



# UNITECH

*Empowering progress  
through Technology*

MANUFACTURERS OF THERMOCOUPLES,  
THERMOWELLS AND RTD'S



# History

**2014**

Founded with the vision of innovate, inspire and ignite change

**2016**

Entered the aluminum sector and provided supply to integrated aluminum industry.

**2018**

Entered the steel sector and started supplying Tata Steel through our channel partners.

**2019**

Ventured into the public sector, initiating the supply of thermocouples for bake oven furnaces to NALCO.

**Present**

Transitioned to a new facility and commenced exports to a prominent aluminum smelter in Oman.



# Products

## Thermocouple

J,K,N,T,E,R,S,B

Simplex/Duplex/Triplex

## Thermowell

Metallic, Ceramic, Carbide

Silicon Nitride, Tungsten Carbide

## RTD's

Pt 100, Pt 1000, Cu and Ni

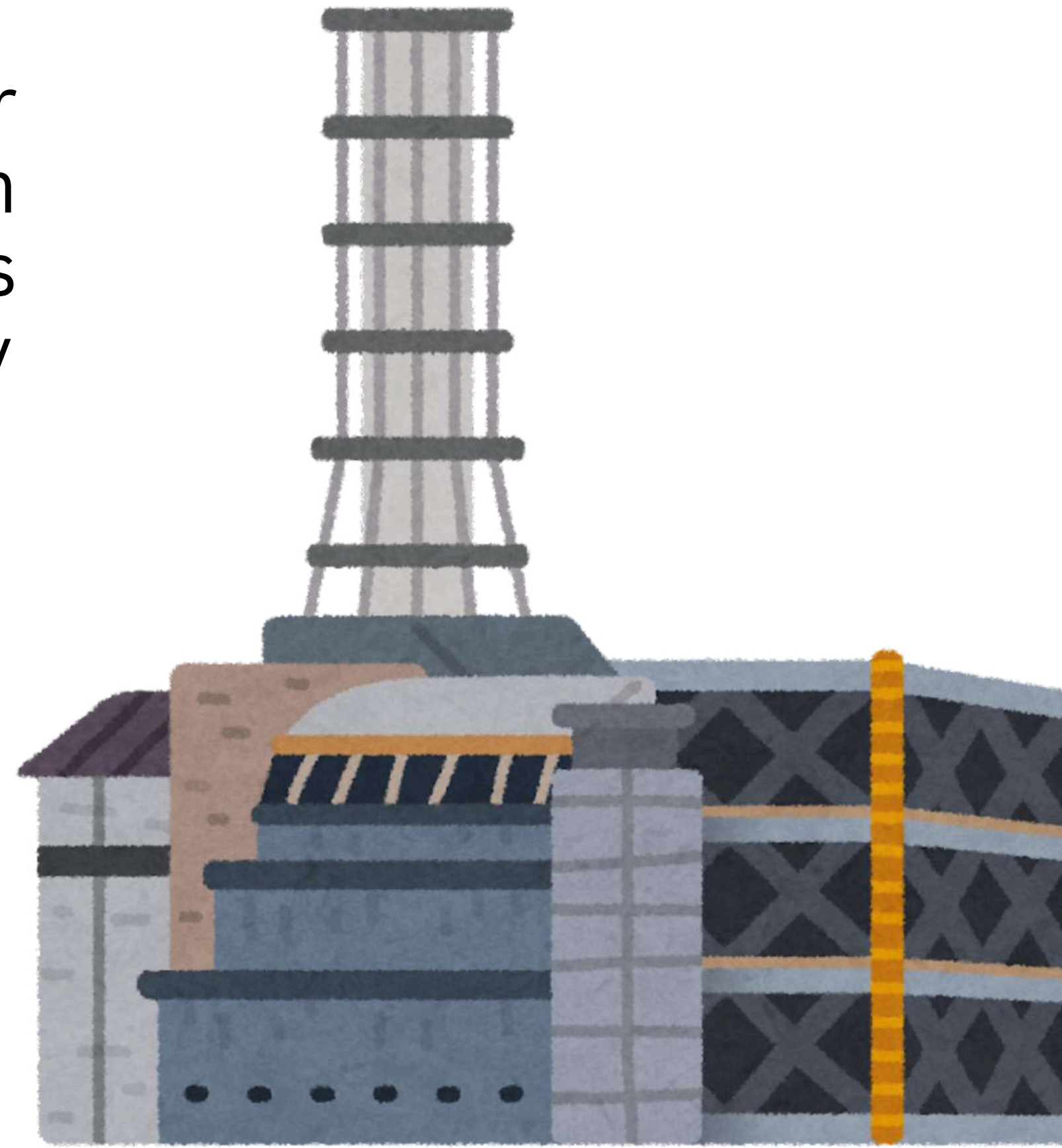
Simplex/Duplex

## Instrument Cables

Thermocouple extension and  
compensating cables

# POWER PLANT

A power plant, also known as a power station or generating plant, is an industrial facility that produces electricity from another form of energy

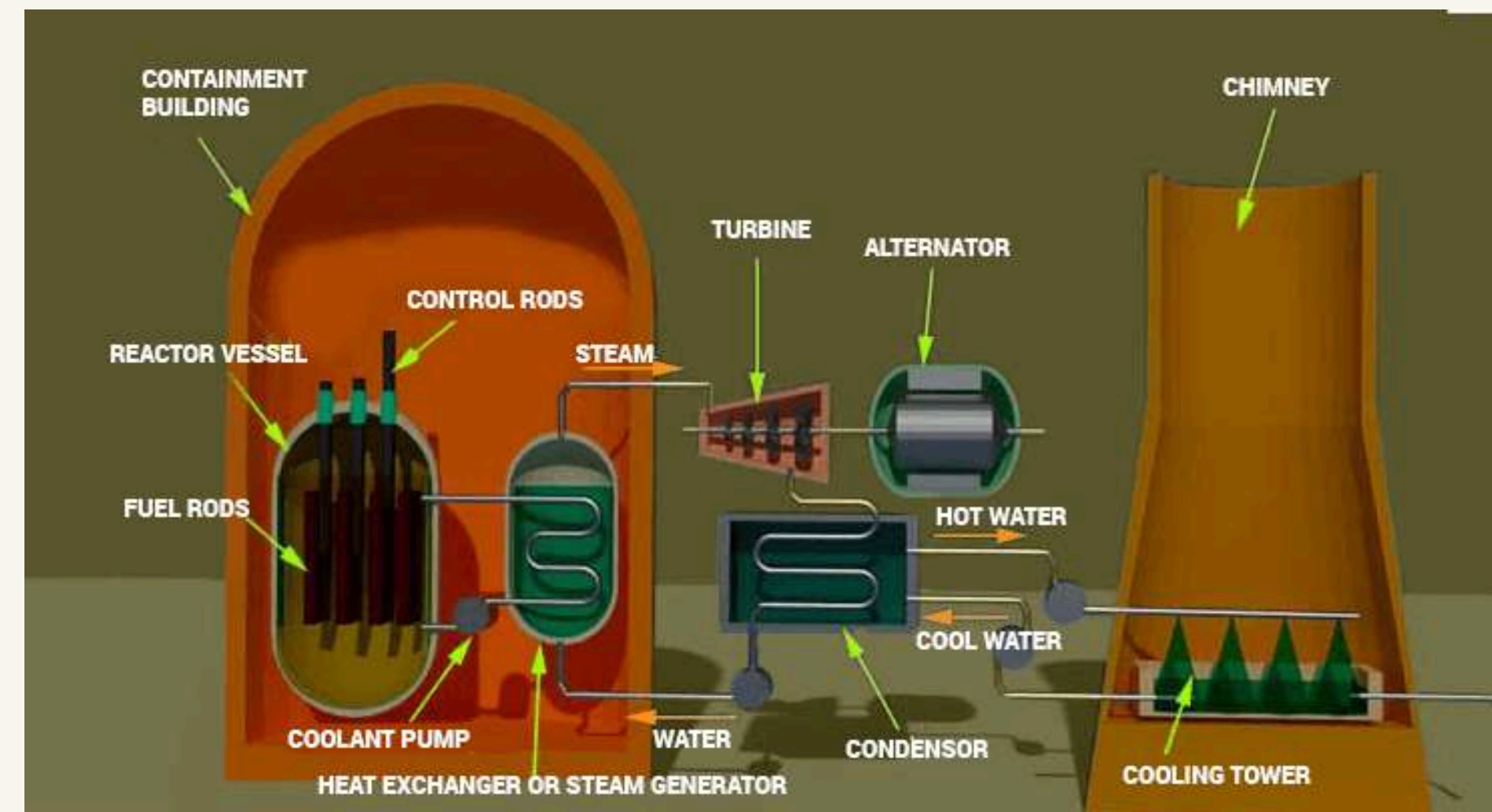


# TYPES OF POWER PLANT

- NUCLEAR POWER PLANTS
- GEOTHERMAL POWER PLANTS
- FOSSIL-FUEL POWER PLANTS
- BIOMASS-FUELED POWER PLANTS
- SOLAR THERMAL POWER PLANTS

# NUCLEAR POWER PLANT

Nuclear power plants are facilities that use nuclear reactions to generate electricity. Here's a basic overview of how they work and some key aspects:





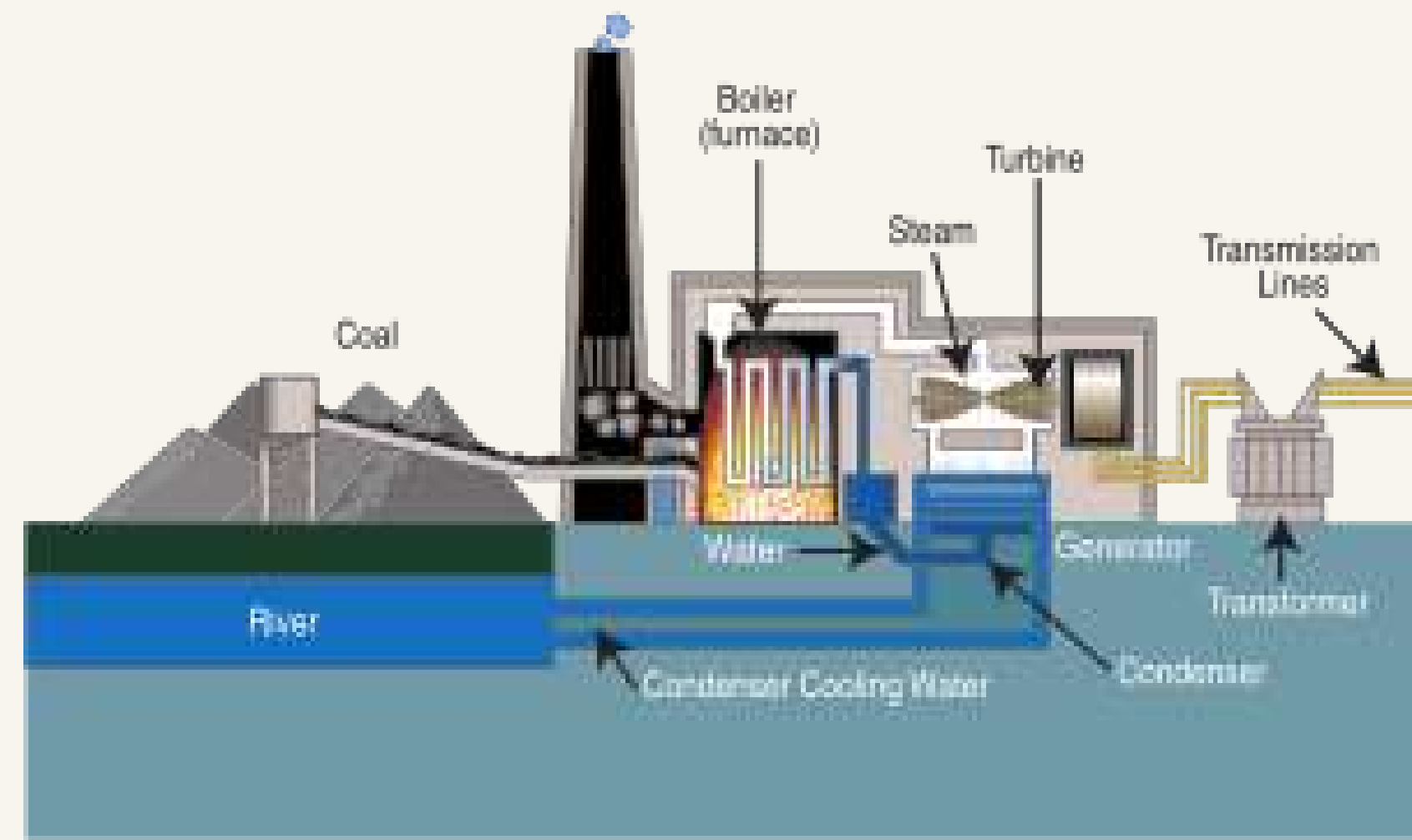
# GEOHERMAL POWER PLANT

A geothermal power plant generates electricity by using steam or hot liquid from underground reservoirs to drive turbines. The three main types of geothermal power plants are dry steam, flash steam, and binary cycle. The type of conversion depends on the temperature and state of the subsurface fluid



# FOSSIL FUEL POWER PLANT

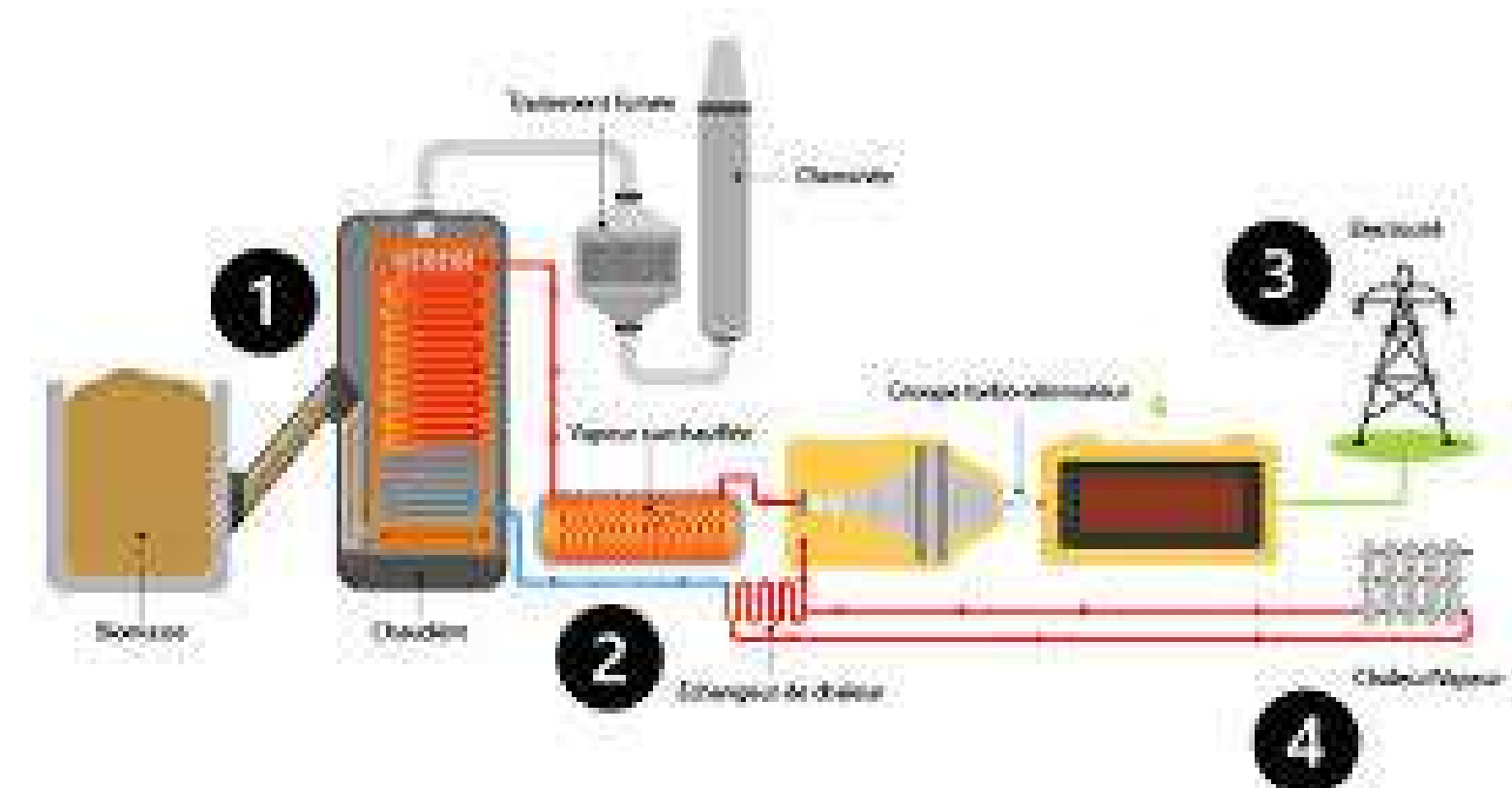
A fossil fuel power plant is a thermal power plant that generates electricity by burning fossil fuels like coal, oil, or natural gas. The heat energy from the combustion process is converted into mechanical energy, which then powers an electrical generator





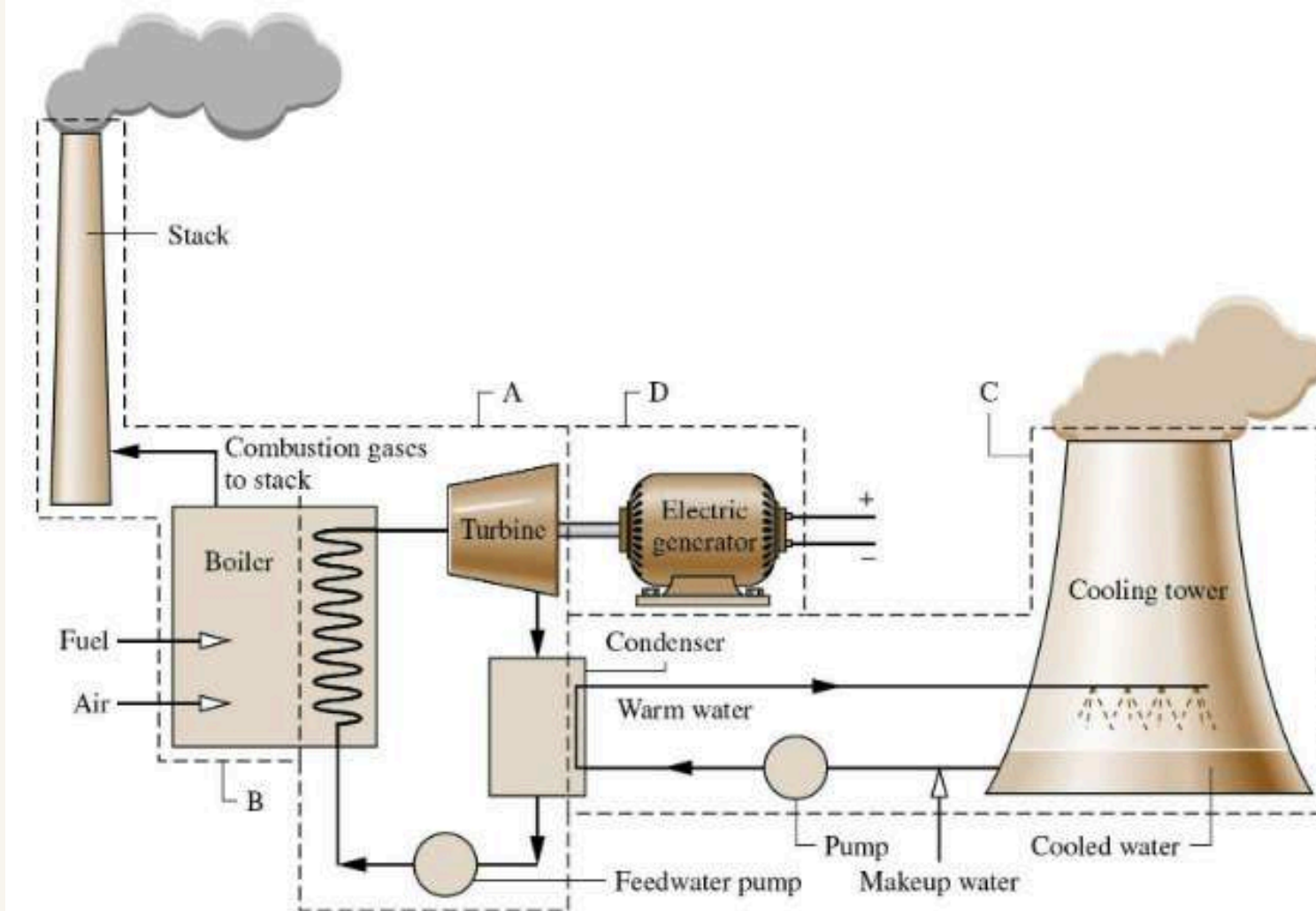
# BIOMASS FUELED POWER PLANT

Biomass power plants use biomass, such as wood chips, to generate electricity and heat:



# THERMAL POWER PLANT

Thermal power plants use heat to generate electricity. The process generally involves burning fuel—such as coal, natural gas, oil, or biomass—to produce steam. This steam then drives a turbine connected to a generator, which produces electricity.



# THERMAL POWER PLANT PROCESS

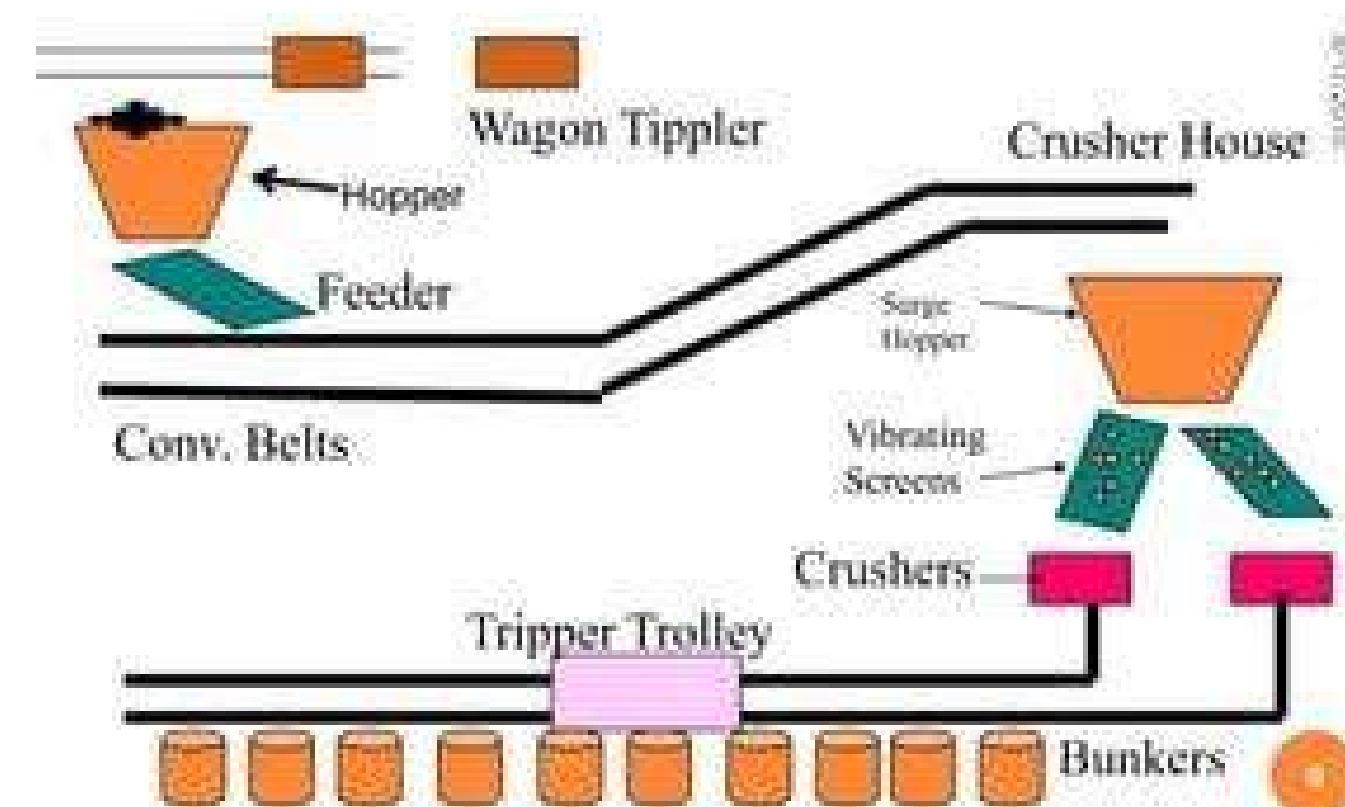
1. COAL HANDLING PLANT
2. PULVERIZING PLANT
3. DRAFT FANS
4. BOILER
5. ASH HANDLING PLANT
6. TURBINE
7. ALTERNATOR
8. CONDENSER
9. COOLING TOWERS AND PONDS
10. FEED WATER HEATER
11. ECONOMIZER

# COAL HANDLING PLANT

A Coal Handling Plant (CHP) is a facility that manages the transportation, storage, and preparation of coal for use, typically in power plants or industries that use coal as a fuel source. The main functions of a coal handling plant include receiving coal, crushing it to suitable sizes, removing impurities, and conveying it to the appropriate locations for further processing or direct use in power generation. Here's a breakdown of key processes in a coal handling plant:

1. Unloading of Coal
2. Conveying System
3. Crushing
4. Screening
5. Storage
6. Coal Sampling
7. Magnetic Separators
8. Dust Suppression
9. Coal Bunkers and Feeders
10. Ash Handling System

## GENERAL LAYOUT OF CHP

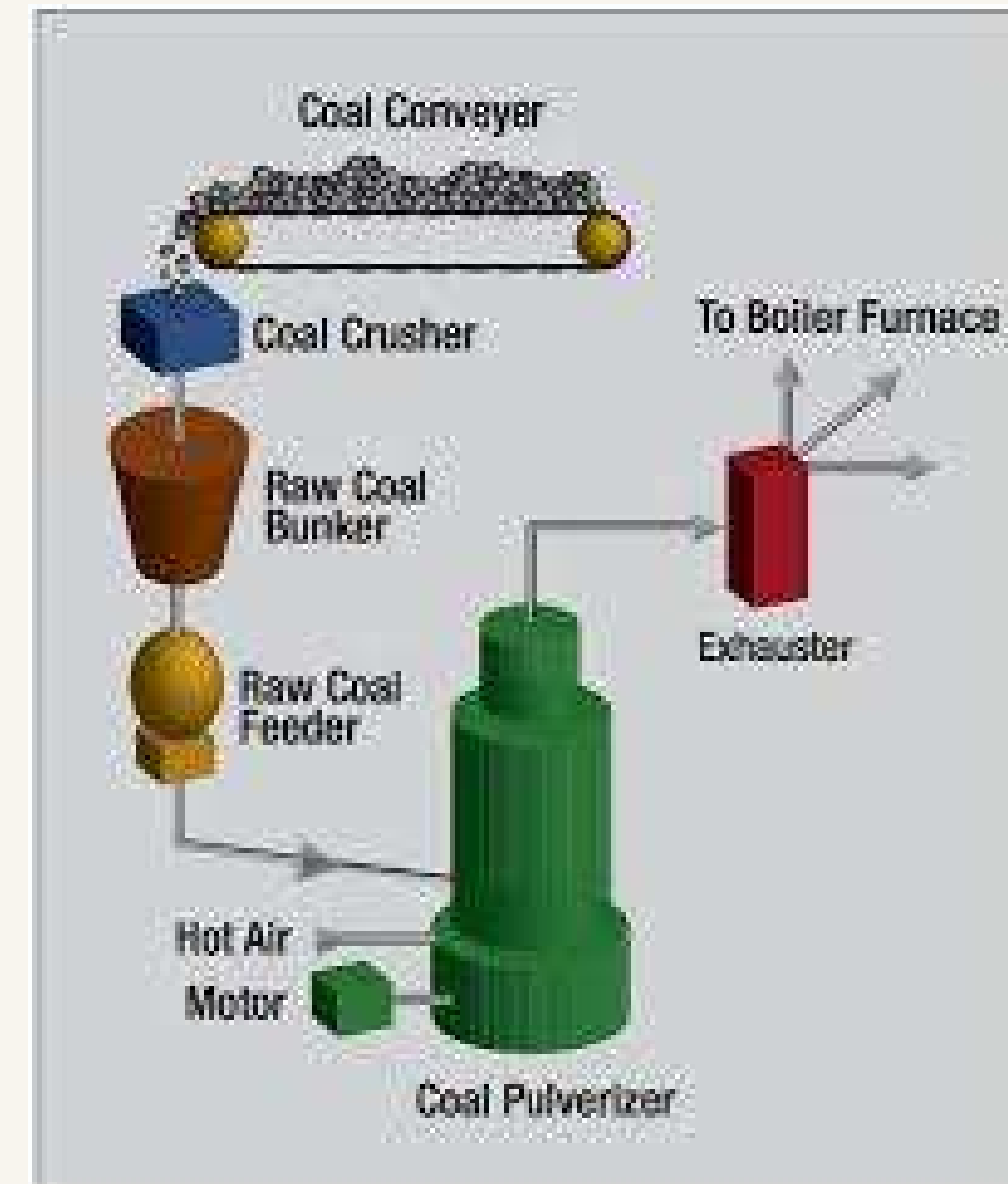


# PULVERIZING PLANT

A Pulverizing Plant is a critical part of a coal-based thermal power plant, designed to crush and grind raw coal into fine particles, making it suitable for combustion in boilers. This fine powdered coal is known as pulverized coal, and it increases the surface area for combustion, leading to more efficient burning and energy extraction. Pulverizing is a key step in thermal power generation because it directly affects the plant's efficiency, output, and emissions.

## Key Components and Processes of a Pulverizing Plant:

1. Raw Coal Feeder
2. Pulverizer (Coal Mill)
3. Classifier
4. Primary Air Fan
5. Coal Pipes
6. Boiler Burners
7. Combustion Process





# DRAFT FANS

Draft fans are essential components in thermal power plants, primarily used to manage the airflow necessary for efficient combustion in the furnace and the removal of flue gases. Proper airflow ensures that the combustion process is maintained at optimal efficiency, while also controlling the furnace pressure. There are two main types of draft fans in a power plant:

1. Forced Draft Fan (FD Fan)
2. Induced Draft Fan (ID Fan)
3. Balanced Draft System)



# BOILER

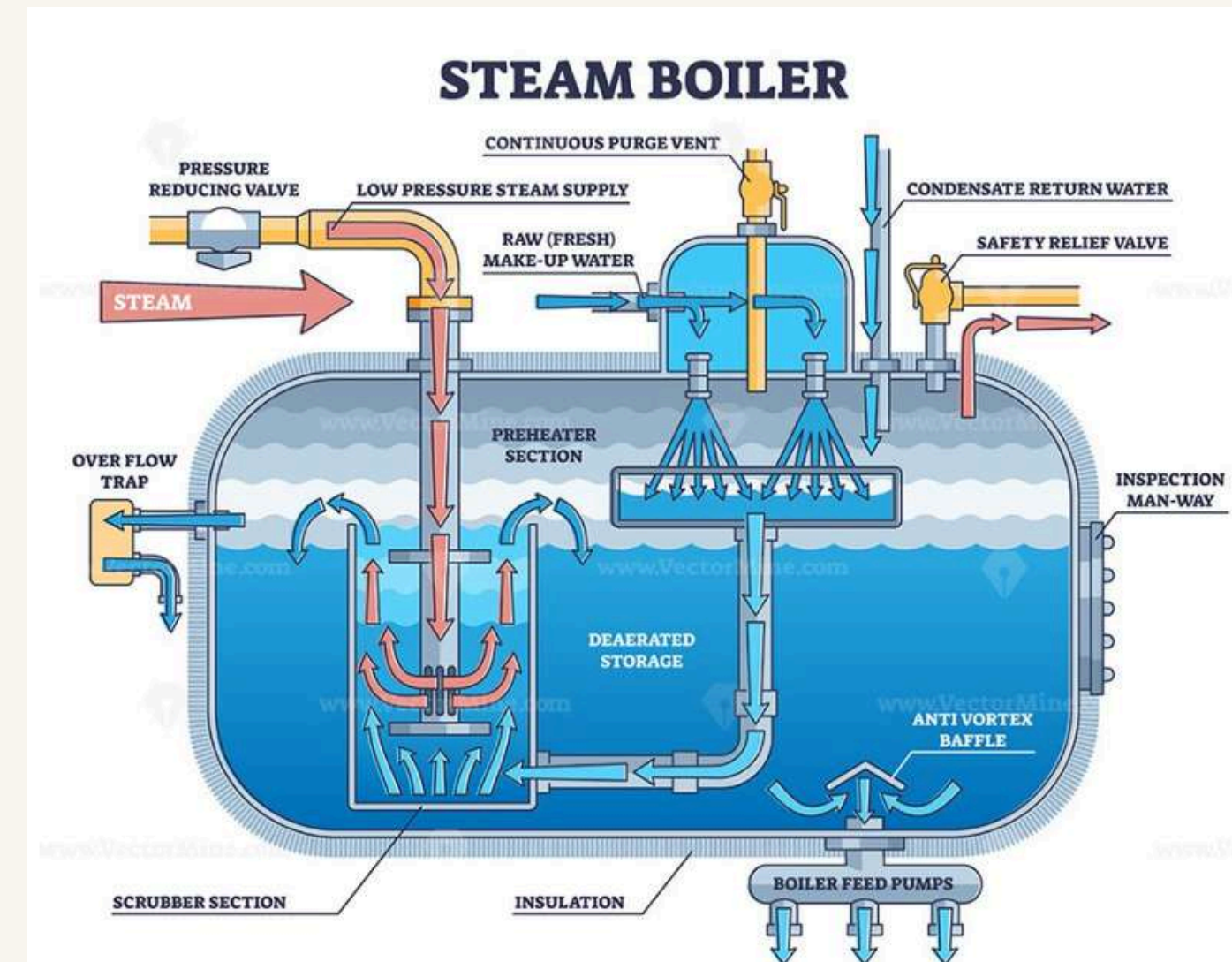
A boiler is a critical component of thermal power plants and many industrial processes. It is a closed vessel in which water is heated to produce steam, which is then used to drive turbines in power plants or for various industrial heating applications. The key function of a boiler is to convert the energy from fuel combustion into usable heat, which in turn generates steam for power generation or process use.

## Components of a Boiler

- Furnace
- Water Tubes
- Steam Drum
- Economizer
- Superheater, Reheater
- Air Preheater
- Burners
- Flue Gas Path

## Types of Boilers

- Fire-Tube Boiler
- Water-Tube Boiler
- Pulverized Coal-Fired Boiler
- Fluidized Bed Combustion (FBC) Boiler:



# BOILER

BOILER METAL TUBE THERMOCOUPLE TYPE “K”

## **SPECIFICATION:**

THERMOCOUPLE TYPE “K”, DUPLEX

SHEATH MATERIAL: SS 316

OD: 06 MM

LENGTH BELOW SEAL POT: 25 MTR

WITH SEAL & PROTECTION SPRING

CABLE: TEF/TEF/SS,7/36, 4 CORE UPTO 02 MTR LONG

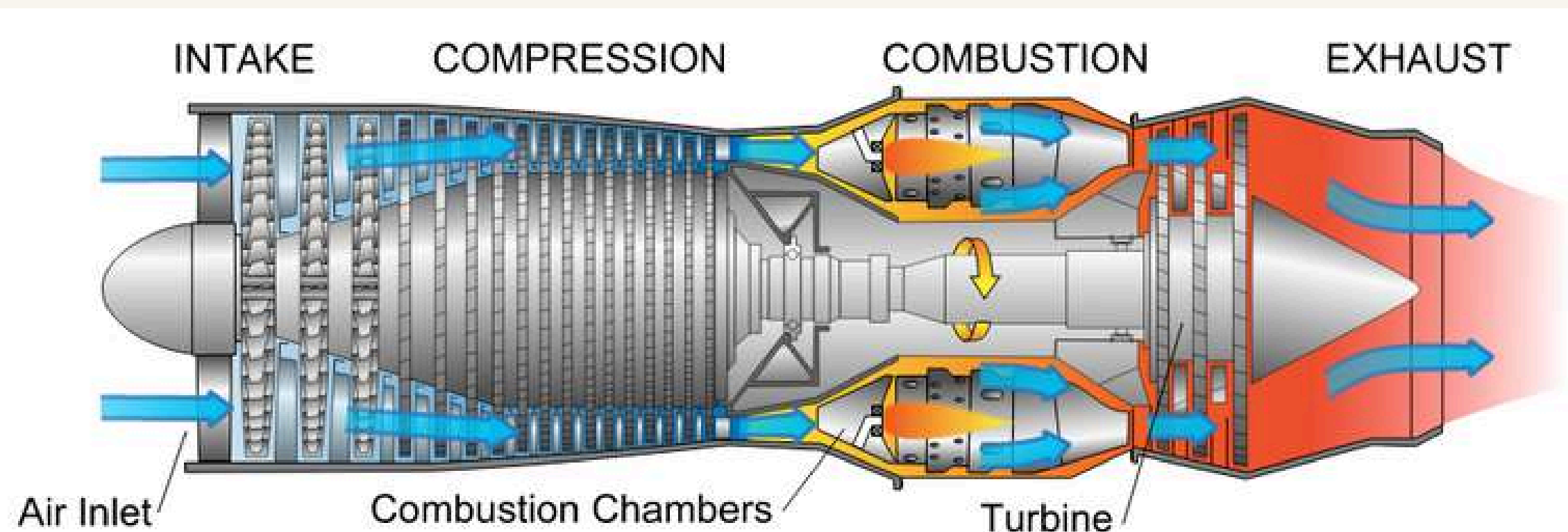
WELD PAD: SHEATH MATERIAL: SS 316

DIMENSION: LXBXH: 40X20X10 MM

PROPERLY CURVED TO INSULATED ON THE BOILER TUBE

# TURBINE

A turbine is a key component in thermal power plants, where it converts the energy from high-pressure, high-temperature steam into mechanical energy, which is then used to generate electricity. The turbine works on the principle of converting the thermal energy from the steam into mechanical energy by forcing steam through a series of blades mounted on a rotor. This mechanical energy is then used to drive a generator, which produces electrical energy.



# TURBINE

CAPSULE TUBE THERMOCOUPLE TYPE “E”

## **SPECIFICATION:**

THERMOCOUPLE TYPE “E”, DUPLEX

SHEATH MATERIAL: SS 316

OD: 4.5 MM

LENGTH: 18 MM

CABLE: TEF/TEF/SS,7/36, 4 CORE UPTO 15 MTR LONG



# TURBINE

RTD PT 100

## **SPECIFICATION:**

RTD PT 100, 3 WIRE , DUPLEX

SHEATH MATERIAL: SS 316

OD: 06 MM

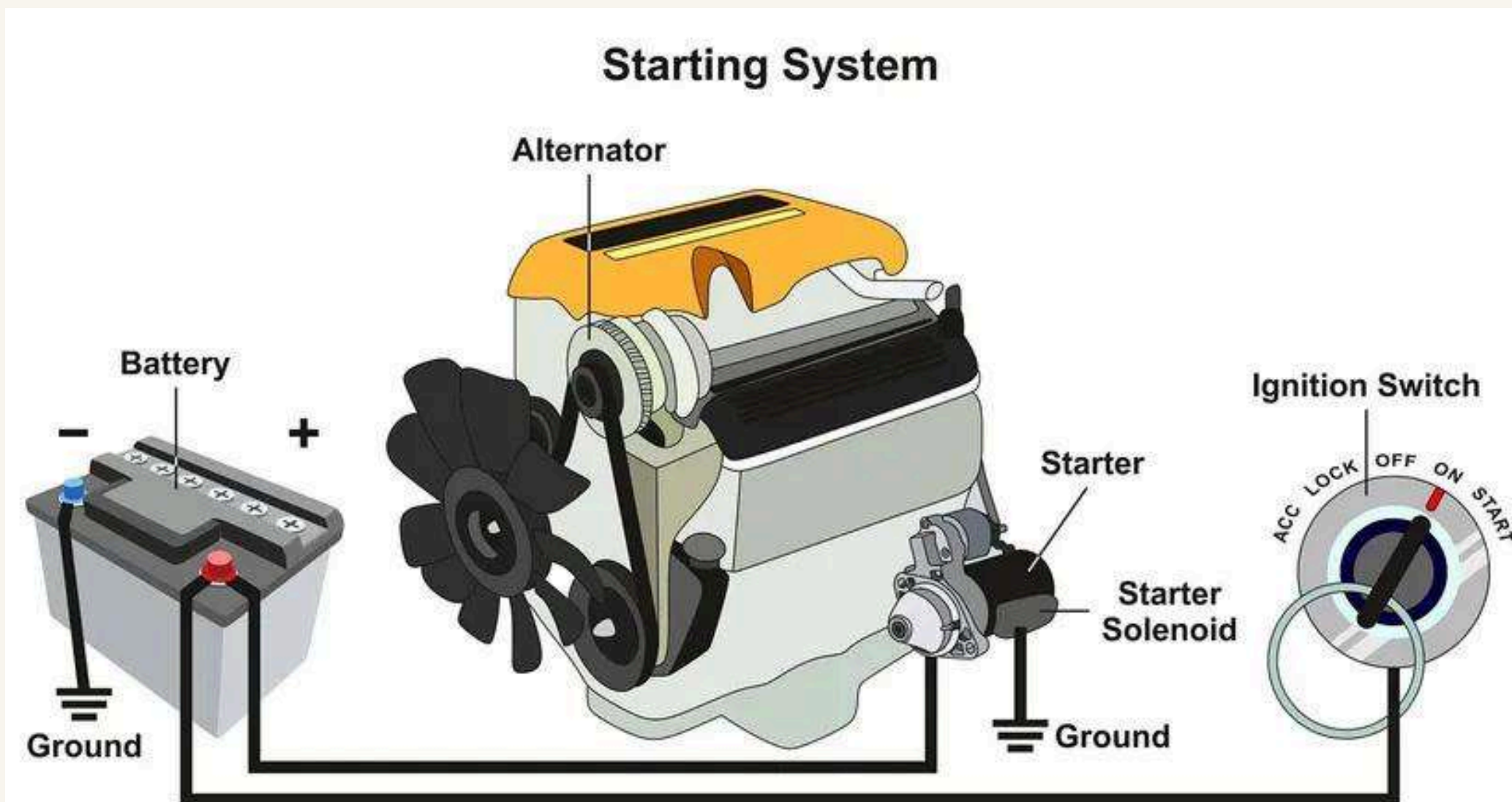
INSERTION LENGTH: 18 MM

CABLE: TEF/TEF/SS, 24/7/36, 6 CORE UPTO 05 MTR LONG

CONNECTION BOLT SS 304, M8X0.75 MM (M), WITH COMPRESSED SPRING

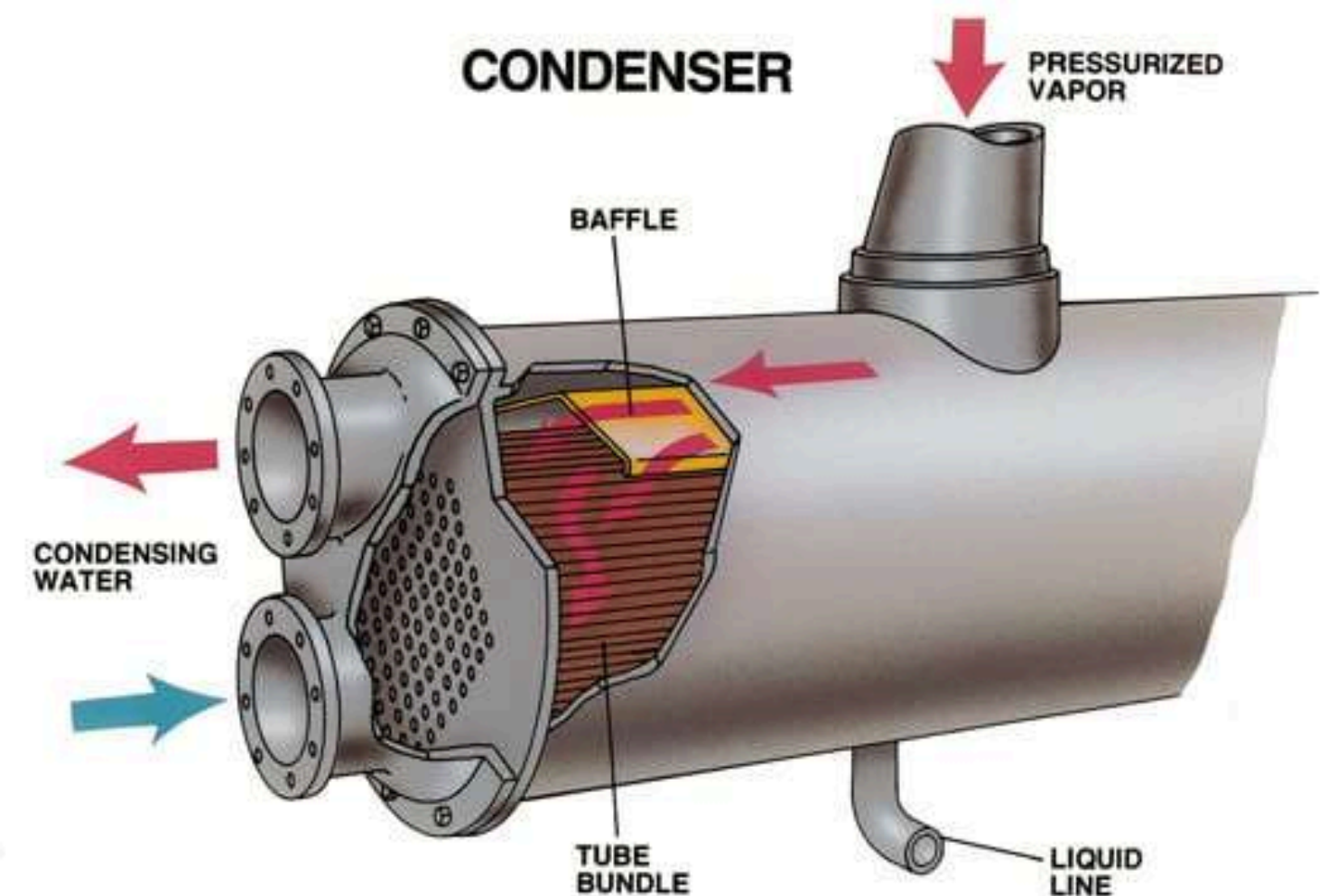
# ALTERNATOR

An alternator is an essential component in a thermal power plant or any power generation system that converts mechanical energy from the turbine into electrical energy. It works on the principle of electromagnetic induction, where a rotating magnetic field induces a current in stationary windings, thus producing alternating current (AC). In thermal power plants, the alternator is directly connected to the steam turbine or gas turbine, which drives its rotor, producing electrical energy that is then fed into the power grid.



# CONDENSER

A condenser is a vital component in thermal power plants, particularly in steam power plants, where it is used to convert exhaust steam from the turbine back into water so it can be reused in the boiler. This condensation process maximizes the efficiency of the steam cycle by allowing the plant to operate in a closed loop. The condenser also plays a crucial role in maintaining a vacuum in the system, which helps improve the efficiency of the turbine by reducing the backpressure on it.





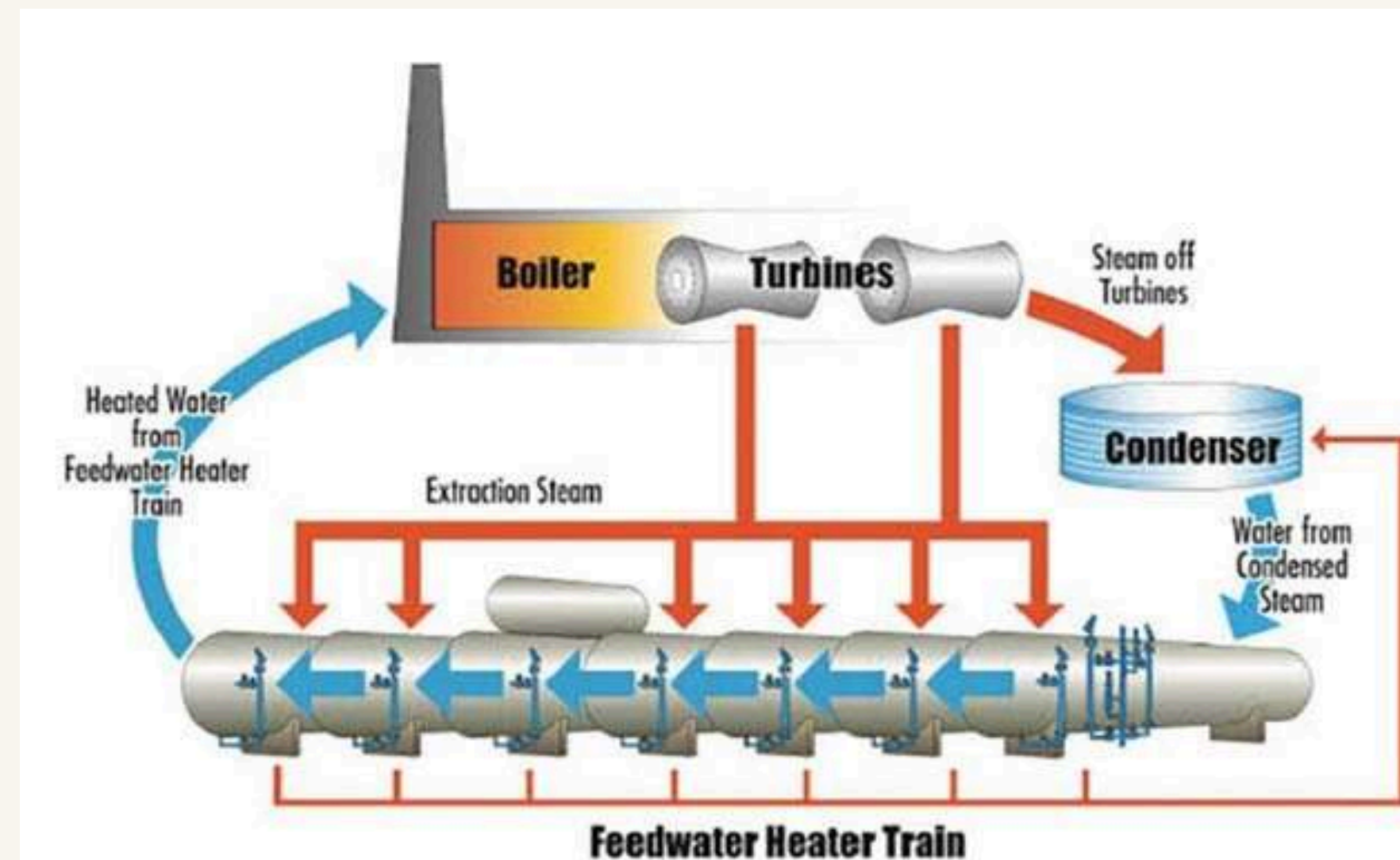
# COOLING TOWERS AND PONDS

Cooling towers and cooling ponds are integral components in thermal power plants and various industrial processes, used to dissipate excess heat from the system. These cooling systems are critical for maintaining the plant's efficiency and preventing overheating of equipment, particularly the condenser, by cooling the water that is used to condense exhaust steam from the turbine.



# FEED WATER HEATER

A Feed Water Heater (FWH) is an essential component in thermal power plants, used to preheat the feedwater before it enters the boiler. This preheating process increases the overall efficiency of the power plant by reducing the thermal shock to the boiler, improving the cycle efficiency, and lowering fuel consumption. Feed water heaters utilize steam extracted from the turbine to heat the water, making the Rankine cycle more efficient.





# FEED WATER HEATER

RTD PT 100 WITH THERMOWELL

## **SPECIFICATION:**

RTD PT 100, 3 WIRE, SIMPLEX

SHEATH MATERIAL: SS 316

OD: 06 MM

LENGTH BELOW SEAL POT: 420 MM

CABLE: TEF/TEF/SS, 24/7/32, 3 CORE UPTO 05 MTR

ADJ. FITTING: 1/2" NPT(M)

THERMOWELL

TYPE: FABRICATED, STRAIGHT

MOC SS 316

OD: 12 MM

ID: 08 MM

TOTAL LENGTH: 380 MM

INSERTION LENGTH: 350 MM

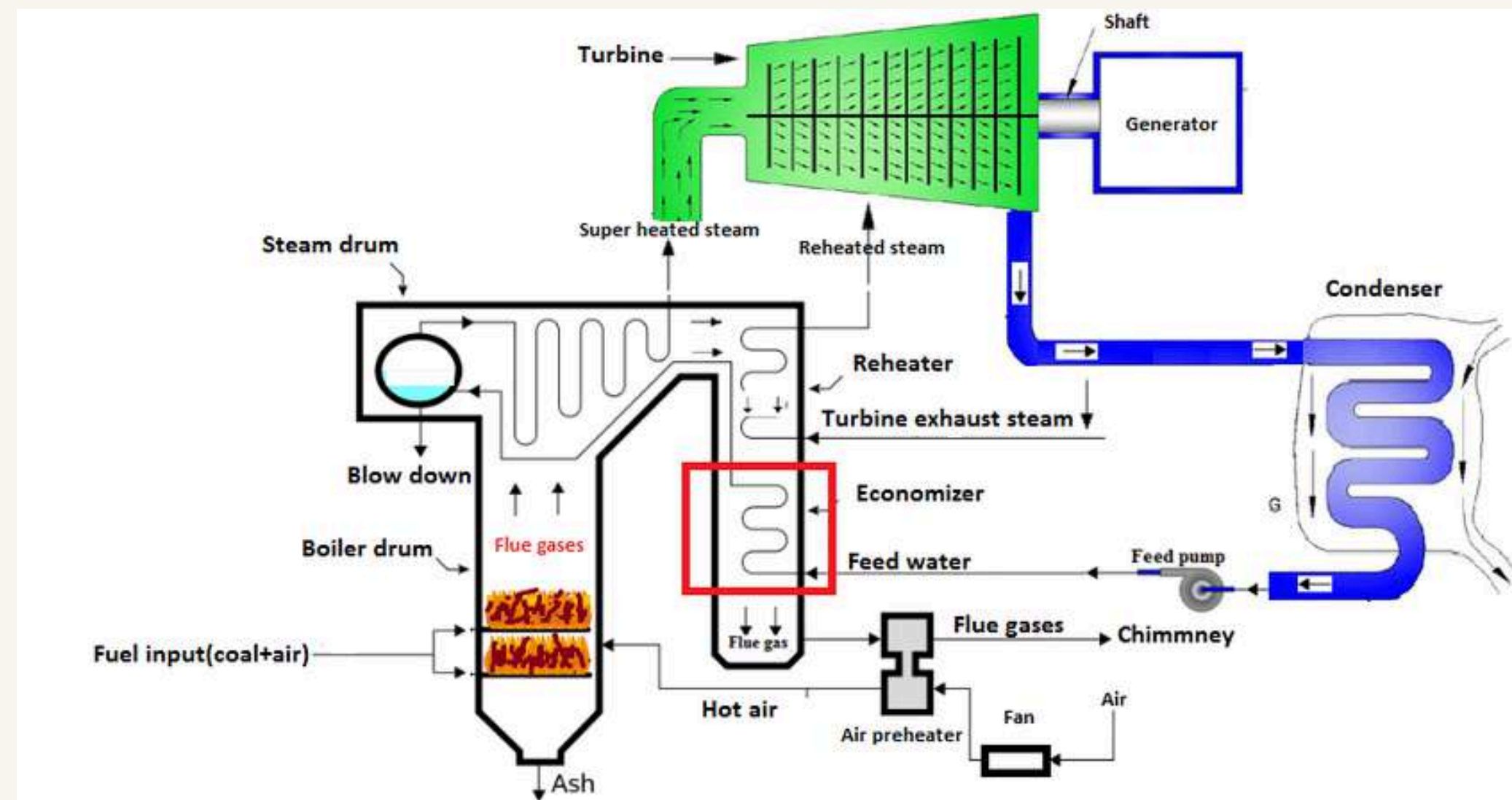
EXTENSION LENGTH: 30 MM

PROCESS CONNECTION: M27X2 MM (M)

INSTRUMENTS CONNECTION: 1/2" NPT(F)

# ECONOMIZER

An economizer is a crucial component in a boiler system designed to enhance efficiency by recovering and utilizing the waste heat from flue gases to preheat the feedwater before it enters the boiler. By increasing the temperature of the feedwater, the economizer reduces the amount of fuel needed to reach the desired steam temperature, thereby improving the overall thermal efficiency of the boiler system.



# ECONOMIZER

THERMOCOUPLE TYPE “K” WITH THERMOWELL

## **SPECIFICATION:**

THERMOCOUPLE TYPE “K”, DUPLEX

SHEATH MATERIAL: SS 316

OD: 06 MM

LENGTH BELOW HEAD: 7000 MM

CONNECTION HEAD

ADJ. FITTING: M20X1.5 MM (M)

THERMOWELL

TYPE: BARSTOCK, STRAIGHT

MOC: SS 316

OD:28 MM

ID: 10 MM

TOTAL LENGTH: 1160 MM

INSERTION LENGTH: 1100 MM

EXTENSION LENGTH: 60 MM

PROCESS CONNECTION: 2" NPT(M)

INSTRUMENT CONNECTION: M20X1.5(F)

HARD SURFACING ON INSERTION LENGTH OF THERMOWELL

# Thankyou.

Looking Forward to Working with you

**Unitech Therminstruments Pvt. Ltd.**

Capt. Sanjay Matolia

+91-8696967111

(Co-Founder)

Mr. Hardik Matolia

+91-9799939994

(Co-Founder)

