



Hartmann & König
STROMZUFÜHRUNGS AG

港口及集装箱搬运设备
哈特曼-传输动力，无处不在。

Ports & Container
We energize mobility. Worldwide.



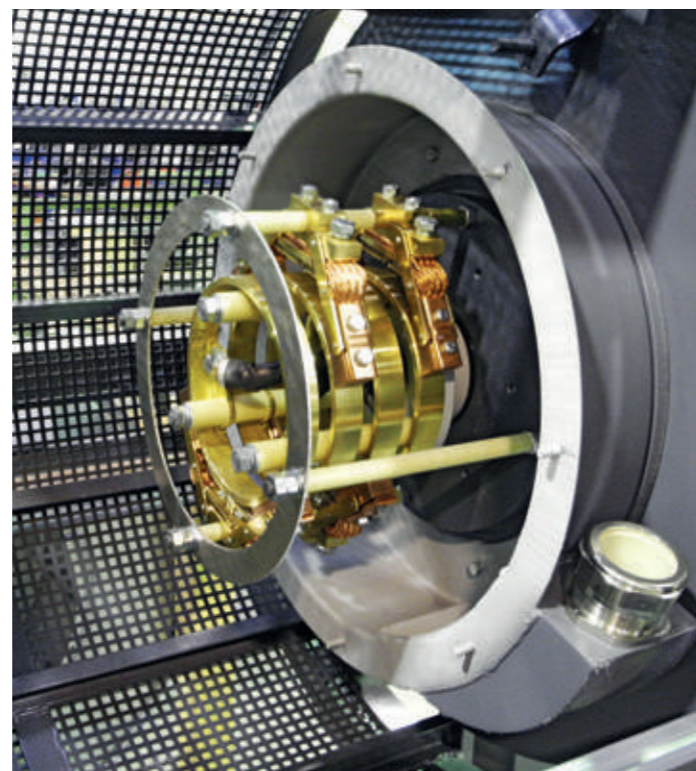
以专业知识满足客户需求

哈特曼 (Hartmann & König) , 作为电动电缆卷筒、弹簧电缆卷筒和滑环箱的主要制造商之一, 向遍布全球的移动设备提供具有最先进技术的动力及数据传输系统。“德国制造”的高品质电缆卷筒被应用与 STS 和门式起重机、船用和工程起重机、挖掘机及各类起重运输设备 - 任何需要可靠传输电力、数据和其它介质 (液体和气体等) 的场合。

丰富的专业经验, 令我们的产品 - 卷筒和滑环箱, 拥有当今同领域中最前沿的技术。中型企业的创新能力、稳定性和灵活性, 是哈特曼取得当前成就的基石。

我们在移动设备供电领域的专业知识, 来自于70多年研发和生产卷筒和滑环箱产品的经验。

我们有专门的团队向客户提供支持, 由最有经验的工程师和设计师组成, 为最具挑战性的应用需求开发最佳的解决方案。我们能够按照客户要求定制几乎所有类型的电动卷筒, 无论是单排螺旋缠绕的卷盘还是水平缠绕的卷筒。缠绕对象可以是传输动力和数据信号的电缆, 可以是传输流体的软管, 也可以是钢丝绳。



Ports & Container market requirements

港口及集装箱搬运设备市场需求

最高的质量标准

当今, 超过90%的货物通过海路运往世界各地。动力和数据传输系统为确保港口和集装箱码头的作业效率起到至关重要的作用。高可靠、低维护即意味着保证顺利作业和最少量的停机检修。

在同等条件下比较, 哈特曼 (H&K) 制造的卷筒和滑环箱是非常坚固耐用的, 适合在全球气候变化多端的港口长期使用。

几十年来, 哈特曼制造的产品服务于各类起重运输设备, 其中包括港口移动式起重机、RMG、RTG、STS, 以及各类多功能起重机等。

我们的卷筒制造执行最高的安全等级, 并且满足最高的防腐要求, 可适用于极端恶劣的作业环境。

哈特曼 (Hartmann & König) 执行最严格的质量标准, 满足全球客户需求。





H&K power supply solutions for Ports & Container market

H&K 为港口和集装箱搬运设备提供供电解决方案

Deck Cranes & Offshore Applications 甲板起重机及海上平台应用

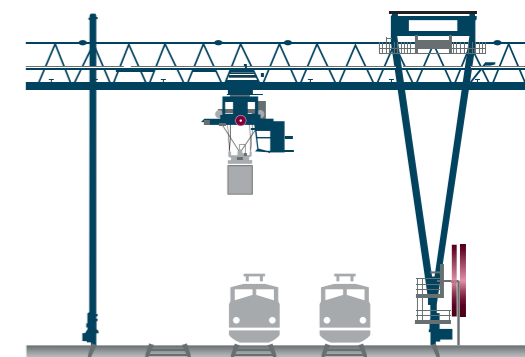
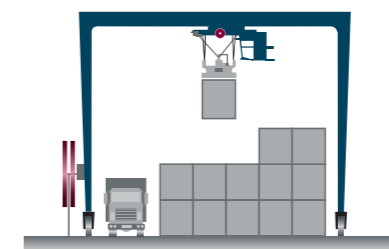
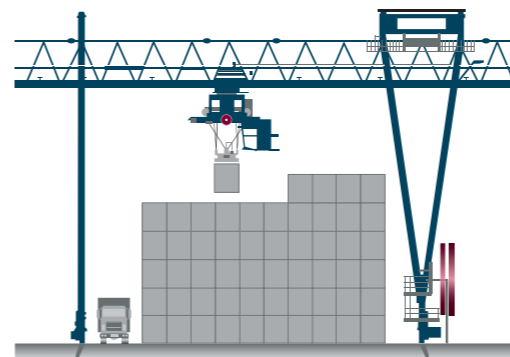
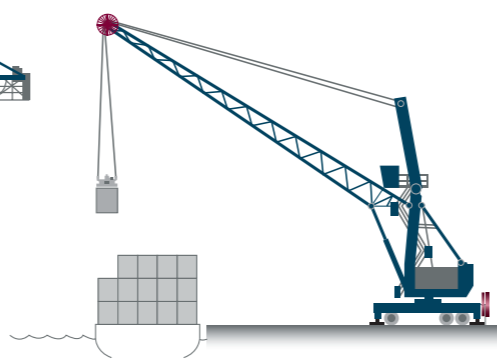
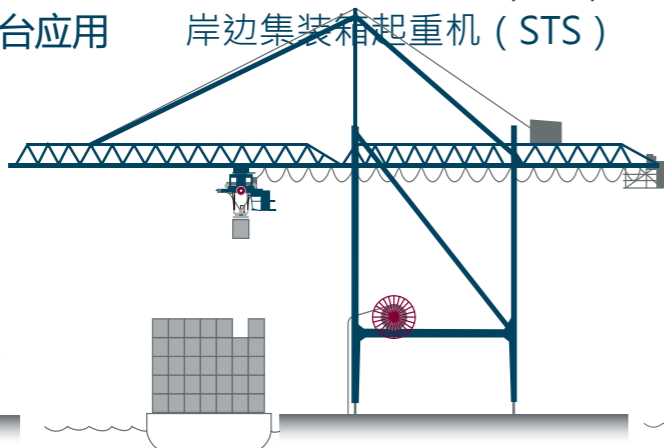
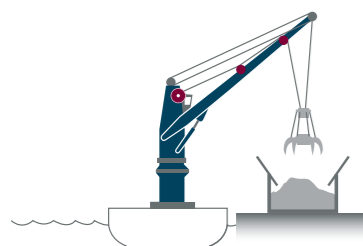
Ship-to-Shore Container Cranes (STS) 岸边集装箱起重机 (STS)

Maritime Cranes 海洋工程起重机

Rail Mounted Gantry Cranes (RMG) 轨道龙门起重机 (RMG)

Rubber Tyred Gantry Cranes (RTG) 轮胎式龙门起重机 (RTG)

Intermodal Cranes 联运中心起重机



In order to move heavy loads on board ships, our motorized cable reels equipped with turbo couplings and cylindrical gears can be relied upon to supply power to the most diverse types of Deck Cranes. At the same time, rope reels stabilise the rotary and slewing movements of grabs and spreaders.

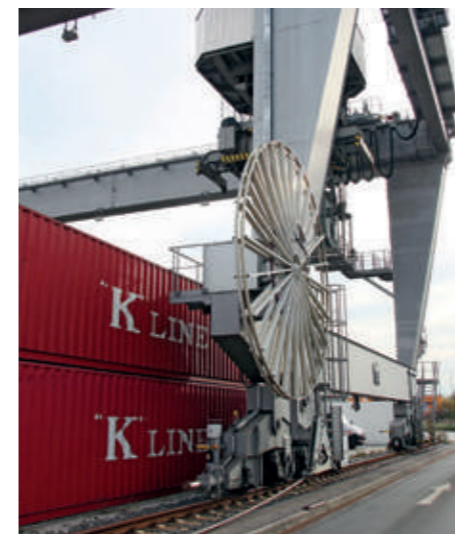
To enable efficient loading and unloading of large ships, Ship-to-Shore cranes master logistical feats of approximately 400-900 tons per hour every day. Motorized cable reels are used to facilitate the vertical movements of spreaders as well as the horizontal mobility of the container crane itself.

Mobile Harbour Cranes are among the most flexible and powerful transshipment machines anywhere in the world today and their lifting capacity of 300 tons allows them to handle containers, general and bulk cargo. Motorized cable reels are used to supply power to spreaders and for the electrification of cranes.

Rail Mounted Gantry Cranes (RMG) provide for efficient and space-saving positioning of containers in sequence. Thanks to their very high lifting and trolley speeds, the motorized cable reels by H&K enable short cycle times while guaranteeing maximum horizontal mobility.

Rubber Tyred Gantry Cranes (RTG) are used in the same way as RMGs for stacking containers. Thanks to their rubber tyres, they are the most flexible gantry cranes worldwide. To facilitate their conversion to more eco-friendly electrical power, H&K can offer tried and tested solutions for the use of motorized cable reels.

Intermodal Cranes serve as flexible interfaces for the transshipment of goods between ports, inland ports and the hinterland. They are used primarily for handling standardised containers on trucks or railways and they operate in a similar manner to RMGs.



Ship-to-Shore Container Cranes (STS)

岸边集装箱起重机 (STS)

Efficient container handling

Ship-to-Shore Cranes perform logistical feats to enable efficient loading and unloading of vessels every day. Given the continuous growth of cargo handling by sea and the ever-increasing size of container ships, optimised cranes are essential to ensure efficient container handling.

Motorized cable reels by Hartmann & König are used to supply energy and data to STS cranes, thereby enabling short cycle times due to high lifting and trolley speeds as well as horizontal flexibility of the crane itself. Since space is often limited, we construct width winding cable reels for fast vertical spreader movements. Wherever possible, we provide spiral winding motor cable reels to enable higher trolley speeds.

Ship loaders and unloaders for ocean-going ships and inland waterway vessels have been designed to optimise and maximise economic handling of bulk materials.



A wide range of rail mounted loading and unloading machines of each size installed at berths enable efficient handling of bulk goods. Motorized cable reels by Hartmann & König are designed to accomplish numerous tasks that include horizontal movements, distances up to 60 m, acceleration of 0.2 m/s² and slip ring bodies of up to 1000 A.

应用于 STS 的电缆卷盘性能参数

性能	吊具电缆卷盘	大车供电电缆卷盘
运行速度	up to 240 m/min	up to 180 m/min
最高加速度	up to 1 m/s ²	0,5 m/s ²
安装高度	up to 60 m	up to 20 m
驱动形式	变频器; 磁滞联轴器	变频器; 磁滞联轴器
滑环箱	动力 + 控制 + 光纤	动力 + 控制 + 光纤
缠绕长度	up to 60 - 70 m	up to 600 m
供电点	端点	中点 / 端点
卷盘外径	up to 2 m	up to 9,5 m
环境温度	from -25° C up to +40° C	from -25° C up to +40° C
附件	改向轮; 导向托辊; 缓冲装置; 电缆拉索。	带过松过紧控制的 导缆架; 改向轮; 导向托辊; 出线装置; 地面接线箱。

Maritime Cranes / 海工起重机

Maximum flexibility

Due to their compact design, Mobile Harbour Cranes are the world's most flexible and powerful cargo handling equipment in ports and container terminals. Today, Mobile Harbour Cranes can be electrified by means of powerful motorized cable reels, largely keeping their flexibility and agility within the quay infrastructure.

应用于 移动式港口起重机 (MHC) 的电缆卷盘性能参数

性能	吊具电缆卷盘	大车供电电缆卷盘
运行速度	up to 240 m/min	60 m/min
最高加速度	up to 1 m/s ²	0,2 - 0,3 m/s ²
安装高度	up to 100 m	5 - 6 m
驱动形式	变频器; 磁滞联轴器	变频器; 磁滞联轴器
滑环箱	动力 + 控制 + 光纤	动力
缠绕长度	up to 100 m	up to 60 m
卷盘外径	3 - 4 m	5 - 6 m
环境温度	from -25° C up to +45° C	from -25° C up to +40° C
附件	缓冲装置; 电缆拉索。	带过松过紧控制的 导缆架; 出线装置; 地面接线箱。

Offering a wide variety of energy and data transfer solutions, Hartmann & König develops and manufactures state-of-the-art motorized cable reels and slip ring bodies specifically to customer requirements. Cable reels mounted on cantilever arms for fast vertical spreader movements can be driven by frequency inverter or hydraulically driven – for maximum lifting speeds of up to 240 m/min and optimum torque.



轮胎式门式起重机 (RTG)

Proven RTG solutions

Eco-friendly power for RTGs

Rubber Tyred Gantry Cranes (RTG) are used in particular for efficient stacking of standard containers. Since they are mobile, RTGs were originally powered by diesel generator systems. In recent years, there has been a clear trend towards the electrification of RTGs. Therefore, motorized cable reels are important components when it comes to retrofitting RTG cranes worldwide with the aim of significantly reducing overall fuel consumption.

Shutting down diesel generators is not only the better environmental solution, but may be a growing economic argument for port operators.

Advantages at a glance:

- Cost-effective solutions due to lower energy consumption
- Better efficiency in comparison to diesel generators
- Protection against volatile oil prices
- No time loss due to refuelling
- Reduced maintenance downtimes
- Significant reduction in CO₂ emissions
- Environmentally friendly due to the elimination of various harmful emissions

应用于 E-RTG 的电缆卷盘性能参数

性能	大车供电电缆卷盘
运行速度	up to 140 m/min
最高加速度	0,25 m/s ²
安装高度	5 - 8 m
驱动形式	变频器； 磁滞联轴器
滑环箱	动力
缠绕长度	up to 200 m
供电点	端点
卷盘外径	5 - 6 m
环境温度	from -25° C up to +40° C
附件	带过松过紧控制的导缆架； 改向轮； 出线装置。



轨道安装门式起重机 (RMG)

Rail Mounted Gantry Cranes (RMG)

Tailor-made robust solutions

Rail Mounted Gantry Cranes (RMG) ensure the efficient and space-saving positioning of standard containers between container corridors. They incorporate both a sturdy design for low-maintenance cargo handling and tailor-made power supply solutions to guarantee reliable just-in-time logistics all over the world. Intermodal Cranes are comparable with RMGs in terms of design and functionality. Therefore, they are equipped with similar, environmentally friendly power transmission components.

Motorized cable reels by H&K are proven systems for energy and data transfer. They enable short cycle times due to high hoist and trolley speeds as well as horizontal flexibility of gantry cranes.

应用于 RMG 的电缆卷盘性能参数

性能	大车供电电缆卷盘
运行速度	up to 180 m/min
最高加速度	0,5 m/s ²
安装高度	up to 12 m
驱动形式	变频器； 磁滞联轴器
滑环箱	动力+ 控制+ 光纤
缠绕长度	up to 400 m
供电点	中点 / 端点
卷盘外径	8 - 9 m
环境温度	from -25° C up to +40° C
附件	带过松过紧控制的导缆架； 改向轮； 导向托辊； 出线装置； 地面接线箱。



Deck Cranes and Offshore Applications

甲板起重机和海上平台应用

Seaworthy and sturdily designed

The ability to move containers, general and bulk cargo as well as heavy loads on board freight vessels and offshore platforms requires energy to operate cranes and grabs of different sizes and functionalities. All technical equipment used at sea must meet the strictest requirements in terms of ruggedness and salt-water resistance to ensure that it can operate reliably for many years even under extremely harsh environmental conditions.

For this reason, we manufacture reel bodies and flanges from stainless steel or hot-galvanised sheet steel with special coatings to protection class IP 66, or higher if required. Our rugged motorized cable reels with cylindrical gears and turbo couplings guarantee a reliable supply of energy to Deck Cranes of all types. Last but not least, rope cable reels by Hartmann & König are used to stabilise the rotary and slewing movements of grabs and spreaders.

应用于甲板起重机的电缆卷盘性能参数

性能	吊具电缆卷盘
运行速度	up to 100 m/min
最大加速度	1 m/s ²
安装高度	up to 50 m
驱动方式	磁滞联轴器；液力耦合器
滑环箱	动力 + 控制
缠绕长度	up to 80 m
卷盘外径	4 - 5 m
环境温度	from -25° C up to +40° C
附件	改向轮；导向辊



Shore-side power supply

岸边供电

Green environment solutions

The use of shore-side power supply for docked container ships and cruise liners is a key technology behind environmentally friendly energy consumption of these types of vessels. Previously, most ships relied on diesel-powered generators on board to remain operational during necessary maintenance and layover periods in port.

However, the introduction in recent years of stricter international environmental requirements and directives aimed at cutting ship emissions and noise pollution in harbours has helped bring about a rethink on the part of port operators.

Shore-side power supply uses land-based transformer stations and lines to the quay with connected loads of up to 12 MW to supply power to the ocean-going giants. On the vessel itself, motorized cable reels can be installed on container ships, for example, inside a container in the lowest level (container solution), whereas other applications supply the entire on-board electricity network from the deck (skid solution). For both applications, we offer customised cable reel applications.

供电集装箱性能参数

性能	螺旋或水平缠绕电机驱动电缆卷筒为货船和邮轮供电
运行速度	up to 12 m/min
最大加速度	0,2 m/s ²
缠绕长度	up to 80 m
供电点	end
卷盘外径	2 - 3 m high single or double cable reels
安装高度	up to 25 m
滑环箱	动力 + 控制 + 光纤
环境温度	from -25 °C up to +40 °C
附件	导向装置
驱动形式	变频器



Motorized cable reels: state-of-the-art technology

电机驱动电缆卷筒：最先进的技术

可靠的动力和数据传输

哈特曼 (H&K) 生产的电机驱动电缆卷筒采用先进的技术和坚固的设计，为港口、集装箱码头和海工机械等各类起重设备提供可靠的动力。卷筒的设计可以满足高速、动态受力、大截面电缆和高牵引力的需要。

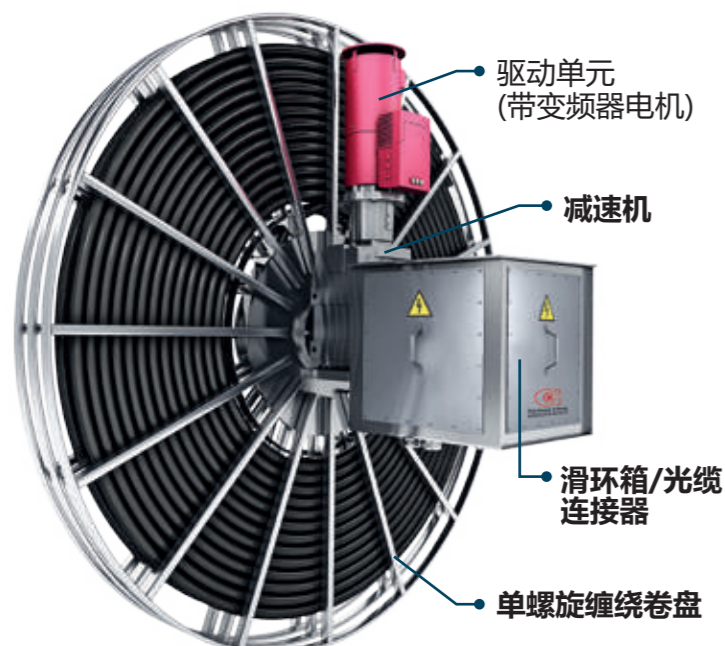
哈特曼能够提供所有形式的卷盘驱动方案：

- 带制动器标准三项电机
- 力矩电机
- 变频器驱动
- 液压驱动
- 磁滞联轴器 (规格 1.8 - 88)
- "Turbo" 联轴器 (规格 274 + 366)
- 伞齿轮或扁平型减速机

精确的变力矩控制

变力矩控制的电机驱动电缆卷筒适用于长距离行走的设备 (如门式起重机)，以及缠绕截面相对较小的电缆。我们采用变频器驱动三相异步电机或伺服电机，达到精确的速度和力矩控制。变频驱动可以减小电缆承受的张力，从而延长电缆使用寿命，同时提高电缆卷筒整体可靠性。

- 水平铺设电缆，缠绕电缆长度可达1000 m
- 缠绕速度可达 200 m/min
- 单螺旋卷盘体，外径 2.5 - 9.5 m
- 三项电机与伞齿轮减速机驱动
- 可变驱动力矩
- 功率范围 1.5 - 2.2 kW
- 滑环箱及电缆规格，低压 1 kV，中压 1 - 25 kV
- 选配光缆连接器；特殊电缆



Drive units at a glance: performance and application fields

驱动方式一览：性能和应用

	磁滞联轴器	变频电机	"Turbo" 联轴器	液压马达
电路连接	简单	简单 (电机+风扇)	简单 (电机+制动器)	-
力矩控制	-	是	-	-
控制选择	-	是	-	by customer
适合高转速	++	+++	+	+++
转速	max. 950 rpm	max. 1450 rpm	max. 750 rpm	max. 3000 rpm
功率 / 扭矩	1,8 to 25 Nm	0,75 kW (5 Nm) to 15 kW (60 Nm)	20 Nm (274) to 30 Nm (366)	up to 22 kW
转动惯量	高	低	高	低
低温环境	standard up to -40° C (lower than -25° with heating unit)	standard up to -25° C (lower temp. with special solutions)	up to -20° C	standard up to -25° C
高温环境	standard up to +40° C	standard up to +40° C, higher temp. up to +50° C with additional deduction	up to +40° Celsius	standard up to +40° C, higher temp. with additional deduction
工业 / 室外环境	适用	适用	适用	适用
港口	适用	适用	适用	适用
船舶 / 海洋	适用	不适用	适用	适用
价格 / 性能	++	+++	++	++



Slip ring systems
滑环系统

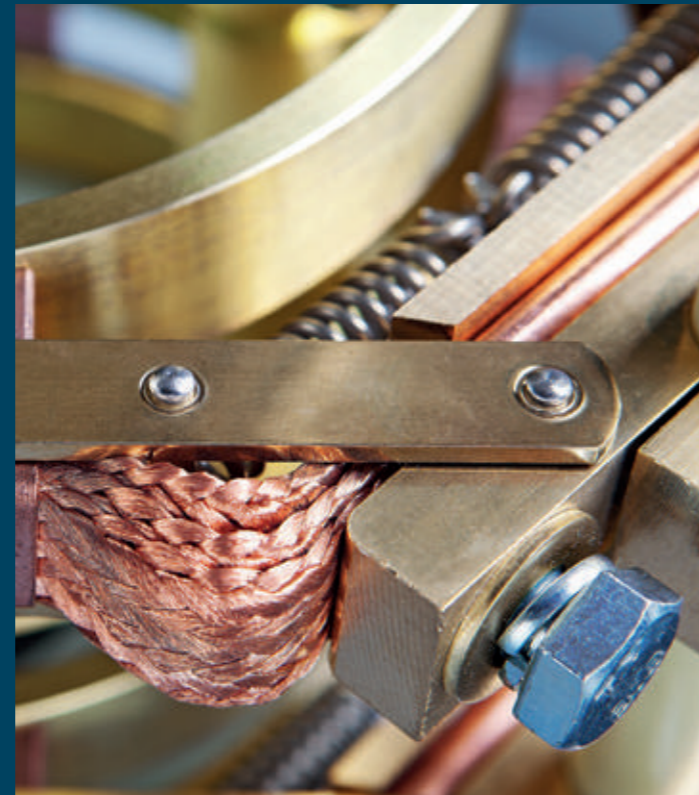
应用

哈特曼 (H&K) 生产的滑环系统和旋转接头可以用于卷筒或其它独立应用。用于任何需要在转动的部件和固定的部件之间传输动力、数据、控制信号和其它介质的部位。

利用模块化设计的开放式或封闭式的滑环系统，我们能够高效地组装出客户需要的产品。另外，我们还提供为大型回转式塔式起重机传输动力和控制信号的特殊的滑环系统。

设计

- 依据触点数量、机械尺寸、特定电压和防护等级要求设计
- 传输的电流 mA - 1000A
- 封闭滑环箱体防护等级为 IP65 或更高
- 便于组装和拆解的设计
- 标准材料组合：黄铜滑环组合铜石墨电刷用于动力传输；铍滑环组合银制电刷用于数字信号传输
- 电刷可以拆卸和更换



Accessories
附件

卷盘附件

Hartmann & König offers a comprehensive range of accessories for its motorized cable reels, such as roller payout guides with or

without control function, deflector and guide pulleys, cable grip, end limit switches, spooling devices or heating units for slip ring housings. More accessories on request.



辊轮导向装置，选配过松过紧保护开关

- 带有控制功能的导向装置，配装接近式或机械式限位开关
- 接近开关工作电压为 15 - 250 VAC 或 15 - 30 VDC



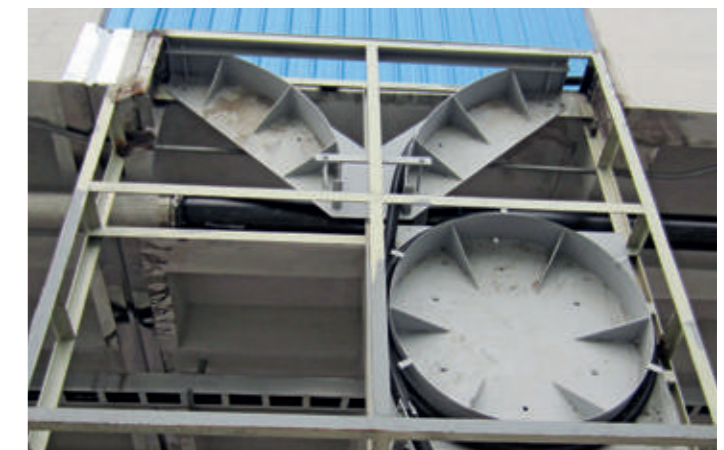
双向导缆滑轮和托辊

- 用于改变电缆出缆方向
- 用于通过中心供电点



中点供电出线装置

- 用于供电点处电缆固定和缓解（弯曲）变形应力
- 中压电缆电压可达 24 kV





Installation & After-Sales Service

安装和售后服务

独特的服务保障

在哈特曼 (H&K) , 我们把客户作为伙伴看待。因此, 我们的服务远早于卷筒或滑环箱交货前。作为动力和数据传输系统的专家, 我们根据需求和安装条件等, 向客户提供综合性的专业咨询建议。

我们的售后服务不仅限于提供备件和易损件, 还可以为有需求的客户提供定期保养服务或协助解决技术故障。

尽管我们的产品是可靠的, 极其坚固耐用, 很少需要维护, 但我们拥有及时响应的服务体系, 为遍布全球的客户提供专业的服务, 并确保几十年的备件供应。

经哈特曼 (H&K) 专业培训的服务人员向客户提供全天候服务。无论距离远近, 我们经验丰富的服务专家, 都会协助您完成复杂的现场安装项目或维护保养任务。



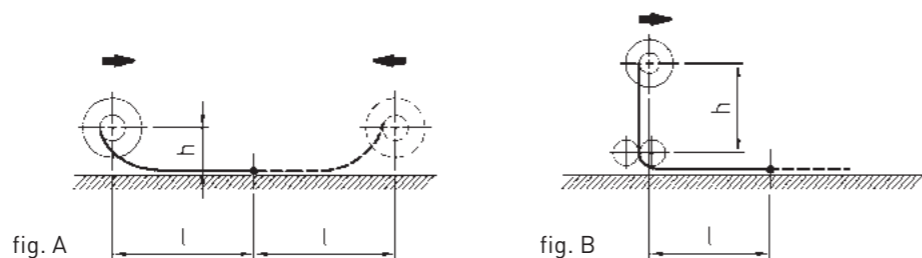
电缆卷筒问询表

<p>01. 设备行走距离 L = m</p> <p>02. 电缆缠绕长度 l = m (中点供电方案, 缠绕长度为行走距离的一半)</p> <p>03. 缠绕形式 <input type="checkbox"/> 单螺旋 <input type="checkbox"/> 水平筒式缠绕 <input type="checkbox"/> 3.2.3 缠绕</p> <p>04. 电缆型号 cross section mm² 外径 Ø mm 重量 kg/m</p> <p>05. 功率和电流 kW A</p> <p>06. 工作周期 %</p> <p>07. 需要绝缘滑环数量 (我们的卷筒总会提供非绝缘接地环)</p> <p>08. 特定应用 (例如: 工程起重机, EOT 起重机, 移动平台等)</p> <p>09. 安装 <input type="checkbox"/> 固定 <input type="checkbox"/> 在移动设备上</p>	<p>10. 出缆形式 <input type="checkbox"/> 水平 <input type="checkbox"/> 垂直 <input type="checkbox"/> 悬挂 (参见安装布置形式说明)</p> <p>11. 安装高度 m (从卷盘中心至基础表面)</p> <p>12. 驱动方式: <input type="checkbox"/> 弹簧 <input type="checkbox"/> 平衡重锤 <input type="checkbox"/> 电机</p> <p>13. 电机工作电压和电流形式: V</p> <p>14. 每小时工作频率 /h</p> <p>15. 每天工作时间 h</p> <p>16. 运行速度 m/min</p> <p>17. 加速度 m/s²</p> <p>18. 电缆铺设位置 <input type="checkbox"/> 轨道之间 <input type="checkbox"/> 轨道外侧</p> <p>19. 缠绕方向 <input type="checkbox"/> 右旋 <input type="checkbox"/> 左旋 (从滑环箱侧观看)</p>	<p>20. 卷筒安装布置形式 (示意图见下页) <input type="checkbox"/> A <input type="checkbox"/> E <input type="checkbox"/> B <input type="checkbox"/> F <input type="checkbox"/> C <input type="checkbox"/> G <input type="checkbox"/> D <input type="checkbox"/> H</p> <p>21. 特殊气候条件: <input type="checkbox"/> 安装在海拔 1000m 以上 <input type="checkbox"/> 海上 <input type="checkbox"/> 地下 <input type="checkbox"/> 湿度 % 强震动 <input type="checkbox"/> 是 说明 <input type="checkbox"/> 否 Noise level in db according to DIN 45633 sheet.1 环境温度范围 °C from to 环境空气 <input type="checkbox"/> 沙尘 <input type="checkbox"/> 煤尘 <input type="checkbox"/> 烟雾 其他介质和应用</p> <p>22. 涂装 priming and cover coat according to RAL 7040 (standard colour) <input type="checkbox"/> hot-dip galvanised <input type="checkbox"/> sand blasting <input type="checkbox"/> other surface treatments <input type="checkbox"/> sea water protection</p>
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For large cable reels please send us a drawing or sketch of the installation or attachment conditions.

Figures A and B

卷筒安装在移动设备上。电缆铺设于地面或连续表面之上。水平方向单向或双向放缆。
Figure B 带导向装置。



Figures C and D

Cable reel on mobile unit. Cable deposit on supports for l_1 up to 1 m. For l above 1 m to max 3 m, the cable is kept on rollers or on smooth supports rounded upwards.
Figure D via a deflector pulley.

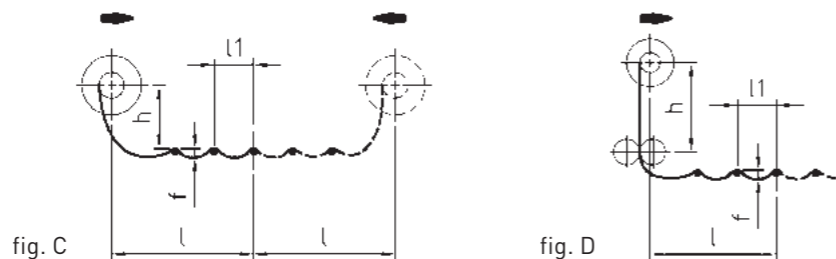


Figure E

Cable reel on mobile unit or on a fixed point. Horizontal cable payout is towards one or two sides. (f is dependent on cable cross-section and on tensile force).

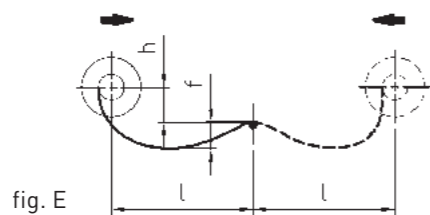


Figure F

Cable reel is stationary. Horizontal cable payout towards one side or two sides, cable is deposited as above in figures C and D, however on rollers.

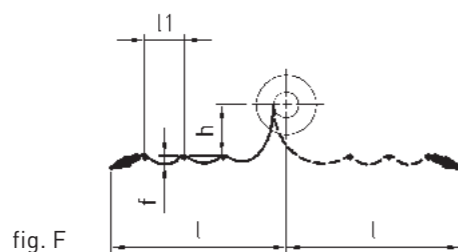


Figure G

垂直向下放缆。

l_1 = 起升高度 / 放缆长度
 L = 电缆长度 = $l_1 + l_2 + 2$ 安全圈

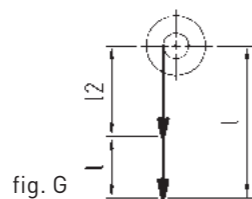
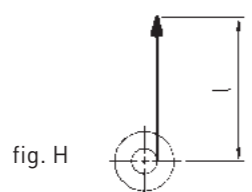


Figure H

垂直向上放缆。
否则与 Figure G 相同。



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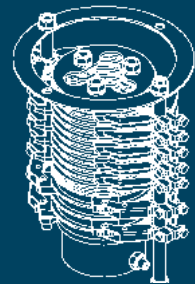
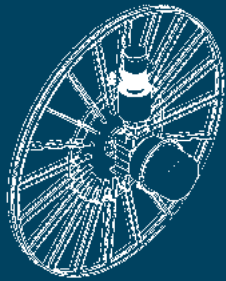
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