

# Shellmax Global™

Fully Packaged 3 Pass Smoke Tube Boiler  
with **Effimizer™** and **Thermowiz™**

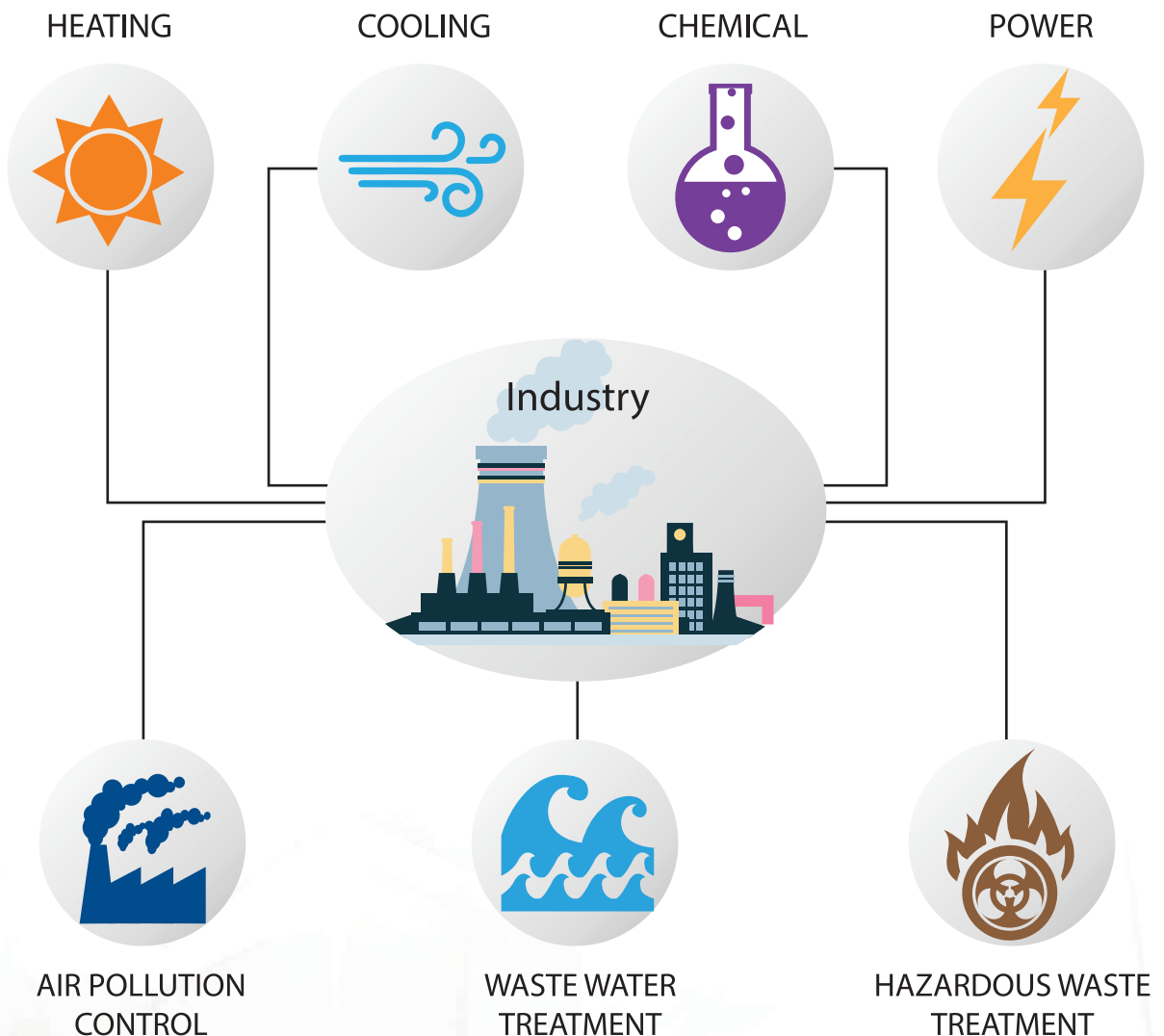


Heating Division

## Improving your business is our business

Thermax offers products, systems and solutions in energy and environment engineering to industrial and commercial establishments around the world.

### Business Expertise

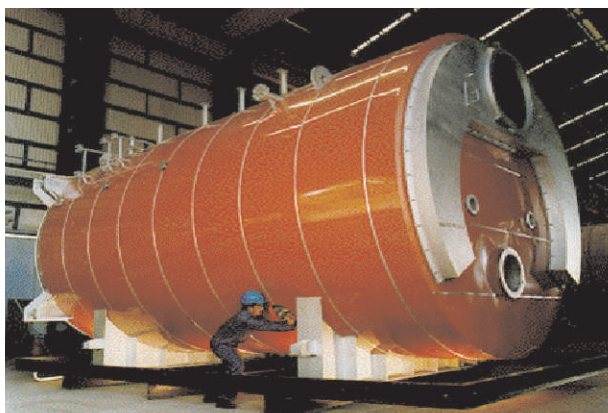


### Packaged Heating Systems

As leader's in heating solutions over the last five decades. Thermax has been pioneering innovative solutions for wide range of industrial and commercial heating applications. The company has scripted several innovations to support its clients. Fuel shift for example, allows business to switch to available low cost fuels - fossil (oil, gas, coal, lignite etc.) or biomass (agriculture waste, process waste etc.) Today, with over 35,000 installations across the world. Thermax helps small and medium firms to fortune 500 companies to reduce energy costs.

## Thermax's capability in Oil and Gas industry

Thermax supplies oil & gas fired, shell type, steam generators, hot water generator and thermic fluid heaters over a wide range of capacities & pressures. More than 10000+ installations supplied over 70+ countries are testimony to the efficient & sustainable solutions offered by Thermax Ltd over the last 30 years.



## Smoke tube boiler configurations

- |  |   |
|--|---|
| ● Capacity Range                         | – 1 TPH to 50 TPH                                     |
| ● Maximum design pressure                | – 35 kg/cm <sup>2</sup>                               |
| ● Steam temperature                      | – Saturated, Superheated steam – 50°C over saturated  |
| ● Fuels (Oil)                            | – FO, LDO, HSD, LSHS, LACO & many more                |
| ● Fuels (Gas)                            | – CNG, Hydrogen, Biogas, Corex Gas, BFG and many more |
| ● Design Standards                       | – IBR, ASME, EN, GOST                                 |
| ● Certification                          | – CE, DOSH, SASO, NFPA, FM Global                     |
| ● Design and manufacturing certification | – Llyod, BV, TUV, SGS, IBR, ABS, Moodys               |



## Shellmax Global™ Introduction

Continuing the legacy of product innovation Thermax is now introducing the next generation of Shellmax™ - Shellmax Global™ series. These boilers are fully packaged, smoke tube type, 3 pass, light oil / gas fired boilers. They are conceptualized keeping in mind best in class efficiency, meeting global standards, low cost of ownership &

### PLUG & PLAY

Save installation time & cost with

- Minimum civil work.
- Factory insulated Boiler Skid.
- Pre-assembled & pre-wired.

### COMPACT FOOTPRINT

- 100% skid mounted unit.
- World class aesthetics.
- Ergonomic design.
- Robust lagging.

### BURNER

- Monobloc design.
- Enhanced safety.
- Highest combustion efficiency.



world class aesthetic. With new series we are introducing unique patented design of heat recovery unit offering best in class efficiency and fuel flexibility. Ending the era of relay based panels we are providing PLC based IOT compatible smart controller as standard offering.



### **EFFIMIZER™**

- Extra efficiency, save fuel cost at all loads.
- Assured Fuel flexibility.
- Save space, ducting, piping & installation cost.

upto  
**95%  $\eta$**

### **THERMOWIZ™**

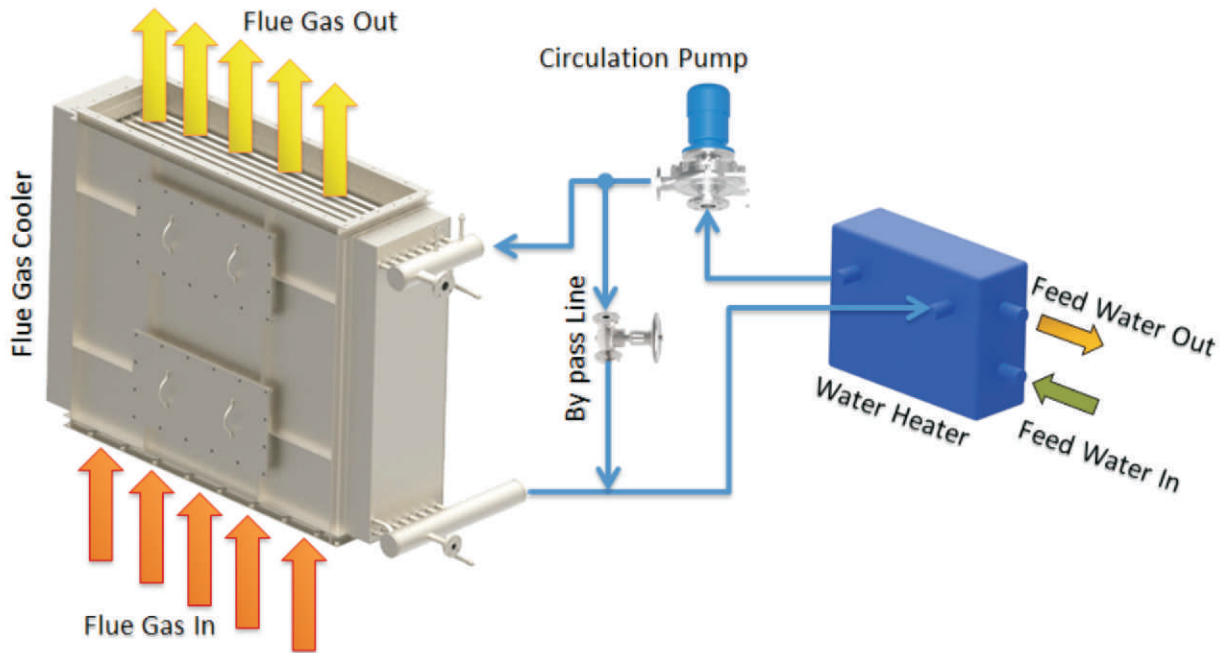
- Unleashing new PLC with HMI.
- IOT enabled, with remote monitoring.
- Connect over Web & Android.

### **PROBE LEVEL CONTROLLER**

- Improve uptime
- Simple installation
- Enhanced safety
- Energy efficient

## Heat Recovery System - EFFIMIZER™

Thermax is pleased to introduce unique heat recovery solution, which adjusts to change in fuel variety and maximizes heat recovery performance at all load conditions.

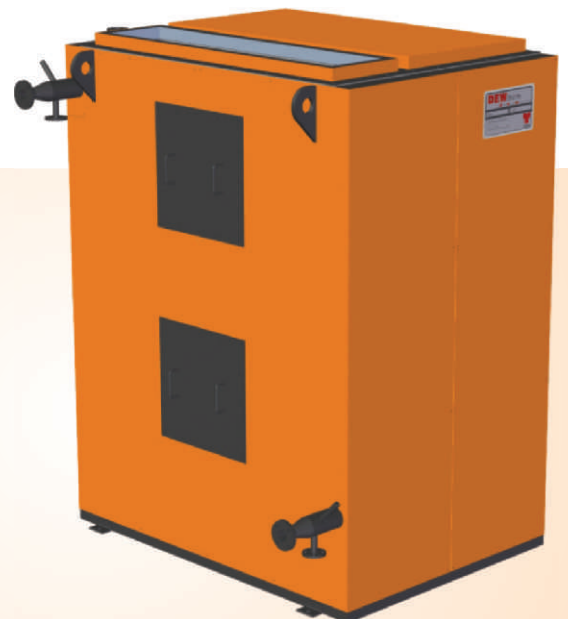


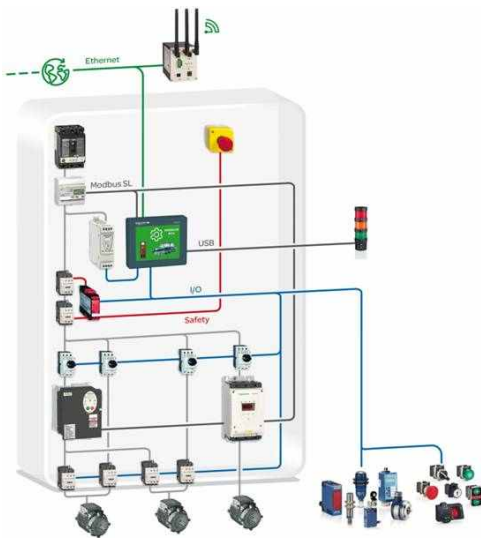
- Adjustable operating temperature to maximize heat recovery with control on corrosion.
- Save fuel cost – Additional efficiency 1% on Oil & 2% on Gas, as compared to conventional HRU.
- Fuel flexibility – Suitable for variety of fuels like Heavy Oil, Light Oil & Gaseous fuels.
- Improved uptime – No boiler stoppage for tube failure.
- Reliability & long life – Higher resistance to corrosion by pitting.
- Patent pending technology.

## Heat Recovery System – DEW THERM™

DEWtherm is the new benchmark for efficiency in process heating. It is add on heat recovery unit, based on condensing heat exchanger technology which maximizes sensible & latent heat recovery by condensing water vapor available in flue gas generated from non-sulphur bearing, low C/H ratio fuels (Natural Gas, LPG)

- Enhance efficiency upto 103% on NCV basis.
- Selected as per heat sink available, hence independent of boiler capacity
- Can generate additional hot water for process application (non-boiler heat sink).
- Flue gas re-heater & de-mister, eliminate need for separate stack.
- No modifications in existing boiler system – Designed as additional heat recovery loop & works without any modification to existing system.

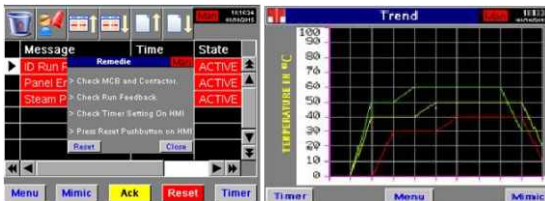




## Thermowiz™

Experience the power of technology with Thermax, upgrade your system today with **Thermowiz™** Smart Controller that will end the era of relay based panels

- User comfort – Touch screen graphical operator interface.
- MIS reporting – Real time trends, data logging on USB drive.
- Networking – Embedded ports on Ethernet, Serial, CAN Open protocols.
- Stay connected – via Web-gate using PC browser. Remote access on Smart Phones / Tablets.
- Program modification – Download programs through USB drive.



## Thermowiz™ Plus

An advanced version of the standard **Thermowiz™** controller with additional features, also offering all the benefits of a PLS based systems for large industrial projects.



- IOT enabled – Host of services on IOT.
- Boiler efficiency monitoring system with MIS reporting & monitoring via DCS, Web-gate, Android devices.
- SCADA Runtime / Development modules with PC systems.
- Email / SMS alerts on triggering pre-set safety conditions.
- Tower Light Alarm System.



## Probe Level Controller

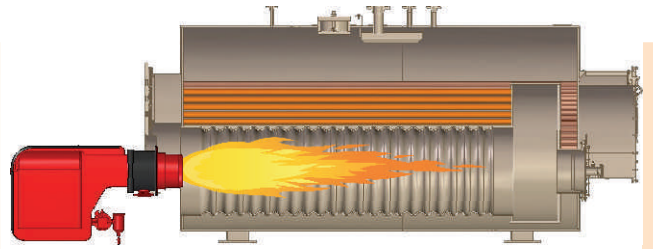
Probe type level controller will replace conventional float type (Mobrey) as standard offering. It is provided for monitoring boiler water level. It works on the basis of conductive fill level method of measurement.

- Maximum Uptime – Zero moving parts & no electro-mechanical interface.
- Energy Efficient – Blow-down is not required.
- Compact & easy to install hence saves complicated piping.
- Self monitoring controller complies with SIL 3.
- CE marking, meets EC directive 97/23/EC.



## Furnace

- Liberally sized furnace (high volume) helps in achieving higher combustion efficiency & longer life of the boiler.
- Suitable for variety of burners.
- $VHRR < 1 \text{ mw/m}^3$  ensures lower emissions & higher efficiency.
- Higher HTA, lower exit temp ensures longer life.



## Unique offering from Thermax – Corrugated Furnace for reliability & longer life

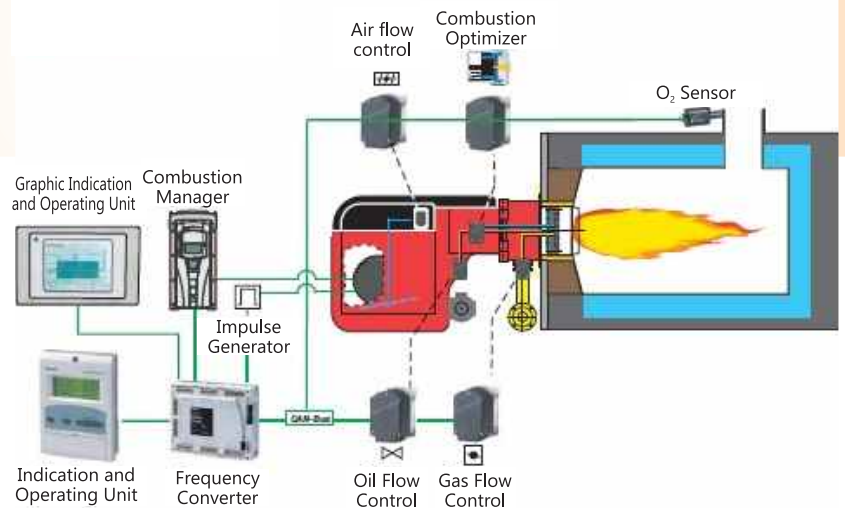
The furnace of boiler is subject to high pressure, differential temperature across wall which causes bending stress due to differential expansion. Further, load fluctuations & pressure variation create enormous thermal cycling across the furnace, Boiler code (EN 12953) has recommended corrugation to improve mechanical strength of boiler by increasing the moment of inertia.

- Each corrugation acts as point of support, increasing the moment of inertia.
- Corrugation provides adequate flexibility to take care of differential expansion between furnace & tubes.
- Uniformity does not allow high stress concentration at discrete points, unlike bowling hoops / stiffener rings.
- The entire corrugation process is carried out at in-house facility, at normalizing temperature (hot forming at  $950^\circ$  to  $980^\circ\text{C}$ ) to make sure the grain structure in the steel is oriented close to the parent metal to assure physical properties

## Burner

Fundamentals of burner design & manufacturing are efficiency, safety, service & environment friendliness. Shellmax Global series of boilers are provided with pressure jet, mono-bloc type burners..

- Compact & simple installation with mono-bloc design.
- Safe & reliable – Designed as per international standards EN 676, EN 267.
- Meeting stringent emission norms.
- Sourced from specialist manufacturers, having extensive R&D and testing facilities.
- Advance technologies like ECR, O<sub>2</sub>/CO trimming, Low NO<sub>x</sub>, speed control for CA fan are available on request.



## Electronic Compound Regulation With O<sub>2</sub> Trimming System

Fuel & air controls are linked electronically, with individual stepping motors meeting highest safety norms. This technology offers accurate controls, high repeatability & eliminates hysteresis. This system was developed by Siemens & adopted by reputed burner manufacturers.

### Benefits of ECR & O<sub>2</sub> Trimming –

- Thermal efficiency improvement at part load.
- Energy conservation through blower motor speed control.
- Supervisory control system – easy to monitor.
- Fail safe BMS with built-in diagnostics.

### Why Thermax ECR –

- Burner & component designed changed & tested in collaboration with Siemens
- Separate servo motor for regulating sleeve for precise control on primary & secondary air distribution
- Number of installations running successfully across globe.





## Gas Train Assembly



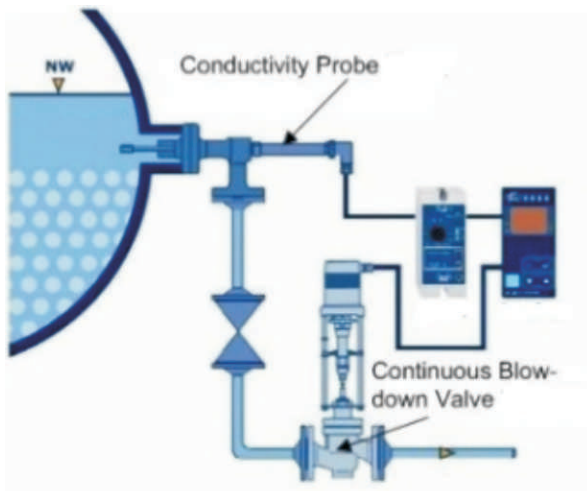
- Enhanced safety – Designed as per international codes like EN 676, NFPA.
- Zero gas leakage – with valve proving system.
- Save installation time & space – pre-piped, fully assembled gas train housed within boiler skid.
- Reliability – Components are sourced from European suppliers, tried & tested on field.

## Feed water pumps

Boilers are provided with 2 boiler feed pumps in 1 working + 1 standby configuration.



- Reduce power bill with efficient pumps sourced from renowned OEMS.
- Superior metallurgy & manufacturing process guarantees long life & uptime.
- Avoid treated water wastage with mechanical seals.
- Low NPSH requirement, service tanks can be placed at lower heights.



## Surface type Automatic Blowdown System

Blow-down systems are required to maintain boiler water quality within acceptable limits, throughout the operating period of the boiler.

- Saves energy – By optimizing blow-down rates, based on water quality & boiler load.
- Frees skilled boiler operators for other task, as well avoids human errors.
- Automatic temperature compensation for accurate measurement.

## Flow meters

For measuring consumption of utilities / generation of steam

- A. Steam flow meter – Vortex type / Orifice type
- B. Water flow meter – Vortex type / Orifice type
- C. Oil flow meter – Gear type / Coriolis type



- High measurement accuracy & repeatability.
- Quality construction for long service life & reliability.
- Easy to use & maintain.
- Seamless communication with panel for data display, record & reporting.

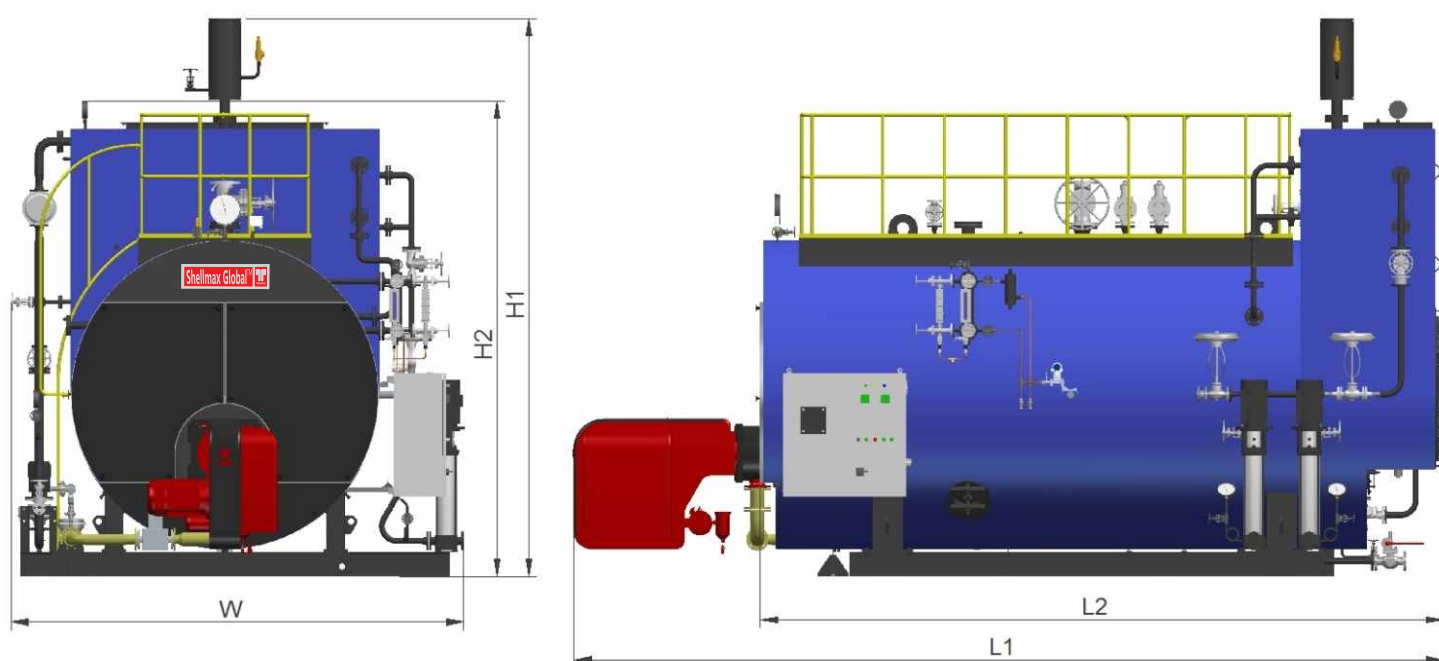
## TECHNICAL SPECIFICATIONS & GENERAL ARRANGEMENT DRAWING

PARAMETER FOR <b>Shellmax Global™</b> with <b>Effimizer™</b>										
Output-F&A 100°C	kg/hr	1000	1500	2000	3000	4000	5000	6000	8000	10000
Design pressure	kg/cm <sup>2</sup> g	10.54/17.5								
Efficiency (LDO/HSD)	%	93.0								
Efficiency (NG)	%	94.0								
Efficiency(FO)	%	92.5								
Fuel consumption (LDO)	kg/hr	57	85	114	171	228	285	342	455	569
Fuel consumption (HSD)	kg/hr	55	83	111	166	221	276	332	442	553
Fuel consumption (NG)	nm <sup>3</sup> /hr	68	84	113	169	225	282	338	451	563
Fuel consumption (FO)	Kg/hr	60	91	121	181	242	302	363	484	605
Connected Load (LDO/HSD)	SVLOP 10.54 kw	4.75	5.45	8.75	11.05	14.0	15.0	19.2	24.7	30
	SVLOP 17.5- kw	5.55	6.25	9.55	13.55	16.5	18.5	22.7	34.2	39.5
Connected Load (NG)	SVLOP 10.54 kw	4.75	5.45	7.25	9.55	12.5	13.5	17	22.5	26
	SVLOP 17.5-kw	5.55	6.25	8.05	12.05	15.0	17.0	20.5	32	35.5
Connected Load (FO)	SVLOP 10.54-kw	12.62	12.62	13.62	23.92	24.87	25.87	35.37	40.87	50.37
	SVLOP 17.5-kw	13.42	13.42	14.42	26.42	27.37	29.37	38.87	50.37	59.87
Dimension- Skid Length	mm	3.9	4.5	5.0	5.5	5.8	6.65	7.1	8.05	8.45
Dimension- Skid Breadth	mm	3.2	3.3	3.3	3.4	3.6	3.5	3.7	3.8	4.0
Dimension- Skid Height	mm	3.6	3.9	4.1	4.3	4.6	4.6	4.9	5.0	5.2
Flooded weight of boiler skid	tonne	9.85	12.71	12.93	17.4	22.19	24.16	28.910	34.82	44.63

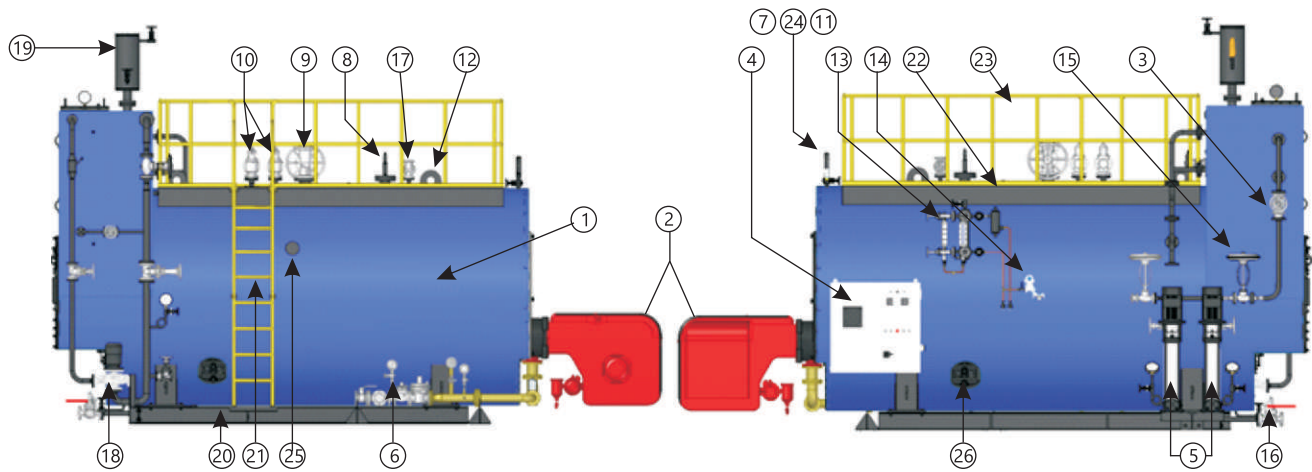
Note –

Efficiency as per BS 845 Part 1 - Indirect method, at full load

Connected loads mentioned are excluding standby



## SCOPE OF SUPPLY



1	Unit Assembly	8	Level controller	15	Feed Control Valve	22	Platform
2	Burner	9	MSSV	16	Blow down Valve	23	Railing
3	Effimizer	10	Safety Valves	17	Air Vent Valve	24	Inspector's Pr. Gauge
4	Thermowiz	11	Main Pr. Gauge	18	Circulation Pump	25	Nozzle for ABS
5	Feed Pumps	12	Lifting Hook	19	Expansion Vessel	26	Headhole
6	Gas Train	13	Level Gauge	20	Skid		
7	Pr. Tansmitter	14	Level Transmitter	21	Ladder		

## SERVICES

Reliable support for maximum value – Thermax has dedicated service units attached to its core energy and environment businesses to take care of spares, parts, preventive and breakdown maintenance services. Thermax also supports its clients with specialized services like energy audits, O&M, retrofits and upgrades and many more.



**Specialized products and solutions**



**Operation and maintenance**



**Energy audit services**



**Genuine spares for enhanced uptime**



**Five decades of delivering energy-environment solutions for sustainable growth worldwide**



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#### Thermax Business Portfolio

- Heating
- Cooling
- Power Generation
- Air Pollution Control
- Chemicals
- Water & Wastewater Solutions
- Solar
- Specialised Services