

LESSON PLAN

Date _____

Trade:- Welder

Name _____

Week No:- six

Subject :- Arc welding power source- Transformer, rectifier, motor generator set and inverter type welding machine. Care and maintenance. Advantages and disadvantages of AC and DC welding machine.

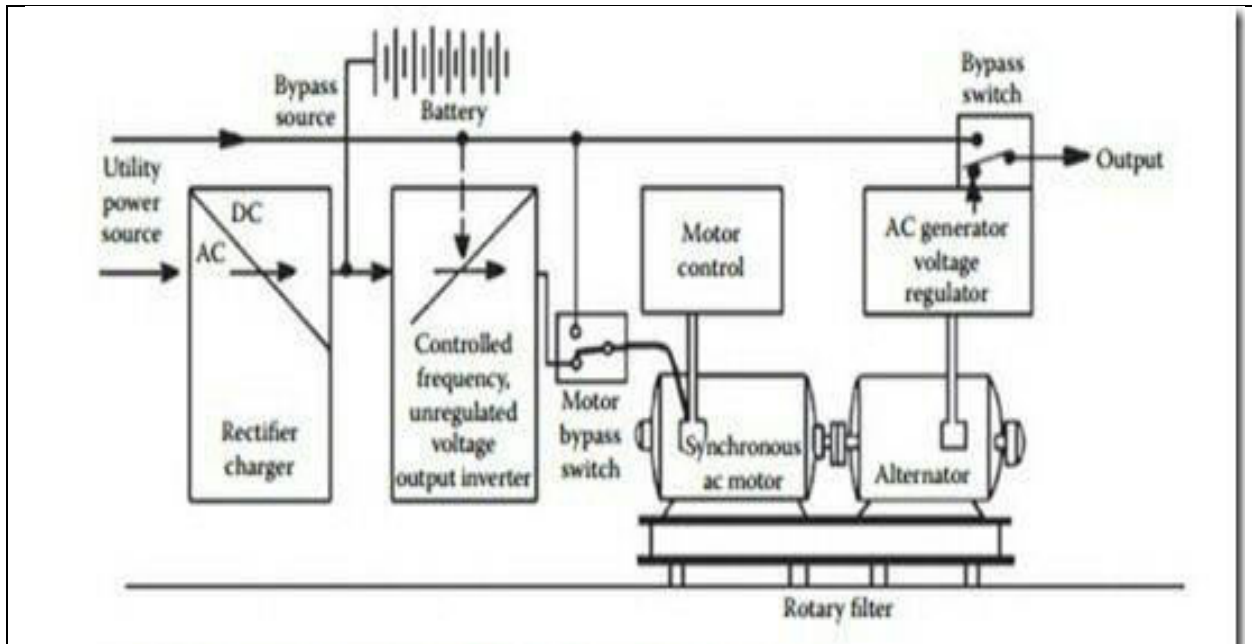
Motivations:- in previous week we learned about Common gases use for welding and cutting. Flame temperature and uses. Chemistry of oxy-acetylene flame. Types of oxy-acetylene flame and uses. oxy-acetylene cutting equipments, parameters and applications.

PREPARATION: - Teaching Aids:-Chalk, Charts,

INTRODUCTION: - arc welding power source are main source to convert electrical energy to heat energy. There is much type of machines available in industry but mainly three types of arc welding power source. AC Transformer, DC motor/engine generator set and rectifier set.

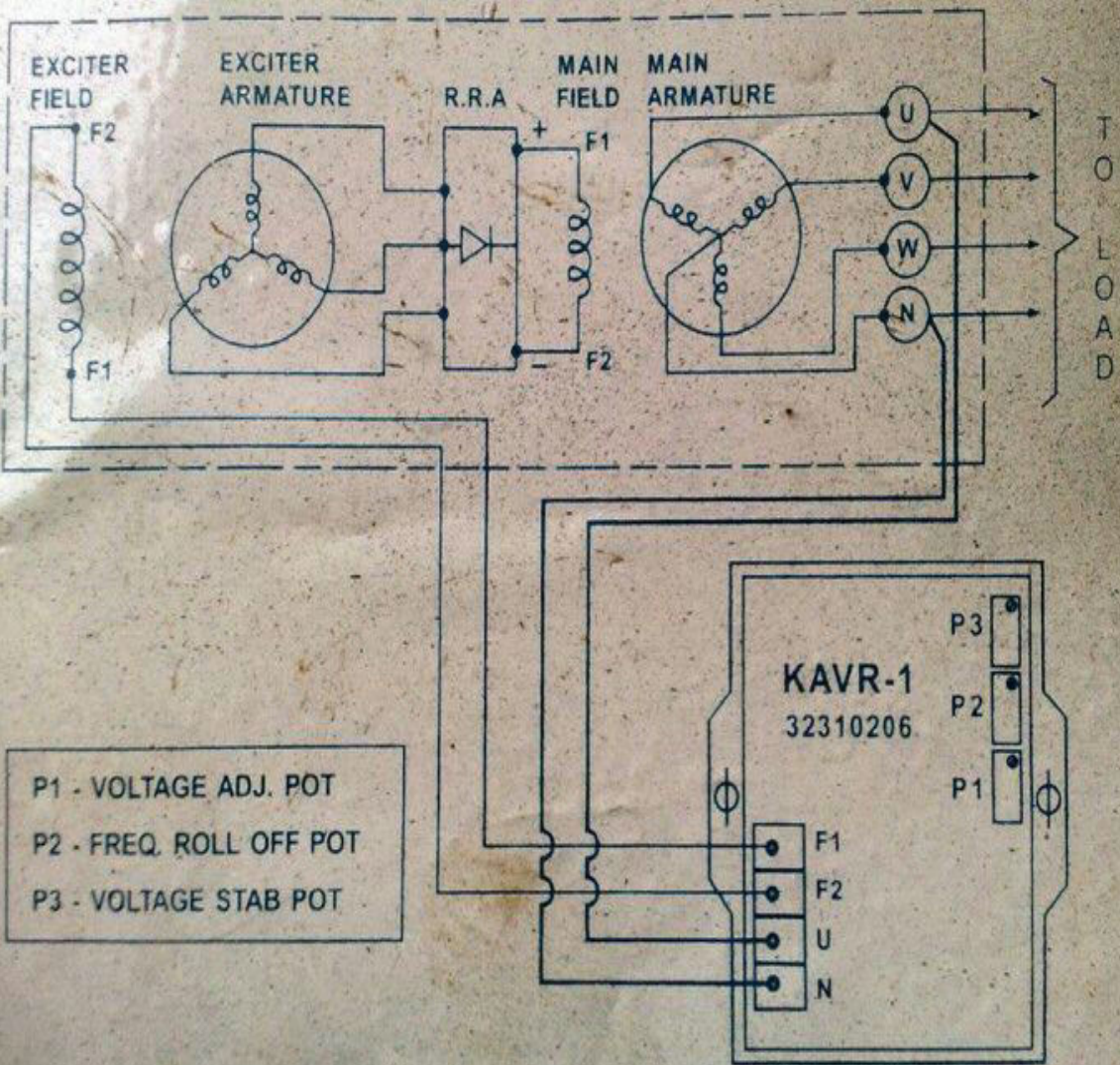
PRESENTATION:-

Topic	Information Point	Spot Hint
AC Transformer	AC transformer have input AC 220 volt/440 volt and given output 200 to 800 amp. These transformers available in capacity of welding current in amp. With phases and cooling system.	
Capacity	200 amp to 800 and more as per requirement.	
Types	Air cool and oil cool and single phase ,two phase and three phase.	
Principle of working	There are two binding inbuilt these transformers. Primary binding and secondary binding. Ac input (high voltage and low amp) connected with primary binding and create Electro motive force and secondary binding output low voltage and high amp. So these transformers also called step down transformer. A regulator fitted on secondary binding to control current.	
Care and maintenance	<ol style="list-style-type: none"> 1. Lubricate moving parts time to time. 2. Do not overload machines and use always tight electrical connections. 3. Do not up and down current during welding. 	
DC Motor generator/engine generator set	These set are have a generator set for output dc welding current which are driven by electric motor or engine set.	
Types	Motor generator set and engine generator set. Motor generator set run by electrical energy and engine generator set run by engine.	



CONNECTION DIAGRAM OF 3PH BRUSHLESS AC GENERATOR

AC GENERATOR



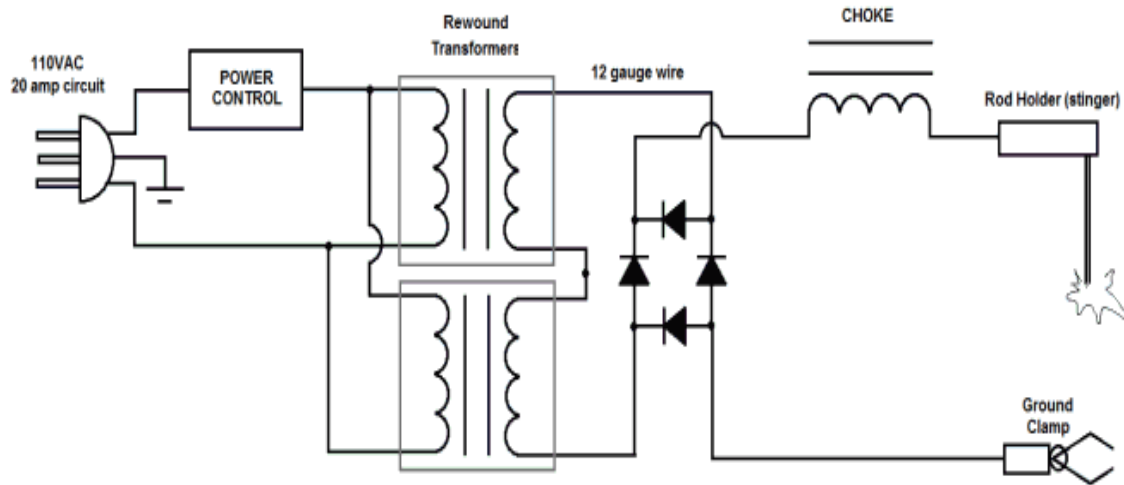
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Rectifier set

This set use ac transformer and through a diode it converts dc from ac. A silicon coated plates use for diode covering.

110 VAC ARC WELDER

Open Circuit Voltage: 70 V
Close Circuit Current: 60 A

**ADVANTAGES OF WELDING**

- A good weld is as strong as the base metal.
- General welding equipment is not very costly.
- *Portable welding equipments are available.*
- *Welding permits considerable freedom in design.*
- A large number of metals/alloys both similar and dissimilar can be joined by welding.
- *Welding can join workpieces through spots, as continuous pressure tight seams, end-to-end and in a number of other configurations.*
- *Welding can be mechanized.*

DISADVANTAGES OF WELDING

- Welding gives out harmful radiations (light), fumes and spatter.
- *Welding results in residual stresses and distortion of the work-pieces.*
- *Edge preparation of the workpieces is generally required before welding them.*
- *A skilled welder is a must to produce a good welding job.*
- *Welding heat produces metallurgical changes. The structure of the welded joint is not same as that of the parent metal.*
- *A welded joint, for many reasons, needs stress-relief heat-treatment.*

12/18/13

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Advantages and Disadvantages

- can be applied to a wide variety of manufacturing and maintenance situations.
- The equipment is portable.
- The cost and maintenance of the welding equipment is low when compared to some other welding processes.
- The cost of welding gases, supplies and operator's time, depends on the materials being joined and the size, shape and position in which the weld must be made.
- The rate of heating and cooling is relatively slow. In some cases, this is an advantage. In other cases where a rapid heating and cooling cycle is desirable, the oxyacetylene welding process is not suitable.
- A skilled welder can control the amount of heat supplied to the joint being welded. This always a distinct advantage.
- The oxygen and nitrogen in the air must be kept from combining with the metal to form harmful oxides and nitrides.

Questions:-

1. Describe the AC transformer set .
2. Describe the DC generator set.
3. Describe the rectifier set.

Next week:-

Welding position as per EN and ASME :flat, horizontal, vertical and over head. Weld sloop and rotations. Welding symbols as per BIS, AWS and BS.

Assignment:-

Arc welding power source- Transformer, rectifier, motor generator set and inverter type welding machine. Care and maintenance. Advantages and disadvantages of AC and DC welding machine.

Checked by.....

Instructor.....