



中文 | ENGLISH

电缆保护系统

CP-SA, CP-HT, CP-ML, CP-AF, CP-SE
为重载制应用中的电缆提供最好的保护

Cable protection systems

CP-SA, CP-HT, CP-ML, CP-AF, CP-SE
For the best-possible protection of cables in
heavy-duty applications



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。我们以卓越的理念和量身定制的解决方案 坚定的站在您的身边。为了支持我们的客户， 我们提供强大的编码器系统、强大的传动技术和全球化服务。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
- 发电行业
- 许多其它应用领域

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
- Port 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 / Task and Solution

任务

重工业对所用部件的可靠性和使用寿命提出了很高的要求。除了选择适当坚固耐用的重型编码器，也有必要保护其供电电缆和信号线免受部分极端负载的影响。

根据行业和应用，这些负载可能包括：

- 户外天气条件的一般影响，如热、冷、潮湿以及紫外线和臭氧辐射
- 由于辐射或直接接触、舔火、飞溅火花或熔融金属飞溅造成的极端温度负荷
- 机械冲击载荷，包括被坠落部件撞击、与运输车辆或人员的接触，以及操作过程中冲击和振动的影响。
- 腐蚀性液体，如酸、碱、冷却乳液、油、化学品或盐水

适用于重载编码器的电缆保护系统需要提供的不仅仅是机械兼容性，它们还必须通过集成屏蔽元件、电缆应变缓解和合适的密封插入来保证无干扰的工厂运行。



电缆保护系统 CP-SA 和 CP-HT
Cable protection systems CP-SA and CP-HT

解决方案

Johannes Hübner Giessen 为此类应用需求提供完美协调的系统解决方案，包括坚固耐用的编码器和特定应用、定制的电缆保护

本目录中提供了以下电缆保护系统：

- CP-SA：用于标准应用
- CP-HT：对于极端温度保护
- CP-ML：对于机械冲击荷载的保护
- CP-AF：防止腐蚀性液体的保护
- CP-SE：对含盐环境的保护

Task

Heavy industry places tough demands on the reliability and service life of the components utilized. In addition to selecting appropriately robust heavy-duty encoders, it is also necessary to protect their supply cables and signal lines against partly extreme loads.

Depending on the industry and the application these loads can include:

- The general effects of outdoor weather conditions, such as heat, cold and wetness as well as UV and ozone radiation
- Extreme temperature loads due to radiation or direct contact, licking flames, flying sparks or molten metal spatter
- Mechanical impact loads from being struck by falling parts, contact with transport vehicles or personnel as well as the effects of shock and vibration during operations
- Aggressive fluids such as acids, alkalis, cooling emulsions, oils, chemicals or salt water

Suitable cable protection systems for heavy-duty encoders need to offer more than mechanical compatibility, they must also guarantee interference-free plant operations with an integrated shielding element, cable strain relief and a suitable sealing insert.



电缆保护系统 CP-ML 和 CP-AF
Cable protection systems CP-ML and CP-AF






























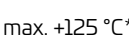



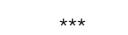

Solution

For such application requirements Johannes Hübner Giessen offers perfectly coordinated system solutions consisting of robust heavy-duty encoders and application specific, tailor-made cable protection systems.

The following cable protection systems are presented in this catalog:

- CP-SA: For standard applications
- CP-HT: Protection against extreme temperatures
- CP-ML: Protection against mechanical impact loads
- CP-AF: Protection against aggressive fluids
- CP-SE: Protection against saliferous environment

选型表和订货型号 / Selection table and article code

| CP- | | 高温 High temperatures | 高保护等级 High degree of protection | 腐蚀性液体 Aggressive fluids | 机械冲击载荷 Mech. impact loads | 高柔韧性 (弯曲半径) High flexibility (bending radii) | 环境 (紫外线、臭氧、海洋空气) Environment (UV, ozone, sea air) |
|-----|---|--|--|---|--|--|---|
| SA |  |  max. +120 °C* |  IP66 / IP67** |  |  |  *** |  |
| HT |  |  max. +1640 °C* |  IP54** |  |  |  *** |  |
| ML |  |  max. +600 °C* |  IP40** |  |  |  *** |  |
| AF |  |  max. +250 °C* |  IP68 / IP69** |  |  |  *** |  |
| SE |  |  max. +125 °C* |  IP66 / IP67** |  |  |  *** |  |

根据要求提供特殊项目的定制解决方案。 / Special project-specific custom solutions on request.

* 指保护软管的最大温度。 / refers to the maximum temperature of the protective hose.

** 指软管 (接线盒处的连接始终为 IP68)。 / refers to hose (connection at terminal box always IP68).

*** 见后面“技术参数”。 / see following page “Technical data”.

订货型号 / Article code

Y H C P O

电缆保护系统 CP / Cable protection system CP

版本 / Version

- SA- = 标准应用 / Standard applications
- HT- = 高温 / High temperatures
- ML- = 机械冲击载荷 / Mechanical impact loads
- AF- = 侵蚀性流体 / Aggressive fluids
- SE- = 含盐环境 / Saliferous environment
- ADA = 适配器 M20 至 25 / Adapter M20 to M25

电缆密封件 / Seals for cables

- A = 密封, 1 个开口, 用于 1x Ø 6–13 mm 电缆 / Seal with 1 opening for 1x Ø 6–13 mm cable
- B = 用 2 个开口密封 1x Ø 8 mm 和 1x Ø 5 mm 电缆
Seal with 2 openings for 1x Ø 8 mm and 1x Ø 5 mm cables



保护软管长度 / Length of protection hose

- O__ = 长度, 单位: 米 [m] (注意: 可用的最大长度为 30 米)
Lengths in meters [m] (attention: available maximum length 30 m)

技术参数 / Technical data

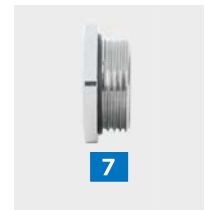
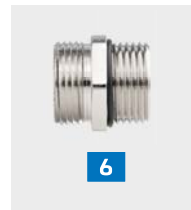
| 系列 / Series | CP-SA | CP-HT |
|--|--|---|
| 应用 Application | 标准应用程序 (例如起重机技术、采矿) Standard applications (e. g. crane technology, mining) | 高温 (例如炼钢厂、热轧厂) High temperatures (e. g. steel making, hot rolling mills) |
| 图片 Image |  |  |
| 材料 (软管) Material (Hose) | 镀锌钢; PVC 护套 Galvanized steel; PVC sheath | 光纤; 硅胶护套 Optical fiber; silicone sheath |
| 特性 Characteristics | <ul style="list-style-type: none"> • 非常坚固和防震 • 耐腐蚀、耐油 • 抗紫外线、臭氧和耐候 • Extremely robust and shock-proof • Corrosion resistant, oil resistant • UV, ozone and weather resistant | <ul style="list-style-type: none"> • 短时间阻燃, 非常柔软 • 耐油耐化学腐蚀 • 抗紫外线、臭氧和耐候 • Briefly flame resistant, very flexible • Oil and chemical resistant • UV, ozone and weather resistant |
| 保护软管 / Protection hose | | |
| 内 / 外径 / Inside / outside Ø | 16 mm / 21 mm (½") | 16 mm / 22 mm (⅝") |
| 温度范围 Temperature range | -45 ... +105 °C (+75 °C UL/CSA) +120 °C (短期 / short-term) | -55 ... +260 °C, +1640 °C (15–30 s), +800 °C (20 min.) |
| 保护等级 / Degree of protection | IP66 / IP67 | IP54 |
| 最大弯曲半径 Max. bending radii static / dynamic | 90 mm / 110 mm | 无限制 No restriction |
| 最大强度分类 Max. strength classification (NEN-EN-IEC 61386) | 抗拉强度 / Tensile: 1000 N (CL. 4) 压缩 / Compression: 1250 N (CL. 4) 冲击 / Impact: 6 J (CL. 4) | N、A. (可弯曲) N.A. (bendable) |
| 认证 / 进一步特征 Certifications / Further characteristics | UL/CSA 认证 良好的 EMC 性能 Good EMC properties | EN 45545-2 标准 (轨道车辆 / 消防) (Rail vehicles / Fire protection) |
| 连接 / Connection | | |
| 卡环 / 旋入套筒 Clamp ring / screw-in sleeve | 聚酰胺 / 镀锌钢 Polyamide / galvanized steel -45 ... +105 °C; IP68; UL/CSA | 黄铜、镀镍 / 镀锌钢 Brass, nickel-plated / galvanized steel -55 ... +125 °C; IP68 |
| 插入式密封 / O型密封圈 Seal insert / O-ring | EPDM V0 / NBR -40 ... +100 °C; IP68 (UL/CSA: 只有 / only Ø 6–13 mm) | EPDM V0 / NBR -40 ... +100 °C; IP68 |
| 联管螺母 + 电缆密封套 + 连接螺纹 M20x1,5 (编码器) Union nut + cable gland + connection thread M20x1.5 (encoder) | 黄铜, 镀镍 Brass, nickel-plated -55 ... +125 °C; IP68; UL/CSA | 黄铜, 镀镍 Brass, nickel-plated -55 ... +125 °C; IP68 |
| 选项 / Options | | |
| 适配器 / Adapter M20x1.5 – M25x1.5 | 黄铜, 镀镍 / O型圈 NBR Brass, nickel-plated / O-ring NBR -55 ... +125 °C (O形圈 / O-ring: -45 ... +105 °C); IP68 | 黄铜, 镀镍 / O型圈 NBR Brass, nickel-plated / O-ring NBR -55 ... +125 °C (O形圈 / O-ring: -45 ... +105 °C); IP68 |

技术参数 / Technical data

| CP-ML | CP-AF | CP-SE |
|---|---|--|
| 机械冲击载荷 (例如轧钢厂、矿山) Mechanical impact loads (e. g. rolling mills, mines) | 侵蚀性流体 (例如炼钢厂、化工厂) Aggressive fluids (e. g. steel refining, chemical plants) | 含盐环境 (例如海上部门、起重机技术) Saliferous environment (e. g. offshore sectors, crane technology) |
|  |  |  |
| 不锈钢 V2A (Agraft AISI-304) Stainless steel V2A (Agraft AISI-304) | 不锈钢 V4A (波纹管 AISI-316L) / Stainless steel V4A (corrugated tube AISI-316L) | 不锈钢 V4A (AISI-316) ; TBU护套 Stainless steel V4A (AISI-316); TBU sheath |
| <ul style="list-style-type: none"> • 极其坚固、灵活和防震 • 良好的耐油性和耐化学性 • 防紫外线、防臭氧和防风雨 • Extremely robust, flexible and shock-proof • Very good oil and chemical resistance • UV, ozone and weather-proof | <ul style="list-style-type: none"> • 最大耐腐蚀性, 坚固耐用 • 良好的耐油性和耐化学性 • 抗紫外线、臭氧和耐候 • Maximum corrosion-resistance, robust • Very good oil and chemical resistance • UV, ozone and weather resistant | <ul style="list-style-type: none"> • 极耐紫外线、臭氧和天气 • 非常坚固和防震 • 耐腐蚀、耐油和耐化学腐蚀 • Extremely UV, ozone and weather resistant • Extremely robust and shock-proof • Corrosion, oil and chemical resistant |
| 17 mm / 21 mm (½") | 16 mm / 22 mm (DN 16) | 16 mm / 21 mm (½") |
| -100 ... +600 °C | -70 ... +250 °C | -55 ... +105 °C +125 °C (短期的 / short-term) |
| IP40 | IP69 | IP66 / IP67 |
| 75 mm / 100 mm | 60 mm / 180 mm | 75 mm / 110 mm |
| 抗拉强度 / Tensile: 1000 N (CL. 4) 压缩 / Compression: 4000 N (CL. 5) 冲击 / Impact: 6 J (CL. 4) | 抗拉强度 / Tensile: 1000 N (CL. 4) 压缩 / Compression: 750 N (CL. 3) 冲击 / Impact: 2 J (CL. 3) | 抗拉强度 / Tensile: 1000 N (CL. 4) 压缩 / Compression: 1250 N (CL. 4) 冲击 / Impact: 6 J (CL. 4) |
| EN 45545-2 (轨道车辆 / 消防) (Rail vehicles / Fire protection) | 很好的 EMC 特性 Very good EMC characteristics | - |
| 黄铜, 镀镍 / 黄铜, 镀镍 Brass, nickel-plated / Brass, nickel-plated -55 ... +125 °C; IP68 | 黄铜, 镀镍 / PTFE (密封圈, 白色) Brass, nickel-plated / PTFE (sealing ring, white) -55 ... +125 °C; IP68 | 聚酰胺 / 不锈钢 V4A (AISI-316) Polyamide / stainless steel V4A (AISI-316) -45 ... +105 °C; IP66/IP67 |
| EPDM V0 / NBR -40 ... +100 °C; IP68 | EPDM V0 / NBR -40 ... +100 °C; IP68 | EPDM V0 / NBR -40 ... +100 °C; IP66/IP67 |
| 黄铜, 镀镍 Brass, nickel-plated -55 ... +125 °C; IP68 | 黄铜, 镀镍 Brass, nickel-plated -55 ... +125 °C; IP68 | 不锈钢 V4A (AISI-316) Stainless steel V4A (AISI-316) -55 ... +125 °C; IP66/IP67 |
| 黄铜, 镀镍 / O型圈 NBR Brass, nickel-plated / O-ring NBR -55 ... +125 °C (O形圈 / O-ring: -45 ... +105 °C); IP68 | 黄铜, 镀镍 / O型圈 NBR Brass, nickel-plated / O-ring NBR -55 ... +125 °C (O形圈 / O-ring: -45 ... +105 °C); IP68 | 不锈钢 V4A (AISI-316) / O形圈 NBR Stainless steel V4A (AISI-316) / O-ring NBR -55 ... +125 °C (O-Ring: -45 ... +105 °C); IP66/IP67 |



设计和功能 / Design and functionality



- | | |
|--|---|
| <p>1 保护软管 / Protection hose</p> <p>2 联管螺母 / Union nut</p> <p>3 卡环+旋入式套筒 / Clamp ring + screw-in sleeve</p> <p>4 电缆密封套插件 / Cable gland insert</p> | <p>5 密封嵌件 / Seal insert</p> <p>6 螺纹 M20 适配器 / Adapter with thread M20</p> <p>7 可选适配器 M20x1.5 至 M25x1.5 Optional adapter M20x1.5 to M25x1.5</p> |
|--|---|

单个软管最大长度可达到 30 m。可根据要求实现更长的长度。
Individual hose lengths possible up to the maximum length of 30 m. It is possible to realize longer lengths on request.



询价表
如果你已经在跟踪一个项目：
利用我们的询价表，方便地要求
报价。

请将填妥的表格发送至：
sales@huebner-giessen.com



Inquiry forms
If you are already working on a
project: we support you with our
inquiry forms to easily request a
quote.

Please send the completed form to:
sales@huebner-giessen.com



屏蔽元件

必要时，可在密封套和适配器之间安装屏蔽元件。

Shielding element

Where necessary a shielding element can be realized between the sealing insert and adapter.



防踩踏保护

作为对我们强大编码器系统的补充，电缆保护系统 CP-SA、CP-ML、CP-AF 和 CP-SE 还可防止重量负载，例如，当人员站立/踩踏时。

Tread protection

Complementary to our robust encoder systems, the cable protection systems CP-SA, CP-ML, CP-AF and CP-SE also protect against weight loads, e. g. when stood/stepped on by personnel.



密封概念

安全安装，防止液体进入编码器接线盒。

- 带o形密封圈的 M20 连接螺纹
- 适用于电缆组合的集成密封嵌件（见下文）

Sealing concept

Secure installation protects encoder terminal boxes by preventing the undesired ingress of fluids.

- M20 connection thread with o-ring seal
- Integrated sealing insert suitable for cable combination (see below)

为密封、电缆应变消除和不同电缆组合量身定制的密封嵌件

Tailor-made sealing inserts for sealing, cable strain relief and different cable combinations



带有 1 个开口和内部插入件的密封件，适用于直径为 6–13 mm 的电缆；适用于安装单根电缆，如铜缆或光缆。

Seal with 1 opening and internal insert for cable \varnothing 6–13 mm; suitable for installing a single cable, e.g., copper or fiber optic cable.



用 2 个开口密封 \varnothing 8 mm 和 \varnothing 5 mm 电缆；适合通过电缆密封套安装两条电缆

- 例如，最大 8 mm 的光缆（信号线）
- 例如，最大 5 mm 的铜电缆（电源电压）

Seal with 2 openings for \varnothing 8 mm and \varnothing 5 mm cables; suitable for installing two cables through a cable gland

- e.g., fiber optic cable up to \varnothing 8 mm (signal line)
- e.g., copper cable up to \varnothing 5 mm (supply voltage)

如果需要，客户可以现场切割密封嵌件（例如，插入 FOC 连接器）。

If required, the customer can slit the sealing inserts on-site (e.g., to insert FOC connectors).

应用实例 / Application examples

1 CP-SA 用于标准应用 / for standard applications



U-ONE-LWL 基本单元 UOL 40，带电缆保护系统 CP-SA，利用两个接线接口在接线盒中：

左侧：信号传输光缆
右侧：电源铜电缆

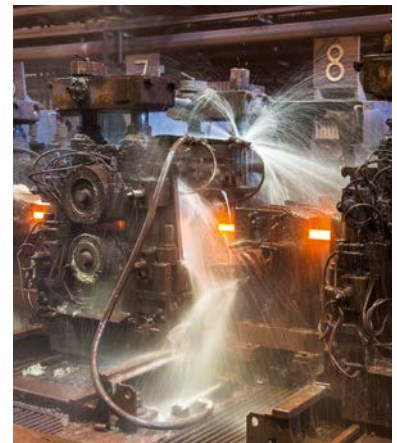
- 应用实例：监测暴露在室外天气条件下的起重机；或者不锈钢电缆保护（CP-SE）用于极端含盐空气、湿度、紫外线辐射等（海上）

The U-ONE-LWL basic unit UOL 40 with cable protection system CP-SA utilizing both wiring interfaces in the terminal box:

Left side: FOC cable for signal transmission
Right side: Copper cable for the power supply

- Application example: Monitoring crane hoists exposed to outdoor weather conditions; alternatively stainless steel cable protection (CP-SE) for extremely saliferous air, humidity, UV radiation etc. (offshore)

2 暴露于极端温度下的 CP-HT / when exposed to extreme temperatures



绝对值编码器 ALS 40 (SSI)，带电缆保护系统 CP-HT。

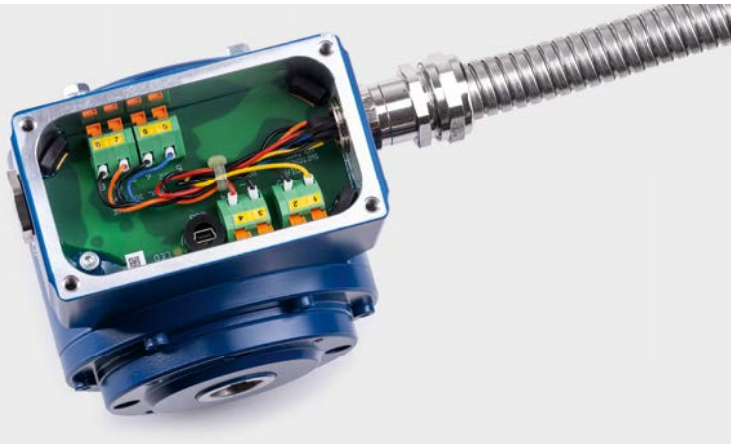
- 应用实例：热轧活套定位控制

Absolute encoder ALS 40 (SSI) with cable protection system CP-HT.

- Application example: Positioning control on loopers in hot rolling mills

应用实例 / Application examples

3 暴露于机械冲击载荷时的 CP-ML / when exposed to mechanical impact loads



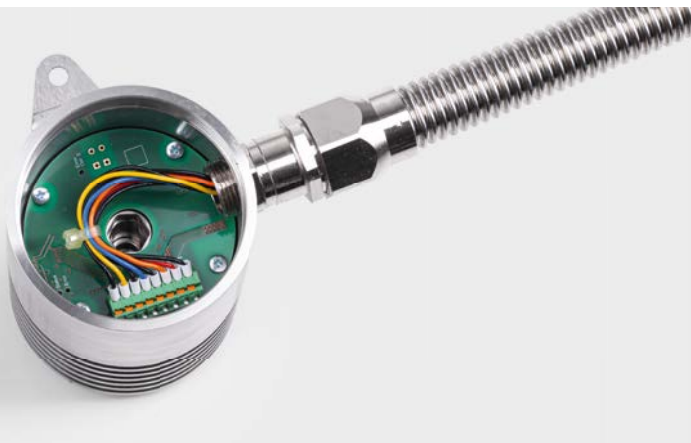
带电缆保护系统 CP-ML 的超速开关 EGS4 41.

- 应用实例：矿用斗轮挖掘机速度监测

Overspeed switch EGS4 41 with cable protection system CP-ML.

- Application example: Speed monitoring on bucket wheel excavators used in mining

4 CP-AF 暴露在腐蚀性液体中时 / when exposed to aggressive fluids



带电缆保护系统 CP-AF 的增量编码器 FGJ INOX.

- 应用实例：腐蚀性流体化工厂传动装置的速度控制

Incremental encoder FGJ INOX with cable protection system CP-AF.

- Application example: Speed control for drives in chemical plants with aggressive fluids

Johannes Hübner

Fabrik elektrischer Maschinen GmbH
Siemensstrasse 7
35394 Giessen
Germany
Tel./Phone: +49 641 7969-0
Fax: +49 641 73645
E-mail: info@huebner-giessen.com
www.huebner-giessen.com

中国代理:

鞍山维盛自动化科技有限公司
地址: 辽宁省鞍山市高新区千山中路 153 号
鞍山软件园二期三楼
总机: 0412-5223868
手机: 13941248798/13504120338
传真: 0412-5214675
E-mail: info@aswisdom.com
网址: www.aswisdom.com



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