

Auto Sizing Control Panel for Needle Bearing

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Abstract: In daily routine life the use of bearing is very essential, as we use many house hold devices like washing machines, water motors, bikes, cars and many more devices. Without bearings there can be a friction between two surfaces which will reduce the life of any device. So to overcome all these problems there should be some way which will give us better efficiency with greater throughput. And it should also give us higher rate of efficiency. On the other hand the bearings are used for less clearance, which will enhance the life. The bearings which were initially designed expected to limit the rate of rotation and now developed to provide us higher rates with large range in limited rotations. These bearings are used by many houses for their devices as well as in machinery and those machineries are owed by the industries. By the use of bearings the friction between two surfaces is avoided or more over it is reduced which increases the life of the devices.

Keywords: PLC, HMI, A TO D CONVERTER.

1. INTRODUCTION

Needle bearing are used in many industries to reduce the force of friction which will increase the life of device. In this project we will implement the project to auto size the needles which gives us higher rates of production with minimum number of drawbacks. Here all the time we just need to give the reference needle size depending on that size remaining needle will be produced which will be of same size as given. As this project is autosizing the needle production so we require less no of man power and it also reduces the manual error. As it is automatic there is less wastage of needles. In this project the basic units are like PLC, HMI, MCBS, some relays are also used, cable tray, power supply and the most important thing is the programming. Here for programming purpose the ladder language is used. There are many ways to do programming for plc but we are using here ladder one because it is very simple to programme and it is user friendly. This language is easy to understand.

2. PLC

A Programmable Logic Controller, or PLC, is more or less a small computer with a built-in operating system (OS). This Operating systems iare highly specialized to handle incoming events in real time, i.e. at the time of their occurrence. These PLCs has input lines where sensors are connected to notify upon events (e.g. temperature above/below a certain level, liquid level reached, etc.), and

output lines to signal any reaction to the incoming events (e.g. start an engine, open/close a valve, etc.).



Figure1: Programming Logic Controller

2.1 HMI

Human-machine interface is the part of the main part of the project machine that handles the Human-machine interaction. Membrane Switches, Keypads and

Touchscreens are the basic examples of that part of the Human Machine Interface which we can see and touch.

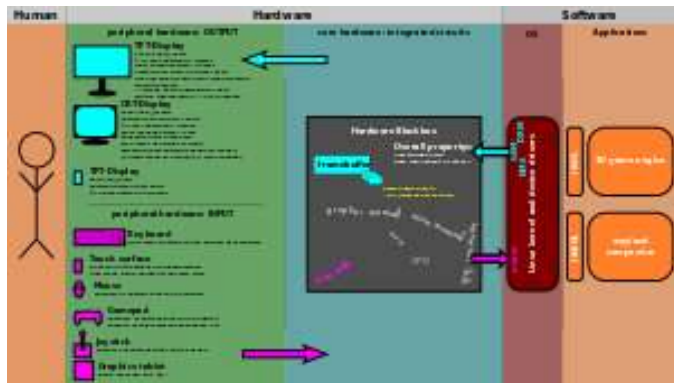


Figure 2: Human Machine Interface

3. SYSTEM DEVELOPMENT

In this chapter we are going to explain the project in detail. By giving the full system development programme which will comprises both the parts that is the software part and the hardware part. The software part will explain the ladder programming. A specific dimension needle is needed for specific application, by the human error the required dimension is not achieved as there is very precision while considering the application hence we are going to use the automation system to automatically manage the size of needle bearing. The needle bearing production by using the automation, here we are thinking to replace human by some machines which will full-fill our requirement of producing needle bearing of specific dimension without any error. It reduces the time also and cost effective method is used, there is no limitation to the machines as the human have like environment friendly, limitation of human body.

3.1 HMI PROGRAMMING

The hmi programming is shown in below diagram which shows various windows screen which will appear when we press any buttons on the screen; it works as a ATM screen which we saw at the time of money transfer. When we withdraw the money or deposit the one screen is connected to another likewise here no of screens are connected and depending on our requirement we can shift to any screen and get that information.

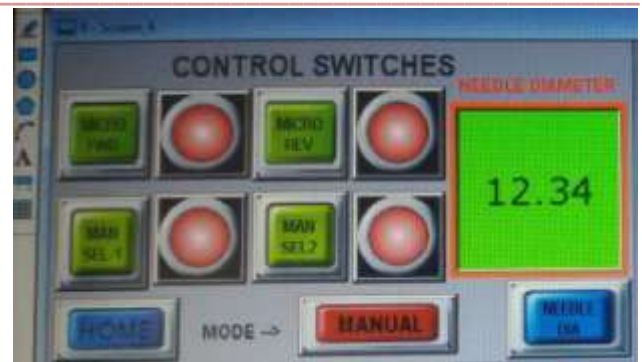


Figure3: control switch slide



Figure4: Needle diameter slide

This are the two examples of slide in which one will show the control switches and another is needle diameter if you see the control switch slide there is a needle diameter switch if you press that switch then we will be automatically switch to the slide which will show the needle diameter in in large manner. And if you again come back to the home slide you need to switch to the control switch by that you will came back and again by pressing home you can come back to home screen likewise we have near about 11 slides which gives you full information.

3.2 PLC PROGRAMMING

Plc programming is done by the use of ladder programming this programming language is easy to understand and it is user friendly. By this programming the calculation is done. This calculation is done to get the step size by the step size we can reduce the size of the raw material. This shows the calculation part of the programme, by which we can minimise the size of the raw material. By calculating the step size we are calculating the minimum unwanted raw material, and now we can reduce the size of needle as we require.

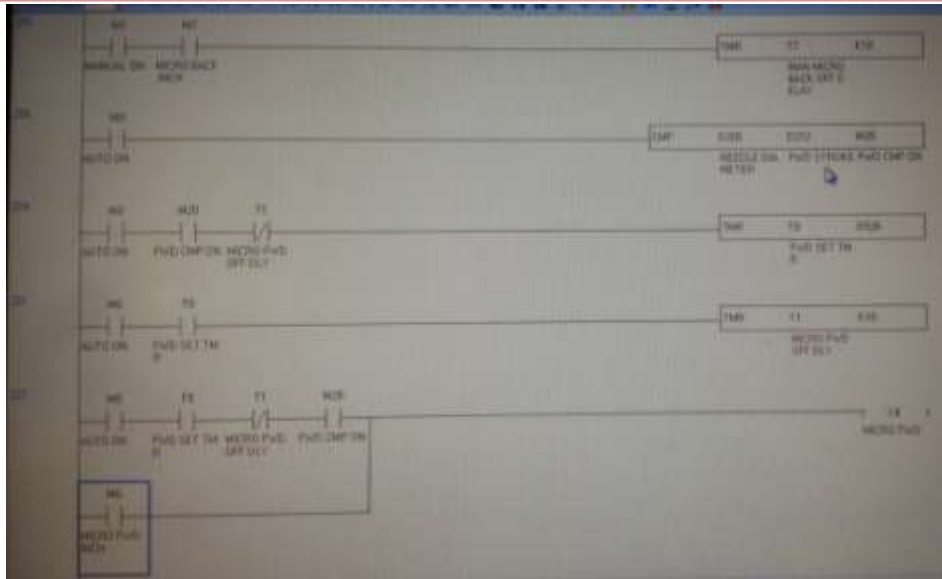


Figure5: Programming logic controlled

4. SYSTEM ANALYSIS

Production of needle bearing rates of is depend on various parameters like the raw material used, given zero point that is the comparison or the reference point, conveyor belt its speed and the step size. Now here by the use of automation we are increasing the rate of production as well as we are increasing the number of varieties per production machines. Here we are using only one plc machine and we are manufacturing the number of needle by means of one machine, just bychanging the needle size. We are all the time changing the reference and we are manufacturing number of needles from one single machine. This all happens by means of one machine we are just changing the

programming as the requirement increases or decreases depending on the production and the demand from market production always changes. But it is not always benifietory to change the machine all the time for single type of needle production.

4.1 HARDWARE IMPLEMENTATION

the following figure shows the final implementation of the units or this is the assembly of all the parts. Which consist of smps, mcbs, the cable trays, the plc all the basic equipment's are combined in a tray.And the hmi screen is placed on the cable tray. The hmi screen will now able to show all the readings as per our requirement.



Figure6: Hardware Implementation of Needle Roller Bearing

5. APPLICATION

As already mentioned all the feature of the automation in above comparison the application is in various types of needle production. Can be used in needle production to manufacture different types of needle from a single machine which will be cost efficient. Less manpower is required to look after as it goes according to programming so produces exact required size of needle. Here wastage of needle will be less as it is automatic. If any type of needle production suddenly goes down so no worry we can just stop the production of that needle as contrast if any additional size is required we can just change the arrangement and continue to produce that needle. After the production of needle with different sizes that can be used in different applications they are mentioned below.

- 1) Used in electronic devices
- 2) Motor vehicles
- 3) In industrial conveyors
- 4) Washing machines
- 5) Industrial robots

6. CONCLUSION

Autosizing control panel for needle bearing will overcome most of the disadvantages of single needle by single machine concept. It is cost efficient system, low maintains cost, The production of needle bearing can or will be manufactured by the use of automation which is new way for rapid and quality production. It increases the production

of needle bearing which will be different in size and shape but the overall mass production is increased with this process. It uses the automation which is nothing but the use of automatic control of production of needle bearing.

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