



# THERMOPAC<sup>®</sup>

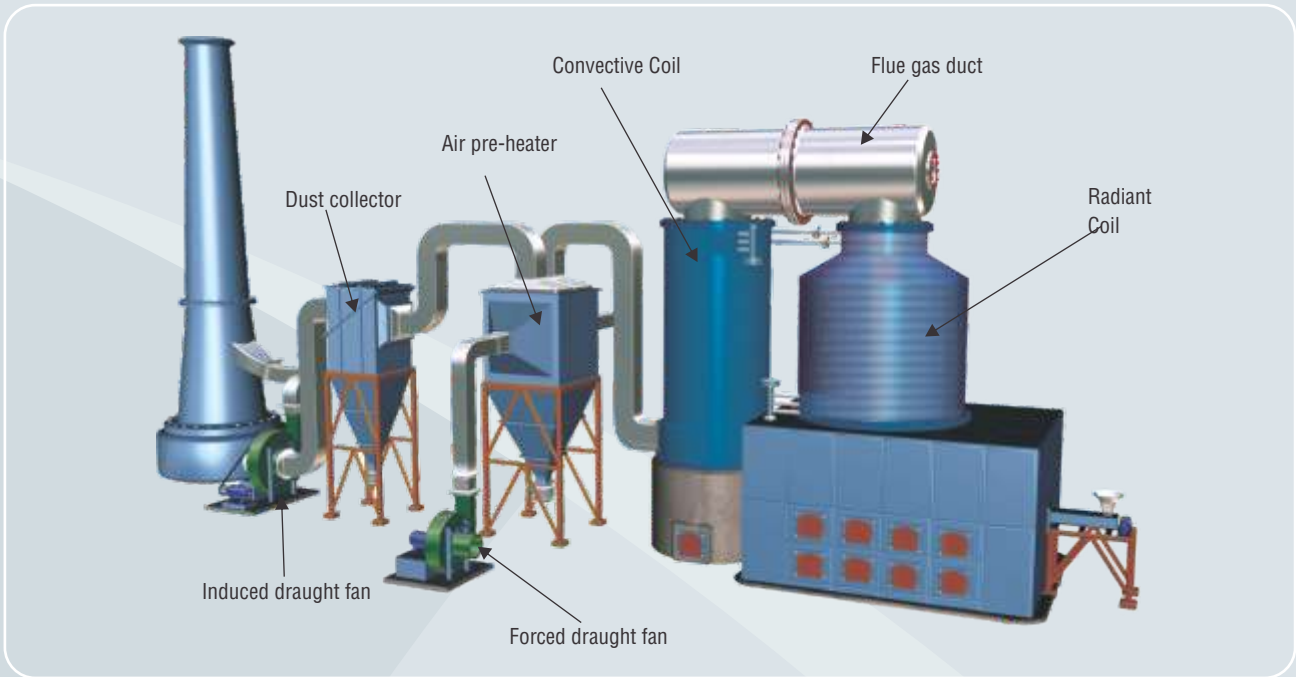
Solid Fuel Fired Vertical Thermal Oil Heater with stationary combustor

# The perfect solution for every indirect heating requirement

## Vertical Thermopac

The Vertical Thermopac is the perfect answer to the ever changing energy / fuel situation. The vertical design offers compactness, multi-fuel flexibility, and is ideal for heating applications in textile, plywood, chemicals, food, edible oil, rubber, leather and all other industries requiring indirect heating.

Thermax, pioneers in thermic fluid heating in India, leverages over four decades of extensive R&D experience and pioneering track record in the combustion of over 100 different kinds of solid fuels.



## Product offering

- Vertical closed loop thermal oil heating
- Capacity - 4,00,000 to 30,00,000 Kcal/hr
- Operating temperature - 280°C
- Fuel - Coal, lignite, sawdust, wood logs, wood chips, paddy husk, bagasse and petcoke

## Options available

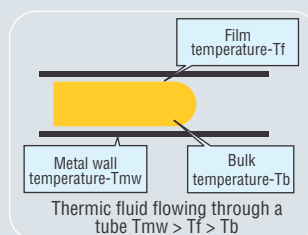
- Operating temperature - 300°C
- Combination fuel firing
- Saw dust, bagasse, lignite and petcoke firing
- Screw and rotary feeder
- Capacities up to 4 million kCal/ hr
- Complete boiler house and accessories on turnkey basis
- Separate deaerator and expansion tanks with multiple units

## Controls and safeties

- Low thermic fluid flow cut-off
- High thermic fluid outlet temperature cut-off
- Precise thermic fluid temperature control
- Low level cut-off in deaerator tank
- High stack temperature cut-off
- Safety valve for protection against high pressure

## Engineered for maximum benefits

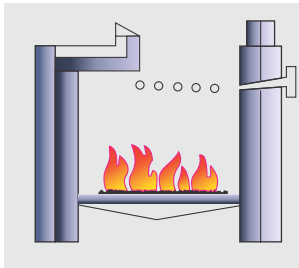
- Design adopts principles of DIN and API codes
- Air pre-heater improves combustion efficiency and ensures lower power consumption of ID fan
- Precise thermic fluid temperature control
- Low flow alarm to prevent coil tube overheating and choking
- Safety relief valve to prevent high pressure conditions
- Level indicator and float actuated level switch to signal drop in thermic fluid levels
- Adequate furnace volume and heat transfer surface to ensure higher thermal efficiency
- Modular assembly to facilitate quick and easy installation
- Dedicated DG set to keep thermic fluid in circulation during power failure



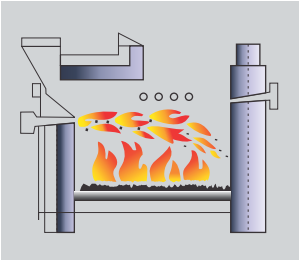
## Multi-solid fuel flexibility



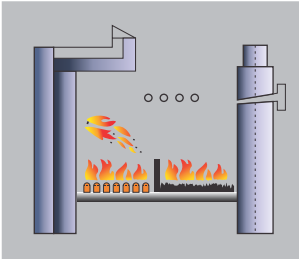
## Right furnace for every requirement



Horizontal Grate  
(Manual fuel feeding)



Pneumatic Spreader  
(Automatic fuel feeding)



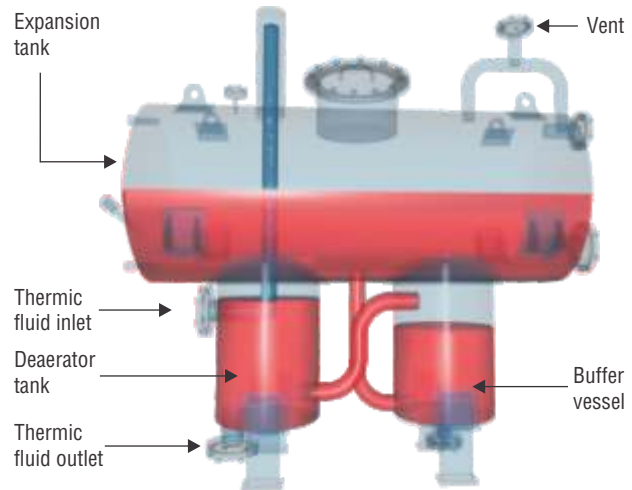
Fixed Grate  
with Bubbling Bed

## Combustion technology

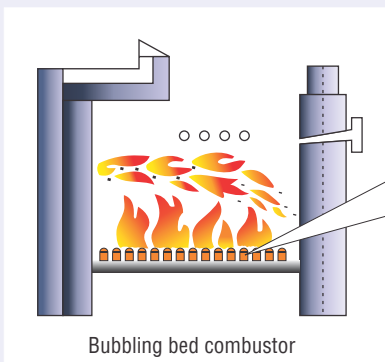
Complete combustion of solid fuel is achieved by ensuring the 3Ts (Time, Temperature and Turbulence) of fuel and air. Every solid fuel has different physical and chemical properties that influence boiler performance. Properties of ash also play a critical role in the operation and maintenance of boilers.

## Compact Deaerator-cum-Expansion tank

Requiring less space, it comes with a buffer vessel to prevent cooling of hot oil coming from the process, while the tangential thermic fluid entry in the deaerator ensures optimal deaeration.



## Variant available with bubbling bed combustor



Bubbling bed combustor



Specially designed nozzles

The Vertical Thermopac with bubbling bed combustor, from Thermax, has been designed for fuels with high carbon content, less ash content, high percentage of fines and small particle size like Indonesian coal and petcoke. This variant of Thermopac offers the benefit of fluidised bed as well as the simplicity of the fixed grate.

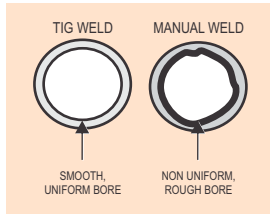
### Advantages

- Better efficiencies and less carry over than stationary grates
- Ease of operation in part load conditions
- Specially designed nozzles ensure lower temperatures at nozzle tips and thus avoid burning out
- Specially made nozzle layout to ensure uniform distribution and spread of air-fuel mixture for complete combustion
- Lower electrical power consumption than fluidised bed combustor

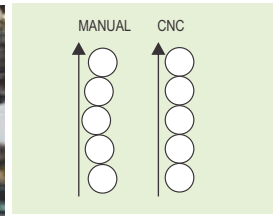
### Technical specifications

Description	Unit	VT 04BB	VT 06BB	VT 10BB	VT 15BB	VT 20BB	VT 25BB	VT 30BB
Capacity	kcal / hr	400000	600000	1000000	1500000	2000000	2500000	3000000
Maximum Outlet Temperature	°C				280			
Thermic Fluid Flow Rate	m <sup>3</sup> / hr	24	36	60	90	120	150	180
Thermic Fluid Temperature Rise	°C				34			
<b>Efficiency</b>		<b>As per BS 845 Part 1 NCV Basis</b>						
Indonesian Coal	%	78						
Petcoke	%	76						
<b>Fuel</b>		Indonesian Coal / Petcoke						
Fuel Firing System		Screw feeder with VFD (Bubbling bed)						
<b>Fuel Consumption</b>								
Indonesian Coal	kg / hr	92	137	229	343	458	572	687
Petcoke	kg / hr	66	99	164	247	329	411	493
<b>Connected Electrical Load</b>		<b>With MDC / Cyclomax</b>						
Indonesian Coal / Petcoke	kW	14 / 16	20 / 22	29 / 31	40 / 44	57 / 60	64 / 72	80 / 87

# Manufacturing excellence



Fully automated tube to tube TIG Welding Machine enables smooth uniform bore



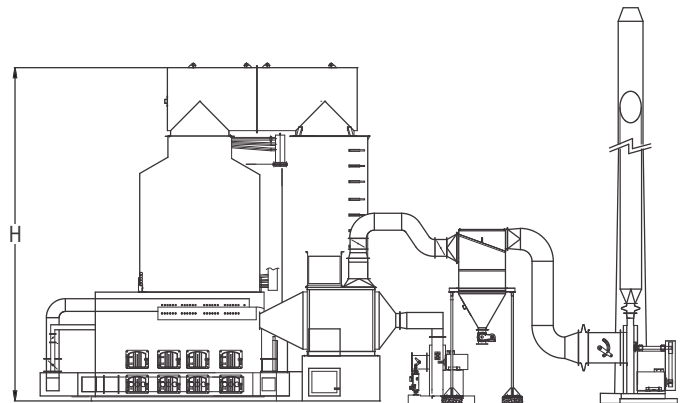
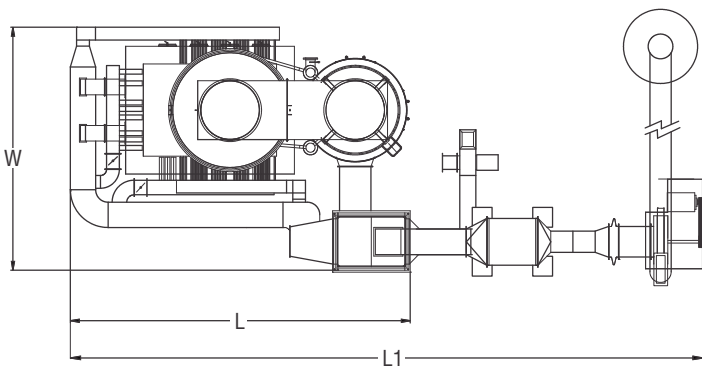
CNC coil winding machine ensures proper alignment, avoiding possibility of hot spots

# Technical specifications

Description	Units	VTB 04	VTB 06	VTB 10	VTB 15	VTB 20	VTB 25	VTB 30	
<b>Capacity</b>	kcal/hr	400000	600000	1000000	1500000	2000000	2500000	3000000	
Maximum Outlet temperature	°C	280							
Thermic Fluid Flow rate	m <sup>3</sup> /hr	24	36	60	90	120	150	180	
Thermic Fluid Temperature Rise	°C	34							
<b>Efficiency</b>		As per BS 845 Part 1 NCV Basis							
Rice Husk	%	77.5							
Indian Coal	%	78					N.A.		
Wood	%	77.5					N.A.		
Fuel		Indian Coal / Rice Husk / Wood					Rice Husk		
Fuel Firing System		Manual (Horizontal Fixed Grate)					Pneumatic Spreader		
<b>Fuel Consumption</b>									
Rice Husk	kg/hr	178	267	445	667	890	1112	1335	
Indian Coal	kg/hr	119	179	298	447	596	N.A.		
Wood	kg/hr	175	262	437	656	875	N.A.		
<b>Connected Electrical Load</b>									
Rice Husk	kW	9.95	15.65	20.95	32.25	41.25	47.05	60.25	
Indian Coal	kW	9.55	13.45	19.45	30.45	39.25	N.A.		
Wood logs	kW	9.95	15.65	20.95	32.25	41.25	N.A.		
<b>Dimensions &amp; Weight</b>									
Length	mm	4200	5000	5800	6200	7100	7900	8100	
Width	mm	3200	3500	3900	4500	4900	5300	5900	
Height	mm	5300	5400	6300	6500	7000	7500	8000	
L1	m	9.3	10.2	11.9	12.6	14.2	15.2	15.5	
Chimney top diameter	mm	310	390	500	660	700	790	870	
Dry Weight	kg	3345	4335	5840	7675	9850	12195	15225	

Notes: Design Standard-IBR. Efficiency is calculated based on NCV of Husk as 2900 kcal/kg, Coal as 4300 kcal/kg and Wood as 2950 kcal/kg. Units suitable for 300°C bulk oil temperature are also available. Above mentioned weight and dimensions may vary with actuals. Please refer to offer document for more details.

# General arrangement



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