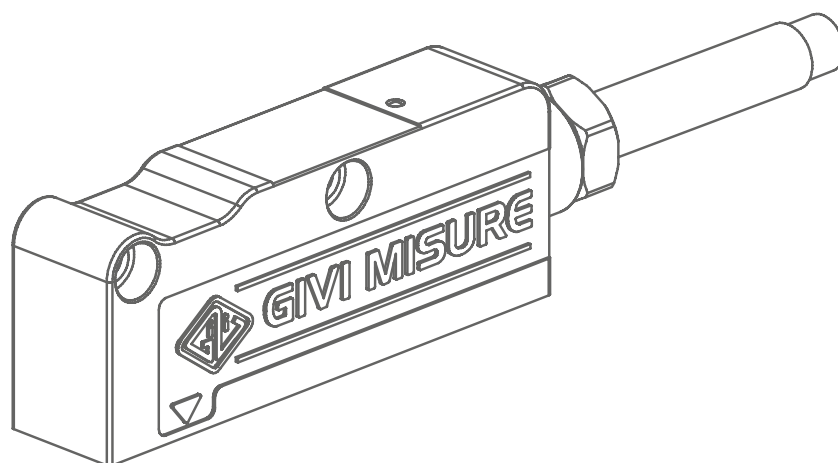


安装手册

*Installat on
manual*

磁性传感器
Magnet c sensor
AGM-2



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磁性传感器
Magnetic sensor
AGM-2

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1. 序言

本手册的目的是为正确使用AGM-2磁性传感器提供适当的信息。

在进行产品安装之前，请仔细阅读以下注意事项。

在加工过程中，要清除任何不利于运动部件自由滑动的积屑、灰尘等。

建议使用保护罩，以防止工具或材料掉落造成的任何损坏。

避免在安装表面涂抹，并检查其平面度。

2. 安全信息

- 在安装和使用本产品时，请遵守您所在国家的安全和预防法规。
- 所有的安装和维护操作必须由专业人员进行，他们必须能够识别来自机械和电气设备的危险。
- 请勿将产品用于与设计目的不同的用途。
- 由于用户未能遵守安全信息而造成的损害或伤害，Givi Misure将不承担任何责任。
- 不要在爆炸性区域使用本产品。
- 在电源关闭且电池(在场时)除外的情况下进行连接。
- 在产品安装过程中，任何设备都不应该处于运动状态。
- 不要篡改产品，不要对其进行机械干预。
- 小心地处理产品，避免不适当的压力。

警告

确保用于组装的工具经过严格的消磁处理。



警告

不要接触电缆终端（或连接器触点），以避免设备上出现静电放电（ESD）。



1. PRELIMINARY REMARKS

The purpose of this manual is to provide the appropriate information for a correct use of the AGM-2 magnetic sensor.

Before proceeding with the product installation, read carefully the notes below.

During machining, remove any accumulation of shavings, dust, etc. that oppose to the free sliding of the moving parts.

The use of a protection cover is recommended to prevent any damage from falling tools or material.

Avoid supporting surfaces painting and check their planarity.

2. SAFETY INFORMATION

- Follow the safety and prevention regulations in your Country when installing and using the product.
- All installation and maintenance operations must be carried out by specialized personnel, able to recognize the dangers deriving from mechanical and electrical equipment.
- Do not use the product for different purposes from those for which it was designed.
- No responsibility will be attributed to Givi Misure for damages or injury depending on the user's failure to comply with safety information.
- Do not use the product in explosive areas.
- Make connections when power supply is switched off and batteries (when present) are excluded as well.
- No equipment should be in motion during the product installation.
- Do not tamper with the product and do not carry out mechanical interventions on it.
- Handle the product with care, avoiding undue stress.

WARNING

Make sure the tools used for assembly are rigorously demagnetized.



WARNING

DO NOT TOUCH the cable terminals (or connector contacts) to avoid electrostatic discharges (ESD) on the device.



3. 耐化学性

低冲击剂

甲酸、乳酸、甲醛40%、甘油93℃、正己烷、异辛烷、亚麻籽油、棉油、大豆油、矿物油。

中等冲击剂

乙炔、丙酮、乙酸、油酸、硬脂酸70℃、海水、氨水、汽油、异丙醚、石油、蒸汽。

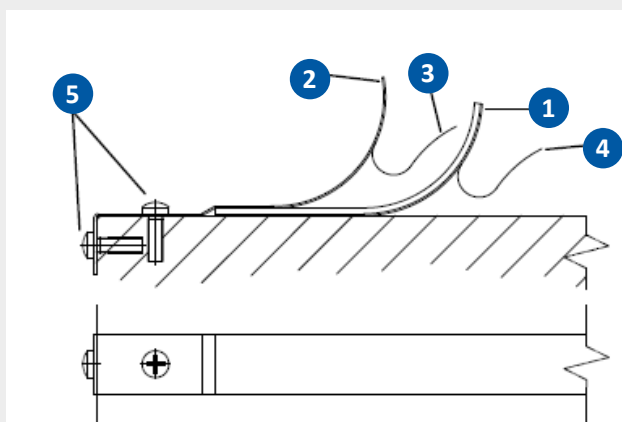
强冲击剂

硝酸、苯、二甲基苯、四乙基呋喃、硝基苯、溶剂、甲苯、四氯化碳、松节油、三氯乙烯。

警告

保护磁带不受外部磁场影响。与任何永久磁铁接触都会对磁带造成不可挽回的损害。

4. 固定磁带 MP



警告

如果磁带已经受到CV103盖子的保护，就不能使用SP202支架。

警告

为了保证系统的准确性，磁带①必须比机器的测量长度长80mm（每边40mm）。

在安装过程中，磁带必须充分地对准测量长度的中心。

3. RESISTANCE TO CHEMICAL AGENTS

LOW-IMPACT AGENTS

Formic acid, lactic acid, formaldehyde 40%, glycerine 93 °C, hexane, iso-octane, linseed oil, cotton oil, soybean oil, mineral oil.

MEDIUM-IMPACT AGENTS

Acetylene, acetone, acetic acid, oleic acid, stearic acid 70 °C, seawater, ammonia, gasoline, ether isopropyl, petroleum, vapour.

STRONG-IMPACT AGENTS

Nitric acid, benzene, dimethylbenzene, tetraethyl furan, nitrobenzene, solvent, toluene, carbon tetrachloride, turpentine, trichloroethylene.

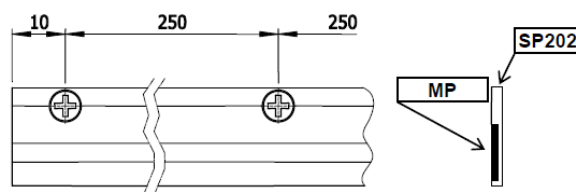
WARNING

Protect the band from external magnetic fields. Contact with any permanent magnet can irreparably damage the magnetic band.

4. FIXING OF MAGNETIC BAND MP

建议固定SP202支架

Recommended fixing of SP202 support



WARNING

It is not possible to use the SP202 support if the magnetic band is already protected by the CV103 cover.

WARNING

To guarantee the system accuracy, the magnetic band ① has to be 80 mm longer than the measuring length of the machine (40 mm for each side).

During mounting, the magnetic band has to be adequately centered on the measuring length.

磁带可以固定在任何类型的非磁性表面。

为了更好地保护磁带不受刨花、液体、粉末等的影响，我们建议使用已经配备了双面胶带 ② 的保护罩 CV103

③ 或者使用铝制支架 SP202，使磁带保持在适当的位置。

最佳的胶合温度是在 20 °C 和 30 °C 之间。不建议在温度低于 10 °C 时进行操作。

如果磁带的储存温度比机器的温度低或高，建议在上胶前等待几个小时，以稳定磁带的状态。至少在 48 小时后，粘合的部分才会完成。

粘合磁带时，请按照下面的报告进行：

- 使用无痕溶剂，仔细清理固定表面的油、油脂或任何种类的污物。
- 提起几厘米的胶粘剂保护层 ④，正确放置磁带，在最初的胶粘剂区域施以轻压。
- 继续进行磁带的固定，逐步去除粘合剂保护，并施加均匀的压力。如果可能的话，使用一个小的手动滚筒。
- 如上所述，在准确地清洁了表面之后，将不锈钢保护带粘在磁带上。
- 使用保护层胶带超过的部分进行机械固定和接地连接，使用 CH 螺丝 M3x8 ⑤。

5. AGM-2 传感器安装

警告

在开启传感器之前，要确保其安装正确。

使用两个 M4 螺纹孔来固定磁传感器。作为一种选择，它们可以作为通孔，用于安装合适长度的 TCEI M3 螺钉。

关于零点定义以及传感器和磁带的安装，请参考下图。

The magnetic band can be fixed on any kind of non-magnetic surface.

For a better protection of the magnetic band from shavings, liquids, powder, etc., we recommend the use of the protective cover CV103 ②, already equipped with a double-sided adhesive tape ③, or of the aluminum support SP202 which keeps the magnetic band in the proper position.

The best gluing temperature is between 20 °C and 30 °C. It is not advisable to perform the operation at temperatures below 10 °C.

In case the magnetic band has been stocked at a lower or higher temperature than the machine, it is advisable to wait some hours before gluing it, to stabilize the magnetic band. The adhesion of the glued parts is completed after at least 48 hours.

TO GLUE THE MAGNETIC BAND, PROCEED AS REPORTED BELOW:

- CLEAN carefully the fixing surface from oil, grease or any kind of dirt, using trace-free solvents.
- RAISE few centimeters of the adhesive protection ④ and place the magnetic band properly, exerting a light pressure on the initial adhesive zone.
- PROCEED with the magnetic band fixing, removing progressively the adhesive protection and exerting a uniform pressure. If possible, use a small manual roller.
- PROCEED as above to glue the stainless steel cover tape on the magnetic band, after having accurately cleaned the surface.
- USE the exceeding part of the protective cover tape for its mechanical fixing and ground connection, by means of CH screws M3x8 ⑤.

5. AGM-2 SENSOR MOUNTING

WARNING

Before turning on the sensor, make sure it is mounted correctly.

Use the two M4 threaded holes to fix the magnetic sensor. As an alternative, they can be used as through holes for TCEI M3 screws of suitable length.

For the zero definition and for the sensor and magnetic band mounting, please refer to the picture below.

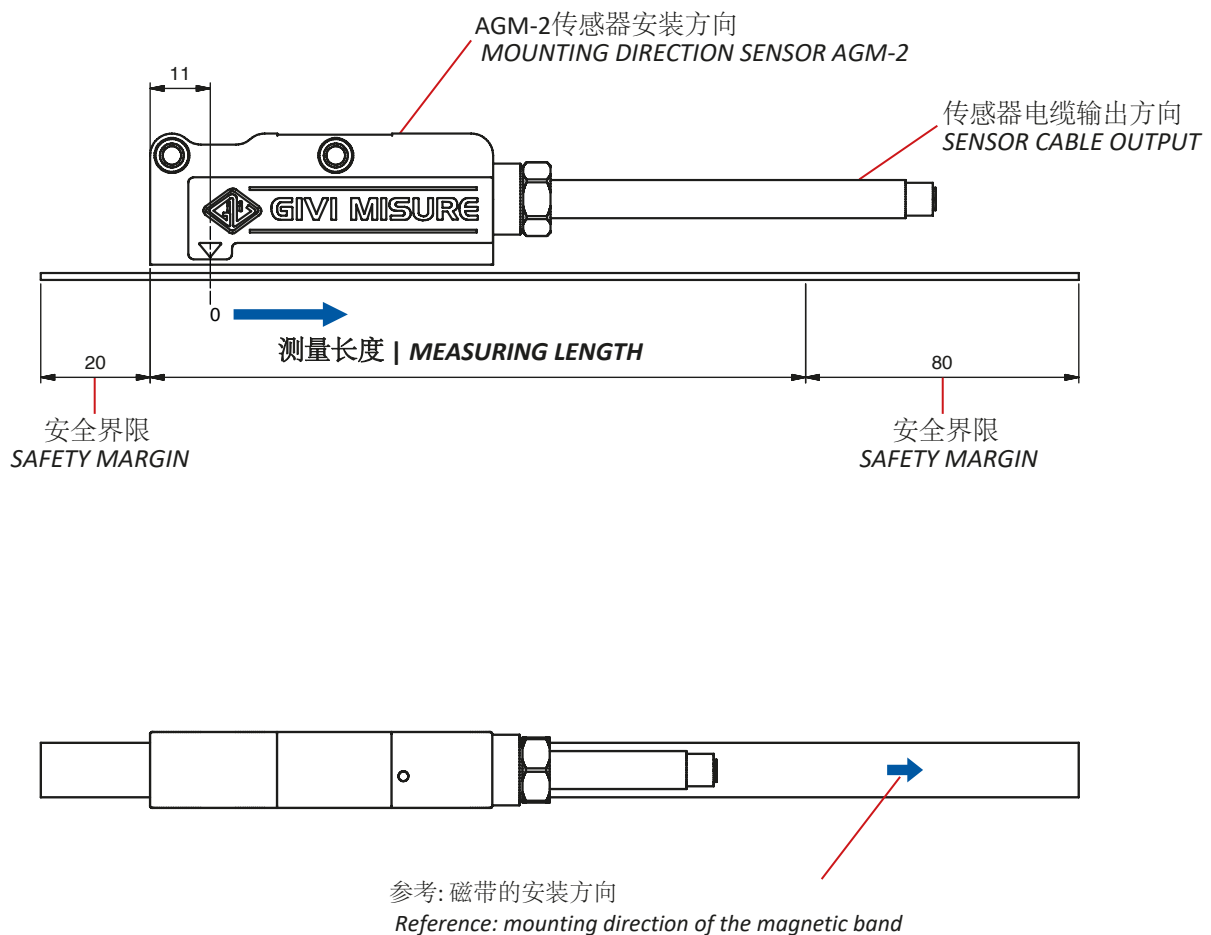
一旦机械安装完成，放置电源线并手动覆盖整个测量长度，以确保传感器和电缆能够不受干扰地移动。

检查整个测量长度上的对准公差以及传感器和磁带之间的距离。任何定位错误都必须得到纠正。

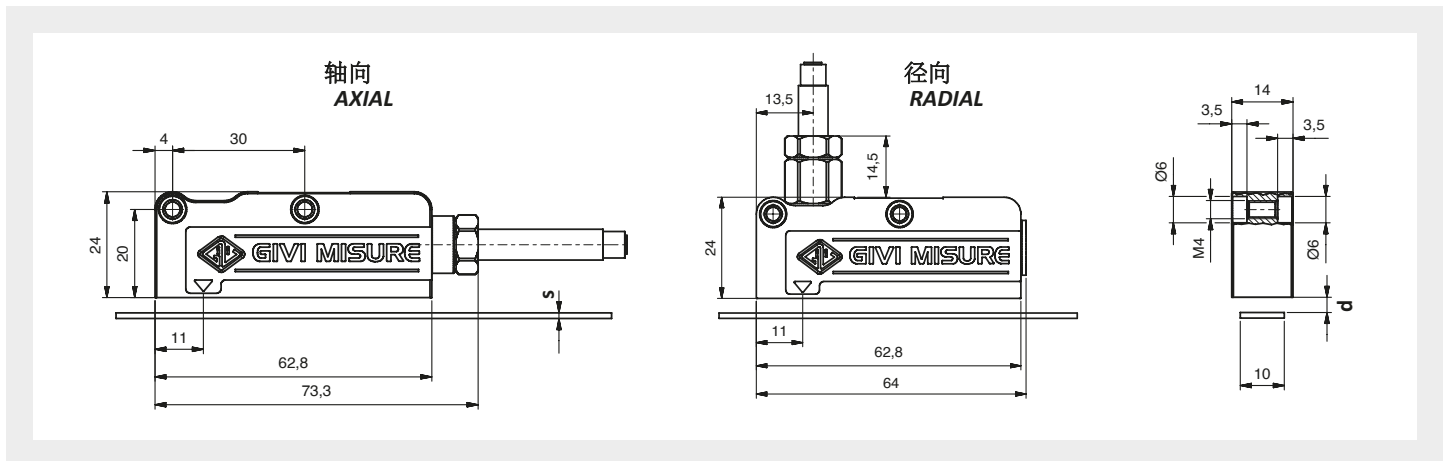
间隔块或支撑臂应该有足够的尺寸和硬度，以排除任何可能影响系统精度的弯曲或振动。

- Once the mechanical mounting has been concluded, place the power supply cable and manually cover the entire measuring length to make sure that both the sensor and the cable are able to move without interferences.
- Check the respect of the alignment tolerances and the distance between the sensor and the magnetic band along the entire measuring length. Any positioning error must be corrected.
- Spacer blocks or supporting arms should be adequately sized and made rigid to exclude any flexion or vibration that could compromise the system's accuracy.

MP200A方向 | ORIENTATION MP200A



尺寸及钻孔图 | DIMENSIONS AND DRILLING DIAGRAM

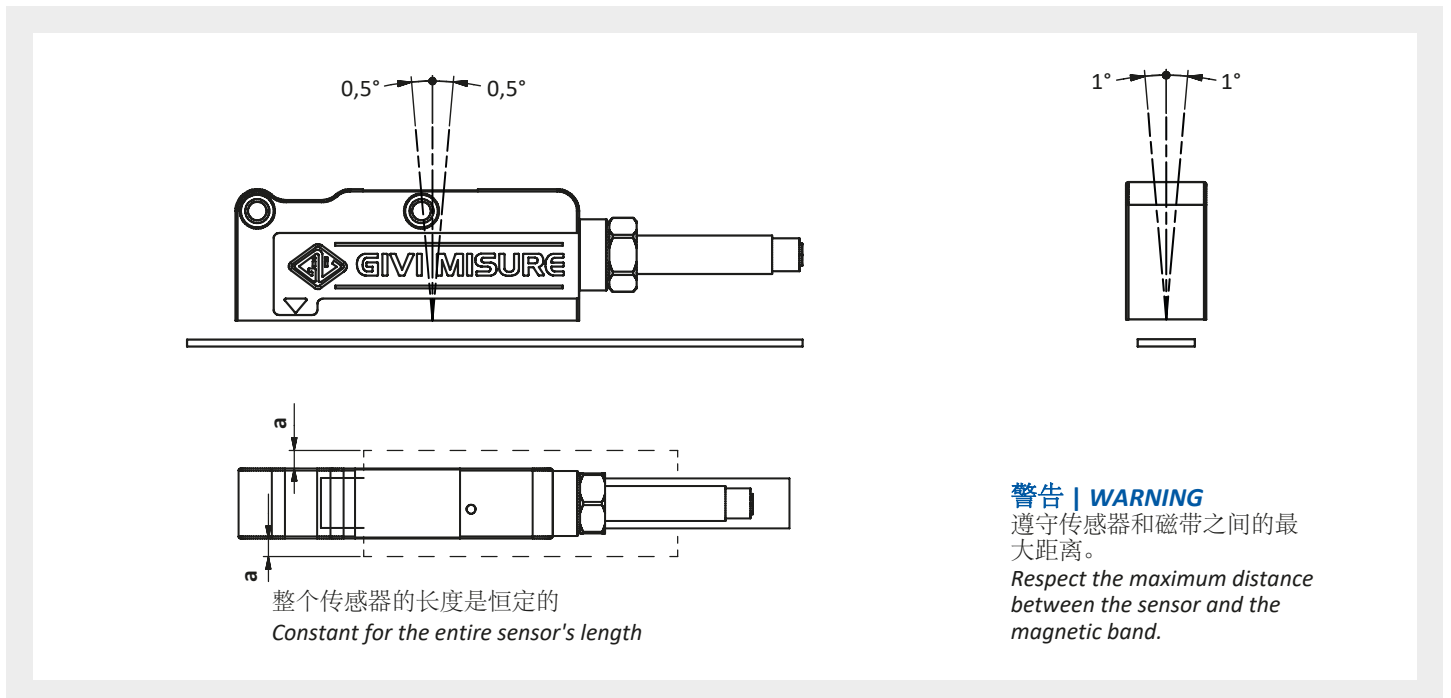


	MP200A	MP200A + CV103	MP200A + SP202
s (mm)	1,3	1,6	2,1
d (mm)	0,4 ÷ 1	0,7 _{MAX}	0,2 _{MAX}

s = 不含双面胶的厚度。带双面胶的厚度 + 0.1 mm。
Thickness without double-sided tape. Thickness with double-sided tape + 0.1 mm.

d = 传感器和磁带（或最终的盖子/ 支架）表面之间要保持的距离。
Distance to be maintained between sensor and surface of the magnetic band (or eventual cover/support).

定位公差 | ALIGNMENT TOLERANCES



警告 | WARNING
遵守传感器和磁带之间的最大距离。
Respect the maximum distance between the sensor and the magnetic band.

	AGM-2
a (mm)	0,5 _{MAX}

a = 定位公差 | Alignment tolerance

6. 电缆和电气连接

串行 + 模拟输出

AGM-2 绝对磁传感器提供了一条10芯屏蔽电缆 $\phi = 6,2$ mm, PUR外部护套, 摩擦系数低, 耐油, 适合连续运动。在电缆内部还有一个用于数字信号 (SSI - BiSS) 的双绞线的屏蔽层。

导体截面:

- 电源: 0,30 mm²
- 信号: 0,10 mm²

注意

电缆的弯曲半径不应低于 80 mm。

有以下输出信号可用:

信号	线芯颜色
+V	红
0V	蓝
A	绿
\bar{A}	橙
B	白
\bar{B}	浅蓝
CK	棕
\bar{CK}	黄
D	粉
\bar{D}	灰
SCH	屏蔽

6. CABLES AND ELECTRICAL CONNECTIONS

SERIAL + ANALOG OUTPUT

The AGM-2 absolute magnetic sensor is supplied with a 10-wire shielded cable $\phi = 6.2$ mm, PUR external sheath, with low friction coefficient, oil-resistant and suitable for continuous movements. Inside the cable a further shield for the twisted pair of the digital signals (SSI - BiSS) is present.

Conductors section:

- power supply: 0.30 mm²
- signals: 0.10 mm²

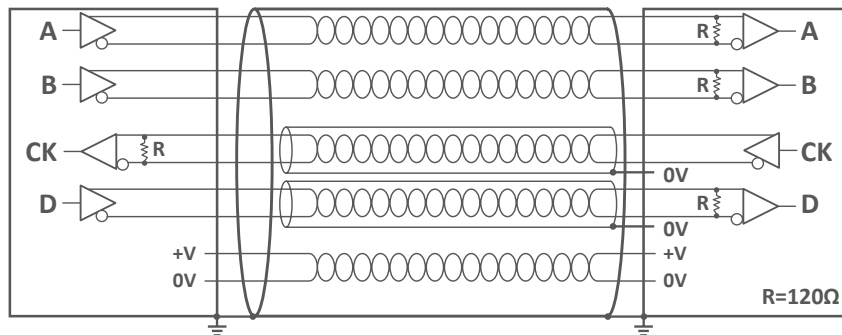
NOTE

The cable's bending radius should not be lower than 80 mm.

The following output signals are available:

SIGNALS	CONDUCTOR COLOR
+V	Red
0V	Blue
A	Green
\bar{A}	Orange
B	White
\bar{B}	Light-blue
CK	Brown
\bar{CK}	Yellow
D	Pink
\bar{D}	Grey
SCH	Shield

AGM-2



串行输出

AGM-2 绝对磁传感器提供 6 芯屏蔽电缆 $\phi = 6,2 \text{ mm}$, PUR外部护套, 摩擦系数低, 耐油, 适合连续运动。

导体部分:

- 电源: $0,35 \text{ mm}^2$
- 信号: $0,25 \text{ mm}^2$

注意

电缆的弯曲半径不应低于 70 mm 。

有以下输出信号可用:

信号	线芯颜色
+V	棕
0V	白
CK	绿
$\overline{\text{CK}}$	黄
D	粉
$\overline{\text{D}}$	灰
SCH	屏蔽

符合 DIN 47100.

SERIAL OUTPUT

The AGM-2 absolute magnetic sensor is supplied with a 6-wire shielded cable $\phi = 6.2 \text{ mm}$, PUR external sheath, with low friction coefficient, oil-resistant and suitable for continuous movements.

Conductors section:

- power supply: 0.35 mm^2
- signals: 0.25 mm^2

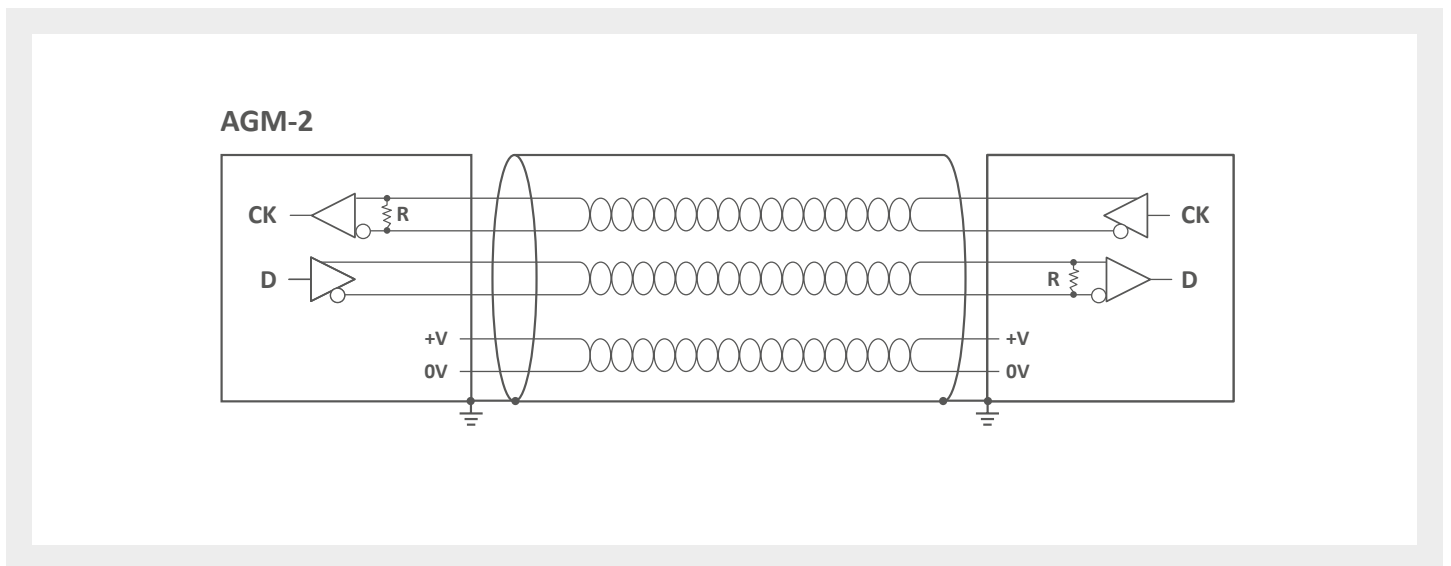
NOTE

The cable's bending radius should not be lower than 70 mm .

The following output signals are available:

SIGNALS	CONDUCTOR COLOR
+V	Brown
0V	White
CK	Green
$\overline{\text{CK}}$	Yellow
D	Pink
$\overline{\text{D}}$	Grey
SCH	Shield

Complying to DIN 47100.



避免将电缆放置在任何可能造成电磁干扰的设备旁边 (电机、电磁阀、变频器)。

如果检测到干扰, 使用EMC滤波器直接对干扰源采取行动。

Avoid locating the cable next to any device that may cause electromagnetic interferences (motors, solenoid valves, inverters).

If interferences are detected, act directly on the source of disturb using EMC filters.

如果需要延长电缆，有必要使用截面至少为 0.5 mm² 的屏蔽电缆用于供电，0.25 mm² 用于信号。

电缆的电容应为: $C \leq 90 - 100 \text{ pF/m}$.

If cable extensions are needed, it is necessary to use shielded cables with a section of at least 0.5 mm² for power supply and 0.25 mm² for signals.

The cable capacity should be: $C \leq 90 - 100 \text{ pF/m}$.

	SSI			BiSS			
电缆长度 <i>Cable length</i>	≤ 10 m	≤ 20 m	≤ 50 m	≤ 2 m	≤ 10 m	≤ 20 m	≤ 50 m
时钟频率 <i>Clock frequency</i>	1,2 MHz	0,4 MHz	0,2 MHz	8 MHz	4 MHz	1 MHz	0,4 MHz

该传感器提供了一条标准的2m长的电缆，适用于连续运动，但也可能需要更长的长度。

在确保传感器的最低电源为5V的情况下，最大的电缆长度可以延长到 50 m。

在延长电缆的情况下，有必要保证:

- 连接器的主体和电缆屏蔽之间的电气连接;
- 传感器的最低电源电压为5V。

The sensor is supplied with a standard 2-m long cable, suitable for continuous movements, but longer lengths can be required.

Ensuring a minimum power supply of 5 V to the sensor, the maximum cable length can be extended to 50 m.

In case of cable extension, it is necessary to guarantee:

- *the electrical connection between the body of the connectors and the cables shield;*
- *a minimum power supply voltage of 5 V to the sensor.*

7. 通过LED发出警告

AGM-2传感器配备了一个RGBW的LED灯，用来显示读取系统的正确功能:

LED 绿色: 正确操作

LED 红色: 位置读取不正确

LED 黄色: 绝对位置的读取正在进行

导致绝对位置读数错误的可能原因:

- 存在一个改变传感器读数的外部磁场;
- 传感器没有正确地与磁带对齐;
- 传感器和磁带没有在指定的公差范围内对齐 (见本手册中 "对齐公差" 一段);
- 磁带的某个部分被损坏或消磁;

7. WARNINGS THROUGH LED

The AGM-2 sensor is equipped with a LED RGBW that signals the correct functioning of the reading system:

Green LED: *correct operation*

Red LED: *incorrect reading of the position*

Yellow LED: *absolute position reading in progress*

Possible causes of a wrong reading of the absolute position are:

- *presence of an external magnetic field that alters the sensor's reading;*
- *the sensor is not properly aligned with the magnetic band;*
- *the sensor and the magnetic band are not aligned within the indicated tolerances (see the paragraph "Alignment Tolerances" in this manual);*
- *a section of the magnetic band is damaged or demagnetized;*

- 传感器和磁带的安装方向相反；
- 传感器没有完全定位在磁带上方；
- 传感器不能正常工作。

恢复系统的正常功能：

- 确认没有外部磁场；
- 验证传感器的正确安装并纠正任何错位；
- 检验传感器上的箭头和磁带上的箭头是否有相同的方向；
- 尝试在不同的阅读区域移动传感器。

如果执行这些操作后，LED仍然是红色，请联系制造商。

错误信号

Biss版本

如果传感器检测到一个错误的位置，它将降低错误和报警位，并传输最后的有效位置；在这个阶段，LED是红色的。

SSI版本

如果传感器检测到一个错误的位置，它将降低错误位（如果激活），并传输最后的有效位置。如果错误位没有激活，则传输一个0位置；在此阶段，LED为红色。

传感器通电时的错误

当通电时，传感器只有在检查了系统的正确功能后才会读取绝对位置。在这段时间内（约0.3秒），传感器不处于活动状态，串行线路上不应该出现位置请求。在正确读取绝对位置后，传感器准备好传送位置（传感器发出数据信号）；在这一阶段，LED灯为绿色。如果传感器没有读到绝对位置，它将保持在读取的初始阶段；在这个阶段，LED灯变成黄色。

- the sensor and the magnetic band are mounted in the opposite direction;
- the sensor is not completely positioned over the magnetic band;
- the sensor does not work properly.

TO RESTORE THE PROPER FUNCTIONING OF THE SYSTEM:

- verify the absence of external magnetic fields;
- verify the proper installation of the sensor and correct any misalignment;
- verify that the arrows on the sensor and on the magnetic band have the same direction;
- try to move the sensor in a different reading area.

If the LED remains red even after performing these operations, please contact the Manufacturer.

ERROR SIGNAL

Biss Version

If the sensor detects a wrong position, it lowers the Error and Alarm bits and transmits the last valid position; in this phase, the LED is red.

SSI Version

If the sensor detects a wrong position, it lowers the Error bit, if active, and the last valid position is transmitted. If the Error bit is not active, a 0 position is transmitted; in this phase, the LED is red.

ERROR AT THE SENSOR'S POWER ON

When powered on, the sensor reads the absolute position only after having checked the correct functioning of the system. In this time (about 0.3 sec), the sensor is not active and requests for positions should not be present on the serial line.

After having properly read the absolute position, the sensor is ready to transmit the position (the sensor raises the DATA signal); in this phase, the LED is green.

If the sensor does not read the absolute position, it remains in the initial phase of reading; in this phase, the LED turns yellow.

警告

如果传感器部分定位在磁带上，可能会验证一个错误的绝对位置。

WARNING

If the sensor is partially positioned over the magnetic band, it could validate a wrong absolute position.

**克服错误状况
(热启动)**

如果检测到一个错误的位置，传感器发出上述的错误信号。

然后，传感器按照这个程序获得一个新的绝对位置：

- 1 传感器读取磁带的存在。
- 2 一旦检测到磁带的存在，传感器就会获得绝对位置。

警告

如果传感器的位置不正确，它可能会验证一个错误的绝对位置。

- 3 一旦绝对位置被读取，传感器就克服了错误阶段，绿色LED灯亮起。

**OVERCOMING AN ERROR CONDITION
(WARM START)**

If a wrong position is detected, the sensor signals the error as described above.

Then, the sensor acquires a new absolute position, following this procedure:

- 1 The sensor reads the presence of the magnetic band.
- 2 Once the presence of the magnetic band has been detected, the sensor acquires the absolute position.

WARNING

If the sensor is not properly positioned, it could validate a wrong absolute position.

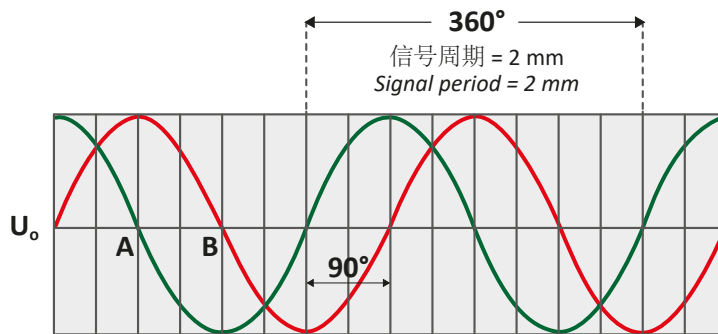
- 3 Once the absolute position has been read, the sensor overcomes the error phase and the green LED lights up.

8. 输出信号

1 VPP增量信号

8. OUTPUT SIGNALS

1 VPP INCREMENTAL SIGNALS



信号 Signals	信号振幅 Signals amplitude	参考电源 U ₀ Reference voltage U ₀	A 和 B 相位差 A and B phase displacement	最大频率 (在 600 m/min) Max. frequency (at 600 m/min)
A, \bar{A} , B, \bar{B}	0,8 Vpp ÷ 1,2 Vpp 典型 1 Vpp typical 1 Vpp	≈ 2,2 V	90° ± 10° 电气 electrical	5 kHz

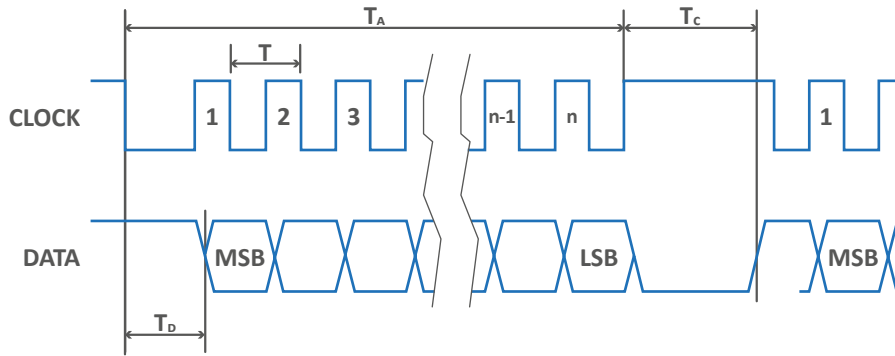
信号振幅是指以120Ω阻抗和5V±5%电源电压对传感器进行差分测量所得值。

Signals amplitude is referred to a differential measurement made with 120 Ω impedance and power supply voltage to the sensor of 5 V ± 5%.

串行信号

SERIAL SIGNALS

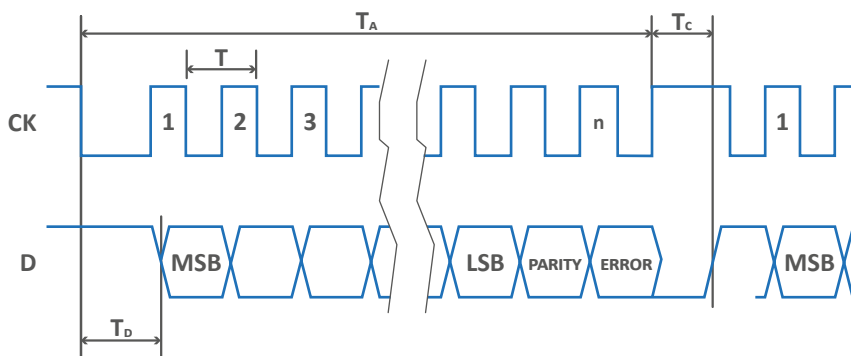
SSI版本 | SSI Version



接口 Interface	信号电平 Signals level	时钟频率 Clock frequency	n	TA	TC	TD
SSI (同步串行接口) 二进制码 - 格雷码 SSI (Synchronous Serial Interface) Binary - Gray	EIA RS 422	0,2 ÷ 1,2 MHz * 占空比 50% ± 10%	位置位 Position bit	时钟序列 Clock sequence	max. 25 µs	max. 7 µs

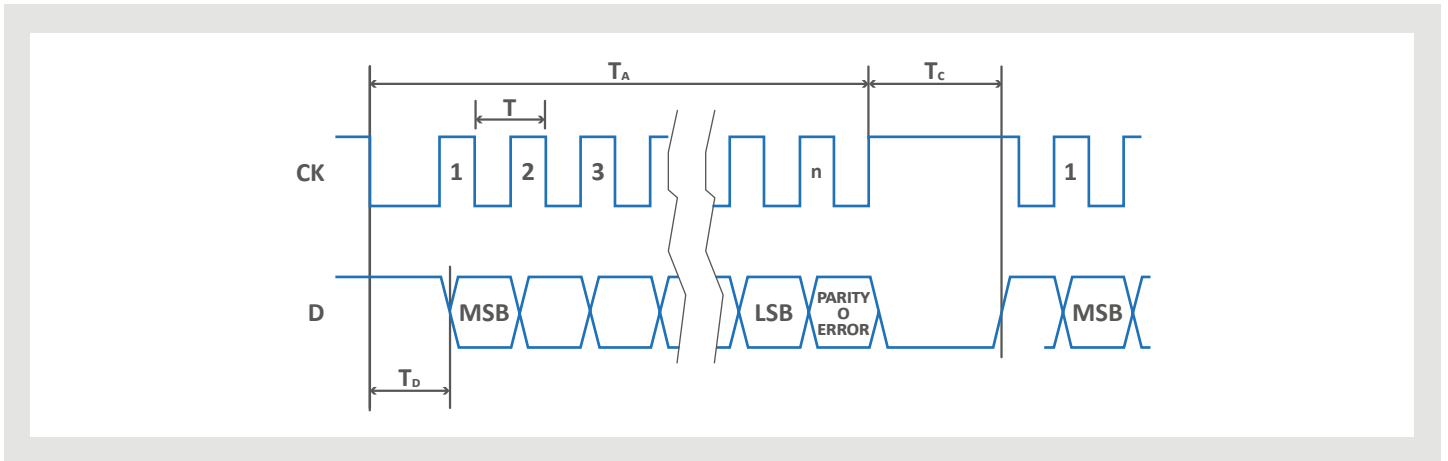
* 在电缆长度不超过2m的情况下，可以保证最高频率。 The maximum frequency is guaranteed with a cable length up to 2 m.

SSI 版本 | SSI Version



接口 Interface	n
SSI (同步串行接口) 二进制 SSI (Synchronous Serial Interface) Binary	位置位 + 校验 + 错误 Position bit + Parity + Error

SSI版本 | SSI Version



接口 Interface	n
SSI (同步串行接口) 二进制 SSI (Synchronous Serial Interface) Binary	位置位 + 校验 Position bit + Parity
	位置位 + 错误 Position bit + Error

SSI协议参数

位置位

传输的位数由所需的分辨率决定。
该值的传输带有符号。

PARAMETERS FOR SSI PROTOCOL

Position bit

The number of bit transmitted is determined by the resolution required.
The value is transmitted with sign.

读取分辨率 | Reading resolution

分辨率 Resolution	1 μm	5 μm	10 μm	50 μm	100 μm	500 μm
N° 位置位 N° of position bit	28 bit	24 bit			20 bit	

可选位

- ▶ **校验:** 传输奇校验或偶校验的附加位。
- ▶ **错误:** 它表示读取绝对位置时出错。
错误位 = 1 绝对位置正确
错误位 = 0 绝对位置错误

Optional bit

- ▶ **Parity:** an additional bit for odd parity or even parity is transmitted
- ▶ **Error:** it signals an error in reading the absolute position
Error bit = 1 absolute position ok
Error bit = 0 absolute position wrong

编码

用于传输位置的代码是二进制或格雷格式的。如果使用格雷码，就不可能在传输的帧中有可选的位。

Code

The code used for the transmission of the position is in binary or Gray format. In case the Gray format is used, it is not possible to have the optional bit in the transmitted frame.

刷新时间

在T_c周期结束时，传感器提供一个新的位置。
如果不需要新的位置，传感器每25微秒刷新一次位置。

Refresh time

At the end of T_c period, the sensor provides a new position.
If a new position is not required, the sensor refreshes its position every 25 μs.

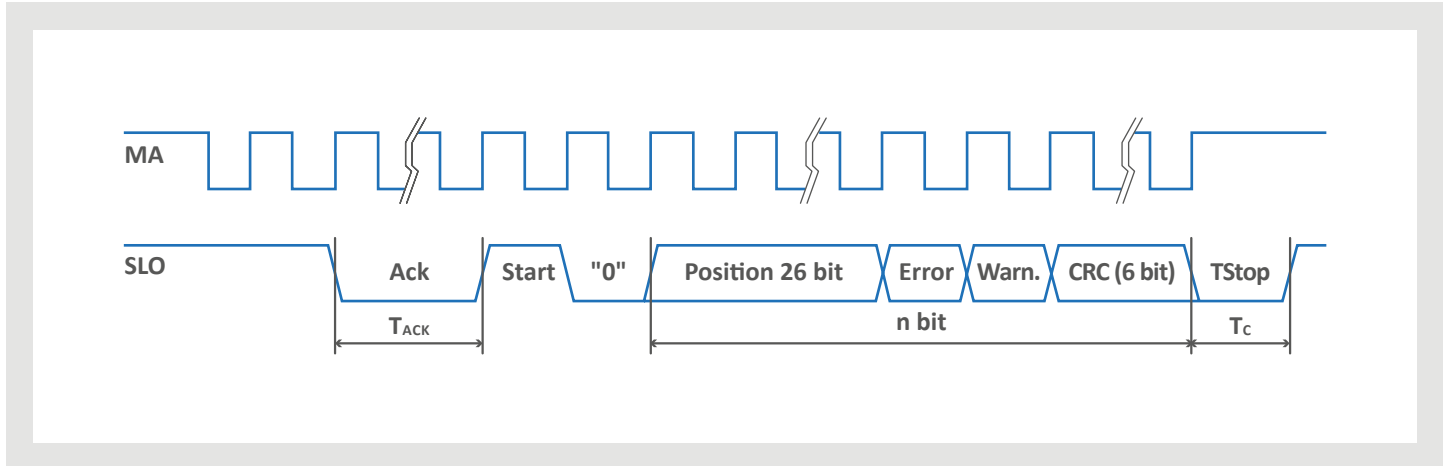
SSI 超时

在串行线路出现错误/中断的情况下，传感器在 1600 μs 的时间内回到 "准备" 状态。

SSI timeout

In case of error/interruption of the serial line, the sensor goes back in the "ready" status after a period of 1600 μs.

BiSS C (单向) 版本 | BiSS C (unidirectional) Version



接口 Interface	信号电平 Signals level	时钟频率 Clock frequency	n	T _c	T _{ACK}
BiSS C 单向 BiSS C unidirectional	EIA RS 485 / RS 422	0,4 ÷ 8 MHz * 占空比 50% ± 10%	26 + 2 + 6 bit	max 25 μs	3 Clock

* 在电缆长度不超过2m的情况下，可以保证最高频率。 | The maximum frequency is guaranteed with a cable length up to 2 m.

BiSS C 单向协议的参数

位置位

该值以 26 位的符号传输。

- ▶ **错误:** 它表示绝对位置读数有错误
 错误位 = 1 绝对位置正确
 错误位 = 0 绝对位置错误
- ▶ **报警:** 它表示阅读困难
 报警位 = 1 读取正确
 报警位 = 0 读取困难

刷新时间

在 T_c 周期结束时，传感器提供一个新位置。如果不需要新位置，传感器会每 2000 μs 刷新一次位置。

BiSS 超时

如果串行线路出现错误/中断，传感器会在 400 μs 后返回“就绪”状态。

PARAMETERS FOR BiSS C UNIDIRECTIONAL PROTOCOL

Position bit

The value is transmitted with sign at 26 bit.

- ▶ **Error:** it signals an error in the absolute position reading
 Error bit = 1 absolute position ok
 Error bit = 0 absolute position wrong
- ▶ **Warning:** it signals a reading difficulty
 Warning bit = 1 reading ok
 Warning bit = 0 difficulty in reading

Refresh time

At the end of T_c period, the sensor provides a new position. If a new position is not required, the sensor refreshes its position every 2000 μs.

BiSS timeout

In case of error/interruption of the serial line, the sensor goes back in the "ready" status after a period of 400 μs.

CRC6 多项式

CRC 6 位取反，多项式 0x43，MSB 作为帧的第一位。

CRC6 polynomial

CRC at 6 bit inverted, with polynomial 0x43, MSB as first bit of the frame.

9. 传感器的技术特性

下图（精度、插值-SDE和重复性）显示了在一个计量室中在受控气候条件下进行的测试。T = 20 °C ± 0.1 °C，U.R.= 45 ÷ 55%。用于比较位置测量的参考系统是具有1纳米分辨率的干涉测量，并配备了环境补偿装置。传感器按照推荐的机械配置安装，与磁带的距离为0.5mm。

精度图: 传感器测量的数值与参考系统测量的数值之间的偏差。

SDE (插值误差) 图: 单极间距内插补装置的精度。

重复精度图: 通过在两个前进方向上进行多次测量获得。

- 单向重复性: 在不改变传感器的运动方向的情况下检测到的测量误差。
- 滞后性: 由于传感器运动方向的反转而导致的测量差异。

9. SENSOR TECHNICAL CHARACTERISTICS

The following graphs (accuracy, interpolation-SDE and repeatability) show tests carried out in a metrological room under controlled climatic conditions: T= 20 °C ± 0.1 °C and R.H.= 45 ÷ 55%. The reference system for the comparison of position measurements is interferometric with 1 nm resolution and equipped with an environmental compensation device. The sensor is installed according to the recommended mechanical configuration at a distance of 0.5 mm from the magnetic band.

Accuracy graph: deviation between the value measured by the sensor and the value measured by the reference system.

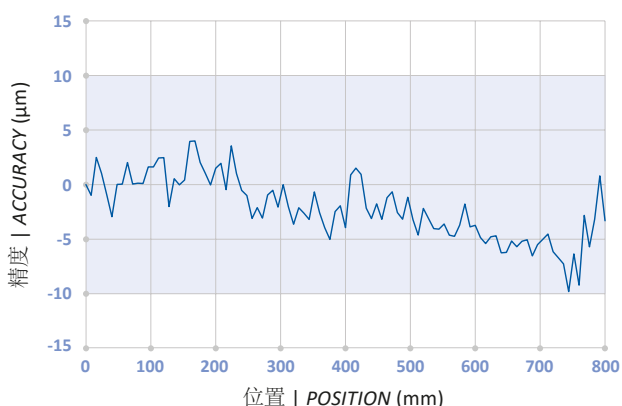
SDE (sub-division error) graph: accuracy of the interpolation device within the single pole pitch.

Repeatability graph: obtained by carrying out the measurements several times in both directions of advancement.

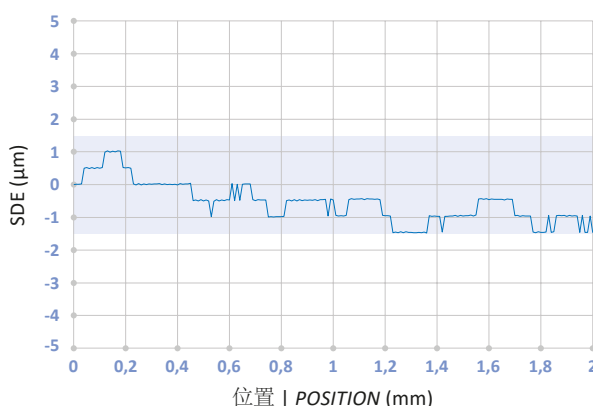
● Unidirectional repeatability: measurement error detected without inverting the movement direction of the sensor.

● Hysteresis: difference in the measure due to the inversion of the sensor movement direction.

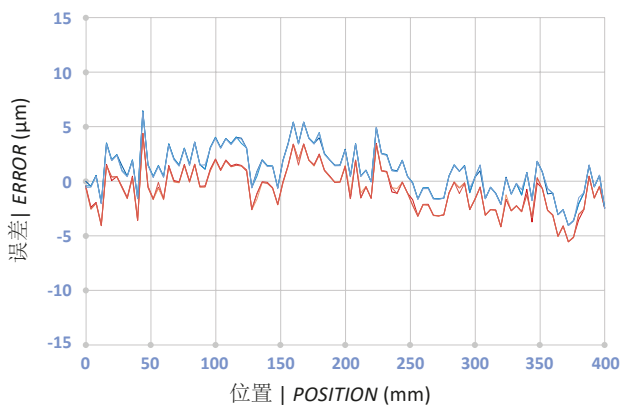
精度 | ACCURACY



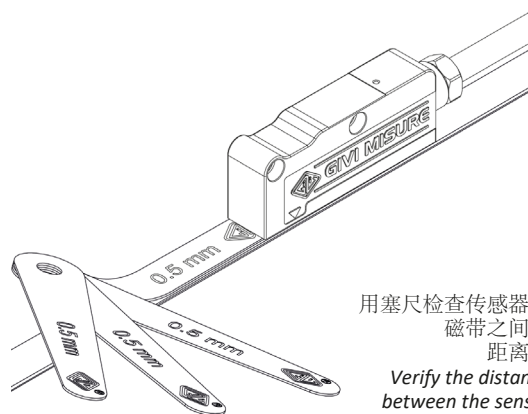
插值误差 | INTERPOLATION - SDE



重复精度 | REPEATABILITY



■ 正向 | 向正方向运动 ■ 反向 | 向负方向运动



用塞尺检查传感器与磁带之间的距离。
Verify the distance between the sensor and the magnetic band with the feeler gauge.

极距 <i>Pole pitch</i>	2+2 mm
增量信号 <i>Incremental signal</i>	正弦波 1 Vpp (可选) <i>sine wave 1 Vpp (optional)</i>
1 Vpp分辨率 <i>Resolution 1 Vpp</i>	高达 1 μm <i>up to 1 μm *</i>
信号周期 <i>Signal period</i>	2 mm
串行接口 <i>Serial interface</i>	SSI - BiSS C (单向 <i>unidirectional</i>)
绝对位置分辨率 <i>Resolution absolute position</i>	500 - 100 - 50 - 10 - 5 - 1 μm
精度等级 <i>Accuracy grade</i>	± 10 μm **
插值误差 (SDE) <i>Interpolation error (SDE)</i>	± 1,5 μm ***
单向重复精度 <i>Unidirectional repeatability</i>	± 0,5 μm ***
滞后性 <i>Hysteresis</i>	2 μm ***
测量长度 ML <i>Measuring length ML</i>	高达 30000 mm <i>up to 30000 mm</i>
最大移动速度 <i>Max. traversing speed</i>	600 m/min
抗震性 <i>Vibration resistance (EN 60068-2-6)</i>	200 m/s ² [55 ÷ 2000 Hz]
防护等级 <i>Protection class (EN 60529)</i>	IP 67
工作温度 <i>Operating temperature</i>	-20 °C ÷ 75 °C
储存温度 <i>Storage temperature</i>	-40 °C ÷ 80 °C
相对湿度 <i>Relative humidity</i>	100%
电源 <i>Power supply</i>	5 ÷ 24 Vdc ± 5%
电流消耗 <i>Current consumption</i>	200 mA _{MAX} (con <i>with R = 120 Ω</i>) 5 Vdc 80 mA _{MAX} (con <i>with R = 1200 Ω</i>) 24 Vdc
最大电缆长度 <i>Max. cable length</i>	20 m ****
电气连接 <i>Electrical connections</i>	见相关表格 <i>see related table</i>
电气保护 <i>Electrical protections</i>	反极性和短路 <i>inversion of polarity and short circuits</i>
重量 <i>Weight</i>	80 g

* 取决于 CNC 的细分系数。| *Depending on CNC division factor.*

** 所声明的 ± X μm 精度等级是指 1 m 的测量长度。| *The declared accuracy grade of ± X μm is referred to a measuring length of 1 m.*

*** 声明的误差受校准公差的影响。| *The error declared is subject to the respect of the alignment tolerances.*

**** 确保传感器的最小电源为 5 V，最大电缆长度可延长至 50 m。| *Ensuring a minimum power supply of 5 V to the sensor, the maximum cable length can be extended to 50 m.*

10. 磁带技术特性

MAGNETIC BAND TECHNICAL CHARACTERISTICS

MP200A

极距 <i>Pole pitch</i>	2+2 mm
精度等级 <i>Accuracy grade</i>	± 20 µm 标准版 <i>standard version</i> * ± 10 µm 特别版 <i>special version</i> *
宽度 <i>Width</i>	10 mm
厚度 <i>Thickness</i>	1,3 mm 不含胶带 <i>without double-sided tape</i> + 0,1 mm 含胶带 <i>with double-sided tape</i>
最大长度 <i>Maximum length</i>	30 m
线性热膨胀系数 <i>Linear thermal expansion coefficient</i>	10,5 x 10 ⁻⁶ °C ⁻¹ T ref. = 20 °C ± 0,1 °C
弯曲半径 <i>Bending radius</i>	130 mm _{MIN}
工作温度 <i>Operating temperature</i>	-20 °C ÷ 70 °C
储存温度 <i>Storage temperature</i>	-20 °C ÷ 80 °C
磁带重量 <i>Magnetic band weight</i>	65 g/m
盖重量 <i>Cover weight</i>	25 g/m

* 所声明的 ± X µm 精度等级是指 1 m 的测量长度。 | *The declared accuracy grade of ± X µm is referred to a measuring length of 1 m.*

11. 使用和维护

磁带和 AGM-2 传感器不需要任何特殊维护。正确安装、遵守安装说明以及正确使用可保证质量和良好的运行。

如有任何不符，应向制造商报告，以便修理或更换有缺陷的零件。

维护后，验证安装公差并调整任何最终的不对准。

警告

为保持系统的准确性，请勿对磁带施加机械压力。磁条必须始终以相同的方式卷（塑性铁氧体朝外），最小直径为 250 mm。

11. USE AND MAINTENANCE

The magnetic band and the AGM-2 sensor do not require any particular maintenance. A proper installation, complying with the mounting instructions, and the correct use guarantee quality and good operation.

Any discrepancy should be reported to the Manufacturer for repairing or replacement of defective parts.

After maintenance, verify the mounting tolerances and adjust any eventual misalignment.

WARNING

To preserve the accuracy of the system, do not stress mechanically the magnetic band.

The magnetic band has to be rolled always in the same way (plastoferrite towards the outside), with a minimum diameter of 250 mm.

12. 保修条款

AGM-2 传感器自购买之日起 24 个月内保证不会出现制造故障。任何维修必须在制造商的场所进行，客户应安排交付产品，并承担其风险和费用。

由于不遵守这些说明或安装公差而导致保修条款失效，制造商被免除任何损害索赔。

保修不提供那些因疏忽或误用、不正确的安装或维护、由未经授权的人员进行的维护、运输或任何其他排除了产品制造故障的情况而损坏的部件的维修和/或更换。

同样，如果序列号或识别产品的任何数据被取消或以任何方式改变，以及如果未经制造商书面授权而对产品进行修改，则保修不适用。

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13. 处置

废弃电子电气设备的处理。欧洲议会指令2012/19/UE。



使用WEEE标志表明，本产品不得作为家庭废物处理。如果本产品得到正确处理，你将有助于保护环境。

有关本产品回收的更多详细信息，请联系当地政府、家庭废物处理服务提供商或您购买本产

品的零售商。

根据2012/19/EU欧洲议会指令，本信息仅涉及欧洲客户。对于其他国家，请参考当地法律要求。

在没有事先通知的情况下，产品可能会被修改，制造商保留在认为有必要时对产品进行改进的权利。

12. WARRANTY TERMS

The AGM-2 sensor is guaranteed against manufacturing faults for a period of twenty-four months from the date of purchase. Any repair must take place at the Manufacturer's premises and the Customer shall arrange the delivery of the product, at its own risk and expense.

The Manufacturer is released from any claim against damages due to the non-observance of these instructions or mounting tolerances which causes the annulment of the warranty terms.

The warranty does not provide for repairing and/or replacement of those parts that have been damaged by negligence or misuse, improper installation or maintenance, maintenance performed by unauthorized personnel, transport or any other circumstance that excludes a manufacturing fault of the product.

Similarly, the warranty does not apply if serial numbers or any data identifying the product are cancelled or altered in any way, and if product modifications are introduced without the written authorization of the Manufacturer.

The Manufacturer declines any responsibility for damages to people or properties deriving from the use of the product, including any loss of profit or any other direct, indirect or incidental loss.

13. DISPOSAL

Disposal of waste electrical and electronic equipment (WEEE). European Council Directive 2012/19/EU.



The use of the WEEE Symbol indicates that this product may not be treated as household waste.

If this product is disposed correctly, you will help to protect the environment.

For more detailed information about the recycling of this product, please contact your local authority, your household waste disposal service provider or the retailer where you purchased the product.

This information regards only European customers, according to 2012/19/EU European Parliament Directive.

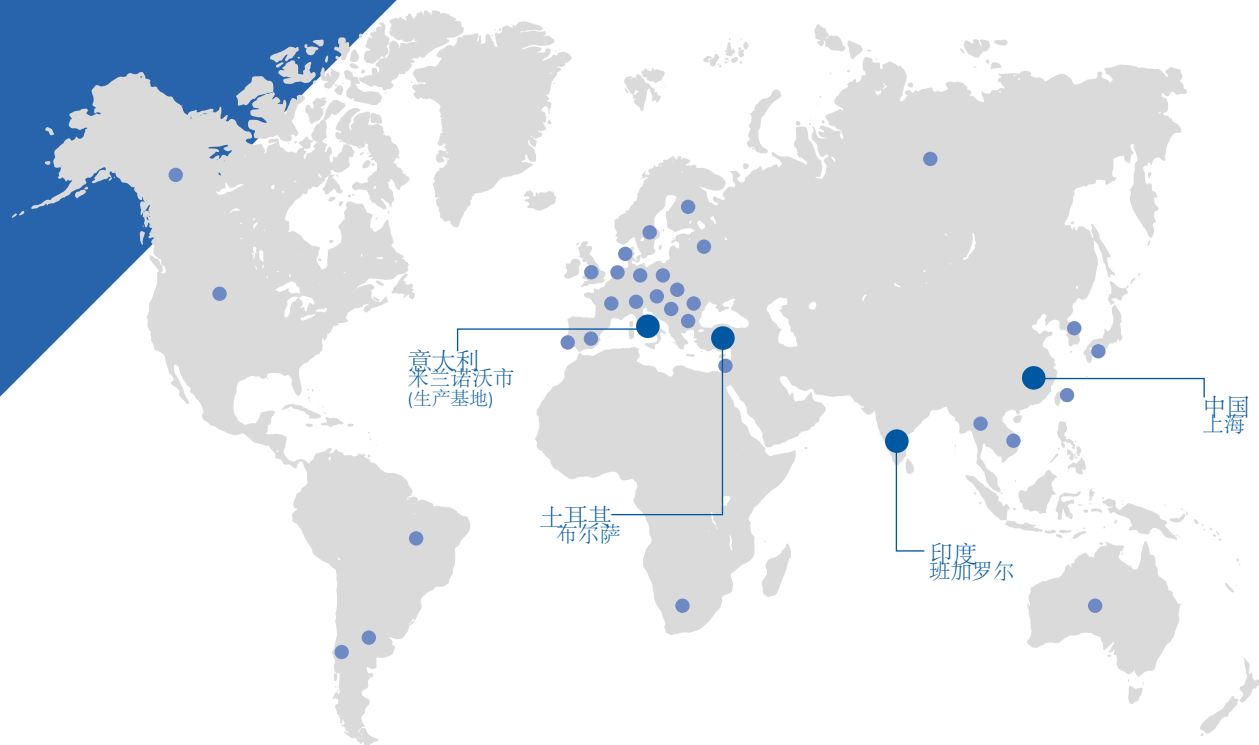
For other Countries, please refer to local law requirements.

Without prior notice, the products may be subject to modifications that the Manufacturer reserves to introduce as deemed necessary for their improvement.

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