土建及建筑机械、

起重机技术和起重设备技术



CONSTRUCTION MACHINES, CRANE AND LIFTING TECHNOLOGY









用于土建建筑机械以及起重机和起 重设备技术的智能式传感器

用于土建建筑机械和起重机及起重设备 技术领域的传感器,直线式和旋转式位 置检测、以及倾斜度和速度检测。

优势:

- 高度的灵活性和坚固耐用性
- 安全式传感器的性能等级高达 PLd
- 高达 IP6K9K 的高度防护等级
- 温度范围 (零下40°C 至 零上 105°C)
- 传感器具备 E1 认证许可
- 高度的电磁兼容性
- 传感器具备 PURE.MOBILE 尖端技术
- 100% 聚焦于移动式机械

Innovative sensors for construction machines, crane and lifting technology

Sensors for linear and rotary position detection and detection of inclination and speed in construction machines and in crane and lifting technology.

Advantages:

- High flexibility and durability
- Safety sensors up to PLd
- High protection class up to IP6K9K
- Temperature ranges from (-40 °C ... + 105 °C)
- Sensors with E1 certification
- High electro-magnetic compatibility
- Sensors with PURE.MOBILE technology
- 100% focus on mobile machines

SIKO-里程碑

SIKO MILESTONES

1963

第一个产品创意: 带集成模拟式显示器的手 轮,由 Dr.-Ing. Gunther Wandres 博士创建开发。

The first product idea: a handwheel with an integrated analogue indicator. Dr.-Ing. Günther Wandres founded SIKO GmbH.



2009

安全第一: 开发出第一 款带模拟接口的冗余式 安全拉绳编码器。

Safety first: Development of the first redundant safety draw-wire encoder with analog interface.







1978

2010

器。

Introduction of the first

MEMS-based inclination

sensor for applications

in mobile machines and

renewable energies.

开发出第一款用于位置检 测的齿轮电位器——电子 式绝对旋转位置测量方式 的起始。

First geared potentiometer for position detection is developed. The start into the electronic absolute rotary position measurement.

1982

位置测量技术的电子时代 开始了,开发出测量显示 器和第一款电子式空心轴 编码器。

The electronic era of position measurement technology begins; Electronic displays and the first electronic hollow shaft encoders are developed.



首次推出磁性测量原 理 (MagLine) 和拉绳 编码器。

Introduction of the measuring principle (MagLine) and draw-wire encoders.



2016

推出首款用于商用车和 推出用于液压缸体行程测 可再生能源领域的基于 量的新型拉绳编码器和第 MEMS 科技的倾角传感 一款符合 Pld 性能等级的 绝对安全旋转编码器。

> Introduction of a new drawwire encoder for stroke measurement in hydraulic cylinders as well as the first absolute safety rotary encoder with PLd.

2020

推出首款具备 PLd 性能等 级的基于 MEMS 科技的安 全式倾角传感器,坚固耐 用且带有温度补偿功能。

Introduction of the first MEMS-based safety inclination sensor with PLd. Robust and with temperature compensation.







公司概况

COMPANY PROFILE

充满活力和技术创新

我们的测量技术在全球和整个机械工程领域得到了成 功的验证。约 60 个国内外代理办事处确保为我们的 本地客户和国际客户提供直接联系和技术支持。 位于 美国、中国、新加坡、瑞士和意大利的五个强大子公 司加强巩固了SIKO 有限公司在全世界的品牌形象。

Dynamic & Innovative

Our measuring technologies are successfully represented world-wide and in the entire mechanical engineering sector. Approx. 60 representatives ensure direct contact technical support for our customers, both nationally and internationally. Our **5** successful subsidiaries in the USA, China, Singapore, Switzerland and Italy strengthen the global presence of SIKO GmbH.

展望未来

Dipl.-Wirt.-Ing. Horst Wandres 先生, 公司创始人之 子, 自 1990 年以来带领公司、卓越远见、展望未 来。于2014 年八月任命Sven Wischnewski 先生进入 领导层,加强管理班子。

今天就始终如一地在 Buchenbach 和 Bad Krozingen 基地为将来的几十年发展设定前途方向。

Into the future with a vision

Graduated Industrial Engineer Horst Wandres, son of the company founder, has led the company into the future with a vision since 1990. Sven Wischnewski was appointed to the Executive Board in August 2014 for reinforcement.

Already today, Buchenbach and Bad Krozingen are consistently setting the course for the coming decades.



产品提供和解决方案

SIKO 公司专注于为工业、机械工程领域和移动机械提 供高质量的产品和解决方案:

线性传感器:用于液压缸体的无轴承线性编码器 (MagLine)、拉绳编码器和位置传感器

旋转传感器:无轴承旋转编码器 (MagLine)、旋转编码 器和倾角传感器

定位系统: 机械式和电子式位置显示器以及定位驱动器

客户定制式解决方案



Products and Solutions

SIKO specializes in high-quality products and solutions for industry, mechanical engineering and mobile machines:

Linear sensors: Bearingless linear encoders (MagLine), draw-wire encoders and position sensors for hydraulic cylinders

Rotary sensors: Bearingless rotary encoders (MagLine), encoders and inclination sensors

Positioning systems: Mechanical and electronic position indicators and positioning drives

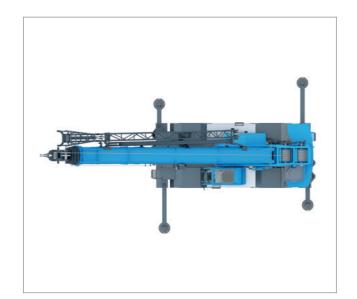
Customized solutions

起重机和起重技术

CRANE & LIFTING TECHNOLOGY

无论是移动式起重机、高空作业平台还是伸缩臂叉装机,在起重机技术和起重技术中,始终取决于拥有一个安全的支架和大负载的移动能力。为了始终确保对人员和环境的保护,并安全地移动所需负载,需要智能传感器以能够可靠地检测关键信息,并将其转发给控制器。



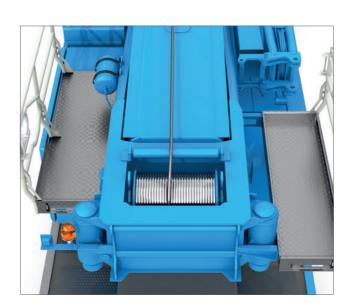


通过精确的位置检测实现可调式支架底座

用于精确测量底座支架位置的拉绳编码器,或将其直接集成在液压缸体中,可确保起重机在施工现场的稳固立足并提高其位置灵活性。特别适合其应用:性能等级达 d (Pld) 级的安全传感器。

Variable support base thanks to exact position detection

Draw-wire encoders for the exact measurement of the position of the outrigger or directly integrated in the hydraulic cylinder ensure a secure stability and added flexibility on construction sites. Particularly suitable: safe sensors up to Performance Level d (PLd).

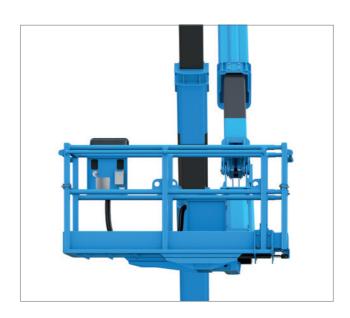


缆线绞盘的位置和速度检测

安全升降至关重要,尤其是在搬运重物时。智能且坚固的编码器检测缆线绞盘的绝对位置和运行速度 安全可靠、坚固耐用、异常精确。

Position and speed detection of winch systems

Safe lifting and lowering is essential, especially when moving heavy loads. Intelligent and robust encoders measure the absolute position and speed of the cable winch – safe, robust, precise.



在安全保险性至关重要之时! 乘人吊篮倾斜度的检测

借助冗余式倾角传感器确保乘人吊篮的安全升降。通过高度的温度稳定性和绝对冗余式倾角检测确保人和机器的安全。

When safety counts! Inclination detection of the basket

Redundant inclination sensors ensure safety in the passenger basket. High temperature stability and fully redundant inclination detection protect people and the machine.

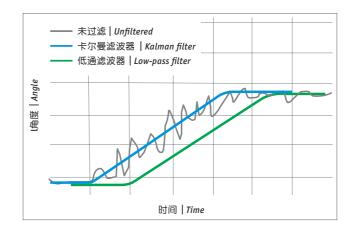
土建机器机械

EARTH MOVING EQUIPMENT

土建机器机械必须以最佳精度和效率持续提供最佳功能。使用来自 SIKO 的坚固耐用且面向未来的传感器,可以持续提高工作效率,进一步提高工作流程的优化和自动化。

Construction machines must provide maximum performance with optimum precession and efficiency as smoothly as possible. Rely on the robust and sustainable sensors from SIKO to increase this efficiency sustainably and further optimize and automate working processes.



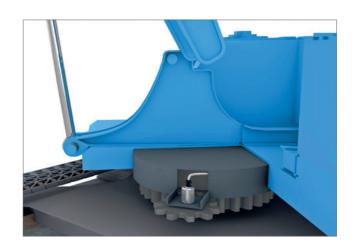


稳定可靠测量值的创新式算法

得益于智能传感器的混体融合,倾角传感器即使在具 有强度干扰的动态应用中也能提供稳定可靠的测量值。

Innovative algorithms for stable measurement values

Thanks to the intelligent sensor fusion the inclination sensors always deliver stable and reliable measurement values even in dynamic applications with high interferences.



可靠地检测旋转支承座的位置

SIKO 安全旋转编码器非常适用于实现负载力矩限制功能和设立"虚拟墙壁"。

Safe detection of slewing ring position

The SIKO safety encoders are ideally suited for the implementation of load moment limiting systems and "virtual walls".

起到优良的保护作用 通过集成式位置传感器

集成式位置传感器,用于在液压缸体内检测位置和速度。

Perfectly protected: integrated position sensors

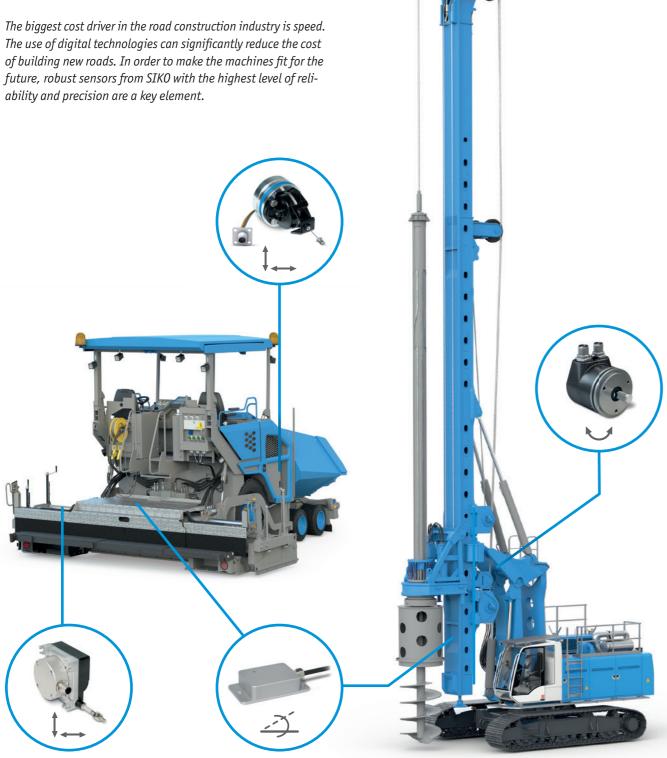


道路工程机械和地下土建机械

ROAD & DEEP DRILLING MACHINERY

在道路建设中,工程速度至关重要。 使用数字技术可 以显著降低修建新道路的成本。 为了得到适应未来和 现代化相应机械,使用具备最高度可靠性和精度的坚 固耐用的 SIKO 传感器是关键要素。

The use of digital technologies can significantly reduce the cost future, robust sensors from SIKO with the highest level of reliability and precision are a key element.





什么都是垂直的又怎么样? 用于特殊地下土建 工程的传感器!

无论是在特深钻洞机、缆绳挖掘机还是打桩技术中: 适合其应用领域的传感器必须坚固耐用且检测可靠。 旋转编码器、无轴承旋转编码器和倾角传感器是建造 "虚拟墙"或自动化桅杆等辅助系统的重要组成部分。

Everything vertical, or what? Sensors for deep drilling!

No matter whether drilling rig, duty-cycle cranes or in piling rigs. Sensors in this area of application must be robust and work reliably! Rotary encoders, bearingless rotary encoders and inclination sensors are important parts of assistance systems such as the "virtual wall" or the automatic mast alignment.



铺路机熨平板的位置检测

熨平板是每个铺路机的核心部件,通过使用拉绳编码 器或集成在熨平板中的测量系统达到自动完成所需的 摊铺宽度。

Position detection of the screeds

Screeds are the heart of every paver. The desired pave width can be automatically approached with draw-wire encoders or integrated measuring systems in the cylinder.



自动调平器 - 来自高水准的传感器

调平器缸体中用于检测高度的坚固传感器,以及用于 检测横向倾角的动态补偿式倾角传感器,是在所有道 路铺平过程中所需的达到精确和高效铺路的基础。

Automatic leveling

Robust sensors for height measurement in the leveling cylinders as well as dynamically compensated inclination sensors for detecting lateral inclination are the basis for profile-accurate and efficient paving on any surface.

安全可靠的位置检测

SAFE & RELIABLE POSITION MEASUREMENT

现今的移动机械已经提供大量完整的功能和工作流程。为了同时确保人员和环境的安全保护,可靠并安全的传感器的使用是必不可少的。 无论是位置、速度还是倾角检测; 无论是直线运动还是旋转运动的检测——作为移动机械中可靠并安全的传感器的领先供应商,我们总能提供适合您应用的 SIKO 品牌传感器。

Mobile machines already perform multiple complex functions and work processes. To ensure the safety of people and the environment, the use of functionally safe sensors is mandatory. Whether position, speed or inclination measurement; whether linear or rotative movements – As one of the leading suppliers of functionally safe sensors for mobile machines, you will always find the right SIKO sensor for your application.

冗余式硬件设计方式

通过符合 CAT3 标准的冗余式结构设计和安全可靠的机械设计,我们的传感器特别适用于在安全要求异常苛刻的应用中,其传感器适合用于性能等级要求达 d (PLd)级的应用。

创新的安全性理念

借助通过 SIL2 (IEC61508) 认证的创新安全性理念, 达到以最紧凑的结构设计实现安全保险的位置检测。 SIKO 传感器即使利用单通道结构,也适用于性能等级 达 d (PLd) 级的安全要求苛刻的应用。

Redundant hardware design

Due to the redundant design according to CAT3 as well as a safe mechanical design, the sensors are predestined for use in safety-critical applications. Therefore, the sensors can be used in applications up to Performance Level d (PLd).

Innovative safety concept

The innovative safety concept, which has been certified according to SIL2 (IEC61508), enables safe position meas-urement with the most compact design. Thus, SIKO sensors are suitable for use in safety-critical applications up to Performance Level d (PLd) even with single-channel design.



图片来源

第1页

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传感器独特为移动机械而开发

SENSORS DEVELOPED FOR MOBILE MACHINES

无论是高温、低温、冲击和震动、水、泥土还是沙尘影响 诸如商用车、工程机械、市政车辆或农业机械之类的移动机器都必须在任何困难条件下可靠地运行工作。为了保证达到其要求,需要传感器即使在最苛刻的条件下也能不间断地收集和提供所需数据。针对其特殊应用要求,SIKO 公司研发了 PURE.MOBILE 尖端技术。

Heat, cold, shock, vibration, water, mud or dust – mobile machines must work reliably under all conditions. To ensure this, the machines need sensors that detect and provide data continuously even under the harshest conditions. To acquire and send this data, SIKO has developed PURE.MOBILE technology.

PURE.MOBILE 技术的优势

- 100% 为移动式机械设备的位置检测 而设计和研发。
- 所有传感器都可提供应用性能等级高达 d (PLd) 级的安全功能类型
- 高达 IP6K9K 的高防护等级
- 扩展了的温度范围 (-40°C至+85°C、特选可达:+105°C)
- 高电磁兼容性
- 具备 E1 认证许可

The advantages of the PURE.MOBILE technology

- Designed and developed 100% for position detection in mobile machines
- All sensors are available in a Safety version up to Performance Level d (PLd)
- Protection class up to IP6K9K
- Extended temperature range: -40 ... +85 °C (Optional: +105 °C)
- High EMC compatibility
- E1 (UN ECE R10) certified / compliant































线性传感器

LINEAR SENSORS

拉绳编码器是一种易于安装的用于直线式位置和速度检 测的解决方案。 自 1990 年代初以来, 即使在最恶劣 的环境条件下, 我们的客户也一直信赖我们久经考验的 SIKO 拉绳编码器。 2015 年, 我们实现了一项全球创新 性技术, 既将 SIKO 拉绳编码器直接集成到液压缸体中。

Draw-wire encoders are an easy-to-install solution for linear position and speed measurement. Even under the most adverse environmental conditions, our customers have been relying on our proven SIKO draw-wire encoders "since the beginning of the 1990s." As a worldwide innovation since 2015, they can also be integrated directly into hydraulic cylinders!

CANOPER

SAFJ1939

IO-Link

















拉绳编码器

DRAW-WIRE ENCODERS

凭借几十年的专业经验,坚固耐用的 SIKO 拉绳编码器 专为移动机械适合苛刻要求的使用而开发。 集成紧凑的 结构设计使其特别适用于土建工程机械、起重机和起重 技术领域。

规格类型和优势

- 测量长度为 600 至 15000 mm
- 温度范围为 -40 °C 至 +85 °C
- 坚固耐用,即使在潮湿和肮脏的应用环境下
- 安全类型适用于性能等级高达 d (PLd) 级的安全应用
- 防护等级高达 IP6K9K
- 非常紧凑的结构设计
- 带集成倾斜传感器型式可选





Specifications & advantages

- Measuring range from 600 ... 15000 mm
- Temperature range from -40 °C ... +85 °C
- Robust even under wet and dirty conditions
- Safety versions for applications up to Performance Level d (PLd)
- Protection class up to IP6K9K
- Very compact design
- Optionally available with integrated inclination sensor

The robust SIKO draw-wire encoders are thanks to decades of

experience, developed especially for tough use in mobile ma-

chines. The compact design predestines them for use in con-

struction machinery as well as in crane and lifting technology.













accumulators.







液压缸体用位置传感器

POSITION SENSORS FOR HYDRAULIC CYLINDERS

位置传感器基于久经考验的线拉原理,适用于移动式 液压系统、工业用液压缸体、伸缩缸体或活塞式蓄能 器等,特别适合在工业应用中安全要求高和使用环境 苛刻的情况下。

规格类型和优势

- 缸体位置的绝对值式检测
- 测量范围高达 5000 mm
- 无需对活塞进行通穿钻孔
- 也可用于伸缩缸体和活塞式蓄能器
- 安全类型适合用于性能等级高达 d (Pld) 级的应用



Specifications & advantages Absolute detection of the cylinder position ■ Measuring range up to 5.000 mm

No drilling of the piston required

■ Can also be used in telescopic cylinders & piston accumulator

Position sensors based on the proven draw-wire principle for

demanding and safety-critical applications in the area mobile

hydraulics, industrial hydraulics, telescopic cylinders or piston

Safety versions for applications up to Performance Level d (PLd)



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旋转式传感器

ROTARY SENSORS

在位置和角度检测的同时, SIKO 的旋转传感器还提供大量不同的功能选择可能, 由此可以灵活地适应您的应用需求。 无论是用于重载工程、特安全型还是陆地及海上应用, 我们的传感器都以其坚固性、可靠性和安全性而著称。

In addition to position and angle measurement, SIKO's rotary encoders offer a wide range of different features and thus can be flexibly adapted to your needs. Whether for heavy-duty, safety or onshore/offshore applications, the sensors convince with their robustness, reliability and safety.





























旋转编码器

ROTARY ENCODERS

结构紧凑且极其坚固的旋转编码器为精确可靠的旋转式位置检测提供了最佳解决方案。 通过独特的结构设计,其非常适合于安全要求特高的苛刻应用。

The compact and extremely robust rotary encoders are the perfect solution for accuracy and reliable position measurement. Thanks to the unique design the sensors are suitable for the rough usage in safety-critical applications.

规格类型和优势

- 绝对无电池测量系统
- 单圈和多圈式类型
- 抗冲击和振动能力强
- 防护等级高达 IP6K9K
- 安全类型适用于性能等级高达 d (PLd) 级的应用
- 具备E1 (UN ECE R10) 认证
- 适合海上应用的传感器可选

Specifications & advantages

- Absolute battery less measuring system
- Single- and multiturn version
- High shock and vibration resistance
- Protection class up to IP6K9K
- Safety versions for applications up to Performance Level d (PLd)
- E1 (UN ECE R10) certification
- Sensors for Offshore applications available



















LAGERLOSE ENCODER | MAGLINE

无轴承编码器 | MAGLINE

无轴承编码器解决方案是替代旋转编码器系统的理想方案 - 特别是在安装空间有限的应用中同时必须精确检测位置时。

The bearing less encoder solutions are the perfect alternative to rotary encoders, especially, if position has to be measured precisely and reliably even in applications with limited installation space.

规格类型和优势

- 绝对无磨损测量系统
- 非常高的系统精度和测量值重现性
- 可灵活集成到整个系统中
- 安全类型适用于性能等级高达 d (PLd) 级的应用

Specifications & advantages

- Absolute wear-free measuring system
- High system accuracy and reproducibility
- Flexible integration into overall system
- Safety versions for applications up to Performance Level d (PLd)

CANOPER





倾斜度传感器

INCLINATION SENSORS

与其他旋转传感器相比,倾斜度传感器检测其相对重力的角度。 因此,倾角传感器的应用领域非常广泛。 由于其中未安装机械部件,因此倾角传感器几乎无磨损且免维护工作。 此外,倾角传感器也可以安装在枢轴点之外,从而便于集成到整个系统中。

Compared to other rotary encoders, inclination sensors measure the angle in relation to the earth's gravitational force. The fields of application of inclination sensors are diverse. Since no mechanical components are used, inclination sensors are almost wear- and maintenance free. In addition, inclination sensors can also be mounted outside the pivot point, which simplifies integration into the overall system.



SAFJ1939









静态式倾角传感器

STATIC INCLINATION SENSORS

如果必须异常精确测量倾角,尤其是在恶劣的环境影响下进行可靠检测,SIKO 倾角传感器提供了完美的解决方案。

规格类型和优势

- 提供 1 轴和 2 轴类型
- 安全类型适用于性能等级高达 d (PLd) 级的应用
- 防护等级高达 IP6K9K
- 带温度补偿功能
- 符合 E1 (UN ECE R10) 标准
- 提供可设置的低通滤波器功能

If inclinations have to be measured precisely and, above all, reliably even under harsh environmental conditions, SIKO inclination sensors offer the perfect solution.

Specifications & advantages

- 1 and 2 axis version available
- Safety versions for applications up to Performance Level d (PLd)
- Protection class up to IP6K9K
- Temperature compensated
- E1 (UN ECE R10) conform
- Configurable low pass filter









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动态式倾斜传感器 (IMU)

DYNAMIC INCLINATION SENSORS

借助创新的传感器组合功能,即使在动态应用中,您也可以获得精确和稳定的倾角值。 其通过加速度和倾角值的整体组合,并通过新的过滤算法得到。

规格类型和优势

- 提供 1 轴和 2 轴类型
- 可配置的过滤算法功能(卡尔曼、巴特沃思和 "临界阻尼")
- 防护等级高达 IP6K9K
- 温度补偿功能
- 经过E1 (UN ECE R10) 认证

Thanks to innovative sensor fusion, you get precise and stable inclination values even in dynamic applications. This is possible by combining acceleration and inclination values using new filter algorithms.

Specifications & advantages

- 1 and 2 axis version available
- Configurable filter algorithms (Kalman, Butterworth and "critically damped")
- Protection class up to IP6K9K
- Temperature compensated
- E1 (UN ECE R10) certified











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速度检测

SPEED MEASUREMENT

旋转编码器和无轴承编码器提供了一种有效且易于使 用的解决方案,用于检测速度、转速和行进方向。 可提供不同类型的 Heavy- Duty 重型和Safety 安全 型,可以高度集成到驱动系统中,也可以很容易地适 配作为轴承式安装的旋转编码器。

The rotary encoders and bearingless encoders offer an effective and easy-to-use solution for measuring velocity, speed and direction of travel. Highly integrable in drive systems or easily adaptable as rotary encoders, these encoders are available in different heavy-duty and safety versions.

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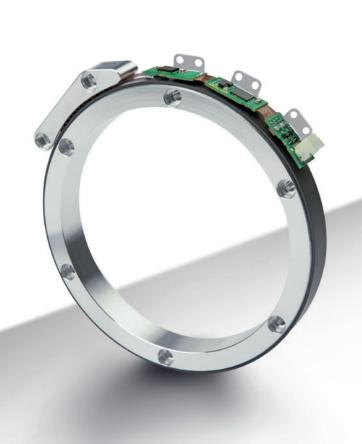




















▶ 打开视频

SIKO - Motor and Position Feedback with flexCoder for cobots

旋转编码器

ROTARY ENCODERS

我们为您提供多种带轴承的旋转编码器,用于精确检 测速度和行进方向。 从经济高效的增量编码器到高分 辨率的绝对编码器。

规格类型和优势

- 增量式或绝对式传感器
- 温度范围为 -40 °C 至 +85 °C
- 安全类型适用于性能等级高达 d (PLd) 级的应用
- 非常紧凑的结构设计
- 空心轴或实心轴式设计款式
- 转速高达 12000 rpm
- 可选择具备通过 E1 认证 (UN ECE R10) 参数

cise detection of speed and direction of travel. From costeffective incremental encoders to high-resolution absolute encoders.

We offer a large selection of rotary encoders for the pre-

Specifications & advantages

- Incremental or absolute encoders
- Temperature range from -40 °C ... +85 °C
- Safety versions for applications up to Performance Level d (PLd)
- Very compact design
- Hollow shaft or solid shaft version
- Speeds up to 12000 rpm
- Optionally available with E1 approval (UN ECE R10)













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无轴承编码器 | MAGLINE

BEARING-LESS ENCODERS | MAGLINE

无轴承磁性编码器是传统光学旋转编码器系统的理想替 代方案。 特别适合在苛刻的应用条件下以高速度进行 精确的转速或行驶方向的检测时。

The bearingless encoder solutions are the perfect alternative to rotary encoders, especially, if position and speed have to be measured precisely and reliably even in applications with limited installation space.

规格类型和优势

- 使用无磨损技术
- 对灰尘、碎屑、湿气、油、油脂等不敏感。
- 耐冲击和振动
- 防护等级高达 IP6K9K
- 系统精度高





Specifications & advantages

- Wear-free technology
- Insensitive to dust, wood chips, Moisture, oils, grease etc.
- Robust against shock and vibration
- Protection class up to IP6K9K
- High system accuracy











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