

Assel and Piercing Mill Setting using AC and DC Drives Control Panels

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Abstract—In Assel and Piercing in mill setting we are using AC and DC Drives which are assembled in control panels namely MTB, MDO, MBI. The AC Drive (ACS550) and (DCS800) with other components are assembled in these panels. These AC DC Drives are commissioning through Drive window Software. These Drive communicate with Siemens PLC .The Drives are useful for controlling the mechanical output of (example torque ,speed or position) that controls the electromagnetic states of the electric machine (example voltage ,currents and magnetic flux) to produce the desired response.

Keywords—Control panels, AC DC Drives, Commissioning Drive, Assel, Piercing.

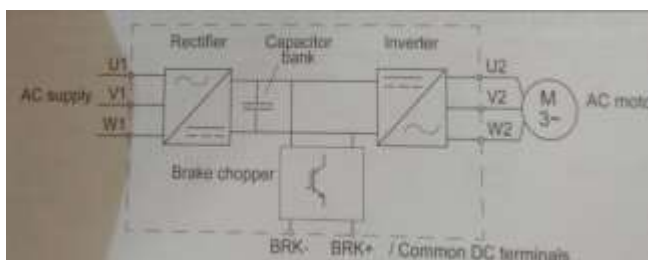
I. INTRODUCTION

The electric motors play very important role in day to day life in industrial applications and run everything we needed. Motor runs on electricity, in order to do there work providing Torque and Speed they required electric energy motor consumes electricity to provide speed and torque needed. If speed or torque is high or low the mechanical control are used to slow down shift or control. Results inefficiency, there will be wastage of energy and as well as materials. In this paper ACS550 and DCS800 drives and other components are enclosed in MBI, MTB, MBDO PANEL which is centralized and operated by PLC and SCADA based communication

II. AC DRIVES

ACS550 Drive combines a sophisticated microprocessor with advanced IGBT power switching technology to deliver V/F, close loop flux vector and sensor less vector control of AC motors. Its intuitive control panel offers numerous benefits making it most user Friendly panel in Drive industry. This Drives can handle the most demanding industrial applications in an efficient, dependable and economic manner [1].

Block Diagram:



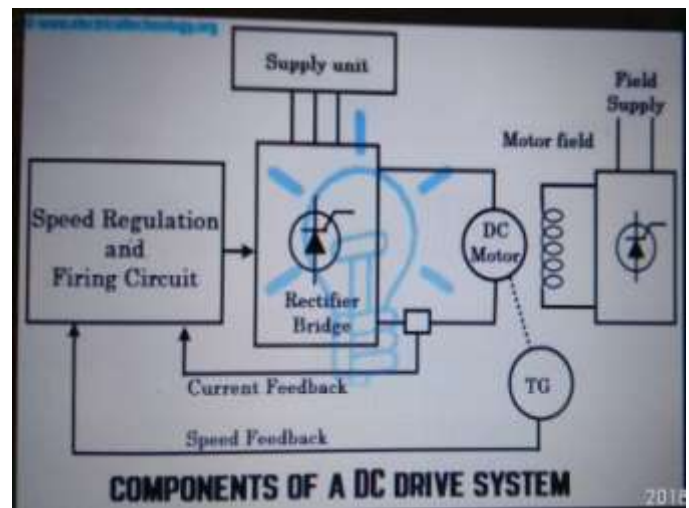
In above AC drive the input power is run through rectifier that converts AC power to DC power. The DC power is fedded to capacitor inside the drive to smooth out the DC power, which provides a clear supply for next step. Then the power flows to the inverter which then changes DC power to AC power that goes to motor. This allows the drive to adjust frequency and voltage that is supplied to motor based on current process demand.

Benefits:-Maintenance cost reduces, reduce ambient noise, low cost, reduce scrap.

III. DC DRIVES

DCS800 Drive gives us reliability and performs with flexibility to meet requirements. This drive is build in three phase exciter. It is build in mode bus with whole range of optional communication options. It is also build in control for shared motion, double motor operation, field reversal and classic 12 pulse installation [2]

Block Diagram:-



In above block diagram DC drive consist of operator controller and drive controller DC motor. Operating controller provides altering the speed. The drive controller will regulate the input by the means of phase control device or pulse width modulator (PWM). In this DC motor is an electrical device that needs to be adjusted to perform at a various speed

IV. TYPES OF PANELS

A. MBI

These panels consist of 13 AC drives (acs550) and 1 DC drive (dcs800).

B. MTB

It consists of one DC drive (dcs800).

C. MBDO

It consists of one DC drive (dcs800).

V. COMPONENTS

CONTACTOR -The Contactors are used by electrical equipment which frequently turned off and on by opening and closing circuit. The contactors function is to make and break all the power supply lines running to a Load or to repeatedly establish and interrupt an electrical power circuit.

RELAY - Overload and other faults on electrical lines are detected by electromechanical relays, by opening and closing circuit breakers. Relay is an electromagnetic switch which is operated by a relatively small electric current that can turn on or off a much larger electric current. The heart of a relay is an electromagnet (a coil of wire is a temporary magnet when electricity flows through it) [5].

CHOKER - VFD input used input choke as filter. Output choke is used when cable length is longer than few metres.

INCOMER - All basic components are connected to this incomer. It also known as SFU(Switch Fuse Unit). It have one handle with fuse unit. When it is turned ON the supply will pass to the next stage through fuse if any major fault occurs in side panel board, it will trip and it isolate supply.

BUS BAR - A Busbar is a simple metallic strip or bar which is made of (typically copper, brass or aluminium) it conducts electricity within switchgears and other apparatus. Conducting a substantial current is its main function.

VI. CENTRALIZATION

Drives are used to to control speed and torque characteristics of motor. Motor are used for performing various operation.

The parameter of motor can be controlled through Drives. These drives are operated locally by remote. In industries there are so many workers who are changing parameters of the motor whenever it is needed but the other is unknown of the changes that are made. Hence it became necessary that all the panels are centralized[4]. The control panels are centralized by Siemens PLC S71200. Since they are centralized for the following reasons:

1. Safe operation
2. To reduce time for setting
3. Reduce man power

VII. SOFTWARE AND PROGRAMMING

SCADA is software that include various GUI form or display on which user can create that different process and these process can be linked with the controlling hardware like PLC or other controllers. Communication between the controller unit and SCADA can be done through many communication media like Ethernet or serial communication. Profibus is open serial communication that enable data exchange between all kind of automation components. The RPBA-01 Profibus DP Adapter module which supports

The profibus DP protocol including its DP-V1 extension. Through these module it is possible give command to drive [3].

VIII. CONCLUSION

The Assel and perciel of rolling mills is done for efficient performance, Drives are used that are assembled in MBDO ,MBI , MTB panels .The panels are design such that we get desired result . The panels are centralized, The drives are assembled in the panels and they are controlled by using PLC and monitored through SCADA.

REFERENCES

- [1]. Acs550 User manual
- [2]. Dcs800 hardware manual
- [3]. EN RPBA01 user manual
- [4]. www.siemens.co.in
- [5]. www.google.com