



中文 | ENGLISH

活套编码器 AL... 40 单圈

特别开发的重载绝对值编码器适用于最极端恶劣的环境条件

Looper encoder AL... 40 Singleturn

Specially developed heavy duty absolute encoder for most extreme environmental conditions



Johannes Hübner Giessen

精确、优势、关注客户

我们专注于技术— 我们了解我们的客户。我们坚定的站在客户一边为其提供特殊的设想、定制的方案。为了支持我们的客户，我们提供了强大的编码器系统、强大的传动技术和全球化的服务。我们将与我们的客户一起克服在重工业领域或其它极其恶劣条件领域的巨大的挑战，继而不断的增进客户的业务。你有什么挑战？

我们的应用领域：

- 金属及轧制技术
- 港口和起重机技术
- 矿山工业
- 石油和天然气工业
- 运输
- 海洋工程
- 发电
- 其它应用领域

Precision. Strength. Customer focused.

We are fascinated by technology – and we understand our customers. We stand firmly at your side with exceptional ideas and tailor-made solutions; to support our customers we offer robust encoder systems, powerful drive technology and a worldwide service. That is how we overcome together with our customers the huge challenges in heavy industry and other fields subject to harsh conditions to sustainably improve their business. What challenges do you have?

Our fields of applications:

- Metal and rolling mill technology
- Harbour and crane technology
- Mining industry
- Oil and gas industry
- Transport
- Marine engineering
- Power generation
- ... and many other applications



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任务和解决方案

任务

在轧制过程中，活套通常用于控制轧机架之间带钢的张力。测量活套角度的编码器暴露在极端环境条件下。活套的轻微摆动会导致轴承中的油脂分配不均，从而导致润滑膜堆积润滑不足。在非运动的轴上，高振动负荷还会导致轴承滚道的局部疲劳和润滑膜的老化。编码器在现场还将受到冷却乳化液的侵蚀和高温影响。迄今为止，客户使用的标准编码器无法提供所需的寿命。



解决方案

针对这个应用，Johannes Hübner Giessen 开发了特别的活套编码器，其核心技术是特别设计的编码器的长寿命。它的轴承可以满足特定的要求：高于 40% 动态负载额定值，特殊的润滑可提供更长的使用寿命。该轴承不是为高速设计的，而是为高达 450g 的冲击负荷而设计的。带有额外保护边缘的特别径向轴密封环可在恶劣的环境条件下提供所需的保护等级。由于其特殊的设计，Hübner Giessen 活套编码器的使用寿命是普通的几倍。

Task and Solution

Task

In rolling mills loopers are normally used to control the tension of the metal strip between roll stands. The angular position of the looper is measured by an encoder exposed to extreme environmental conditions. The slight swing motions of the looper result in an unfavourable grease distribution in the bearings and thus in an insufficient built-up of the lubrication film. At nonmoving shaft high vibration loads can additionally contribute to local fatigue of the bearing raceway and aging of the lubricant film. On site the encoder is furthermore subject to aggressive cooling emulsions and high temperatures. The standard encoders used to date by customers have been unable to offer the required lifetime.



Solution

For this application Johannes Hübner Giessen developed a special looper encoder, which scores with a considerably longer lifetime thanks to particularly designed-in features. It has bearings which cope with the specific requirements: 40% higher dynamic load rating and a special lubricant provide a longer lifetime. The bearings are not designed for high speeds, but for high shock loads up to 450 g. A special radial shaft sealing ring with additional protective lip provides the required degree of protection in harsh ambient conditions. As a result of its special design the Hübner Giessen looper encoder offers several times of the usual lifetime.

产品的优点 / Product benefits

极其坚固 / extremely robust

- 与标准编码器相比，寿命增加许多倍
 - 负载额定值提高 40% 的特别轴承用于高振动负载
 - 高强度不锈钢制成的特殊加强轴，以抵抗高轴向和径向力
 - 超高抗冲击性可达 450 g
 - 高防护等级 IP66 / IP67
 - 轧机的潮湿区域
-
- Lifetime increased many times over in comparison with standard encoders
 - Special bearings with 40% higher load rating designed for high vibration loads
 - Specially reinforced shaft made of high tensile stainless steel to resist high axial and radial forces
 - Extra high shock resistance up to 450 g
 - High degree of protection up to IP66 / IP67
 - Wet areas in rolling mills

安全性 / safe

- 具有坚固外壳的最先进的电子设备
 - 所有螺纹连接附加防振装置
 - 键与键槽正连接
 - 即使端子箱被打开，密封的电子部分都受到保护
 - 具有状态输出的内部诊断（半导体继电器，无源）
 - 高质量 EMC 电缆锁紧套
-
- State-of-the-art electronics in a robust, thick-walled housing
 - All screwed connections additionally secured against vibration
 - Positive connection with feather key / keyway
 - Encapsulated electronics protected even when terminal box is open
 - Internal diagnostics with status output (semiconductor relay, potential-free)
 - High-quality EMC cable glands



产品的优点 / Product benefits



可定制 / tailor-made

- 特殊润滑和特殊的密封保护的球轴承免受污染物的侵入
 - 特别的 O 形密封圈
 - 扩展温度范围可达 +100 °C
- 法兰/底脚安装适用于直径 14 mm 的实心轴
 - 配套附件和安装服务 (可选)
- Special grease and special seal protect the ball bearings against ingress of contaminants
 - Special O-ring seals housing
 - Extended temperature range up to +100 °C
- Flange/foot versions for solid shafts up to Ø 14 mm
- Suitable attachments and mounting service (optional)

灵活性 / flexible

- 高质量信号，可达 16 bit 单圈，多种接口
 - 可选增量输出 HTL 或 TTL
- 客户友好的安装，一个带有 LED 显示电源 “on” 的大尺寸的端子箱。
 - 对于 TTL 输出，可选 5 VDC 电源电压
 - 个性化咨询
- High signal quality, up to 16 bit singleturn, variety of interfaces
 - Alternatively with incremental output HTL or TTL
- User-friendly installation thanks to a generously sized terminal box with status LED to indicate power is “on”
 - Optional 5 VDC supply voltage for TTL output
 - Individual consultation

机械参数 / Mechanical data

保护等级依据 DIN EN 60529 Degree of protection acc. to DIN EN 60529	密封 Sealing	允许速度 Permissible speed	转子转动惯量 Rotor moment of inertia	破损扭矩 Breakaway torque
IP66/IP67	径向轴密封环 / Radial shaft sealing ring	最大 / max. 4000 rpm	600 gcm ²	10 Ncm

更多机械参数 / Further mechanical data		
重量 (大约) Weight (approx.)		3.5 kg
抗振动 Vibration resistance	DIN EN 60068-2-6 / IEC 68-2-6 (10 – 2000 Hz)	20 g (= 200 m/s ²)
抗冲击 Shock resistance	DIN EN 60068-2-27 / IEC 68-2-27 (6 ms)	450 g (= 4500 m/s ²)
最大的编码器轴负载 Max. encoder shaft load	F _{a,max} (轴向 / axial)	140 N
	F _{r,max} (径向 / radial)	170 N
轴尺寸 Shaft dimensions	标准 / Standard	Ø 14 j6 x 30 mm
	选项 / Optional	Ø 11 j6 x 30 mm

技术说明 Technical notes

环境温度

最大允许环境温度取决于编码器的速度 and 保护等级 (轴密封), 还有频率、信号电缆长度和安装情况。

Ambient temperature

The max. perm. ambient temperature depends on speed and degree of protection (shaft sealing) of the encoder as well as on frequency, signal cable length and mounting situation.

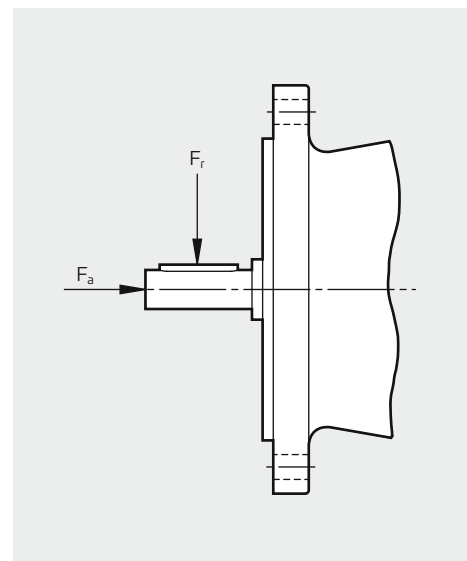
保护等级

为了确保保护等级, 电缆直径必须与电缆填料函相适应

Degree of protection

To comply with the degree of protection the signal cable diameter must be appropriate to the cable gland.

编码器轴负载 Encoder shaft load



电气参数 / Electrical data

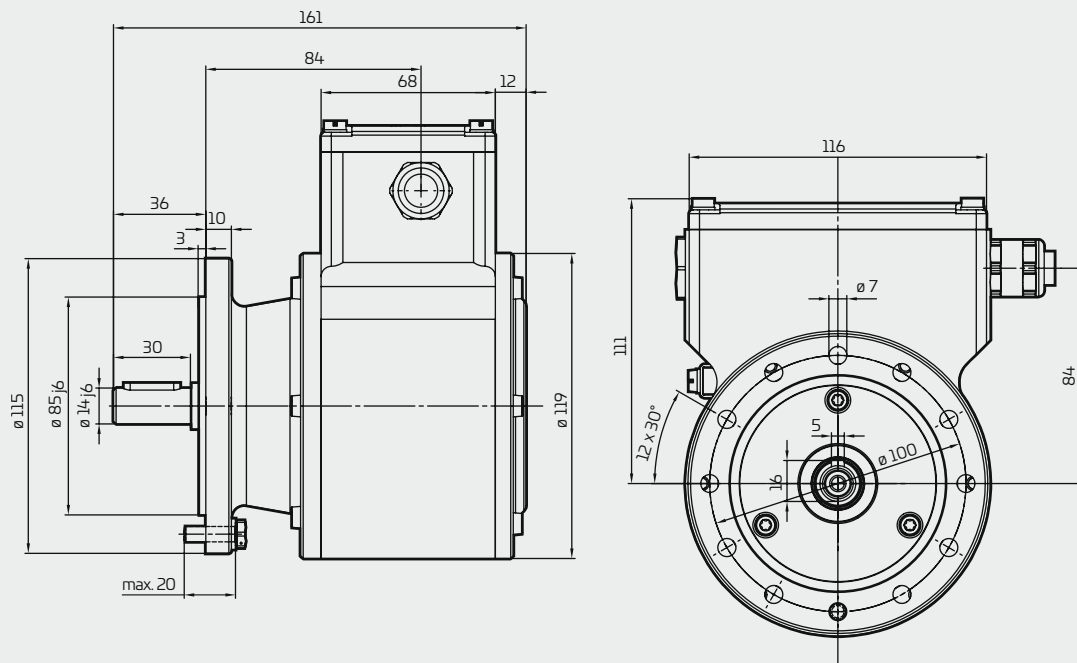


分辨率 单圈 Resolution Singleturn	最大 16 bit (每圈 65536 步) max. 16 bit (65536 steps per rotation)
电子部分温度范围 Temperature range electronics	-25 ... +100 °C
电源电压 /Supply voltage	12–30 VDC (选项 5 VDC, 用于增量TTL输出) 12–30 VDC (optional 5 VDC for incremental output TTL)
接线/Connection	端子箱内端子排/Terminal strip in a terminal box 直出电缆/Fixed cable
接口 (产品名称) * Interfaces (Product name)*	SSI (ALS 40), 并行 /Parallel (ALPA 40), HTL 或 /or TTL (FGL 40)
时钟输入 SSI/Clock input SSI	光耦/Optocoupler
信号幅度/Signal amplitude	5 V
输入电流/Input current	6 mA
时钟频率/Clock frequency	80 kHz – 1 MHz
时钟率/传输 Clock rate / Transmission	可达 16 (带状态位可达 17 bit) Up to 16 (with status bit up to 17)
传输周期间的时长 Time between transmission cycles	> 30 µs (无重复数据) ; < 20 µs (有重复数据) > 30 µs (without data repetition); < 20 µs (with data repetition)
数据输出 SSI/Data output SSI	
接口/Interface	RS422, 可调节二进制码 /RS 422, binary code adjusted
数据输出 /Data output	可达 16 Bit (带状态位可达 17 bit) Up to 16 bit (with status bit up to 17)
计数方向和预设输入 Counting direction and preset input	光耦/Optocoupler
信号幅度/Signal amplitude	5–30 V
输入电流/Input current	6 mA
状态输出/Status output	无源开关触点 (固态继电器) Potential-free switch contact (solid-state relay)

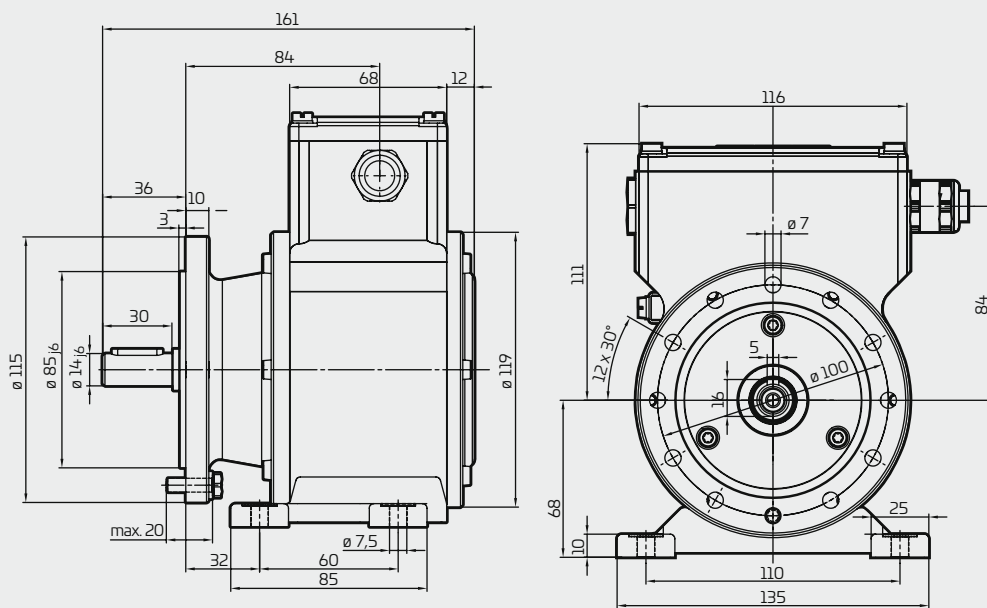
* 其它接口可指定 / Other interfaces on request.

尺寸图 AL...40

Dimension drawings AL...40

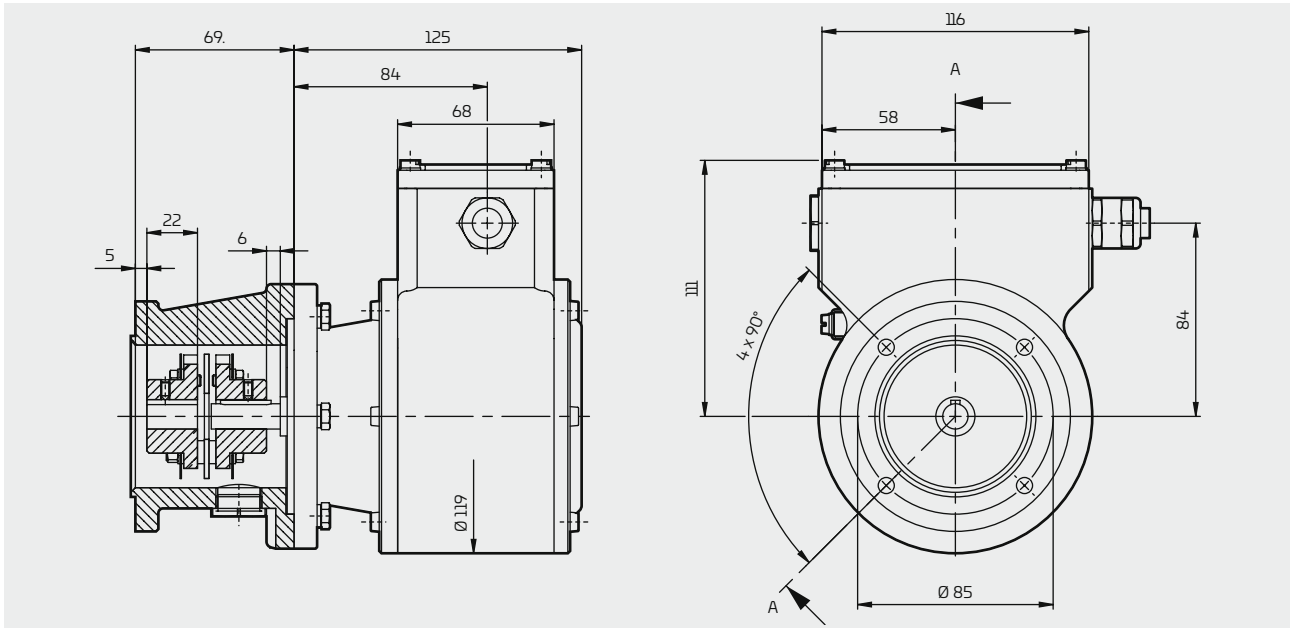


ALS 40 K-13 结构形式 B5
Construction type B5



ALS 40 K-13 结构形式 B35
Construction type B35

尺寸图 AL...40 Dimension drawings AL...40



ALS 40 K-13

安装实例，用于结构形式 B5，带中间法兰和联轴器 HK522
Mounting example for construction type B5 with intermediate flange and coupling HK 522

HK 5 联轴器，标准长度联轴器

HK 5 Coupling lengths – standard couplings

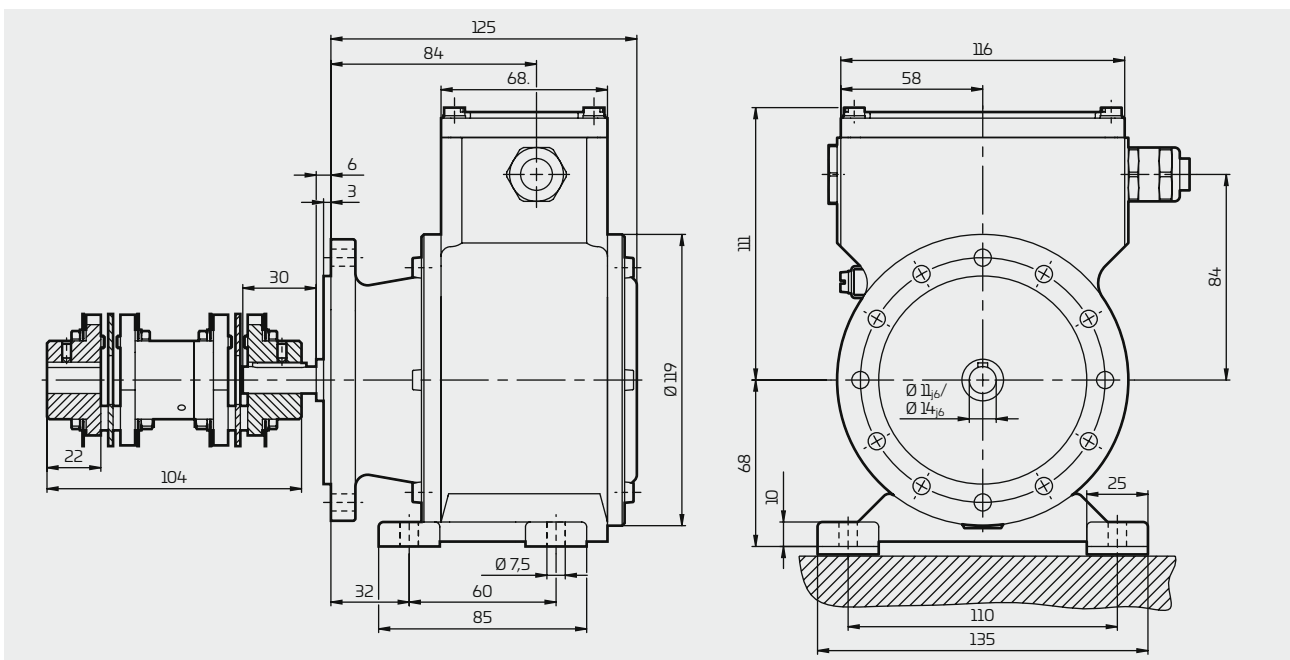
型号 / Type	HK 520	HK 522	HK 532	HK 533
长度 / Length	44 mm	52 mm	60 mm	68 mm

HKD 5 联轴器，标准长度双节联轴器

HKD 5 Coupling lengths – standard double-joint couplings

型号 / Type	HKD 568	HKD 522	HKD 532	HKD 533
长度 / Length	68 mm	104 mm	112 mm	120 mm

或者推荐我们的安全型联轴器 HKS 和 HKDS。 / Alternatively we recommend our safety couplings HKS and HKDS.



ALS 40 K-13

安装实例，结构形式B35，带双节联轴器 HKD 522
Mounting example for construction type B35 with double-joint coupling HKD 522

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