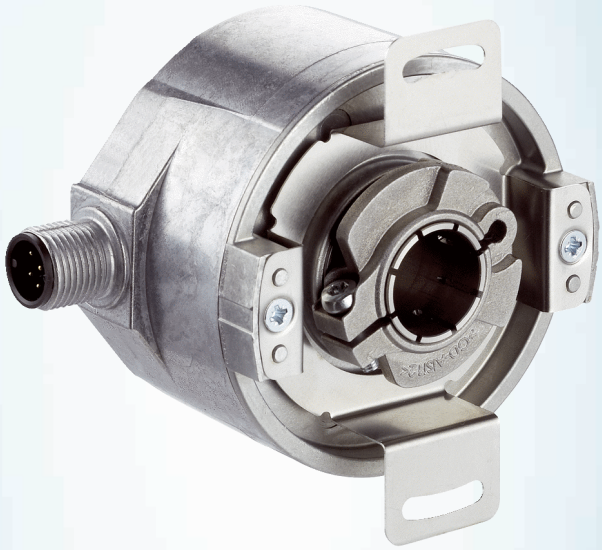
在线数据表

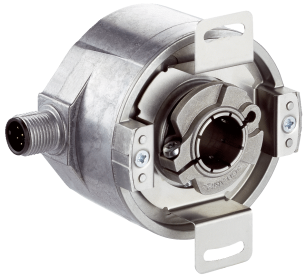


AFM60E-BBAC000256

AFS/AFM60 SSI

绝对值型编码器

SICK
Sensor Intelligence.



图片可能存在偏差

订购信息

类型	订货号
AFM60E-BBAC000256	1058795

其他设备规格和配件 ➜ www.sick.com/AFS_AFM60_SSI

详细技术参数

性能

每圈最大步数	256
最大圈数	4,096
最大分辨率（单圈型、多圈型）	256 (8 bit), 4,096 (12 bit)
误差限值	± 0.3°
重复精度	0.002°

接口

电气接口	SSI/Gray
初始化时间	50 ms [1]
位置数据生成时间	< 1 µs

[1] 此后可读取有效位置.

SSI

编码类型	Gray
编码流程可参数化	CW/CCW 可编程
时钟频率	1 MHz [1]
V/R （旋转方向上的步序）	低电平激活 (L = 0 - 1,5 V, H = 2,0 - Us V)

[1] 最小低电平 (Clock+)：周期为500 ns.

电气参数

连接类型	M12 8 针插头, 径向
工作电压区间	4.5 V DC ... 32 V DC
功耗	0.5 W (无负荷)
极性反接保护	✓
MTTFd：危险故障间隔时间	250 年 (EN ISO 13849-1) [1]

[1] 本产品是标准产品，而不是一个按照机械指令制作的安全部件。计算基于组件的额定负荷、40°C 的平均环境温度、8760 小时/年的使用频率。所有电子故障均被视为危险故障。详细信息请参见编号为 8015532 的文档.

机械参数

机械规格	盲孔空心轴

轴直径	8 mm
重量	0.2 kg
启动转矩	
+20 °C	0.8 Ncm
工作转矩	
+20 °C	0.6 Ncm
允许静态/动态轴向轴位移	± 0.5 mm, ± 0.2 mm
允许静态/动态径向轴位移	± 0.3 mm, ± 0.1 mm
转动惯量	40 gcm²
轴承使用寿命	3.0 x 10^9 圈
角加速度	≤ 500,000 rad/s²

环境参数

电磁兼容性	根据 EN 61000-6-2 和 EN 61000-6-3 [1]
外壳防护等级	IP65, 轴侧 (根据 IEC 60529 标准) [2] IP67, 外壳侧 (根据 IEC 60529 标准)
允许相对湿度	90 % (光学扫描元件不允许冷凝)
运行温度范围	0 °C ... +85 °C
储存温度范围	–40 °C ... +100 °C, 无包装
抗冲击能力	50 g, 6 ms (根据 EN 60068-2-27)
抗振能力	20 g, 10 Hz ... 2,000 Hz (根据 EN 60068-2-6)

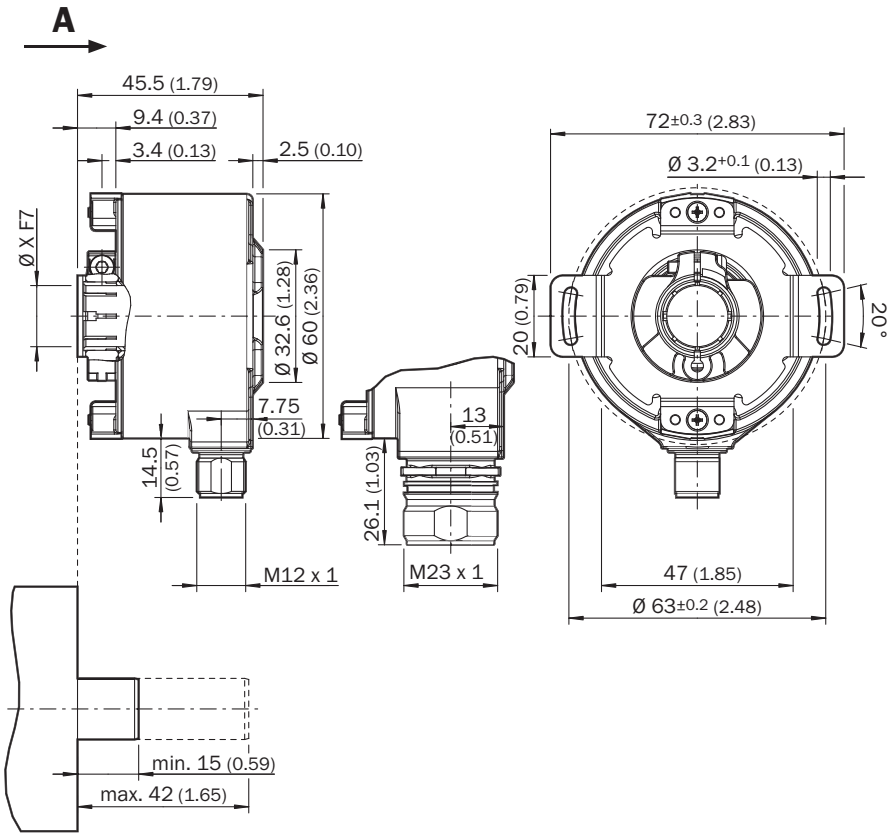
[1] 使用屏蔽电缆时，电磁兼容性需遵循指定标准.
[2] 安装配套连接器.

分类

ECl@ss 5.0	27270502
ECl@ss 5.1.4	27270502
ECl@ss 6.0	27270590
ECl@ss 6.2	27270590
ECl@ss 7.0	27270502
ECl@ss 8.0	27270502
ECl@ss 8.1	27270502
ECl@ss 9.0	27270502
ETIM 5.0	EC001486
ETIM 6.0	EC001486
UNSPSC 16.0901	41112113

尺寸图 (尺寸单位：mm)

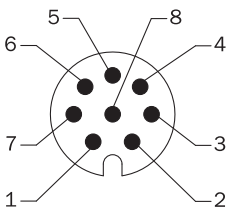
盲孔空心轴，M12 和 M23 径向插头插座



符合 DIN ISO 2768-mk 的一般公差

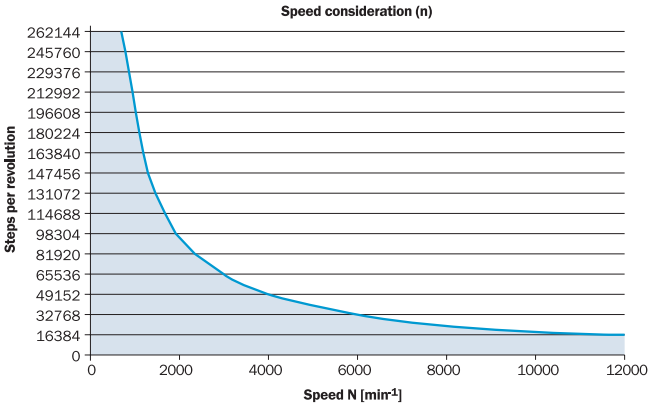
引脚分配

编码器上的 M12 设备插头视图



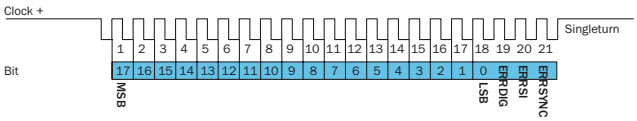
Pin	Color wires	Signal SSI	Explanation
1	Brown	Data–	Interface signals
2	White	Data+	Interface signals
3	Black	CW/$\overline{\text{CCW}}$	Counting sequence when turning
4	Pink	SET	Electronic adjustment
5	Yellow	Clock+	Interface signals
6	Lilac	Clock–	Interface signals
7	Blue	GND	Ground connection
8	Red	+U_s	Supply voltage
		Screen	Screen on the encoder side connected to the housing. On the control side connected to earth.

图表



The maximum speed is also dependent on the shaft type.

SSI data format singleturn



Bit 1–18: Position Bits

- LSB: Least significant Bit
- MSB: Most significant Bit

Bit 19–21: Error Bits

- ERRDIG: Failure message about speed. If this failure occurs during the position building procedure it will be indicated by the ERRDIG-Bit.
- ERRSI: Light source monitoring failure.
- ERRSYNC: Contamination of the disc or scanning system. During the determination of the position, an error has occurred since the last SSI transmission. The error bit will be deleted during the next data transmission.

The evaluation of the error bits has to be realized in the PLC.

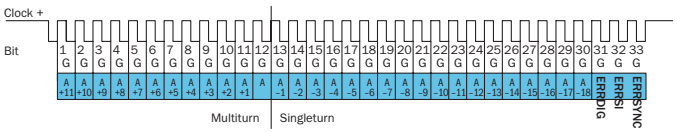
The provided error bits don't have to be used by the PLC compulsorily.

Example

If the resolution of the absolute encoder is set on 13 bits, 16 bits are provided by the encoder: 13 data bits and 3 error bits.
If the PLC is not able to evaluate the error bits, the PLC has to be set on a resolution of 13 bits. Then the error bits have to be masked out by the PLC.

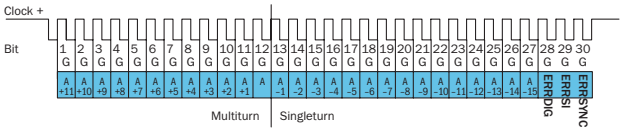
SSI data format multiturn

30 Bits



Bit 1–12: Position Bits multiturn
Bit 13–30: Position Bits singleturn
Bit 31–33: Error Bits

27 Bits



Bit 1–12: Position Bits multiturn
Bit 13–27: Position Bits singleturn
Bit 28–30: Error Bits

Error Bits

- ERRDIG: Failure message about speed. If this failure occurs during the position building procedure it will be indicated by the ERRDIG-Bit.
- ERRSI: Light source monitoring failure.
- ERRSYNC: Contamination of the disc or scanning system. During the determination of the position, an error has occurred since the last SSI transmission. The error bit will be deleted during the next data transmission.

The evaluation of the error bits has to be realized in the PLC.

The provided error bits don't have to be used by the PLC compulsorily. The multiturn resolution is fixed on 12 bits.

Example

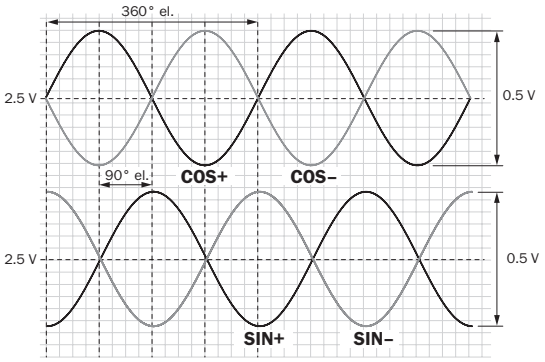
If the resolution of the absolute encoder is set on 27 bits, 30 bits are provided by the encoder: 27 data bits and 3 error bits.
If the PLC is not able to evaluate the error bits, the PLC has to be set on a resolution of 27 bits. Then the error bits have to be masked out by the PLC.

Electrical interfaces sine 0.5 V_{pp}

Power supply	Output
4.5 ... 5.5 V	Sine 0.5 V_{pp}

Signal **before** differential generation at load 120 Ω at U_S = 5 V

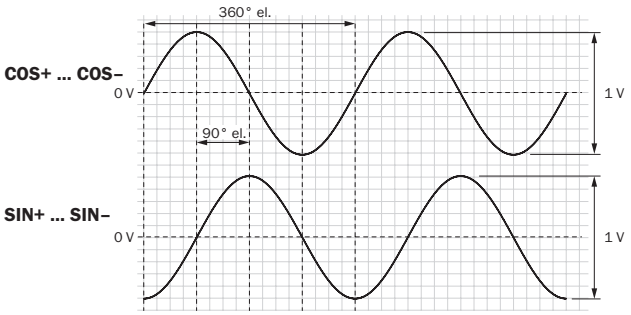
Signal diagram for clockwise rotation of the shaft looking in direction “A” (shaft)



Interface signals Sin, $\overline{\text{Sin}}$, Cos, $\overline{\text{Cos}}$	Signal before differential generation at load 120 Ω	Signal offset
Analog differential	0.5 V_{pp} ± 20 %	2.5 V ± 10 %

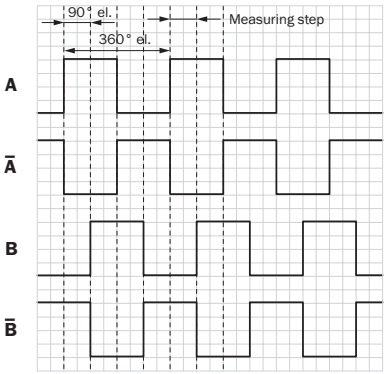
Signal **after** differential generation at load 120 Ω at U_S = 5 V

Signal diagram for clockwise rotation of the shaft looking in direction “A” (shaft)



Electrical interfaces HTL/TTL

Incremental pulse diagram for clockwise rotation of the shaft looking in direction “A”, see dimensional drawing



推荐配件

其他设备规格和配件 ➜ www.sick.com/AFS_AFM60_SSI

	简述	类型	订货号
插头和电缆			
	A 头: 插座, M12, 8 针, 直头 B 头: 电缆 电缆: 适用于输送带, 无卤 PUR, 屏蔽, 2 m	DOL-1208-G02MAC1	6032866
	A 头: 插座, M12, 8 针, 直头 B 头: 电缆 电缆: 适用于输送带, 无卤 PUR, 屏蔽, 5 m	DOL-1208-G05MAC1	6032867
	A 头: 插座, M12, 8 针, 直头 B 头: 电缆 电缆: 适用于输送带, 无卤 PUR, 屏蔽, 10 m	DOL-1208-G10MAC1	6032868
	A 头: 插座, M12, 8 针, 直头 B 头: 电缆 电缆: 适用于输送带, 无卤 PUR, 屏蔽, 20 m	DOL-1208-G20MAC1	6032869
	A 头: 插头, M12, 8 针, 直头, A 编码 B 头: - 电缆: 增量式, 屏蔽	STE-1208-GA01	6044892
	A 头: 插座, M12, 8 针, 直头, A 编码 B 头: - 电缆: 增量式, SSI, 屏蔽	DOS-1208-GA01	6045001
	A 头: 电缆 B 头: 电缆 电缆: SSI, 适用于输送带, 无卤 PUR, 屏蔽	LTG-2308-MWENC	6027529

SICK 概览

SICK 是工业用智能传感器和传感技术解决方案的主要制造商之一。独特的产品和服务范围为安全有效地控制流程创造最优的基础，防止发生人身事故并且避免环境污染。

我们在诸多领域拥有丰富的经验，熟知其流程和要求。这样我们就可以用智能传感器为客户提供其所需。在欧洲、亚洲和北美洲的应用中心，我们会根据客户的需求测试并优化系统解决方案。SICK 是值得您信赖的供应商和研发合作伙伴。

全面的服务更加完善我们的订单：SICK 全方位服务在机器整个寿命周期中提供帮助并保证安全性和生产率。

这对我们来说就是“传感智能”。

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