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上海振华重工

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自动化引导小车及伴侣 Automated Guided Vehicle & Mate



AGV驶入AGV伴侣以装载集装箱 AGV is going into the AGV mate to be carried containers

公司介绍

上海振华重工（集团）股份有限公司（ZPMC）为全自动化码头系统研发了新一代自动化引导小车（AGV），可分别运载单 20、40、45 英尺或双 20 英尺集装箱。AGV 采用柴油发电机－锂电池混合动力，具有节能、环保、维护成本低等优点。为了有效减少 AGV 与后场自动轨道吊之间的相互等候时间，ZPMC 开发了拥有自主知识产权的 AGV 伴侣（中国专利号：201110151753.9）从而可以显著提高自动化码头的装卸效率。



技术参数 Technical data

项目Item	值Values	单位Units
额定载荷 Maximum rated load	65	t
车辆长度 Maximum length	15	m
车辆宽度 Maximum width	3.1	m
车辆高度 Height	2.2	m
车轮基距 Wheel base	9	m
转弯半径 Turning radius	9	m
油箱容量 Fuel tank capacity	1000	l
集装箱 Containers	20ft, 40ft, 45ft, 2x20ft	
最大行车速度 Maximum traveling speed	350	m/min
最大转弯速度 Maximum curve speed	≤175	m/min
最小寸动速度 Minimal inching speed	6	m/min

A new generation Automated Guided Vehicle has been developed by Shanghai Zhenhua Heavy Industries Co., Ltd. It can handle single 20, 40, 45 ft container or twin 20 ft containers. The AGV is powered by diesel-lithium electric hybrid system which have many advantages such as energy saving, environment friendly, low maintenance costs. ZPMC also developed AGV Mate which is in patent pending (Chinese Patent No. 201110151753.9) to improve efficiency of terminal operating by reducing the latency time between AGV and ARMG.

控制系统 Control systems

AGV 的控制系统主要由导航系统、定位系统、无线数据传输和避障监测系统组成。整车采用先进的 can bus 总线通讯系统，可靠性高、抗干扰性好、响应速度快。硬件采用工程车辆专用控制器，运行速度快，防护等级高，抗冲击、振动性能好。系统配置了完备的安全保护系统如：超声波障碍检测、速度保护系统、集装箱位置检测、电池充放电保护、电池低电量保护等确保车辆运行安全可靠。另外，作为选择项，AGV 还可提供故障监视、中控监视、胎压监测等额外的安全监控系统。

The control system is consisted of Navigation system, Position measuring system (s), Radio data system and Obstacle detection system. The vehicle adopts advanced can-bus communication system which guarantees high reliability, good interference resistance and fast response. Engineering vehicle special Controller which has fast running speed, high protection grade, good shock and vibration resistance is adopted. The system also provides complete safety protection such as ultrasonic obstacle detection, speed protection system, container position detecting, battery charge and discharge protection, low battery protection ensures that the AGV running safety. As an option, fault monitoring & control, center control monitoring, tire pressure monitoring systems can be provided in additionally.

动力系统 Power System

柴油发电机 + 锂电池混合动力，具有节能、低污染、低噪音、低维护成本的优点：
 一、使用混合动力的柴油发电机组，其额定功率仅为全柴油发电机组的 1/4~1/5，从而显著降低柴油机的运行和怠速油耗以及维护成本，且污染排放更低、噪音更小。
 二、锂电池组作为辅助电源不仅可以在车辆加速时补充电能，还可在电机制动时进行能量回收，更节能、环保。

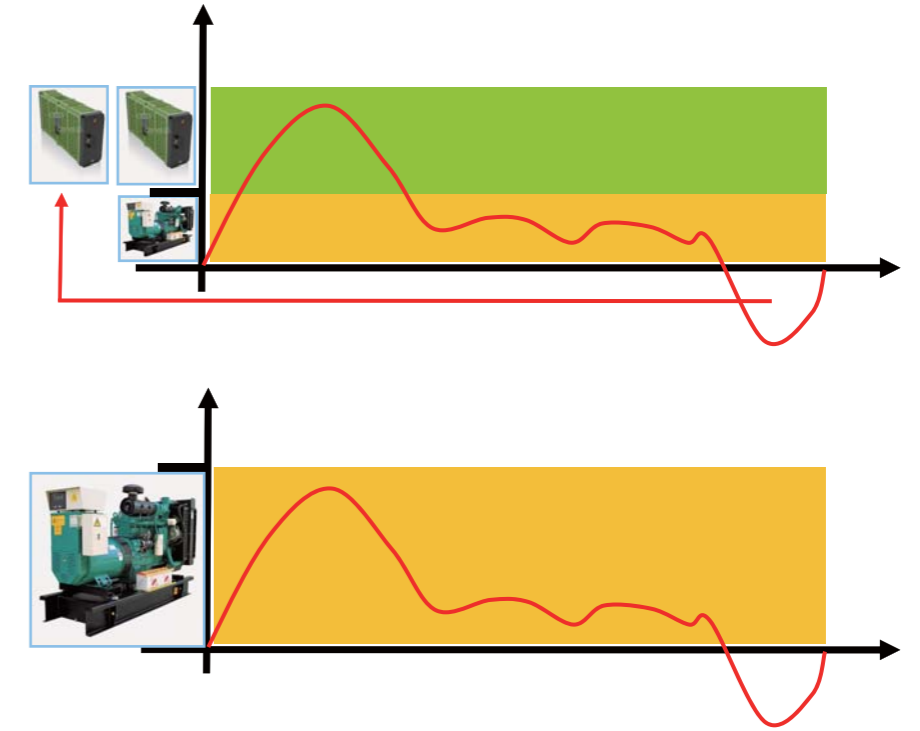
Diesel-lithium electric hybrid power system enjoys the advantages of energy-saving, low pollution, low noise, low maintenance cost:

- 1) The rated power of diesel generator set of hybrid powered system is only 1/5~1/4 compared with using a diesel electric power system only. It can reduce fuel consumption of diesel in both operating and idle speed. It also results in lower maintenance cost, lower pollution and noise.
- 2) The lithium batteries package working as the auxiliary power is for power complementarities during accelerating and energy storage during braking. It is more energy efficient and environmentally friendly.

AGV 伴侣 AGV Mate

AGV 伴侣可作为选择项提供。AGV 伴侣作为 AGV 和自动轨道吊间的中转站，具有自动装卸 AGV 上集装箱的功能，因此可显著减少两者间的相互等待时间，从而提高码头作业效率和减少自动化码头 AGV 的总体需求数量。另外，AGV 伴侣还适合现有 AGV 码头的升级改造。

AGV Mate can be provided as an option. The AGV mate has the function of loading and unloading containers from AGV automatically as a transfer station between AGVs and ARMGs. It can improve efficiency of terminal operating significantly by decrease the latency time and thus decrease the quantity of AGVs accordingly. AGV mate is suitable to not only new automatic terminals but also the upgrading of the exiting AGV terminals.



卸载 Unloading

装载 Loading

避让 Avoiding