

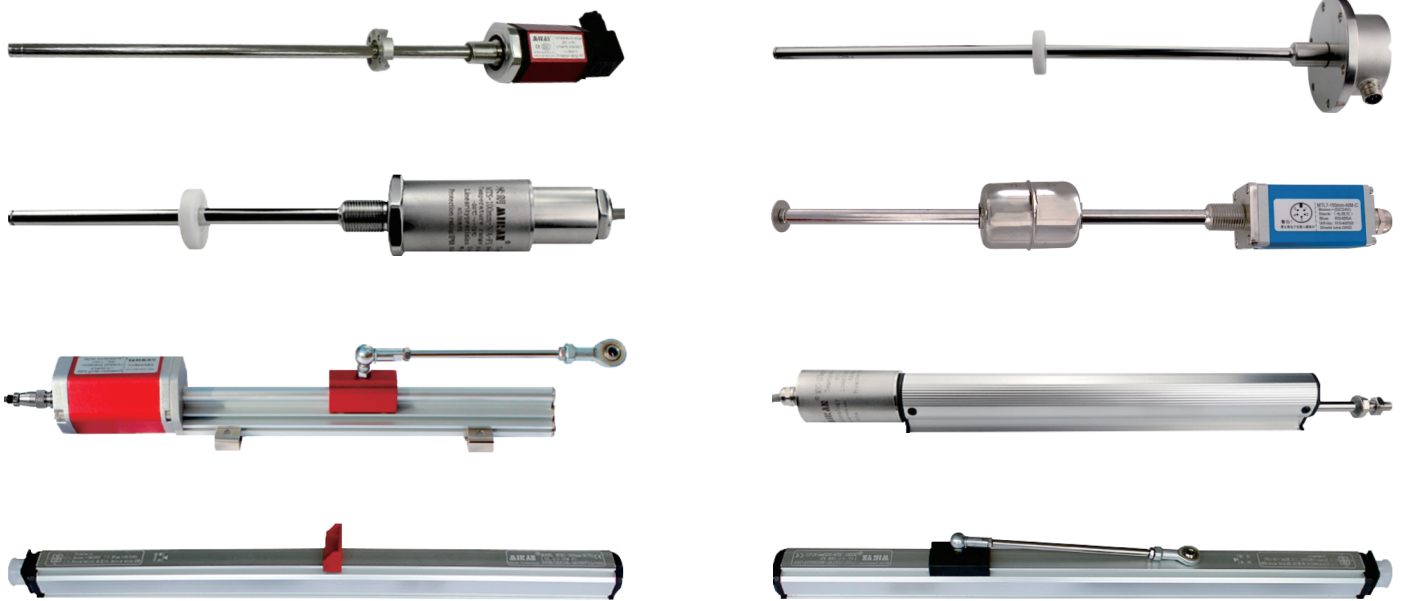
中国工信部高精度传感器一条龙应用计划示范项目

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

## 磁致伸缩位移传感器

### Magnetostrictive Displacement Sensor



## 磁致伸缩位移传感器

### MAGNETOSTRICTIVE DISPLACEMENT SENSORS

- 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

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产品型号选型 Product Model Selection

MTL系列 MTL Series

MTL [ ] - [ ] [ ] [ ] [ ] mm - [ ] / [ ] - [ ]

- 2:法兰安装式(侧出线)  
2:Flange mounting type (side outlet)
- 3:磁环式  
3:Magnetic loop type
- 4:浮球式  
4:Ball float type
- 5:加强密封型磁环式  
5:Reinforced sealed magnetic ring type
- 6:加强密封型浮球式  
6:Reinforced sealed float type
- 7:方形电子仓浮球式  
7:Square electronic warehouse float

50至5000mm  
(可选任意有效行程)  
50 to 5000mm  
(Any effective stroke is optional)

N:为磁环由电子仓向尾端移动数值变大  
N: the value increases as the ring moves from the electronics compartment to the end.  
S:为磁环由电子仓向尾端移动数值变小  
S: the value becomes smaller as the ring moves from the electronics compartment to the end.

- P:航空插头  
P:aviation plugs
- C:防水接头  
C:waterproof connector
- H:赫斯曼插头  
H:hersman plug

模拟信号:  
Analog signal:

- |                                    |   |
|------------------------------------|---|
| V1:(0-5V) 电压<br>V1:(0-5V)voltage   | V2:(0-10V) 电压<br>V2:(0-10V)voltage                                    |
| A:(4-20mA) 电流<br>A:(4-20mA)current | A2d:(4-20mA) 二线电流(低功耗型)<br>A2d:(4-20mA)2-wire current(low-power type) |

注1: V1、V2、A选择赫斯曼插头时, 供电负和信号负共用一根线, 详见接线图

Note 1: When selecting Hersman plugs for V1, V2, and A, the power supply negative and signal negative share a common wire, see wiring diagram for details

注2: V1、V2、A选择防水接头或者航空插头时, 默认为四线制, 如有需要也可以做三线制

Note 2: When choosing waterproof connector or aviation plug for V1, V2, A, the default is four-wire system, and three-wire system can also be made if needed

注3: A2d限MTL3/MTL4/MTM系列

Note 3: A2d limited to MTL3 / MTL4 / MTM series

数字信号  
Digital signal:

- M:RS485/Modbus RTU    CO:CANopen    S:(SSI)    St:(start-stop)

例如 Example: MTL3-1000mm-N/A-C

表示MTL3磁环式, 量程1000mm,磁环由电子仓向尾端移动数值变大, 4-20mA电流信号输出, 防水接头出线。

Indicates MTL3 magnetic ring type, range 1000mm, the magnetic ring from the electronic compartment to the end of the moving value becomes larger, 4-20mA current signal output, waterproof connector out.

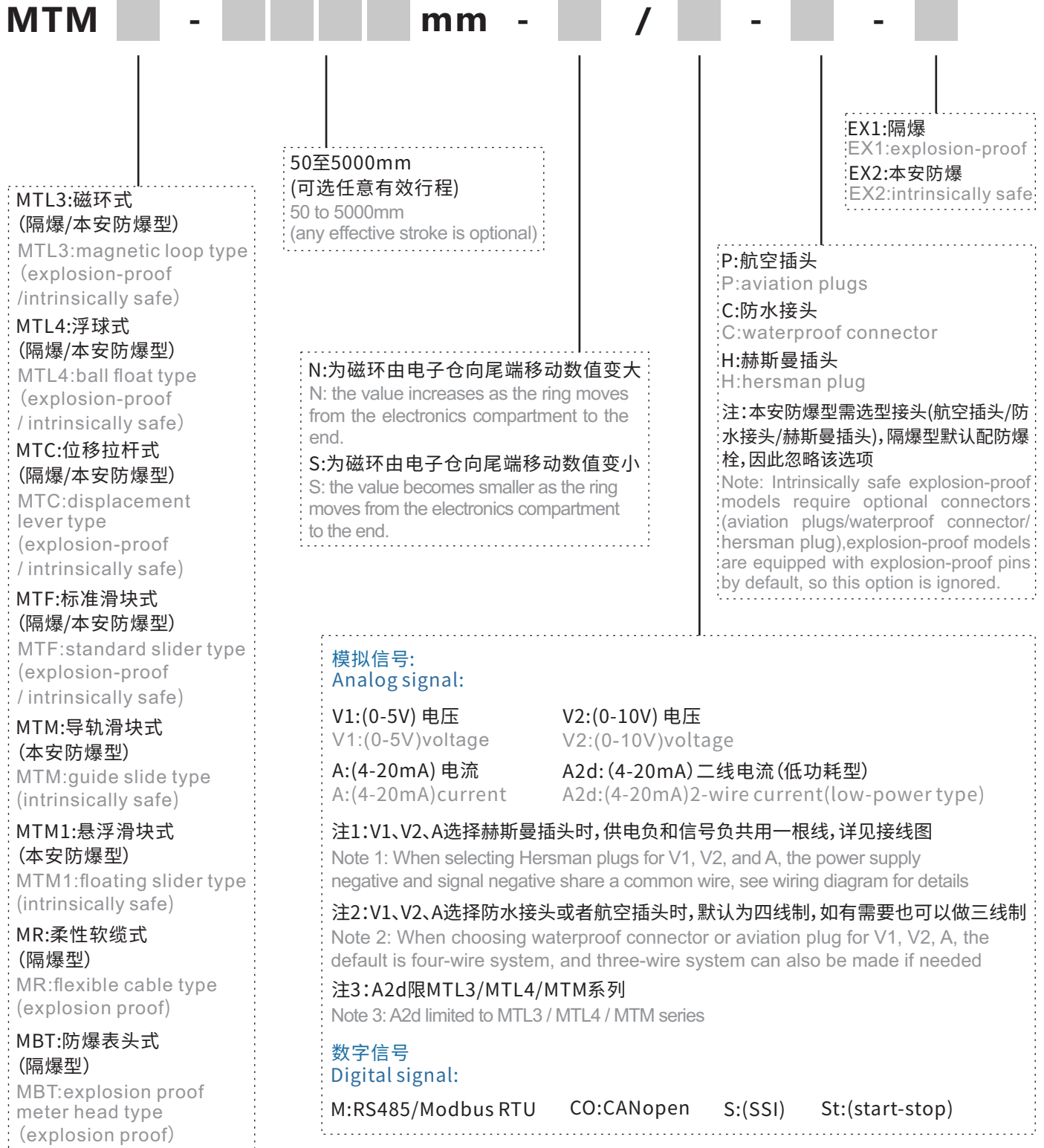
常规系列 Conventional Series



例如 Example: MTS-500mm-S/A-FS

表示MTS小电子仓式,量程500mm,磁环由电子仓向尾端移动数值变小,4-20mA电流信号输出,深水型。  
MTS small electronic silo type, range 500mm, the magnetic ring from the electronic silo to the end of the movement of the value becomes smaller, 4-20mA current signal output, deep water type.

防爆/本安系列 Explosion-proof/Intrinsically Safe Series



例如 Example: MTL3-2000mm-N/A-EX(隔爆)

表示MTL3磁环式,量程2000mm,磁环由电子仓向尾端移动数值变大,4-20mA电流信号输出,隔爆型。

Indicates MTL3 magnetic ring type, range 2000mm, the magnetic ring from the electronic compartment to the end of the moving value becomes larger, 4-20mA current signal output, flameproof type.

## 产品概述 Product overview

在铁磁质中磁化方向的改变会引起介质晶格间距的改变,从而使得铁磁质的长度和体积发生改变,即:磁致伸缩现象,也称为威德曼效应,其逆效应称为维拉里效应。

磁致伸缩传感器的原理是利用两个不同磁场相交时产生一个应变脉冲信号,然后计算这个信号被探测所需的时间周期,从而换算出准确的位置。这两个磁场一个来自磁环中的永磁铁,另一个来自传感器电子仓中的电子部件产生的激励脉冲。激励脉冲沿传感器内用磁致伸缩材料制造的波导丝以声速运行。当与磁环中的永磁场相交时,由于磁致伸缩现象,波导丝产生的机械振动形成一个应变脉冲。应变脉冲很快便被电子仓中的感测电路探测到。从产生激励脉冲的一刻到应变脉冲被探测到总的时间乘以固定的声速,我们便能准确的计算出磁铁的位置变化。这个过程是连续不断的,所以每当磁环位置改变时,新的位置会被迅速测量出来。由于输出信号是真正的绝对值,而不是比例的或需要再放大处理的信号,所以不存在信号漂移或变值的情况,更不必像其他传感器那样需要定期重标。

磁致伸缩传感器为非接触式,永不磨损。具有高分辨率、高精度、高稳定性、高可靠性、响应时间快、工作寿命长等优点。传感器不用重新标定,也不用定期维护。

A change in the direction of magnetization in a ferromagnetic material causes a change in the lattice spacing of the medium, which results in a change in the length and volume of the ferromagnetic material, i.e., the phenomenon of magnetostriction, also known as the Wiedemann effect, the inverse effect of which is known as the Villari effect.

The principle of magnetostrictive sensors is to use the intersection of two different magnetic fields to generate a strain pulse signal, and then calculate the time period required for this signal to be detected, thus converting the exact position. One of these two magnetic fields comes from the permanent magnets in the magnetic ring and the otherThe two magnetic fields come from permanent magnets in the magnetic ring and from excitation pulses generated by the electronics in the sensor's electronics compartment. The excitation pulse runs at the speed of sound along a waveguide filament made of magnetostrictive material inside the sensor. When it intersects the permanent magnetic field in the magnetic ring, a strain pulse is formed by the mechanical vibration of the waveguide wire due to the magnetostrictive phenomenon. The strain pulse is quickly detected by the sensing circuitry in the electronic compartment. The total time from the moment the excitation pulse is generated until the strain pulse is detected is multiplied by the fixed speed of sound, and we can accurately calculate the change in position of the magnet. This process is continuous, so that whenever the position of the magnet ring changes, the new position is quickly measured. Since the output signal is a true absolute value, not a proportional one or one that needs

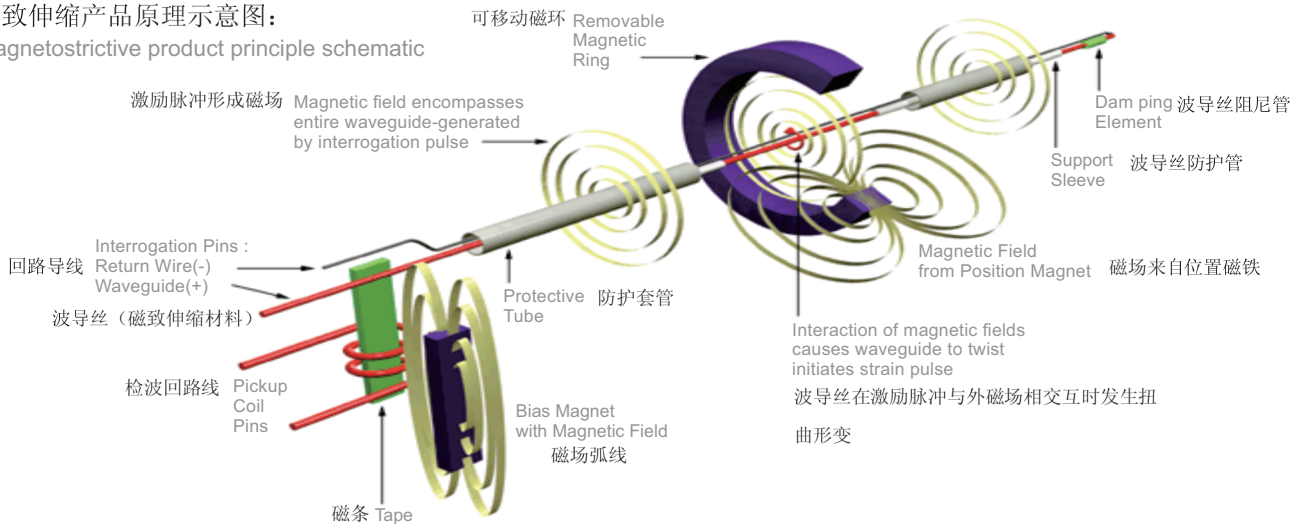


to be re-amplified and processed, there is no signal drift or change in value, not to mention the need for periodic re-calibration, as is the case with other sensors.

Magnetostrictive sensors are non-contact and never wear out. It has the advantages of high resolution, high accuracy, high stability, high reliability, fast response time and long working life. The sensors do not need to be recalibrated or regularly maintained.

磁致伸缩产品原理示意图:

Magnetostrictive product principle schematic



如客户使用现场有耐压要求,则需要根据客户现场不同压力需求,选择对应的抗压材料,没有特殊要求默认客户现场使用无压力要求,使用标准材料生产。

If customers use the site with pressure resistance requirements, it is necessary to choose the corresponding pressure-resistant materials according to the different pressure requirements of the customer site, there is no special requirement default customer site use no pressure requirements, the use of standard material production.

测杆耐压明细参考如下:

Refer to the following for the breakdown of measuring rod pressure resistance:

|               |                          |             |                              |
|---------------|--------------------------|-------------|------------------------------|
| Φ10*壁厚 1.5mm  | Φ10*wall thickness 1.5mm | 耐压 21.9mPa  | pressure resistance 21.9mPa  |
| Φ10*壁厚 2.0mm  | Φ10*wall thickness 2.0mm | 耐压 29.2mPa  | pressure resistance 29.2mPa  |
| Φ10*壁厚 2.5mm  | Φ10*wall thickness 2.5mm | 耐压 36.6mPa  | pressure resistance 36.6mPa  |
| Φ10*壁厚 3.0mm  | Φ10*wall thickness 3.0mm | 耐压 43.9mPa  | pressure resistance 43.9mPa  |
| Φ 12*壁厚 1.5mm | Φ10*wall thickness 1.5mm | 耐压19.21mPa  | pressure resistance 19.21mPa |
| Φ12*壁厚 2.0mm  | Φ10*wall thickness 2.0mm | 耐压 25.62mPa | pressure resistance 25.62mPa |
| Φ12*壁厚 2.5mm  | Φ10*wall thickness 2.5mm | 耐压 32.03mPa | pressure resistance 32.03mPa |
| Φ12*壁厚 3.0mm  | Φ10*wall thickness 3.0mm | 耐压 38.43mPa | pressure resistance 38.43mPa |
| Φ 14*壁厚 1.5mm | Φ10*wall thickness 1.5mm | 耐压17.08mPa  | pressure resistance 17.08mPa |
| Φ 14*壁厚 2.0mm | Φ10*wall thickness 2.0mm | 耐压 22.77mPa | pressure resistance 22.77mPa |
| Φ 14*壁厚 2.5mm | Φ10*wall thickness 2.5mm | 耐压 28.47mPa | pressure resistance 28.47mPa |
| Φ 14*壁厚 3.0mm | Φ10*wall thickness 3.0mm | 耐压 34.16mPa | pressure resistance 34.16mPa |

接订单后一律按照客户要求的耐压数值对照上述数值匹配适合的测杆!如有更大耐压需求,请与技术人员沟通,目前可以做到耐压60mPa左右。

After receiving the order, we will always match the suitable stylus with the above values according to the pressure resistance value required by the customer! If there is a need for greater pressure resistance, please communicate with the technical staff, currently can be achieved pressure resistance of about 60mPa.

## 安装前注意事项 Precautions before installation

认真阅读全部安装说明,防止安装的环境温度、冲击、振动、压力及尺寸超出传感器的允许范围;不可使测杆弯曲;切勿使传感器的电子部件端或最末端承受大的冲击;用户应对产品的使用环境、防腐蚀、防爆及功能选择负责,无特殊要求的传感器不可用于有化学反应或其它对传感器有损害的易燃、易爆、腐蚀、蒸气和液体等场合;安装完毕,应对电子仓进行保护处理。

Carefully read all the installation instructions to prevent the installation of the ambient temperature, shock, vibration, pressure and size beyond the permissible range of the sensor; do not make the rod bending; do not make the sensor's electronic parts end or the end of the most end of the big impact; the user should be responsible for the use of the product's environment, corrosion protection, explosion-proof and functional selection, no special requirements of the sensor can not be used for chemical reactions or other sensors have a detrimental effect on the inflammable, explosive, corrosive, vapors and liquids and other occasions; the installation is complete, should be the electronic compartment of the protection process.

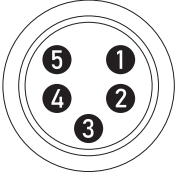
## 电气安装Electrical installation

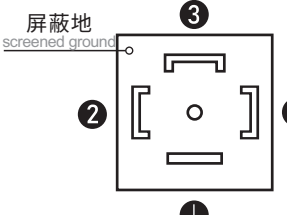
### 传感器接线前注意事项: Precautions before wiring the sensor:

- 一、传感器的屏蔽电缆线必须避开大功率电源,射频信号源和其它有噪声的传输线等。  
一、The sensor's shielded cable must avoid high-power power supplies, radio frequency signal sources and other noisy transmission lines.
- 二、用户在接线前,请检查供电电源是否满足: +24VDC的要求,并且电源输出功率必须大于产品总功耗,按不同量程每支传感器 $\leq 80\text{mA}$ 计算。如果电源不能满足要求,请更换供电电源以保证传感器能够正常工作。  
二、The user in the wiring, please check whether the power supply to meet: +24VDC requirements, and power output must be greater than the total power consumption of the product, according to the different ranges of each sensor  $\leq 95\text{mA}$  calculation. If the power supply can not meet the requirements, please replace the power supply to ensure that the sensor can work properly.
- 三、警告!禁止将电子仓浸入液体中!  
三、Warning! It is prohibited to immerse the electronic compartment in liquid!

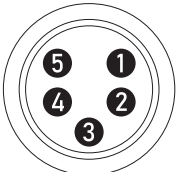


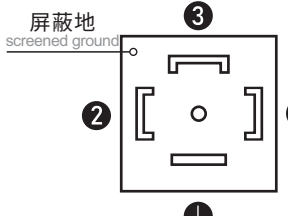
## 二线电流输出接线方式 2-wire current output wiring

| 航空插头/防水接头接线图<br>Aviation plug/waterproof connector wiring diagram   | 针号<br>Gauge | 颜色<br>Color        | 定义<br>Define             |
|---|-------------|--------------------|--------------------------|
|  <p>公接头针号排列(面向传感器头)<br/>Male connector pin number arrangement (facing the sensor head)</p> | 1           | 棕<br>brown         | 电源正<br>power positive    |
|   | 2           |                    |                          |
|   | 3           | 蓝<br>blue          | 信号输出+<br>signal output + |
|   | 4           |                    |                          |
|   | 5           | 屏蔽线<br>shield wire | 壳体地<br>shell ground      |

| 赫斯曼插头接线图<br>Hersman plug wiring diagram   | 针号<br>Gauge | 颜色<br>Color        | 定义<br>Define             |
|---|-------------|--------------------|--------------------------|
|  <p>屏蔽地<br/>screened ground</p> | 1           | 棕<br>brown         | 电源正<br>power positive    |
|   | 2           | 蓝<br>blue          | 信号输出+<br>signal output + |
|   | 3           |                    |                          |
|   | 4           | 屏蔽线<br>shield wire | 壳体地<br>shell ground      |

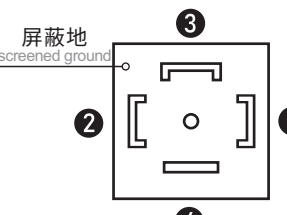
## 三线制/四线制模拟信号输出接线方式 3-wire/4-wire analog signal output wiring method

| 航空插头/防水接头接线图<br>Aviation plug/waterproof connector wiring diagram  | 针号<br>Gauge | 颜色<br>Color        | 定义<br>Define             |
|--|-------------|--------------------|--------------------------|
|  <p>公接头针号排列(面向传感器头)<br/>Male connector pin number arrangement (facing the sensor head)</p> | 1           | 棕<br>brown         | 电源正<br>power positive    |
|  | 2           | 黑<br>black         | 电源负<br>power negative    |
|  | 3           | 蓝<br>blue          | 信号输出+<br>signal output + |
|  | 4           | 白<br>white         | 信号输出-<br>signal output - |
|  | 5           | 屏蔽线<br>shield wire | 壳体地<br>shell ground      |

| 赫斯曼插头接线图<br>Hersman plug wiring diagram  | 针号<br>Gauge | 颜色<br>Color         | 定义<br>Define                       |
|--|-------------|---------------------|------------------------------------|
|  <p>屏蔽地<br/>screened ground</p> | 1           | 棕<br>brown          | 电源正<br>power positive              |
|  | 2           | 蓝<br>blue           | 信号输出+<br>signal output +           |
|  | 3           | 黑、白<br>black, white | 电源负、信号-<br>power negative, signal- |
|  | 4           | 屏蔽线<br>shield wire  | 壳体地<br>shell ground                |

## 数字信号输出接线方式 Digital signal output wiring

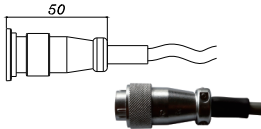
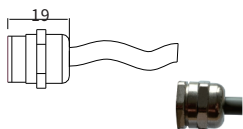
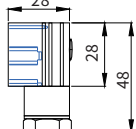
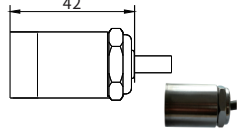
| 航空插头/防水接头接线图<br>Aviation plug/waterproof connector wiring diagram   | 针号<br>Gauge | 颜色<br>Color        | 定义<br>Define          |
|---|-------------|--------------------|-----------------------|
|  <p>公接头针号排列(面向传感器头)<br/>Male connector pin number arrangement (facing the sensor head)</p> | 1           | 棕<br>brown         | 电源正<br>power positive |
|   | 2           | 黑<br>black         | 电源负<br>power negative |
|   | 3           | 蓝<br>blue          | RS485A                |
|   | 4           | 白<br>white         | RS485B                |
|   | 5           | 屏蔽线<br>shield wire | 壳体地<br>shell ground   |

| 赫斯曼插头接线图<br>Hersman plug wiring diagram   | 针号<br>Gauge | 颜色<br>Color | 定义<br>Define          |
|---|-------------|-------------|-----------------------|
|  <p>屏蔽地<br/>screened ground</p> | 1           | 棕<br>brown  | 电源正<br>power positive |
|   | 2           | 蓝<br>blue   | RS485A                |
|   | 3           | 白<br>white  | RS485B                |
|   | 4           | 黑<br>black  | 电源负<br>power negative |

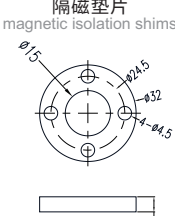
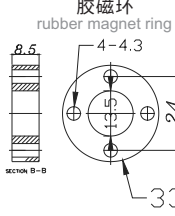
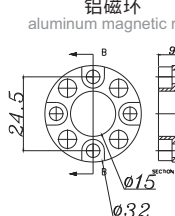
备注: 以上仅为参考, 具体接线定义以产品实物标签上的标注为准。

Note: The above is for reference only, the specific wiring definition is subject to the labeling on the product physical label.

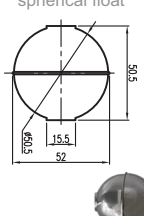
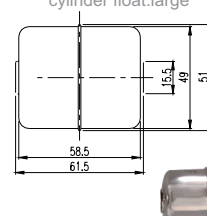
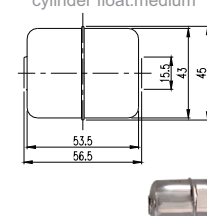
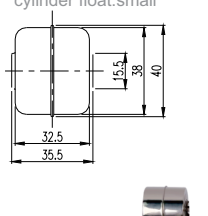
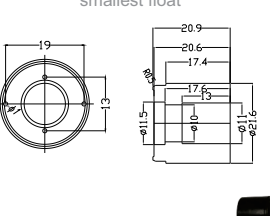
## 接头选型 Connector Selection

|  |   |   |  |
|--|---|---|--|
| <p><b>P:航空插头</b><br/>P:aviation plug</p>  | <p><b>C:防水接头</b><br/>C:waterproof connector</p>  | <p><b>H:赫斯曼插头</b><br/>H:hersman plug</p>  | <p><b>Ex:防爆栓</b><br/>Ex:explosion-proof pins</p>  |
|--|---|---|--|

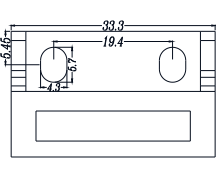
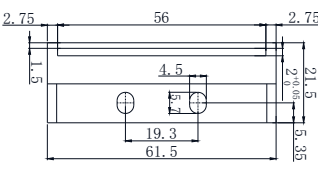
## 配件图纸 Accessory Drawings

|  |   |  |
|--|---|--|
| <p><b>隔磁垫片尺寸</b><br/>Magnetic isolation spacer size</p> <p>隔磁垫片<br/>magnetic isolation shims</p>  | <p><b>MTL2/MTL3/MTL5/MTS可选磁环尺寸</b><br/>MTL2/MTL3/MTL5/MTS Selectable ring sizes</p>                                       |  |
| <p>胶磁环<br/>rubber magnet ring</p>   | <p>铝磁环<br/>aluminum magnetic ring</p>  |  |

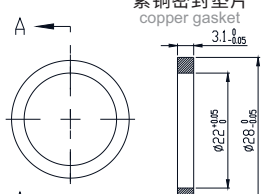
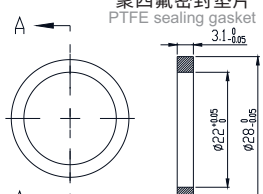
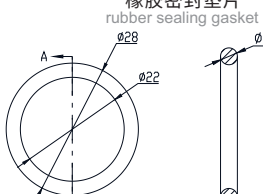
**MTL2/MTL4/MTL6/MTL7/MTS浮球尺寸图:**  
MTL2/MTL4/MTL6/MTL7/MTS Float Dimensions:

|   |   |  |  |  |
|---|---|--|--|--|
| <p><b>圆球体浮球</b><br/>spherical float</p>  | <p><b>圆柱体浮球:大号</b><br/>cylinder float:large</p>  | <p><b>圆柱体浮球:中号</b><br/>cylinder float:medium</p>  | <p><b>圆柱体浮球:小号</b><br/>cylinder float:small</p>  | <p><b>最小号浮球</b><br/>smallest float</p>  |
|---|---|--|--|--|

**MTM1/MTM3滑块尺寸图:**  
MTM1/MTM3 slider dimensions:

|   |   |
|---|---|
| <p><b>磁悬浮标准滑块</b><br/>magnetic levitation standard slider</p>  | <p><b>磁悬浮加长滑块</b><br/>magnetic levitation extended slide</p>  |
|---|---|

**MTL2/MTL3/MTL4/MTS-FS密封圈尺寸图:**  
Dimensional drawing of MTL2/MTL3/MTL4/MTS-FS seals:

|  |   |  |
|--|---|--|
| <p><b>紫铜密封垫片</b><br/>copper gasket</p>  | <p><b>聚四氟密封垫片</b><br/>PTFE sealing gasket</p>  | <p><b>橡胶密封垫片</b><br/>rubber sealing gasket</p>  |
|--|---|--|

## 安装指南 Installation Guide

### 常用安装方式 Common installation methods

方式一:适应于部分液罐测量,可选厂家提供的连接法兰或用户特殊订制的法兰、液位传感器直接旋入。

Mode 1: Adapted to part of the liquid tank measurement, can choose the connecting flange provided by the manufacturer or the user's special customized flange, the liquid level sensor is directly screwed in.

方式二:适用于开罐测量,可选厂家提供的传感器支架与锁紧螺母配件,将液位传感器固定在所需安装位置。

Mode 2: Applicable to open tank measurement, optional sensor bracket and lock nut accessories provided by the manufacturer, the level sensor will be fixed in the desired installation position.

方式三:适应于开罐与密封罐测量。

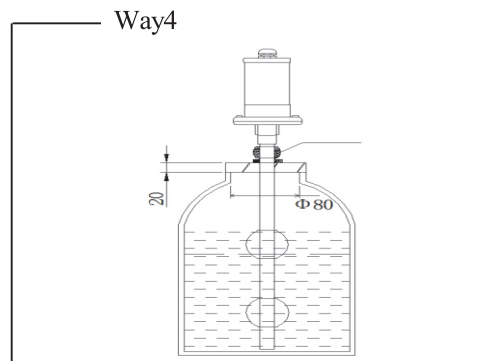
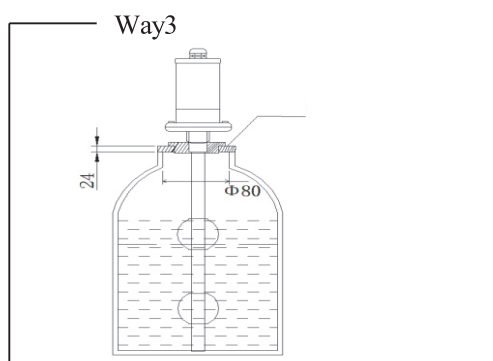
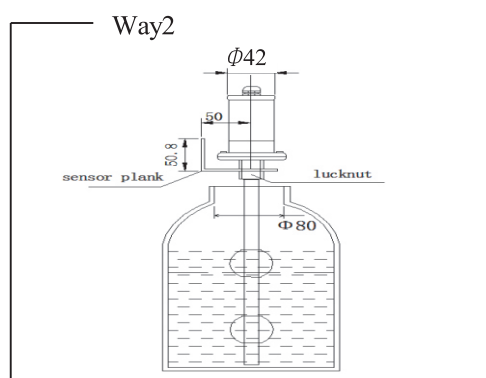
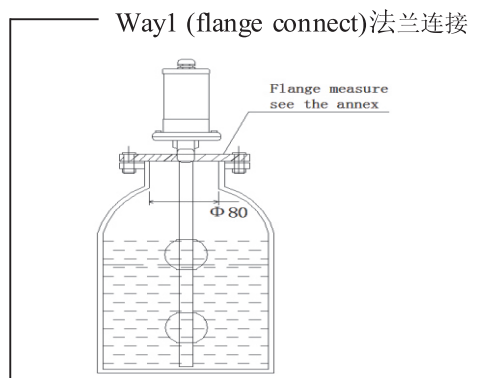
Mode 3: Adapted to open and sealed can measurements.

方式四:适应于测量高度可调整的开罐与密封罐测量。

Mode 4: Adapted to the measurement of open and sealed cans with adjustable measuring height.

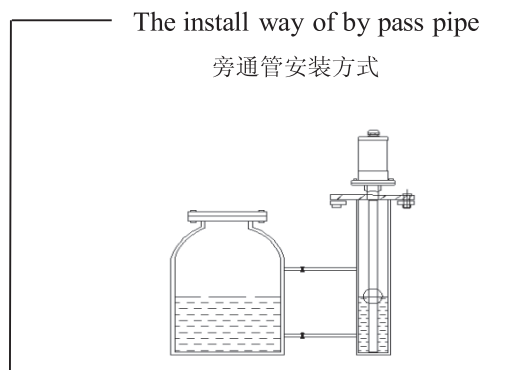
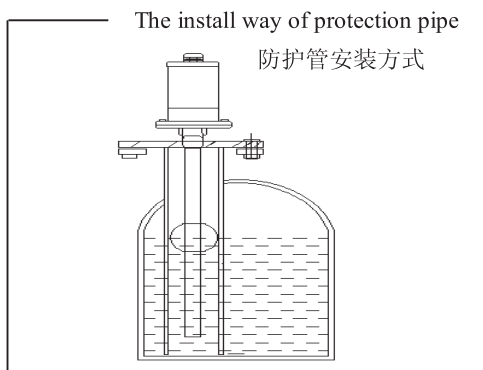
注意:罐体开口大于 $\Phi 80$ ,便于浮子安装;法兰上的安装螺纹孔应与选用的传感器相符合。

Attention: the opening of the tank is larger than  $\Phi 80$ , which is convenient for float installation; the mounting thread holes on the flange should be compatible with the selected sensor.



## 防护管与旁通管安装方法 Protection pipe and by-pass installation

- 1.对罐内介质有轻微搅拌或进出液体时有冲击的场合,可按防护管方式安装。  
1. If the medium in the tank is slightly agitated or there is impact when entering or leaving the liquid, it can be installed in the way of protection pipe.
- 2.对罐内介质搅拌程度比较剧烈或介质温度较高的应用场合需按旁通管方式安装。  
2. For applications where the degree of agitation of the medium in the tank is more intense or the temperature of the medium is higher, it is necessary to install it in the way of bypass pipe.
- 3.加装防护管,最高处的液位导通孔一定要在液位不能达到的地方开孔,将防护管下部与液体导通,使得防护管内外的液位一致,最好是防护管的各个高度都要有孔.使得管内外的介质均匀一致。  
3. Installation of protection tube, the highest level of the guide hole must be in the liquid level can not be reached in the place of the hole, the protection of the lower part of the tube and the liquid conduit, so that the protection of the level of liquid inside and outside the same, preferably the protection of the tube of all heights should have a hole. Make the medium inside and outside the tube uniform.



## A 内置安装方法 Built-in installation method

- 1.将传感器旋入 M18×1.5安装孔,注意“O”形圈的密封面按图示加工。  
1. Screw the sensor into the M18X1.5 mounting hole and note that the sealing surface of the "O" ring is processed according to the drawing.
- 2.根据磁环的位置,在自制的活塞上钻四个螺纹孔.将磁环用内六角螺钉M4X20固定好.螺钉头部朝向传感器的电子仓侧;磁环应尽量与测杆同心,但磁环偏心对测量精度无影响.如有振动的影响,建议在磁环和活塞之间加四氟乙烯导向套。  
2. According to the position of the magnetic ring, drill four threaded holes in the homemade piston. Fix the magnetic ring with hexagonal screw M4X20. The head of the screw faces the electronic compartment side of the sensor; the magnetic ring should be concentric with the measuring rod as much as possible, but the eccentricity of the magnetic ring has no effect on the measurement accuracy. In case of vibration effects, it is recommended to add a PTFE guide sleeve between the magnetic ring and the piston.

3.如活塞为导磁材料制作,须在磁环和活塞之间加装非导磁垫圈。

3. If the piston is made of magnetically conductive material, a non-conductive washer must be added between the magnetic ring and the piston.

## B 外置安装方法 External mounting method

对测量范围小于1000mm 的传感器,建议选用安装附件;大于1000mm 的,选用测杆支架安装。

For sensors with a measuring range of less than 1000 mm, it is recommended to use the mounting accessories; for sensors larger than 1000 mm, use the stylus bracket for mounting.

1.用传感器支架将传感器卡住,并用锁紧螺母将支架固定在传感器的螺纹上。

1.Snap the sensor in place with the sensor bracket and secure the bracket to the threads of the sensor with the lock nut.

2.将磁环用内六角螺钉M4×16 固定在磁环支架上,当将磁环装在测杆时,螺钉头部应朝向电子仓侧;磁环应尽量与测杆同心且无接触,但磁环稍有偏心不会影响传感器的性能。

2.Fix the magnetic ring with hexagon socket head cap screw M4×16 on the magnetic ring bracket, when the magnetic ring is mounted on the measuring rod, the head of the screw should be directed towards the side of the electronic compartment; the magnetic ring should be concentric with the measuring rod as far as possible and without contact, but a slight eccentricity of the ring will not affect the performance of the sensor.

3.将固定板条紧绕在测杆的最末端,并用三个 M4×16 螺钉和三个 M3 螺母固定好。

3. Wrap the fixing slat tightly around the far end of the rod and secure it with three M4 x 16 screws and three M3 nuts.

注意:安装附件只提供一根固定板条,将其固定在距测杆末端 50mm以内;测杆支架安装方式附件有三根固定板条,安装方法为:一根固定在距末端约 25mm 以内,另外两根均布在测杆上。

Note: The mounting accessory provides only one fixing slat, which is fixed within 50mm of the end of the stem; the stem mounting bracket accessory has three fixing slats, which are mounted as follows: one is fixed within 25mm of the end, and the other two are evenly distributed across the stem.

4.最后将整个初装好的传感器根据安装要求用自制螺钉固定好即可。

4. Finally, the entire initial installation of the sensor according to the installation requirements with homemade screws can be fixed.

## C 安装示意图 Installation Diagram

液压缸内安装方式:

Mounting in hydraulic cylinder :

根据油缸工作压力选择合适的密封方式,常用的油缸密封安装方式有以下几种:

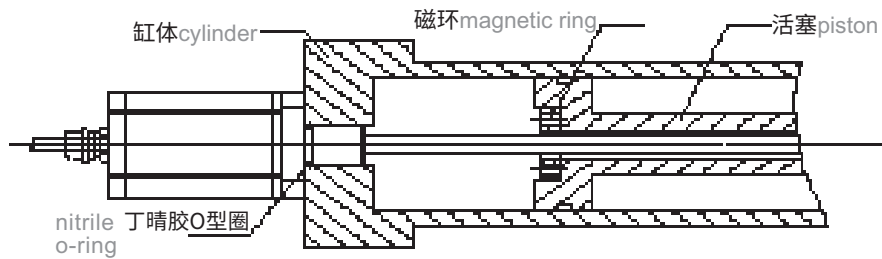
According to the working pressure of the cylinder to choose the appropriate sealing method, commonly used cylinder sealing installation methods are as follows:

注:如用户订货时无特殊说明,默认安装方式为方式一,配 O 型圈作为密封方式。

Note: If there is no special instruction when the user orders, the default installation mode is mode 1, with O-ring as the sealing mode.

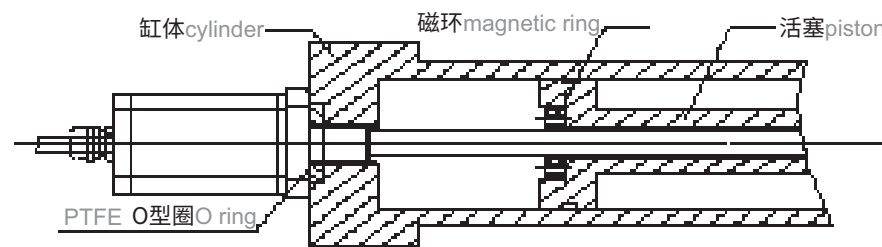
方式一:丁腈胶O型圈密封,一般适用于油缸压力 $\leq 15\text{MPa}$

Mode 1: O-ring sealing of butyl rubber, generally applicable to the cylinder pressure  $\leq 15\text{MPa}$



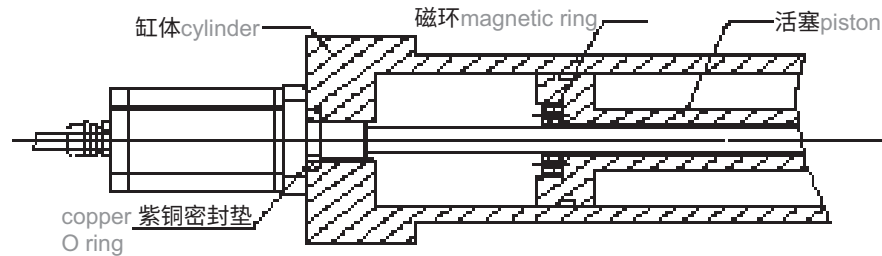
方式二:聚四氟乙烯密封垫,一般适用于油压力 $15\text{MPa}-30\text{MPa}$

Mode 2: PTFE gasket, generally applicable to oil pressure  $15\text{MPa}-30\text{MPa}$



方式三:紫铜垫密封,一般适用于油缸压力 $\geq 30\text{MPa}$

Mode 3: Purple copper gasket sealing, generally applicable to the cylinder pressure  $\geq 30\text{MPa}$



## 调校calibrate

该传感器在出厂时已经按照满量程将零点和满度调校好。由于传感器的长期稳定性很好,整个使用周期内不需要调整。由此,为了提高可靠性,传感器没留有供调校用的端口。请选用参数校准的二次仪表进行测量。如用户需要重新设定零点和满度,请与我公司联系。

The sensor is factory adjusted for zero and fullness to full scale. Due to the excellent long-term stability of the sensor, no adjustments are required throughout its life cycle. As a result, the sensor does not have a port for adjustment to increase reliability. Please use a parameter calibrated secondary instrument for measurement. If the user needs to reset the zero and fullness, please contact us.

## 常见问题及处理 Common Problems and Handling:

以下为一般故障原因与处理方法:

The following are general causes of malfunctions and how to deal with them:

1. 接线错误(最常发生):按接线表重新接线。

1. Wiring error (the most common): according to the wiring table to rewire.

2. 供电不对或反向连接,电源不稳定:提供正确稳定和纯净电源重接。

2. Incorrect power supply or reverse connection, unstable power supply: Provide correct, stable and pure power supply and reconnect.

3. 不匹配零件,如配对接头错误:联系我们重订所需配件。

3. Mismatched parts, such as the wrong pair of connectors: contact us to reorder the required parts.

4. 磁铁受到破坏(注意:磁铁本身为“永磁体”不会自我消磁):更换磁铁。

4. The magnet is damaged (note: the magnet itself is a "permanent magnet" will not demagnetize itself): replace the magnet.

5. 信号不稳定,接地不对(如DC电路地线和机械外壳地线接在一起)。

5. Signal instability, grounding is not right (such as DC circuit ground and mechanical shell ground connected together).

6. 通讯故障,请查看控制器厂家的相关资料或联系供应商。

6. Communication failure, please check the relevant information of the controller manufacturer or contact the supplier.

7. 控制器失效:如果可能的话,用户应该把传感器与控制器分开,独立检查传感器是否工作正常。

7. Controller failure: If possible, the user should separate the sensor from the controller and independently check whether the sensor is working properly.

8. 外来电子EMI噪音干扰(包括对电缆的干扰):请检查所选用电缆是否带屏蔽和符合要求。

8. External electronic EMI noise interference (including interference with the cable): Please check whether the selected cable is shielded and meet the requirements.

9. 传感器受到外来破坏,如水淹、高温、电缆被切断又或受到猛烈的冲撞等事故(在一些环境恶劣如钢铁厂,木材厂等生产线上,这些事故可能经常发生,并不为奇):可寄回修理,但如果严重的话,可能需要重新订货。

9. The sensor is subject to external damage, such as flooding, high temperature, cable is cut or subject to violent impact and other accidents (in some harsh environments, such as steel mills, timber mills and other production lines, these accidents may be frequent and not surprising): can be sent back to the repair, but if the seriousness of the case, it may be necessary to re-order.

注:按上述方法故障排除不了,请送生产厂家检修。

Note: If you are unable to solve the problem by the above method, please send it to your healthcare provider for repair.



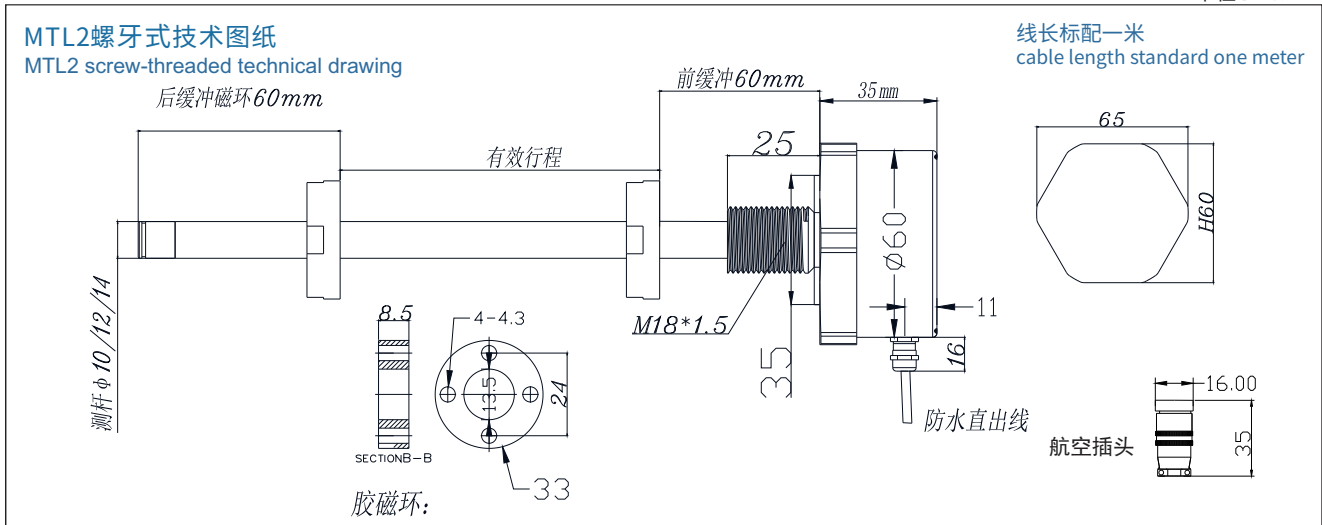
# MTL2磁致伸缩位移传感器

## MTL2 Magnetostrictive Displacement Sensor

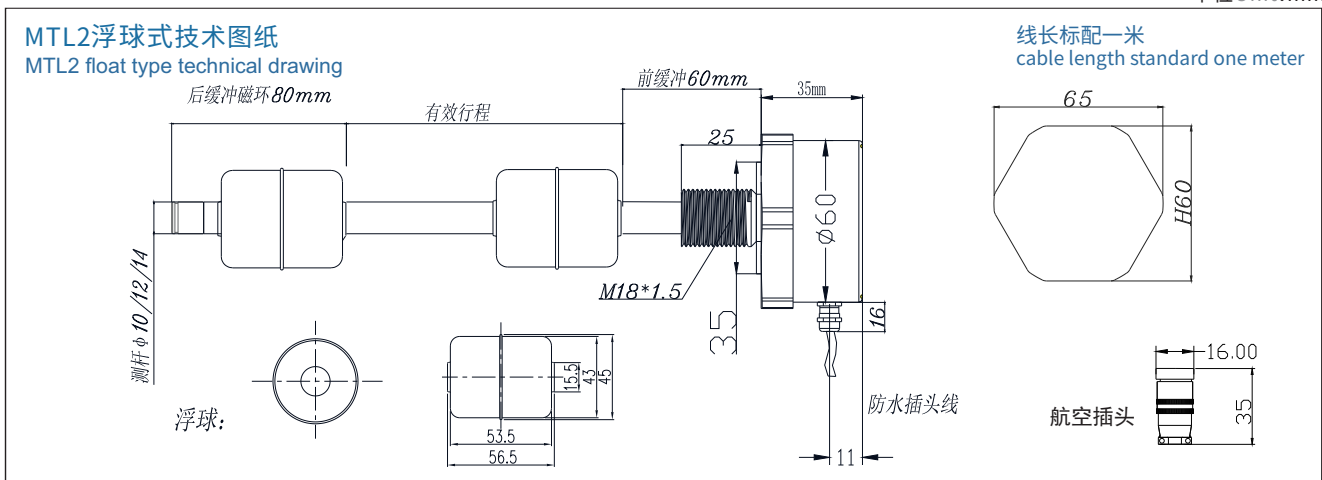
### 产品尺寸图 Product Dimension Drawing

### MTL2尺寸图 MTL2 Dimension Drawing

单位 Unit: mm

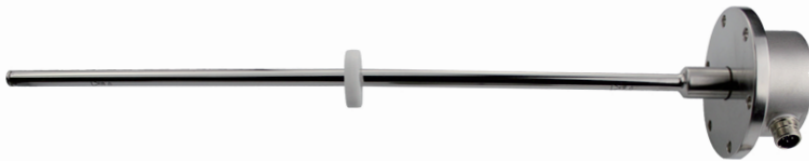
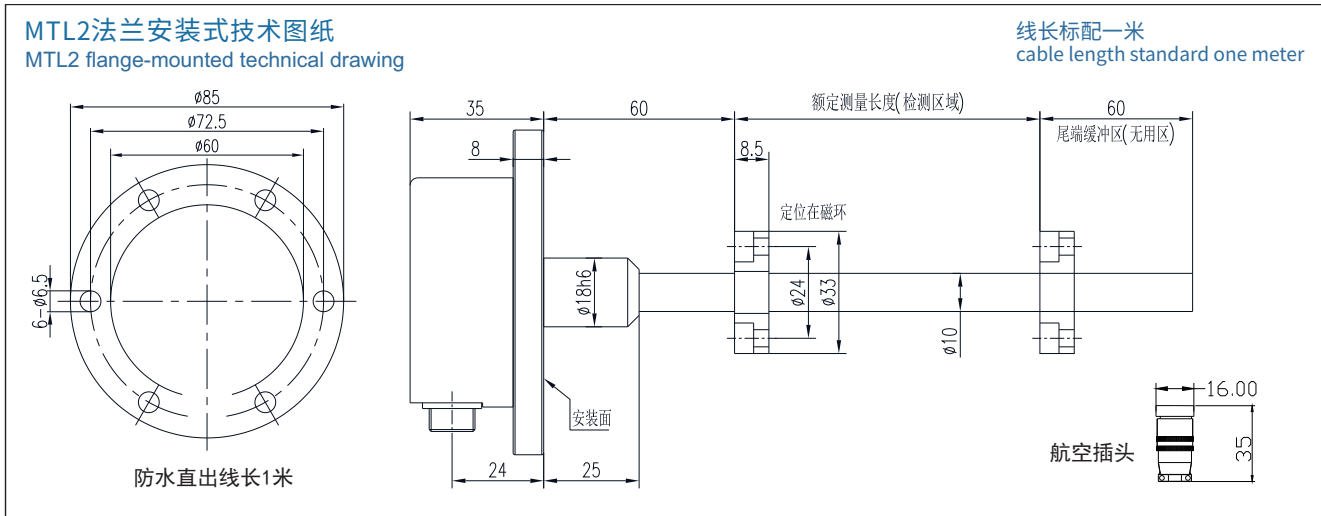


单位 Unit: mm





单位Unit:mm



## 性能参数 Performance Parameters

### 电气指标 Electrical indicators

| MTL2磁致伸缩位移/液位传感器<br>MTL2 Magnetostrictive Displacement/Level Sensor |  |                              |             |
|---|--|------------------------------|-------------|
| 量程范围<br>Measurement range   | 50~5000mm  | 供电电压<br>Supply voltage       | DC24V (±2V) |
| 外壳防护等级<br>Shell protection grade                                    | IP65   | 重复性误差<br>Repeatability error | ≤0.005%FS   |
| 非线性误差<br>Nonlinear error  | ≤0.05%FS   | 迟滞<br>Hysteresis             | ≤0.001%FS   |
| 分辨率<br>Resolution ratio   | ≤0.038mm   | 工作电流<br>Operating current    | ≤60mA       |
| 电子仓温度<br>Electronic warehouse temperature                           | -40°C~85°C   | 测杆温度<br>Rod temperature      | -40°C~150°C |
| 温度稳定性<br>Temperature stability                                      | ≤0.002%/°C   |                              |             |
| 输出信号<br>Output signal   | 0-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen/SSI/start-stop  |                              |             |
| 工作压力<br>Work pressure   | 持续工作压力≤35MPa (MTL内置高压式系列)<br>Continuous working pressure ≤35MPa (MTL built-in high pressure type series)                               |                              |             |
| 测杆材料<br>Rod material  | 默认:0CR18NI9 (304不锈钢);可定制为:316不锈钢<br>Default: 0CR18NI9 (304 stainless steel);can be customized to: 316 stainless steel                  |                              |             |
| 电子仓外壳<br>Electronic warehouse shell                                 | 默认:0CR18NI9 (304不锈钢);可定制为:316不锈钢<br>Default: 0CR18NI9 (304 stainless steel);can be customized to: 316 stainless steel                  |                              |             |
| 负载能力<br>Load capacity   | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω   |                              |             |
| 引线方式<br>Lead wire method  | 耐高温双绞屏蔽电缆线 (默认长度:1m,也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request) |                              |             |

# MTL3磁致伸缩位移传感器

## MTL3 Magnetostrictive Displacement Sensors

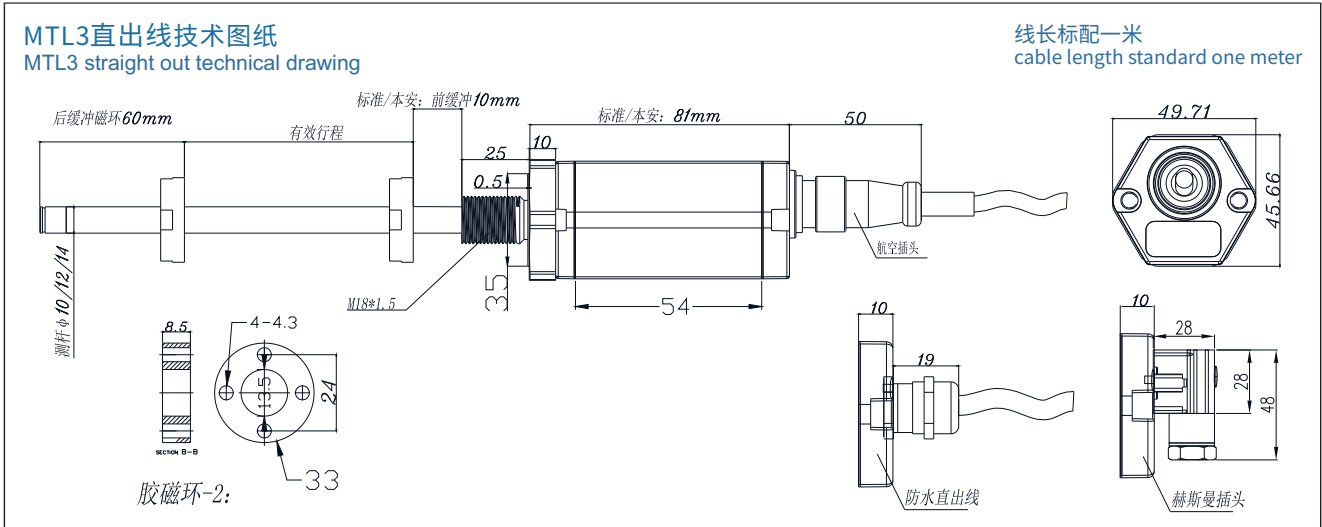
### 产品尺寸图 Product Dimension Drawing

### MTL3尺寸图 MTL3 Dimension Drawing

单位 Unit: mm

MTL3直出线技术图纸  
MTL3 straight out technical drawing

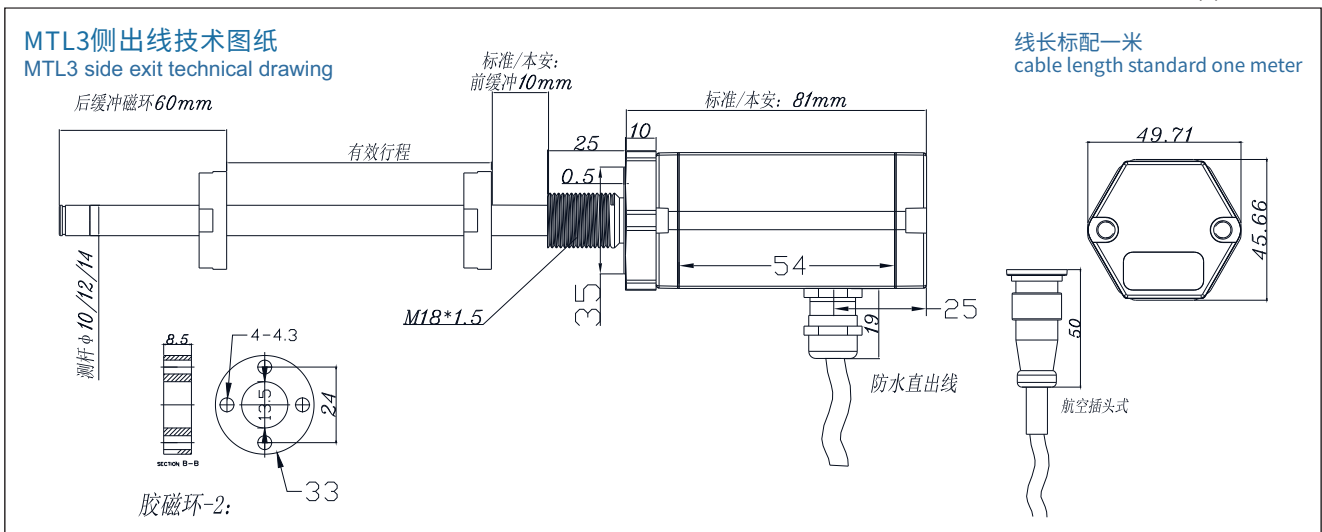
线长标配一米  
cable length standard one meter



单位 Unit: mm

MTL3侧出线技术图纸  
MTL3 side exit technical drawing

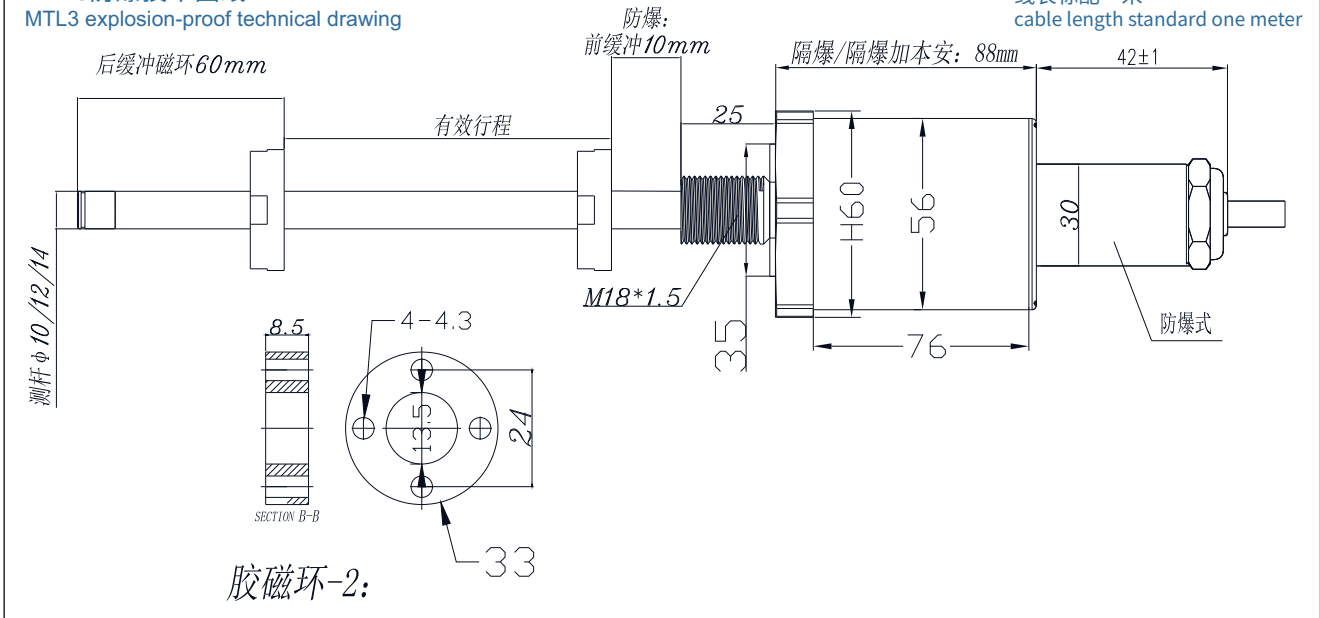
线长标配一米  
cable length standard one meter



单位Unit:mm

MTL3防爆技术图纸  
MTL3 explosion-proof technical drawing

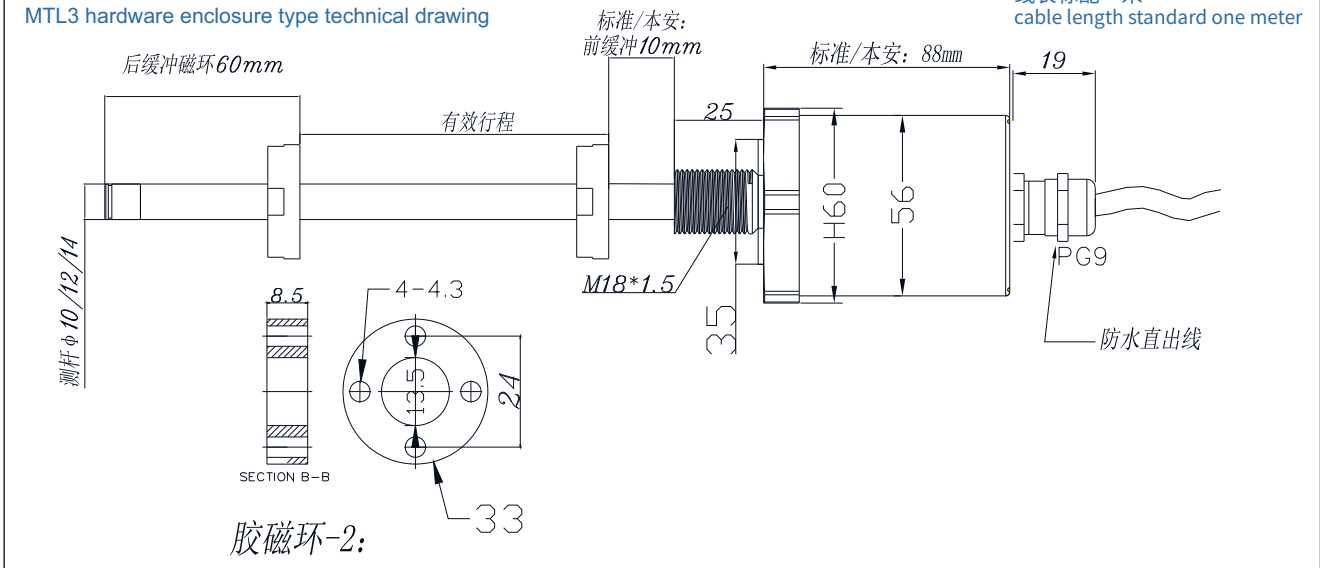
线长标配一米  
cable length standard one meter



单位Unit:mm

MTL3五金外壳型技术图纸  
MTL3 hardware enclosure type technical drawing

线长标配一米  
cable length standard one meter



## 性能参数 Performance Parameters

### 电气指标 Electrical indicators

| MTL3磁致伸缩位移/液位传感器<br>MTL3 Magnetostrictive Displacement/Level Sensor |   |
|---|---|
| 量程范围<br>Measurement range   | 50~5000mm   |
| 非线性误差<br>Nonlinear error  | ≤0.05%FS  |
| 分辨率<br>Resolution ratio   | ≤0.038mm  |
| 重复性误差<br>Repeatability error  | ≤0.005%FS   |
| 输出信号<br>Output signal   | 0-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen/SSI/start-stop |
| 供电电压<br>Supply voltage  | DC24V (±2V)   |
| 迟滞<br>Hysteresis  | ≤0.001%FS   |
| 工作电流<br>Operating current   | ≤60mA   |

### 性能指标 Performance indicators

|   |   |
|---|---|
| 温度稳定性<br>Temperature stability            | ≤0.002%/°C  |
| 外壳防护等级<br>Shell protection grade          | IP65、IP67   |
| 电子仓温度<br>Electronic warehouse temperature | -40°C~85°C  |
| 测杆温度<br>Rod temperature                   | -40°C~150°C   |
| 工作压力<br>Work pressure                     | 持续工作压力≤35MPa (MTL内置高压式系列)<br>Continuous working pressure ≤ 35MPa (MTL built-in high pressure type series)   |
| 测杆材料<br>Rod material                      | 默认: 0CR18NI9 (304不锈钢); 可定制为: 316不锈钢<br>Default: 0CR18NI9 (304 stainless steel); can be customized to: 316 stainless steel   |
| 电子仓外壳<br>Electronic warehouse shell       | 默认: 铝合金/0CR18NI9 (304不锈钢); 可定制为: 316不锈钢<br>Default: aluminum alloy/0CR18NI9 (304 stainless steel); can be customized to: 316 stainless steel  |
| 负载能力<br>Load capacity                     | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω  |
| 引线方式<br>Lead wire method                  | 耐高温双绞屏蔽电缆线 (默认长度: 1m, 也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request)  |
| 防爆标志<br>Explosion-proof symbol            | 防爆标志: Ex d IIB T5 Gb/Ex tD A21 IP65 T80°C 防爆本安标志: Ex ia IIB T4 Ga<br>Explosion-proof Marking: Ex d IIB T5 Gb/Ex tD A21 IP65 T80°C Explosion-proof Intrinsically Safe Marking: Ex ia IIB T4 Ga |

# MTL4磁致伸缩位移传感器

## MTL4 Magnetostrictive Displacement Sensors

### 产品尺寸图 Product Dimension Drawing

### MTL4尺寸图 MTL4 Dimension Drawing

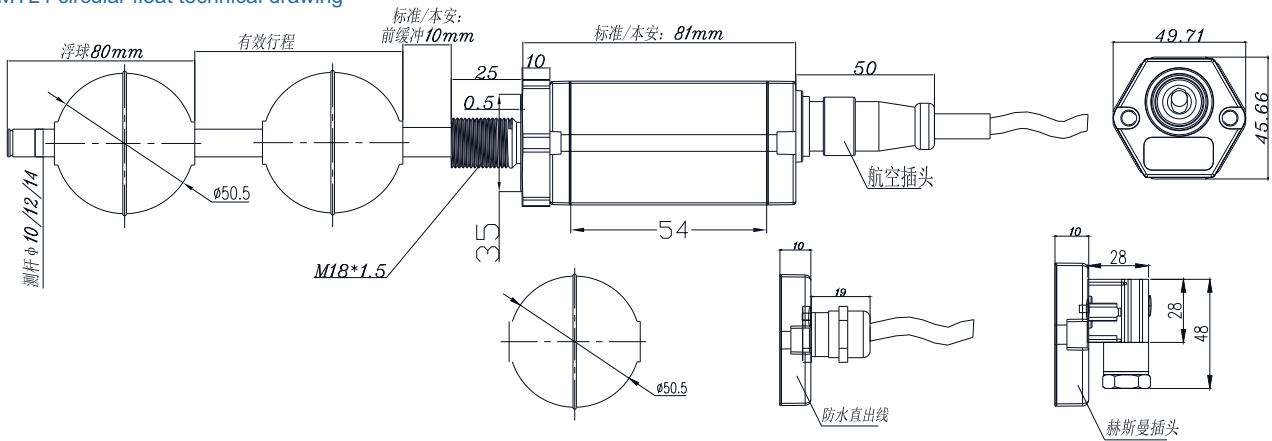
单位 Unit: mm

MTL4圆形浮球技术图纸

MTL4 circular float technical drawing

线长标配一米

cable length standard one meter



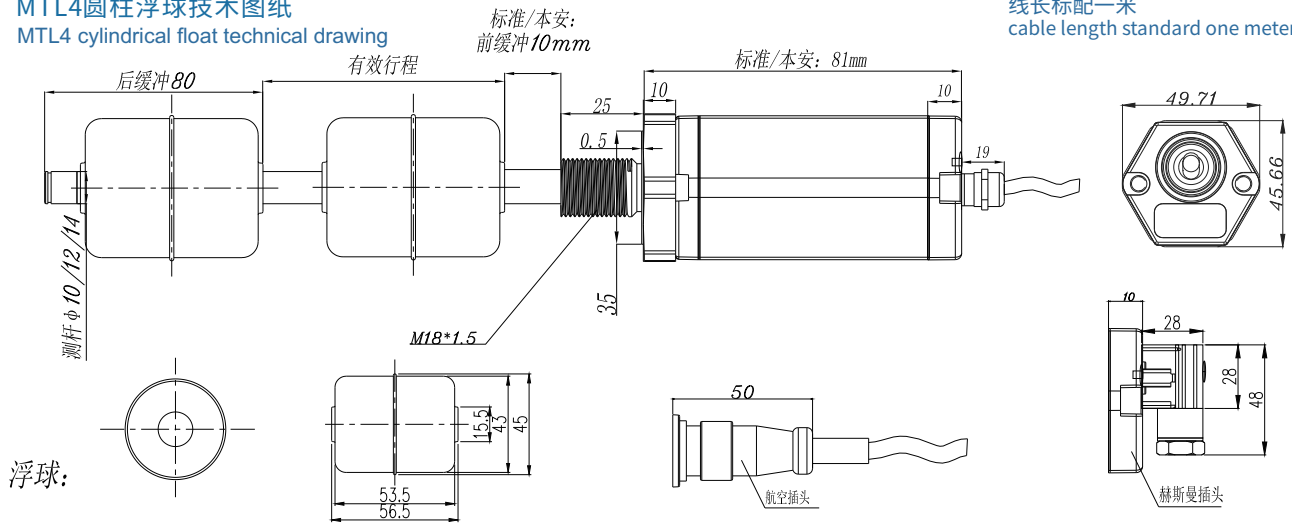
单位 Unit: mm

MTL4圆柱浮球技术图纸

MTL4 cylindrical float technical drawing

线长标配一米

cable length standard one meter



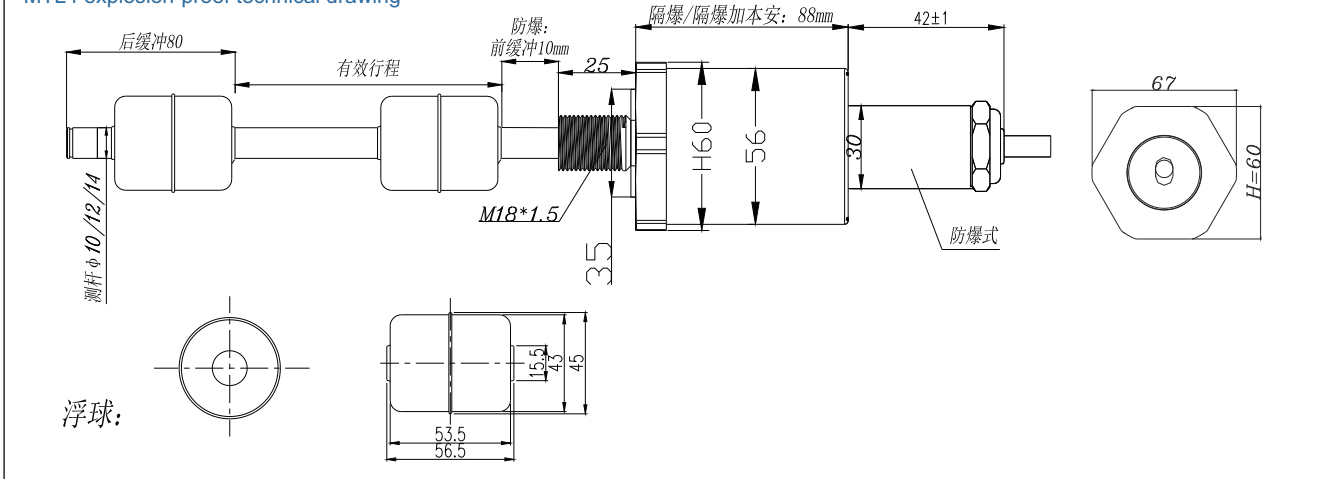
单位Unit:mm

MTL4防爆型技术图纸

MTL4 explosion-proof technical drawing

线长标配一米

cable length standard one meter



性能参数 Performance Parameters

电气指标 Electrical indicators

| MTL4磁致伸缩位移/液位传感器<br>MTL4 Magnetostrictive Displacement/Level Sensor |   |                              |             |
|---|---|------------------------------|-------------|
| 量程范围<br>Measurement range   | 50~5000mm   | 供电电压<br>Supply voltage       | DC24V(±2V)  |
| 外壳防护等级<br>Shell protection grade                                    | IP65、IP67   | 重复性误差<br>Repeatability error | ≤0.005%FS   |
| 非线性误差<br>Nonlinear error  | ≤0.05%FS  | 迟滞<br>Hysteresis             | ≤0.001%FS   |
| 分辨率<br>Resolution ratio   | ≤0.038mm  | 工作电流<br>Operating current    | ≤60mA       |
| 温度稳定性<br>Temperature stability                                      | ≤0.002%/°C  | 测杆温度<br>Rod temperature      | -40°C~150°C |
| 电子仓温度<br>Electronic warehouse temperature                           | -40°C~85°C  |                              |             |
| 输出信号<br>Output signal   | 0-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen/SSI/start-stop   |                              |             |
| 工作压力<br>Work pressure   | 持续工作压力≤35MPa (MTL内置高压式系列)<br>Continuous working pressure ≤ 35MPa(MTL built-in high pressure type series)  |                              |             |
| 测杆材料<br>Rod material  | 默认:0CR18NI9 (304不锈钢);可定制为:316不锈钢<br>Default: 0CR18NI9 (304 stainless steel);can be customized to: 316 stainless steel   |                              |             |
| 电子仓外壳<br>Electronic warehouse shell                                 | 默认:铝合金/0CR18NI9 (304不锈钢);可定制为:316不锈钢<br>Default: aluminum alloy/0CR18NI9 (304 stainless steel); can be customized to: 316 stainless steel   |                              |             |
| 负载能力<br>Load capacity   | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω  |                              |             |
| 引线方式<br>Lead wire method  | 耐高温双绞屏蔽电缆线(默认长度:1m,也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request)   |                              |             |
| 防爆标志<br>Explosion-proof symbol                                      | 防爆标志: Ex d IIB T5 Gb/Ex tD A21 IP65 T80°C 防爆本安标志: Ex ia IIB T4 Ga<br>Explosion-proof Marking: Ex d IIB T5 Gb/Ex tD A21 IP65 T80°C Explosion-proof Intrinsically Safe Marking: Ex ia IIB T4 Ga |                              |             |

# MTL5/MTL6磁致伸缩位移传感器

## MTL5/MTL6 Magnetostrictive Displacement Sensors

### 产品尺寸图 Product Dimension Drawing

### MTL5/MTL6尺寸图 MTL5/MTL6 Dimension Drawing

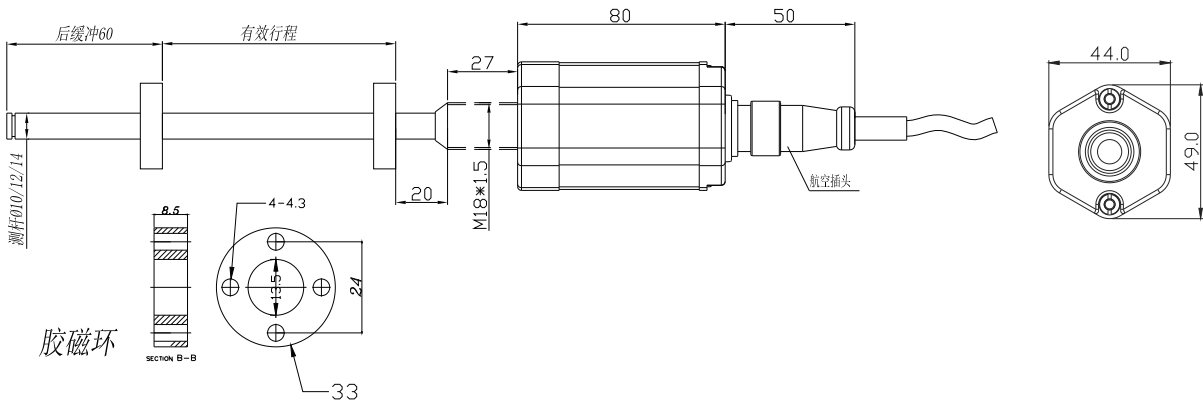
单位 Unit: mm

#### MTL5加强密封型技术图纸

MTL5 reinforced sealed technical drawing

线长标配一米

cable length standard one meter



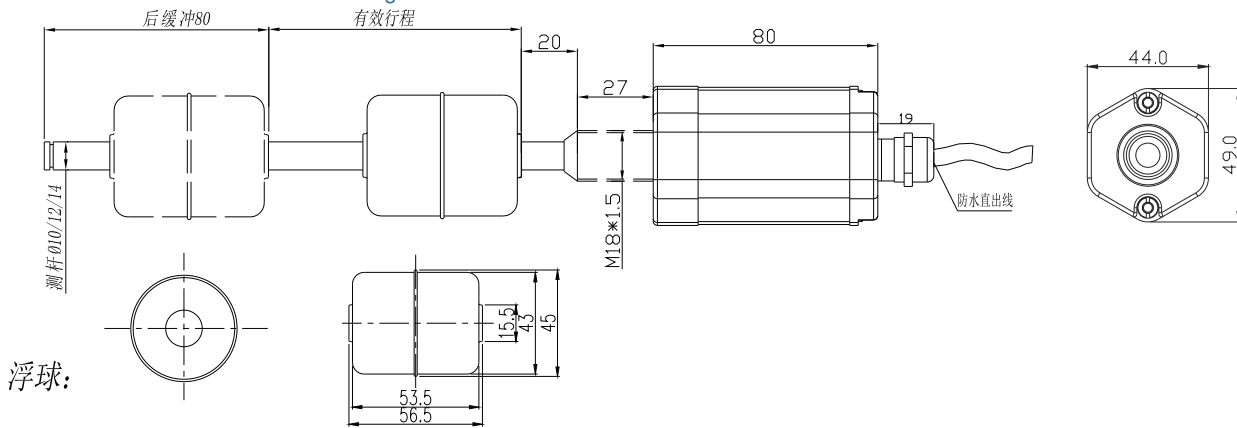
单位 Unit: mm

#### MTL6加强密封型技术图纸

MTL6 reinforced sealed technical drawing

线长标配一米

cable length standard one meter



## 性能参数 Performance Parameters

### 电气指标 Electrical indicators

| MTL5/MTL6磁致伸缩位移/液位传感器<br>MTL5/MTL6 Magnetostrictive Displacement/Level Sensor |   |
|---|---|
| 量程范围<br>Measurement range   | 50~5000mm   |
| 外壳防护等级<br>Shell protection grade  | IP65  |
| 非线性误差<br>Nonlinear error  | ≤0.05%FS  |
| 分辨率<br>Resolution ratio   | ≤0.038mm  |
| 电子仓温度<br>Electronic warehouse temperature                                     | -40°C~85°C  |
| 供电电压<br>Supply voltage  | DC24V (±2V)   |
| 重复性误差<br>Repeatability error  | ≤0.005%FS   |
| 迟滞<br>Hysteresis  | ≤0.001%FS   |
| 工作电流<br>Operating current   | ≤60mA   |
| 测杆温度<br>Rod temperature   | -40°C~150°C   |
| 温度稳定性<br>Temperature stability  | ≤0.002%/°C  |
| 输出信号<br>Output signal   | 0-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen/SSI/start-stop   |
| 工作压力<br>Work pressure   | 持续工作压力≤35MPa (MTL内置高压式系列)<br>Continuous working pressure ≤ 35MPa(MTL built-in high pressure type series)                              |
| 测杆材料<br>Rod material  | 默认:0CR18NI9 (304不锈钢);可定制为:316不锈钢<br>Default: 0CR18NI9 (304 stainless steel);can be customized to: 316 stainless steel                 |
| 电子仓外壳<br>Electronic warehouse shell   | 默认:铝合金<br>Default: aluminum alloy   |
| 负载能力<br>Load capacity   | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω  |
| 引线方式<br>Lead wire method  | 耐高温双绞屏蔽电缆线(默认长度:1m,也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request) |



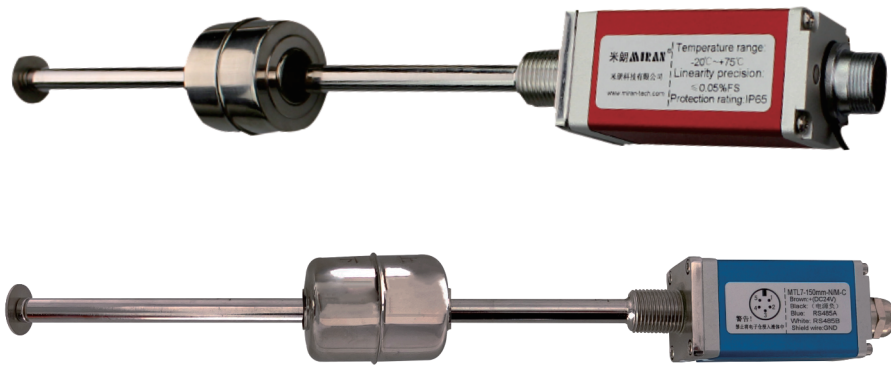
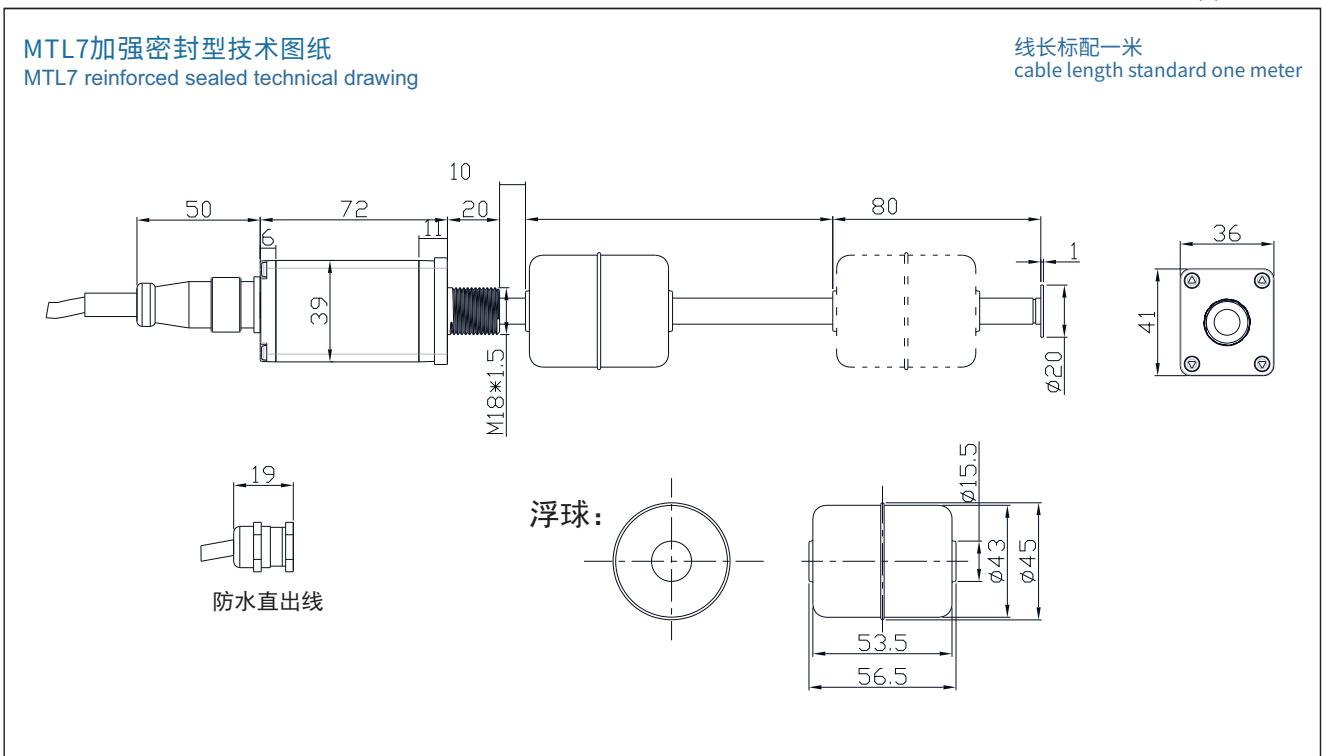
# MTL7磁致伸缩位移传感器

## MTL7 Magnetostrictive Displacement Sensors

### 产品尺寸图Product Dimension Drawing

### MTL7尺寸图MTL7 Dimension Drawing

单位Unit:mm



## 性能参数 Performance Parameters

### ⚡ 电气指标 Electrical indicators

| MTL7磁致伸缩位移/液位传感器<br>MTL7 Magnetostrictive Displacement/Level Sensor |   |
|---|---|
| 量程范围<br>Measurement range   | 50~5000mm   |
| 供电电压<br>Supply voltage  | DC24V(±2V)  |
| 非线性误差<br>Nonlinear error  | ≤0.05%FS  |
| 分辨率<br>Resolution ratio   | ≤0.01mm   |
| 迟滞<br>Hysteresis  | ≤0.001%FS   |
| 工作电流<br>Operating current   | ≤60mA   |
| 重复性误差<br>Repeatability error  | ≤0.005%FS   |
| 输出信号<br>Output signal   | 0-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen/SSI/start-stop |

### ⚡ 性能指标 Performance indicators

|   |   |
|---|---|
| 外壳防护等级<br>Shell protection grade          | IP65、IP67   |
| 电子仓温度<br>Electronic warehouse temperature | -40°C~85°C  |
| 测杆温度<br>Rod temperature                   | -40°C~150°C   |
| 温度稳定性<br>Temperature stability            | ≤0.002%/°C  |
| 工作压力<br>Work pressure                     | 持续工作压力≤35MPa (MTL内置高压式系列)<br>Continuous working pressure ≤ 35MPa(MTL built-in high pressure type series)                              |
| 测杆材料<br>Rod material                      | 默认:0CR18NI9 (304不锈钢);可定制为:316不锈钢<br>Default: 0CR18NI9 (304 stainless steel);can be customized to: 316 stainless steel                 |
| 电子仓外壳<br>Electronic warehouse shell       | 默认:铝合金<br>Default: aluminum alloy   |
| 负载能力<br>Load capacity                     | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω  |
| 引线方式<br>Lead wire method                  | 耐高温双绞屏蔽电缆线(默认长度:1m,也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request) |

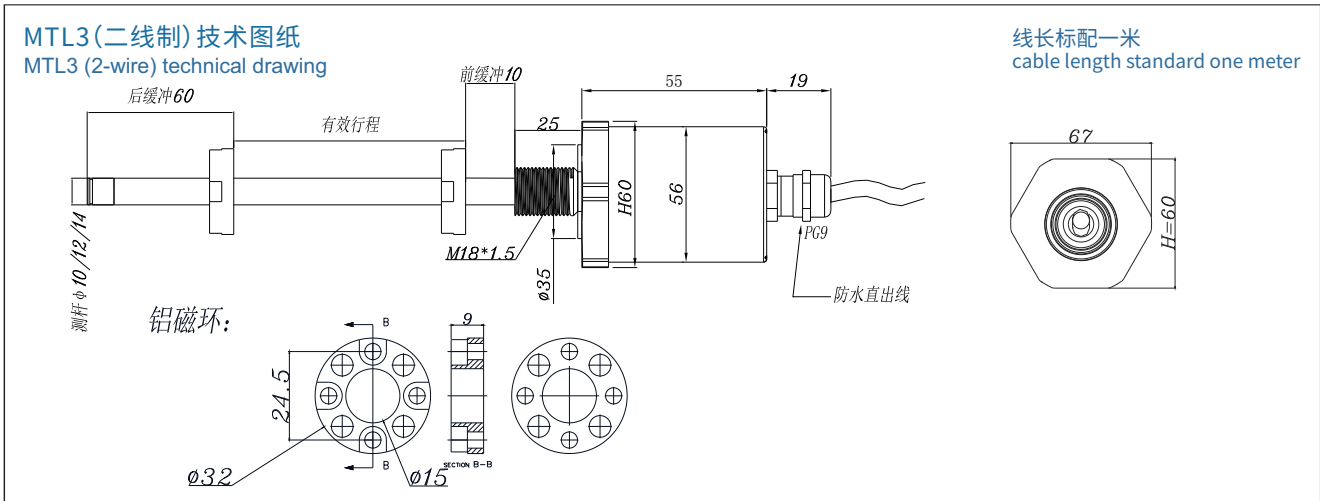
# MTL3/MTL4 (二线制) 磁致伸缩位移传感器

## MTL3/MTL4(2-wire) Magnetostrictive Displacement Sensors

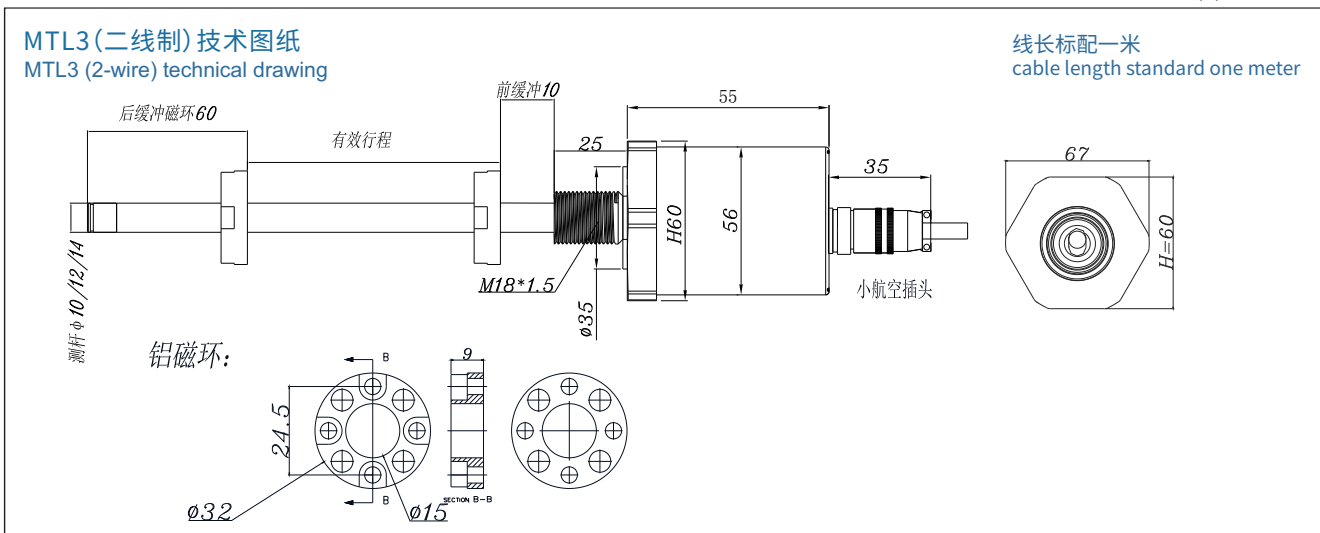
### 产品尺寸图 Product Dimension Drawing

### MTL3/4 (二线制) 尺寸图 MTL3/4 (2-wire) Dimension Drawing

单位 Unit: mm



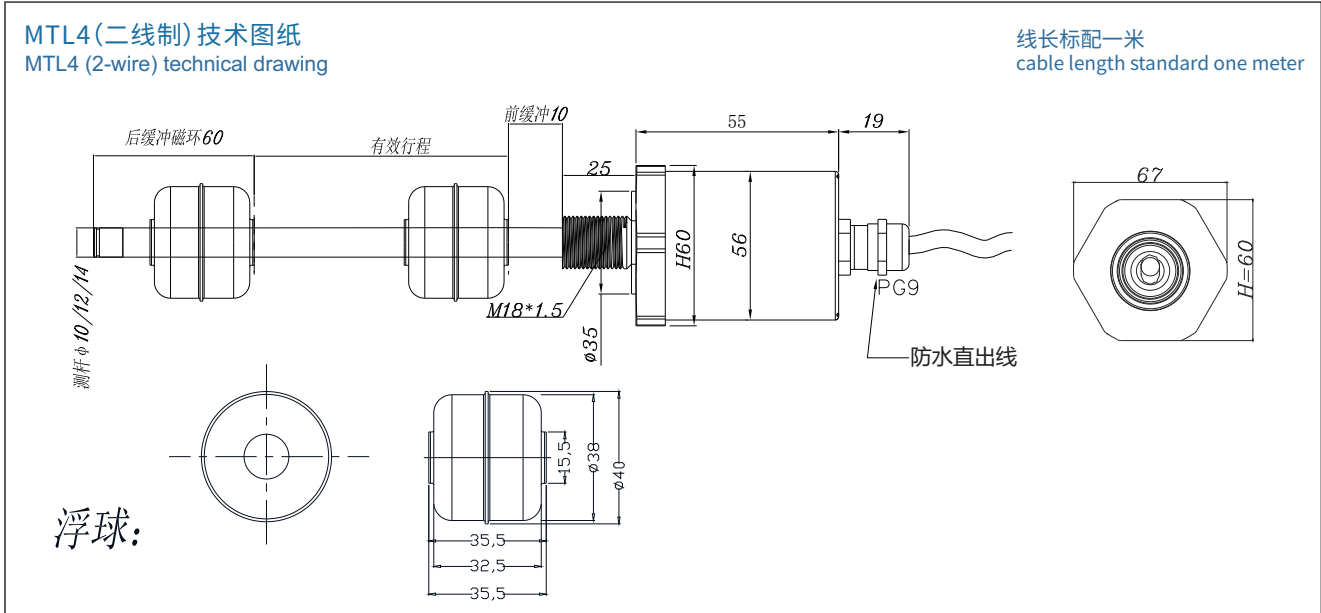
单位 Unit: mm



单位Unit:mm

MTL4(二线制)技术图纸  
MTL4 (2-wire) technical drawing

线长标配一米  
cable length standard one meter



## 性能参数 Performance Parameters

### 电气指标 Electrical indicators

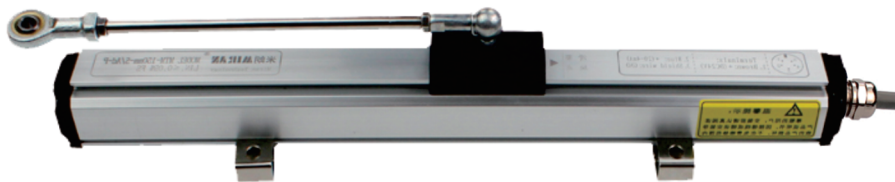
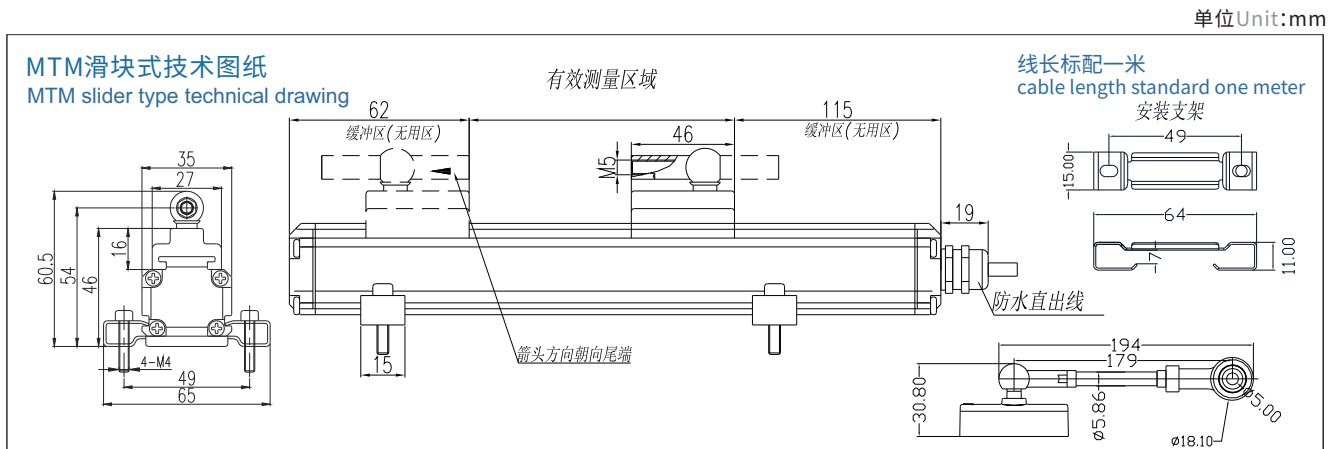
| MTL3/MTL4(二线制) 磁致伸缩位移/液位传感器<br>MTL3/MTL4 (2-wire) Magnetostrictive Displacement/Level Sensor |   |                                  |                                     |
|--|---|----------------------------------|-------------------------------------|
| 量程范围<br>Measurement range  | 30~1500mm   | 供电电压<br>Supply voltage           | 15~24VDC                            |
| 线性精度<br>linear accuracy  | ±1mm  | 迟滞<br>Hysteresis                 | 优于0.002%FS<br>Better than 0.002% FS |
| 电子仓温度<br>Electronic warehouse temperature  | -40°C~85°C  | 测杆温度<br>Rod temperature          | -40°C~150°C                         |
| 分辨率<br>Resolution ratio  | 1mm   | 外壳防护等级<br>Shell protection grade | IP65、IP67                           |
| 输出信号<br>Output signal  | 二线制电流4-20mA DC(低功耗)<br>2-wire current 4-20mA DC (low power)   |                                  |                                     |
| 测杆材料<br>Rod material   | 默认:0CR18NI9(304不锈钢);可定制为:316不锈钢<br>Default: 0CR18NI9 (304 stainless steel);can be customized to: 316 stainless steel                  |                                  |                                     |
| 电子仓外壳<br>Electronic warehouse shell  | 默认:0CR18NI9(304不锈钢);可定制为:316不锈钢<br>Default: 0CR18NI9 (304 stainless steel);can be customized to: 316 stainless steel                  |                                  |                                     |
| 负载能力<br>Load capacity  | 电流信号输出负载≤500Ω<br>Current signal output load ≤500Ω   |                                  |                                     |
| 引线方式<br>Lead wire method   | 耐高温双绞屏蔽电缆线(默认长度:1m,也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request) |                                  |                                     |

# MTM (二线制) 磁致伸缩位移传感器

## MTM (2-wire) Magnetostrictive Displacement Sensors

### 产品尺寸图 Product Dimension Drawing

### MTM (二线制) 尺寸图 MTM (2-wire) Dimension Drawing



### 性能参数 Performance Parameters

#### 电气指标 Electrical indicators

| MTM (二线制) 磁致伸缩位移传感器<br>MTM (2-wire) Magnetostrictive Displacement Sensor |   |                                     |                                     |
|--|---|-------------------------------------|-------------------------------------|
| 量程范围<br>Measurement range  | 30~1500mm   | 供电电压<br>Supply voltage              | 15~24VDC                            |
| 输出信号<br>Output signal  | 二线制电流4-20mA DC (低功耗)<br>2-wire current 4-20mA DC (low power)  | 迟滞<br>Hysteresis                    | 优于0.002%FS<br>Better than 0.002% FS |
| 线性精度<br>linear accuracy  | ±1mm  | 工作温度<br>Operating temperature       | -40°C~85°C                          |
| 分辨率<br>Resolution ratio  | 1mm   | 外壳防护等级<br>Shell protection grade    | IP65                                |
| 负载能力<br>Load capacity  | 电信号输出负载≤500Ω<br>Current signal output load ≤500Ω  | 电子仓外壳<br>Electronic warehouse shell | 默认: 铝合金<br>Default: aluminum alloy  |
| 引线方式<br>Lead wire method   | PVC屏蔽电缆线 (默认长度: 1m, 也可根据用户要求提供)<br>PVC shielded cable (default length: 1m, also available upon request) |                                     |                                     |

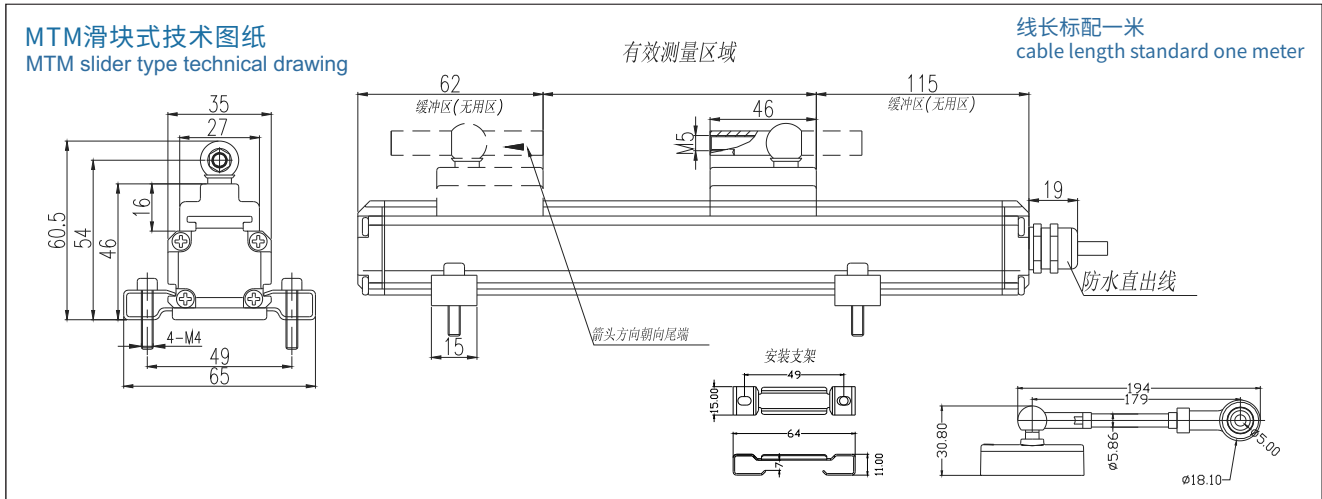
# MTM/1/2/3系列磁致伸缩位移传感器

## MTM/1/2/3 Series Magnetostrictive Displacement Sensors

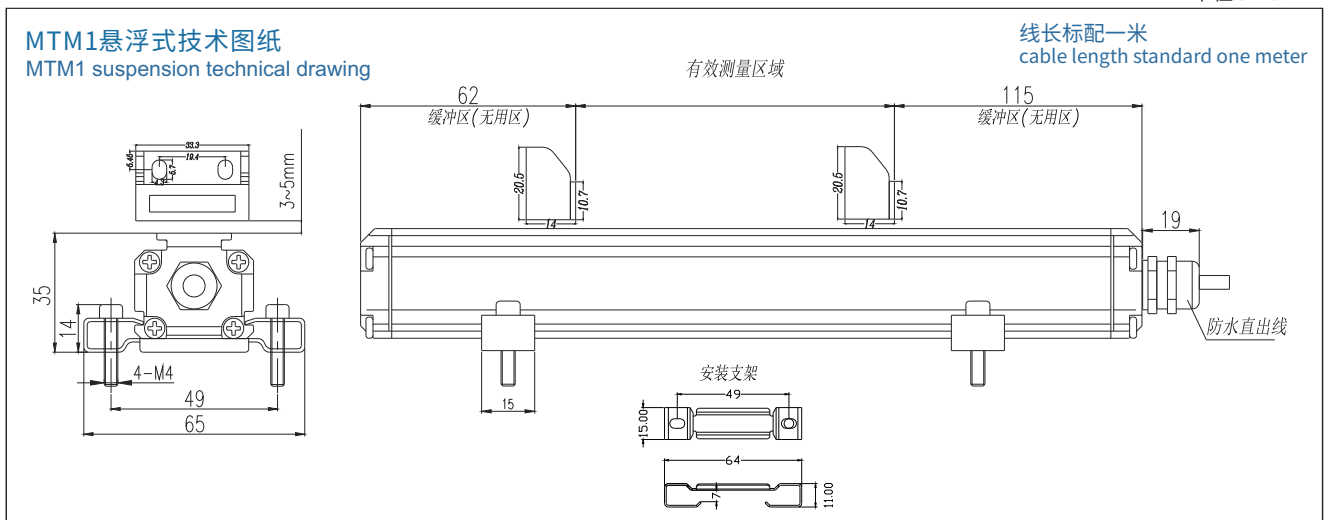
### 产品尺寸图 Product Dimension Drawing

### MTM/1/2/3尺寸图 MTM/1/2/3 Dimension Drawing

单位 Unit: mm



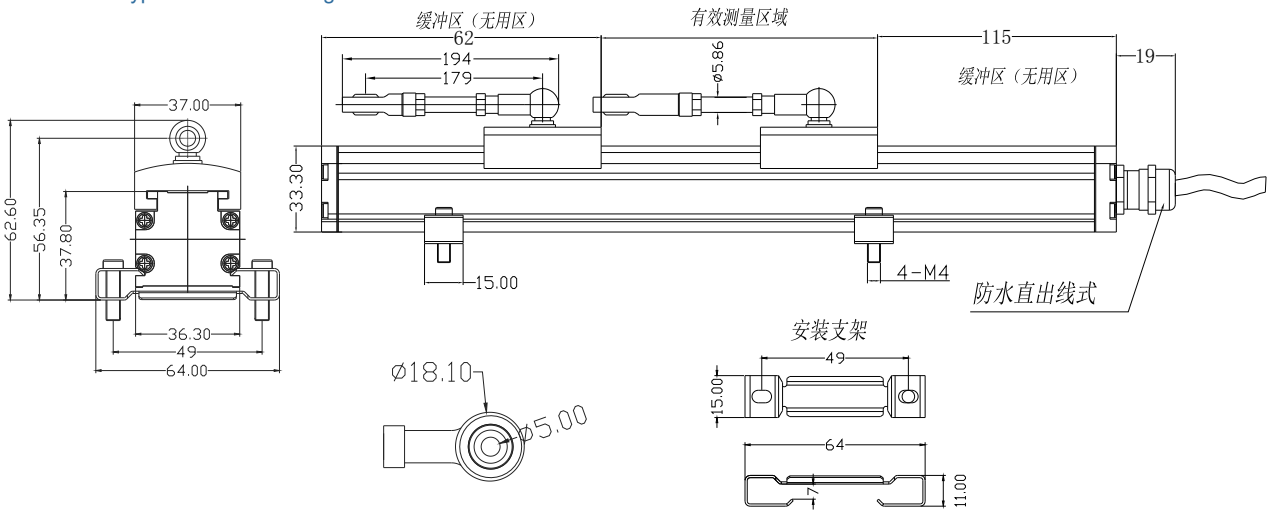
单位 Unit: mm



单位Unit:mm

MTM2滑块式技术图纸  
MTM2 slide type technical drawing

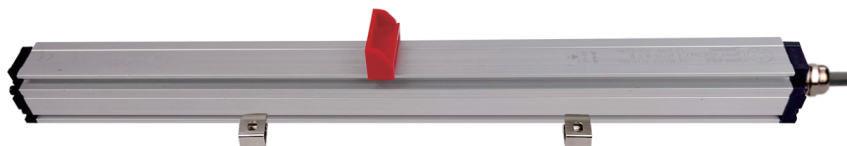
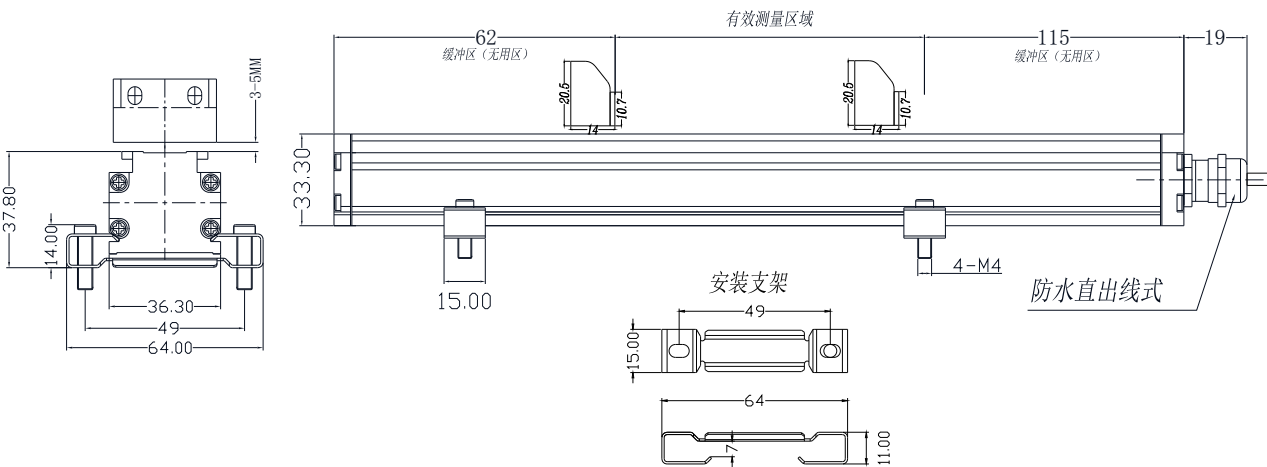
线长标配一米  
cable length standard one meter



单位Unit:mm

MTM3悬浮式技术图纸  
MTM3 suspension technical drawing

线长标配一米  
cable length standard one meter



## 性能参数 Performance Parameters

### ⚡ 电气指标 Electrical indicators

| MTM/MTM1/MTM2/MTM3磁致伸缩位移传感器<br>MTM/MTM1/MTM2/MTM3 Magnetostrictive Displacement Sensor |   |
|--|---|
| 量程范围<br>Measurement range  | 50~5000mm   |
| 供电电压<br>Supply voltage   | DC24V (±2V)   |
| 非线性误差<br>Nonlinear error   | ≤0.05%FS  |
| 分辨率<br>Resolution ratio  | ≤0.038mm  |
| 迟滞<br>Hysteresis   | ≤0.001%FS   |
| 工作电流<br>Operating current  | ≤60mA   |
| 重复性误差<br>Repeatability error   | ≤0.005%FS   |
| 输出信号<br>Output signal  | 0-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen/SSI/start-stop |

### ⚡ 性能指标 Performance indicators

|                                     |  |
|-------------------------------------|--|
| 外壳防护等级<br>Shell protection grade    | IP65   |
| 温度稳定性<br>Temperature stability      | ≤0.002%/°C   |
| 工作温度<br>Operating temperature       | -40°C~85°C   |
| 工作压力<br>Work pressure               | 持续工作压力≤35MPa (MTL内置高压式系列)<br>Continuous working pressure ≤ 35MPa(MTL built-in high pressure type series)                                 |
| 电子仓外壳<br>Electronic warehouse shell | 默认: 铝合金<br>Default: aluminum alloy   |
| 负载能力<br>Load capacity               | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω   |
| 引线方式<br>Lead wire method            | 耐高温双绞屏蔽电缆线 (默认长度: 1m, 也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request) |
| 防爆标志<br>Explosion-proof symbol      | 防爆本安标志: Ex ia IIB T4 Ga<br>Explosion-proof Intrinsically Safe Marking: Ex ia IIB T4 Ga   |



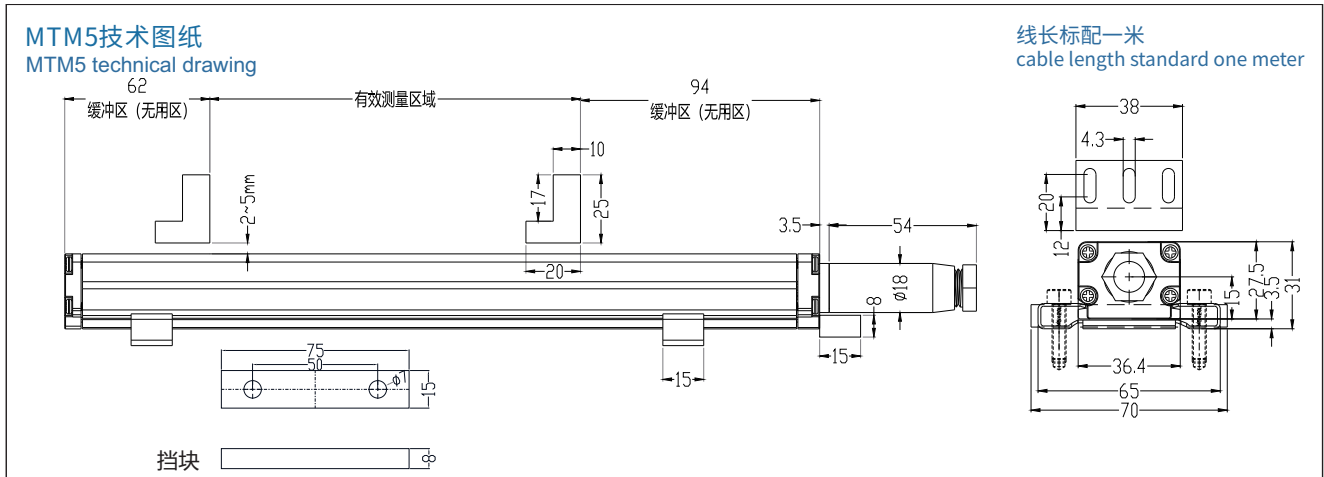
# MTM5硫化机专用磁致伸缩位移传感器

## MTM5 Magnetostrictive Displacement Sensor for Curing Machines

### 产品尺寸图 Product Dimension Drawing

### MTM5尺寸图 MTM5 Dimension Drawing

单位 Unit: mm



### 性能参数 Performance Parameters

#### 电气指标 Electrical indicators

| MTM5硫化机专用磁致伸缩位移传感器<br>MTM5 magnetostrictive displacement sensor for curing machines |   |                                  |                                     |
|---|---|----------------------------------|-------------------------------------|
| 量程范围<br>Measurement range   | 30~4800mm   | 重复性误差<br>Repeatability error     | 优于0.005%FS<br>Better than 0.005% FS |
| 供电电压<br>Supply voltage  | DC24V(±2V)  | 迟滞<br>Hysteresis                 | 优于0.002%FS<br>Better than 0.002% FS |
| 分辨率<br>Resolution ratio   | 优于0.038mm<br>Better than 0.038mm  | 工作温度<br>Operating temperature    | -40℃~85℃                            |
| 电子仓外壳<br>Electronic warehouse shell   | 默认:铝合金<br>Default: aluminum   | 外壳防护等级<br>Shell protection grade | IP65                                |
| 非线性误差<br>Nonlinear error  | ±0.05%FS, 200mm以下最大误差100μm<br>±0.05%FS, maximum error 100μm under 200mm   |                                  |                                     |
| 负载能力<br>Load capacity   | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω  |                                  |                                     |
| 输出信号<br>Output signal   | 0-5V/1-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen   |                                  |                                     |
| 引线方式<br>Lead wire method  | 耐高温双绞屏蔽电缆线(默认长度:1m,也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request) |                                  |                                     |

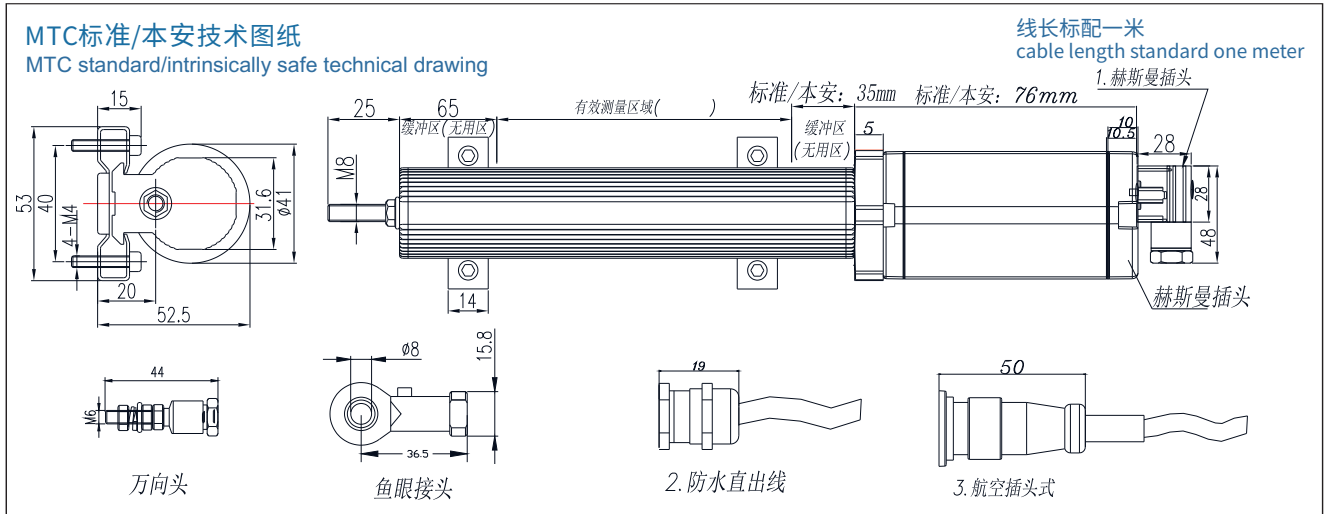
# MTC磁致伸缩位移传感器

## MTC Magnetostrictive Displacement Sensor

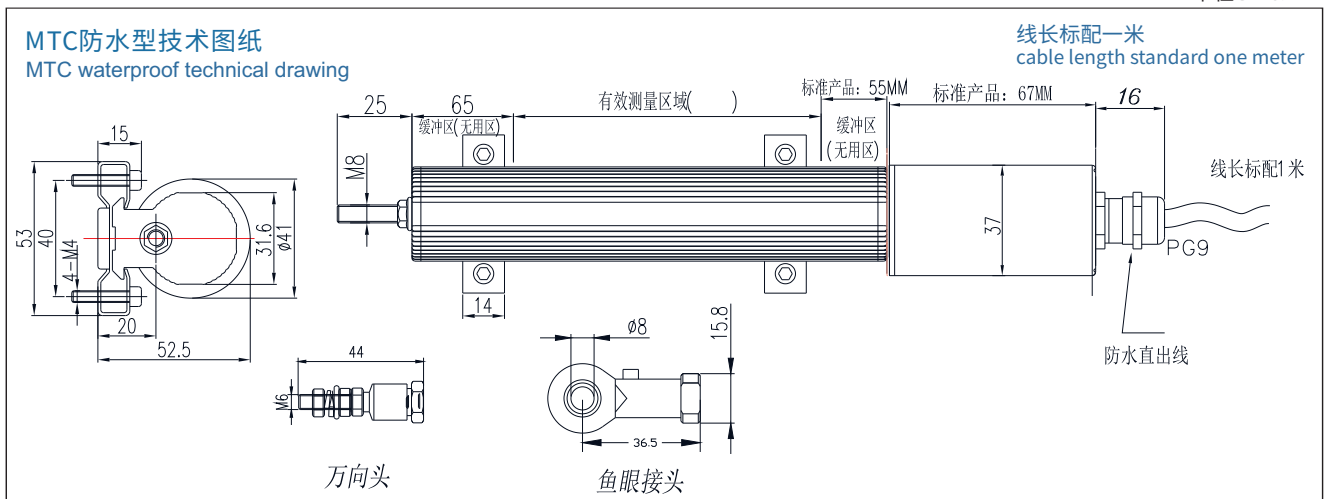
### 产品尺寸图 Product Dimension Drawing

### MTC尺寸图 MTC Dimension Drawing

单位Unit:mm



单位Unit:mm

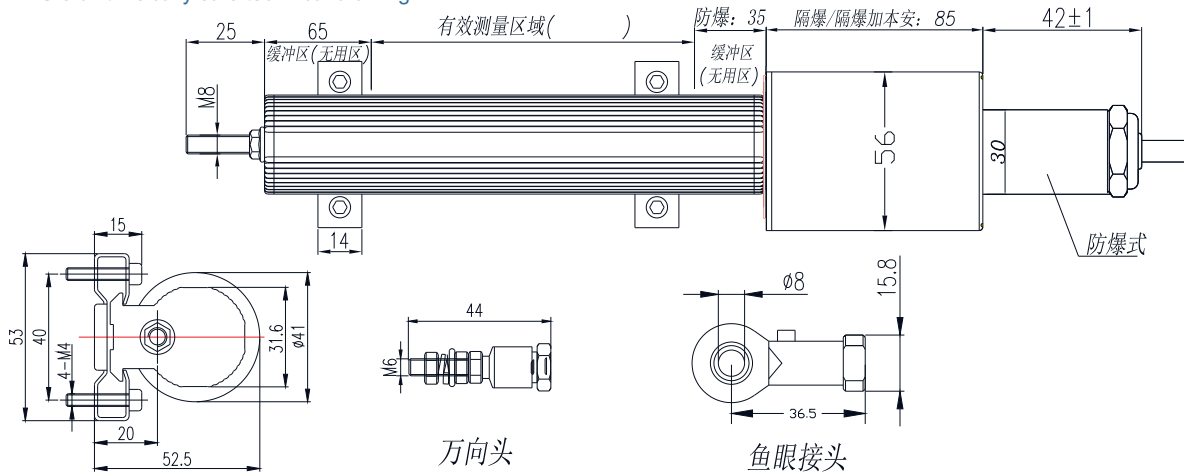


单位Unit:mm

MTC防爆/本安型技术图纸

MTC ex/intrinsically safe technical drawing

线长标配一米  
cable length standard one meter



性能参数 Performance Parameters

⚡ 电气指标 Electrical indicators

| MTC磁致伸缩位移传感器<br>MTC Magnetostrictive Displacement Sensor |   |                               |             |
|--|---|-------------------------------|-------------|
| 量程范围<br>Measurement range                                | 50~5000mm   | 供电电压<br>Supply voltage        | DC24V (±2V) |
| 外壳防护等级<br>Shell protection grade                         | IP65、IP67   | 重复性误差<br>Repeatability error  | ≤0.005%FS   |
| 非线性误差<br>Nonlinear error                                 | ≤0.05%FS  | 迟滞<br>Hysteresis              | ≤0.001%FS   |
| 分辨率<br>Resolution ratio                                  | ≤0.038mm  | 工作电流<br>Operating current     | ≤60mA       |
| 温度稳定性<br>Temperature stability                           | ≤0.002%/°C  | 工作温度<br>Operating temperature | -40°C~85°C  |
| 输出信号<br>Output signal                                    | 0-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen/SSI/start-stop   |                               |             |
| 工作压力<br>Work pressure                                    | 持续工作压力≤35MPa (MTL内置高压式系列)<br>Continuous working pressure ≤ 35MPa (MTL built-in high pressure type series)   |                               |             |
| 电子仓外壳<br>Electronic warehouse shell                      | 默认: 铝合金/0CR18NI9 (304不锈钢); 可定制为: 316不锈钢<br>Default: aluminum alloy/0CR18NI9 (304 stainless steel); can be customized to: 316 stainless steel  |                               |             |
| 负载能力<br>Load capacity                                    | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω  |                               |             |
| 引线方式<br>Lead wire method                                 | 耐高温双绞屏蔽电缆线 (默认长度: 1m, 也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request)  |                               |             |
| 防爆标志<br>Explosion-proof symbol                           | 防爆标志: Ex d IIB T5 Gb/Ex tD A21 IP65 T80°C 防爆本安标志: Ex ia IIB T4 Ga<br>Explosion-proof Marking: Ex d IIB T5 Gb/Ex tD A21 IP65 T80°C Explosion-proof Intrinsically Safe Marking: Ex ia IIB T4 Ga |                               |             |

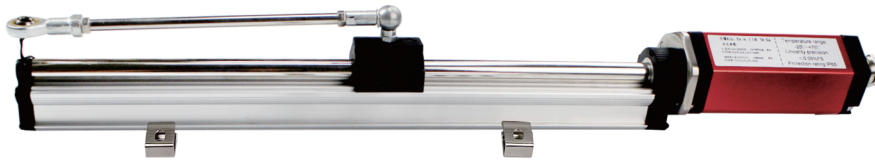
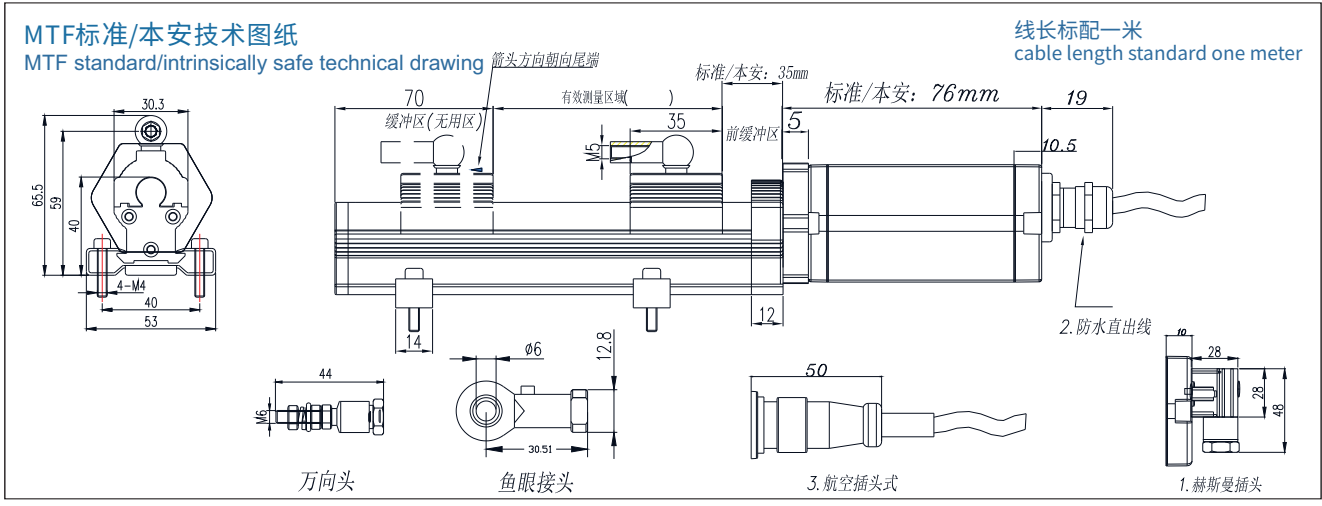
# MTF磁致伸缩位移传感器

## MTF Magnetostrictive Displacement Sensor

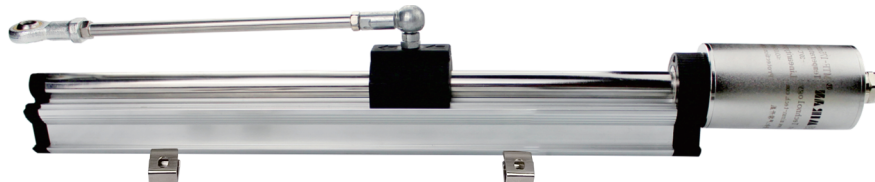
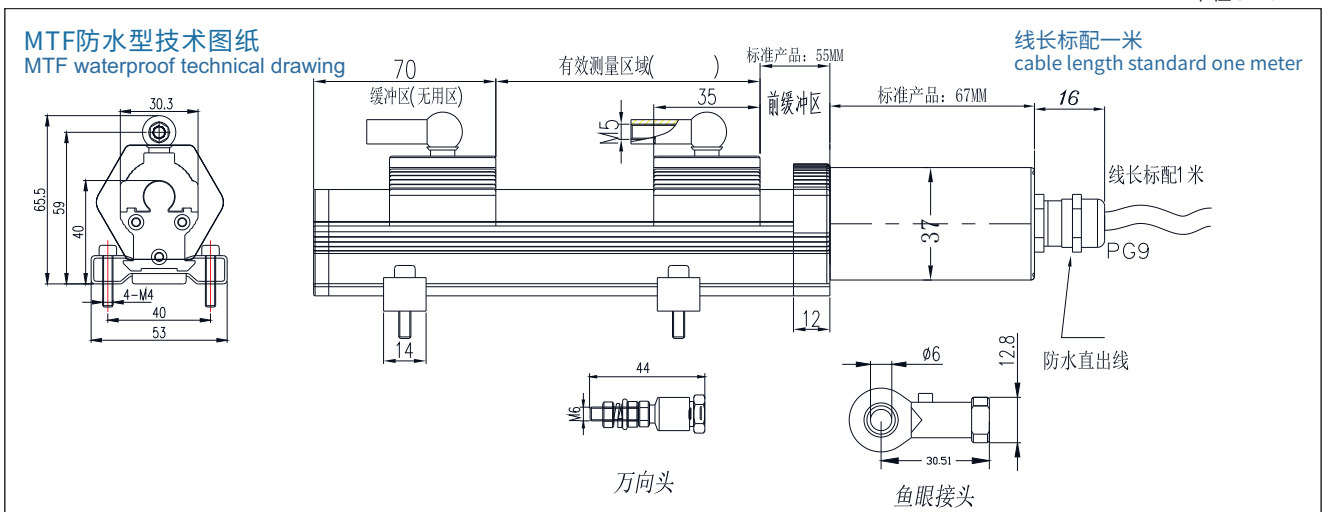
### 产品尺寸图 Product Dimension Drawing

### MTF尺寸图 MTF Dimension Drawing

单位 Unit: mm



单位 Unit: mm

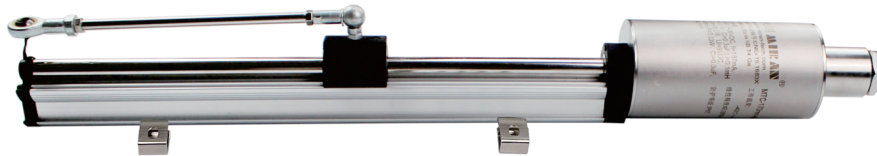
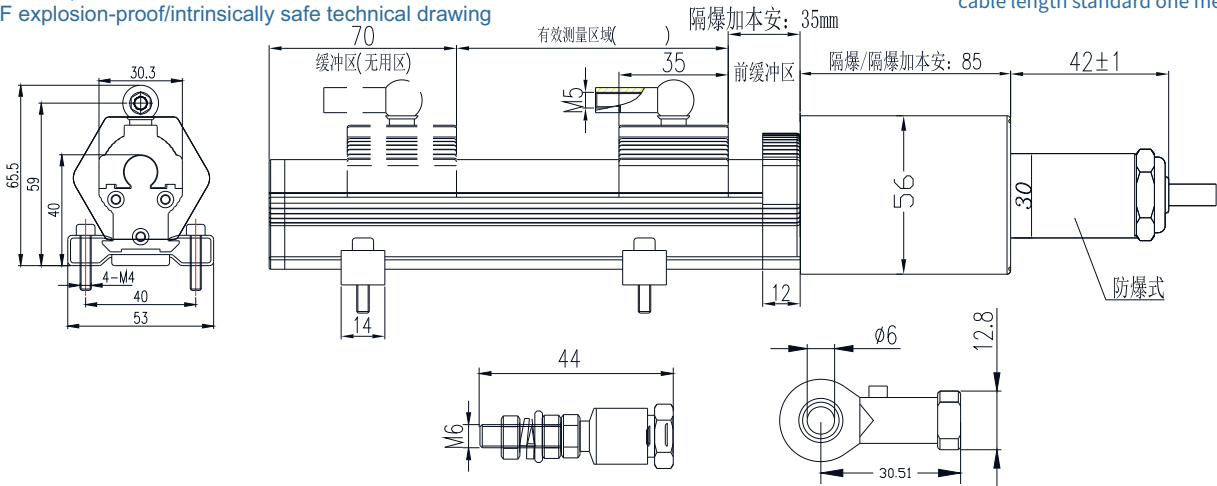


MTF防爆/本安型技术图纸

MTF explosion-proof/intrinsically safe technical drawing

线长标配一米

cable length standard one meter



性能参数 Performance Parameters

电气指标 Electrical indicators

| MTF磁致伸缩位移传感器<br>MTF Magnetostrictive Displacement Sensor |   |                               |             |
|--|---|-------------------------------|-------------|
| 量程范围<br>Measurement range                                | 50~5000mm   | 供电电压<br>Supply voltage        | DC24V (±2V) |
| 外壳防护等级<br>Shell protection grade                         | IP65、IP67   | 重复性误差<br>Repeatability error  | ≤0.005%FS   |
| 非线性误差<br>Nonlinear error                                 | ≤0.05%FS  | 迟滞<br>Hysteresis              | ≤0.001%FS   |
| 分辨率<br>Resolution ratio                                  | 标准: ≤0.038mm<br>Standard: ≤0.038mm  | 工作电流<br>Operating current     | ≤60mA       |
| 温度稳定性<br>Temperature stability                           | ≤0.002%/°C  | 工作温度<br>Operating temperature | -40°C~85°C  |
| 输出信号<br>Output signal                                    | 0-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen/SSI/start-stop   |                               |             |
| 工作压力<br>Work pressure                                    | 持续工作压力≤35MPa (MTL内置高压式系列)<br>Continuous working pressure ≤ 35MPa(MTL built-in high pressure type series)  |                               |             |
| 电子仓外壳<br>Electronic warehouse shell                      | 默认: 铝合金/0CR18NI9 (304不锈钢); 可定制为: 316不锈钢<br>Default: aluminum alloy/0CR18NI9 (304 stainless steel); can be customized to: 316 stainless steel  |                               |             |
| 负载能力<br>Load capacity                                    | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω  |                               |             |
| 引线方式<br>Lead wire method                                 | 耐高温双绞屏蔽电缆线(默认长度: 1m, 也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request)   |                               |             |
| 防爆标志<br>Explosion-proof symbol                           | 防爆标志: Ex d IIB T5 Gb/Ex tD A21 IP65 T80°C 防爆本安标志: Ex ia IIB T4 Ga<br>Explosion-proof Marking: Ex d IIB T5 Gb/Ex tD A21 IP65 T80°C Explosion-proof Intrinsically Safe Marking: Ex ia IIB T4 Ga |                               |             |

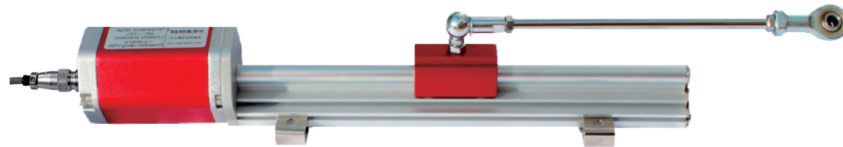
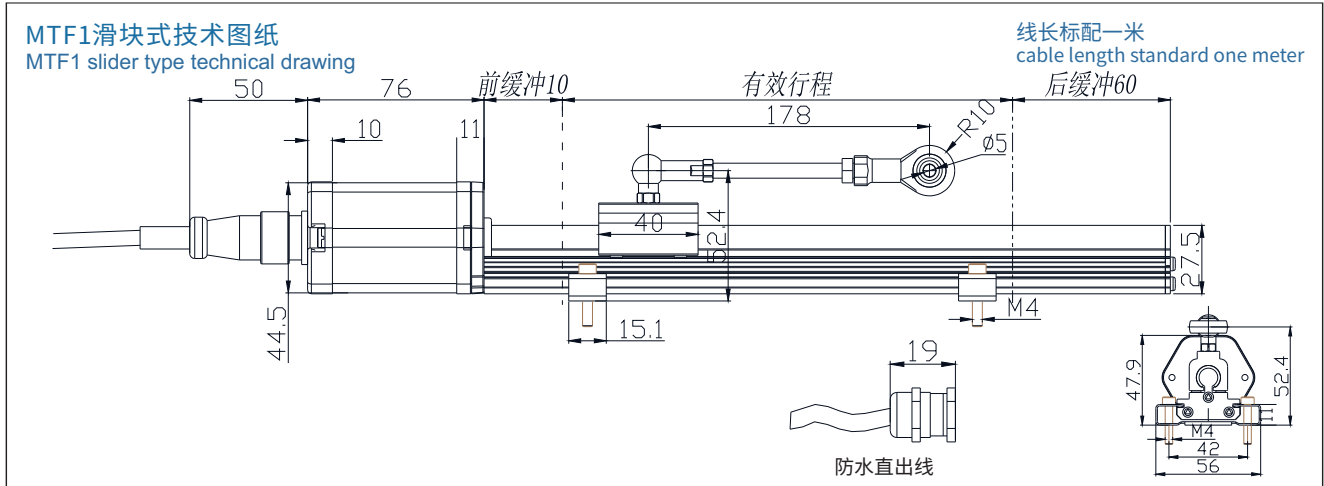
# MTF1/2磁致伸缩位移传感器

## MTF1/2 Magnetostrictive Displacement Sensor

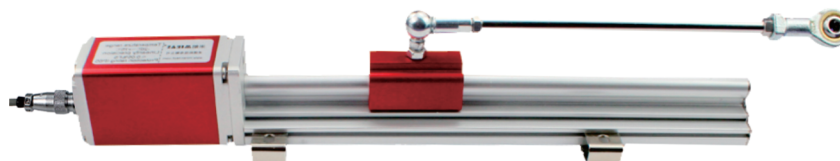
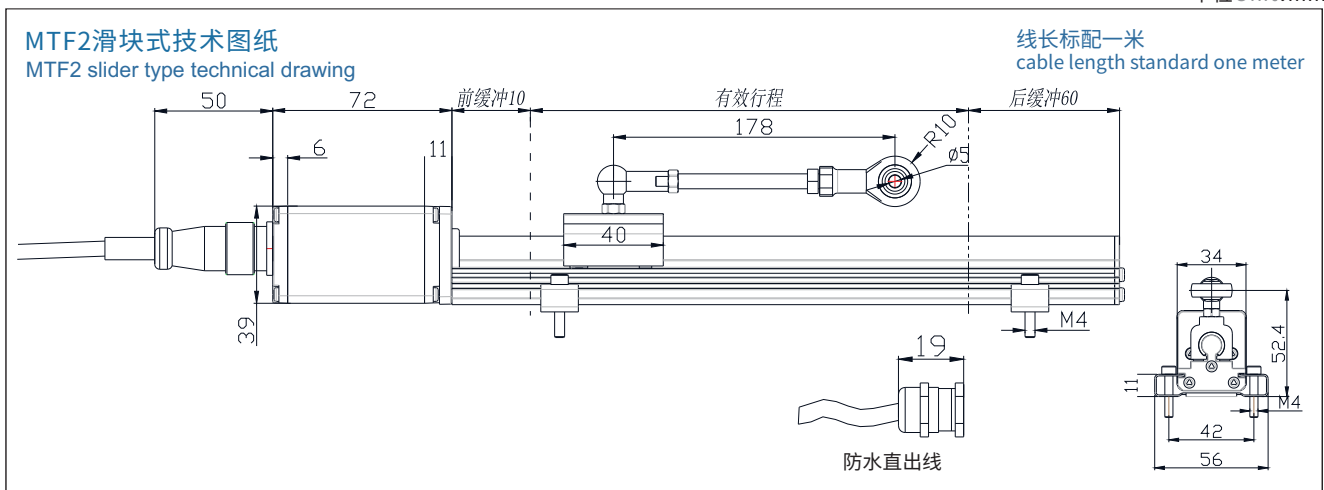
### 产品尺寸图 Product Dimension Drawing

### MTF1/2尺寸图 MTF1/2 Dimension Drawing

单位Unit:mm



单位Unit:mm



## 性能参数 Performance Parameters

### ⚡ 电气指标 Electrical indicators

| MTF1/MTF2磁致伸缩位移传感器<br>MTF1/MTF2 Magnetostrictive Displacement Sensor |   |
|--|---|
| 量程范围<br>Measurement range  | 50~5000mm   |
| 供电电压<br>Supply voltage   | DC24V (±2V)   |
| 非线性误差<br>Nonlinear error   | ≤0.05%FS  |
| 分辨率<br>Resolution ratio  | 标准: ≤0.01mm<br>Standard: ≤0.01mm                          |
| 迟滞<br>Hysteresis   | ≤0.001%FS   |
| 工作电流<br>Operating current  | ≤60mA   |
| 重复性误差<br>Repeatability error   | ≤0.005%FS   |
| 输出信号<br>Output signal  | 0-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen/SSI/start-stop |

### ⚡ 性能指标 Performance indicators

|                                     |   |
|-------------------------------------|---|
| 外壳防护等级<br>Shell protection grade    | IP65、IP67   |
| 温度稳定性<br>Temperature stability      | ≤0.002%/°C  |
| 工作温度<br>Operating temperature       | -40°C~85°C  |
| 工作压力<br>Work pressure               | 持续工作压力≤35MPa (MTL内置高压式系列)<br>Continuous working pressure ≤ 35MPa (MTL built-in high pressure type series)   |
| 电子仓外壳<br>Electronic warehouse shell | 默认: 铝合金<br>Default: aluminum alloy  |
| 负载能力<br>Load capacity               | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω  |
| 引线方式<br>Lead wire method            | 耐高温双绞屏蔽电缆线 (默认长度: 1m, 也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request)  |
| 防爆标志<br>Explosion-proof symbol      | 防爆标志: Ex d IIB T5 Gb/Ex tD A21 IP65 T80°C 防爆本安标志: Ex ia IIB T4 Ga<br>Explosion-proof Marking: Ex d IIB T5 Gb/Ex tD A21 IP65 T80°C Explosion-proof Intrinsically Safe Marking: Ex ia IIB T4 Ga |



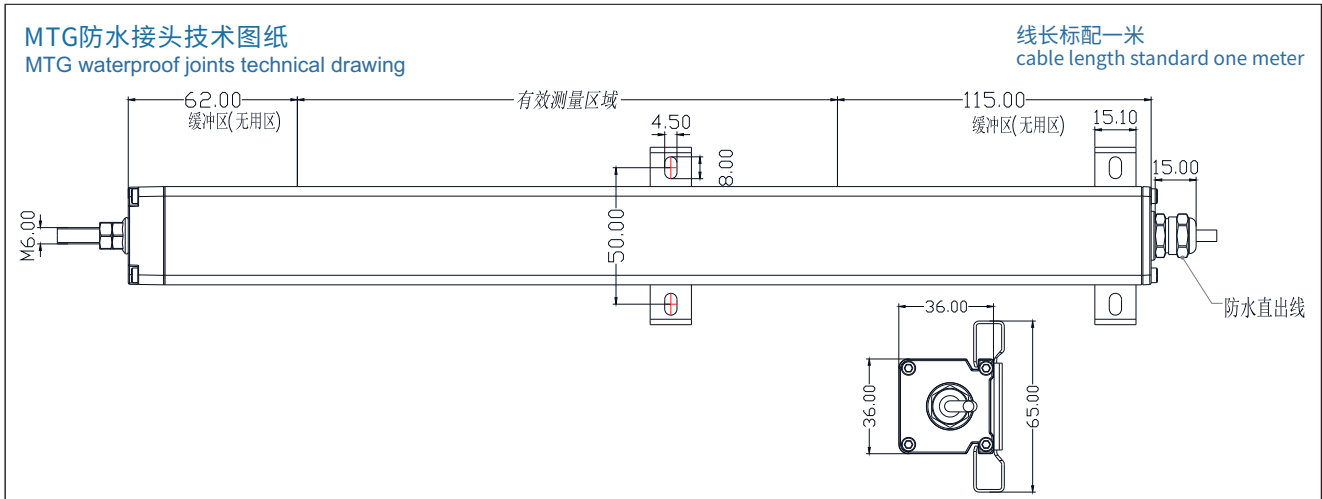
# MTG磁致伸缩位移传感器

## MTG Magnetostrictive Displacement Sensor

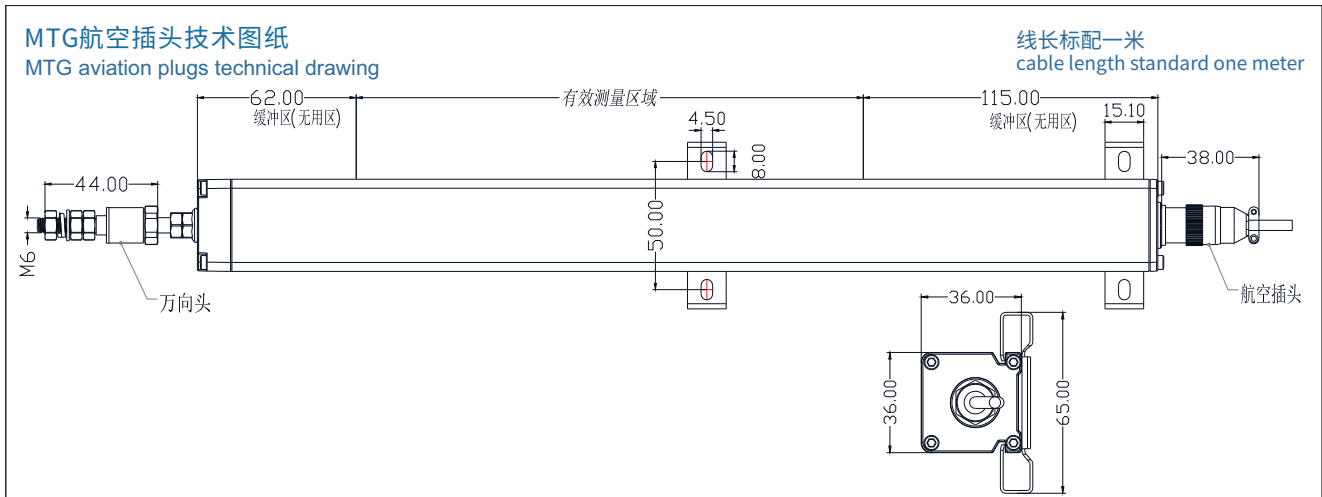
### 产品尺寸图 Product Dimension Drawing

### MTG尺寸图 MTG Dimension Drawing

单位 Unit:mm



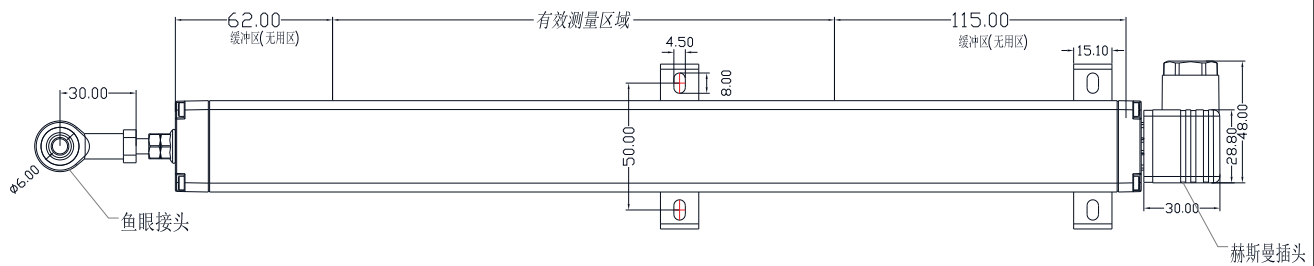
单位 Unit:mm



单位Unit:mm

MTG赫斯曼插头技术图纸  
MTG hirschmann plug technical drawing

线长标配一米  
cable length standard one meter



## 性能参数 Performance Parameters

### 电气指标 Electrical indicators

| MTG磁致伸缩位移传感器<br>MTG magnetostrictive displacement sensors |  |                                  |            |
|---|--|----------------------------------|------------|
| 供电电压<br>Supply voltage                                    | DC24V (±2V)  | 量程范围<br>Measurement range        | 50~5000mm  |
| 重复性误差<br>Repeatability error                              | ≤0.005%FS  | 迟滞<br>Hysteresis                 | ≤0.001%FS  |
| 非线性误差<br>Nonlinear error                                  | ≤0.05%FS   | 工作电流<br>Operating current        | ≤60mA      |
| 分辨率<br>Resolution ratio                                   | ≤0.038mm   | 工作温度<br>Operating temperature    | -40°C~85°C |
| 温度稳定性<br>Temperature stability                            | ≤0.002%/°C   | 外壳防护等级<br>Shell protection grade | IP65       |
| 电子仓外壳<br>Electronic warehouse shell                       | 默认: 铝合金<br>Default: aluminum   |                                  |            |
| 输出信号<br>Output signal                                     | 0-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen/SSI/start-stop  |                                  |            |
| 负载能力<br>Load capacity                                     | 电压信号输出负载 ≥4KΩ 电流信号输出负载 ≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω   |                                  |            |
| 引线方式<br>Lead wire method                                  | 耐高温双绞屏蔽电缆线 (默认长度: 1m, 也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request) |                                  |            |

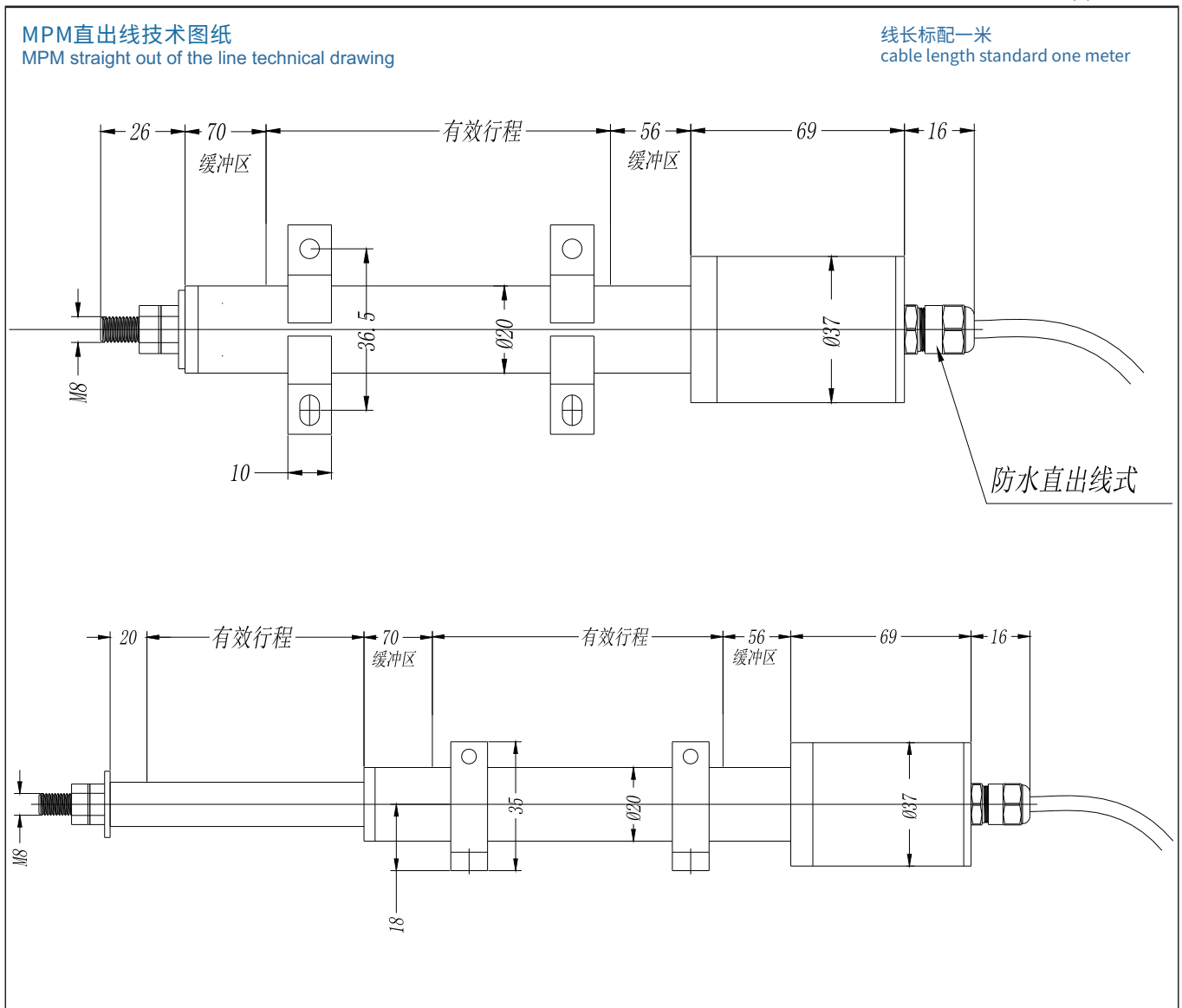
# MPM磁致伸缩位移传感器

## MPM Magnetostrictive Displacement Sensor

### 产品尺寸图 Product Dimension Drawing

### MPM尺寸图 MPM Dimension Drawing

单位 Unit:mm

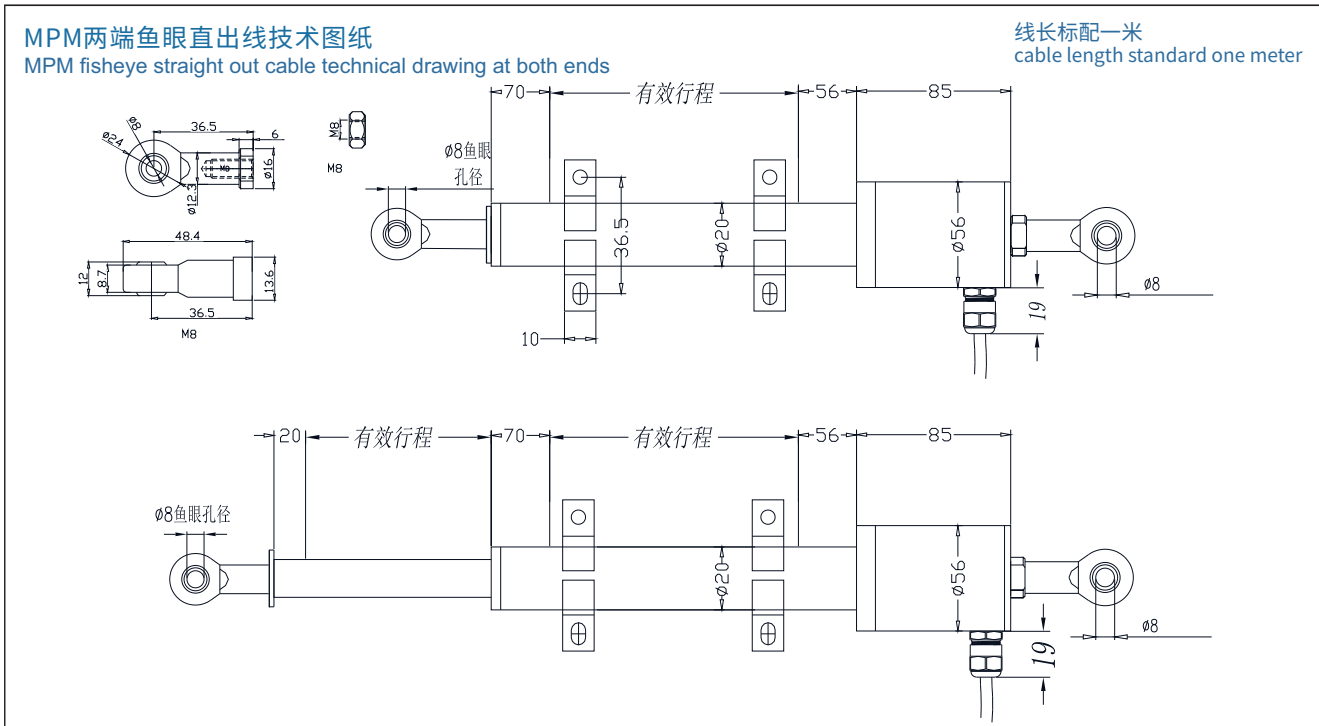


单位Unit:mm

MPM两端鱼眼直出线技术图纸

MPM fisheye straight out cable technical drawing at both ends

线长标配一米  
cable length standard one meter



性能参数 Performance Parameters

电气指标 Electrical indicators

| MPM磁致伸缩位移传感器<br>MPM Magnetostrictive Displacement Sensor |  |                               |             |
|--|--|-------------------------------|-------------|
| 量程范围<br>Measurement range                                | 50~5000mm  | 供电电压<br>Supply voltage        | DC24V (±2V) |
| 外壳防护等级<br>Shell protection grade                         | IP67   | 重复性误差<br>Repeatability error  | ≤0.005%FS   |
| 非线性误差<br>Nonlinear error                                 | ≤0.05%FS   | 迟滞<br>Hysteresis              | ≤0.001%FS   |
| 分辨率<br>Resolution ratio                                  | ≤0.038mm   | 工作电流<br>Operating current     | ≤60mA       |
| 温度稳定性<br>Temperature stability                           | ≤0.002%/°C   | 工作温度<br>Operating temperature | -40°C~85°C  |
| 输出信号<br>Output signal                                    | 0-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen/SSI/start-stop  |                               |             |
| 电子仓外壳<br>Electronic warehouse shell                      | 默认:0CR18NI9(304 不锈钢);可定制为:316不锈钢<br>Default: 0CR18NI9 (304 stainless steel);can be customized to: 316 stainless steel                  |                               |             |
| 工作压力<br>Work pressure                                    | 持续工作压力≤35MPa (MTL内置高压式系列)<br>Continuous working pressure ≤ 35MPa(MTL built-in high pressure type series)                               |                               |             |
| 负载能力<br>Load capacity                                    | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω   |                               |             |
| 引线方式<br>Lead wire method                                 | 耐高温双绞屏蔽电缆线 (默认长度:1m,也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request) |                               |             |

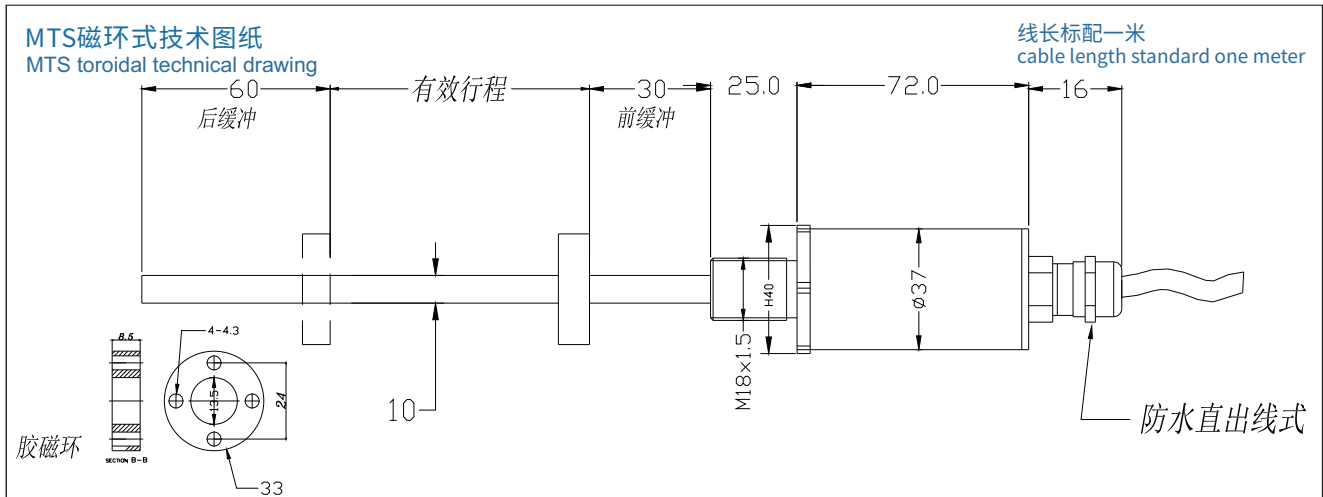
# MTS磁致伸缩位移传感器

## MTS Magnetostrictive Displacement Sensor

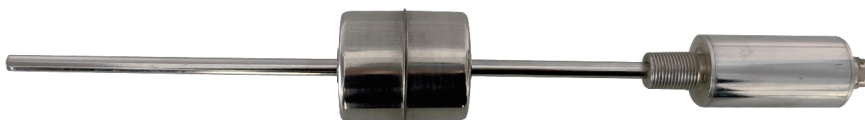
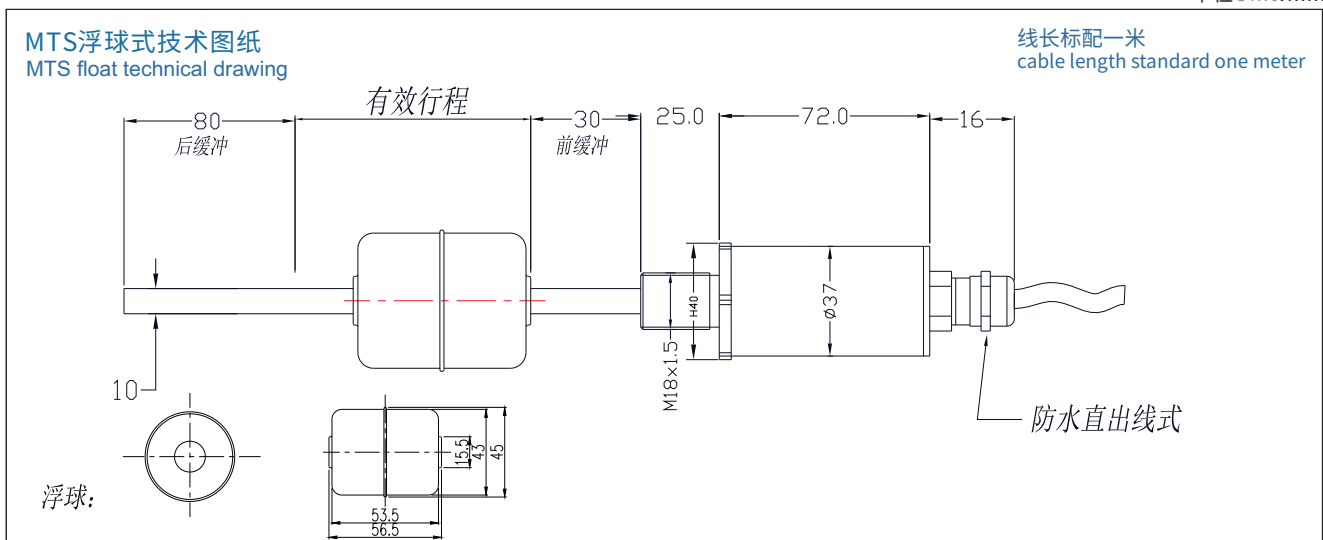
### 产品尺寸图 Product Dimension Drawing

### MTS尺寸图 MTS Dimension Drawing

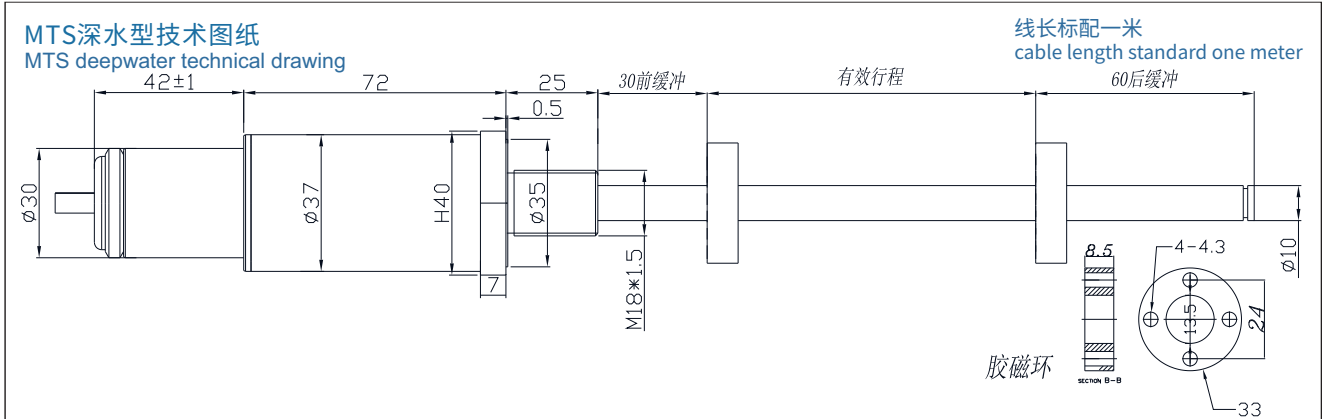
单位 Unit: mm



单位 Unit: mm



单位Unit:mm



## 性能参数 Performance Parameters

### 电气指标 Electrical indicators

| MTS磁致伸缩位移/液位传感器<br>MTS Magnetostrictive Displacement/Level Sensor |  |                              |             |
|---|--|------------------------------|-------------|
| 量程范围<br>Measurement range   | 50~5000mm  | 供电电压<br>Supply voltage       | DC24V (±2V) |
| 温度稳定性<br>Temperature stability                                    | ≤0.002%/°C   | 重复性误差<br>Repeatability error | ≤0.005%FS   |
| 非线性误差<br>Nonlinear error  | ≤0.05%FS   | 迟滞<br>Hysteresis             | ≤0.001%FS   |
| 分辨率<br>Resolution ratio   | ≤0.038mm   | 工作电流<br>Operating current    | ≤60mA       |
| 电子仓温度<br>Electronic warehouse temperature                         | -40°C~85°C   | 测杆温度<br>Rod temperature      | -40°C~150°C |
| 输出信号<br>Output signal   | 0-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen/SSI/start-stop  |                              |             |
| 外壳防护等级<br>Shell protection grade                                  | IP65、IP68(防爆格兰头, 深水型可耐压10MPa)<br>IP65、IP68(Explosion-proof glands, deep water type can withstand pressure 10MPa)                         |                              |             |
| 工作压力<br>Work pressure   | 持续工作压力≤35MPa (MTL内置高压式系列)<br>Continuous working pressure ≤ 35MPa(MTL built-in high pressure type series)                                 |                              |             |
| 测杆材料<br>Rod material  | 默认: 0CR18NI9 (304不锈钢); 可定制为: 316不锈钢<br>Default: 0CR18NI9 (304 stainless steel); can be customized to: 316 stainless steel                |                              |             |
| 电子仓外壳<br>Electronic warehouse shell                               | 默认: 0CR18NI9 (304不锈钢); 可定制为: 316不锈钢<br>Default: 0CR18NI9 (304 stainless steel); can be customized to: 316 stainless steel                |                              |             |
| 负载能力<br>Load capacity   | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω   |                              |             |
| 引线方式<br>Lead wire method  | 耐高温双绞屏蔽电缆线 (默认长度: 1m, 也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request) |                              |             |

注: MTS磁环式、MTS浮球式外壳防护等级为IP65, MTS深水型外壳防护等级为IP68。

Note: MTS magnetic ring type, MTS float type shell protection grade for IP65, MTS deep water type shell protection grade for IP68.

# MFTS磁致伸缩位移传感器

## MFTS Magnetostrictive Displacement Sensor

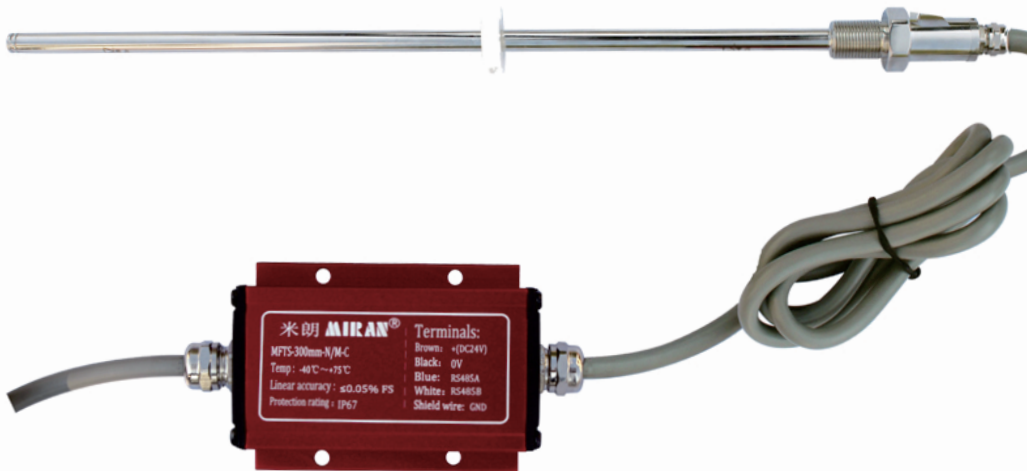
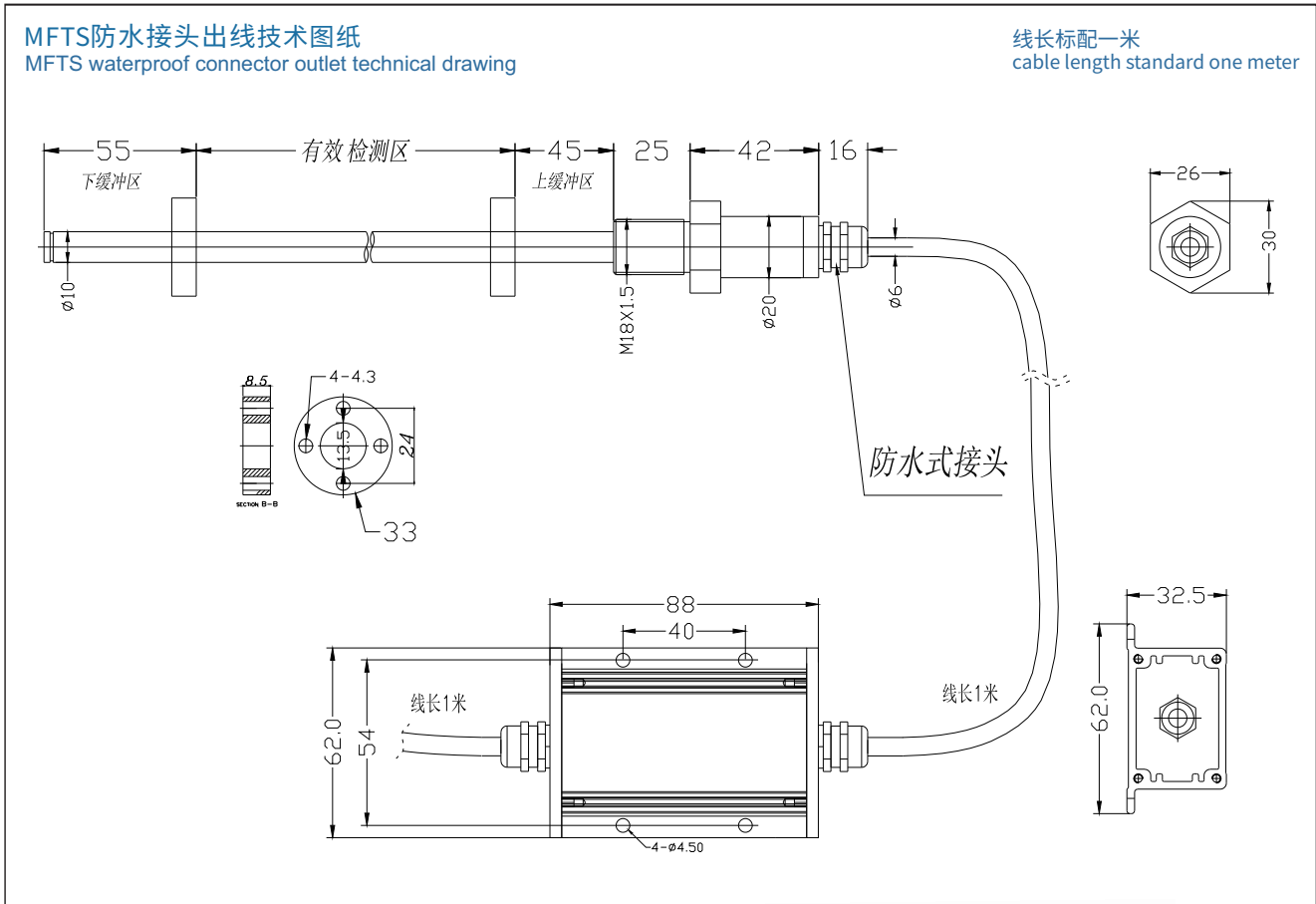
### 产品尺寸图 Product Dimension Drawing

### MFTS尺寸图 MFTS Dimensional Drawing

单位 Unit:mm

MFTS防水接头出线技术图纸  
MFTS waterproof connector outlet technical drawing

线长标配一米  
cable length standard one meter





## 性能参数 Performance Parameters

### ⚡ 电气指标 Electrical indicators

| MFTS磁致伸缩位移/液位传感器<br>MFTS Magnetostrictive Displacement/Level Sensor |   |
|---|---|
| 量程范围<br>Measurement range   | 50~5000mm   |
| 迟滞<br>Hysteresis  | ≤0.001%FS   |
| 非线性误差<br>Nonlinear error  | ≤0.05%FS  |
| 分辨率<br>Resolution ratio   | ≤0.038mm  |
| 工作电流<br>Operating current   | ≤60mA   |
| 供电电压<br>Supply voltage  | DC24V(±2V)  |
| 重复性误差<br>Repeatability error  | ≤0.005%FS   |
| 输出信号<br>Output signal   | 0-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen/SSI/start-stop |

### ⚡ 性能指标 Performance indicators

|   |   |
|---|---|
| 外壳防护等级<br>Shell protection grade          | IP65  |
| 电子仓温度<br>Electronic warehouse temperature | -40°C~85°C  |
| 测杆温度<br>Rod temperature                   | -40°C~150°C   |
| 测杆材料<br>Rod material                      | 默认:0CR18NI9(304不锈钢);可定制为:316不锈钢<br>Default: 0CR18NI9 (304 stainless steel);can be customized to: 316 stainless steel                  |
| 电子仓外壳<br>Electronic warehouse shell       | 默认:铝合金<br>Default: aluminum alloy   |
| 工作压力<br>Work pressure                     | 持续工作压力≤35MPa(MTL内置高压式系列)<br>Continuous working pressure ≤ 35MPa(MTL built-in high pressure type series)                               |
| 负载能力<br>Load capacity                     | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω  |
| 引线方式<br>Lead wire method                  | 耐高温双绞屏蔽电缆线(默认长度:1m,也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request) |

# MF磁致伸缩位移传感器

## MF Magnetostrictive Displacement Sensor

### 产品尺寸图Product Dimension Drawing

### MF尺寸图MF Dimension Drawing

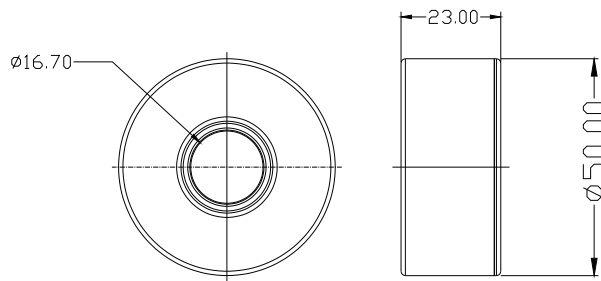
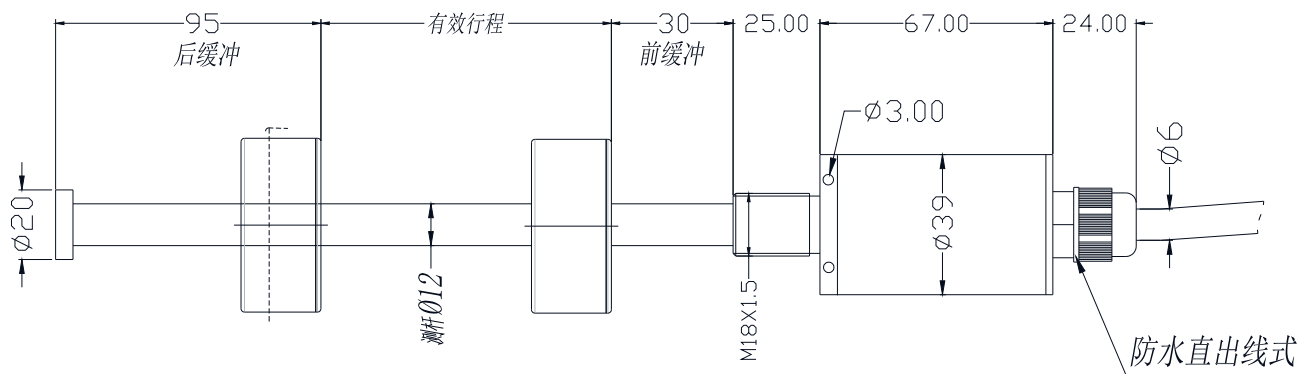
单位Unit:mm

MF圆柱浮球技术图纸

MF cylindrical float technical drawing

线长标配一米

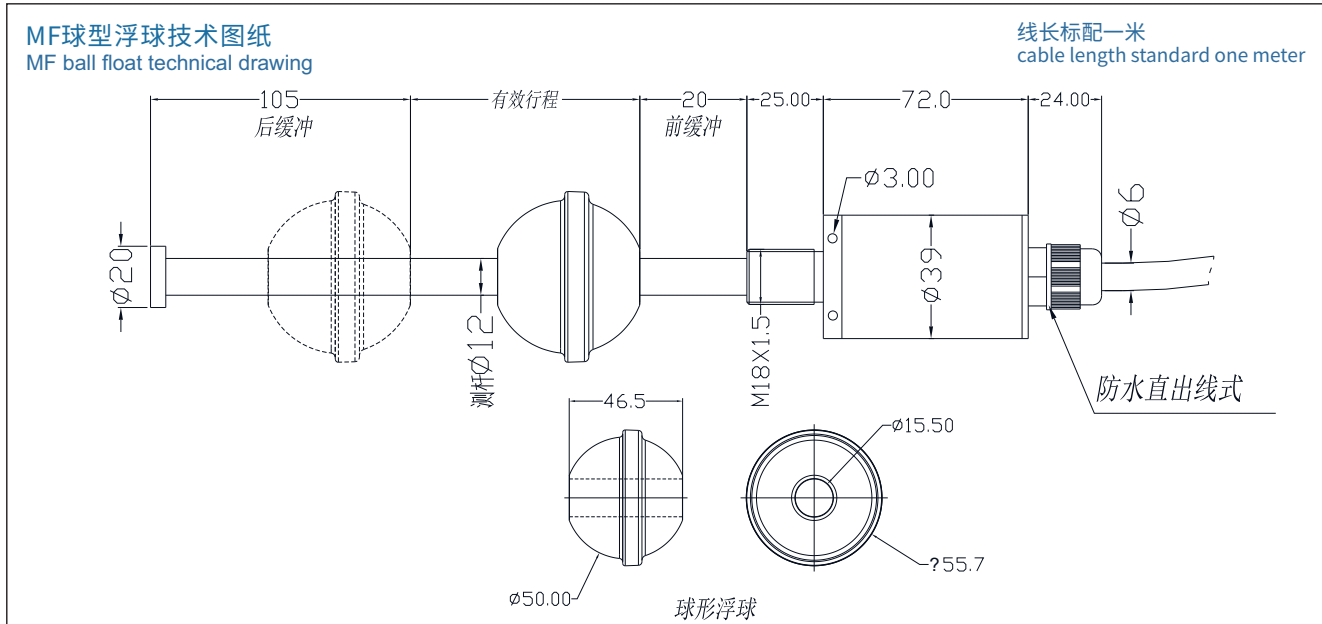
cable length standard one meter



圆柱浮球



单位Unit:mm



## 性能参数 Performance Parameters

### 电气指标 Electrical indicators

| MF磁致伸缩位移/液位传感器<br>MF Magnetostrictive Displacement/Level Sensor |  |                                     |                                  |
|---|--|-------------------------------------|----------------------------------|
| 量程范围<br>Measurement range                                       | 50~5000mm  | 供电电压<br>Supply voltage              | DC24V (±2V)                      |
| 外壳防护等级<br>Shell protection grade                                | IP65   | 重复性误差<br>Repeatability error        | ≤0.005%FS                        |
| 非线性误差<br>Nonlinear error  | ≤0.05%FS   | 迟滞<br>Hysteresis                    | ≤0.001%FS                        |
| 分辨率<br>Resolution ratio   | ≤0.038mm   | 工作电流<br>Operating current           | ≤60mA                            |
| 温度稳定性<br>Temperature stability                                  | ≤0.002%/°C   | 电子仓外壳<br>Electronic warehouse shell | 聚四氟乙烯<br>Polytetrafluoroethylene |
| 电子仓温度<br>Electronic warehouse temperature                       | -40°C~85°C   | 测杆温度<br>Rod temperature             | -40°C~150°C                      |
| 输出信号<br>Output signal   | 0-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen/SSI/start-stop  |                                     |                                  |
| 工作压力<br>Work pressure   | 持续工作压力≤5MPa (MTL内置高压式系列)<br>Continuous working pressure ≤ 5MPa (MTL built-in high pressure type series)                                  |                                     |                                  |
| 测杆材料<br>Rod material  | 默认: 聚四氟乙烯/0CR18NI9 (304不锈钢); 可定制为: 316不锈钢<br>Default: PTFE/0CR18NI9 (304 stainless steel); can be customized to: 316 stainless steel     |                                     |                                  |
| 负载能力<br>Load capacity   | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω   |                                     |                                  |
| 引线方式<br>Lead wire method  | 耐高温双绞屏蔽电缆线 (默认长度: 1m, 也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request) |                                     |                                  |

注: 测杆材料内部为不锈钢材质, 外部为聚四氟乙烯材质。  
Note: Stem material is stainless steel internally and PTFE externally.

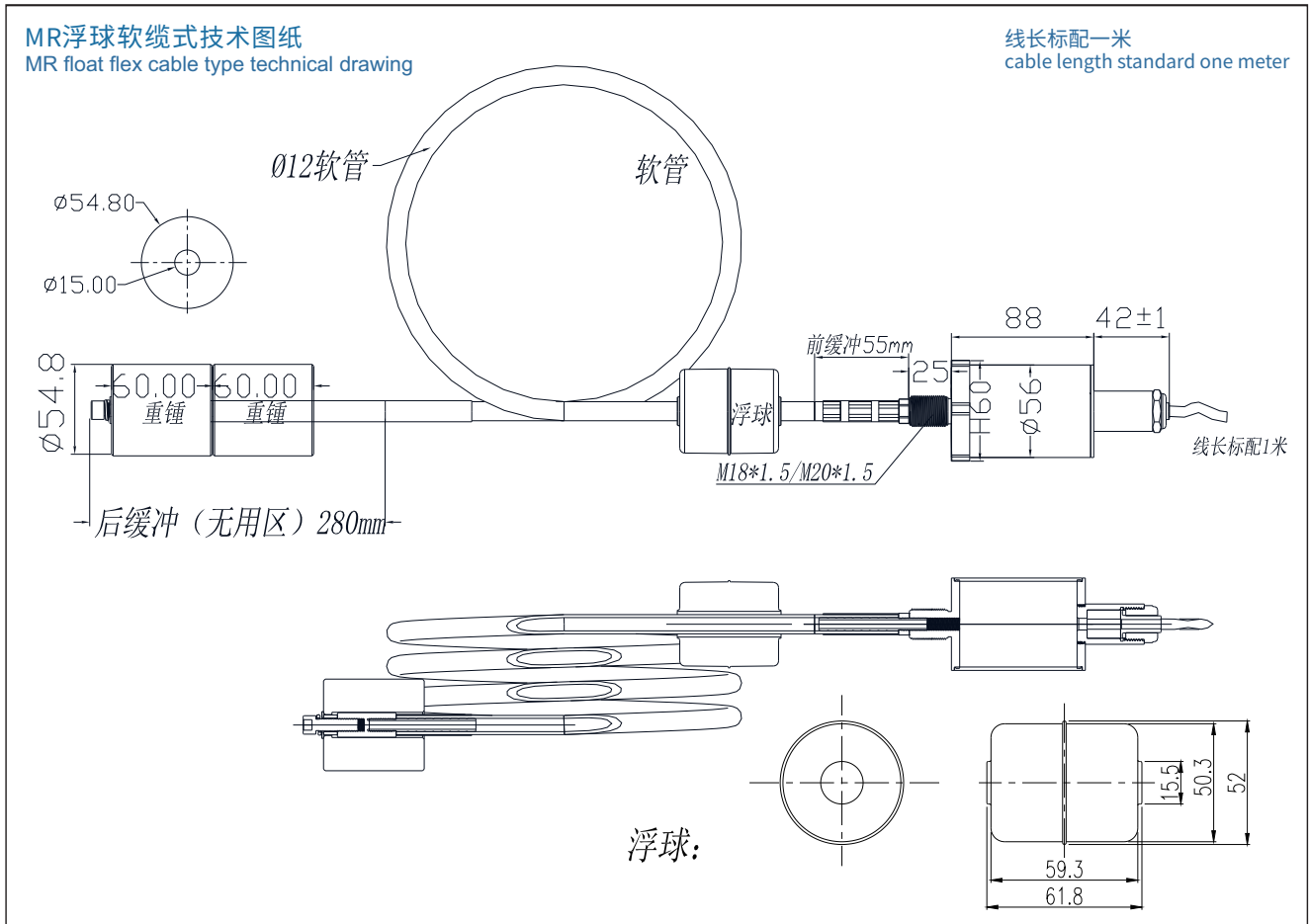
# MR磁致伸缩位移传感器

## MR Magnetostrictive Displacement Sensor

### 产品尺寸图 Product Dimension Drawing

### MR尺寸图 MR Dimension Drawing

单位 Unit: mm



## 性能参数 Performance Parameters

### ⚡ 电气指标 Electrical indicators

| MR磁致伸缩位移/液位传感器<br>MR Magnetostrictive Displacement/Level Sensor |   |
|---|---|
| 量程范围<br>Measurement range                                       | 50~12000mm  |
| 供电电压<br>Supply voltage  | DC24V (±2V)   |
| 非线性误差<br>Nonlinear error  | ≤0.05%FS  |
| 分辨率<br>Resolution ratio   | ≤0.038mm  |
| 迟滞<br>Hysteresis  | ≤0.001%FS   |
| 工作电流<br>Operating current                                       | ≤60mA   |
| 重复性误差<br>Repeatability error                                    | ≤0.005%FS   |
| 输出信号<br>Output signal   | 0-5V/0-10V/4-20mA/RS485/MODBUS RTU/CANopen/SSI/start-stop |

### ⚡ 性能指标 Performance indicators

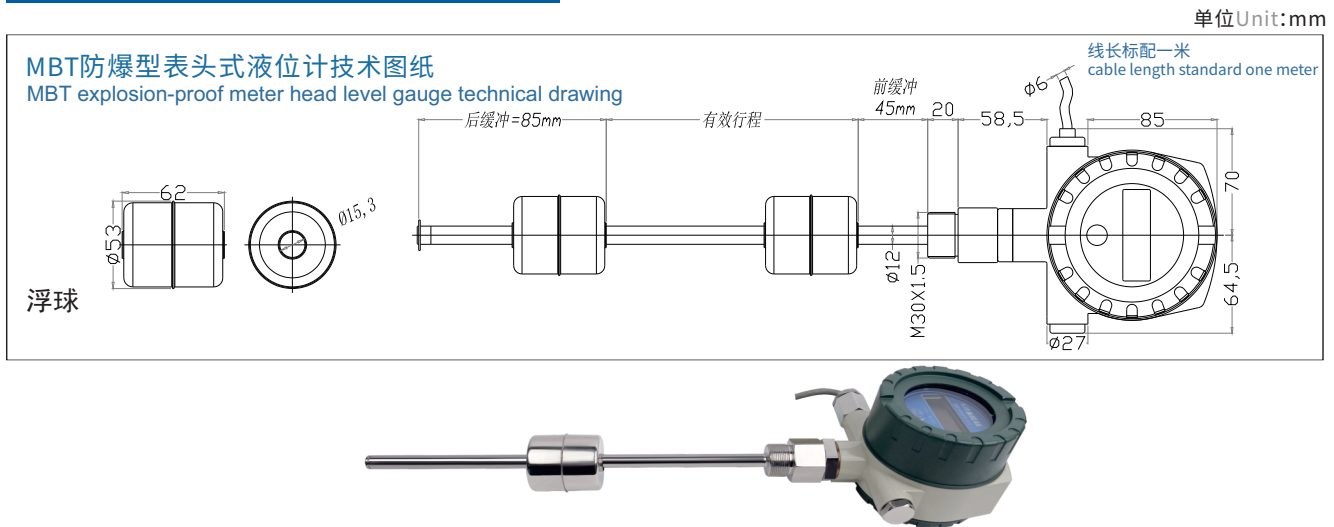
|   |   |
|---|---|
| 温度稳定性<br>Temperature stability            | ≤0.002%/°C  |
| 工作压力<br>Work pressure                     | 持续工作压力≤5MPa<br>Continuous working pressure ≤ 5MPa   |
| 电子仓温度<br>Electronic warehouse temperature | -40°C~85°C  |
| 测杆温度<br>Rod temperature                   | -40°C~150°C   |
| 外壳防护等级<br>Shell protection grade          | IP65、IP67   |
| 软缆材料<br>Flexible cable material           | 默认:0CR18NI9 (304不锈钢);可定制为:316不锈钢编织网<br>Default: 0CR18NI9 (304 stainless steel); can be customized to: 316 stainless steel woven wire mesh |
| 电子仓外壳<br>Electronic warehouse shell       | 默认:0CR18NI9 (304不锈钢);可定制为:316不锈钢<br>Default: 0CR18NI9 (304 stainless steel);can be customized to: 316 stainless steel                     |
| 负载能力<br>Load capacity                     | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω  |
| 引线方式<br>Lead wire method                  | 耐高温双绞屏蔽电缆线(默认长度:1m,也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request)     |
| 防爆标志<br>Explosion-proof symbol            | 防爆标志:Ex d IIB T5 Gb<br>Explosion-proof marking: Ex d IIB T5 Gb  |

# MBT防爆型温度/液位磁致伸缩传感器

## MBT Explosion-proof Temperature/level Magnetostrictive Sensors

### 产品尺寸图 Product Dimension Drawing

### MBT尺寸图 MBT Dimension Drawing



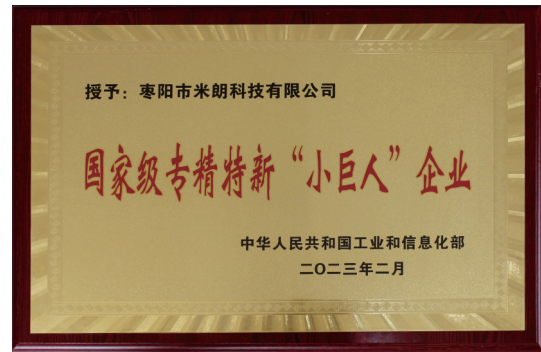
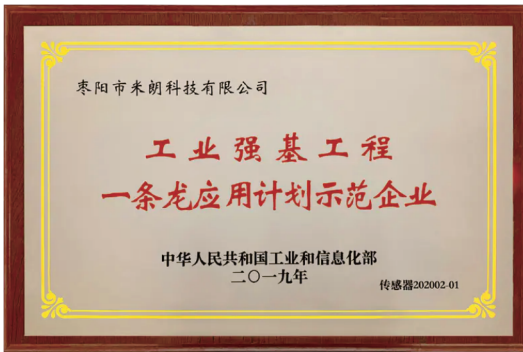
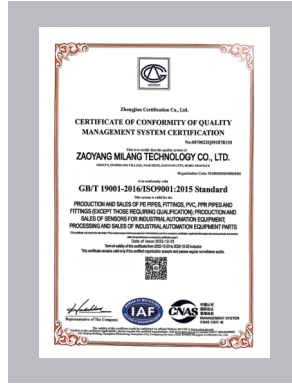
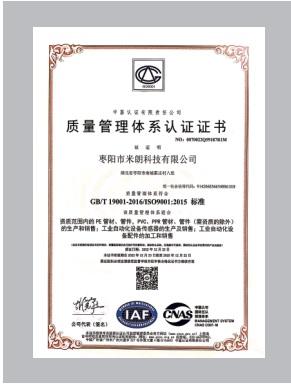
### 性能参数 Performance Parameters

#### 电气指标 Electrical indicators

| MBT防爆型温度/液位磁致伸缩传感器<br>MBT Explosion-Proof Magnetostrictive Sensors for Temperature/Liquid Levels |   |                                  |             |
|--|---|----------------------------------|-------------|
| 量程范围<br>Measurement range  | 30~5000mm   | 供电电压<br>Supply voltage           | DC24V (±2V) |
| 电子仓外壳<br>Electronic warehouse shell  | 默认: 铝合金<br>Default: aluminum alloy  | 重复性误差<br>Repeatability error     | ≤0.005%FS   |
| 非线性误差<br>Nonlinear error   | ≤0.05%FS  | 迟滞<br>Hysteresis                 | ≤0.001%FS   |
| 分辨率<br>Resolution ratio  | ≤0.038mm  | 工作电流<br>Operating current        | ≤60mA       |
| 温度稳定性<br>Temperature stability   | ≤0.002%/°C  | 外壳防护等级<br>Shell protection grade | IP65、IP67   |
| 电子仓温度<br>Electronic warehouse temperature  | -40°C~85°C  | 测杆温度<br>Rod temperature          | -40°C~150°C |
| 工作压力<br>Work pressure  | 持续工作压力≤35MPa (MTL内置高压式系列)<br>Continuous working pressure ≤ 35MPa (MTL built-in high pressure type series)   |                                  |             |
| 测杆材料<br>Rod material   | 默认: 0CR18NI9 (304不锈钢); 可定制为: 316不锈钢<br>Default: 0CR18NI9 (304 stainless steel); can be customized to: 316 stainless steel   |                                  |             |
| 输出信号<br>Output signal  | 0-5V/0-10V/4-20mA/RS485/SSI/MODBUS RTU/CANopen/start-stop   |                                  |             |
| 负载能力<br>Load capacity  | 电压信号输出负载≥4KΩ 电流信号输出负载≤500Ω<br>Voltage signal output load ≥4KΩ current signal output load ≤500Ω  |                                  |             |
| 引线方式<br>Lead wire method   | 耐高温双绞屏蔽电缆线 (默认长度: 1m, 也可根据用户要求提供)<br>High temperature resistant twisted shielded cable (default length: 1m, also available upon request)  |                                  |             |
| 防爆标志<br>Explosion-proof symbol   | 防爆标志: Ex d IIB T5 Gb/Ex tD A21 IP65 T80°C 防爆本安标志: Ex ia IIB T4 Ga<br>Explosion-proof Marking: Ex d IIB T5 Gb/Ex tD A21 IP65 T80°C Explosion-proof Intrinsically Safe Marking: Ex ia IIB T4 Ga |                                  |             |



荣誉证书 Certificate of Honor

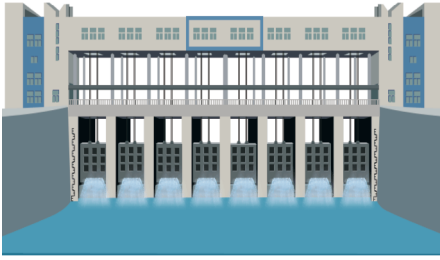


检测证书 Test Certificate





应用领域 Areas of application



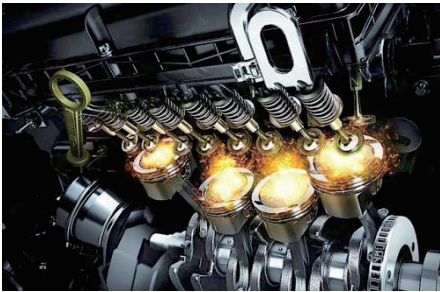
• 闸门开度控制  
Gate Opening Control



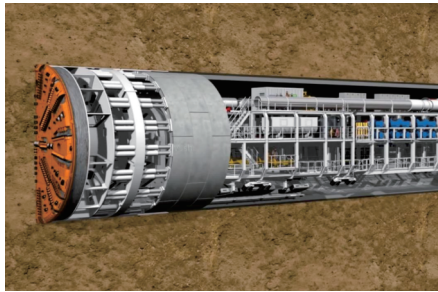
• 吹瓶机油缸位置反馈  
Blowing Machine Cylinder Position Feedback



• 液压机升降位置监测  
Hydraulic Press Lift Position Monitoring



• 活塞位置检测  
Piston Position Detection



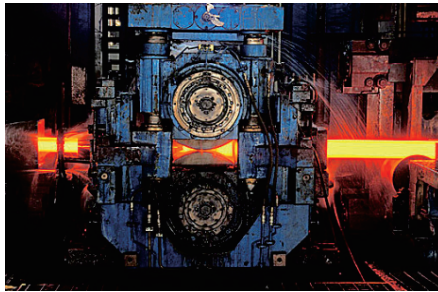
• 盾构机位移检测  
Shield Displacement Detection



• 桥梁与大坝位移监测  
Bridge & Dam Displacement Monitoring



• 石油钻井设备位移反馈  
Oil Drilling Equipment Displacement Feedback



• 轧钢机油缸位置检测  
Rolling Mill Cylinder Position Detection



磁致伸缩位移传感器应用场所极多,随着核心技术的发展,磁致伸缩位移传感器得到越来越广泛的应用。

Magnetostrictive displacement sensors are used in an extremely large number of places, with the development of core technology, magnetostrictive displacement sensors are more and more widely used.

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。  
Suitable for application in factories, mountains, railroads, tunnels, shipping industry, machinery, construction industry, medical business, bridge laying, dam construction, automotive industry, nuclear industry and aerospace business, etc.



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质量第一  
Quality First

用户至上  
Customer First

诚信为本  
Credit First

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

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Main author: Wang Gong

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