



Process Heating



## The Best Keeps Getting Better

Presenting nextgen multi-fuel hybrid boiler: Combloc® UFS



Capacities: 1.5 TPH to 8 TPH  
Standard Design Pressure - 10.54/17.5 kg/cm<sup>2</sup>(g)

# Conserving Resources, Preserving the Future.

Thermax is a leading conglomerate in the energy and environment space and a trusted partner in energy transition. Thermax's extensive portfolio includes clean air, clean energy, clean water and chemical solutions. Backed by its longstanding industry partnerships across multiple sectors, Thermax has cultivated strong expertise in audit, consulting, execution, and maintenance coupled with digital solutions, ensuring a unified energy-management experience. Leveraging its distinctive engineering capabilities, Thermax converts costs to profits while protecting the environment – a win-win for the industry and society at large.

## Combloc® UFS

Combloc® is packaged, solid fuel fired, smoke cum water tube boiler. Offered with UFS technology, it is multi-fuel flexible, highly efficient and semi-automatic in operation. Combloc® UFS is factory assembled.

Offered with pre-engineered, modular balance of plant equipment, it ensures compact and hassle free installations.



## Fuel Firing Options



Indonesian Coal



Crushed Biomass  
Briquettes



Wood Chips



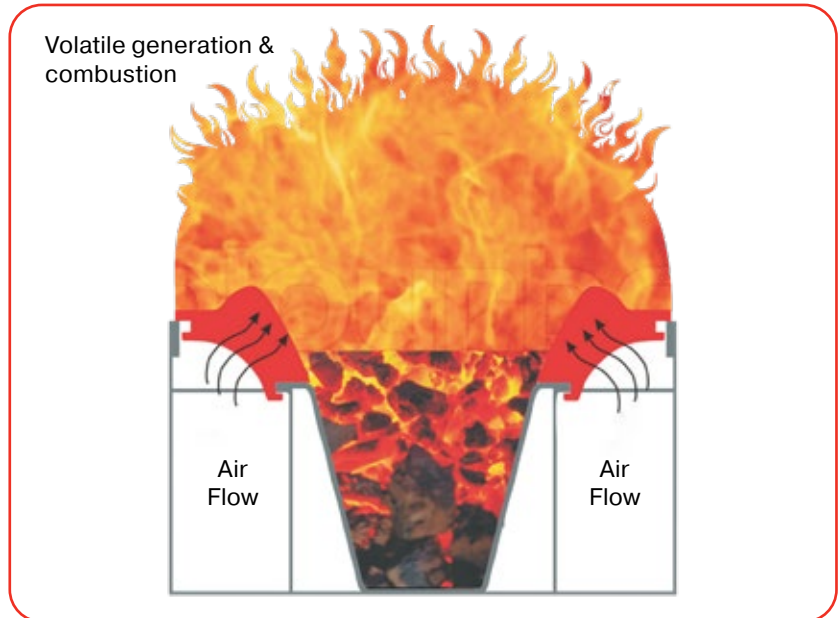
Biomass Pellets

# Thermax with it's insatiable urge for technological developments brings yet another technical marvel

The underfeed stoker technology is one of the most popular technology in the European and North American markets. It is known for the combustion of variety of fuels. Thermax has partnered with Lambion Energy Solutions GmbH, Germany to introduce this technology for the first time in Asian markets till 5 MW heat generation capacity, specially custom designed to suit the local fuel availability.

## How it works

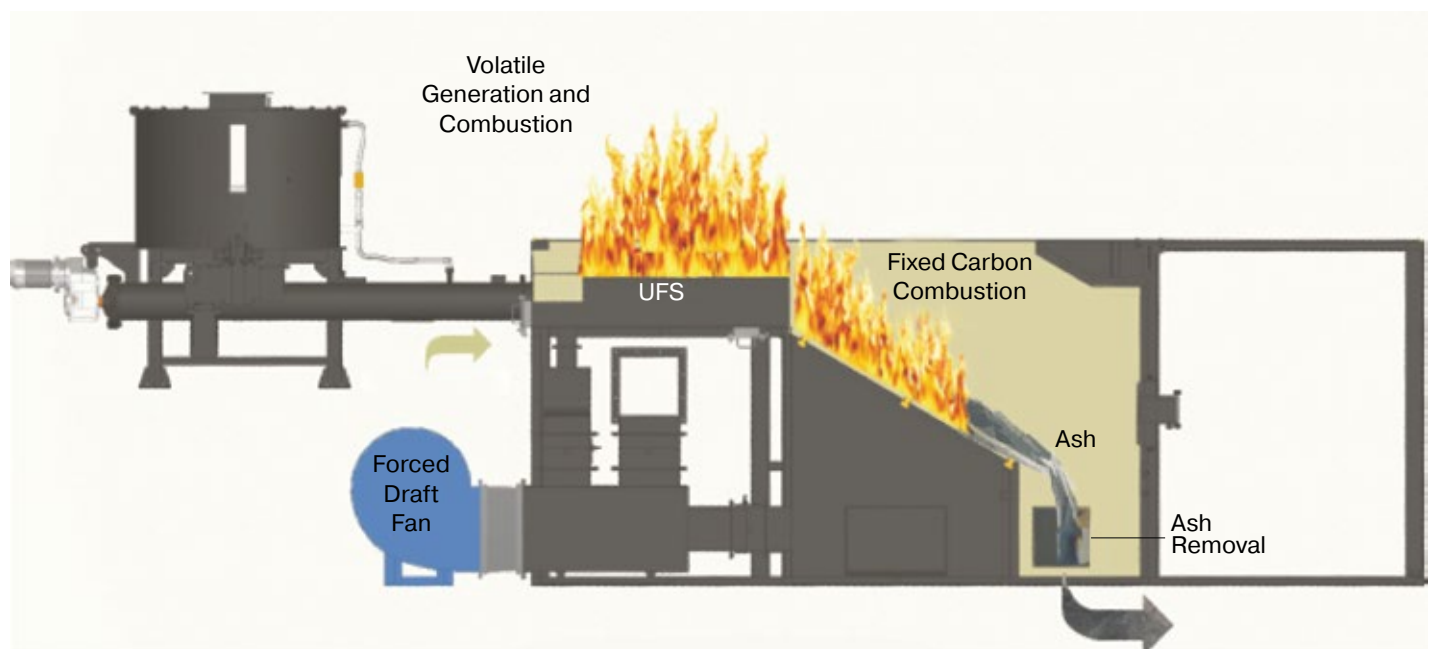
Underfeed stoker essentially utilises combined gasification and combustion of fuel. The name itself suggests that fresh fuel is fed from beneath the heap of burning fuel and is continuously replenished in the entire length of retort with a screw feeder. The combustion air is supplied through a set of castings mounted on the retort. The gasification of fuel on the top layer of the heap facilitates volatile combustion. The balance combustion of fixed carbon happens on flat surfaces provided in furnaces or on stationary grates.



## Underfeed Stoker Technology

Underfeed stoker technology can be used with both boilers and heaters. Thermax offers UFS technology in packaged, hybrid boiler - Combloc®.

Packaged with UFS - Combloc® is the most efficient, smart and affordable solution for process heating industry.



## CB UFS Features

Proven technology in the European market for over four decades. Curated for domestic market

Custom designed to give the best performance for combustion of a variety of fuels

Automated and regulated fuel feeding to ensure efficient combustion

Consistently high efficiency at full and part load conditions

Multiple pass furnace design to facilitate efficient heat transfer

Eco-friendly operation - smokeless combustion ensures very low CO and dust emission

Silent combustion - very less carryover of fuel

Modular design - ease of construction, minimal site refractory and low installed cost

Factory insulated units ensure better aesthetics, personnel safety and lowest radiation heat losses

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## Typical Combloc® Boiler House with Balance of Plant

Thermax introduces 100% modular, skid mounted, factory insulated boiler house design.



### Features

Pre-engineered boiler house layout

100% modular and skid mounted design

Automatic fuel feeding and combustion control system as standard supply

Easy access for cleaning

In-house design and manufacturing to ensure superior quality

# Combloc® Underfeed Stoker

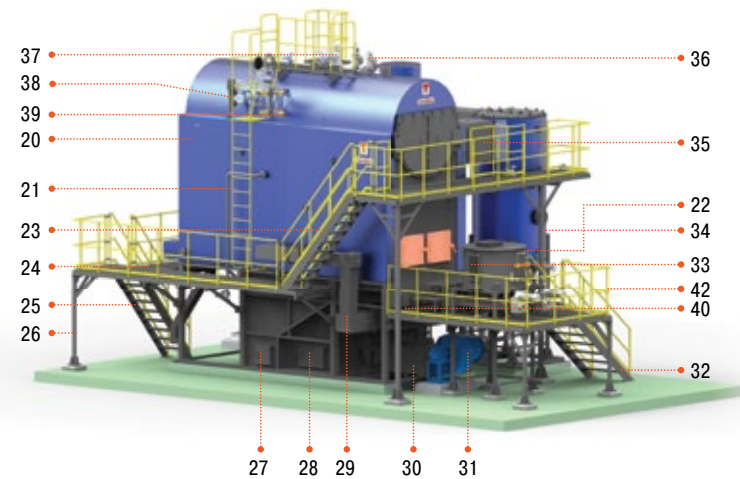
CB - UFS								
Description	Unit	CB-UFS 15	CB-UFS 20	CB-UFS 30	CB-UFS 40	CB-UFS 50	CB-UFS 60	CB-UFS 80
Performance Parameters								
Max Steam Output ( F & A 100 ° c )	Kg / Hr	1500	2000	3000	4000	5000	6000	8000
Design Pressure (SVLOP )	Kg / cm2(g)	10.54 / 17.5						
Design Steam Temperature	°C	185 / 208						
Product Attributes								
Mechanical Design Code	-	IBR 1950 with Latest Amendments						
Mode of Firing		Automatic with VFD Operated Screw Feeder & Combustion Control System						
Ash removal Mode		Manual						
Type of Combustor		Underfeed Stoker with Stationary Grate						
Eciency as per BS 845 Part 1 Indirect on NCV Basis (%) with Economiser								
Indonesian Coal		84.0						
Biomass Briquette		85.0						
Wood chips		85.0						
Biomass Pellets		86.0						
Fuel Consumption @ 100% Load								
Indonesian Coal	Kg /hr	173	231	346	462	577	692	923
Biomass Briquette		260	346	519	692	866	1039	1385
Wood chips		323	430	645	861	1076	1291	1721
Biomass Pellets		247	329	494	658	823	988	1317
Weight & Overall Dimensions								
Length	m	8.93	8.98	9.00	9.52	9.97	10.17	11.00
Width	m	4.64	4.88	5.20	5.42	5.29	5.92	6.30
Height	m	6.10	6.25	6.47	6.77	7.04	7.17	7.48
Dryweight of Heaviest Module	kg	8550	9730	11550	14000	16100	17700	20800
Chimney Top Dia	mm	400	450	550	650	750	800	850
Connected Load								
With Eclone & 10.54 SVLOP	kW	15.74	19.04	23.34	28.04	36.44	39.94	44.64
With Eclone & 17.5 SVLOP	kW	16.54	19.84	25.84	30.54	39.94	43.44	46.64

## Notes:

- Efficiency and fuel consumption is calculated as per the analysis of fuel mentioned in the offer. It may vary as per variation in fuel specifications. Kindly refer offer document for more details.
- Weights and dimensions mentioned in the table may vary.

# Key Components

Standardised BOP and pre-engineered layout provides one stop solution, ensuring high quality, safe, ergonomic operation and hassle free installation. This is a standard scope of supply.



- 1 Boiler Shell
- 2 Platform 1 - for Shell Cleaning
- 3 Railing - for Platform 1
- 4 Front Access Fire Door
- 5 Fuel Dosing Bin
- 6 Fuel Feeder Geared Motor
- 7 Platform 2 - for Fuel feeding Access
- 8 Support Structure - Economiser
- 9 RAV for Economiser
- 10 Feed Water Pumping system
- 11 RAV for Eclone
- 12 Induced Draft Fan Assembly
- 13 Support Structure - Eclone
- 14 Economiser Assembly
- 15 Eclone Assembly
- 16 Flue Gas Ducting between Economiser and Eclone
- 17 Flue Gas Ducting between Eclone and ID Fan
- 18 Platform 3 - Boiler trim Access
- 19 Railing - for Platform 3
- 20 Membrane Panel Assembly
- 21 Ladder - for Platform 3
- 22 Fire Extinguishing System
- 23 Staircase - for accessing Platform 1
- 24 Platform 4 - for Boiler Rear Side Access
- 25 Staircase - for accessing Platform 4
- 26 Structure - for Boiler Platform
- 27 Access Door - for Bed Ash Removal
- 28 Access Door - for Ash Removal below SG
- 29 Secondary Combustion Air Ducting
- 30 Primary Combustion Air Ducting
- 31 Forced Draft Fan Assembly
- 32 Staircase - for Platform 2
- 33 Dosing Bin Fuel Level Sight Glass
- 34 Support Structure - for Boiler Cleaning Platform
- 35 Shell Smoke Chamber to Economiser Flue Gas Ducting
- 36 Safety Valve
- 37 Main Steam Stop Valve
- 38 Shell Water Level Controller
- 39 Shell Water Level Gauges
- 40 Access Door - for Cleaning Duct
- 41 Railing - for Platform 2

**Note:**

\* Kindly refer scope of supply document for details of balance of plant equipment

\* ID fan is part of standard scope of supply

# Thermowiz™ Smart Control

## User Comfort

Touch screen graphical operator interface



## MIS Reporting

Real time trends. Facility for data logging on USB drive



## Program Modification

Facility to download revised programs through USB drive



## Stay Connected

Via Web-gate using PC browser. Remote access on smart phones/tablets



## Networking

Embedded ports on ethernet, serial, CAN open protocols



## Auto Combustion Control System

Amount of fuel to be fired and required combustion air changes with variation of process load on the boiler. Higher than necessary air results in excess air loss, whereas lower air results in unburnt loss. Hence, it is important to accurately maintain the air to fuel ratio in order to respond to fluctuating load as well as to maintain better efficiency.

### Scope includes:

- Pressure sensor to map the variation in process load
- VFD operated feeders to accurately maintain fuel firingrate
- Electrically actuated combustion air damper for modulating air flow
- Implementation of logic through Thermowiz



## Draft Control System (Optional Scope)

For safe operation of a solid fuel fired boiler, it is very important to ensure the passage of flue gasses through the boiler while maintaining a negative draft. The draft requirement varies with the change in process load on the boiler. More than necessary draft allows higher excess air to pass through the system, thus increasing efficiency loss. And higher power consumption.

### Scope includes:

- Pressure sensor to map the variation in draft
- VFD operated ID fan to accurately maintain draft
- Implementation of logic through Thermowiz



## Drum Level Control (Optional Scope)

Water level control is most important concern area for boiler management. If the water level of a boiler drops below a specified limit, it can lead to serious mechanical failure. On/O systems are employed in small capacity manually operated boilers, but they have serious limitations like slow response, more wear and tear, variance in steam pressure and water carryover.

### Scope includes:

- Single element control: Thermowiz implements logic along with level transmitter and VFD operated pumps to accurately maintain the water level
- Two element control: This operates on two loops. The primary loop works on error in water level and is comparatively slow. The secondary loop works directly on steam demand and has faster response
- Three element control: A third loop is superimposed on the previous calculations by measuring actual flow rate of feedwater into the boiler. This system is often deployed where water level fluctuations cannot be tolerated

Conserving Resources,  
Preserving the Future.



Air Pollution  
Control



Boiler and  
Heater



Build-Own  
-Operate



Chemical



Cooling



Projects and  
Energy  
Solutions



Process  
Heating



Renewable  
Energy



Water and Waste  
Solutions

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This brochure presents only some of our products and we reserve the right to amend any product details without notice.  
The photographs used in the brochure are indicative and may not match the actual plant

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