FABCON
DESIGN & ENGINEERING (PVT) LTD.

SINGLE DRUM
WATER TUBE BOILERS

Construction:

The “heavy duty” boiler is provided with a membrane wall construction which is water cooled and fully gastight. Those membrane walls are stiffened with buckstays (beams) to bear the flue gas pressure in case of sudden increase and to avoid any vibrations. The boiler is a bottom supported natural circulating boiler with single drum and and consisting of a rigid water-cooled frame for supporting the heating surfaces and steam drum.

All heating surfaces are horizontally arranged and supported in the water-cooled structure of the boiler and in the uncooled casings at cold end of boiler. They are provided with sufficient spaces in between the tubes and ensured in its position to minimize the fouling and avoid any blocking.

The boiler has fast site assembly water tube structure, the membrane panels, heating surface coils and pre-fabricated steam drums are very fast in erection.

COMBUSTION AND FUEL:

The furnace is large sized for a residence time of 3 seconds and furnace outlet temperature of 950 °C. Further large sized over-firing nozzles are installed in the side wall to mix the air with the unburned gasses and particles and to improve the efficiency and to minimize the fouling of the tube banks.
The dumping grate is of the standard type which has proven its reliability in the sugar industry. The dumping grate is split in sections which split further in 2 parts, each
provided with pneumatic actuator.

AIR SYSTEM AND ASH SYSTEM

The air to the grate and over-firing system is heated up in separate sections in a steam air preheater. The air will be heated up to approx. 105 °C to avoid any possible corrosion in the flue gas air preheater. The combustion air is supplied by forced draft air fan. The over-firing air is supplied by over-firing air fan. The air spreading system is provided with its own air spreading fan.

Fuel turns into ash after burning and drops into the hopper at the bottom of grate. Ash accumulates on sliding gate and can be collected on ash carrier or other transport means. Remaining parts of ash fly with flue gases “called fly ash” is filtered by the cyclone type dust filter fall into hoppers of dust collector.

Control:

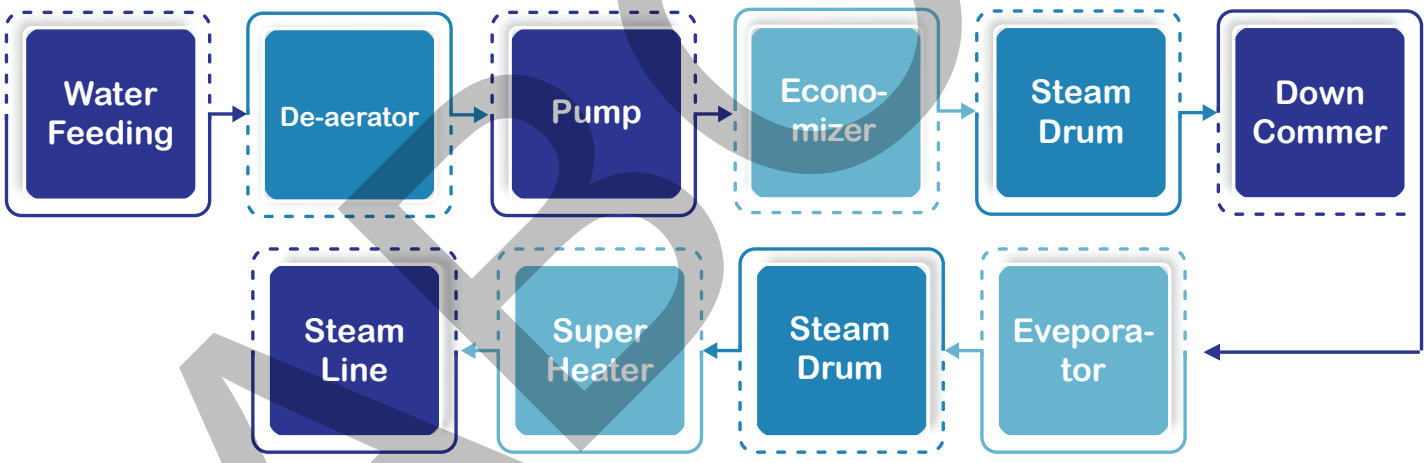
Our boiler is fitted with all necessary field instruments and control components supplied in form of control loops as mentioned below:

Three element drum level control (loop # 1): Three-element drum-level control is suited for handling variable feedwater pressure or multiple boilers with multiple feedwater pumps. The three elements in this system handle level, steam and feedwater flow.

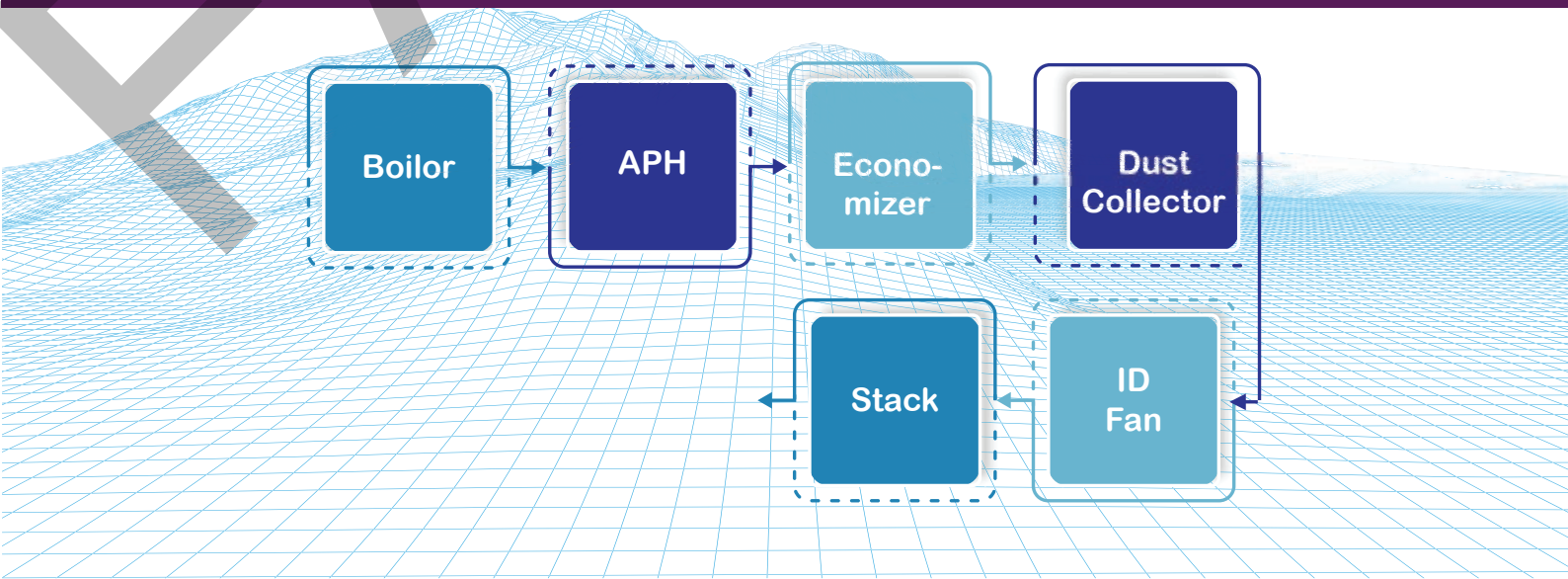
Steam pressure control (loop # 2): Modulating control improves boiler operation by monitoring the steam line to produce a continuous control signal that determines the fuel input.

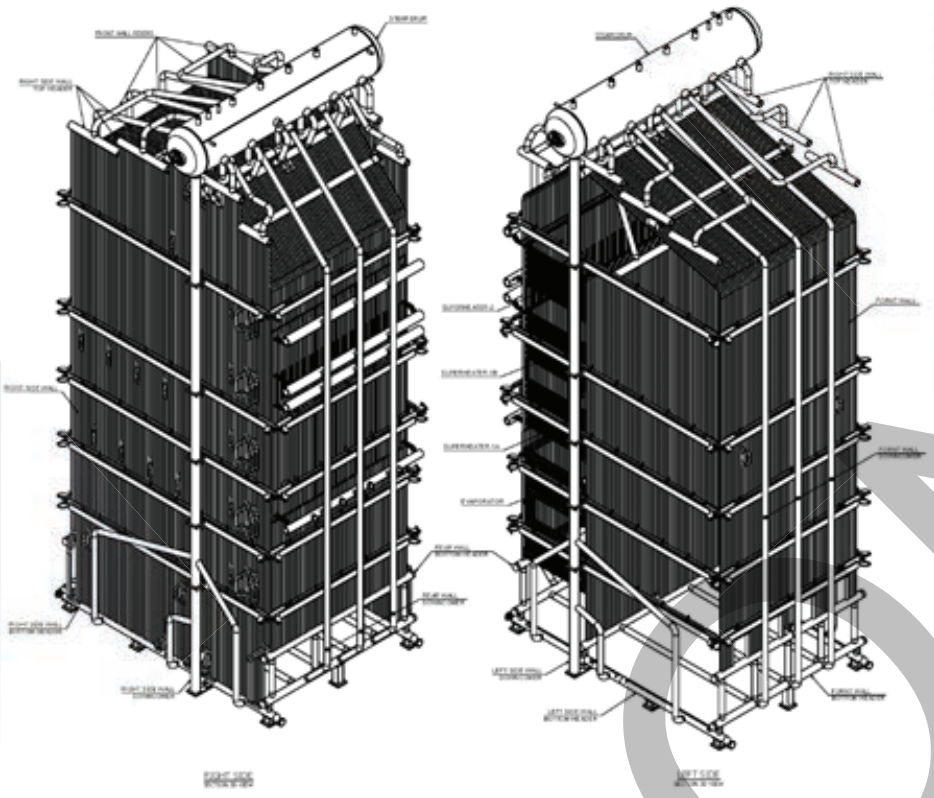
Furnace- draft- control (loop # 3): Modulating control improves boiler operation by monitoring the furnace draft and produce a continuous control signal that determines the ID fan speed.

Water Scheme



Fuel Gas Scheme

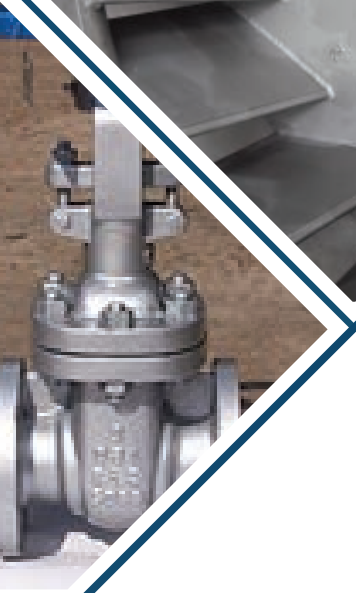




Boiler Module

Module / Parameter			BWSB/40-6.5	BWSB/50-6.5	BWSB/60-6.5	BWSB/80-6.5	BWSB/100-6.5	BWSB/120-6.5	BWSB/140-6.5	BWSB/160-6.5
Rated capacity		**t/h**	**40**	**50**	**60**	**80**	**100**	**120**	**140**	**160**
Operation pressure		Mpa	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Steam temperature		C	485	485	485	485	485	485	485	485
Water-inlet temperature		C	105	105	105	105	105	105	105	105
Heating efficiency		%	86	86	86	86	86	86	86	86
Area of Grate		m^2	16.38	21.2	26.4	32.5	39	46	53	62
Bagasse (LHV 1,750kcal/kg)		kg/h	17,200	21,500	25,800	34,400	43,000	51,600	60,200	68,800
Water supply	Capacity	m3/hr	47	58	70	93	116	139	162	185
	Motor power	kw	160	250	350	400	500	600	710	850
Force Draft Fan	Capacity	m3/h	44,400	54,000	59,400	78,000	99,000	119,400	144,000	168,000
	Motor power	kw	37	45	55	90	132	2 x 90	2 x 132	2 x 160
Over Firing Fan	Capacity	m3/h	22,800	25,800	29,400	39,600	54,000	69,000	84,000	102,000
	Motor power	kw	70	110	132	160	200	2 x 90	2 x 110	2 x 132
Spreader Fan	Capacity	m3/h	6,600	7,500	8,400	9,900	11,400	13,200	15,000	16,800
	Motor power	kw	37	37	45	45	55	55	75	75
Induced Draft Fan	Capacity	m3/h	147,000	172,500	199,200	264,600	318,000	396,000	468,000	564,000
	Motor power	kw	160	250	315	400	450	2 x 250	2 x 315	2 x 400

* Custom design for boiler capacity ranges from 20tph to 200tph at pressure ranges from 15 barg to 52 barg can be made by in-house.



Main part supply:

- Fuel Feeders
- Down-Commers
- De-Super Heater
- Dumping Stoker
- Air Pre-heater
- Soot Blowers
- Rotary Valves
- Control Valves
- Pipe Fittings
- Flue Gas Ducts
- Membrane Wall Panels
- Evaporator
- Supporting Frames
- Peeping Door
- Platform
- Draft Fans
- Control Cabinet
- Safety Valves
- De-Aerator
- Stack
- Steam Drum
- Super Heater
- Insulator Layer
- Economizer
- Dust Collector
- Inducing Fan
- BFW Pumps
- Mechanical Valves
- Air Ducts



Advantages:

- Designed as per ASME code
- Cost efficient due to compact size
- Boiler parts are pre-fabricated and shipped as modular units ensuring easy assembly at site
- Easy maintenance
- Economical civil works cost
- Ecologically efficient (Minimum NOx and CO2 emissions)
- Impossible to have tube leakages.
- Water/Steam circulation circuits resulting in very good level stability Very fast start up and shut downs, usually of conventional bi-drum boilers

Suitable Module for:

- Chemical plants
- Sugar Industry
- Co-generation Power Plants
- Paper and Board Industry
- Cement Plants

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