

THCD-8 无盲区焊接小车产品规格书

THCD-8 No-dead-end Automatic welding carriage

一、概要及特点:

I. Summary and features:

1、概要:

1. Summary:

1.1、此款小车用于全位置角焊缝工件，通过齿轮传动及曲柄摆杆机构沿焊缝方向拖动焊枪，实现焊枪与小车车体间的相对运动，克服传统小车因焊枪固定安装及焊接机车身宽度而产生的“焊接盲区”。特别适用于方格、窄小空间及全位置角焊缝焊接；

1.1、 This trolley is used for all-position fillet weld workpieces. The welding torch is dragged along the weld direction by gear transmission and crank swing mechanism, so that the relative movement between the welding torch and the trolley body can be realized, and the "welding blind area" caused by the fixed installation of the welding torch and the width of the welding machine body of the traditional trolley can be overcome. Especially suitable for square, narrow space and all-position fillet welding;

1.2、小车吸附力 $\geq 36\text{Kg}$,可平行、立式、仰式角缝焊接工件，焊枪夹持机构具有摆动功能，适用于宽、厚焊缝的焊接；

1.2、 The adsorption force of trolley is $\geq 36\text{Kg}$, and it can weld workpieces in parallel, vertical and upward corner joints. The welding gun clamping mechanism has swing function, which is suitable for welding wide and thick welds.

1.3、焊枪夹持角度 $35^\circ\text{-}45^\circ$ ，适用于 T 形接头、角接头工件搭接方式和角度调节；
The clamping angle of welding gun is 35-45, which is suitable for the overlapping mode and angle adjustment of T-joint and corner joint workpieces.

1.4、内置高性能永磁体配合导向轮沿着工件边仿形跟踪焊缝完成焊接。
1.4、 Built-in high-performance permanent magnets cooperate with guide wheels to trace the welding seam along the edge of the workpiece to complete welding.

1.5、采用蓄电池供电，特别适用于野外及不便于提供小车电源的焊接场合，小车具有重量轻巧，磁吸附具有手柄提拉自动离合功能，方便操作者现场作业；

1.5、The battery is used for power supply, which is especially suitable for outdoor and welding occasions where it is not convenient to provide power for the trolley. The trolley is light in weight, and the magnetic adsorption has the function of lifting the handle and automatically engaging and disengaging, which is convenient for operators to work on site.

1.6、操作简单，即便是无专业技术的操作人员经简单培训既可使用，也能获得良好的焊接效果，且具有自动限位停止功能。焊接自动化程度较高，一个操作人员可同时控制多台焊接机以提高产能。

1.6、Simple operation, even operators without professional skills can use it after simple training, and can also get good welding effect, and it has the function of automatic limit stop. The degree of welding automation is high, and one operator can control multiple welding machines at the same time to improve the productivity.

2、特点：

2. Features:

2.1、车体上安装离合装置，可人工快速移动车体、数码管数字化显示，方便调整各项参数。

2.1、A clutch device is installed on the car body, which can manually move the car body quickly. Digital display of digital tube is convenient for adjusting various parameters.

2.2、采用程序精密控制行走速度、摆动速度、摆动角度、左、右停留时间等。摆动器受程序控制，摆动具有左停、右停功能，防止摆动焊接时出现熔池不足的现象；同时焊接时可对焊缝中心进行调整，防止偏焊。

2.2、The walking speed, swing speed, swing angle, left and right residence time, etc. are precisely controlled by program. The swinging device is controlled by the program, and the swinging device has the functions of left stop and right stop, so as to prevent the phenomenon of insufficient molten pool during swinging welding; At the same time, the weld center can be adjusted during welding to prevent partial welding.

2.3、焊枪倍率调节受程序控制，可调整起弧与收弧焊接速度。起弧与收弧各有2S 延长时间，削除焊接弧坑。

2.3、The adjustment of welding torch magnification is controlled by program, which can adjust the welding speed of starting and closing arc. Arc starting and closing have 2S extension time, respectively, to remove welding arc pits.

2.4、焊枪摆动机构结构合理，机械传动稳定可靠，实现无盲区焊接，无需工人进

行二次补焊，且车体占用空间小；

2.4、The swing mechanism of welding gun has reasonable structure, stable and reliable mechanical transmission, realizes blind spot welding, does not need workers to carry out secondary repair welding, and the car body occupies little space;

2.5、24V-4AH 锂电池组，给小车提供电源，减少其对外界电源依赖。

2.5、And 24V-4AH lithium battery pack, which provide power for the trolley and reduce its dependence on external power supply.

二、适用范围：

II. Scope of application:

2.1 适用材质说明

2.1 description of applicable materials

2.1.1 自动焊接机满足平行式、立向式、仰式各种 T 形接头、角接接头角焊缝，其顶轮靠板高度应大于 75mm 以便顶轮顶靠。工件表面为平面或半径大于 1.2m 的圆弧面；

2.1.1 The automatic welding machine shall meet all kinds of parallel, vertical and upward T-joints and fillet welds, and the height of the top wheel abutment plate shall be greater than 75mm so that the top wheel abuts. The surface of the workpiece is a plane or an arc surface with a radius greater than 1.2m;

2.1.2 焊接小车行走宽度应大于 360mm，工件间距需 $\geq 320\text{mm}$ ，以保证焊接机构的正常运行空间；焊缝母材间隙应一致，否则影响焊接效果；

2.1.2 The walking width of the welding trolley should be greater than 360mm, and the workpiece spacing should be $\geq 320\text{mm}$ to ensure the normal operation space of the welding mechanism; The gap between the base metal of weld should be consistent, otherwise the welding effect will be affected;

2.1.3 小车使用改良型磁吸附系统，可满足具有一定磁吸附性能的双向不锈钢材质（其磁吸附性能应不小于常规铁质材料的 40%）的吸附、仿型要求。

2.1.3 The trolley adopts the improved magnetic adsorption system, which can meet the requirements of adsorption and copying of bidirectional stainless steel with certain magnetic adsorption performance (its magnetic adsorption performance should be no less than 40% of that of conventional iron materials).

2.2 适用焊材

2.2 applicable welding materials

适用于Φ1.6mm 及以下普通焊丝及药芯焊丝。

Applicable to common welding wires and flux-cored wires with $\phi \Phi 1.6\text{mm}$ and below.

三、规格及技术参数：

III. Specifications and technical parameters:

| 序号 | 项 目 | | 参 数 内 容 |
|----|---------|----|--|
| 1 | 适用工件 | | 铁质、带行走盲区的全位置角焊缝 |
| 2 | 行走方式 | | 通过机械顶轮顶靠母材立板及吸附装置对母材底板的磁吸附，保证焊接机沿焊缝方向直线运行 |
| 3 | 驱动方式 | | 四轮驱动（橡胶轮） |
| 4 | 吸附力 | | $\geq 32\text{KG}$ （钢板测试） |
| 5 | 行走速度 | | 0、3.5 — 93.0 (cm/min) |
| 6 | 焊接模式 | | 焊枪自起始位置摆动到中点后，焊接机开始行走，限位开关触碰动作后，焊枪自中点摆动到终点位置结束焊接，按回位键焊枪自动返回起始位置以待下次启动。 |
| 7 | 摆动速度 | | 0—40 周/分 |
| 8 | 左/右停留时间 | | 0—2.5S |
| 9 | 起弧、收弧速度 | | （0.8-1.2 倍率）起弧、收弧自动延时 2.0S， |
| 10 | 行程限位开关 | | 触碰行走停止 |
| 11 | 摆动角度 | | 0— $\pm 8^\circ$ |
| 12 | 焊枪调节范围 | 横向 | 30mm |
| | | 垂直 | 30mm |

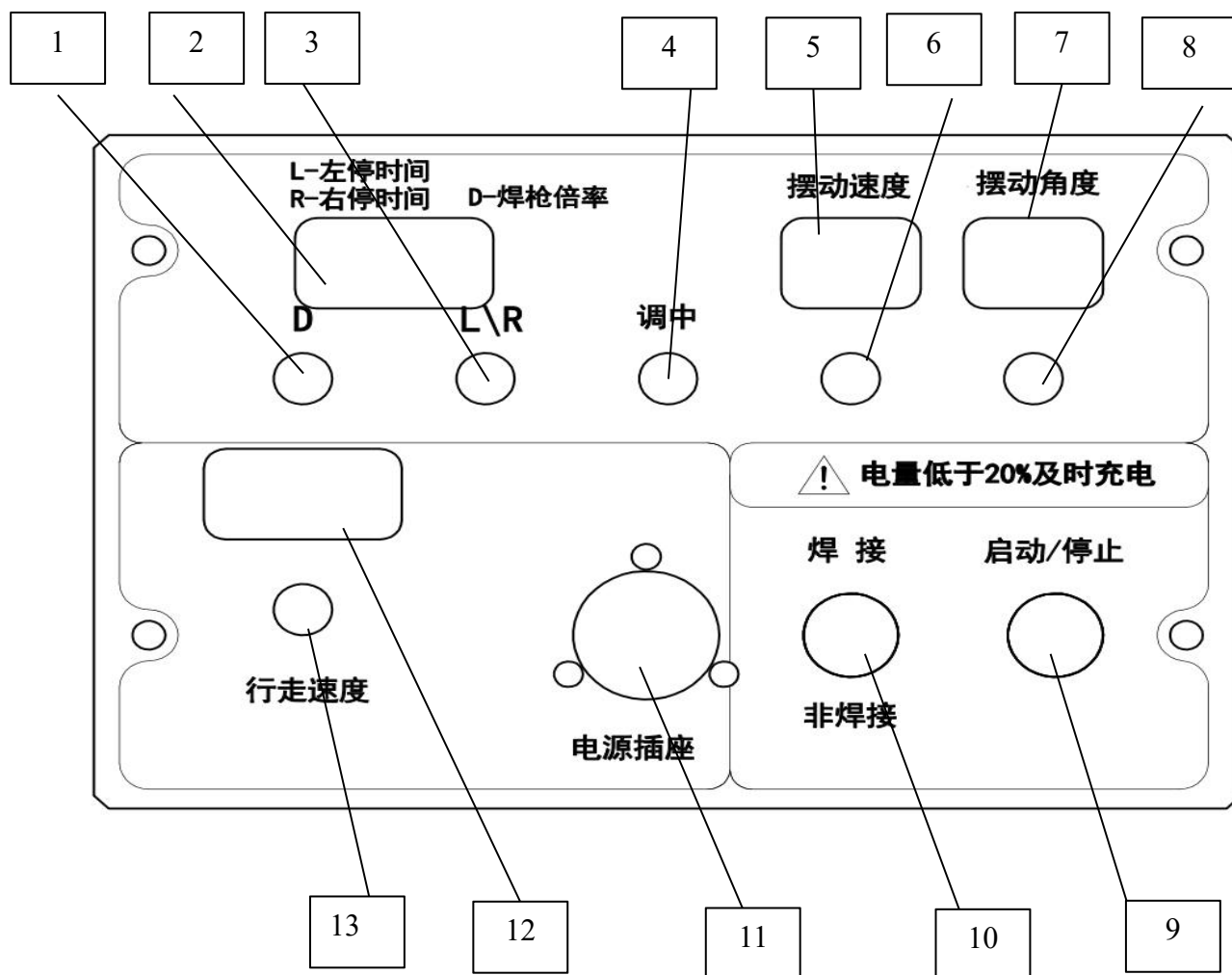
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|----|--------|--------------------------------|
| 13 | 焊枪限位开关 | 摆动机构沿焊缝方向焊完收弧位置，触碰延时 2.0S 停止焊接 |
| 14 | 主体材质 | 铝合金 |
| 15 | 输入电源 | 24V-4AH 锂电池 |
| 16 | 小车尺寸 | 长×宽×高：270×330×242 |
| 17 | 小车重量 | 13kg |

| serial number | Item | Parameter internal capacity |
|---------------|--------------------------------|---|
| 1 | Applicable workpiece | Iron, all-position fillet weld with walking blind area |
| 2 | Walking mode | Through the mechanical top wheel propping against the base metal vertical plate and the magnetic adsorption of the adsorption device to the base metal bottom plate, the welding machine can run straight along the weld line. |
| 3 | type of drive | Four-wheel drive (rubber wheel) |
| 4 | adsorption capacity | ≥32KG (steel plate test) |
| 5 | Walking speed | 0、3.5 — 93.0 (cm/min) |
| 6 | Welding mode | After the welding torch swings from the initial position to the midpoint, the welding machine starts to walk. After the limit switch is touched, the welding torch swings from the midpoint to the end position to finish welding. Press the return key to automatically return to the initial position for the next start. |
| 7 | Swing speed | 0-40 cycles/min |
| 8 | Left/right dwell time | 0—2.5S |
| 9 | Arc starting and closing speed | (0.8-1.2 magnification) The automatic time delay of arc starting and closing is 2.0S, |

| | | | |
|----|--------------------------------|-------------------------|--|
| 10 | Travel limit switch | | Touch walking stop |
| 11 | Swing angle | | 0—±8° |
| 12 | Welding torch adjustment range | cross wise | 30mm |
| | | be on the perpendicular | 30mm |
| 13 | Welding torch limit switch | | The swinging mechanism welds the arc closing position along the weld line direction, and the touch delay is 2.0S Stop welding |
| 14 | Material | | aluminium alloy |
| 15 | Input power supply | | 24V-4AH lithium battery |
| 16 | Trolley size | | Length× width× height: 270×330×242 |
| 17 | Weight | | 13kg |

四、控制面板操作说明：

IV. Operating instructions of the control panel:



| | 名 称 | 功能 |
|----|-----------------|--|
| 1 | 焊枪倍率调节电位器 | 电位器旋轴带按下功能，用于显示参数标记的切换，顺时针参数增加，逆时针参数减小； |
| 2 | 焊接工艺时间 显示数码管 | 显示格式为 X Y.Y X 为显示标记，可通过按动时间调节电位器旋轴在 L-R-D 间循环切换。其中 L 表示摆动器左极限位置停留时间；R 表示摆动器右极限位置停留时间；d 表示焊枪倍率从起弧与收弧两端焊接速度与行走速比。 |
| 3 | 焊接工艺时间 调节电位器 | 电位器旋轴带按下功能，用于显示参数标记的切换； 旋转电位器旋轴以调节与显示参数标记相对应的的时间参数，顺时针参数增加，逆时针参数减小； |
| 4 | 调中电位器 | 用于调节摆动器摆动中心的位置，顺时针右偏，逆时针左偏； |
| 5 | 摆动速度 显示数码管 | 显示格式为 XX，用于比例显示摆动器摆动速度； |
| 6 | 摆动速度 调节电位器 | 旋转电位器旋轴以调节摆动速度大小，顺时针数值增加，逆时针数值减小。 |
| 7 | 摆动角度 显示数码管 | 显示格式为 XX，用于比例显示摆动角度。 |
| 8 | 摆动角度 调节电位器 | 旋转电位器旋轴以调节摆动角度大小，顺时针增加，逆时针减小； |
| 9 | 启停开关 | 用于切换小车的启停状态，每按动一次开关，则小车在启停状态间切换一次； |
| 10 | 焊接/非焊接控制开关 | 用于控制焊接状态，将开关拨到“焊接”，则焊接与小车同步，启动小车时焊接电源同步动作（起弧延时时间仍然有效，同时需小车焊枪端口与电源送丝机正确连接） |
| 11 | 电源插座 | |
| 12 | 行走速度 显示数码管 | 显示格式为 XX.X，用于实际显示行走速度大小； |
| 13 | 行走速度 调节电位器 | 旋转电位器旋轴以调节行走速度数值大小，顺时针旋转数值增加，逆时针旋转数值减小； |

| | Naming | function |
|-------|---|---|
| one | Welding torch magnification adjusting potentiometer | The potentiometer has the function of pressing the shaft, which is used to display the switch of parameter marks. The clockwise parameter increases and the counterclockwise parameter decreases. |
| two | Welding process time Display nixie tube | The format is X Y.Y To display the mark X, you can switch between L-R-D by pressing the rotary shaft of the time adjusting potentiometer. L represents the residence time of the left extreme position of the wiggler; R represents the dwell time of the right limit position of the swinger; D represents the welding gun magnification, welding speed and walking speed ratio from both ends of arc starting and closing. |
| three | Welding process time Adjusting potentiometer | The potentiometer has a pressing function, which is used to display the switch of parameter marks; Rotate the potentiometer shaft to adjust the time parameter corresponding to the displayed parameter mark, and the clockwise parameter increases and the counterclockwise parameter decreases; |
| four | Medium potentiometer | Used to adjust the swing center position of the swinger, clockwise to the right and counterclockwise to the left; |
| five | Swing speed Display nixie tube | The display format is XX, which is used to proportionally display the swinging speed of the swinger; |
| six | Swing speed Adjusting potentiometer | Rotate the potentiometer shaft to adjust the swing speed. The clockwise value increases and the counterclockwise value decreases. |
| seven | Swing angle Display nixie tube | The format is XX, which is used to display the swing angle proportionally. |
| eight | Swing angle Adjusting potentiometer | Rotate the potentiometer shaft to adjust the swing angle, increasing clockwise and decreasing counterclockwise; |
| nine | Start-stop switch | Used to switch the start-stop state of the car. Every time the switch is pressed, the car switches between the start-stop states once; |
| ten | Welding/non-welding control switch | It is used to control the welding state. When the switch is set to "Welding", the welding will be synchronized with the trolley, and the welding power supply will act synchronously when the trolley is started (the arc starting delay time is still valid, and the welding gun port of the trolley needs to be correctly connected with the power feeder). |

| | | |
|----------|--|---|
| eleven | electric outlet | |
| twelve | Walking speed Display nixie tube | The format is XX.X, which is used to actually display the walking speed; |
| thirteen | Walking speed Adjusting potentiometer | Rotate the potentiometer shaft to adjust the walking speed value. The clockwise rotation value increases and the counterclockwise rotation value decreases. |

五、安装及使用：

V. Installation and use:

1.1 电气连接检查

1.1 electrical connection inspection

电池、摆动器对接插头、焊枪控制插头应安装正确、无松动；

Battery, swinging device butt plug and welding gun control plug shall be installed correctly without looseness;

1.2 小车安放

1.2 car placement

清理小车前进路径及小车底面上的杂物、铁屑后将小车安装在待焊工件上，两顶轮均顶靠在立板上。

Clean up the path of the trolley and the sundries and scrap iron on the underside of the trolley, and then install the trolley on the workpiece to be welded, with both top wheels propped against the vertical plate.

1.3 焊枪位置调整

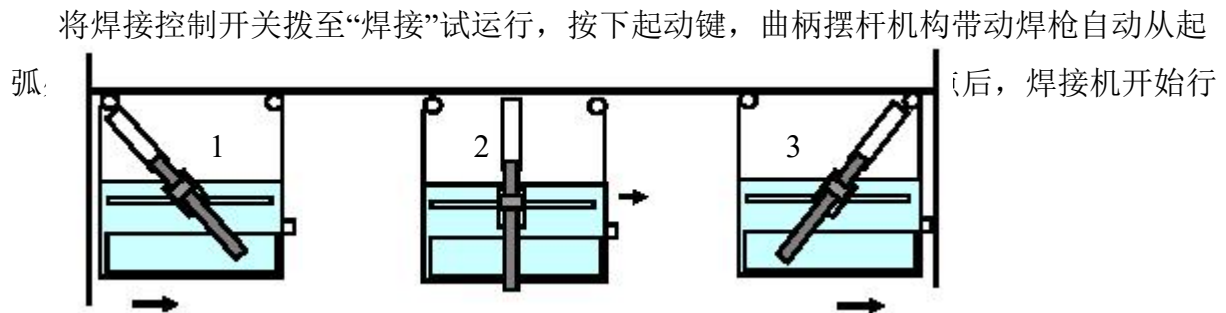
1.3 welding torch position adjustment

试运行前请先将焊接开关打到“非焊接”位置，按试焊模式键，曲柄摆杆机构带动焊枪对焊缝模运行以验证焊枪行走、摆动轨迹。焊枪夹持机构自动回到中点，将焊枪夹持在焊枪夹具上固紧（可使用小车对中功能和十字调节架进行焊枪对缝）。

Before the trial operation, please turn the welding switch to the "non-welding" position, press the trial welding mode key, and the crank rocker mechanism will take the welding torch to run on the welding mold to verify the walking and swinging track of the welding torch. The welding gun clamping mechanism automatically returns to the midpoint, clamping the welding gun on the welding gun fixture and fastening it (welding gun butt welding can be performed by using the trolley centering function and the cross adjusting frame).

1.4 焊接作业

1.4 welding operation



走--图 2。限位开关触碰动作后, 焊枪自中点摆动到终点位置结束焊接收弧延时 2S (削除弧坑)--图 3。此间可根据焊接效果对小车行走参数、焊枪高度及焊接参数进行微调。

1.4、Set the welding control switch to "Welding" for trial operation, press the start key, and the crank rocker mechanism will drive the welding gun to automatically weld from the arc starting position and delay for 2S (arc pit cutting)-Figure 1. After the welding gun swings from the initial position to the midpoint, the welding machine starts to walk-Figure 2. After the limit switch is touched, the welding torch swings from the midpoint to the end position, and the welding arc closing time is delayed for 2S (arc pit cutting)-Figure 3. According to the welding effect, the trolley walking parameters, welding torch height and welding parameters can be fine-tuned.

1.5 启/停焊接

1.5 start/stop welding

焊接完成后提起小车, 离开工件后, 按回位键焊枪自动返回起始位置以待下次启动 (同一规格角焊缝用“非焊接”模式对中焊缝一次, 连续作业按《5.4 焊接作业》既可。

After welding, lift the trolley, and after leaving the workpiece, press the return key, and the welding gun will automatically return to the initial position for the next start (the fillet weld of the same specification will be centered once in the "non-welding" mode, and continuous operation can be done according to 5.4 Welding Operation.

1.6 参数预置

1.6 parameter preset

根据具体工艺需求 (用户自行编制), 对小车参数 (焊接工艺时间、摆动速度、摆动角度、行走速度、起弧-收弧速度) 进行初步预设;

According to the specific process requirements (compiled by users themselves), preliminarily preset the trolley parameters (welding process time, swing speed, swing angle, walking speed, arc starting and closing speed);

六、检查及维护：

VI. Inspection and Maintenance:

为了安全、长期使用自动焊接小车，要定期进行设备维护。

In order to use the automatic welding trolley safely and for a long time, the equipment should be maintained regularly.

1、清除控制盒面板、焊枪调整部位的飞溅：经常清理控制盒面板、焊枪调整部位的飞溅，防止出现线路板损坏、焊枪无法调整的现象。

1. Remove the splash from the control box panel and welding torch adjustment position: always clean the splash from the control box panel and welding torch adjustment position to prevent the circuit board from being damaged and the welding torch from being unable to be adjusted.

2、清除焊渣：经常清除导向轮、驱动轮、轨道、磁铁和滑块部位的焊渣及异物。

2. Removal of welding slag: Always remove welding slag and foreign matter from the guide wheel, driving wheel, track, magnet and slider.

3、固紧焊枪夹具和导向轮的螺钉：如果出现松动，会造成行走不稳及焊接不良等现象。

3. Fasten the screws of the welding gun fixture and the guide wheel: if they are loose, they will cause unstable walking and poor welding.

4、经常检查插头、焊枪控制线是否损坏，蓄电池是否能正常充、放电。

4, often check whether the plug, welding torch control line is damaged, whether the battery can charge and discharge normally.

5、经常检查行走电机、摆动电机、行走机构等部位的运行状况，确认是否有异常的发热或杂音。

5. Regularly check the running status of the traveling motor, swing motor, traveling mechanism, etc. to confirm whether there is abnormal heat or noise.

七、产品图片

VII. Product pictures

