

An Approach with Operation Box for the Performance Improvement of the Welding Robot

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Abstract : *The robotic welding concept is beginning of the twenty first century because of to reduce the efforts of manual welding & to increase the need of high performance, high production rates, accuracy and Labor cost, automation has been adopted to the welding technology that were once the programmable logic controller (PLC) for large manufacturing plans are often familiar with their function. For small manufactures often did not want to invest in PLC hardware. Now in existing system we perform work of welding Robot with the help of operation box which is in built in robot controller unit this Robot controller can now handle many typical PLC functions, such as start-up and shut down sequence, fault diagnostics and including manual controls such operation box can used for communication from controller to Robot.*

Keywords: *Robot, Robot Controller, robotic arc welding, Robot welding systems, Robotic welding operator, Qualified Robot Technician, PLC.*

I. Introduction

The methodology which was used to the automated system included welding. Welding was done by handheld welding guns in previous condition but in industries handheld welding not be sufficient to industry progress, less amount of complete welding job with less accuracy and precision as compared to the automated system of welding. This automated welding is done by robot. Robot welding process was time consuming and it had demanding less man power. Such factors are resulted in number production. Also, the welding process which was implemented had safety issues. The automated method was proposed as a result of large amount of production as well as consideration of safety issues of workers. Industrial robotics welding is by far the most popular application of robotics worldwide. In fact, there is huge number Products that require welding operations in their assembly process. Because of their users require a good and highly automated welding process in a way to respond to client needs in time and high quality. This should lead to cheaper products since productivity and quality can be increased and production cost and manpower can be decreased. When robot are used with PLC still difficult to use and program by regular operators, because of their internal PLC construction. The robots can be classified depending on their function and market needs. Two major classes of robot were classified that is industrial robot and service robots.

II. Welding Robot Without Plc

Now, industrial robotics consist of PLC all the functionality robotics is controlled by PLC with the help of programming. Now a day's robot controller becomes more advanced, they are adding functionality and capability that were once bailiwick of programmable logic controllers (PLC). PLC have been around for long time and time and people in medium to large manufacturing plants are often familiar with their functions, programming, ladder logic editing and troubleshooting. Smaller manufactures often did not have in-house PLC expertise and didn't want to invest in PLC hardware and training. The latest robot controllers support as much I/O and I/O processing functionality as some lower end PLC. In many cases, the new controllers can support the need of smaller manufactures eliminating the need for programming. When planning the new robotics system, how can you determine whether the need of PLC or whether the robot controller can do it. The robot controller can handle all the function of PLC such as clamping, decamping, start-up and shutdown sequences. The with PLC connection welding robot requires more wiring, if we used robot controller expanded connectivity reduces system complexity and saves cost in wiring troubleshooting documentation and integration time. Using the robot controller versus a PLC offers a host of advantages; you can use the robot programming pendant of access everything associated with robot.

III. System Design And Implementation

In Industry previous condition welding robot work with PLC in four sections. In first section robot weld the job and then move to the second section that time worker free upto the robot goes on third and fourth

section or complete our total welding job in that four workers are dependent on each other. If in between anyone section error or fault in welding process is produced this faulty job is still go ahead to the last section after that in checking process error is detected. In this case more time is waste and less production obtained that's why industry may get loss their production. Using the PLC system in welding section due to excessive wiring production loss is obtained and man power also in large number. So, All these operations are performed by inbuilt operation box of robot controller and some operations like clamping decamping the job by manually this way design with operation box and remove the PLC with such crowding wiring. Due to remove the more wiring space saves, dependency is reduced and production is obtained large in amount.

MIG-MAG and TIG welding are mainly preferred for welding. Hazardous working conditions may lead to use robots, Flexibility in different production line, Reduction in overall costs, Increase productivity and eliminate faults due to human, Increase repeatability in accuracy.

Welding Technology

Robots in Welding are most useful as like, robotic welding is feasible for high and medium size production numbers. The dimensional tolerances must also be determined during production. Superiorities to semi-automatic systems: High efficiency, Improved health and safety, Increased quality and Strong welds.

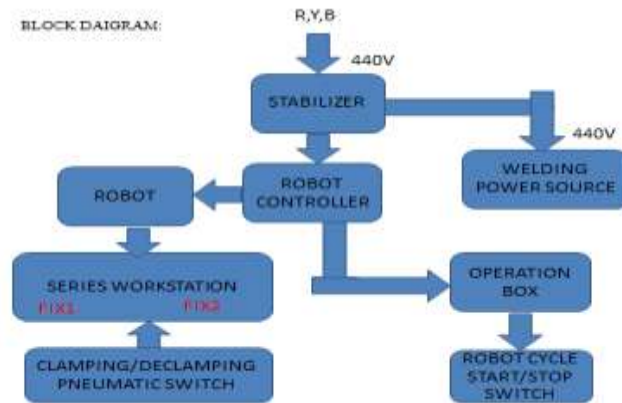


Fig 1. Block Diagram Of welding Robot

Hardware Development

Hardware is developed by using some different tools. As further specified as like Stabilizer, Controller, Operation Box, Power Supply and clamping and unclamping using push button switch.

Stabilizer:

It is used for three phase power supply with the help of this unit synchronized the voltage in all units. The working operation required 440v Ac Supply this stabilizer unit controls the fluctuation in AC supply.

Welding power supply:

This power source used for welding operation. It connected to the stabilizer input.

Robot controller:

Today's robot controllers feature faster processing speeds, allowing the controller to handle all I/O sequencing and motion planning. They also feature increased I/O (1,024 points), plus the connectivity required to communicate with devices that operate at the field-bus level. Robot control architecture has evolved. Previously, robots could just be "nodes" to a "master" PLC. Now, the robot controller can take on the role of I/O "master" over various different bus-level networks, such as Device Net, The robot controller now serves as the "master" of field devices such as I/O blocks, sensors and switches. This field-bus capability also permits all I/O connections to be routed through one cable versus being individually terminated using discrete wiring.

Operation box:

Operation box performs ON-OFF & Cycle Start-stop & emergency stop operations and functions.

IV. Conclusion

When robots are used on the shop floor to perform welding tasks, users get massive improvements in terms of flexibility, productivity and quality Using welding robot within short period of time. Less Labour cost is required. Dependency of workers is reduced. Crowding of wires is as less as possible. Eliminating an external PLC and using the robot controller for system level control function is now a viable and cost effective alternative for many applications. The hardware implementation of the project has been done and 75% of the work is completed.

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