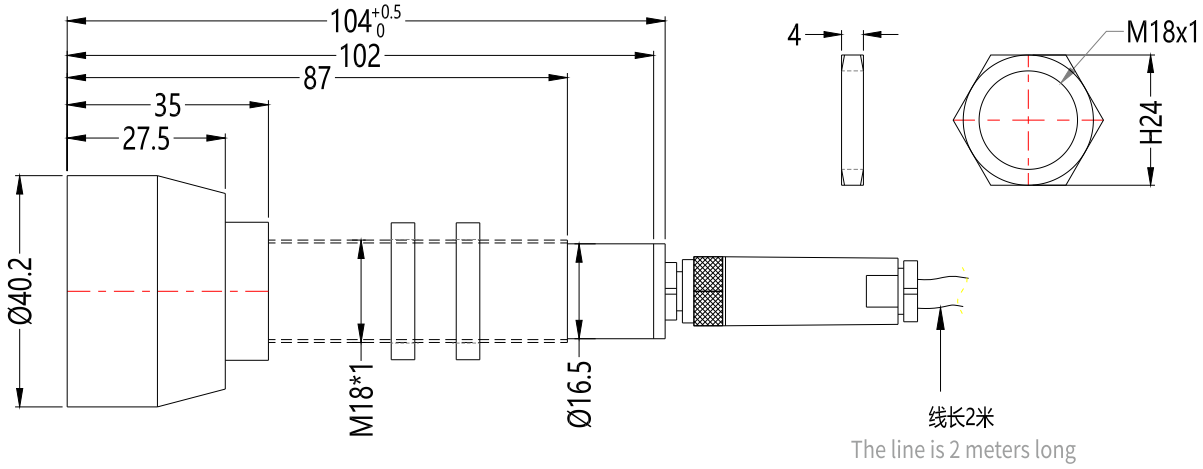




A2型尺寸：L104mm*W18mm*H40.2mm(最大量程：4000mm)

A2-type size: L104mm * W18mm * H40.2mm (maximum range: 4000mm)

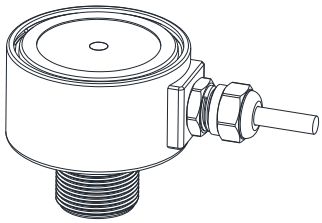


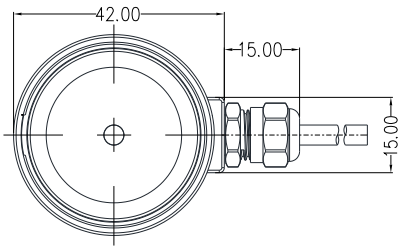


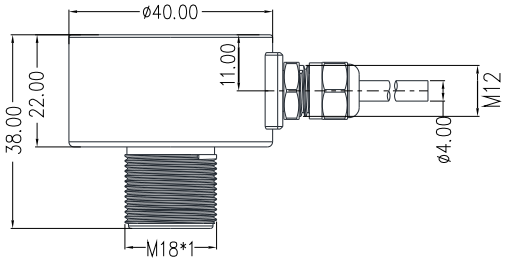
B型尺寸:L42mm*W40mm*H38mm(最大量程:1000mm)

B-type size: L42mm * W40mm * H38mm (maximum range: 1000mm)





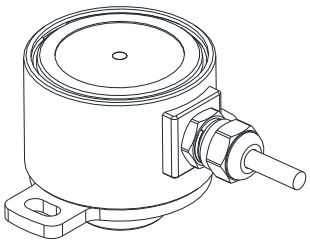


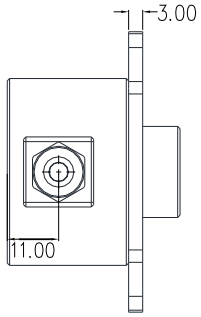


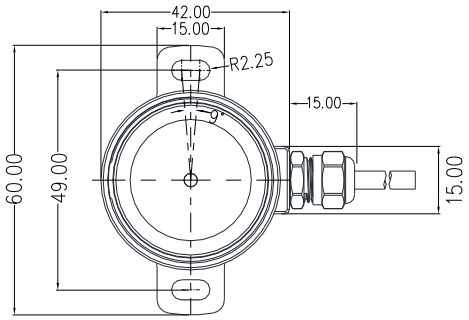
C型尺寸:L42mm*W60mm*H37mm(最大量程:1000mm)

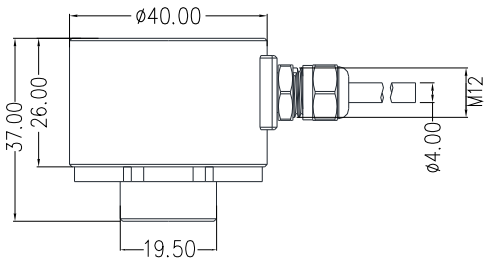
C-type size: L42mm * W60mm * H37mm (maximum range: 1000mm)





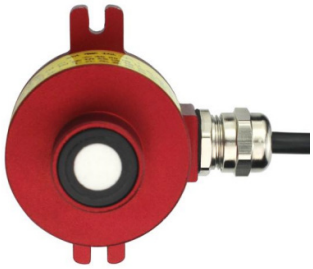


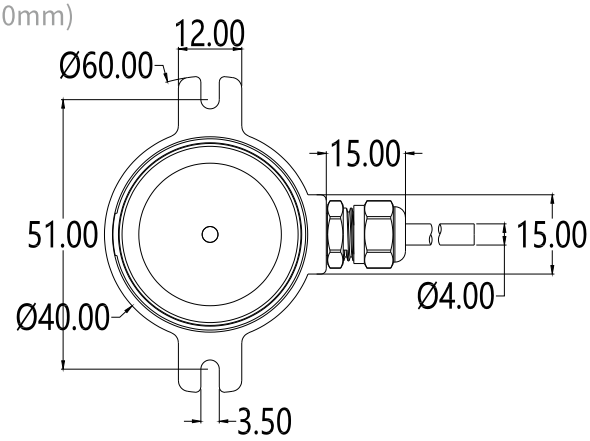


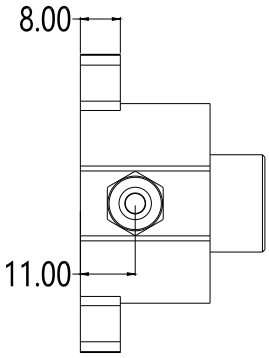


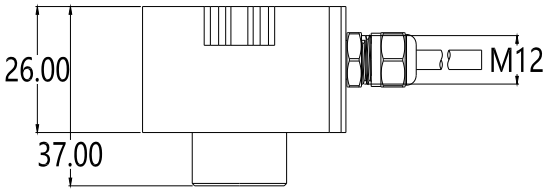
D型尺寸:L42mm*W51mm*H37mm(最大量程:1000mm)

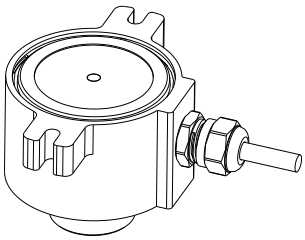
D-type size: L42mm * W51mm * H37mm (maximum range: 1000mm)







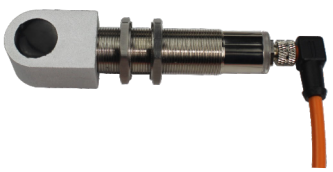


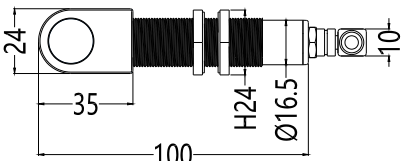


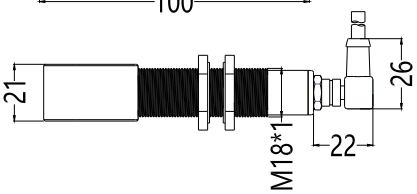
E型尺寸:L100mm*W24mm(最大量程:1000mm)

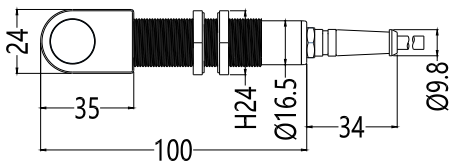
E-type size: L100mm * W24mm (maximum range: 1000mm)

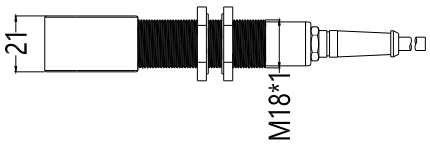


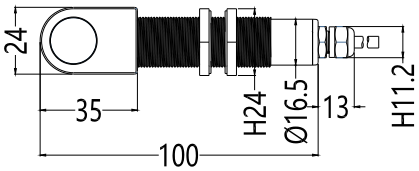


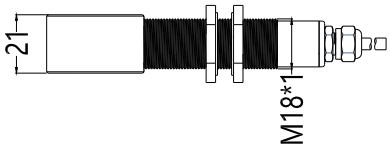












调节方法 Adjustment Method

传感器通电后，尾部的红色指示灯和黄色指示灯会亮起。
When the sensor is powered on, the red indicator light and the yellow indicator light on the tail will light up.

指示灯含义 Meaning of indicator lights	黄灯：黄灯不变，表示物体在测量范围内；黄灯闪烁，表示设定功能状态下检测到物体。 Yellow light: The yellow light is unchanged, indicating that the object is within the measurement range; Blinking yellow: An object is detected in the set function state. 红灯：红灯常亮，表示电源上电；红灯闪烁，表示设定功能状态下未检测到物体。 Red light: If the indicator is steady red, the power supply is powered on. Blinking red: No object is detected in the set function state. 蓝灯：开关量输出1供电指示。 Blue light: Switching output 1 Power supply indicator. 绿灯：开关量输出2供电指示。 Green light: Switching output 2 Power supply indicator.

超声波传感器设定测量距离时，需要选取传感器距离被测物较近的点与传感器距离被测物较远的点，这两个点可以任意设定为A1点或A2点。
When the ultrasonic sensor sets the measurement distance, it is necessary to select the point where the sensor is closer to the measured object and the point where the sensor is farther from the measured object, and the two points can be arbitrarily set as A1 point or A2 point.

设置A1点：

在想要设定距离的地方放一个被测物。将灰线（学习线）和蓝线（电源负）相接，在此期间，如果被测物被捕捉到了，黄色灯会一直闪烁。此状态持续四到五秒之后，把灰线拿开。A1点设定成功。

Set A1 point:
Place a test object where you want to set the distance. Connect the gray line (learning line) and the blue line (power negative), during which time, if the object is captured, the yellow light will keep flashing. After four to five seconds, remove the gray line. Point A1 is set successfully.

设置A2点：

在想要设定距离的地方放一个被测物。将灰线（学习线）和棕线（电源正）接一起，在此期间，如果被测物被捕捉到了，黄色灯会一直闪烁。此状态持续四到五秒之后，把灰线拿开。A2点设定成功。

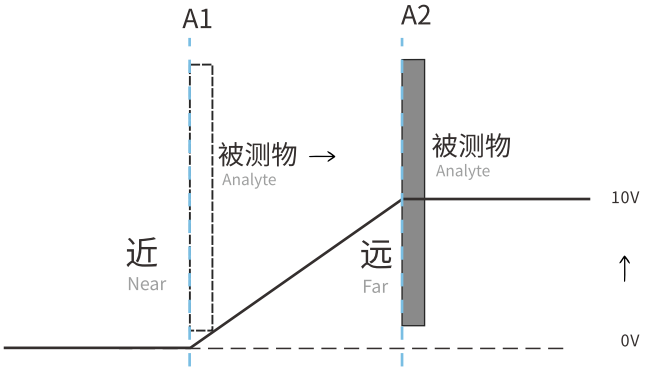
Set A2 point:
Place a test object where you want to set the distance. Connect the gray line (learning line) and the brown line (power supply positive) together, during which time, if the object is captured, the yellow light will keep flashing. After four to five seconds, remove the gray line. Point A2 is set successfully.

注：设定过程中可能会出现黄灯和红灯一起闪烁的情况，说明传感器没有准确捕捉到被测物。需要把传感器稍微移动来对准被测物。直至黄灯单独连续闪烁为止。此设定过程必须在5分钟之内完成，否则传感器将被锁定。需要断开电源重新供电，然后重新设定。

Note: During the setup process, it is possible to encounter a situation where both the yellow and red lights flash simultaneously, indicating that the sensor has failed to accurately detect the object being measured. You need to slightly move the sensor to align it with the object. Continue until the yellow light flashes continuously alone. This setup process must be completed within 5 minutes; otherwise, the sensor will be locked. You need to disconnect the power supply, re-power it, and then re-set.

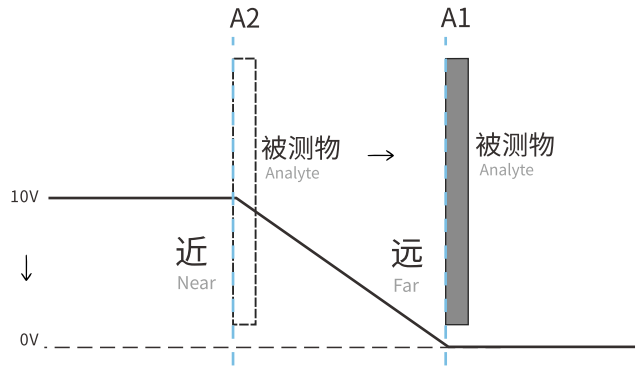
一、模拟量信号输出 标定方式

First, analog signal output calibration method



先设置距离传感器较近点为A1点，再设置距离传感器较远点为A2点，被测物由A1点向A2点移动时，数值是由小到大变化的。

Set the endpoint first, then set the zero point. When the sensor moves from P1 (endpoint) to P2 (zero point), the value changes from large to small.



先设置距离传感器较近点为A2点，再设置距离传感器较远点为A1点，被测物由A2点向A1点移动时，数值是由大到小变化的。

Set the zero point first, then set the endpoint. When the sensor moves from P1 (zero point) to P2 (endpoint), the value changes from small to large.

二、开关量信号输出 标定方式

Second, switching signal output calibration method

1:开关量输出，高代表负载供电，低代表负载断电

Relay output, high represents load power supply, low represents load power off.

2:NPN:表示共用电源正极，输出负电压。 PNP：表示共用电源负极，输出正电压。

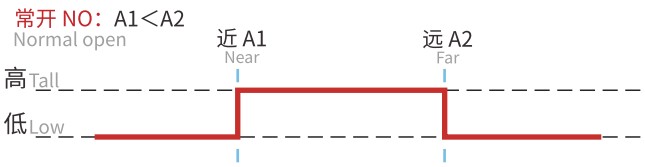
NPN: Indicates that the common power positive pole is used, and the output is a negative voltage. PNP: Indicates that the common power negative pole is used, and the output is a positive voltage.

3:NO表示常开，常态下负载不供电，检测到物体时负载供电；NC表示常闭，常态下负载供电，检测到物体时负载断电。

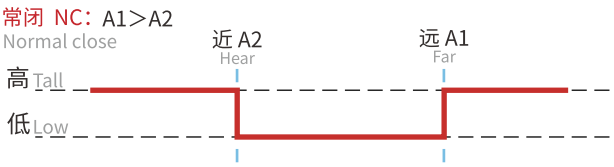
NO means normally open, the load is not powered on under normal circumstances, and the load is powered on when an object is detected; NC means normally closed, the load is powered on under normal circumstances, and the load is powered off when an object is detected.

1、窗口模式 Wmode

常开 NO：A1＜A2
Normal open

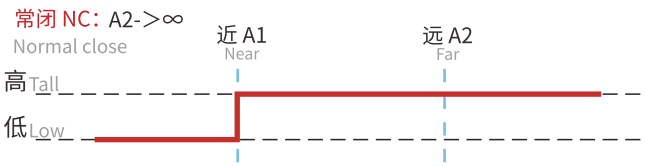


常闭 NC：A1＞A2
Normal close

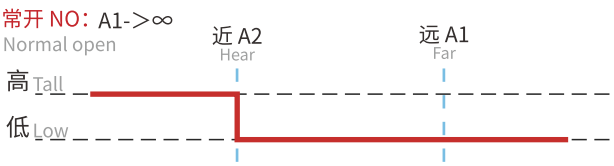


2、单开关点模式 Single switch point mode

常闭 NC：A2->∞
Normal close



常开 NO：A1->∞
Normal open



开关量输出型传感器将A1，A2点设置无穷远∞，即单开关点模式的方法如下：

The switching output sensor sets A1 and A2 points to infinity ∞, that is, the method of single switching point mode is as follows:

移开传感器检测范围内的所有物体，黄色指示灯不停闪烁。将灰线(学习线)和蓝线(电源负 GND)连接，5秒后断开学习线连接。A1点设定成功。

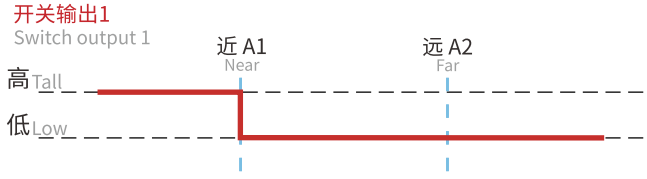
Remove all objects within range of the sensor. The yellow light keeps flashing. Connect the gray line (learning line) to the blue line (power negative GND), and disconnect the learning line after 5 seconds. Point A1 is set successfully.

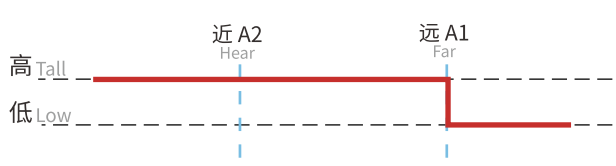
移开传感器检测范围内的所有物体，黄色指示灯不停闪烁。将灰线(学习线)和棕线(电源正 V+)连接，5秒后断开学习线连接。A2点设定成功。

Remove all objects within range of the sensor. The yellow light keeps flashing. Connect the grey (learning) line to the brown (power positive V+) line and disconnect the learning line after 5 seconds. Point A2 is set successfully.

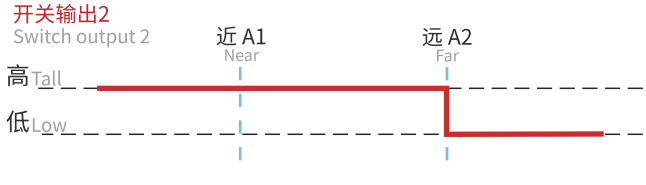
3、双路常开 Two roads are always open

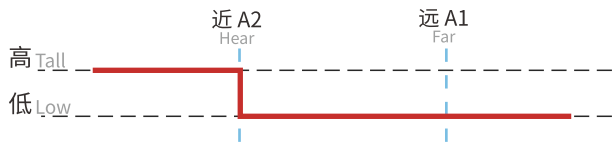
开关输出1
Switch output 1



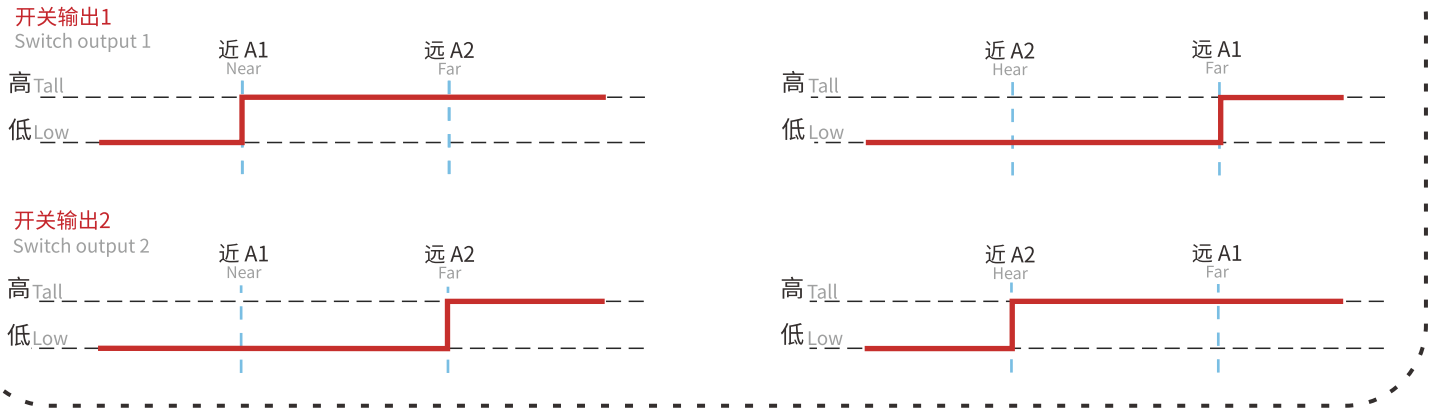


开关输出2
Switch output 2





4、双路常闭 Both paths are normally closed



注意事项 Matters Needing Attention

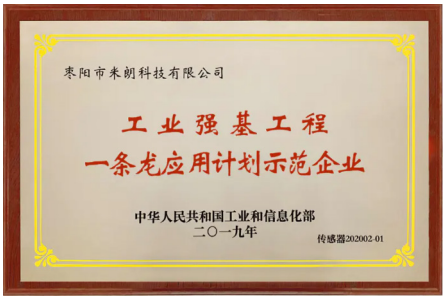
- 传感器为精密仪器，请勿刮花表面。
  The sensor is a precision instrument, please do not scratch the surface.
- 不能在真空区或防爆区使用该传感器。
  This sensor cannot be used in vacuum or explosion-proof areas.
- 确保传感器的供电电压和纹波电压在规格范围内。
  Ensure that the power supply voltage and ripple voltage of the sensor are within the specified range.
- 请勿在50°C以上的水、蒸汽、酸、溶剂附近使用该传感器。
  Do not use this sensor near water, steam, acid, or solvents above 50 °C.
- 传感器使用时，不能有强烈的机械震动，工作环境不应该有强烈的电磁干扰。
  When using sensors, there should be no strong mechanical vibration and the working environment should not have strong electromagnetic interference.
- 为确保可靠性及使用寿命，请勿高于额定温度使用和储存。
  To ensure reliability and service life, do not use and store above the rated temperature.
- 请勿在大气不均匀产生温度梯度环境下使用，会导致测量误差。
  Do not use it in an atmosphere with uneven temperature gradient, which may cause measurement errors.
- 产品不得使用在溶解性有机物的环境中或存储在腐蚀性气体中，尤其是其中的氯化氢气体，硫化氢气体，酸，碱，盐或类似存在。在仓库存放的产品要注意正常的温度和湿度，存储过程中请注意防潮，防止引脚氧化。
  The product shall not be used in the environment of dissolved organic matter or stored in corrosive gases, especially hydrogen chloride gas, hydrogen sulfide gas, acid, base, salt or similar presence. The products stored in the warehouse should pay attention to normal temperature and humidity, and pay attention to moisture during storage to prevent oxidation of the pins.
- 传感器不得私自拆开，如若私自拆开有损坏而导致的一切后果，本公司概不承担。
  The sensor shall not be disassembled without permission. If the sensor is damaged without permission, the company will not bear all the consequences.

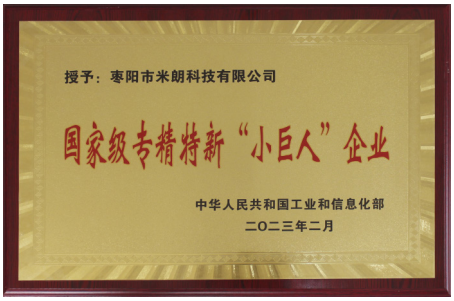
安装说明 Installation Instructions

由于超声波传感器具有方向性，因此一定要注意其安装位置。建议安装位置最好和被测物垂直这样测量数据会相对准确。(附带安装固定螺母)

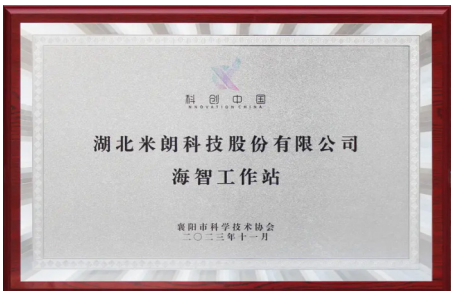
Due to the directionality of ultrasonic sensors, it is important to pay attention to their installation position. It is recommended that the installation position be perpendicular to the object being measured, so that the measurement data will be relatively accurate. (Comes with installation fixing nuts)

荣誉证书 Certificate Of Honor

















应用领域Application Area



● 液位测量
Level measurement



● 材料堆积高度测量
Measurement of material stacking height



● 间隙测量
Gap measurement



● 物体计数
Object Count



● 包装检测
Packaging inspection



● 尺寸测量
Tension control



● 直径和速度测量
Measurement of diameter and velocity



● 高度测量
Height measurement

●●●

超声波位移传感器应用场所极多，随着核心技术的发展，超声波位移传感器得到越来越广泛的应用。
适合应用于工厂、山体、铁路、隧道、船业、机械、建筑业、医疗事业、桥梁铺设、水坝建设、汽车行业、核工业和航空航天事业等。

There are many applications for ultrasonic displacement sensors, and with the development of core technology, ultrasonic displacement sensors are becoming increasingly widely used.Suitable for applications in factories, mountains, railways, tunnels, shipbuilding, machinery, construction, medical industry, bridge laying, dam construction, automotive industry, nuclear industry, and aerospace industry.



辐射全国 放眼世界

Radiate to the whole country and see the world

质量第一 Quality First

用户至上 Customer First

诚信为本 Credit First

本彩页内产品尺寸，性能等参数仅作为参考，随着产品的不断更新换代，或可能有所调整改变，恕不另行通知，最终尺寸要以产品实物为准。实际产品尺寸和性能参数等，需要在实际购买的时候，与我司业务或者技术人员沟通确认最终数据，以最终书面确认的尺寸和数据为准。

（尤其是在尺寸方面要求特别严格的，或者在产品实物没收到之前，就要先在自己设备上加工做好安装孔位和确定安装空间位置的，要特别注意,要在购买前3天内与我们书面再次确认好产品的实际尺寸，以免造成不必要的返工等损失，若没有在购买前3天内与我们书面确认尺寸而造成后续安装困难等损失，我司不予承担，最终尺寸要以产品实物为准。）

将致力于位移、物位、角度等测控领域

Will be committed to the field of displacement, level, angle measurement and control

为客户提供一站式解决方案的产品与服务

Products and services that provide one-stop solutions for our customers

版权归深圳市米朗科技有限公司所有

Copyright belongs to Shenzhen Miran Technology Co., Ltd

本选型样本如有变动，恕不另行通知，以最新版本为准

This selection sample is subject to change without prior notice, and the latest version shall prevail

任何拷贝、复制、拍摄制作为商业用途均属于侵权

Any copy, reproduction, filming and production for commercial purposes is infringing

20260701-米朗超声波彩页

20260701-Miran Ultrasound Brochure

主要著作人：李工

Main author: Engineer Li

2026年7月出品

Produced in July 2026