穿梭车存储系统使用手册

RADIO SHUTTLE SYSTERM MANUAL

密集	智能	高效	安全
Intensive	Intelligent	Effective	Safe

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ApexBeam

ApexBeam

南京鸿桁仓储设备有限公司

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穿梭车工作环境

　　APEXBEAM 穿梭车用于在设有本公司专用轨道的穿梭式货架系统中升降及沿轨道行驶,以在 货架上沿轨道移动货物托盘,实现货物的存取。穿梭车的无线遥控为数字调频模式,可进行 双面控制方便工作人员操作。在 A 面和 B 面均可实现托盘存取。开机后 A,B 面存取可一键切换。

　　APEXBEAM wireless remote control shuttle cart is suitable for APEXBEAM racking system and guide rail to deposit and pick up pallet. The shuttle cart is radio remote digital frequency modulation mode controlled for A or B sides, which is convenient for operation. Deposit and pick up pallet from A side or B side can be changed by one key on the remote controller.

穿梭车工作环境
WORK ENVIRONMENT

工作环境温度(冷库型):-30 ℃ 至 5 ℃
Environment temperature (cold):-30 ºC to +5 ºC

工作环境温度(标准型):5 ℃ 至 +40 ℃
Environment temperature (cold):-30 ºC to +40 ºC

穿梭车充电、存放环境温度 :+5 ℃ 至 +40 ℃
Charge working and stored temperature :+5 ºC to +40 ºC

光照条件 :大于 50Lux ,小于 3000Lux
Illumination ≤3000Lux   ≥50Lux

相对湿度条件 ≤85%
Relative humidity ≤85%

WORK ENVIRONMENT

穿梭车必需按照本手册说明使用及操作。穿梭车不可用于有静电、爆炸风险的区域。穿梭车工作环境中不可有腐蚀性气体。

The shuttle cart must be operated strictly according to the instruction and should not work in the electrostatic, explosive or caustic environment.
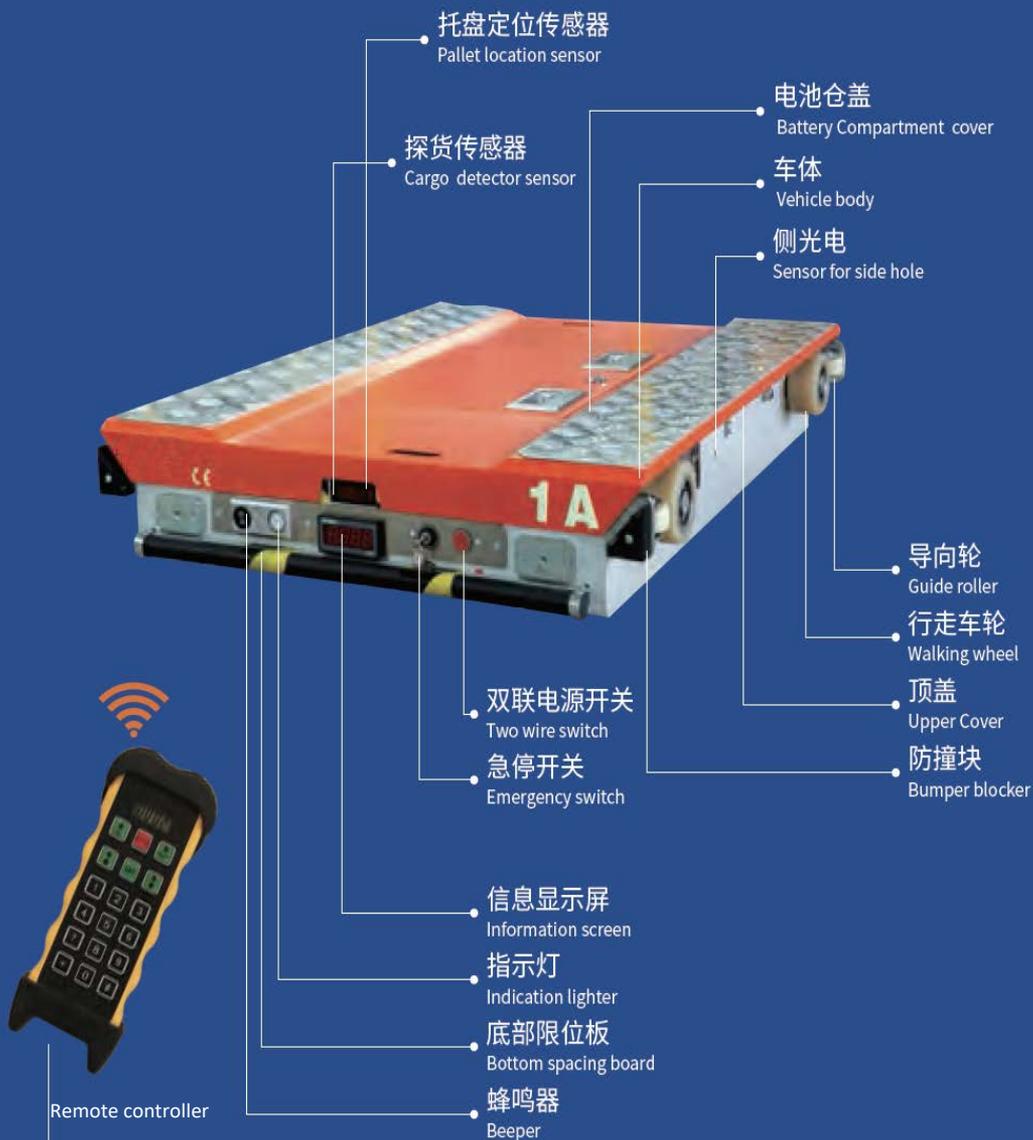
对货架及轨道安装的要求

　　根据《立体仓库焊接式钢结构货架技术要求》、《悬挂轨道的制作和安装要求》及本穿梭车运行环境的需要制订下述精度要求：

　　According to the standards of the 「Criterion for steel shelving structure」,「Requests on production and assembly of hanging rails」 and the working environment of the shuttle cart, the racking system must be produced by the following precision:

1　轨道材料 :镀锌钢板;
　　Material of rails Zinc-coated steel;

2　轨道直线度每 3 米长不超过 5mm;
　　Linear measure of the rails is not more than 5mm per 3 meters;

3　运行轨道纵向水平度每 3 米长不超过 5mm;
　　Portrait leveling measurement of rails is not more than 5mm per 3 meters;

4　两轨道滚动面的高度偏差应满足穿梭车平稳运行;
　　At the same cross section, the height difference between two rails must be satisfied for travelling smoothly;

5　两导轨垂直轨面的宽度与穿梭车配合根据运行需要留有适当间隙;
　　The width of the two rails of the vertical rail surface need to leave appropriate gap,
　　which is according to the shuttle cart when travelling;

6　轨道接头处加强板不得妨碍穿梭车通过;
　　The reinforced boards at ends of the rails (connecting rails) should not impede the travelling of
　　the shuttle cart;

7　轨道接头处的滚动面及侧壁应修整平滑;
　　The rolling surface and sidewall of the rail joints shall be trimmed smoothly;

8　轨道接头留有伸缩缝保证在环境温度变化时有热胀冷缩的间隙;
　　Leaving the expansion joint of the Rail joint to ensure that the thermal expansion and contraction gap
　　when ambient.

穿梭车基本结构

托盘定位传感器
Pallet location sensor

电池仓盖
Battery Compartment cover

探货传感器
Cargo detector sensor

车体
Vehicle body

侧光电
Sensor for side hole

1A

导向轮
Guide roller

行走车轮
Walking wheel

顶盖
Upper Cover

防撞块
Bumper blocker

双联电源开关
Two wire switch

急停开关
Emergency switch

信息显示屏
Information screen

指示灯
Indication lighter

底部限位板
Bottom spacing board

蜂鸣器
Beeper

Remote controller

穿梭车主要结构作用介绍

穿梭车围绕一个盒形底盘构造而成,整体钢结构,带有四个改性尼龙敷层的车轮及 4 个导 向轮。穿梭车由 1 个 26 伏高性能免维护可充电锂电池驱动。

The shuttle cart is constructed from around a box-shaped chassis with four Nylon wheels and four adjustable guiding wheels. The shuttle cart is driven by a high-performance 26-volt maintenance free rechargeable lithium ion battery. The front side of shuttle cart marked with A and back side marked with B.

在两面都有指示灯和双联电源开关,穿梭车 A 面设置信息显示屏、蜂鸣器、紧停开关或钥匙 开关,B 面设置有电源插孔,可用以对穿梭车充电及为救援电磁铁组件供电。

There are indication lighter and two wire power switch on both sides. Information screen, buzzer, key switch on A side and power socket on B side. Power socket can be used to charge for the shuttle and power for rescue electromagnet.

双联开关: 双联电源开关分布于穿梭车 A 面及 B 面,便于从 A、B 面中的任意一面启动穿梭 车。

Two wire power switch: There are two wire power switch on both sides of shuttle cart. The shuttle can be switched on from each side of the shuttle cart.

钥匙开关: 钥匙开关用以·防止非授权人员使用穿梭车。

Key switch: Key switch are used for prevent non authorized person to use the shuttle.

灯光显示代表了穿梭车的工作状态, 设备改进升级后灯光显示会调整变更, 恕不另行通知。

The light-display represents the state of the shuttle cart, which will change to adjust to the equipment upgraded without notice.

指示灯情况 LIGHT DISPLAY		描述 DESCRIPTION
🟢	绿灯常亮 GREEN LIGHT ON	工作状态中 The work is in progress
🔴	红灯常亮 RED LIGHT ON	故障报警(显示板显示 A2~A17) Message error (the display panel show A2~A17)
🔴	红灯闪烁 RED LIGHT TWINKLE	电池电压低报警(显示板显示"A1") Low power (the display panel show "A1")
🟢🔴	红灯、绿灯都熄火 BOTH LIGHT OFF	待机状态(显示板显示「1 或 -1」) Standby mode (when the display panel show "r1"or"-1")

遥控器及遥控接收器:

Remote controller and remote controller receiver :

可用一台手持遥控器控制多台穿梭车,遥控器采用数字调频技术,使用数字脉冲编码技术实现遥控器及遥控接收器间的数据传输,遥控器上按不同的数字键即与对应的穿梭车建立联系,其后使用三个功能键控制对应穿梭车完成相应功能。三个功能键即为遥控器第一排三个键。如遥控器工作不正常,请更换遥控器电池。

A digital frequency modulation controller would be used to control several shuttle carts. The receiver and controller cooperate by digital pulse codes. When a shuttle cart wants to be selected, press the relative number, then the shuttle cart is controlled by the three function keys. Three keys in first row of remote Controller is

function keys.If remote controller can.t work properly, please change the battery within the remote controller.

穿梭车及货架技术数据

技术细节 TECHNICAL DETAILS

动力单元 POWER UNIT		电池 Battery	
操作方式 CONTROL MANNER		无线遥控 Remote control	
额定负载 RATED LOAD	公斤 kg	1500 1500	
运行速度(无载荷) SPEED (WITHOUT LOADING)	米/秒 m/s	0.7-1.0 0.7-1.0	
运行速度(有额定载荷) SPEED (WITH LOADING)	米/秒 m/s	0.6-0.8 0.6-0.8	
加速度 ACCELERATE	米/秒平方 m/s²	0.3 0.3	

电池   BATTERY

电池种类 TYPE		锂电 Lithium	
电池容量 BATTERY CAPACITY	伏/安培小时 V/AH	26/60 26/60	
充电时间 CHARGE TIME	小时 Hour	＜7 ＜7	
电池重量 WEIGHT	公斤 kg	18 18	

充电器   CHARGER

输出 OUTPUT	伏/安培 V/A	29.4DC/12 29.4DC/12	
输入 INPUT	伏/瓦 V/W	100-240AC/440 100-240AC/440	

遥控   REMOTE CONTROL

类型 TYPE		数字调频 数字调频	
供电 POWER SUPPLY		5#, DC1.5V×2 5#, DC1.5V×2	

穿梭车主要尺寸
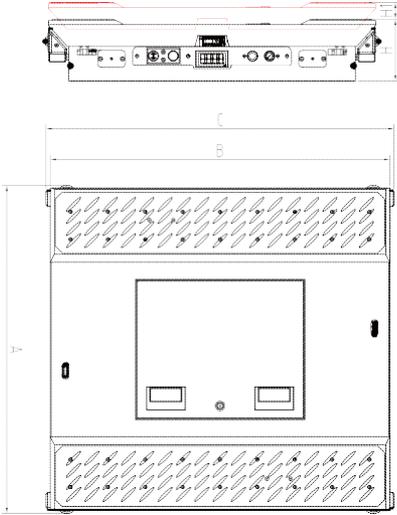
托盘规格 PALLET SIZE				
mm	W1200 D1000	W1200 D1100	W1200 D1200	W1300 D1100
A	978	978	978	1078
B	1000	1100	1200	1100
C	1025	1125	1225	1125
H	183	183	183	183
H1	30~40CM	30~40CM	30~40CM	30~40CM

1.穿梭车尺寸可根据标准托盘尺寸进行选择.
1.The size of the shuttle cart can been chose by pallet size.
2.穿梭车性能及尺寸是带有误差的标称值.
2.The performance and size of the shuttle is nominal value with deviation.
3.产品改进恕不通知.
3.The Product of APEXBEAM will be improved without notice.
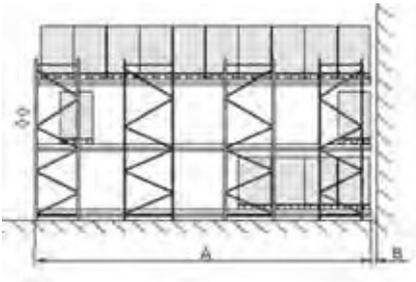
侧视图-先进后出巷道深度
Side view – depth of FILO

A: 巷道深度
300mm+(n×(托盘深度+20mm)
B: 货架后的空余空间≥150 毫米
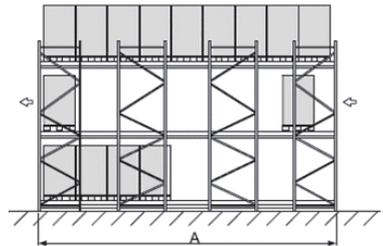
侧视图-先进先出巷道深度
Side view – depth of FIFO

A: 巷道深度 300mm+(n×(托盘深度+20mm))+300mm

穿梭车操作说明及常见故障含义

初开机 STARTING OF SHUTTLE CART

开始 :打开钥匙开关及双联开关 ,显示器先是显示初始化数据 ,然后显示0.0" 设备进行初始动作 ,到初始位后停 ,显示"r1" ,进入待机状态。

Start: Open the key switch and two wire power switch, the LED would show the initial data, then show"0.0" and the shuttle cart begins primary action till stopping at the home position, showing"r 1", changing to standby status.

中止 :在显示"0.0"时按中间功能键 ,将显示"A9" ,设备停止动作。在显示"A9"时按中间功 能键 ,将重新开始初始动作。

Pause: when"0.0"is shown, pressing the middle function key and"A9"would be shown, the shuttle cart stops. If middle function key is pressed when"A9"shown, the shuttle cart would begin to run again. 确定要

操作的穿梭车 SELECTING SHUTTLE CART

在遥控器上按下与穿梭车编号对应的数字键 ,建立遥控器与相应穿梭车的联系 ,其后即可用功能键控制穿梭车完成各项功能。

Pressing the relative number key to make the connection between controller and shuttle cart, and then use three function keys to operate the shuttle cart to complete each function.

转换设备方向（由 A 面存取转换为 B 面存取）
CHANGING SIDE OF THE SHUTTLE CART (SIDE A AND SIDE B FOR MUTUAL CONVERSION)

r1 时 ,点按红键 3 秒 ,显示将变为-1 并行驶到新的初始位置。-1 时 ,点按红键 3 秒 ,显示将变 为 r1 并行驶到新的初始位置。中止 :在此执行过程按遥控器红键或穿梭车碰到障碍物或变 形过大的托盘 ,穿梭车将回到执 行此过程之前的初始位置并显示 r1 或-1。

"r1"shown, press middle function key for three seconds to show"-1", the shuttle cart will run to the new initial position.

"-1"shown, press middle function key for three seconds to show"r1", the shuttle cart will run to the new initial position.

Pause: when carrying out the change ,if the middle function key is pressed or the shuttle cart encounter obstacle or the pallet deform too much , it will back to the initial position where unchanged ,and will show "r1"or" -1".

进入菜单 ENTERING MENU

穿梭车显示面板上出现 r1 或-1 时 ,点 按遥控器上面 ◎ 键 ,会逐个显示 "d1"、"L1"、"P0"、"H1"、"C***"、 "t**"。以下将对显示的代号做说明。

When the shuttle cart display-panel show "r1"or"–1", click middle function key of the remote controller, the panel will show"d 1"、"L 1"、"P0"、"H1"、"C***"、"t**"、"E0"one by one, Following will explain the codes.

点按"遥控器第一排中间键"显示示意图：
SCHEMATIC WHEN PRESSING THE◎KEY:

开始进入
ENTERING

r1(-1) — d1 — L1 — P0 — y1 — H1 — C** — t**
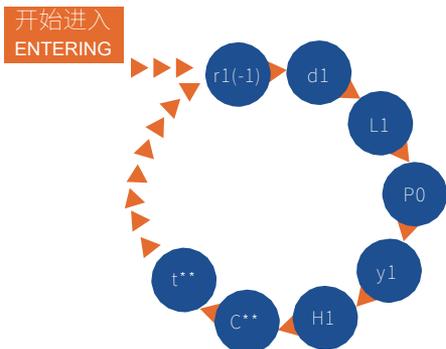
OPERATION INSTRUCTIONS & COMMON BREAKDOWNA
穿梭车操作说明及常见故障含义

显示 DISPLAY	说明 DISCRIPTION
0.0	开机初始动作阶段 Initial action after start
r1 \ -1	待机状态 Stand by status
r2 \ -2	放货过程 Picking pallet process
r3\ -3	取货过程 Drawing pallet process
d 1	手动控制穿梭车进退菜单 Manual travelling
d 2	穿梭车手动前进中 Manual travelling forward
d 3	穿梭车手动后退中 Manual travelling backward
L 1	手动控制穿梭车升降菜单 Manual lifting
L 2	穿梭车手动上升中 Manual up
L 3	穿梭车手动下降中 Manual down
P 0	取指定数字的货物菜单 Picking appointed quantity of the pallets
P *	*个货盘自动取货中(*为数字) *th of pallet are being picking(* is number)
y 1	移货 Shifting cargo
y 2	移货过程中 Shifting cargo in process
H 1	回起始点菜单 Backing home
H 2	回起始点过程中 Backing home in process
C***	显示所剩电池量(百分数)***% Battery capacity
t **	穿梭车电源开一次的连续工作时间(分钟) Minutes when the power on for continuous work

穿梭车操作说明及常见故障含义

放货过程 DEPOSITING PROCESS

开始 r 1 或- 1 时点按↑键。显示 r2 或- 2。

结束 :回到起点 ,到初始位并显示 r 1 或-1。

中止 :在 r 2 或- 2 时按遥控器红键显示 A12 ,穿梭车降到低位然后退回起点 ,显示 r1 或-1

Start: r1 or -1 shown, press left function key
Display: r2 or – 2
Ending: Back to home position. Then r1 or -1 will be shown at home position.
Pause: r 2 or – 2 shown, press middle function key to display A12, the shuttle cart will fall to the lowest place and back to the home position, showing r 1 or -1.

穿梭车放第一盘货行驶到位后 ,会回退 20-30 厘米(可调)后再将托盘放下 ,以为在用叉车将这盘货取下后放置一台用于取货的穿梭车留出空间。

When the shuttle cart run to the target location with first pallet , it will back between 20 cm and 30 cm (adjustable), then put the pallet down so that to leave room for the forklift to get the pallet and put a shuttle cart which is used to pick cargo.

取货过程（一次取货） PICKING PROCESS 开始：

r 1 或- 1 时点按↓键。显示 r 3 或- 3。 结束：

回到起点 ,到初始位并显示 r 1 或-1。

中止 :在 r 3 或- 3 时按红键 ,显示 A13 ,穿梭车降到低位然后退回到起点 ,显示 r1 或-1。

Start: r1 or -1 shown, press right function key
Display: r2 or – 2
Ending: Back to home position. Then r1 or -1 will be shown at home position.
Pause: r 3 or – 3 shown, press middle function key to display A13, the shuttle cart will fall to the lowest place and back to the home position, showing r 1 or -1.

自动全巷道取货过程 AUTOMATICALLY PICKING ALL THE CARGO FROM THE AISLE

开始 r 3 或-3 时长按↓键 3 秒以上。 显示 r 3 或-3。

结束 :取完所处巷道的所有货物托盘后 ,到巷道最末端寻货 ,确认已完成取货任务后回到起点 ,到初始位并显示 r 1 或-1。

中止 :在 r 3 或- 3 时按红键 ,显示 A13 ,到低位停止取货退回到起点 ,显示 r 1 或-1。

Start: r1 or -1 shown, press right function key for no less than 3 seconds
Display: r3 or -3
Ending: When all the pallets within the aisle are picked, the shuttle cart will run to the end of aisle to search for pallet to confirm picking all the pallets, then run back to the home position.
Pause: r 3 or – 3 shown, press middle function key to display A13, the shuttle cart will fall to the lowest place and back to the home position, showing r 1 or -1.

穿梭车操作说明及常见故障含义

取指定数目的货物 PICKING APPOINTED QUANTITY OF THE PALLETS

进入 :在显示 L1 时 ,点按一下红色的键。进入取指定数目的货物设定状态 ,显示板显示 P0。

指定取货的数量 :在 P 0 时点按一下↑键数字加 1 ,点按一下↓键数字减 1。 显示 :P**(** 为相应的数字)。

开始 :显示 P 非零时点按红键开始。 工作过程 :穿梭车将货物取至存取货口后返回取下一盘货 ,同时面板显示数字减一。穿梭 车行驶到货物托盘的下方后抬起 ,将托盘取至穿梭车上 ,然后反向 ,朝存取货口行驶 ,如前 一盘货已被取走 ,则穿梭车行驶至存取货口后降到低位将货物放在轨道支撑面上。再去取 下一盘货物 ,同时面板显示数字减一 ,如前一盘货尚未取走 ,则穿梭车行驶到距离前一盘 货一定距离(可通过 A/B 面的方形光电进行调整)后停止 ,在前一盘货物取走后将所载货 物放到存取货口 ,放下后再去取下一盘货物 ,同时面板显示数字减一。 结束 :当指定数量的货物都取走后 ,面板显示 P0 ,本次 P 过程结束。 中止 :P 过程中按红键 ,显示 A10 ,下降并退回原点 ,显示 r 1 或- 1。

Entry: L1 shown, press middle function key ,the shuttle cart will be in the status of the picking appointed quantity of the pallets, displaying P0

Appoint the quantity of pallets: P0 shown, press left function key for adding 1 or right function key for reducing 1

Display: P** (**=quantity)

Start: P** (** not zero) shown, press middle function key.

Process: The shuttle cart will pick one pallet to the home position, unload it and then run back for next one. The number showing will reduce by 1. Shuttle cart travel to the bottom of the pallet and lift the pallet to the shuttle cart, and then reverse, travelling toward to the pick up position, if the previous stock has been removed, the shuttle cart will travel to the cargo port and down it to the lowest place; put the goods on the rail supporting surface. Then it will back to remove another cargo, at the same time, panel shows the number reduce by one, if the previous stock has not been removed, the shuttle cart travel to a certain distance before previous stock (available through the A / B side of the square photoelectric adjusted), when the previous one in the cargo port removed then put the cargo on the cargo position, lay it down and then pick up next set of goods, and panel display numbers reduced by one

Ending: When the specified numbers of the pallets are picked, P0 will be shown, then end of the process

Pause: During the process, press middle function key and A10 will be shown; the shuttle cart will fall down and travel back to the home position, showing r 1 or −1.

穿梭车操作说明及常见故障含义

进入 r1 或- 1 时点红色的键 ,直到显 d1

d1 :Manual travelling forward or back   Entry:
r1 or -1, press middle key till d1 displayed.

手动前进 :开始 d1 时按住↑键。 显示 :
d2 停止 :d2 时松开↑键 ,停止后显示 d1。

Manual travelling forward: Start :
d1 shown, press left function key
Display: d2
Stop :d2 shown, loosen left function key then d1 shown.

手动后退 :开始 d1 时按住↓键。 显示 :
d3。 停止 :d3 时松开↓键 ,停止后显示
d1。

Manual travelling backward: Start :
d1 shown, press right function key
Display: d3
Stop :d3 shown, loosen right function key ,then d1 shown.

L1 :手动升降 进入 :在显示 d1 时 ,点按一
下红色的键。

L1 :Manual lifting   Entry:
when d1 shown, press middle function key.

手动上升 :开始 L1 时点按↑键。 显示 :
L2 结束 :到位后停 ,显示 L1。
中止 :L2 时点按红色的键 ,停止后显示 L1。

Manual up: Start:
L1 shown, press left function key
Display: L2
Stop: up to the position, L1 shown
Pause: L2, press middle function key, L1 shown.

手动下降 :开始 L1 时点按↓键。
显示 :L3 结束 :到位后停 ,显示 L1。
中止 :L3 时点按红色的键 ,停止后显示 L1。

Manual down: Start:
L1 shown, press right function key
Display: L3
Stop: up to the position, L1 shown
Pause: L3, press middle function key, L1 shown.

穿梭车操作说明及常见故障含义

移货 SHIFTING CARGO

进入 :在显示 P0 时 ,点按一下红色的键。

开始 :y1 时点按↓键。 显示 :

y2

工作过程 :用以将货物托盘移到靠近存取货口的位置 ,为双向存取时从轨道另一端补充货物留出空间并使此后的取货操作中穿梭车运行时间缩短 ,以提高效率 ,穿梭车根据 A、B 面 的方形光电开关及两侧面光电开关信号来控制穿梭车在载货轨道上来回运行 ,以实现货物托盘的 移位 ,移货功能完成前后的情况。如下图所示 :

Entry: when P 0, press middle function key

Start: when y1, press the right function key

Display: y2

Process: To move the cargo pallets near to the location of the picking position, leave space for the two-way access from the rail of the other end, and then when picking operation, the shuttle cart will use less time in order to improve efficiency, shuttle cart will travel forward or back on the rail by A side and B side of the square photoelectric switches and both sides of the surface photoelectric switch signal in order to achieve the shift of the cargo pallets. Before and finish the shifting cargo functions the completion of the case as shown below:
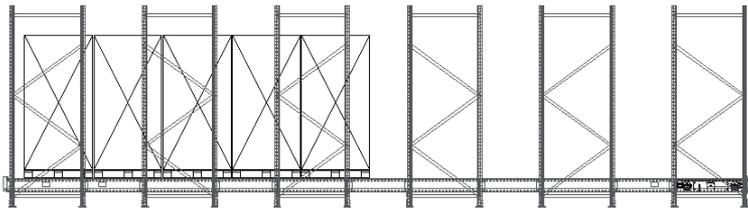
y 过程执行前
y process before execution
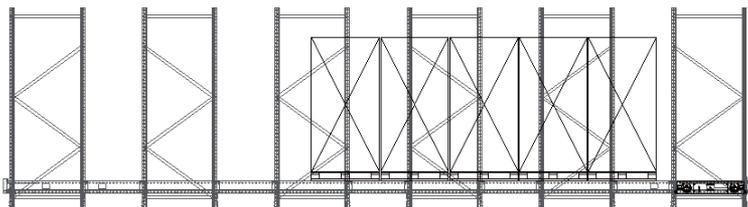
y 过程执行后
y process before execution

结束 :完成移货功能后回到初始位置并显示 r1 或-1。

中止 :y2 时按红键 ,回到 r1 或-1。

End: When finish y function, the shuttle cart will back home and show r1 or -1.

Pause: Press middle function key when y2 and return to r 1 or − 1.

穿梭车操作说明及常见故障含义

进入 :在显示 y1 时 ,点按一下红色的键。
开始 :H1 时点按↓键。 显示 :
H2
结束 :穿梭车降到低位并回到初始位置。
中止 :按红色的键。

Entry: Press middle function key when showing y1
Begin: Press the right key when showing H1
Display: H2
End: The shuttle cart will fall to the lowest position and back to the beginning position.
Pause: Press middle function key

C ***（电池量的百分比） C ** (BATTERY CAPACITY)

进入 :在显示 H1 时 ,点按一下红色的键。

Entry: H1 shown , press middle function key

t **（电源开一次后连续工作的分钟数）
t** (MINUTES WHEN THE POWER ON FOR CONTINUOUS WORK)

进入 :在显示 C ***时 ,点按一下红色的键 ,连续按两次↓键清除累计时间。

Entry: C ** shown, press middle function key, if press right function key twice, the time will be cleared.

穿梭车故障报警代码及处理建议

显示 DISPLAY	说明 DISCRIPTION
A1	电池电量低 Low battery
A2	上升超时 Up timed out
A3	下降超时 Down timed out
A4	发生碰撞 Collisions occur
A5	通讯故障 Message error
A6	开机规定时间内下降未到位 Boot lifting timed out
A7	工作中货物偏移 The cargo move when travelling
A8	电流超过设定的值 Current over the set value
A9	初始化终止 Pause of initialization
A10	终止取指定数量货物 Pause of picking up fixed pallet
A11	存货初始发生偏移 The cargo move when starting to deposit
A12	中止放货并回初始位置 Pause of depositing the pallet, and return home
A13	中止取货并回初始位置 Pause of picking up the pallet, and return home
A14	位移电机过热保护 Over-heat protection for moving motor
A15	升降电机过热保护 Over-heat protection for lifting motor
A16	复位进行中 Reset in progress
A17	复位暂停 Pause of reset

穿梭车故障报警代码及处理建议

显示 DISPLAY	故障排除方式　EXPLAIN AND TREATMENT SUGGESTION
A1	更换锂电池 Change lithium battery
A2	检查发讯板是否松动, 或接近开关是否异常 Check if message send board loosen and proximity switch
A3	检查升降电机刹车是否放开, 调整松紧度 Check if lifting motor brake is off, adjust it if necessary
A4	移除穿梭车运行路径上的障碍物 Remove obstacle within the way of shuttle
A5	测量 DC 模块 58.24 号线是否是 5V±0.5 或线路检测 Check if voltage between 58# and 24# wire is DC 5V±0.5 or check wiring
A6	PLC 模拟量或电机控制器线松动, 中间继电器损坏 PLC analogue wire or motor controller wire loosen or intermediate relay broken
A7	上光电未能感应到托盘, 调整托盘位置 Pallet locate sensor has not detect pallet, adjust pallet position
A8	检测电流互感器是否异常, 线路检查或更换 Check current sensor, check wire of change current sensor
A9	终止开机自检过程, 按红键恢复自检过程 Stop initial act, press middle function key to restart initial act
A10	终止定盘取货操作, 并回到初始位置 Pause of picking up fixed pallet and back to home position
A11	货物偏离, 或托盘不合格 Cargo deviate from pallet or pallet is unqualified
A12	托盘卡住或轴承磨损 The pallet is seized up or bearing is wear off
A13	侧光电异常调整光电长度 Side sensor effective range should be adjusted
A14	检测位移电机线路碳刷轴承轴是否损坏及磨损 Check carbon brush in moving motor and bearing axis
A15	检测位移电机线路碳刷或货物超载 Check carbon brush in lifting motor and check if the shuttle is overload
A16	穿梭车进入高速行使状态返回原点 The shuttle high speed back to home position
A17	穿梭车暂停, 按遥控红键回到高速行使状态 The shuttle is paused, press middle function key back to high speed back home

穿梭车操作说明及常见故障含义

穿梭车显示板显示 A10、A12、A13 时穿梭车将以慢速回到初始位置 ,到位后显示面板显 示 r 1 或- 1。

The shuttle cart will back to the initial position with slow speed when its display panel shows A10、A12、A13,when arrived, the display panel will show r1 or -1.

若在显示板显示 A10、A12、A13 时按遥控器红键时 ,穿梭车显示面板将显示 r 1 或- 1 ,由 于此时未到初始位置 ,穿梭车控制程序会启动 A16 过程回初始位置 ,A16 启动初始约 1 米行 程 为慢速度行驶 ,其后即为高速 ,以提高回原点的效率 ,直到再次检测到轨道侧壁的孔后改为 低速。

If the middle function key is pressed when the display panel shows A10、A12、A13,the shuttle cart display panel will show r1 or -1,because of not arriving, the shuttle cart control program will start A16 process to back to home. When starting A16, the shuttle cart will travel for About 1 meters with slow speed, then will change to high speed so that to improve the efficiency of backing to the starting position, it will back to slow speed when detects the hole of the rail sidewall .

为避免穿梭车高速时与轨道端头发生碰撞 ,在 A10、A12、A13 过程时若穿梭车距离轨 道 侧壁靠近存取货口的第二个孔距离较近(1 米以内),不可按红键 ,距离较远时可按红键使穿 梭车以 A16 过程返回初始位置 ,利用穿梭车在 A16 过程中的高速阶段提高穿梭车运行效率。穿 梭车以 A16 过程返回初始位置 ,利用穿梭车在 A16 过程中的高速阶段提高穿梭车运行效 率。

In order to avoid the shuttle cart at high speed collision with the rail ends, pressing the red key is forbidden if the distance of the shuttle cart closes to the second hole(less than one meter)of the rail sidewall near the picking position, if there is a long distance ,the middle function key can be pressed to make the shuttle cart back to home by A16 process, using the high speed of the A16 process to improve the operating efficiency of the shuttle cart.

穿梭车保养及处置

定期检查穿梭车以及时发现其可能的损坏,检查开关的功能,当其动作时控制灯应亮起。

Inspecting the shuttle cart regularly to find the possibly damage, checking the function of the pressure wave switch, when its action, the red control light should be lit.

应定期检查确认车轮和导向轮是否损坏,用软布拭去光电传感器上的灰尘。不允许对穿梭车用水清洗或高压清洗,只能用微湿的软布擦拭,通常可用擦拭汽车的清洁剂。

Inspecting the shuttle cart wheels and the guide wheels regularly to find out if there any destruction in the wheels. Using soft cloth to wipe away dust on photoelectric sensor. Water or pressure washing is prohibited; only wipe with a slightly damp soft cloth, usually the car cleaner can be used for wiping.

保证穿梭车清洁,根据穿梭车实际工作条件定期对穿梭车进行清理,清除杂物

Keeping clean of the shuttle cart, the shuttle cart should be cleaned regularly and clear the debris according to the actual working conditions.

若穿梭车需在冷库环境中工作,应选择冷库型穿梭车,穿梭车较长时间不用时,应从冷库取出存放,穿梭车在冷库内需保持开机状态。

If the shuttle cart needs to work in the cold environment, shuttle cart of cold warehouse style should be chose. If the shuttle cart will out of work for a long time ,it should be removed out of the cold warehouse. The shuttle needs to be turned on in the cold storage.

穿梭车机械电气结构及控制软件为 APEXBEAM 知识产权,严禁非法复制及拷贝。

APEXBEAM keeps the rights of shuttle cart of the mechanical & electrical structure and the control software, any copy would be prohibited.

不允许对穿梭车做任何改动,除非得到 APEXBEAM 书面允许,不允许将穿梭车用于其它任何场 合。只有具备相关能力及资质并接受过 APEXBEAM 相关培训的人员才能进行穿梭车修理,只能 使用原厂配件,必须按照本手册说明对穿梭车进行操作,对于因未遵守本规定而导致的损 失,APEXBEAM 不承担责任。

Any change on the shuttle cart would be prohibited without APEXBEAM written permission, Do not allow the shuttle cart to be used for any other occasion. Only the person who own relevant ability and qualifications and according to the APEXBEAM related training can repair the shuttle cart and only use the original accessories. The shuttle cart must be operated follow this manual, APEXBEAM will not responsibility for the damage caused as a result of not complying with the provisions.

穿梭车如长期不用,存放温度应为+5℃—+50℃, 相对湿度 35%-85%, 无凝露,存放环境 内不能有腐蚀性气体,如存放温度低于 0℃,应将 PLC 电池取出存放于+5℃-50℃环境。

If the shuttle cart stays for a long time without working, it should be kept under the conditions of +5℃~+50℃ ,relative humidity of 35%~85% without dew or caustic gas; if the temperature is lower than 0℃ ,the PLC battery should be removed and stored in the environment of +5℃~50℃.

穿梭车 PLC 电池保存程序的时间约为 4 年,如长期不用,PLC 电池电量耗尽后可能导致程序丢失。

The PLC battery of the shuttle cart would be used for about 4 years; In case the shuttle cart stays for a long time without working, the PLC battery capacity would be exhausted and the program will possibly lose.

穿梭车在长时间停用时应将电池取出妥善存放,电池的存放与废弃必须遵守相关规定和环保条例。

In case the shuttle cart stays for a long time without working, the battery should be removed and stored properly. The storage and supersession of the battery should obey the rules and environment protection statute.

附件

穿梭车定期维护周期表

维护项目	维护内容	工具	每天	每周	每月	3个月	6个月
			○——清洁、检查、校正、调整　×——更换				
台车主体机械部分	车体清洁除尘	吸尘器、棕毛刷、揩布	○	○	○	○	○
	车体连接螺栓紧固	扳手、螺丝批			○	○	○
	行走车轮	扳手、螺丝批			○	○	○
	举升车轮	扳手、螺丝批			○	○	○
	上盖板组合件紧固	扳手、螺丝批			○	○	○
	铝合金顶板紧固	扳手、螺丝批			○	○	○
	导向轮	扳手、螺丝批			○	○	○
	防撞块	扳手、螺丝批			○	○	×
	防振压力波检测胶条	扳手、螺丝批			○	○	○
	链条张紧度	扳手、螺丝批			○	○	○
台车主体电气部分	前后光电	扳手、螺丝批、棕毛刷、揩布			○	○	○
	左右侧光	扳手、螺丝批、棕毛刷、揩布			○	○	○
	上光栅AB	扳手、螺丝批、棕毛刷、揩布	○		○	○	○
	升降定位接近开关	扳手、螺丝批、棕毛刷、揩布			○	○	○
	急停开关	扳手、螺丝批			○	○	○
	船型开关	目测			○	○	○
	端子连接线	扳手、螺丝批				○	○
	电气线路清洁除尘	吸尘器、棕毛刷			○	○	○
锂电池及充电器	清洁除尘	吸尘器、棕毛刷、揩布			○	○	○
	电插头、连接端子	目测				○	○
	充放电测试					○	○
遥控发射器	清洁除尘	揩布	○	○	○	○	○
	遥控器电池	万用表、目测				○	○

附件

MAINTAIN PERIODIC TABLE ON A REGULAR BASIS

○——Cleaning, inspection, calibration, adjustment ×——Replace							
Maintenance of the project	Maintenance of the content	tools	Daily	Weekly	Monthly	Three months	Six months
The main mechanical parts	Cleaning body dust	vacuum cleaner, brush, wipe-cloth	○	○	○	○	○
	Fastening body's bolt	wrench, screwdriver			○	○	○
	Travelling wheel	wrench, screwdriver		○	○	○	○
	Lifting wheel	wrench, screwdriver		○	○	○	○
	Fastening combination of the cover piece	wrench, screwdriver		○	○	○	○
	Fastening aluminum roof	wrench, screwdriver		○	○	○	○
	Guide wheel	wrench, screwdriver		○	○	○	○
	Collision block	wrench, screwdriver		○	○	○	×
	Chain slack	wrench, screwdriver				○	○
The main electrical parts	Sensor of front and back	vacuum cleaner, brush, wipe-cloth		○	○	○	○
	Sensor of left and right	vacuum cleaner, brush, wipe-cloth		○	○	○	○
	Sensor of -AB surface	vacuum cleaner, brush, wipe-cloth	○	○	○	○	○
	Proximity switch for lifting and positioning	vacuum cleaner, brush, wipe-cloth			○	○	○
	Emergency stop switch	wrench, screwdriver			○	○	○
	Ship-type switch	Inspection by eye			○	○	○
	Terminal cable	wrench, screwdriver				○	○
	Clean electrical circuit	vacuum cleaner, brush			○	○	○
Lithium battery and charger	Cleaning the dust	vacuum cleaner, brush, wipe-cloth			○	○	○
	Plug connect terminals	Inspection by eye			○	○	○
	Charging and discharging					○	○
Remote transmitter	Cleaning the dust	wipe-cloth	○	○	○	○	○
	Remote controller battery	Multimeter Inspection by eye				○	○

穿梭车日常保养记录表

使用部门　　　　　　　　穿梭车编号　　　　　　　　日期　　　年　　　月

周期	序号	点检内容	日期																													
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
日	1	军体清洁除尘																															
	2	外上光电脑清洁																															
	3	遥控器清洁除尘																															
周	4	车休连接螺栓紧固																															
	5	行走草轮紧固																															
	6	举升草轮紧固																															
	7	上盖板组合件紧固																															
	8	铝合金顶板紧固																															
	9	导向轮紧固																															
	10	防撞块紧固																															
	11	防撞压力波检测校条																															
	12	链条张紧度检测																															
	13	内前后光电清洁及紧固																															
	14	左右侧光清洁及紧固																															
月	15	内上光电脑清洁及紧固																															
	16	升降定位接近开关紧固																															
	17	急停开关紧固																															
	18	倔型开关紧固																															
	19	电气线路清洁除尘																															
	20	电池清洁除尘																															
	21	电池电插头、连接端子检测																															
	22	遥控器电池检测																															
		设备使用人																															
		设备管理人																															

Shuttle Cart Routine laintenance Record Sheet

Depar怕ient:　　　　　　Shuttle No:　　　　　　Date:　　ye缸　month

，elo<l	$erial N	Check content	Date																													
			1	2	3ⁱ	4	5ⁱ	6	7ⁱ	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
laily		Body cleaninii; the dust																															
	2	Cleanini(sensot(AB)																															
	3	Remote controller keen clean																															
eekly	4	Faste阳Mt bodv bolt																															
	5	Fastening travel wheel																															
	6	Faster Ⅲ Ⅱife wheel																															
	7	Fastening cover piece																															
	8	Fastening al阳ninwnroof																															
	9	Fastening 伊ide wheel																															
	10	Fastening collision block																															
	11	Collis回Epressure detection stri阳																															
	12	Ch蚓 sack																															
	13	sensor of front and back																															
	14	sensor of left and right																															
mthl	15	Cleanim sensor(A阶																															
	16	proximitv switch for lifting																															
	17	Urgent switch																															
	18	Ship-t\fl)e switch																															
	19	Eectrical circuit clean dust																															
	20	Batterykeep clean																															
	21	Electric DIUf. COIWCI lemUr叫s																															
	22	Remote controller battery																															

Equipm:nt user

电机维护保养

电机使用 USING OF THE MOTOR

电机工作环境温度高于 40 摄氏度时, 应折减其额定功率使用, 见下表：

The rated power should be reduce when the ambient temperature of the motor working is above 40 degrees centigrade, see follows:

环境温度(摄氏度) Ambient temperature (degrees centigrade)	40	45	50	55	60
额定功率折减系数 Rated power reduction factor	1	0.95	0.9	0.83	0.77

电机所用地区海拔高度高于 1000 米时, 应折减其额定功率使用, 见下表：

The rated power should be reduce when the motor is used higher than 1000 m above the elevation, see follows:

平均海平面以上(米) Above mean sea level (m)	1000	2000	3000	4000	5000
额定功率折减系数 Rated power reduction factor	1	0.92	0.83	0.77	0.67

* 电机不可用于危险区域、环境中有腐蚀性气体的区域及环境中有易燃物的区域

* The motor can not be used in the hazardous areas, the caustic gas and the combustible can't be exist in the environment.

* 电机的检查：确保没有异物进入电机。碳刷和换向器会随着电机的使用而磨损，建议在电机每运行 300 小时后对其进行检查。

* Motor check: ensure that no foreign matter enters the motor, carbon brush and commutator will wear with the use of the motor, it is recommended to check the motor after every 300 hours of operation.

穿梭车标配清单

序号 NO.	名称 NAME	规格型号 MODEL AND SPECIFICATION	数量 NUMBER	备注 REMARK
A1	穿梭车主机 Low battery	W D	1	
A2	锂电池 Up timed out	24V/60AH	1	
A3	锂电池充电器 Down timed out	29.4V/12A	1	
A4	遥控发射器 Collisions occur	\	1	
A5	电池仓电箱锁 Message error	¢19*20L	1	
A6	用户手册 (附合格证) essage error	\	1	