

## Application Note

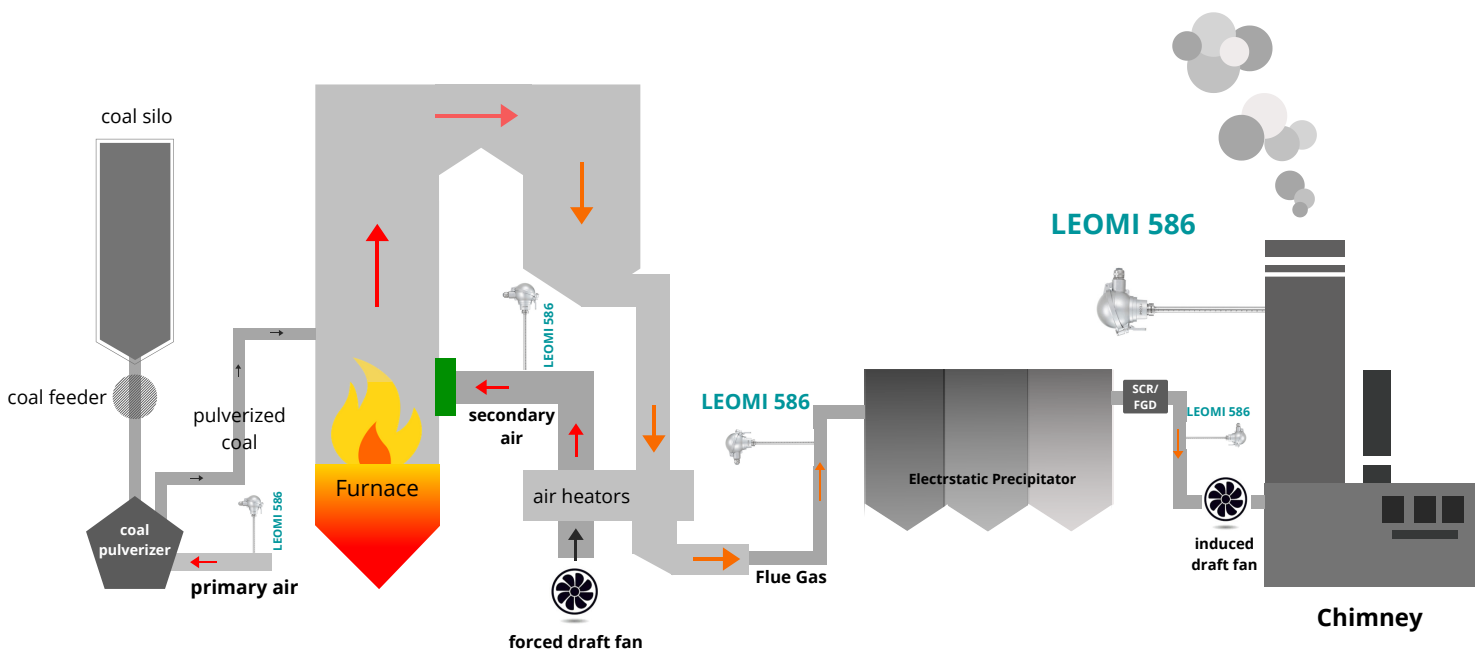
# Air & Gas Flow Measurement in Thermal Power Plants

Many industrial processes are emitting flue (stack) gases such as steel & power plants, textile, food processing, pharmaceutical productions, petrochemical processing and more. In the past, flue gas flow measurement was un-reliable, non-repeatable, high maintenance prone & expensive.

LEOMI's developed a proven insertion thermal mass flow technologies provide solutions to flue gas measurement with superior reliability, repeatable, virtually no maintenance & cost effective solution.

The emitted materials may contain pollutants such as sulfur dioxides, mercury and carbon dioxide that can harm environment. However, most flue gases consist of nitrogen oxides.

Efficient operation of today's power plant depends largely upon accurate and repeatable measurement of primary and secondary air flow to coal mills, flue gas recirculation flow, overfire air flow, air flow to individual burners and other flue gas flows.



**Typical Thermal Power Plant Layout**

### Primary Air Flow to Coal Mills:

- Should be monitored and controlled to improve coal mill efficiency
- To maintain the fineness of the pulverized coal

### Secondary Air Flow to Coal Mills:

- Controlled to maintain the desired stoichiometric fuel/air ratios
- Very important to overall boiler efficiency and NOx reduction
- Reduce the potential for explosive puffs

### Flue Gas Recirculation Flow (FGR):

- It mixes with secondary combustion air and reduces NOx emissions
- The FGR component replaces the diverted under grate air with recycled flue gas
- This maintains mass flow through the grate, keeping the grate combustion cooler and avoiding hot spots
- The FGR dilutes the oxygen concentration at the grate elevation, contributing to reduced NOx formation

### Overfire Air Flow (OFA):

- Added to many boilers to reduce NOx emissions. Each OFA zone must have independent control
- Exit to Reduce Stratifications of Temperature, Oxygen, CO, and NO constituents
- Lower Furnace Exit Gas Temperatures
- Allow for More Complete Combustion and Reduction of Unburned Carbon (LOI)
- Improved Unit Efficiency, and Reliability Reducing Forced Outages

### Air Flow to Individual Burners:

- To improve combustion efficiency and reduce NOx emissions.

### Flue Gas Flows:

- For ammonia injection control in SCR units for NOx reduction
- Gives correct indication of proper combustion process
- Helps in identifying emission control
- Reduce lime dosing for SOX, NOX reduction
- Early warning of preheater leakage detection, if any

LEOMI has designed thermal mass flow meters that provides systematic flue gas measurement solutions. As industries are facing challenges on flue gas measurements, LEOMI thermal mass flow meters are crafted to surmount those challenges.

### Why to choose LEOMI to measure flue gases:

- Mass flow measurement with flue gas solutions
- Cost effective solutions to carry out large duct calibrations
- Customized sensor solutions
- Simple design to operate easily
- Wide range flow measurement accepted

### LEOMI 586 provide huge benefits as below:

- Indicates early warning for Preheater condenser failures
- Help regulates harmful pollutants, dust emission controls
- Useful information on optimizing mass balance
- Helps in energy conservation

