

## WNS SERIES GAS AND OIL FIRED BOILER

### Part 1: Brief Introduction

WNS series gas and oil fired boiler is package type full automatic horizontal three pass fire tube wet back structure boiler. The boiler can produce hot water, saturated steam or superheated steam. It's adaptable for wide ranges of fuels such as natural gas, LPG, biogas, methane gas, diesel heavy oil etc. The boiler has a large corrugated furnace which have big radiate heating area and we adopted threaded smoke tube which greatly increased the boiler heat transfer efficiency. The boiler burners and valve groups are world famous brand from Italy and German, quality is stable and reliable.



#### Quick details:

Steam Capacity	1 to 20 ton/hr 0.7MW-14MW
Fuel Applicable	Natural gas,LPG, LNG, CNG, Diesel, Light oil, Heavy oil, Kerosene,
Working pressure	0.4Mpa, 0.7Mpa,1.0Mpa, 1.25Mpa, 1.6Mpa, 2.5Mpa
Steam temperature	151℃, 170℃,184℃, 194℃, 204℃, 226℃
Structure	Three pass, fire tube, wet back
NOx emission:	<30mg/m <sup>3</sup>
Heat efficiency	≥95%
Application	Industrial production, central heating

## Part 2: Features

### 1. Big corrugated furnace

Adopt the advanced corrugated furnace design, the combustion chamber with large volume. It enlarged the furnace diameter and create a bigger radiant heat exchange area, so increased the boiler thermal efficiency.

2. The boiler is equipped with world famous brand burners and valves groups such as Baltur, Riello, Weishaupt, Oilon etc. , 80% configuration, making the combustion more sufficient with lower failure rate.

### 3. thread smoke tube technology

Strengthen the heat transfer and reduce the number of smoke tubes and boiler shell size.Reduce the thermal stress at the tube end to prevent cracking of tube sheet.

### 4. Wet back structure

Wet-back smoke chamber, the whole smoke chamber is inside boiler proper, directly heating water in boiler proper, greatly increase boiler heating efficiency. It can also lower the temperature of back tube sheet to prevent cracking. And also extend boiler life and reduce maintenance costs.

5. Three-pass exhausted gas flow design, ensure high temperature exhausted gas contacting with boiler tubes adequately, reduce exhausted gas temperature and increase boiler efficiency.

### 6. Automatic PLC control

Independently developed PLC control panel, better match our boiler operation. Siemens PLC with 10 inch touch screen and frequency transformer, more safety and easy operation.

Automatic control system, the electrical cabinet receives signals from all gauges and control the whole working system, including burner set on/off, water pump set on/off, water softener, etc.

7. Automatic Alarming system, it has protective functions of over-temperature, over-pressure, water shortage, leakage detection and flame out, ensuring safe and reliable operation.

8. Designed with special steam water separator,reduce steam humidity and improve steam quality.

9. Double layer 12cm aluminum silicate insulation, seal tight and avoid gas leakage and minimize heat loss.

10. Designed solid steel rod tension bars, increasing the tube plate strength, preventing cracking.

11. Industrial packaging design, stainless steel outer packing, elegant and anti-corrosion.

12. Low Dropout explosion proof door design, prevent explosion, reduce the damage to the boiler, improve the safety of boiler.

13. Double open door design at the front and back smoke box, beautiful appearance and convenient maintenance.

14. Quick-setting high-strength fire-resistant refractory casting material with strong coagulation force, long service life and not fall off.

15. Double safety valve, double water level gauge, double pressure gauge design, backup security, safe and reliable.

16. Large volume for water, stable steam generation and high steam quality.

17. Availability for adjusting steam working pressure

18. Flow type intelligent water treatment equipment, automatic and microcomputer operation, prevent the hurt from boiler.

19. Vertical type stainless steel water pump, delicate and compact structure, low power consumption, can save 50% energy than horizontal type.

20. With 60 years experience in boiler manufacture, we have a mature and skilled production technician team, ensure the high and stable quality.

21. 100% X-ray NDT (non-destructive inspection) of steel plate, tube and welding rod, to ensure the quality of the entire boiler.
22. Over-pressure 40%-50% hydraulic test, ensure the standard working pressure and safety.
23. all steel materials, boiler pipe, boiler drum steel plate according to state standard and from national standard manufacturer, ensure the high material quality.

### Part 3. Application field

1. Food industry: such as rice mills, noodle factory, canned factory, juice processing factory, tomato sauce factory, beer wine factory, etc.
2. Textile industry: textile factory, garment factory, sweater factory, socks industry, dyeing factory.
3. Petrochemical industry: steam can be used to heat oil, to strengthen the liquidity of oil;
4. Foam, furniture production: the steam can be used for producing foam. When making furniture, wood needs to be dried with steam;
4. Filling block production: steam used for drying the aerated brick;
5. Washing ironing industry: generally used in laundry, including dry cleaning machines, dryers, washing machines, dehydration machines, ironing machines, iron and other equipment supporting the use;
6. Packaging machinery industry: labeling machines, sets of standard machine;
7. Hot water boiler application: central heating for greenhouse, hotel, hospital, school, residential area.

### Part 4. Technical Data

WNS Steam boiler specification

Model	Rated capacity	Rated pressure	Rated steam temperature	Boiler efficiency	Oil Fuel consumption	Gas Fuel consumption
	t/h	Mpa	°C	%	m <sup>3</sup> /h	kg/h
WNS1-1.0-Y(Q)	1	1	184	91	84.2	65.5
WNS2-1.25- Y(Q)	2	1.25	194	92	165	129.6
WNS3-1.25-Y(Q)	3	1.25	194	92.1	250	192
WNS4-1.25- Y(Q)	4	1.25	194	93	323.6	256
WNS5-1.25- Y(Q)	5	1.25	194	93	386	318
WNS6-1.25- Y(Q)	6	1.25	194	93.2	450	380
WNS8-1.25- Y(Q)	8	1.25	194	93.5	642	503
WNS10-1.25- Y(Q)	10	1.25	194	93.5	805	628
WNS15-1.25- Y(Q)	15	1.25	194	93.5	1182	940
WNS20-1.25- Y(Q)	20	1.25	194	93.5	1597	1250

### Part 5. Safety System each part of the boiler is designed based on the safety.

1. Independently developed PLC control panel, better match our boiler operation. Siemens PLC with 10 inch touch screen and frequency transformer, more safety and easy operation.

Safety control system:

- 1.1 Control the burner, water feeding, pressure, exhaust gas temperature
- 1.2 Control the burner ignition and flame-out automatically; The burner can switch over from large fire to

small fire.

### 1.3 Control the water feeding:

Automatic Alarm when the water level is higher or lower than normal water level, safety interlock when the water level is over-high or over-low.

When the water level is low, the boiler system will feed water automatically, when the water level is high, the boiler will stop feeding water. When the water level lower than 0 or over-high, the boiler burner flame out.

### 1.4 Pressure control: Safety interlock for over-high pressure.

### 1.5 Control the exhaust gas temperature

when the flue gas temperature is over-high, it will control the boiler alarm firstly and then the burner flame out, the boiler shutdown.

2. Double safety valve, double water level gauge, double pressure gauge design, backup security, safe and reliable.

3. All steel materials, boiler pipe, boiler drum steel plate according to state standard and from national standard manufacturer, ensure the high material quality.

3.1 Boiler, boiler drum steel plate: according to state standard, GB713' steel plates for boiler and pressure vessels'

3.2 Boiler pipe: according to state standard, GB3087' Low medium pressure boiler seamless steel tubes'

### 4. High-level quality control system for every production procedure

1) 100% NDT non-destructive testing inspection for steel plate, tube and welding rod, to ensure the quality of the entire boiler.

2) The boiler needs to be do the hydraulic text before leaving the factory, and it should be under the supervision of relevant government departments.

## Part 6: WNS boiler system and auxiliary list

Number	Item	Brand	Number	Item	Brand
1	Boiler proper	Yuanda	6	Water Softener	USA Fleck
2	Burner	Baltur, Riello, Oilon	7	Steam Header	Yuanda
3	Electric Control Cabinet	Yuanda	8	Chimney	Yuanda
4	Economizer	Yuanda	9	Deaerator	Yuanda
5	Water Pump	Grundfoss	10	Valves&Instrument	Gaoshan

# Boiler Accessories



**Burner**

Equipped with world known burner. Baltur & Riello brand from Italy. Weishaupt & Hofamat brand from Germany. Oilion brand from Finland.



**Feed water pump**

Vertical stainless seamless feed water pump. Compact structure, low power consumption, low failure rate.



**Steam header**

Distribute steam to each pipe of user's workshop. The number of outlet can be designed according to customer's need.



**Valves**

Including a set of valves to connect the boiler, all equipped with China most famous Gaoshan brand valves.



**Electric control cabinet**

10 inch PLC touch screen electric control cabinet, smart control.



**Chimney**

Carbon steel material. Standard length of 8 meters, can be special design based on customer's request.



**Water softener**

Fleck brand from USA. Remove Mg<sup>+</sup>, Ca<sup>+</sup> in the water and improve water quality to prevent hurt from boiler tubes.



**Economizer**

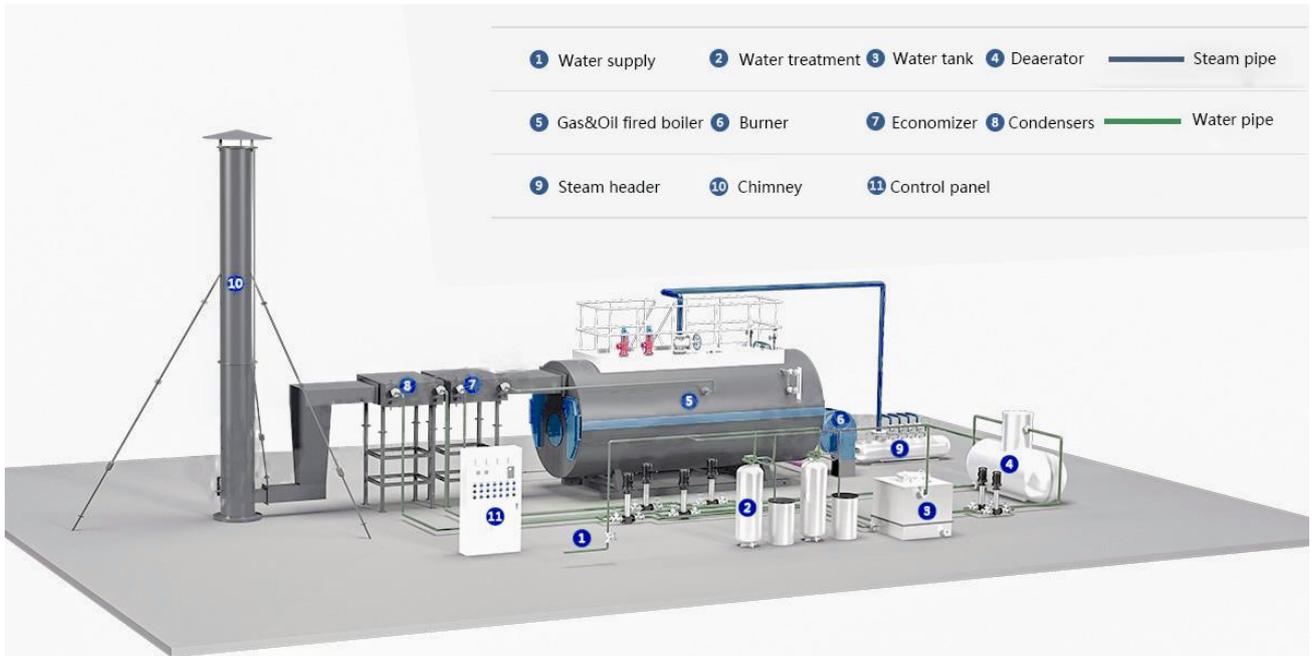
Fin tube design and aluminum silicate insulation. Reduce exhausted gas temperature and increase boiler efficiency.



**Pressure Gauge**

Show the working pressure of the boiler, equipped with China most famous Gaoshan brand gauges.

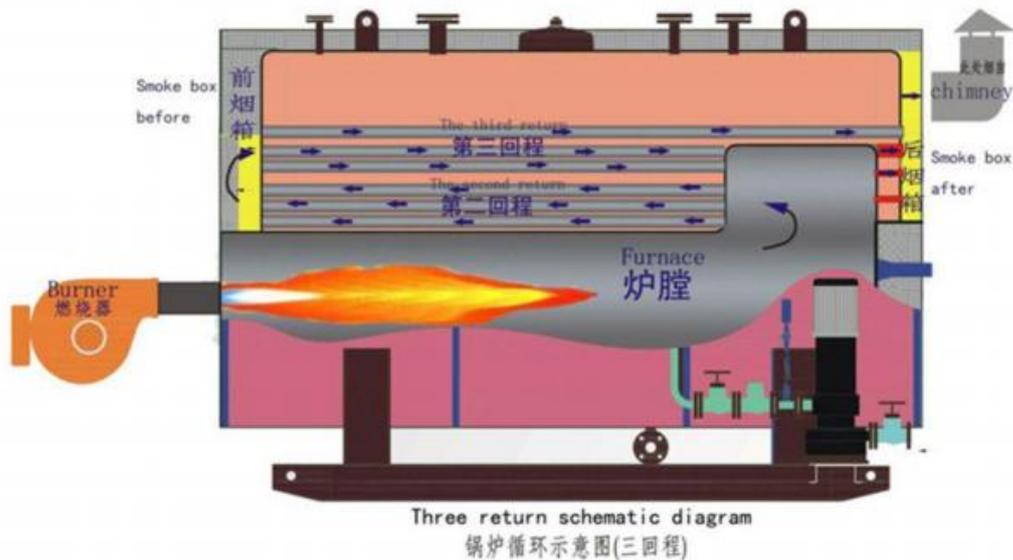
Part 7 boiler system drawings



Part 8 WNS boiler flue gas flow

Two pass flue gas flow:

1. The first return: fire by fuel combustion in the corrugated furnace and transfer radiant heat through the furnace wall.
2. The second return: The high-temperature flue gas generated by combustion converges in the reversal chamber and turns into the second return, that is, the threaded tube bundle. After convective heat transfer, the flue gas temperature is gradually reduced when it come to the front smoke box. The flue gas exits the boiler body from the front smoke box and enters the economizer and condenser set on the top of the boiler, and finally flow into the chimney and discharge into the atmosphere.



### Three pass flue gas flow:

- 1.The first return: fuel combustion in the corrugated furnace
- 2.The second return: The high-temperature flue gas generated by combustion converges in the reversal chamber and turns into the second return, that is, the threaded tube bundle.After convective heat transfer, the flue gas temperature is gradually reduced when it come to the front smoke box.
- 3.The third return: The flue gas turns into the flat tube bundle, then enter the economizer and condenser through the rear smoke box, and finally flow into the chimney and discharge into the atmosphere.

### Part 9 Standard & Criterion for Boiler Design, Manufacture, Acceptance and Testing

1. Material standard According to technical requirement, choose materials as state standard, ministry standard, industry standard and enterprise standard first, to the imported material from abroad should be according to international standard or import standard.
  - 1.1 Boiler, boiler drum steel plate:according to state standard, GB713'steel plates for boiler and pressure vessels'
  - 1.2 Boiler pipe: according to state standard, GB3087'Low medium pressure boiler seamless steel tubes'
2. Generator manufacturing performing standard
  - 2.1Boiler: according to state standard, TSG G0001'The boiler safety technology inspection procedures'
  - 2.2 Boiler Proper: according to state standard, GB/T16508'Pot shell boiler pressure parts
  - 2.3 Boiler Pipe: according to state standard, GB/T222'Water tube boiler pressure parts

### Part 10 Inspection & Testing

Making following test before delivery.

- 1 Hydraulic test, ensure the standard working pressure and safety.
- 2 100% X-ray NDT (non-destructive inspection) report of steel plate, tube and welding rod, to ensure the quality of the entire boiler.

### Part 11 Supervision of Installation and Commissioning Service

Supervision of installation and commissioning the equipment within delivery scope is available by our service team. But the Buyer will be only in charge of:

1. The round air-tickets costs from Zhengzhou city to project site.
2. Board and lodging of seller' s workers for the entire period at the end-user' s site.
3. Necessary communication cost.
4. Service fee of Seller' s worker: USD 100/day/person, for the entire period at the end-user' s site. This quotation excludes all consumables during erection, commission and trail run, like instrument, common tools, installation auxiliaries and oil etc.