Process Heating

THERMAX

ULTRAPAC™

Ultra performance boiler offering unmatched fuel-flexibility, best-in-class efficiency & highest uptime

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.

Ultrapac: Designed for the future

Industries are moving towards fulfilling their sustainability goals using various green fuels for process heating and energy generation requirements.

Accommodating a variety of fuels has remained a challenge due to the fouling characteristics of green fuels causing increased operating maintenance which leads to frequent boiler shutdowns.

Ultrapac offers the best-in-class efficiency, the highest uptime, and multi-fuel flexibility. This robust product is highly compact, & modular designed to reduce installation cost, time & space. It is specially designed to operate on a multitude of fuels with varying fouling characteristics without impacting the equipment's uptime.

Multi-fuel flexibility

The age-old challenges faced in the combustion of biomass have been quite a few. The inconsistent supply of fuel and the seasonal variation in fuel properties make the biomass fuels difficult to combust at desired efficiency levels. Biomass fuels are usually low in density, have higher moisture percentages, and offer lower calorific values.

With its unique features, Ultrapac tackles these difficulties faced in biomass combustion and offers the best of fuel flexibility. A few of the many fuels that Ultrapac efficiently combusts are.

Husk

Wood Chips

Biomass Briquette

Biomass Pellet

Cashew Nut Shell

Palm Kernel Shell

Ground Nut Shell

RDF Pellet / Briquette

Indonesian Coal

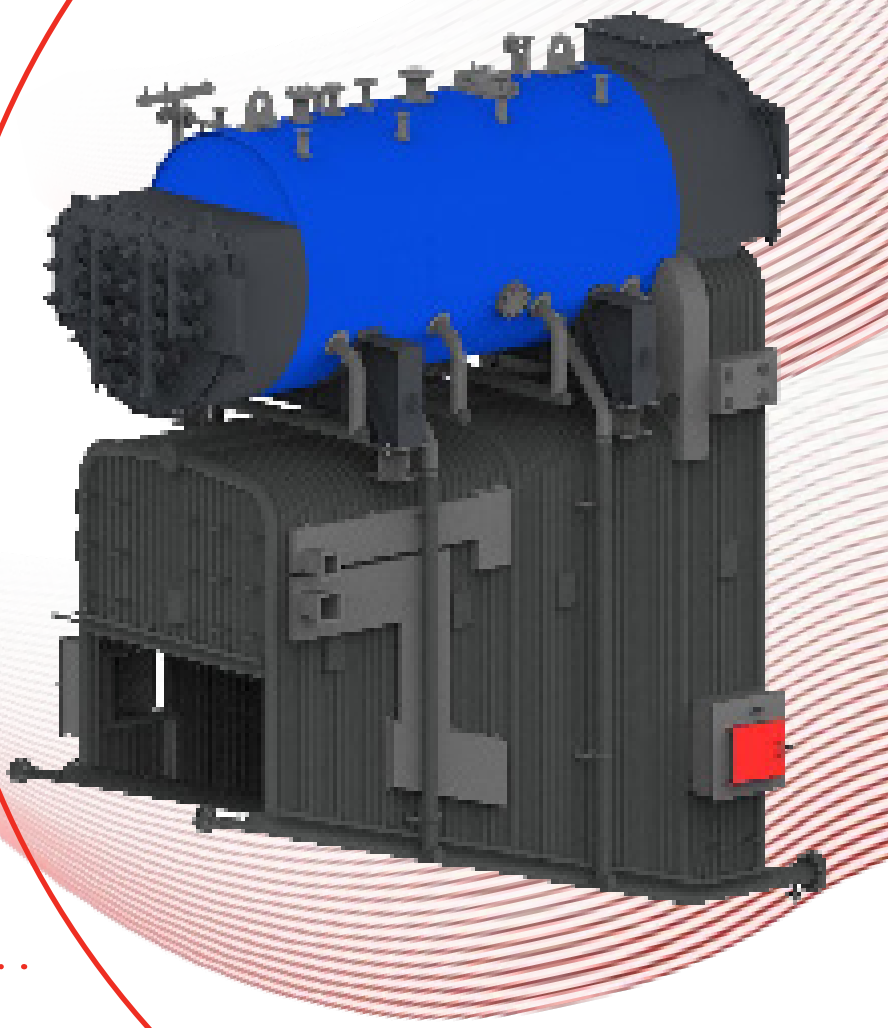
And More

Features

Unique MPA Design

- This design (MPA up to the RG) offers a large heat transfer area, which helps in efficient utilisation of radiant heat, prevents clinker formation, slagging, and fouling by controlling bed and furnace temperature profile, thus improving boiler uptime.
- The membrane panel assembly requires up to 50% less refractory which ensures reduced maintenance, low startup time, application time and clinker formation
- The baffle wall arrangement within the assembly ensures complete combustion and fly ash separation.
- The assembly comes with secondary & tertiary air nozzles that provide high-velocity air for complete combustion.

Over 40% reduction in refractory



Unique Shell Design

- The two-pass design maximises heat recovery from flue gases and in turn, reduces the fuel bill.
- This design allows for a higher water holdup which in turn offers higher thermal inertia to deal with load fluctuations.
- This shell design with a large tube diameter in high flue gas temperature zones minimises fouling in the tubes, thus improving the boiler uptime.
- Efficient cleaning and improved boiler uptime due to no spirals

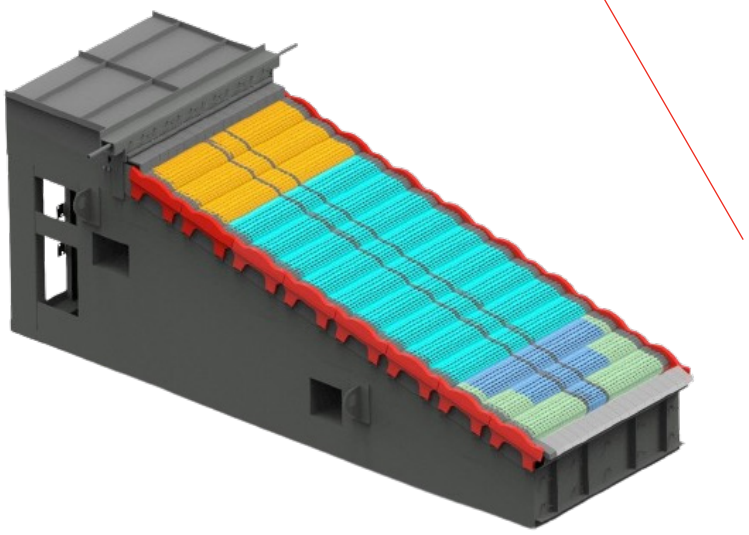
Danblast

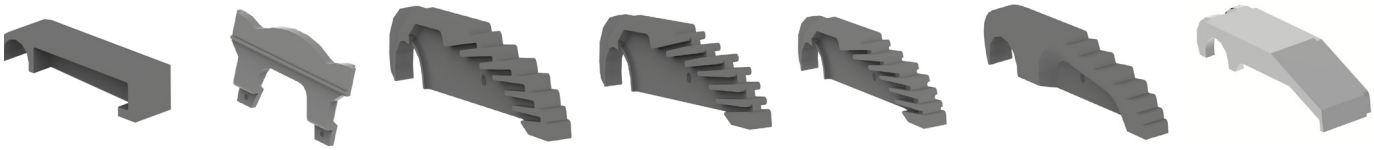
- Danblast is an automatic, online, and continuous soot-blowing mechanism using Danish technology.
- Operating on compressed air, this mechanism sends out shock waves through the boiler tubes to prevent soot build-up.
- The unique sequential operation of Danblast ensures minimal use of compressed air for tube cleaning.
- The assembly comes with secondary & tertiary air nozzles that provide high-velocity air for complete combustion.

Enhances uptime by 2X

Reciprocating Grate – A technology transferred from Lambion, Germany

- This technology efficiently combusts multiple biomass fuels, including the difficult-to-combust low-density and fouling fuels.
- Zone wise speed and air control ensures efficient combustion for a wide variety of fuels
- Grate bars with multiple geometries and perforations ensure the required air variation in a trolley to create a uniform combustion rate.
- Grate bar castings with higher proportions of chromium (upto 26%) and nickel, help achieve desirable abrasion resistance at higher temperatures and ensure high reliability, minimal wear of the grate bars, and a greater life.

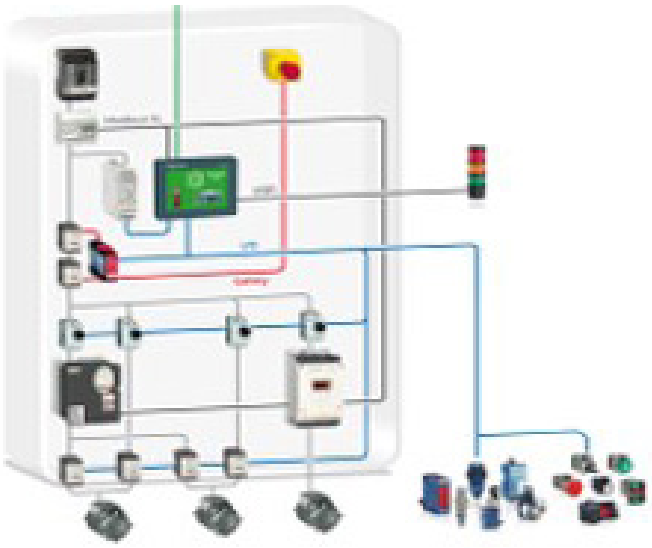




Block Bars | Side Plate Grate Bar | Nozzle-1 | Nozzle-2 | Nozzle-3 | Nozzle-4 | Nozzle-5

Heat Recovery Unit – Economiser

- Ultrapac comes with an Economiser as a Heat Recovery Unit and is a vertical serpentine coil-type design that ensures a high uptime of the unit.
- It comes with a retractable automatic rotary soot-blowing system which helps in effective online cleaning of its tubes.



Thermowiz™ *Nxt*

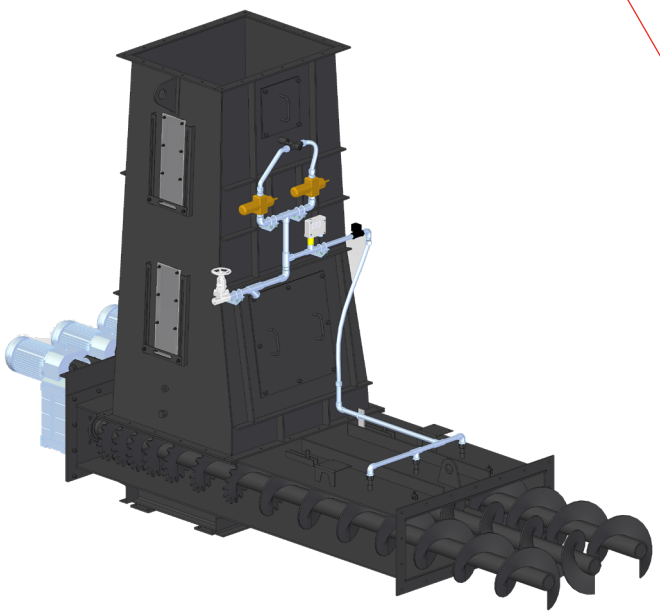
Advanced electrical control system

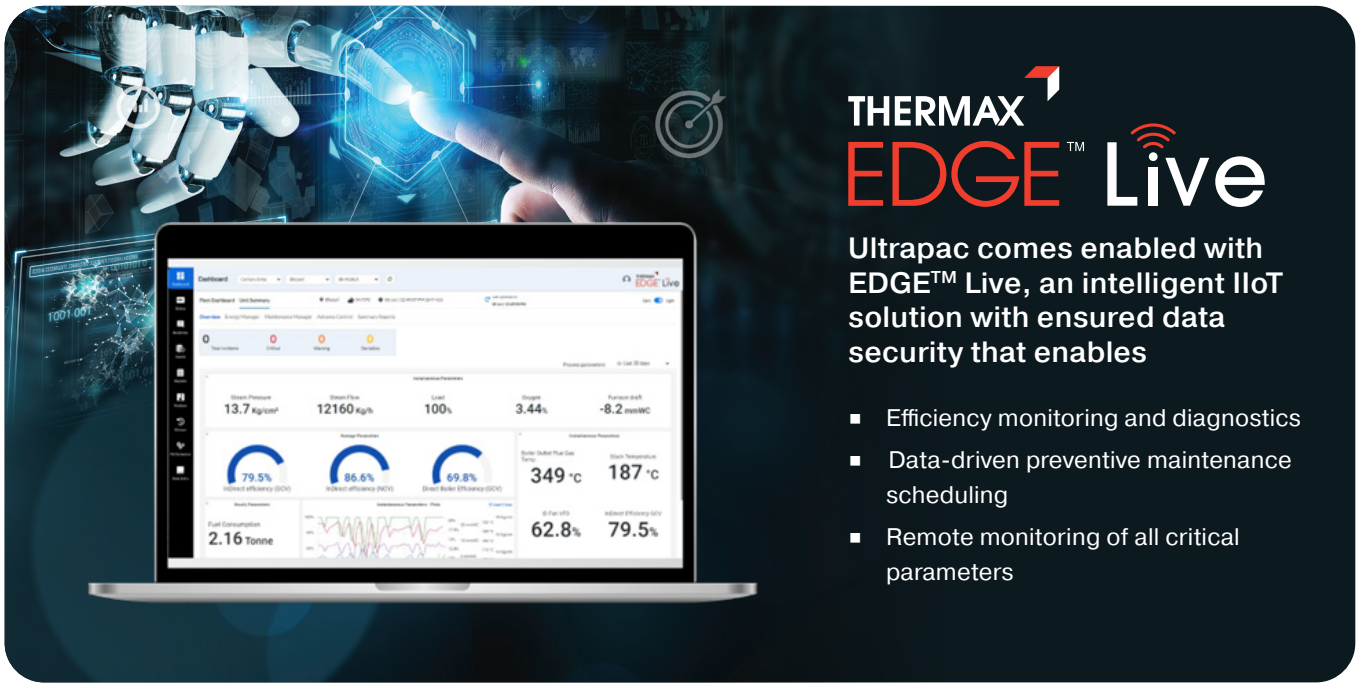
Experience the power of technology with Thermowiz™ Nxt, a digitally powered device for monitoring, control, and protection of equipment.

- User comfort - Touch screen graphical operator interface
- MIS reporting - Real-time trends, and data logging downloadable on a USB drive
- Networking - Embedded ports on Ethernet. Serial. CAN Open protocols
- Program modification - Download programs through a USB drive

Fuel Feeding System

- Fuel feeder with toothed screws having variable pitch helps to deal with fibrous & non-uniform fuel, and eliminate possibility of jamming of screw.
- Inverted fuel hopper (dosing bin) enables fuel storage before fuel feeding screw. This hopper is equipped with temperature sensors and water jets for protection from backfire.
- Photo-electric sensors in the dosing bin help maintain fuel level over the fuel screw feeder to reduce the possibility of backfiring.

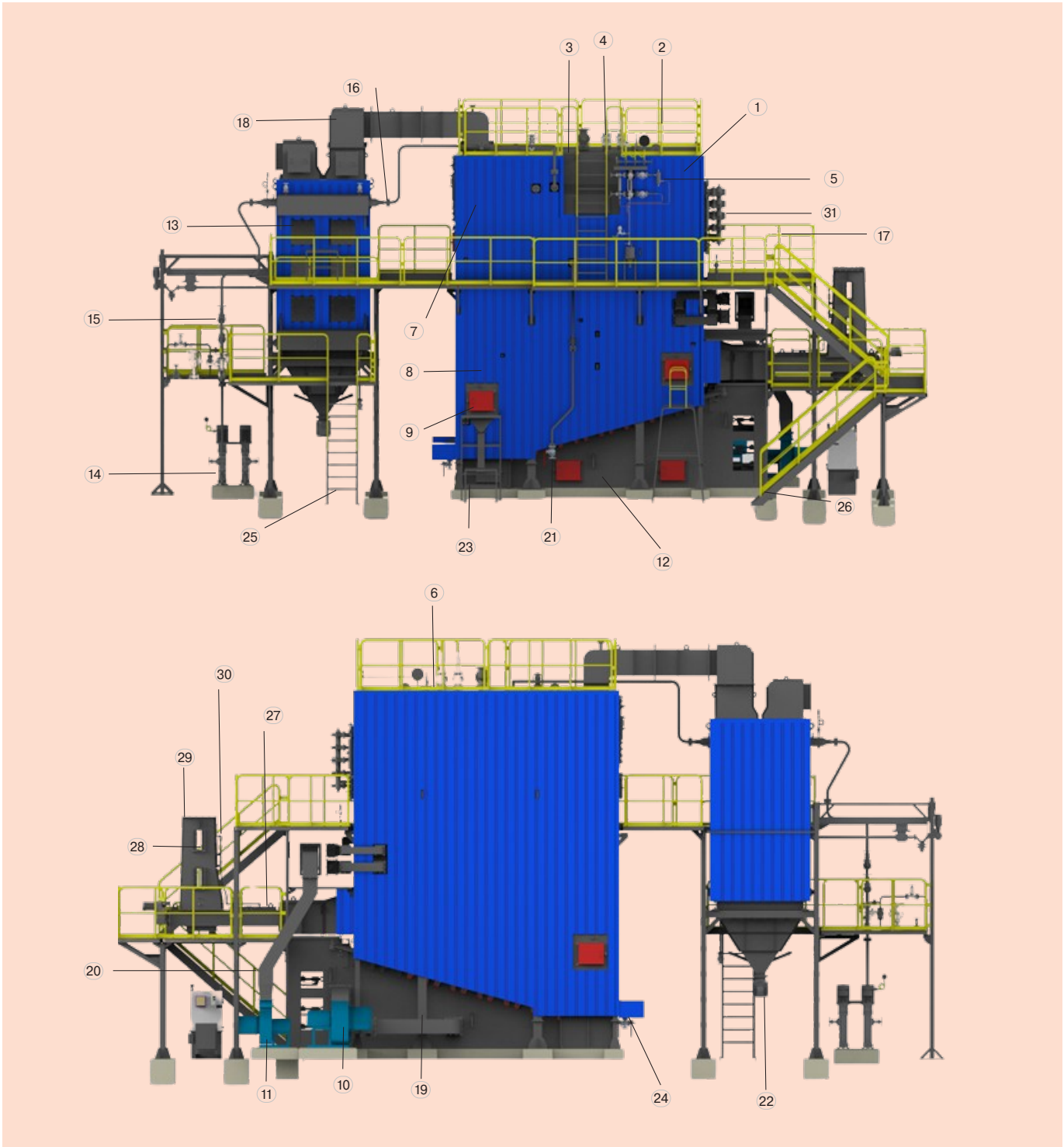




Why Choose Ultrapac

- Best-in-class upto (88%)
- Multi-fuel flexibility
- High uptime
- Ideal for fluctuating loads
- Compact design
- Low installation time

Boiler Components



1. Boiler Shell
2. Boiler Trim Access Platform
3. Main Steam Stop Valve
4. Safety Valves
5. Level Gauge Glass Assembly
6. Probe Level Controller
7. Top Membrane Panel Assembly
8. Bottom MPA with Baffle Walls
9. Access Door (multiple)
10. Primary Fan Assembly
11. Secondary Fan Assembly
12. Sloped Reciprocating Grate
13. Economiser Assembly
14. FW Pumping System
15. Feed Pipe Assembly from pump to economiser
16. Feed pipe assembly from economiser to shell
17. Smoke Tubes Access Platform*
18. Flue Gas Ducting*
19. Primary Air Ducting*
20. Secondary Air Ducting
21. Shell Blowdown Valve
22. Economiser Rotary Airlock Valve
23. Ash Removal Point (MPA)*
24. Ash Removal Point (RG)
25. Staircase for Platforms Economiser(Steel)*
26. Staircase for Platforms Fuel Feeders & Shell (Steel)*
27. Screw feeder
28. Level switch for fuel feeding system
29. Dosing bin
30. Fire extinguisher
31. Danblast

Technical Specifications

Description	Unit	UPRGA 40	UPRGA 50	UPRGA 60	UPRGA 80	UPRGA 100	UPRGA 120
Performance Parameters							
Boiler type		Packaged Hybrid Boiler					
Max steam output (F & A 100 DegC)	Kg /Hr	4000	5000	6000	8000	10000	12000
Design Pressure (SVLOP)	Kg /cm2(g)	11.25 /17.5	11.25 /17.5	11.25 /17.5	11.25 /17.5	11.25 /17.5	11.25 /17.5
Operating Temperature	°C	188	188	205	188	188	188
Dryness	%	98	98	98	98	98	98
Efficiency (On NCV Basis - As per BS 845 Part t- I Indirect Efficiency method at full load)							
Biomass briquettes	%	87	87	87	87	87	87
Woodchips (Total Moisture - 25%)	%	87	87	87	87	87	87
Woodchips (Total Moisture - 40%)	%	86	86	86	86	86	86
Rice husk	%	85	85	85	85	85	85
Groundnut Shell	%	88	88	88	88	88	88
Pellets	%	88	88	88	88	88	88
PKS	%	88	88	88	88	88	88
Indonesian Coal (Total Moisture - 10%)	%	87	87	87	87	87	87
Indonesian Coal (Total Moisture - 35%)	%	85	85	85	85	85	85
Fuel consumption @ 100 % Load	%						
Biomass briquette	kg/hr	677	846	1015	1353	1691	2030
Woodchips (Total Moisture - 25%)	kg/hr	841	1051	1261	1682	2102	2522
Woodchips (Total Moisture - 40%)	kg/hr	1118	1397	1676	2235	2794	3353
Rice Husk	kg/hr	871	1089	1307	1743	2178	2614
Groundnut Shell	kg/hr	582	727	872	1163	1454	1745
Pellets	kg/hr	643	804	965	1287	1608	1930
PKS	kg/hr	548	684	821	1095	1369	1643
Indonesian Coal (Total Moisture - 10%)	kg/hr	446	557	668	891	1114	1337
Indonesian Coal (Total Moisture - 35%)	kg/hr	658	822	987	1315	1644	1973
Mode of firing		Automatic using screw feeder					
Ash removal mode		Automatic using wet/dry bed ash screw conveyor (optional)					
Design Code		IBR 1950 with latest amendments					
Installed Length	mm	15883	16300	16300	16700	16900	17500
Installed Width	mm	5100	5400	5700	5700	6200	6500
Installed Height	mm	7400	7750	7900	8200	8300	8402
Weight of the heaviest single module	Tonnes	6.00	7.00	8.00	10.00	11.00	13.00

Note: Heat Recovery unit (Economiser) is essential for the efficiency & output commited above. Please refer detail technical specifications for fuel composition.

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Preserving the Future.

THERMAX

Air Pollution Control

Boiler and Heater

Build-Own -Operate

Chemical

Cooling

Projects and Energy Solutions

Process Heating

Renewable Energy

Water and Waste Solutions

Registered Office

D-13, MIDC Industrial Area, R D Aga Road,
Chinchwad, Pune 411019, India
Email: enquiry@thermaxglobal.com
Customer Care: 1800-209-0115

Business Office

Thermax Thailand
43, Thai CC Tower,
Room No. 245, 24th Floor, South Sathorn Road,
Yannawa, Sathorn Bangkok - 10120
Email: enquiry@thermaxglobal.com

www.thermaxglobal.com

thermaxlimited thermax_global thermaxglobal

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