

ELITE



ISO 9001 : 2008  
QMS/91/R/1612



0602-1

# E – STEAM

**Packaged Non-IBR Boilers / Instant Steam Generators**

100 kg/hr to 1500 kg/hr

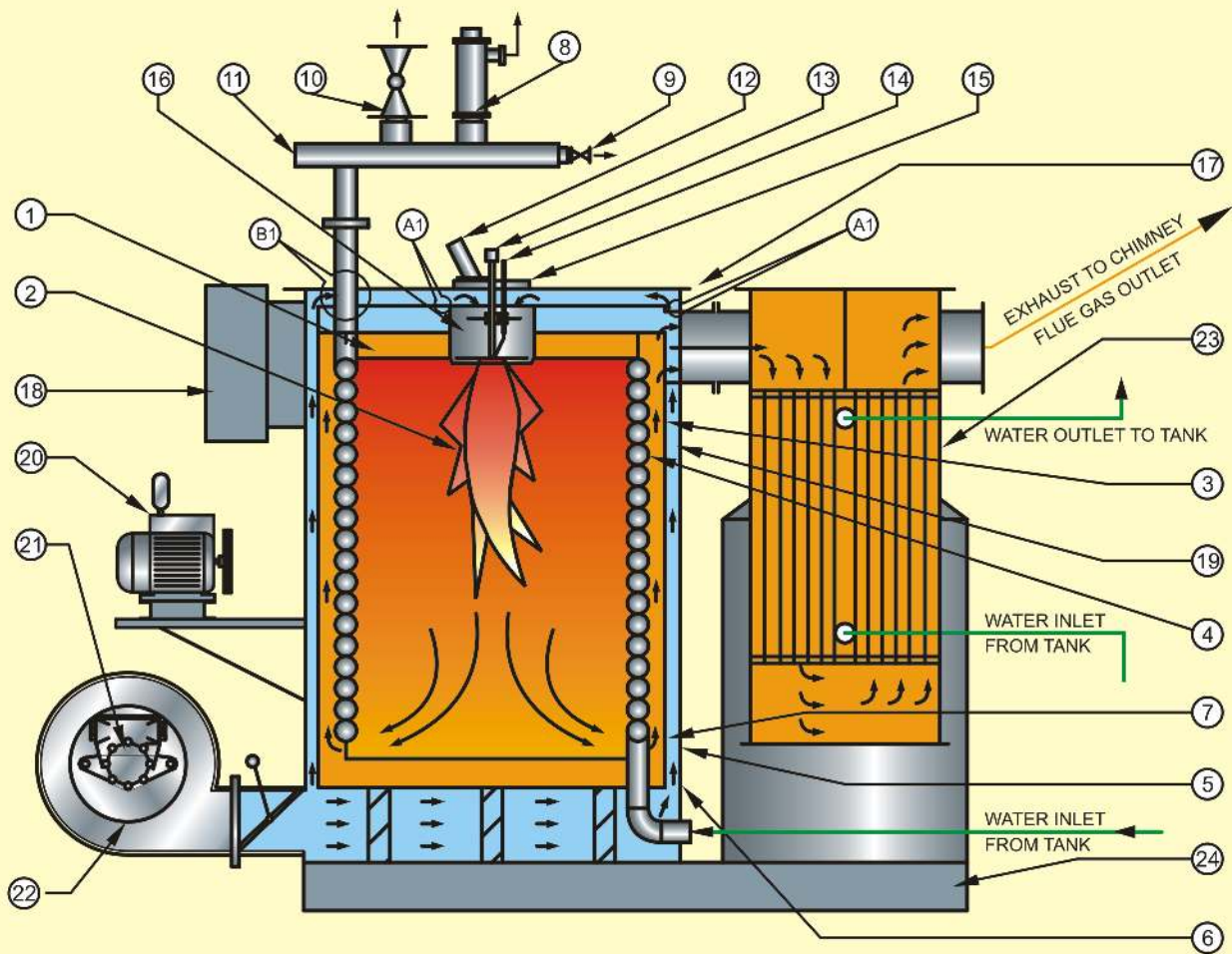


Revolutionary models  
with capacities of  
1250 kg/hr. & 1500 kg/hr.



► Condensate Recovery Possible ◀

## INSIDE CONSTRUCTION



- |                                |                         |
|--------------------------------|-------------------------|
| 1) Top Refractory Plate        | 13) Nozzle Pipe         |
| 2) Flame                       | 14) Ignition Electrodes |
| 3) Inner Shell                 | 15) Burner Plate        |
| 4) Coil                        | 16) Air Cone            |
| 5) Outer Shell                 | 17) Top Plate           |
| 6) Outer Shell Inspection Door | 18) Control Panel       |
| 7) Inner Shell Inspection Door | 19) Aluminum Reflector  |
| 8) Steam Safety Valve          | 20) Water Pump          |
| 9) Steam Bypass Valve          | 21) Fuel Pump           |
| 10) Main Steam Valve           | 22) Blower              |
| 11) Steam Header               | 23) Economiser          |
| 12) Photo Cell Pipe            | 24) Base Frame          |

## SALIENT FEATURES :

- High thermal efficiency of 93% on NCV of fuel
- Instant steam within 3 to 5 minutes from cold start
- Fully automatic in operation, so no running attention required
- Adequate furnace volume, adequate radiant heat transfer zone & adequate convective heat transfer zone ensuring long life of equipment
- Pre-heating of combustion air is an integral part of the equipment ensuring superior thermal efficiency
- Economizer is a part of standard scope of supply which recovers maximum possible waste heat from outgoing flue gas ensuring superior thermal efficiency
- Economizer works on Thermosiphon principles connected to water tank separately which allows condensate recovery from the system if required
- Reliable & robust components giving smooth & trouble free operation
- Space saving, compact design
- Completely packaged unit with all mountings & accessories fitted along with the unit, so site work is minimized & plug & play concept is applicable
- Outside the purview of Indian Boiler Regulations, so no IBR office formalities required & certified boiler attendant is not required

## APPLICATIONS

"Elite" packaged Non-IBR boilers / instant steam generators have applications in following

- Bio-Diesel plants
- Chemical reactors
- Chemical processing industries
- Distillation processes
- Food processing industries
- Inks & dyestuffs industries
- Lamination industries
- Laundry
- Metal processing industries
- Ovens
- Paper industries
- Pharmaceutical Industries
- Plastics
- Printing & packaging machinery
- Radiators of dryers
- Rubber articles manufacturing
- Surface treatment / surface coating
- Tank farms pipe & pump heat tracing
- Unfired hot water generators

## MODEL E – STEAM VERTICAL COIL TYPE DESIGN

- Vertical 4 pass design
- Pre-heated combustion air is an integral part of the design
- Output range from 100 kg/hr to 1500 kg/hr
- Standard maximum operating pressures; 10.54 kg/cm<sup>2</sup> (g) or 15 kg/cm<sup>2</sup> (g) (Customized models having maximum operating pressures more than the values mentioned can be designed, manufactured & supplied as per specific request)
- Fully automatic, oil, gas or dual fuel burners with ON – OFF control / modulating mechanism
- High thermal efficiency of 93% on NCV of fuel

## OPERATING PRINCIPLE

- The combustion air enters through the fan inlet, travels upwards through the space between the inner shell & the outer shell, gets pre-heated & enters the top mounted burner
- Hot flue gases travel down the full length of the vessel inside the coil creating the first (radiant) pass
- The flue gases then travel upwards through the space between the coil & the inner shell creating the second (convection) pass
- The flue gases then enter the economizer & travel downwards through the tubes creating the third (convection) pass
- The flue gases then travel upwards through the tubes creating the fourth (convection) pass

## SAFETIES:

- Flame failure detection device
- No water cutout switch
- Steam superheat controller
- Steam high pressure switch
- Steam low pressure switch
- Blow-down valve open switch
- Overload protection relays for motors
- Miniature circuit breaker for control circuit
- Fail safe instrumentation
- Control circuit logic is such that it ensures equipment going to lock out safety in case of any abnormal operating condition & also monitors any instrument's failure
- Audio visual annunciation on control panel gives guidelines for troubleshooting the unsafe conditions

## TECHNICAL SPECIFICATIONS

| Parameters   | Unit                   | Models  |      |      |      |       |      |       |       |       |       |
|--|------------------------|---|------|------|------|-------|------|-------|-------|-------|-------|
|  |                        | 100   | 200  | 300  | 400  | 500   | 600  | 850   | 1000  | 1250  | 1500  |
| Maximum steam output (F & A 100 deg. C)                        | Kg/hr                  | 100   | 200  | 300  | 400  | 500   | 600  | 850   | 1000  | 1250  | 1500  |
| Maximum steam pressure (SVLOP)                                 | kg/cm <sup>2</sup> (g) | <b>10.54 / 15</b>   |      |      |      |       |      |       |       |       |       |
| Maximum steam temperature                                      | deg. C                 | <b>185 / 200</b>  |      |      |      |       |      |       |       |       |       |
| Thermal efficiency (based on NCV with economizer)              | % ± 1%                 | <b>93</b>   |      |      |      |       |      |       |       |       |       |
| Fuel consumption   |                        |   |      |      |      |       |      |       |       |       |       |
| LDO / HSD  | kg/hr                  | 5.7   | 11.4 | 17.1 | 22.8 | 28.5  | 34.2 | 48.4  | 56.9  | 71.2  | 85.4  |
| FO   | kg/hr                  |   |      |      |      |       | 36.1 | 51.1  | 60.2  | 75.2  | 90.3  |
| LPG  | Nm <sup>3</sup> /hr    | 2.6   | 5.2  | 7.8  | 10.4 | 13.0  | 15.6 | 22.0  | 25.9  | 32.4  | 38.9  |
| Natural Gas  | Nm <sup>3</sup> /hr    | 7.4   | 14.8 | 22.2 | 29.5 | 36.9  | 44.3 | 62.8  | 73.9  | 92.3  | 110.8 |
| Burner control   |                        | <b>ON - OFF</b>   |      |      |      |       |      |       |       |       |       |
| Time required to reach full load from cold start (approximate) | minutes                | <b>3 to 5</b>   |      |      |      |       |      |       |       |       |       |
| Pressure parts   |                        | <b>Outside the Purview of Indian Boiler Regulations (Non-IBR)</b> |      |      |      |       |      |       |       |       |       |
| Electricity supply   |                        | 415 V ± 5%, 50 Hz, 3 Phase, 4 Wire                                |      |      |      |       |      |       |       |       |       |
| Motor for feed water pump                                      | RPM                    | 1000  |      |      |      |       | 1400 |       |       |       |       |
|  | KW                     | 0.37  | 0.37 | 0.37 | 0.75 | 0.75  | 1.12 | 1.49  | 1.49  | 2.23  | 2.23  |
| Motor for blower & fuel pump                                   | RPM                    | 3000  |      |      |      |       |      |       |       |       |       |
|  | KW                     | 0.75  | 1.12 | 1.12 | 1.49 | 2.24  | 2.24 | 3.73  | 3.73  | 3.73  | 3.73  |
| Fuel pre- heater (for operation on FO)                         | KW                     |   |      |      |      |       | 6    | 6     | 7.5   | 7.5   | 9     |
| Total connected electrical load                                |                        |   |      |      |      |       |      |       |       |       |       |
| For operation on LDO / LPG / Natural Gas                       | KW                     | 1.12  | 1.49 | 1.49 | 2.24 | 2.99  | 3.36 | 5.22  | 5.22  | 5.96  | 5.96  |
| For operation on FO  | KW                     |   |      |      |      |       | 9.36 | 11.22 | 12.72 | 13.46 | 14.96 |
| Overall dimensions   |                        |   |      |      |      |       |      |       |       |       |       |
| Length   | m                      | 1.9   | 1.9  | 2    | 2.1  | 2.3   | 2.5  | 2.7   | 2.8   | 3     | 3.2   |
| Width  | m                      | 1.1   | 1.1  | 1.2  | 1.2  | 1.3   | 1.4  | 1.5   | 1.6   | 1.6   | 1.6   |
| Height   | m                      | 1.1   | 1.3  | 1.5  | 1.6  | 2.345 | 1.8  | 2.1   | 2.2   | 2.4   | 2.6   |
| Dry weight (approximate)                                       | kg                     | 750   | 850  | 1100 | 1200 | 1500  | 1700 | 2000  | 2300  | 2600  | 3000  |
| Flue gas outlet size (dia)                                     | mm                     | 200   | 200  | 200  | 200  | 200   | 250  | 250   | 300   | 300   | 300   |

### PLASE NOTE :

- Models with maximum steam pressures at the outlet of the units higher than those mentioned can be designed, manufactured & supplied upon specific request
- Fuel consumption figures are mentioned with following net calorific values (NCV) of fuels as basis  
LDO/HSD 10200 kcal/kg  
FO 9650 kcal/kg  
LPG 22390 kcal/Nm<sup>3</sup>  
Natural Gas 8500 kcal/Nm<sup>3</sup>
- The fuel pre-heater is steam cum electric type, so the connected electrical load mentioned for fuel pre-heater is applicable only for start-up operation
- Specifications & dimensions are approximate. Consult "Elite" for model specific requirements
- Operating specifications may change based on site conditions
- We reserve the right to change the specifications and / or dimensions without prior notice



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(An ISO 9001 : 2008 Certified Company)

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