Network

We, SAMSON Co., Ltd., have been engaged in the manufacture and sales of various Boilers and Food Processing Equipment since our foundation in 1945, and have been enjoying a good reputation from customers in various industrial fields of Japan.
In overseas markets, we have devoted ourselves to exporting our products into mainly Asian countries for a long period and have delivered them to many customers.
After delivery, our authorized distributors in the respective countries have taken care of maintenance services on our equipment through the cooperation from customers.
We are supporting our distributors for the improvement of maintenance technology and we hope our customer can operate our products safely without any trouble.

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SAMSOLUTION

SAMSOLUTION BOILER SYSTEM

For a sustainable future of energy and food SE Series GAS

Made in Japan since 1945

Saving Energy Boiler

SE Advance

From Evolution to Advance !

SE Saving Energy Boiler Advance Series

To realize Low-carbon society,
SAMSOLUTION never stop evolution!!
We advance our technology for Energy Saving.

Everyone try to save the energy from time to time.

But the most important thing for Energy-saving is continuation and advancement.

So, we eager much advanced performance on our Boilers.

SE ADVANCE series are concentrated into Energy-Saving function.

New functions are added on current boiler functions and improved on Safety, Visibility and ENERGY-SAVING !

eco
SAMSON eco-technology

Maximum efficiency	High turn-down	Combustion and Feed water control	High dryness steam
Over 100%	1 : 7	High speed multi-position	99.5%

SCORE SYSTEM & NEW BRM IV

Heat control system for once-through boiler

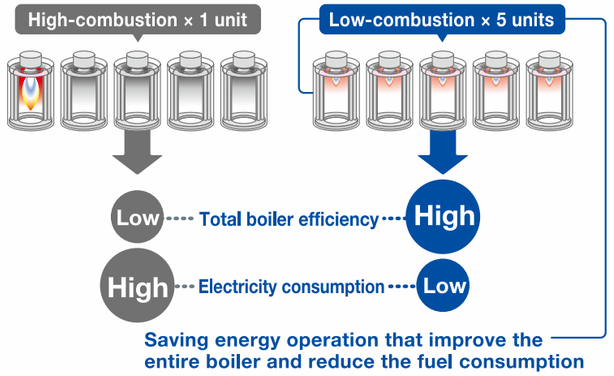
In the boiler room

NEW BRM IV Multi-boilers control panel

Selects the best operation pattern
Minimize fuel & electricity consumption

In case of steam load is small, operation that control multi-boilers under low combustion is more efficient than operation that control a boiler under high combustion.
NEW-BRMIV can be improved the efficiency of the entire system and reduce the electricity consumption by selecting optimal operating pattern to check the operating condition and steam demand.

For example...In case of steam load is 2,000kg/h~3,000kg/h (SE-3000APG × 5 units)



Menu screen
Pictograms and Japanese-English language are easy to operate.

- **Condition monitoring screen**
You can check boiler operating condition, combustion condition, error and inspection information.

- **Individual data screen**
You can check each boiler operating condition by daily data and the day before data screen.

- **Multi-boilers control setting screen**
You can set control pressure range, control quantity, control pattern and priority rank.

In the monitoring room...

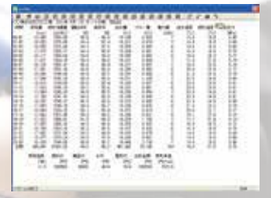
SCORE SYSTEM

To manage the total steam generating system not only boiler but including auxiliary equipment

To indicate the machine condition of entire steam generating system.

To manage the entire system and individual boiler.

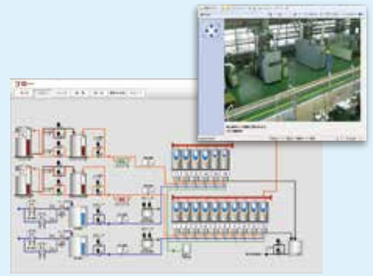
To indicate the guidance that explain the cause and ways to cope with it by using photo and drawing at occurring error and inspection.



To make a report for the entire system and individual boiler.

SCORE SYSTEM HG

We can supply not only standard model「Score VS」but also customized model depending on the customer「Score HG」



If you install monitoring camera(option), you can get information in real time by movie.

SPEC

Specifications

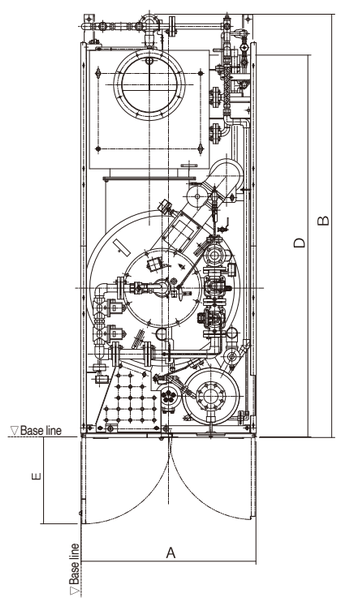
Item		Unit	SE-2000APG	SE-2500APG	SE-3000APG
Type of Boiler		–	Small Type Boiler		
Max. Pressure		MPa(kgf/cm²)	0.98(10)		
Working Pressure Range		MPa	0.49~0.88		
Hydraulic Testing Pressure		MPa(kgf/cm²)	1.58(16)		
Equivalent Evaporation		kg/h	1,999	2,500	3,000
Heat Output		kW	1,254	1,567	1,881
Boiler Efficiency		%	98		
Heating Surface Area		m²	9.89	9.94	
Holding Water Volume		L	170		175
Type of Burner		–	Blast		
Combustion Control		–	Inverter Control, Multi-Position Combustion Control		
Turn-down Ratio	13A	–	1:7		
	LPG	–	1:5		
Feed water control		–	Inverter Control, Multi-Position Combustion Control		
Ignition		–	AC Spark Ignition		
Fire Detection		–	Ultraviolet Ray Phototube		
Dry Weight		kg	2,150	2,330	2,460
Weight in Operation		kg	2,350	2,540	2,670
Fuel Consumption		kW	1,279	1,599	1,919
	13A	m³(N)/h	113.5	141.8	170.2
	LPG Propane	m³(N)/h	49.2	61.4	73.7
		kg/h	99.3	124.1	148.9
	LPG Butane	m³(N)/h	38.7	48.4	58.1
		kg/h	100.8	126.0	151.2
Supply Gas Pressure		MPa	0.06~0.30	0.10~0.30	0.06~0.30
Supply Power Available Electricity		–	AC 200V 3φ (50/60Hz)		
Equipment Power		kW	8.9	9.8	13.4
Total Electric Capacity		kVA	15.8	17.2	21.1
Description	Fan Motor	kW	6.5	7.4	11.0
	Feed Water Pump motor	kW	2.2		
	For Control	kW	0.2		
Main Wire Size		mm²	14		22
Power Breaker Capacity		A	75		100

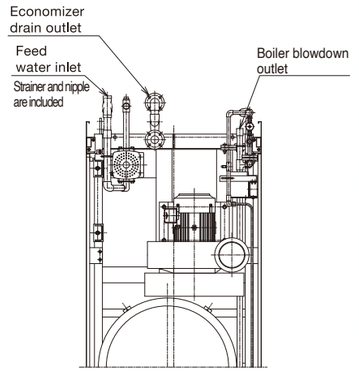
Remarks: 1. The performance display conforms to the "boiler performance display reference value" of Small-Type Once-Through Boiler Association of Japan.
The calculation conditions are as described below.
Calculation condition of boiler efficiency
Heat Balancing : JIS B 8222
Steam pressure = 0.49 MPa, Water supply temperature = 15°C,
Charge air temperature = 35°C
Lower heating value = 13A : 40.6 MJ/m³(N)
Propane : 93.7 MJ/m³(N)
46.4 MJ/kg
Butane : 118.9 MJ/m³(N)
45.7 MJ/kg

2. The allowable values below shall be provided as an error.
- Error of boiler efficiency… ±1%
- Error of combustion quantity (input)… ±3.5%

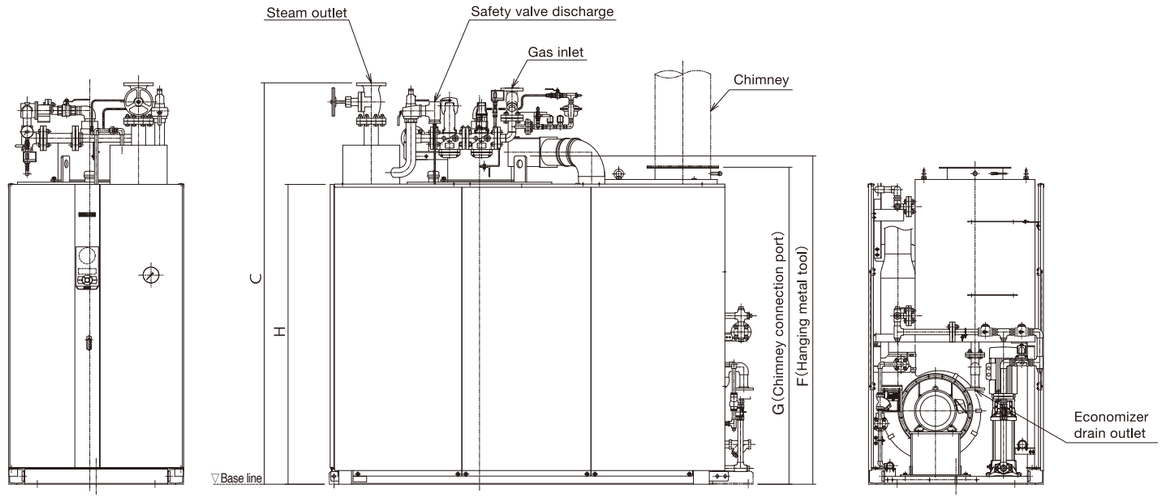
3. It is recommended to use a feed water temperature of more than 55°C.
4. Please made sure to supply gas in stable pressure at boiler inlet regarding standard gas pressure specification.
5. A power supply of 100 VAC (1φ) is required when controlling a water softener separately using a boiler controller.
6. For the diameter of a power lead-in wire, the wiring distance is assumed to be within 15 m at an ambient temperature of 40°C.
7. For the sake of improvement, the contents of specifications may be subject to change without prior notice.

Outline dimensions





	SE-2000APG	SE-2500APG	SE-3000APG
A	990		1,100
B	2,644	2,661	
C	2,443	2,523	
D	2,380		2,400
E	547		
F	2,009	2,064	
G	1,733	1,993	
H	1,885		
Feed water inlet	32A		
Gas inlet	40A		
Steam outlet	65A	80A	
Safety valve discharge	50A		
Boiler blowdown outlet	25A		
Economizer drain outlet	40A		
Chimney	φ300	φ350	



The shape of boiler is different depending on Model and Specification.
This drawing is SE-3000APG model.

SAFETY & STATE EYE

We are seeking for safety and security,
and it is easy to check the boiler status and situation!

SAFETY EYE
Indicate boiler operating condition in real time

- **Light off** — Stand-by
- **Blink** — Combustion starting
- **Light on** — Combustion operating (Flame detected)

- **Light off** — Normal
- **Blink** — Error (Buzzer sound)
- **Light on** — Error (Buzzer stop)

- **Light off** — Normal
- **Blink** — Inspection indicator operating
- **Light on** — Information indicator operating

STATE EYE
Indicate combustion process and water level condition in real time

Combustion process

Pilot combustion | Low combustion | Middle combustion | High combustion

Water level condition

Low water level | Feed water control level | High water level

Feed water control improve from two-stage to multi-stage method!

We adopted feed water multi-position

To measure the change of feed water flow, which is occurred by the difference of operating pressure, by the instantaneous value of feed water flowmeter.
And adjust the rotation speed of feed water pump by multi stage control in order to keep the feed water within the constant flow range.

Save the electricity consumption, and Keep stable the steam pressure

Improve from Belt method to Direct connection method

High speed fan motor

High performance Fan is provided, which Fan is directly connected between new inverter of high speed rotation and Impeller.
Improve the acceleration, the deceleration and also improve the load followability by high speed multi control.

Advanced Safety

Stepping up combustion monitoring & dual processor

Double check the normal operation by following ways, one is to check the rotation of Fan and damper open degree at each combustion position, another is to check the wind pressure switch and sensor.
To check the open-close condition of fuel valve by continuous measurement of instantaneous value of fuel flowmeter.

Dual processor is loaded

Two independent CPU mutually monitor the operating condition concerned to combustion, input/output condition and reliability of safety backup system.
We improve Fail-Safe backup system much stronger.

SAVING ENERGY

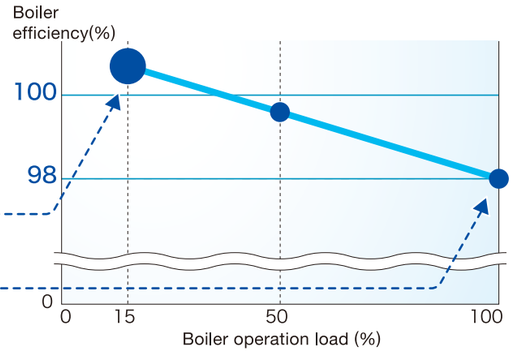
High efficiency

Max. boiler efficiency over 100%!

98% rated operation efficiency is standard thanks to new design economizer and Samson unique micro furnace body. More than 100% efficiency can be achieved in low combustion operation due to allowance of heating surface comparing with combustion amount.

In low boiler load **OVER 100%!**

98% rated operation efficiency is standard.
Efficiency based on "Boiler spec labeling standard" by Japan small type once-through boiler association.



High turn-down

1:7 wide combustion, saving energy operation with few stand-by

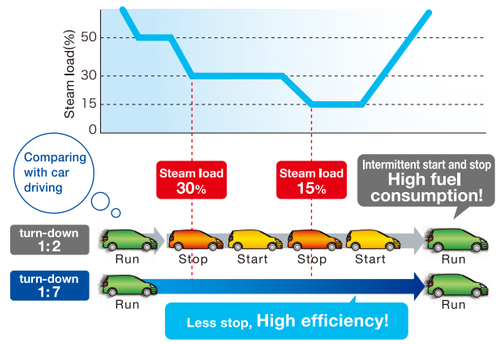
Burner with wide turn down(ratio of maximum combustion - minimum combustion) has wide combustion range, so that efficient operation can be achieved even during boiler load is low.
You can save energy because of less purge heat loss.

Advantage for environment and fuel consumption with high efficiency and high turn-down

Fuel reduction **JPY 800,000/year**

CO_2 reduction **30 tons/year**

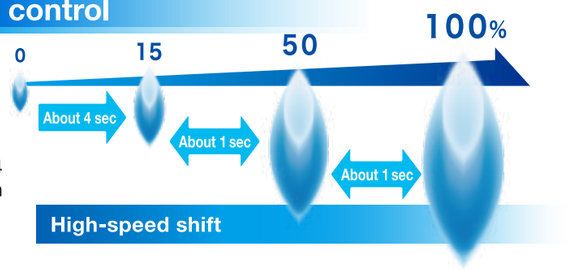
[Estimation condition] 1 unit of SE-3000APG(300days/year, 12hr/day, 30% load operation)
Comparison in boiler efficiency 96% VS 98%, turn-down ratio 1:2 VS 1:7



High-speed multi position combustion control

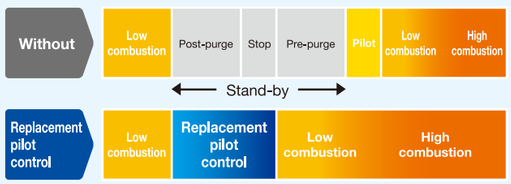
Quick combustion shift is no waste

High-speed multi position combustion control includes 4 combustion position as standard, and can shift to each standard in less than 1 second.



● Replacement pilot control(Optional)

With replacement pilot control(Optional), it is possible to follow up load variation, because the boiler operate stand-by mode that ignite the pilot burner at main burner combustion stop, then main burner start to combust without pre-purge about 4 sec after combustion request.



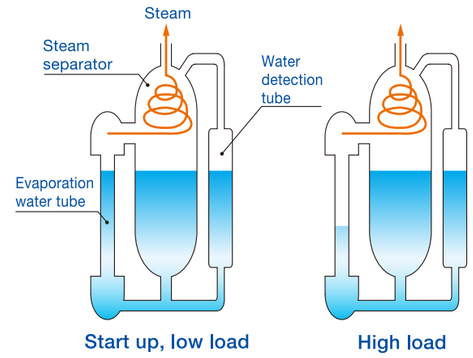
High dryness

Save energy with "High dryness steam" and "High condense operation"!

(measured value)

Dryness of steam **More than 99.5%**

Water level changes referring boiler load and level of water condense to keep high steam dryness.



High dryness steam ··· Supply high dryness steam

Advanced water level control system helps to obtain stable supply of high dryness steam in low - high load.

● What is the advantage of "High dryness steam"?

① **Energy saving operation**
- High dryness steam has more latent heat than wet steam, so that total steam consumption can be reduced.
- Amount of drain from steam trap can be reduced.

② **Less harmful to user machine**
- Less steam hammer.
- Low risk of alkali corrosion.

High condense operation ··· It is possible to run boiler with highly condensed water

In general, carry-over is likely to happen as condensation of boiler water becomes high and dryness of steam will be low. Thus, it is common to operate boiler with low condense water with high blow rate.
SE series has unique water level control and high performance steam separator to obtain high steam dryness even with high condense water.

● What is the advantage of "High condense operation"?

It is possible to operate boiler with high electric conductivity water to lower blow rate. Saving energy with less waste water.

Advantage of high dryness steam
Dryness of steam **1.5%**
SE 99.5% (Other company 98%)

+

Advantage of high condense operation
Blow rate **3%**
SE 5% (Other company 8%)

Energy Saving

With "High dryness steam" and "High condense operation", You can save cost and contribute to environment.

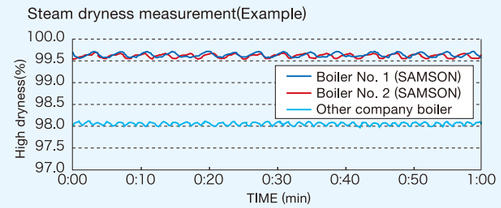
Fuel Saving **JPY 660,000/year**

CO_2 reduction **25t/year**

[Estimation condition]
- Electric conductivity 20mS/m
- Condensate level standard (SE) 400mS/m*
- Condensate level standard (Other company) 250mS/m
- Steam amount 15,000t/year (SE-3000APG × 6unit, 300day/year, 12h/day, boiler load 30%)
- Fuel price: JPY 60/㎥(N)〔13A〕

*Depending on feed water quality

Steam dryness measurement(Example)



SAVING ENERGY

Saving energy

Inverter control as standard for fan motor and feed water pump

Cut electric consumption to 1/4 for fan motor.
Less electric consumption and long-life feed water pump.

● Fan motor inverter control

Saving energy by adjusting fan motor rotation speed for boiler combustion position.

● Feed water inverter control

If boiler operation pressure is low after overall blow or feed water timing, decreasing feed water pump rotation speed make less electric consumption, protect water flow meter and feed water pump, less cavitation.

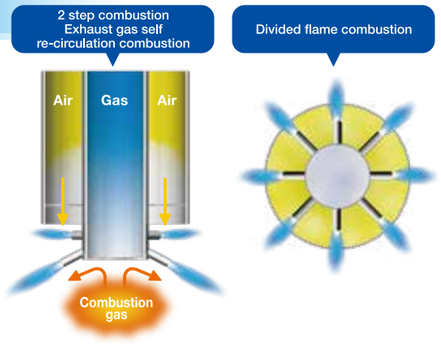
High performance burner

SUPER-LOW-NOx nozzle mix burner

Less than 40ppm

Condition: O_2=0%value, 13A actual measure, room temp. 30°C celsius, humidity 65%.
NOx value changes by fuel condition, room temp., humidity.

Achieved high output and high turn-down with environment friendly burner.
Burner type is nozzle mix. No air filter needed, no trouble with daily maintenance for filter check / cleaning.



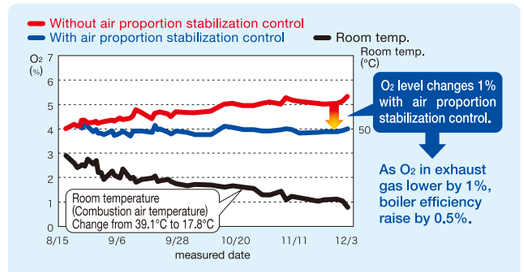
Air proportion stabilization control

Automatic air ratio control in best value through all season

Offset wind amount correspondence to air temp. to stable combustion and saving energy.

Summer ➡ Temp.: raise ➡ Air density: lower ➡ Low air ratio
➡ Raise fan motor frequency
[Avoid combustion fail due to low air ratio (lack of air)]

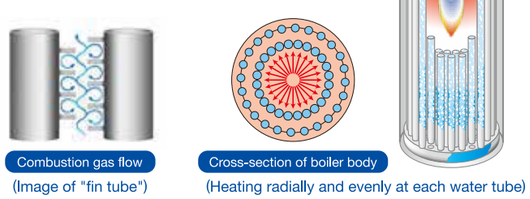
Winter ➡ Temp.: lower ➡ Air density: raise ➡ High air ratio
➡ Lower fan motor frequency
[Avoid lowering efficiency due to high air ratio (too much air)]



High efficiency, Long-life boiler body

Adopt new micro-furnace boiler body

High efficiency heat transfer by adopting fin water tube which is invented for low pressure drop of combustion gas.
Boiler body has the furnace with round-positioned water tube. Heat from combustion gas is transferred to each water tube equally. No particular water tube is overheated so that you can enjoy long-life of boiler.



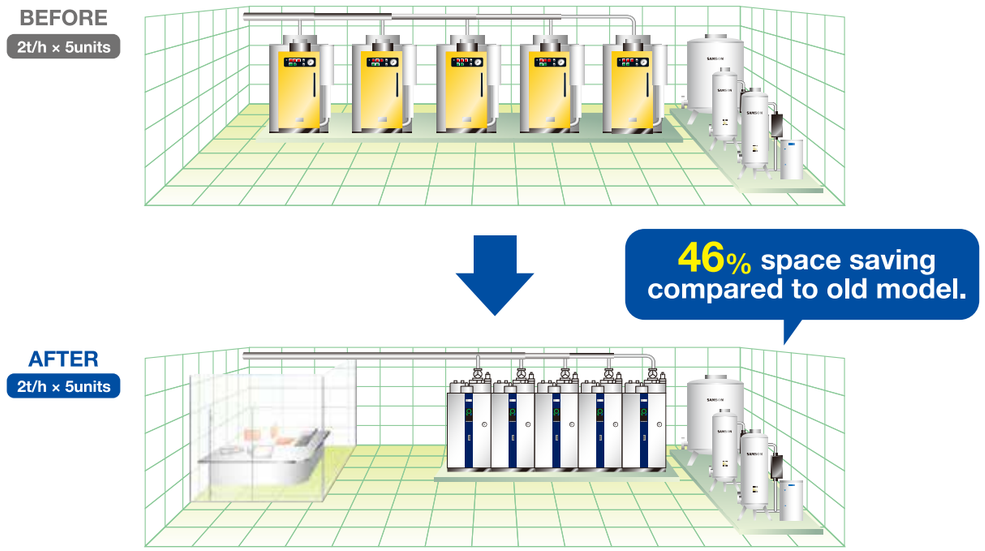
COMFORTABLE AND SAFETY

Saving space & Low cost

Saving space by close placement

Efficient space by close placement.
Save more space with big capacity 3t/h boiler.

● Saving space close placement



Safety

Multiple safe design

Fail safe··· Fail safe design water level control and combustion control

Installed multiple safe device as low-water cut off device, safety valve etc.
More high level safeness with fail safe design feed water control and combustion control.

High reliability with equipped sensors.

- Low water sensor × 2 units
- Steam temperature sensor
- Gas pressure switch
- Exhaust gas temperature sensor
- Wind pressure sensor
- Steam pressure sensor
- Boiler body thermo
- Electric conductivity sensor
- Boiler water temperature sensor

etc.

Prevention method··· Output check point before it breaks

Display check point before output errors.

- Exhaust gas temperature inspection
- Exhaust gas temperature sensor inspection
- Combustion air temperature sensor inspection
- Overall blowdown inspection (Automatic overall blowdown control)*
- Water-level electrode rod inspection
- Steam pressure sensor inspection
- Water tube temperature sensor inspection
- High water level inspection (Pure water specification)*
- Chemical injection inspection
- Electric conductivity sensor inspection
- Concentrated blowdown inspection

etc.

*Option

System Flow

We, SAMSON propose and support total system of boiler

Return drain water from steam piping in the factory

Steam

Delivery to the equipment consuming steam

Steam header

Drainage

Filter

Industrial water
Ground water

Feed water
Tap water

Water softener

Deaerator

Feed water tank

Chemical injection pump

Deaerator

It remove dissolved oxygen in the feed water. And it prevent the boiler, steam piping and steam required equipment from corrosion. We can supply not only membrane but nitrogen substitution type and Heating deaerator system.

Water treatment chemicals for boiler SAMCLEAN

Water Analysis
We suggest optimum water treatment equipment depending on water quality and boiler operating condition.

Our multi-purpose boiler chemicals have a function to prevent scale sticking and corrosion, adjust pH, and disperse sludge. Please use Sam-clean series to keep the boiler good condition for long time.

*We might be unable to export due to the regulation of your country. Please contact us for confirmation.

SAMCLEAN S-125