

# Application of Welding Manipulator to Refrigeration Industry

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Refrigeration pressure vessel mainly refers to a refrigeration device that uses liquefied gas as the refrigerant raw material, the design pressure is generally low and medium pressure, and the design temperature is the low temperature (such as some operating temperatures below -40 °C). Generally speaking, the manufacturing process of refrigeration pressure vessels is basically the same as other pressure vessels. Its characteristic is the low temperature working state, and most of them use low-temperature materials. In other words, in addition to meeting the requirements of conventional pressure vessels, it is necessary to obtain serviceability that meets low-temperature impact. In order to meet the low-temperature impact, it is necessary to obtain fine-grained weld structures. In low-temperature pressure vessel production, how to obtain the above-mentioned structure? It is obtained by a small and balanced welding line energy input, which is a reasonable combination of welding current, welding voltage, and welding speed, which is determined according to the value of the formula U \* I / V.

**Welding manipulator factory** thinks: in the actual welding process, the technical personnel must strictly to ensure the weld surface may not appear obvious defects such as cracks, porosity or splash problem, at the same time control of welding energy input line, ensure the weld microstructure of normal use under low-temperature conditions. And in the process of pressure vessel assembly, technicians often need to use reasonable means to weld effectively according to different parts of the vessel. Due to the influence of numerous welding types, automatic welding equipment is frequently used in the welding production process. However, how to improve the level of automation and intelligence of welding equipment has become the primary problem in the refrigeration industry. And improve the welding quality, improve the working environment has become the main requirements of welding technicians.

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Basic overview of welding manipulator

Basic meaning:

The so-called **welding manipulator** and can be called a welding robot. Generally refers to the 6-axis robot body, which means there are 6 dimensions. Welding manipulator in the formal application of the process often can be along with the established curve movement, that is, along with the three-dimensional curve movement, until the technician to reach the specified position. At the same time, welding manipulator in the composition of the control system and welding system, which contains a lot of content, such as welding power, welding gun, welding software system. When necessary, to complete a spot welding robot engineering and technical personnel also need with the aid of peripheral devices, aims to further enhance the **china welding manipulator** of work efficiency.

## Basic structure:

Automatic welding manipulator equipment is mainly the whole machine structure, control system, welding gun position control structure. Among them, the whole machine structure is mainly composed of the welding machine head, the travelling ring guide rail and the related control system. In the actual application process, mainly plays the role of controlling the whole.



The control system mainly refers to the control system which is composed of microcomputer technology and related control technology and completes the operation of welding manipulator by virtue of the characteristics of each template operating independently and cooperating with each other. Welding gun position control mainly USES the welding gun position signal, mechanical arc swing template and other system structures to ensure that the welding gun position can be effectively controlled. It should be noted that in the process of implementing Omni-directional automatic welding, technicians need to make reasonable adjustments to the position of welding gun according to the application of welding machine head, in order to ensure the final welding effect.

## Basic application advantages

Welding manipulator in the formal work process, the operation is similar to the human hand, mainly used for welding steel products. Compared with traditional manual operation, welding manipulator often has the advantages of high precision operation, strong welding quality and easy control of welding process parameters. The following is a **welding manipulator manufacturer**s combined with practical experience, summed up and the basic application advantages of the welding manipulator, for your reference.

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First of all, the welding manipulator has more stable working effect, high welding quality, and welding uniformity effect strong advantages, the use of welding manipulator can control the welding line energy (intelligent control welding current, welding voltage, welding speed, maximum emasculating man-made factors, can achieve the welding procedure qualification welding processes consistent with the product. Secondly, the welding manipulator is mainly combined with automation technology and intelligent technology, can replace the manual operation, to solve the problem of poor artificial effect in the past. At the same time, welding manipulator can greatly improve labour productivity.

Thirdly, the welding manipulator can effectively improve the poor artificial environment in the past, further improve workers' working conditions, and can deal with the interference of various harmful environment, to avoid the problem of low welding quality in the past. Finally, by taking advantage of **china welding manipulator** can shorten the development period of product preparation and production cycle, reduce the cost of investment, and to some extent can realize welding requirements of small-batch products and automated welding requirements.

Between the **welding manipulator** characteristics and the related advantages of application of most of the technical personnel select, welding manipulator was applied to refrigeration industry refrigeration of pressure vessel. In general, pressure vessel welding manipulator refrigeration often can achieve the goal of optimizing welding parameters, and use of welding seam tracking of the manipulator function can further improve the look of the previous weld defects such as cracks, porosity or splash problem, at the same time control of welding energy input line, ensure the weld microstructure of normal use under low-temperature conditions. The details are as follows:

## Further, enhance the safety of pressure vessels

Welding manipulator in the actual application process can further achieve the arc welding, spot welding, cutting and other operational requirements, often can promote the standardization and general level of products. Generally speaking, the specimens welded by welding mechanical parameters can meet the process assessment standards, and in the actual application of products, the welding parameters can be controlled to be consistent with the welding process assessment. The most important thing is that the pressure vessels produced can further meet the requirements of safety technical specifications and fully solve the problem of low safety degree of pressure vessels in the past. Combined with practical



experience, the application of welding manipulator in the refrigeration pressure vessel can basically enhance the internal pressure of the pressure vessel and the effect of anti-low temperature environment and improve the application safety. And pressure vessel is the thick plate, welding groove, the robot is often more to "visual control system (purpose is to track positioning, accurate search for groove) + arc voltage tracking system (using the arc voltage feedback, automatic adjust the nose position, ensure the constant arc-length, so as to guarantee the stability of the welding parameters)" is given priority to, to 100% control of the welding energy input, can effectively improve the safety of pressure vessels.

Solve the problem of poor quality of manual welding in the past

Combined with the past practical experience, welding workers in the daily production process, often face more workload. Long time work is difficult to achieve the expected work effect, and the welding quality is often poor, which affects the welding quality of refrigeration containers. In view of this, the technical personnel choose to apply high precision to control the welding line energy welding method, mainly will be the welding manipulator into the production of low-temperature materials. Combined with the operation effect, the welding manipulator is equivalent to the workload of 5 welding workers, greatly reducing the work intensity of the staff. Most importantly, the welding appearance quality and metal structure are obviously much stronger than manual welding, which can reduce the follow-up maintenance cost and effectively improve the welding production of refrigeration containers.

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Achieve welding automation control requirements

As an important technical content of welding manipulator, welding seam tracking is an important component of welding automation control system. Welding seam tracking technology can basically further realize the production efficiency of welding automation and enhance the production quality of pressure vessels. Generally speaking, in the practical application of traditional welding technology, obvious weld problems are inevitable, which is not conducive to the production quality of pressure vessels in the long run [6]. Through the application of seam tracking technology, technicians can find the location of weld problems in the first time and use practical measures to improve the production quality of pressure vessels. Most important of all, through the realization of welding automation control requirements, technicians can effectively avoid the problem of previous welding quality is not up to standard, conducive to the further improvement of production quality.

## conclusion

To sum up, the **welding manipulator china** refrigeration pressure vessel welding basically can achieve the result of optimization of welding quality and welding efficiency. In the actual application process, the technician can choose the reasonable welding parameters according to different workpiece and weld joint. And on this basis, combined with the welding seam tracking function of the equipment, it can generally improve the previous welding efficiency is not high or the quality is not up to standard. And with the continuous strengthening of the application of China's welding manipulator, is bound to be popular in the refrigeration industry, to achieve the expected welding effect, let us wait and see!

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