米朗 MIRAN®

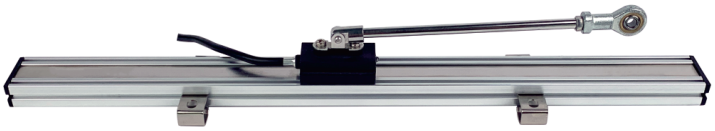
中国工信部高精度传感器一条龙应用计划示范项目

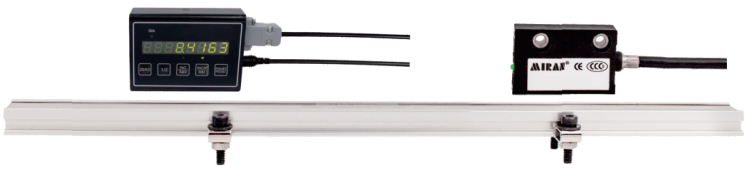
国家级专精特新“小巨人”企业，国家级高新技术企业

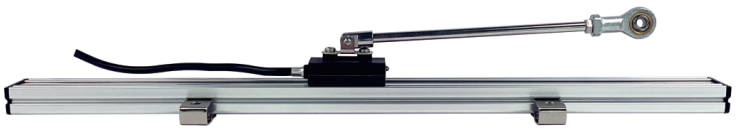
中国工业强基重点产品，中国工信部传感器一条龙应用计划示范企业

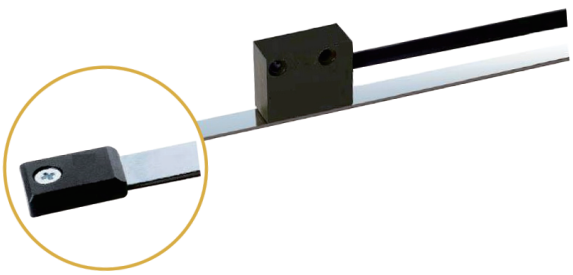
磁栅尺

Magnetic Railing Ruler









MSK/MR50系列磁栅尺

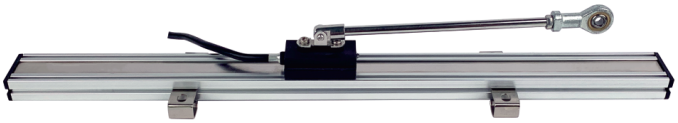
MSK/MR50 SERIES MAGNETIC SCALE

- 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

MSK滑块式磁栅尺/MR50磁栅尺
MSK Slide Type Magnetic Scale / MR50 Magnetic Scale

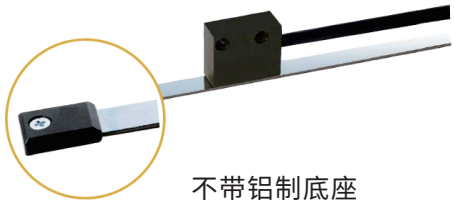
产品实物图Product Picture

MSK磁栅尺MSK Magnetic Scale



MR50磁栅尺MR50 Magnetic Scale

带铝制底座
with aluminum base



不带铝制底座
without aluminum base

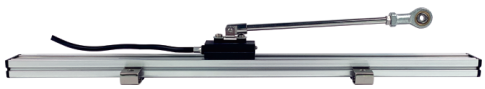
产品型号选型Product Model Selection

MSK磁栅尺MSK Magnetic Scale

MSK - □ - □

代表电线长度
（单位：米/M）
Represents wire length
(in meters/M)

代表有效行程长度
（单位：毫米/MM）
Represents effective
stroke length
(in mm/MM)



MR50磁栅尺MR50 Magnetic Scale

MR50 - □

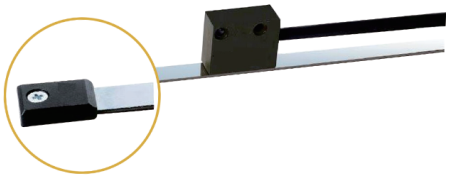
读头
Reading head

读头电缆长度
（单位：米/M）
Readhead cable length
(in meters/M)

MS50 - □

磁尺
(不带铝制底座)
Magnetic ruler
(without
aluminum base)

磁尺长度
（单位：毫米/MM）
Magnetic scale
length
(in mm/MM)



MSS50 - □

磁尺
(带铝制底座)
Magnetic ruler
(with
aluminum base)

磁尺长度
（单位：毫米/MM）
Magnetic scale
length
(in mm/MM)

产品概述Product Overview

磁栅尺测量的工作原理是利用与录音技术相似的方法，通过录磁头在磁性尺(或盘)上录制出间隔严格相等的磁波这一过程称为录磁。已录制好磁波的磁性尺称为磁栅尺。磁栅尺上相邻栅波的间隔距离称为磁栅的波长，又称为磁栅的节距(栅距)。栅的一个重要特点是磁栅尺与磁头处于接触式的工作状态。磁栅的工作原理是磁电转换，为保证磁头有稳定的输出信号幅度，考虑到空气的磁阻很大，故磁栅尺与磁头之间不允许存在较大和可变的间隙，最好是接触式的。

MSK滑块式磁栅尺和MR50磁栅尺均根据磁感应的原理进行工作。当读磁头在磁尺的磁场空间中做直线运动时(MR50磁栅尺中MR是读磁头、MS是磁尺)，读磁头会根据运动的相关位移量实时的输出符合标准的位置脉冲。MSK滑块式磁栅尺和MR50磁栅尺内置LED状态指示灯可提示工作电源和磁尺信号是否正常，并不能保证安装后的测量精度，如果需要提高精度请在安装时尽量将读磁头靠近磁尺。MR50磁栅尺分为磁条安装式和铝制底座安装式，适用于较大量程测量范围，可根据现场安装环境选择。

MSK滑块式磁栅尺和MR50磁栅尺主要用于木工、石材加工、锯切、金属切削、纺织、印刷、包装、塑料加工、自动化系统、切割设备、电子组装设备、测量/检测设备等。

Magnetic scale measurements work on the principle that, using a method similar to the recording technique, magnetic waves at strictly equal intervals are recorded on a magnetic

scale (or disk) by means of a recording head in a process known as magnetic recording. The magnetic tape that has recorded the magnetic waves is called the magnetic scale. Magnetic scale on the distance between neighboring grating wave interval is called the wavelength of the magnetic grating, also known as the pitch of the magnetic grating (grating pitch). An important feature of the grid is that the magnetic scale and the magnetic head is in contact with the operating state. The working principle of the magnetic grid is magnetoelectric conversion, in order to ensure that the magnetic head has a stable output signal amplitude, taking into account the air's magnetoresistance is very large, so the magnetic scale and the magnetic head does not allow the existence of a large and variable gap between the head, it is best to be in contact.

Both the MSK slide scale and the MR50 magnetic scale work on the principle of magnetic induction. When the readhead moves in a straight line in the magnetic field space of the magnetic scale (MR is the readhead and MS is the magnetic scale in MR50 magnetic scale), the readhead will output a standardized position pulse in real time according to the displacement associated with the movement. The built-in status LEDs of MSK slider magnetic scale and MR50 magnetic scale can indicate whether the power supply and the magnetic scale signal are normal or not, and do not guarantee the measurement accuracy after installation. If you need to improve the accuracy, please install the read head as close as possible to the magnetic scale. MR50 magnetic scale is divided into magnetic stripe mounting type and aluminum base mounting type, applicable to a larger range of measurement range, according to the site installation environment to choose.

MSK Slide Magnetic Scale and MR50 Magnetic Scale are mainly used in woodworking, stone processing, sawing, metal cutting, textile, printing, packaging, plastics processing, automation systems, cutting equipment, electronic assembly equipment, measuring/ inspection equipment and so on.

产品特点Product Features

- 非接触式 Non-contact
- 高速测量 High-speed measurement
- 高分辨率 High resolution
- 抗油抗污 Oil and dirt resistant
- 安装简易 Easy installation
- 性价比高 Quality-price ratio

性能参数Performance Parameters

关于分辨率About resolution

一般磁栅尺读数头的分辨率标识为：

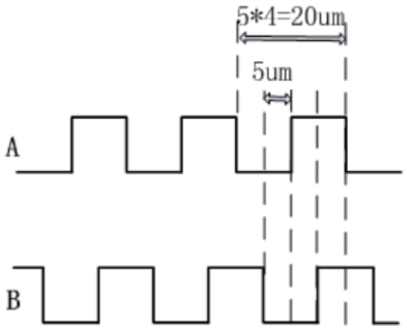
The resolution of a typical magnetic scale readhead is identified as:

将一个完整的脉冲周期4分频后的数值。

the value after dividing a complete pulse period by 4.

例如常说的5um磁头的分辨率，分辨率示意图如图：

For example, it is often said that the resolution of 5um magnetic head, resolution schematic diagram as shown:



性能指标Performance indicators

参数 Parameters / 产品 Offerings	MSK滑块式磁栅尺 MSK Slide Type Magnetic Scale	MR50磁栅尺 MR50 Magnetic Scale
精度指标(20℃) Accuracy Index (20℃)	±50μm/m	±50μm/m
重复精度 Repeatability	Max. ±1个单位分辨率（单方向） Max. ±1 unit resolution (unidirectional)	Max. ±1个单位分辨率（单方向） Max. ±1 unit resolution (unidirectional)
测量长度 Measuring Length	用户指定（无限制） User-specified (unlimited)	用户指定（无限制） User-specified (unlimited)
移动速度 Travel Speed	Max. 25m/s	Max. 25m/s
频　率 Frequency	1.25MHZ	1.25MHZ
Ab信号每1mm脉冲个数 Number of pulses per 1mm of Ab signal	50个（每0.02mm,1个脉冲） 50 (per 0.02mm, 1 pulse)	50个（每0.02mm,1个脉冲） 50 (per 0.02mm, 1 pulse)
Z信号每5mm脉冲个数 Z signal pulses per 5mm	1个 1pcs	1个 1pcs
抗干扰(EMC) Anti-interference (EMC)	Electrostatic discharge(ESD: EN61000-4-2); Radio-frequency(EN61000-4-3, EN61000-4-6); Electrical fast transient(EFT: EN61000-4-4); Surge(EN61000-4-5); Power frequency magnetic field(EN61000-4-8);	Electrostatic discharge(ESD: EN61000-4-2); Radio-frequency(EN61000-4-3, EN61000-4-6); Electrical fast transient(EFT: EN61000-4-4); Surge(EN61000-4-5); Power frequency magnetic field(EN61000-4-8);

性能参数Performance Parameters

产品指标Product Indicators

参数 Parameters / 产品 Offerings	MSK滑块式磁栅尺 MSK Slide Type Magnetic Scale	MR50磁栅尺 MR50 Magnetic Scale
读头 Reading head	/	MR50
配套磁尺(不带铝制底座) Matching magnetic tape (without aluminum base)	/	MS50
配套磁尺(带铝制底座) Matching magnetic ruler (with aluminum base)	该产品是一体的,不具体区分 The product is all-in-one and does not specifically differentiate	MSS50

注:MSK滑块式磁栅尺为一体式,不具体区分读头和配套磁尺,产品本身自带铝制底座,一般情况下只选型电线长度及有效行程长度,有特殊情况可联系沟通。

Note: MSK slider type magnetic scale for the integrated type, do not specifically distinguish between the read head and supporting magnetic scale, the product itself comes with an aluminum base, in general, only the length of the selection of wire length and effective stroke length, there are special circumstances can be contacted to communicate.

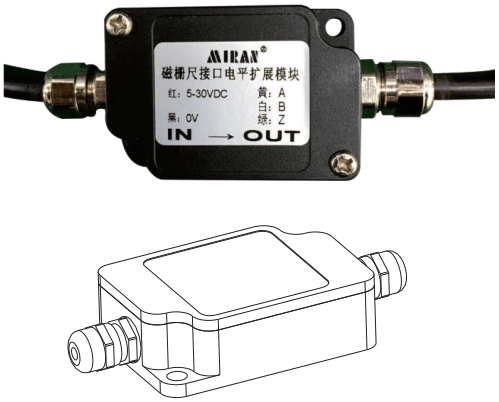
电气指标Electrical indicators

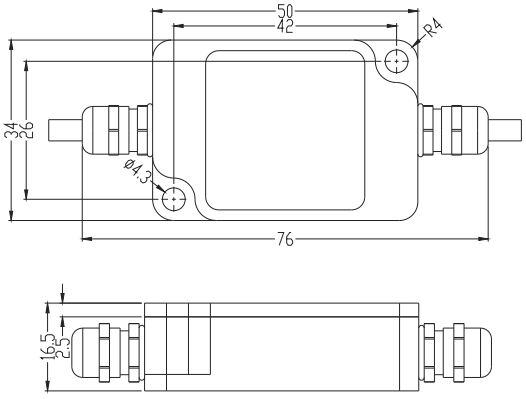
参数 Parameters / 产品 Offerings	MSK滑块式磁栅尺 / MR50磁栅尺 MSK Slide Type Magnetic Scale / MR50 Magnetic Scale
分辨率 Resolution	5μm
工作电压 Operating Voltage	标准供电电压5VDC (最高24VDC) standard supply voltage 5VDC (up to 24VDC)
输出信号 Output Signal	脉冲单端信号A/B/Z(默认);脉冲差分信号A+/B+/Z+/A-/B-/Z-(可选) pulse single-ended signal A/B/Z (default); pulse differential signal A+/B+/Z+/A-/B-/Z- (optional)
安装间隙 Mounting Clearance	Max. 2.5mm
空载电流 No-load Current	Max. 30mA
输出电流 Output Current	Max. 50mA(每路信号) Max. 50mA (per signal)
工作温度 Operating Temperature	-20°C~+85°C
保护等级 Protection Level	IP68(IEC60529:2001)

注:MSK滑块式磁栅尺默认是5V供电最稳定,属于TTL信号,24V供电也可以;如果客户需要24V供电HTL信号格式的,那么就需要配电平扩展模块,需要确认客户现场支持TTL信号格式还是HTL信号格式。

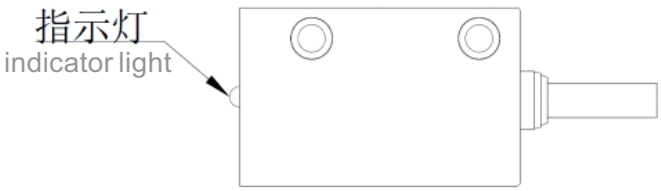
Note: MSK slider type magnetic scale default is the most stable 5V power supply, belongs to the TTL signal, 24V power supply can also be; If the customer needs 24V power supply HTL signal format, then you need to distribution level expansion module, you need to confirm that the customer site support TTL signal format or HTL signal format.

磁栅尺接口电平扩展模块
Magnetic Scale Interface Level Expansion Module





指示灯示意图Indicator Light Schematic



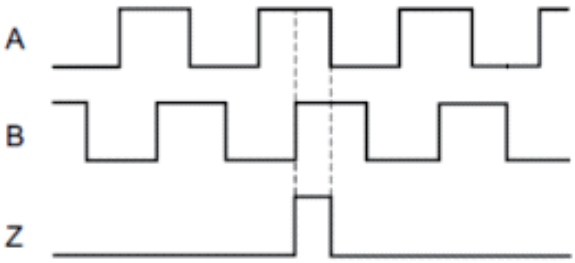
绿 色：工作正常
Green: working normally

红绿色：磁信号太弱，需检查
Red-green: Magnetic signal too weak, need to check

注：指示灯只能提示工作电源和磁尺信号是否正常，并不能保证安装后的测量精度，如果需要提高精度请在安装时尽量将读磁头靠近磁尺。

Note: The indicator light can only indicate whether the working power supply and the signal of the magnetic scale are normal or not, it does not guarantee the measurement accuracy after installation, if you need to improve the accuracy please try to put the reading head as close as possible to the magnetic scale when installing.

时序图chronology



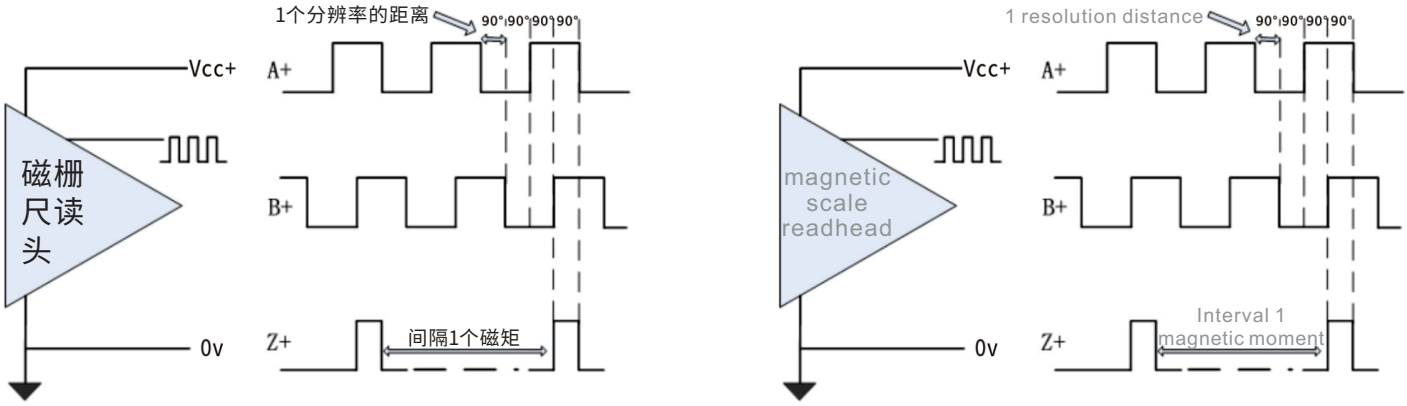
注：Z信号每5mm有一个脉冲（AB信号每0.02mm一个脉冲）

Note: Z signal has one pulse every 5mm (AB signal has one pulse every 0.02mm)

脉冲信号输出定义Pulse signal output definition

接线定义 wiring definition	红色 RED	黑色 BLACK	黄色 YELLOW	白色 WHITE	绿色 GREEN
	+VCC	OV	A	B	Z

单端输出模式single-ended output mode



注:输出信号默认为脉冲A/B/Z,如果需要差分输出信号下单需备注。

Note: The output signal is pulse A/B/Z by default, if you need differential output signal, you need to make a note.

差分信号输出定义Differential Signal Output Definition

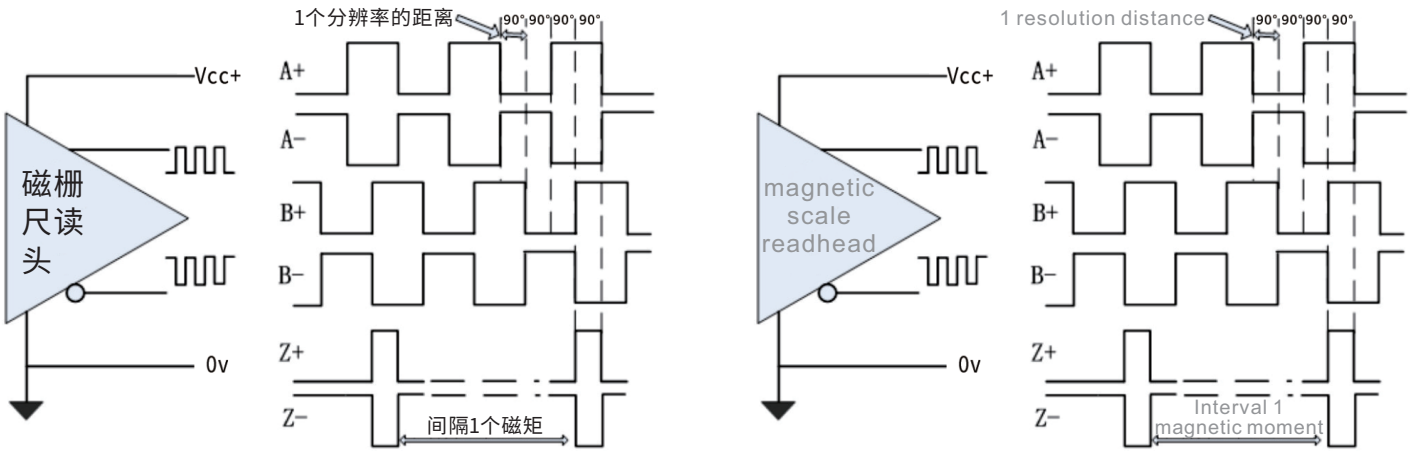
接线定义 wiring definition	红色 RED	黑色 BLACK	黄色 YELLOW	白色 WHITE	绿色 GREEN
	+VCC	OV	A+	B+	Z+

棕色 BROWN	蓝色 BLUE	灰色 GRAY
A-	B-	Z-

对于需要长距离传输或强干扰的环境,建议选择RS422差分传输方式,并使用差分屏蔽专用线材进行延长连接。

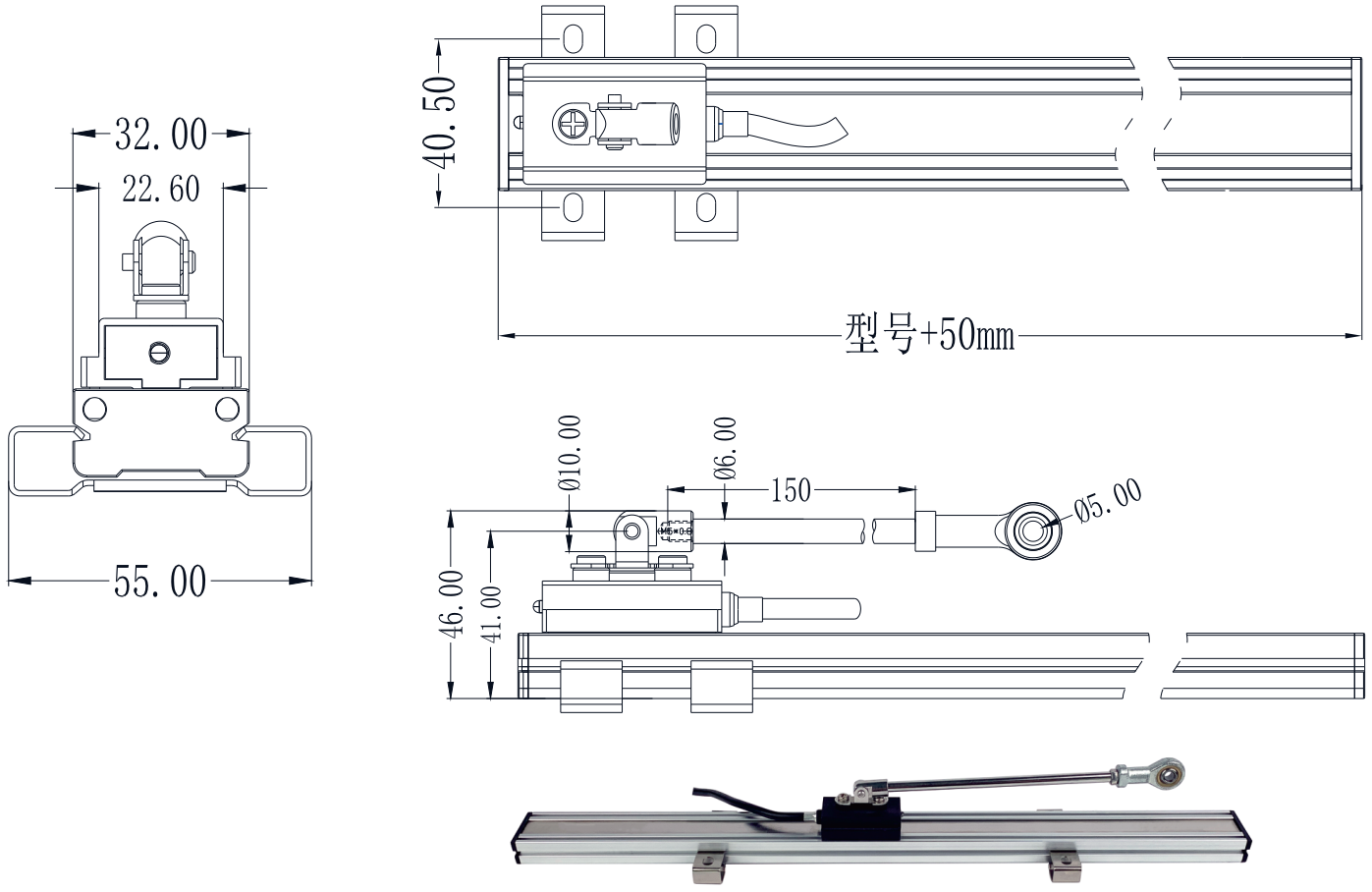
For long distance transmission or strong interference environment, it is recommended to choose RS422 differential transmission method, and use differential shielding special cable for extension connection.

RS422模式RS422 mode



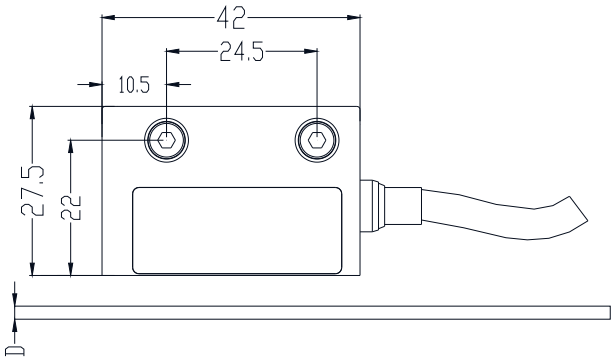
产品尺寸图Product Dimension Drawing

MSK滑块式磁栅尺
MSK Slide Type Magnetic Scale



MR50磁栅尺
MR50 Magnetic Scale

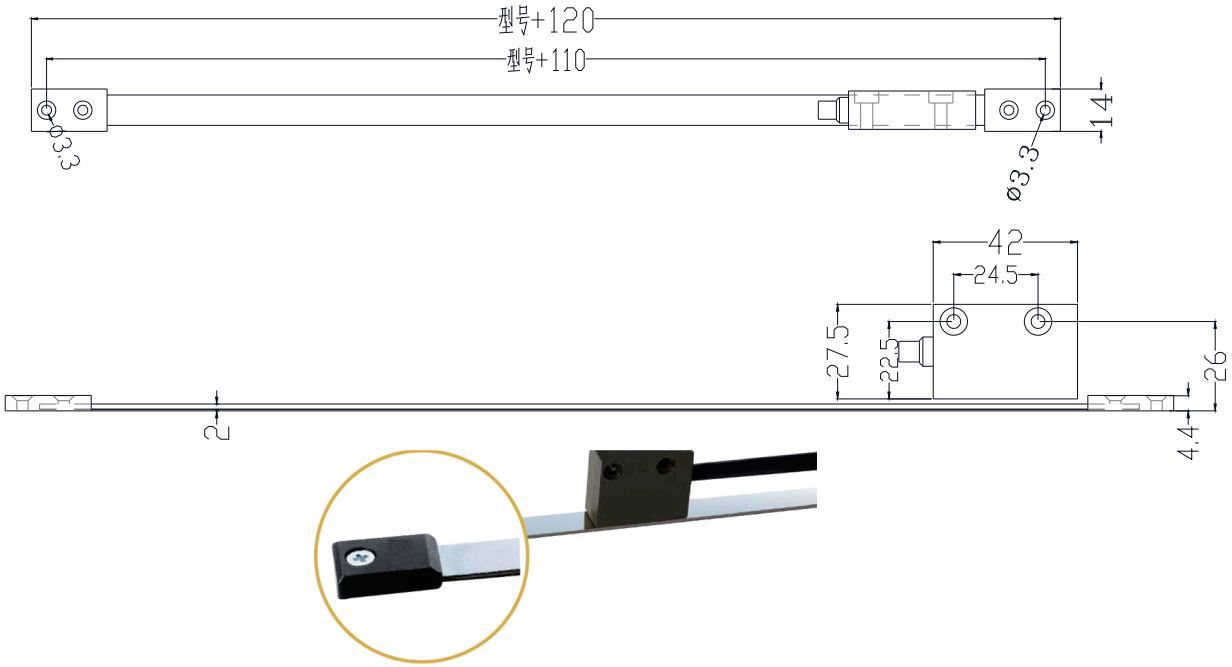
读头Readhead



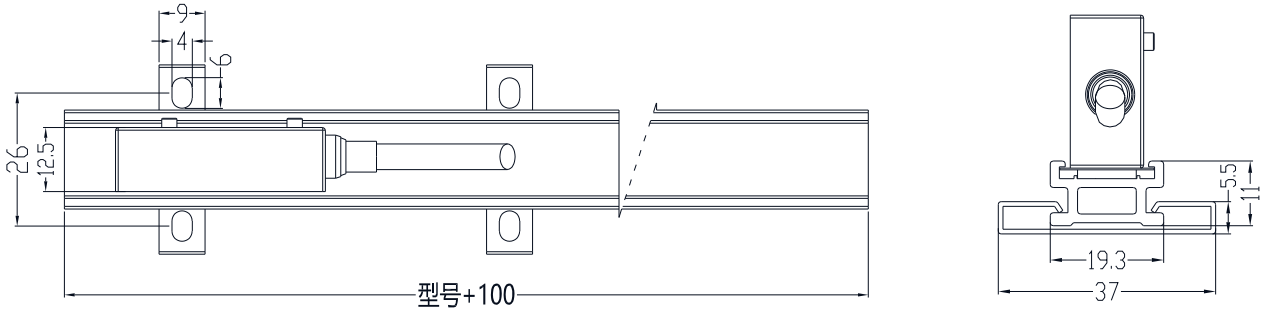
磁尺厚度(尺寸图中D所指部位):不含双面胶1.3mm,含双面胶1.5mm,含保护钢带1.75mm

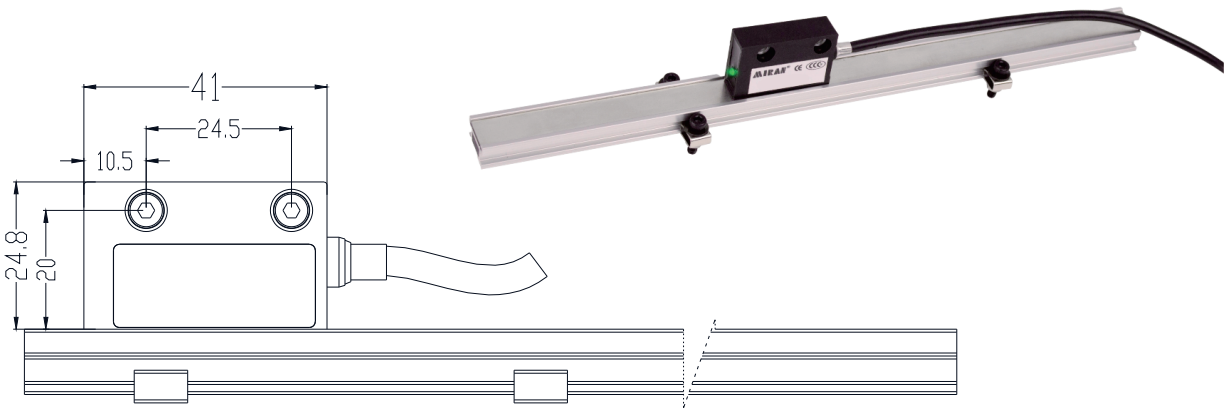
Thickness of magnetic tape (the part pointed out by D in the dimension drawing):
1.3mm without double-sided tape, 1.5mm with double-sided tape, 1.75mm with protective steel tape.

磁尺(不带铝制底座)MS50
Magnetic Scale (without Aluminum Base) MS50



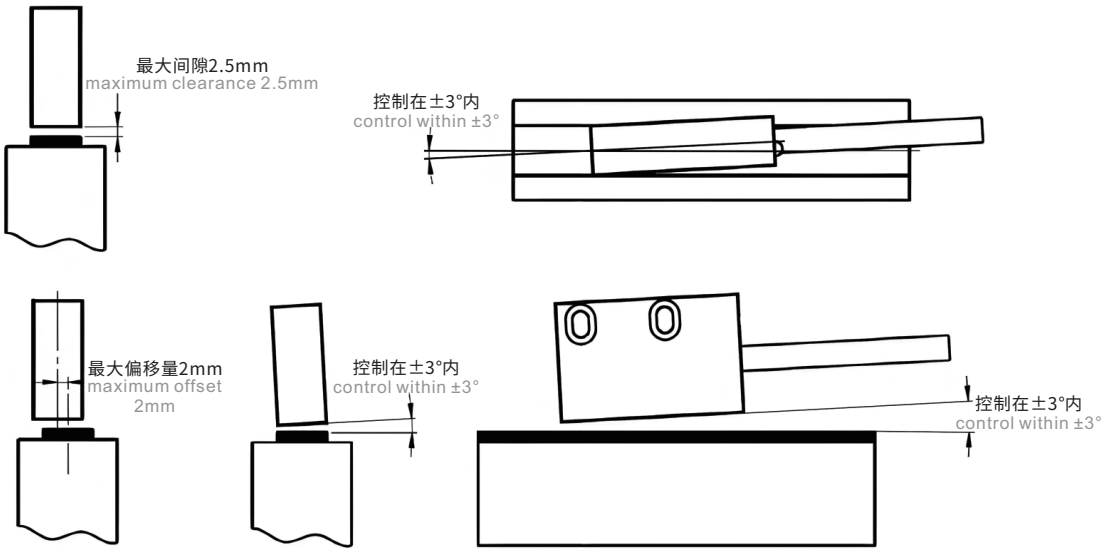
磁尺(带铝制底座)MSS50
Magnetic Scale (with Aluminum Base) MSS50





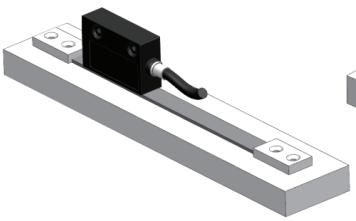
安装要求Installation Requirements

MR50磁栅尺安装要求
MR50 Magnetic Scale Installation Requirements

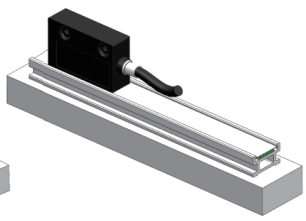


磁尺(不带铝制底座)MS50安装:
Magnetic Scale (without aluminum base) MS50 mounting:

平面固定方式
flat fixing method

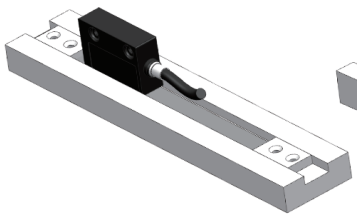


不带铝制底座
without aluminum base

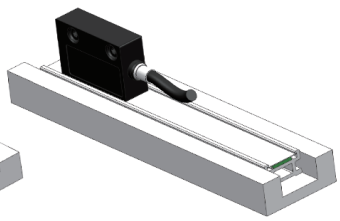


带铝制底座
with aluminum base

安装槽固定方式
mounting slot fixing method

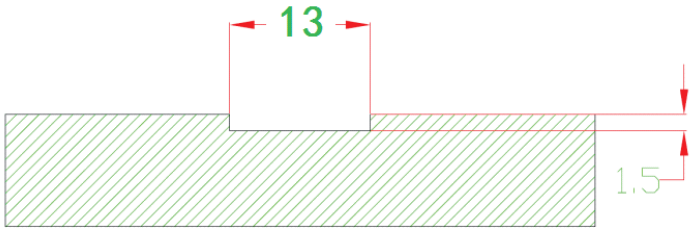


不带铝制底座
without aluminum base



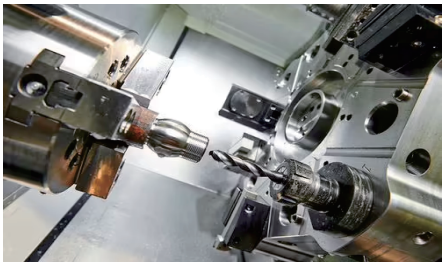
带铝制底座
with aluminum base

采用安装槽方式进行安装时,预先开设的安装槽的尺寸如下图。
When mounting by the mounting slot method, the dimensions of the pre-opened mounting slot are shown below.

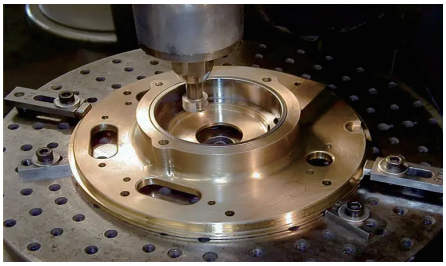


磁尺可以水平安装和侧装,但尽量避免倒置安装。
The magnetic tape can be mounted horizontally and sideways, but try to avoid mounting it upside down.

应用领域Areas of application



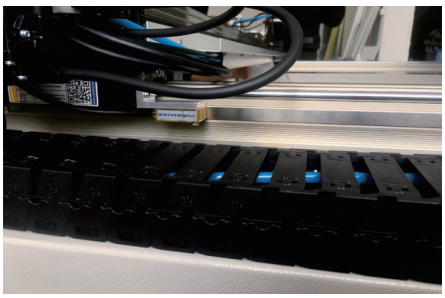
• 设备位移监测
Equipment displacement monitoring



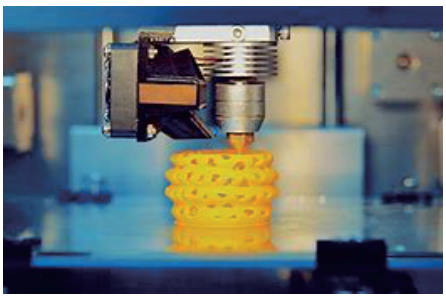
• 金属加工定位
Positioning for metal processing

• 机床监测定位
Machine monitoring and positioning

• 工业自动化
Industrial automation



• 激光切割机
Laser cutting machine



• 印刷设备检测
Printing equipment testing

• 塑料加工检测
Plastic processing inspection

• 电子组装设备
Electronic assembly equipment

• • •

磁栅尺位移传感器应用场所极多，随着核心技术的发展，磁栅尺位移传感器得到越来越广泛的应用。
Magnetic scale displacement sensors are used in a wide variety of applications, and with the development of core technology, magnetic scale displacement sensors are becoming more and more widely used.

适合应用于木工、石材加工、锯切、金属切削、纺织、印刷、包装、塑料加工、自动化系统、切割设备、电子组装设备、测量/检测设备等。
Suitable for applications in woodworking, stone processing, sawing, metal cutting, textiles, printing, packaging, plastics processing, automation systems, cutting equipment, electronic assembly equipment, and measuring/inspection equipment.

辐射全国 放眼世界

Radiate to the whole country and see the world

质量第一	用户至上	诚信为本
Quality First	Customer First	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

主要著作人：王工

Main author: Wang artwork

2024年05月出品

Produced in May 2024