

# AIR POLLUTION CONTROL SYSTEM USING ELECTRICAL SYSTEM

ARSUL P P<sup>1</sup>, JADHAV D M<sup>2</sup>, BADE B S<sup>3</sup>, MATE A K<sup>4</sup>

<sup>1</sup> Lecturer, Department of Electrical, M S polytechnic college Beed, Maharashtra, India

<sup>2</sup> HOD, Department of Electrical, Aditya polytechnic college Beed, Maharashtra, India

<sup>3</sup> Lecturer, Department of Electrical, M S polytechnic college Beed, Maharashtra, India

<sup>4</sup> Lecturer, Department of Electrical, Aditya polytechnic college Beed, Maharashtra, India

## ABSTRACT

Air pollution is defined as the addition of various hazardous chemicals, particulate matter, toxic substances and biological organisms into the earth's atmosphere. In view of the several factors that attribute to air pollution, what comes from industries and factories is often considered the prime contributor to air pollution. According to a study conducted by the Environmental Protection Agency (a.k.a. EPA), it has been found that industrial pollution accounts for approximately 50 to 70 percent of the pollution. There are several serious ecological implications and health risks associated with industrial air pollution.

Electrotherm clean air solutions offers pollution control systems for Induction furnace, AOD & LRF.

**Keyword:** - Induction furnace, AOD & LRF, Venturi Scrubbers

## 1. INDUCTION FURNACE

In many industries facing the energy cost, rush operation, safety work on three phase motor so this concept is created, by using frequency inverter easy to control of speed for this inverter, some advantages we get from it like soft starting, speed variation, increase reliability, life of machine, less maintenance high power factor. A frequency inverter is a precision electronic device specifically designed and used to control the speed of AC induction motors without affecting the electricity consumption, torque, impedance, magnetic flux, etc. of the motor. It is integrated to an operator interface for receiving the required speed control commands. Why can't frequency inverters be replaced by other straightforward means? The following article will provide the exact purpose of using frequency inverters to control AC motor speed.

### 1.1 Steel Frame Induction Furnace

- ET Steel frame melting furnaces are available in capacities ranging from 500 Kg to 60 Tons.
- These furnaces are ruggedly built with heavy structural steel for trouble free operation under harsh melt shop conditions.
- Thick walled rectangular coil sections are used to minimize coil losses. The higher coil efficiency ensures energy savings and higher productivity.
- Special coil insulation prevents inter turn sparking.
- Insulated furnace lid is provided to reduce heat loss through radiation.
- Fume extraction ring / Fume extraction hood provided to capture smoke and fumes.
- Coil supports maintain inter turn gap and enhance the rigidity of The coil assembly.

## 2. FUME GAS FILTERATION SYSTEMS

### 2.1 Unique features of ET cassette filters

- Modular design – for easy adaptability of cassette-type filters to specific floor space requirements

- Low operating and maintenance costs
- Due to the reverse air flow cleaning method, the filter bags have longer service life
- Spring-lock mechanism on doors and cassettes ensures fast and easy replacement by only one person
- Minimal residual dust in cleaned air, well below permitted emission rates due to optimal efficiency of filter media in conjunction with reverse air flow cleaning system. Our filter consists of dirty air inlet and distribution.
- Low energy consumption cost due to filters employing low pressure reverse air cleaning
- Increased bag life and low operating maintenance cost
- Reverse air cleaning offers low emission rates due to optimal efficiency of filter media
- Modular design offers standardization of component parts with high quality standard
- Only one person is needed to operate the door and remove the complete set of cassettes with distant mat
- Top entry of gas completely eliminates the re-entrainment that is predominant in hopper gas inlet
- Top inlet with distribution manifold ensures even gas distribution inside the filter
- Pre-assembled and factory tested filter components ensure quality

## 2.2 Venturi Scrubbers

Electrotherm offers a range of technologies for various dust emission sources in iron and steel plants. The main goal is to protect the environment and people as well as to fulfill stringent environmental regulation.

### Unique Features

- It can handle any type of furnace fumes from any scrap quality
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- Flexible on flue gas temperature & moisture content
- Require small area for installation: typically 15 sq meters of space
- Have an ability to remove SO<sub>2</sub> as well as particulate matter
- It can collect sub-micron as well as coarse particles
- Minimal moving parts to maintain
- Both particle collection and absorption of gases, vapors, etc. can be done at the same time
- These high efficiencies are achieved at a low pressure drop
- Lowest power consumption against comparable method

## 3. CASSETTE FILTER

DAFC Hood with Cassette Filter Air Pollution Control System of specified size is primarily built, designed and engineered for use on Induction Furnace with specific size, melt rate capacities, connected power and type of charge used.

This system is intended to exhaust clean smoke filter the dust from smoke emitted by “Induction Furnace”. Same will be let-out into atmosphere through the stack at a height of 33 meters (or as per local pollution authority) from the ground level. System outlet emission will be less than 20 mgm/Nm<sup>3</sup>.

## 4. CONCLUSION

From given electrical system The conclusion is that we can use this System for pollution control in india as well as for creating healthy environment. It will help reduce level of harmful gases from air and increase oxygen level.

So this will very important in future to use electrical system for reducing ail pollution.

## 5. REFERENCES

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