For more information, please contact the following offices.

NIPPON THERMOENER CO., LTD.

Headquarters: 3-2-10 (Shirokanedai Building), Shirokanedai, Minato-ku, Tokyo 108-0071 Japan
Tel: +81-3-6408-8251 (switchboard number)　Fax: +81-3-6408-8278

https://www.n-thermo.co.jp

Hokkaido branch office
Sapporo Branch
TEL+81-11-789-5281
Asahikawa sales office
TEL+81-166-21-5770
Kushiro sales office
TEL+81-154-31-9211
Hakodate sales office
TEL+81-138-87-5001

Tohoku branch office
Sendai Branch
TEL+81-22-244-5181
Yamagata sales office
TEL+81-23-629-7378
Koriyama sales office
TEL+81-24-990-1852
Morioka branch
TEL+81-19-635-3366
Akita sales office
TEL+81-18-887-5630

Southern Kanto branch office
Tokyo branch
TEL+81-3-6408-8260
Tachikawa sales office
TEL+81-42-535-8701
Yamanashi sales office
TEL+81-55-242-2570
Yokohama branch
TEL+81-45-948-3911
Atsugi sales office
TEL+81-46-221-1911
Chiba branch
TEL+81-43-235-0071
Mito sales office
TEL+81-29-244-5720
Tsukuba sales office
TEL+81-29-833-6155

Northern Kanto branch office
Saitama Branch
TEL+81-48-660-2331
Utsunomiya sales office
TEL+81-28-613-0331
Takasaki branch
TEL+81-27-350-7230
Matsumoto sales office
TEL+81-263-48-3815
Nagano sales office
TEL+81-26-286-0341
Niigata branch
TEL+81-25-283-0171
Nagaoka sales office
TEL+81-258-20-5202

Chubu branch office
Nagoya Branch
TEL+81-52-509-5211
Mie sales office
TEL+81-59-213-5980
Hokuriku branch
TEL+81-76-223-4001
Toyama sales office
TEL+81-76-421-1131
Shizuoka branch
TEL+81-54-245-0253
Hamamatsu sales office
TEL+81-53-464-0253

Kansai branch office
Osaka Branch
TEL+81-6-6488-2233
Takamatsu sales office
TEL+81-87-864-5755
Kobe branch
TEL+81-78-579-6150
Himeji sales office
TEL+81-79-281-6227
Minami-Osaka branch
TEL+81-72-226-5165
Kyoto branch
TEL+81-75-935-2541

Chugoku branch office
Chugoku Branch
TEL+81-82-503-1606
Okayama sales office
TEL+81-86-800-7700
Sanin sales office
TEL+81-859-34-6577
Yamaguchi sales office
TEL+81-83-972-2666

Kyushu branch office
Kyushu Branch
TEL+81-92-711-1511
Kitakyushu sales office
TEL+81-93-963-5550
Oita sales office
TEL+81-97-554-2322
Kumamoto sales office
TEL+81-96-328-9811
Kagoshima sales office
TEL+81-99-255-3801

Kyoto plant
TEL+81-75-935-2500

Kanto plant
TEL+81-29-833-6110

AFFILIATES

NTEC Chemical CO., LTD.
NTEC Engineering CO., LTD.
NTEC Service CO., LTD.
NIPPON THERMOENER (THAILAND) CO., LTD.
TEL+66-(0)2-653-0660

ISO 9001 certified
JQA-QMA14830
Nippon Thermoener Co., Ltd.
Headquarters
Kyoto Plant
Kanto Plant

ISO 14001 certified
Nippon Thermoener Co., Ltd.
Kyoto Plant
JQA-EM0253
Kanto Plant
JQA-EM0253A

● Please note that the descriptions are subject to change without prior notice.

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2023.03R

NTEC

Once-through Boiler Series

super Eqos

EQI/EQO-Series

EQOS Steam Boiler

GAS EQi (H) Series

OIL EQI (H) Series / EQO Series

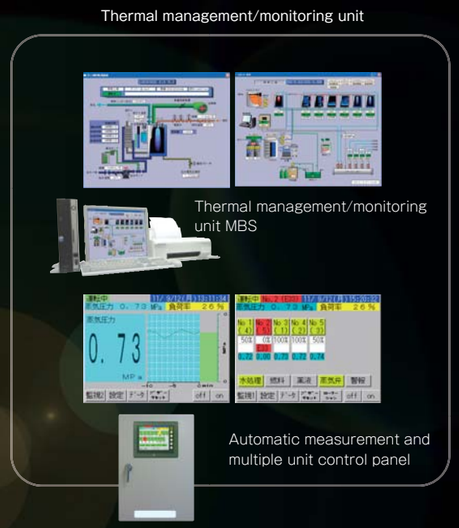
NIPPON THERMOENER CO., LTD.

“Super EQOS” Series, high-end models pursuing high efficiency and excellent functions

Realizes higher levels of performance, leading to a new stage of once-through boilers

“Higher Levels of Performance”

- Load following capability
- Steam dryness
- Boiler efficiency
- Combustion control



System flow (example)

1 Water softener

This device thoroughly removes substances in raw water that increase the water hardness and cause scale to adhere to the boiler without troubling users. The high-performance water hardness leakage sensor strengthens reliability by regularly checking the water hardness when water is passed and immediately switching the water softener to another one if water hardness leakage is detected.

2 Feedwater tank

Feedwater deaeration and boiler water supply are automated. Of course, an opening for drain recovery is provided and can be used together. The tank is made of stainless steel, which is resistant to rust.

3 Nitrogen gas type deoxygenation device

Utilizes a method to blow in nitrogen gas into the water and remove other gases. When water contacts nitrogen gas, dissolved oxygen in the water moves to air bubbles of the nitrogen gas that have a lower oxygen partial pressure.

4 Chemical feeding equipment

By injecting a water treatment chemical (Thermo Fresh), this device treats scale and a s light amount of substances increasing the water hardness that cannot be treated by the water softener.

5 Pure chemical Thermofresh

This pure chemical for (simplified / compact / large) once-through boilers prevents various failures and troubles caused by water and supports their stable operation for a long period of time.

6 Carbon dioxide pH neutralization device

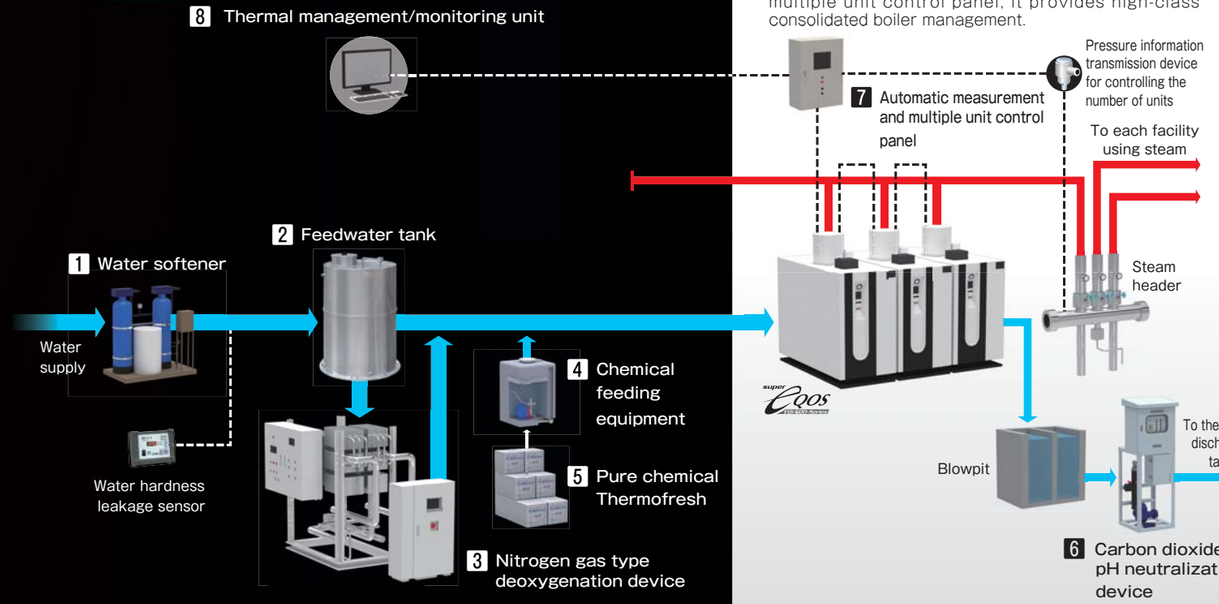
Delivers superior performance in pH treatment of boiler blow-down water. A proprietary technique of controlling the inside of the pipe provides a high mixing rate, and easy operations and maintenance are realized. In addition, this space-saving device can easily be installed both indoors and outdoors.

7 Automatic measurement and multiple unit control panel

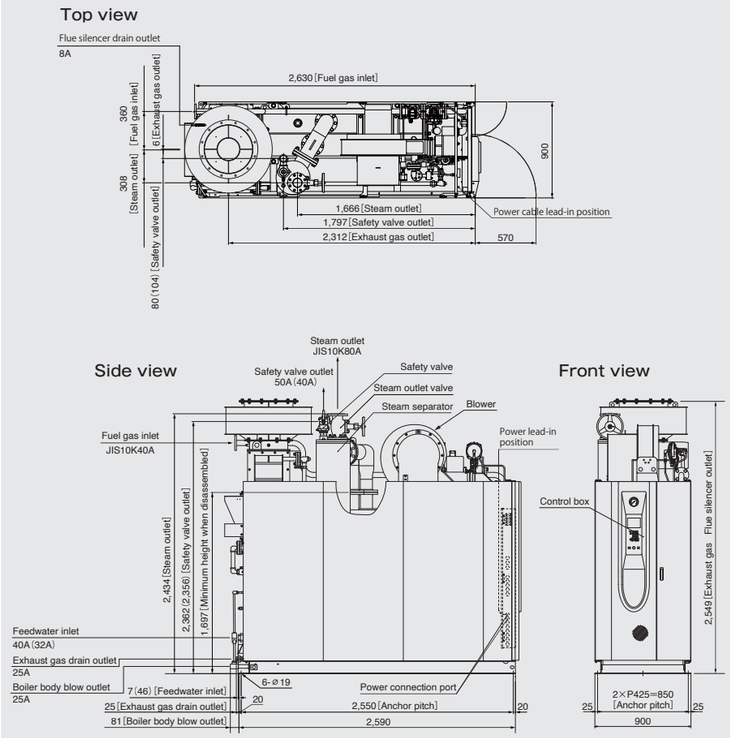
For multiple boilers, this device properly controls operation of each boiler according to the steam load.

8 Thermal management and monitoring unit

In combination with the automatic measurement and multiple unit control panel, it provides high-class consolidated boiler management.



External dimensional drawing (unit: mm)



* Values in ( ) show dimensions of EQi-2000.

EQi-2000・2500NM/LM

Once-through boiler Conversion evaporation: 2,000/2,500kg/h

■Specifications

Item		Model※1	EQi-2000NM/LM	EQi-2500NM/LM
Performance	Conversion evaporation	kg/h	2,000	2,500
	Actual evaporation	kg/h	1,676	2,096
	Thermal output	kW	1,254	1,567
	Heating surface area	m^2	9.8	
	Maximum working pressure	MPa	0.98	
	Boiler efficiency	%	99	
	Holding water quantity	L	200	
	Max combustion capacity (input)	kW	1,267	1,583
	Fuel consumption LNG	m^3(N)/h	112.3	140.4
	Fuel consumption Propane	m^3(N)/h	48.7	60.8
	Fuel consumption Propane	kg/h	98.3	122.8

Item			Model※1	EQi-2000NM/LM	EQi-2500NM/LM
Performance	Power source			Three phase, AC 200V, 50/60Hz	
	Facility electric power		kW	9.4	10.9
	Sub - Items	Feedwater pump motor		2.2	3.7
		Blower motor		7.0	
		Control box		0.2	
Connecting pipe diameter	Fuel inlet		A	40	
	Feedwater inlet			32	40
	Steam outlet			80	
	Safety valve discharge outlet			40(80)	50(80)
	Exhaust gas outlet		φmm	400(Flue silencer outlet)	450(Flue silencer outlet)
Product weight			kg	2,500	2,600

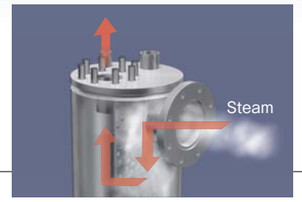
Notes:
1. The actual evaporation is the value for the saturated steam at 15°C feedwater temperature and 0.49MPa steam pressure.
2. The boiler efficiency value is calculated by the heat loss scheme provided in JIS B 8222-2023. However, the calculation is made under the following conditions. 0.49MPa steam pressure, 15°C feedwater temperature, 35°C charge air temperature
3. The margins of error are as follows:
   ・Boiler efficiency error: ±1% (point)　・Combustion capacity error: ±3.5%
4. The fuel consumptions are calculated based on the following fuel lower calorific values:
   LNG : 40.6MJ/m^3 (N)
   Propane : 93.7MJ/m^3 (N), 46.4MJ/kg
5. Install the gas piping so as to ensure a sufficient feed gas pressure, even while the boiler is running, stopped, or other gas equipment is being operated.
   Supply gas pressure: 0.035 to 0.3Mpa
6. The main unit of the boiler come with an economizer. Be sure to set the feedwater temperature to 50℃ or higher.
7. If the feedwater temperature is high when, for example, collecting the drain water, fuel consumption may be reduced as the standard of actual evaporation.
8. The diameter of the safety valve discharge outlet shown between parentheses applies piping for blowing outdoors.
9. Maximum combustion capacity (input) is computed based on the standard lower calorific value.
10. The silencer for the flue is included as standard. The position to connect the flue is the outlet of the silencer for the flue.

*1. The model display is as follows
EQi-2000□M
N: LNG
L: Propane

POINT 1 Supplies high-quality steam

A combination of the advanced water level control according to two parameters of the combustion capacity and pressure, and the newly designed baffle plate type separator has realized resistance to load fluctuations and stable steam dryness of 99% or more.

Steam dryness **99% or more**



POINT 2 Super high efficiency & reduced electricity consumption

Combustion at a low fuel-air ratio contributed to achieving industry leading boiler efficiency of 99%. Tightening air supply for combustion means that there is no need to heat redundant air exceeding the amount of air necessary for combustion, leading to improvement in boiler efficiency.
With combustion at a low fuel-air ratio, energy consumption for operating the blower has been reduced by 10% as compared with conventional products. In addition to this, the inverter controls the number of rotation according to the boiler load, which largely reduces energy consumption for the blower during a low load operation. Saving fuel and electricity consumption contributes to reducing CO_2 emissions as well as operation costs.

Boiler efficiency **99%**

Partial load efficiency **100%** (load factor: 20%)

Turndown ratio **5:1*** (four-level control)

* The turndown ratio represents a ratio between the rated (maximum) combustion capacity and smallest combustion capacity. When it is 5:1, the combustion capacity can be reduced to 20%.

Reduction in operation costs and CO_2 emissions when using EQi-2500

Annual load factor	30%
Boiler efficiency	99%
Annual fuel saving amount	7,000m³N
Fuel-air ratio for combustion (exhaust gas O_2 concentration)	1.17(O_2=3.0%)
Energy for activating the blower	5.8kW
Energy consumption saved in a year	Approx. 1,300kWh
LNG CO_2 emissions factor	2.08kg-CO_2/m³N
Electricity CO_2 emissions factor	0.555kg-CO_2/kWh
CO_2 emissions reduced in a year	Approx. 16t-CO_2

CO_2 emissions factor: According to "Calculation Method of Greenhouse Gas Emissions" by Ministry of the Environment

POINT 3 Space saving design

With an installation width of 900mm, which is the smallest level in the industry, a slender boiler package with a compact body has been realized.

Overall width **900mm**

POINT 4 Combustion with super low emissions reduces burden to the environment

In combustion at a low fuel-air ratio in which air supply for combustion is tightened, reducing emissions of CO and NOx has been extremely difficult with conventional techniques. The jet film combustion technique, however, contributed to achieving super low emissions which are at NOx=25ppm and CO=30ppm levels in combustion at a low fuel-air ratio. This is a revolutionary gas emission performance that greatly surpasses existing combustion technologies.

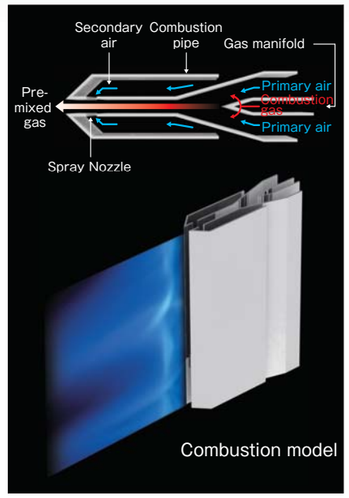
Jet film combustion® is adopted

At a low fuel-air ratio, **low NOx 25ppm CO 30ppm**

* These values change depending on the actually measured value of LNG and operating condition.

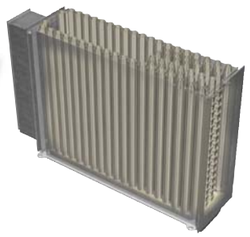
NOx emissions of EQi-2000/2500

	NOx emissions (O_2=0% conversion value)
Fuel-air ratio for combustion (exhaust gas O_2 concentration)	EQi-2000 · 2500
1.35(O_2=5.5%)	10ppm
1.25(O_2=4.2%)	15ppm
1.17(O_2=3.0%)	25ppm



POINT 5 Boiler body with low pressure drop and high efficiency

By further optimizing rectangle-shaped combustion chamber and water pipes (arranged heat-conductive water pipes adopting the downflow system), which are our proven technologies used in the conventional models, the boiler body structure ensuring high efficiency and a low level of pressure drop has been realized.



Boiler body enabling high efficiency and a low fuel-air ratio is adopted

GAS OIL

EQi series comes standard with the S-Navi system

System management for safer and securer maintenance…

Navigation with a color LCD displaying the boiler operation status and management information

This control system not only has an advanced function to enable the boiler to perform heat management and control for efficient steam generation (named "Steaming") by itself but also gives our customers easily-understandable directions to access boiler management information and guidance for boiler operations with a color LCD.
In addition to boiler control, operators can obtain information that goes into the boiler management area with easy operations on this system.

EQi(H)-3000NM/LM

Once-through Boiler Conversion evaporation: 3,000kg/h

■Specifications

Item			Model※1	EQi-3000NM/LM	EQiH-3000NM/LM	
					1.57MPa spec	1.96MPa spec
Performance	Conversion evaporation		kg/h	3,000		
	Actual evaporation		kg/h	2,515	2,487	2,479
	Thermal output		kW	1,881		
	Heating surface area		m²	9.85	14.2	
	Maximum working pressure		MPa	0.98	1.57	1.96
	Boiler efficiency		%	99	99	
	Holding water quantity		L	200	290	
	Max combustion capacity (input)		kW	1,900	1,900	
	Fuel consumption	LNG	m³(N)/h	168.5	168.5	
		Propane	m³(N)/h	73.0	73.0	
			kg/h	147.4	147.4	

Item			Model※1	EQi-3000NM/LM	EQiH-3000NM/LM	
					1.57MPa spec	1.96MPa spec
Performance	Power source			Three phase, AC 200V, 50/60Hz		
	Sub - items	Facility electric power	kW	14.9	18.7	
		Feedwater pump motor		3.7	7.5	
		Blower motor		11.0		
		Control box		0.2		
Connection pipe diameter	Fuel inlet		A	40		
	Feedwater inlet			40		
	Steam outlet			80	65	
	Safety valve discharge outlet			50(80)	32(65)	
	Exhaust gas outlet		φmm	400		
Product weight			kg	2,900	3,230	

Notes: 1. The actual evaporation is the value for the saturated steam under the following conditions:
0.98MPa spec: 15℃ feedwater temperature, 0.49MPa steam pressure
1.57MPa spec: 15℃ feedwater temperature, 1.18MPa steam pressure
1.96MPa spec: 15℃ feedwater temperature, 1.57MPa steam pressure
2. The boiler efficiency value is calculated by the heat loss scheme provided in JIS B 8222-2023. However, the calculation is made under the following conditions.
0.98MPa spec: 0.49MPa steam pressure, 15℃ feedwater temperature, 35℃ charge air temperature
1.57MPa spec: 1.18MPa steam pressure, 15℃ feedwater temperature, 35℃ charge air temperature
1.96MPa spec: 1.57MPa steam pressure, 15℃ feedwater temperature, 35℃ charge air temperature
3. The margins of error are as follows:
Boiler efficiency error: ±1% (point) Combustion capacity error: ±3.5%
4. The fuel consumptions are calculated based on the following fuel lower calorific values:
LNG : 40.6MJ/m³ (N)
Propane : 93.7MJ/m³ (N), 46.4MJ/kg
5. Install the gas piping so as to ensure a sufficient feed gas pressure, even while the boiler is running, stopped, or other gas equipment is being operated.
Supply gas pressure: 0.03 to 0.3MPa
6. The main unit of the boiler come with an economizer. Be sure to set the feedwater temperature to 50℃ or higher.
7. If the feedwater temperature is high when, for example, collecting the drain water, fuel consumption may be reduced as the standard of actual evaporation.
8. The diameter of the safety valve discharge outlet shown between parentheses applies piping for blowing outdoors.
9. Maximum combustion capacity (input) is computed based on the standard lower calorific value.

*1.The model display is as follows
EQiH-3000□M
N : LNG
L : Propane
H : High pressure
None: Standard

POINT 1

Large energy savings with highly efficient operations

Boiler efficiency **99**%

Turndown ratio **5:1*** (four-level control)

The combustion control at four levels, 0-20-60-100%, largely improves efficiency when a load of 20 to 30% is applied. Eliminating unnecessary activations and stops largely saves energy consumption.

* The turndown ratio represents a ratio between the rated (maximum) combustion capacity and smallest combustion capacity. When it is 5:1, the combustion capacity can be reduced to 20%.

POINT 2

Stable supply of high-quality dried steam

Steam dryness **99**% or more

The water level control according to the steam pressure and combustion capacity enables stable supply of dried steam.

POINT 3

Comfortable silence design

POINT 4

Fan inverter included as standard

The blower and feedwater pump are controlled with the fan inverter.

POINT 5

Low NOx emissions reduce burden to the environment

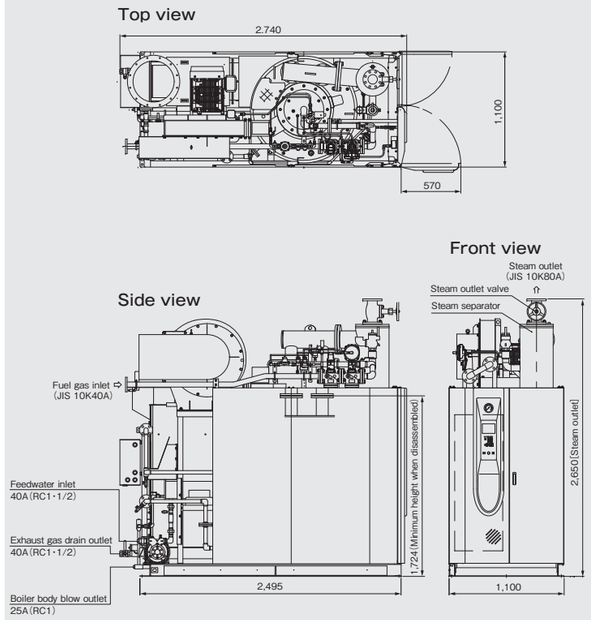
NOx emissions = **60**ppm or less (O_2=0% conversion value)

With the pre-mixed and separated flame burner, the NOx emissions is 45ppm or less in a rated operation. (when the LNG type is used)

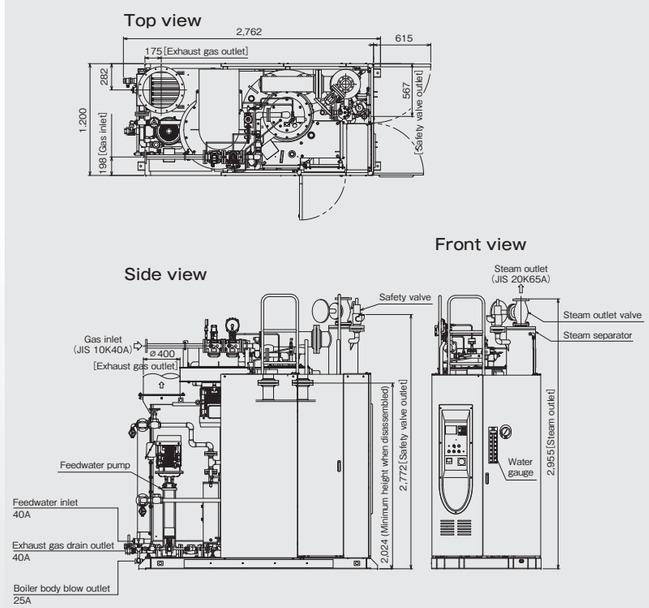
* This value changes depending on the actually measured value of LNG and operating condition.

External dimensional drawing (unit: mm)

■0.98Mpa specifications

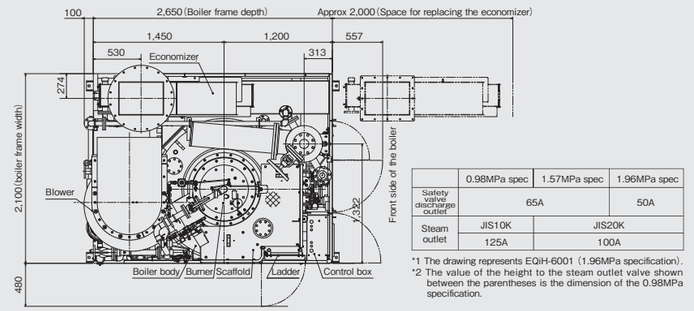


■1.57/1.96Mpa specifications



External dimensional drawing (unit: mm)

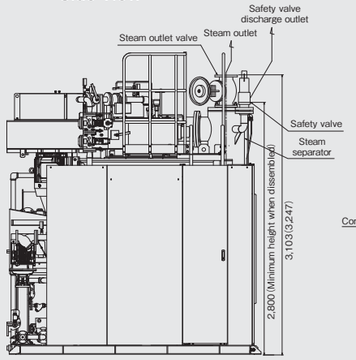
Top view



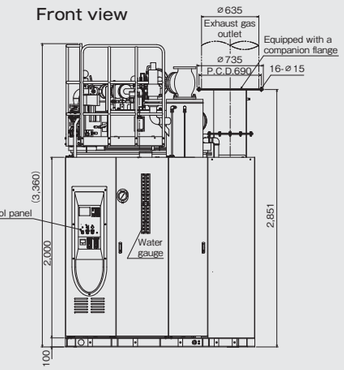
		0.98MPa spec	1.57MPa spec	1.96MPa spec
Safety valve discharge outlet		65A		50A
Steam outlet		JIS10K	JIS20K	
		125A	100A	

*1 The drawing represents EQiH-6001 (1.96MPa specification).
*2 The value of the height to the steam outlet valve shown between the parentheses is the dimension of the 0.98MPa specification.

Side view



Front view



EQi(H)-6001NM/LM

Once-through boiler Conversion evaporation: 6,000kg/h

■Specifications

Item			Model*1	EQi-6001NM/LM	EQiH-6001NM/LM	
					1.57MPa spec	1.96MPa spec
Performance	Conversion evaporation	kg/h		6,000		
	Actual evaporation			5,029	4,973	4,958
	Thermal output	kW		3,762		
	Heating surface area	m^2		25.3		
	Maximum working pressure	MPa		0.98	1.57	1.96
	Boiler efficiency	%		99	98.5	
	Holding water quantity	L		670		650
	Max combustion capacity (input)	kW		3,800	3,819	
	Fuel consumption	LNG	$m^3(N)/h$	336.9	338.6	
		Propane	$m^3(N)/h$	146.0	146.7	
			kg/h	294.8	296.3	

Item			Model*1	EQi-6001NM/LM	EQiH-6001NM/LM	
					1.57MPa spec	1.96MPa spec
Performance	Power source			Three phase, AC 200V, 50/60Hz		
	Facility electric power		kW	27.7	29.7	33.2
	Sub - items	Feedwater pump motor		5.5	7.5	11.0
		Blower motor		22.0		
		Control box		0.2		
Connecting pipe diameter	Fuel inlet		A	50		
	Feedwater inlet			50		
	Steam outlet			125	100	
	Safety valve discharge outlet			65(100)		50(80)
	Exhaust gas outlet		ϕmm	635 (Outer diameter)		
Product weight			kg	7,450	7,520	7,720

Notes:
1. The actual evaporation is the value for the saturated steam under the following conditions:
   0.98MPa spec: 15℃ feedwater temperature, 0.49MPa steam pressure
   1.57MPa spec: 15℃ feedwater temperature, 1.18MPa steam pressure
   1.96MPa spec: 15℃ feedwater temperature, 1.57MPa steam pressure
2. The boiler efficiency value is calculated by the heat loss scheme provided in JIS B 8222-2023. However, the calculation is made under the following conditions.
   0.98MPa spec: 0.49MPa steam pressure, 35℃ feed air temperature, 15℃ feedwater temperature
   1.57MPa spec: 1.18MPa steam pressure, 35℃ feed air temperature, 15℃ feedwater temperature
   1.96MPa spec: 1.57MPa steam pressure, 35℃ feed air temperature, 15℃ feedwater temperature
3. The margins of error are as follows:
   ・Boiler efficiency error: ±1% (point) ・Combustion capacity error: ±3,5%
4. The fuel consumptions are calculated based on the following fuel lower calorific values:
   LNG : 40.6MJ/m^3 (N)
   Propane : 93.7MJ/m^3 (N), 46.4MJ/kg
   *For information on the Butane-fired boilers, please contact our company.
5. Install the gas piping so as to ensure a sufficient feed gas pressure, even while the boiler is running, stopped, or other gas equipment is being operated.
   Supply gas pressure: 0.1 to 0.3MPa
6. The main unit of the boiler come with an economizer. Be sure to set the feedwater temperature to 50℃ or higher.
7. If the feedwater temperature is high when, for example, collecting the drain water, fuel consumption may be reduced as the standard of actual evaporation.
8. The diameter of the safety valve discharge outlet shown between parentheses applies piping for blowing outdoors.
9. Maximum combustion capacity (input) is computed based on the standard lower calorific value.
10. An electromagnetic feedwater flowmeter is adopted as standard. If the boiler feedwater has an electrical conductivity lower than 1mS/m, the flow rate cannot be measured in some cases. Please consult with our sales representative.

*1. The model display is as follows

EQiH-6001□M
- N: LNG
  L: Propane
- H: High pressure
  None: Standard

POINT 1 Industry leading super-highly efficient operation!

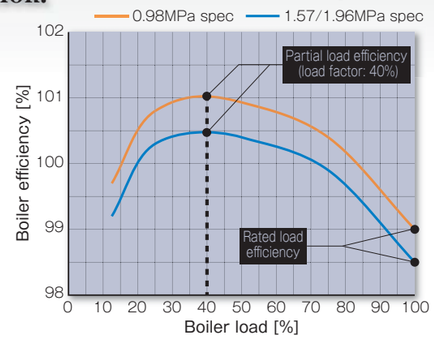
Boiler efficiency of 100% or more has been achieved during partial loading. The boiler does not repeat activations and stops even during a low steam load operation, which enables the high operation efficiency to be maintained.

Rated load efficiency **99%***

Partial load efficiency **101%*** (load factor: 40%)

* 0.98MPa specification (0.49MPa steam pressure, 35℃ feed air temperature, 15℃ feedwater temperature)

Partial load efficiency



POINT 2 PI control (pressure control)

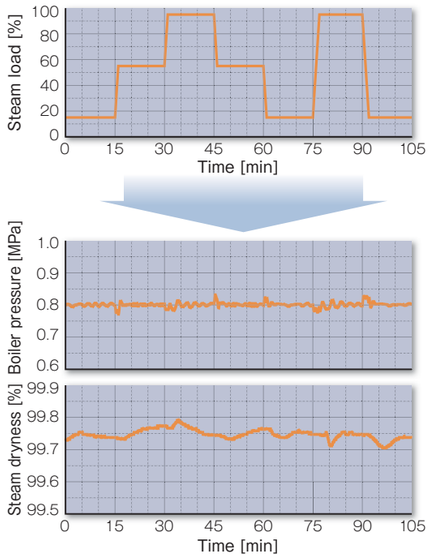
The pressure is controlled with the PI (proportional integral) control method, and the boiler pressure is stable regardless of whether the load keeps stationary or changes.

Range of pressure fluctuations when the load keeps stationary : ±0.005MPa

Range of pressure fluctuations when the load changes : ±0.025MPa

In addition, even when the load changes, the steam dryness is excellent and high-quality steam can be supplied.

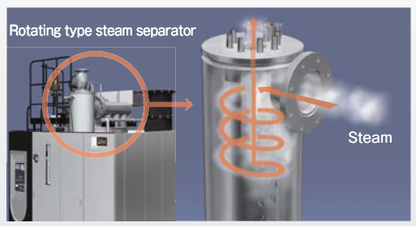
Steam pressure during automatic operation, steam dryness (with respect to the steam load)



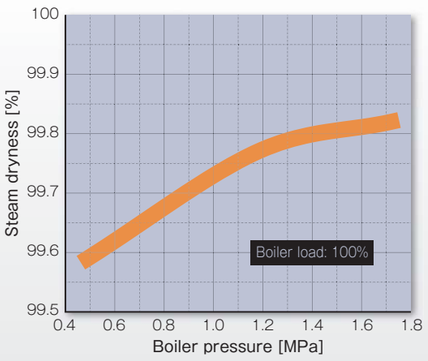
POINT 3 Stable supply of high-quality dried steam

In a wide range of the pressure, steam dryness of 99.5% or more has been achieved.

Steam dryness **99.5%** or more



Steam dryness during a rated operation (with respect to the boiler pressure)



POINT 4 Highly efficient operation reduces burden to the environment

By adopting a proportionally controlled burner having a high turndown ratio, the operation efficiency and load following capability at a low load operation have been improved.
The newly developed burner, which enables combustion at a low fuel-air ratio, contributed to achieving NOx emissions of 55ppm at a fuel-air ratio of 1.2. In addition, proportional control of the combustion capacity in a range of 12 to 100% finely responds to the load demand.

Turndown ratio **8:1*** (proportional control)

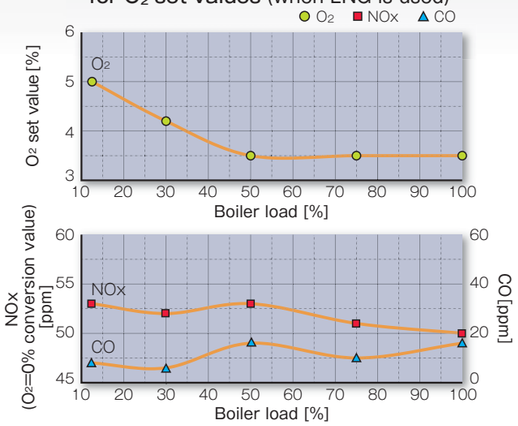
NOx= **55ppm** or less (when the LNG type is used)

Low fuel-air ratio **1.2**

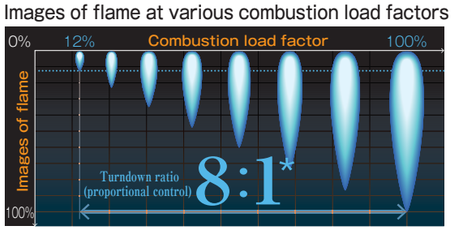
* The turndown ratio represents a ratio between the rated (maximum) combustion capacity and smallest combustion capacity. When it is 8:1, the combustion capacity can be reduced to 12.5%.

* These values change depending on the actually measured value of LNG and operating condition.

Converted NOx and CO values for O_2 set values (when LNG is used)



Images of flame at various combustion load factors

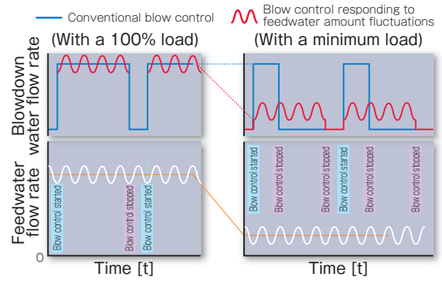


POINT 5 Blow control responding to feedwater amount fluctuations

Comes standard with the blow control mechanism responding to feedwater amount fluctuations

When continuous blowing is conducted, the amount of blowdown water is increased and decreased according to the amount of feedwater, which enables efficient heat recovery from blowdown water regardless of the boiler load.

Blow control

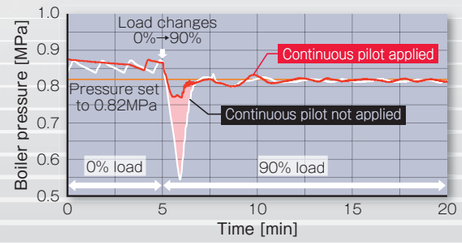


POINT 6 Continuous pilot control (option)

Excellent load following capability

Even when the load is increased from 0%, reduction of the boiler pressure can be minimized.

Load following capability in the continuous pilot mode



POINT 7 Comfortable silence design

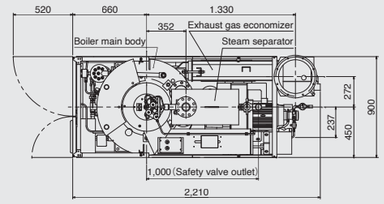
POINT 8 Enables multi-boiler setup

Space saving by **20%***

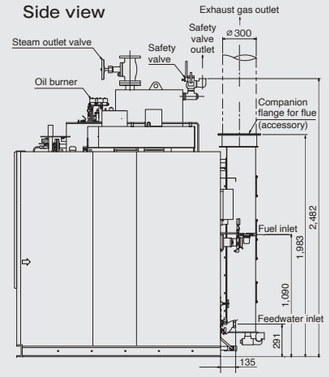
* As compared with our conventional products

External dimensional drawing (unit: mm)

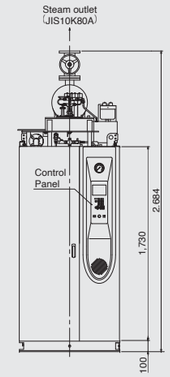
Top view



Side view



Front view



EQO-2000KMR/AMR

Once-through boiler Conversion evaporation: 2,000kg/h

■Specifications

Item			Model※1	EQO-2000KMR/AMR
Performance		Conversion evaporation	kg/h	2,000
		Actual evaporation		1,676
		Thermal output	kW	1,254
		Heating surface area	m²	9.65
		Maximum working pressure	MPa	0.98
		Boiler efficiency	%	97
		Holding water quantity	L	190
		Max combustion capacity (input)	kW	1,293
	Fuel consumption	Kerosine	kg/h	107.0
			L/h	133.7
		Fuel oil A	kg/h	109.0
			L/h	126.8

Item			Model※1	EQO-2000KMR/AMR
Performance		Power source		Three phase, AC 200V, 50/60Hz
	Sub - items	Facility electric power	kW	9.8
		Feedwater pump motor		2.2
		Blower motor		7.0
		Fuel oil burning pump motor		0.4
		Control box		0.2
Connecting pipe diameter		Fuel inlet	A	10
		Feedwater inlet		32
		Steam outlet		80
		Safety valve discharge outlet		40(80)
		Exhaust gas outlet	φmm	300
Product weight			kg	2,125

Notes: 1. The actual evaporation is the value for the saturated steam at 15℃ feedwater temperature and 0.49MPa steam pressure.
2. The boiler efficiency value is calculated by the heat loss scheme provided in JIS B 8222-2023. However, the calculation is made under the following conditions. 0.49MPa steam pressure, 15℃ feedwater temperature, 35℃ charge air temperature
3. The margins of error are as follows: Boiler efficiency error: ±1% (point) Combustion capacity error: ±3.5%
4. The fuel consumptions are calculated based on the following fuel lower calorific values: Kerosine: 43.5MJ/kg, density 0.80g/cm³ Fuel oil A: 42.7MJ/kg, density 0.86g/cm³
5. As to fuel oil A specification, JIS Class 1, No. 1 fuel (sulfur content not to exceed 0.5 weight percent, kinetic viscosity 3.75 mm²/s (at 50°C) or less) should be used.
6. The main unit of the boiler come with an economizer. Be sure to set the feedwater temperature to 50℃ or higher.
7. If the feedwater temperature is high when, for example, collecting the drain water, fuel consumption may be reduced as the standard of actual evaporation.
8. The diameter of the safety valve discharge outlet shown between parentheses applies piping for blowing outdoors.
9. Maximum combustion capacity (input) is computed based on the standard lower calorific value.

*1. The model display is as follows
EQO-2000□MR
K: Kerosine
A: Fuel oil A

POINT 1 Large energy savings with highly efficient operations

Boiler efficiency **97**%

Partial load efficiency **98**% (load factor: 30%)

Turndown ratio **5:1*** (four-level control)

The combustion control of 0-20-50-100%, which covers a wide range of combustion capacity, largely improves efficiency during a low load operation. Eliminating unnecessary activations and stops largely saves energy consumption.

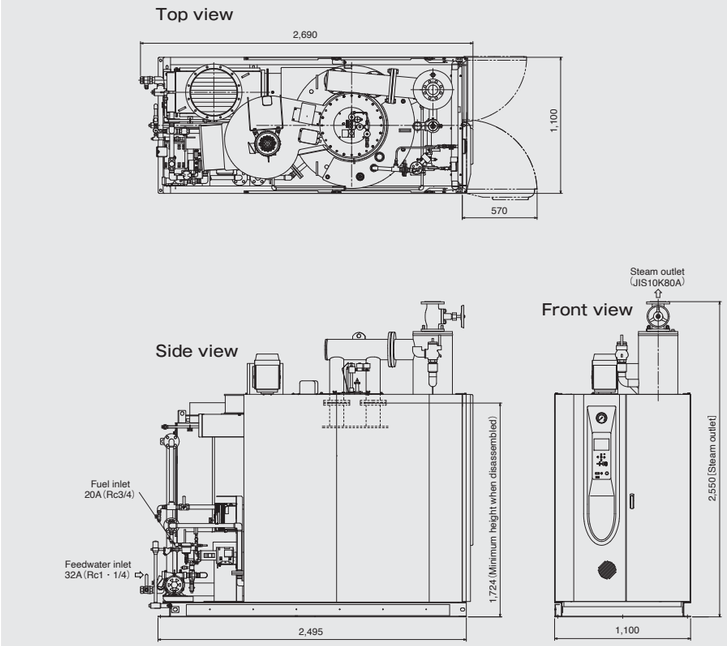
* The turndown ratio represents a ratio between the rated (maximum) combustion capacity and smallest combustion capacity. When it is 5:1, the combustion capacity can be reduced to 20%.

POINT 2 Improved functionality

Four-level combustion control realized improved functionality as compared with our conventional models.

POINT 3 Comfortable silence design

External dimensional drawing (unit: mm)



EQi-2501KM/AM

Once-through boiler Conversion evaporation: 2,500kg/h

■Specifications

Item			Model※1	EQi-2501KM/AM
Performance		Conversion evaporation	kg/h	2,500
		Actual evaporation		2,096
		Thermal output	kW	1,567
		Heating surface area	m²	9.85
		Maximum working pressure	MPa	0.98
		Boiler efficiency	%	96
		Holding water quantity	L	180
		Max combustion capacity (input)	kW	1,633
	Fuel consumption	Kerosine	kg/h	135.1
			L/h	168.9
		Fuel oil A	kg/h	137.6
			L/h	160.2

Item			Model※1	EQi-2501KM/AM
Performance		Power source		Three phase, AC 200V, 50/60Hz
	Sub - Items	Facility electric power	kW	10.7
		Feedwater pump motor		3.1
		Blower motor		7.0
		Fuel oil burning pump motor		0.4
		Control box		0.2
Connecting pipe diameter		Fuel inlet	A	20
		Feedwater inlet		32
		Steam outlet		80
		Safety valve discharge outlet		50(80)
		Exhaust gas outlet	φmm	380
Product weight			kg	2,400

Notes: 1. The actual evaporation is the value for the saturated steam at 15°C feedwater temperature and 0.49MPa steam pressure.
2. The boiler efficiency value is calculated by the heat loss scheme provided in JIS B 8222-2023. However, the calculation is made under the following conditions. 0.49MPa steam pressure, 15°C feedwater temperature, 35°C charge air temperature
3. The margins of error are as follows:
・Boiler efficiency error: ±1% (point) ・Combustion capacity error: ±3.5%
4. The fuel consumptions are calculated based on the following fuel lower calorific values:
Kerosine: 43.5MJ/kg, density 0.80g/cm³
Fuel oil A: 42.7MJ/kg, density 0.86g/cm³
5. As to fuel oil A specification, JIS Class 1, No. 1 fuel (sulfur content not to exceed 0.5 weight percent, kinetic viscosity 3.75 mm²/s (at 50°C) or less) should be used.
6. The main unit of the boiler come with an economizer. Be sure to set the feedwater temperature to 50°C or higher.
7. If the feedwater temperature is high when, for example, collecting the drain water, fuel consumption may be reduced as the standard of actual evaporation.
8. The diameter of the safety valve discharge outlet shown between parentheses applies piping for blowing outdoors.
9. Maximum combustion capacity (input) is computed based on the standard lower calorific value.
*1. The model display is as follows
EQi-2501□M
K: Kerosine
A: Fuel oil A

POINT 1 Largely saves energy consumption with highly efficient operation

Boiler efficiency **96**%
Partial load efficiency **97.5**% (load factor: 33%)
Turndown ratio **3:1*** (three-level control)

The combustion control of 0-33-100%, which covers a wide range of combustion capacity, largely improves efficiency during a low load operation.
Eliminating unnecessary activations and stops largely saves energy consumption.

* The turndown ratio represents a ratio between the rated (maximum) combustion capacity and smallest combustion capacity. When it is 3:1, the combustion capacity can be reduced to 33.3%.

POINT 2 Achieved a larger capacity

A once-through boiler with a generated steam amount of 2.5t/h.
The proven boiler bodies arranged concentrically in two rows realizes equalized heating to improve durability.
In addition, the holding water quality is large (180L), and self-evaporation improves the load following capability when the pressure declines.

POINT 3 Inverter included as standard and silence design

Higher efficiency of the blower and the inverter control largely save energy consumption.

POINT 4 Comfortable silence design

POINT 5 Stable supply of dried steam

Steam dryness **99**% or more

The steam separator has been largely improved. The water level control according to the steam pressure and combustion capacity enables stable supply of dried steam.

EQi(H)-6001KM/AM

Once-through boiler Conversion evaporation: 6,000kg/h

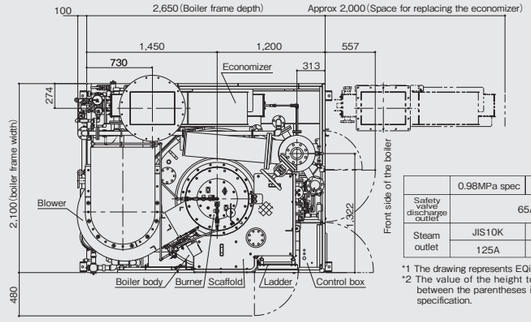
■Specifications

Item			Model※1	EQi-6001KM/AM	EQiH-6001KM/AM	
					1.57MPa spec	1.96MPa spec
Performance	Conversion evaporation		kg/h	6,000		
	Actual evaporation		kg/h	5,029	4,973	4,958
	Thermal output		kW	3,762		
	Heating surface area		m²	25.3		
	Maximum working pressure		MPa	0.98	1.57	1.96
	Boiler efficiency		%	96.5	96.0	
	Holding water quantity		L	670		650
	Max combustion capacity (input)		kW	3,898	3,918	
	Fuel consumption	Kerosine	kg/h	322.6	324.3	
			L/h	403.3	405.4	
		Fuel oil A	kg/h	328.6	330.4	
			L/h	382.4	384.4	

Item			Model※1	EQi-6001KM/AM	EQiH-6001KM/AM	
					1.57MPa spec	1.96MPa spec
Performance	Power source			Three phase, AC 200V, 50/60Hz		
	Sub - items	Facility electric power	kW	29.2	31.2	34.7
		Feedwater pump motor		5.5	7.5	11.0
		Blower motor		22.0		
		Fuel oil burning pump motor		1.5		
		Control box		0.2		
Connecting pipe diameter	Fuel inlet		A	20		
	Feedwater inlet			50		
	Steam outlet			125	100	
	Safety valve discharge outlet			65(100)		50(80)
	Exhaust gas outlet		φmm	635 (Outer diameter)		
Product weight			kg	7,480	7,550	7,750

External dimensional drawing (unit: mm)

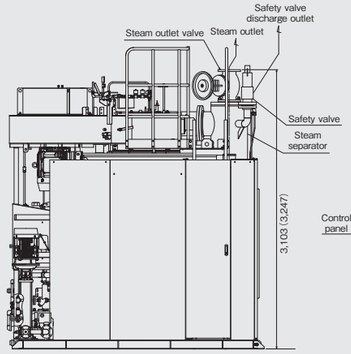
Top view



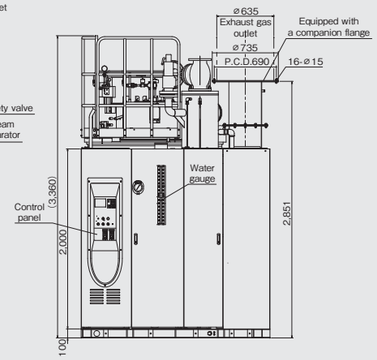
		0.98MPa spec	1.57MPa spec	1.96MPa spec
Safety valve discharge outlet		65A		50A
Steam outlet		JIS10K	JIS20K	
		125A	100A	

*1 The drawing represents EQiH-6001 (1.96MPa specification).
*2 The value of the height to the steam outlet valve shown between the parentheses is the dimension of the 0.98MPa specification.

Side view



Front view



Notes:
1. The actual evaporation is the value for the saturated steam under the following conditions:
   0.98MPa spec: 15℃ feedwater temperature, 0.49MPa steam pressure
   1.57MPa spec: 15℃ feedwater temperature, 1.18MPa steam pressure
   1.96MPa spec: 15℃ feedwater temperature, 1.57MPa steam pressure
2. The boiler efficiency value is calculated by the heat loss scheme provided in JIS B 8222-2023. However, the calculation is made under the following conditions.
   0.98MPa spec: 0.49MPa steam pressure, 15℃ feedwater temperature, 35℃ feed air temperature,
   1.57MPa spec: 1.18MPa steam pressure, 15℃ feedwater temperature, 35℃ feed air temperature,
   1.96MPa spec: 1.57MPa steam pressure, 15℃ feedwater temperature, 35℃ feed air temperature,
3. The margins of error are as follows:
   Boiler efficiency error: ±1% (point) Combustion capacity error: ±3.5%
4. The fuel consumptions are calculated based on the following fuel lower calorific values:
   Kerosine: 43.5MJ/kg, density 0.80g/cm³
   Fuel oil A: 42.7MJ/kg, density 0.86g/cm³
5. As to fuel oil A specification, JIS Class 1, No. 1 fuel (sulfur content not to exceed 0.5 weight percent, kinetic viscosity 3.75 mm²/s (at 50˚C) or less) should be used.
6. The main unit of the boiler come with an economizer. Be sure to set the feedwater temperature to 50℃ or higher.
7. If the feedwater temperature is high when, for example, collecting the drain water, fuel consumption may be reduced as the standard of actual evaporation.
8. The diameter of the safety valve discharge outlet shown between parentheses applies piping for blowing outdoors.
9. Maximum combustion capacity (input) is computed based on the standard lower calorific value.
10. An electromagnetic feedwater flowmeter is adopted as standard. If the boiler feedwater has an electrical conductivity lower than 1mS/m, the flow rate cannot be measured in some cases. Please consult with our sales representative.

*1. The model display is as follows

EQiH-6001□M
- K: Kerosine
  A: Fuel oil A
- H: High pressure
  None: Standard

POINT 1 Industry-leading supper-efficient operation!

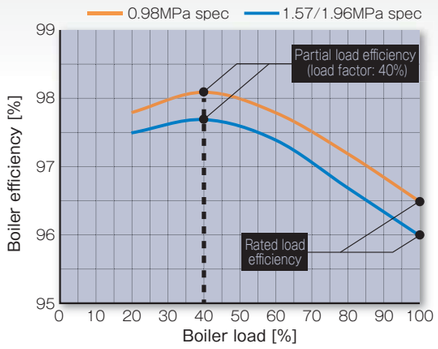
Boiler efficiency of 98% or more has been achieved during partial loading. The boiler does not repeat activations and stops even during a low steam load operation, which enables the high operation efficiency to be maintained.

Rated load efficiency **96.5%***

Partial load efficiency **98.1%*** (load factor: 40%)

* 0.98MPa specification (0.49MPa steam pressure, 35℃ feed air temperature, 15℃ feedwater temperature)

Partial load efficiency



POINT 2 PI control (pressure control)

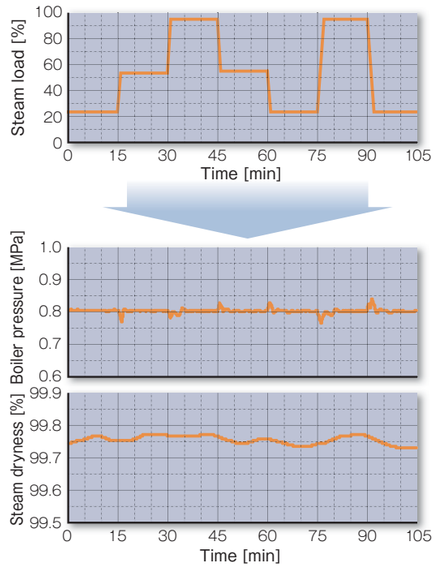
The pressure is controlled with the PI (proportional integral) control method, and the boiler pressure is stable regardless of whether the load keeps stationary or changes.

Range of pressure fluctuations when the load keeps stationary : ±0.005 MPa

Range of pressure fluctuations when the load changes : ±0.025 MPa

In addition, even when the load changes, the steam dryness is excellent and high-quality steam can be supplied.

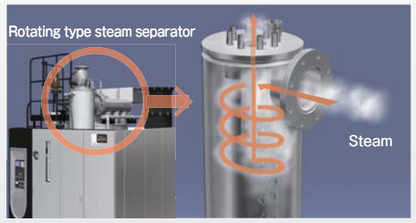
Steam pressure during automatic operation, steam dryness (with respect to the steam load)



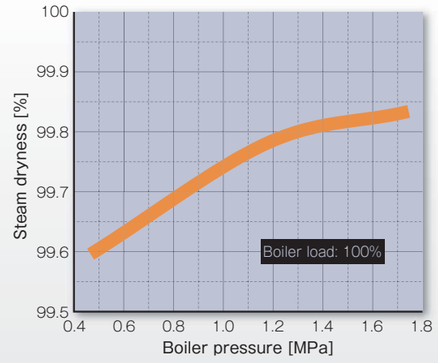
POINT 3 Stable supply of high-quality dried steam

In a wide range of the pressure, steam dryness of 99.5% or more has been achieved.

Steam dryness **99.5% or more**



Steam dryness during a rated operation (with respect to the boiler pressure)



POINT 4 Large energy savings with highly efficient operation

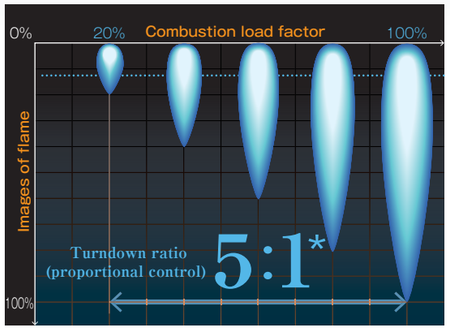
By adopting a proportionally controlled burner having a high turndown ratio, the operation efficiency and load following capability at a low load operation have been improved.
Our newly-developed burner realizes proportional control of the combustion capacity in a range of 20 to 100% to finely respond to the load demand.

Turndown ratio (proportional control) **5:1***

SS=**1** or less (set O_2)

* The turndown ratio represents a ratio between the rated (maximum) combustion capacity and smallest combustion capacity. When it is 5:1, the combustion capacity can be reduced to 20%.

Images of flame at various combustion load factors

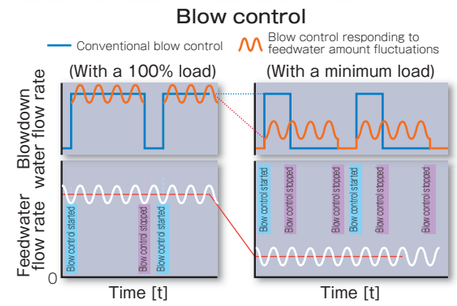


POINT 5 Blow control responding to feedwater amount fluctuations

Comes standard with the blow control mechanism responding to feedwater amount fluctuations

When continuous blowing is conducted, the amount of blowdown water is increased and decreased according to the amount of feedwater, which enables efficient heat recovery from blowdown water regardless of the boiler load.

Blow control



POINT 6 Comfortable silence design

POINT 7 Enables multi-boiler setup

Multi-boiler setup contributes to space saving.

POINT 8 Incorporates an inverter as standard equipment

Control of the blower and feedwater pump with the inverter largely reduces energy consumption.

POINT 9 Incorporates water-washing nozzles as standard equipment

The boiler body and economizer are equipped with nozzles for water washing, which improve maintainability.

POINT 10 Adopted newly developed structure of the boiler body

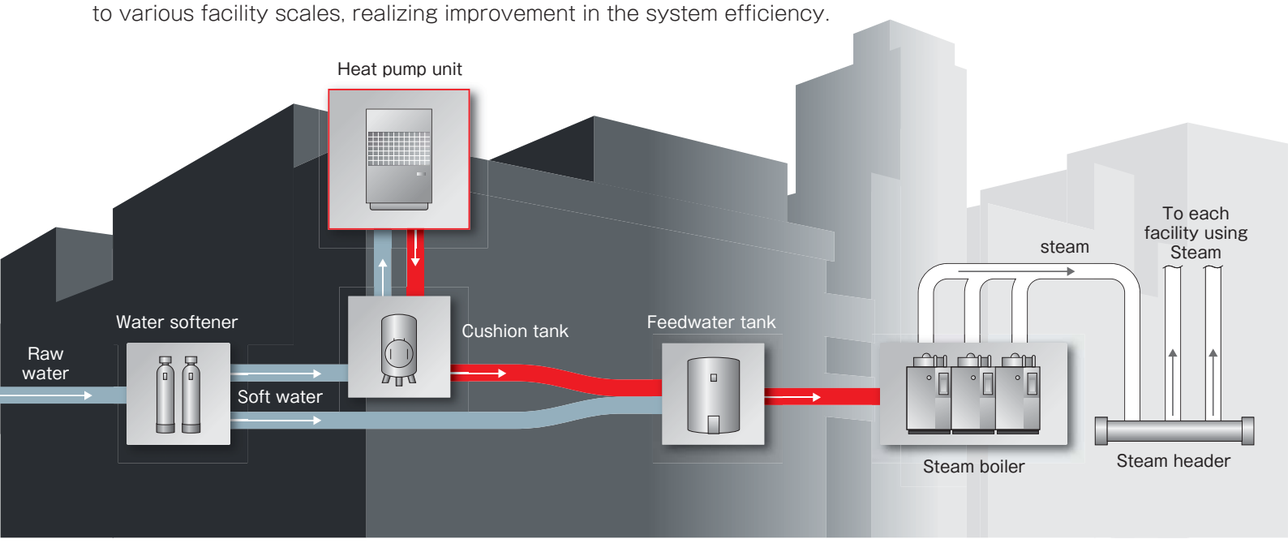
Optimized arrangement of water pipes to improve heat recovery, and realized higher efficiency of the boiler body.

While utilizing existing facility, the steam boiler feedwater preheating system builds a highly efficient system environment.

Steam boiler feedwater preheating system

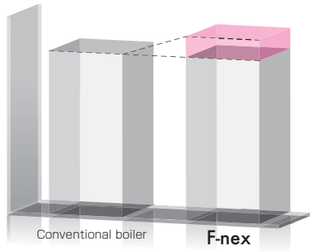
F-nex

F-nex demonstrates a great performance in systems whose drain recovery rate is relatively low, such as food and confectionery related systems, and builds small- to large-scale highly efficient systems for various industries, business types and scales.
This system heats feedwater of the steam boiler with the heat pump unit that is able to extract more heat energy with less electric energy.
The most appropriate heat source equipment can be selected according to various facility scales, realizing improvement in the system efficiency.



Highly efficient boiler evolves into highly efficient boiler system

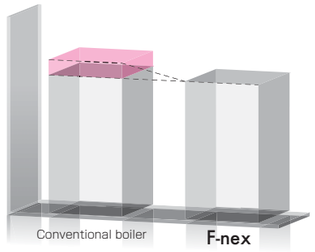
The efficiency of the combustion type boiler itself has already been improved to the highest level. F-nex, which utilizes a combination of a highly efficient heat pump and conventional boiler system, evolves into a highly efficient boiler system.



Comparison of highly efficient systems

Improves daily running costs

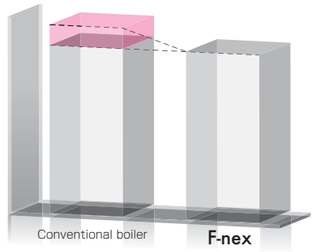
Heating low-temperature feedwater by its own steam causes a large energy loss.
F-nex supports the sensible heating range up to 60℃ to enable the facility to improve its efficiency.



Comparison of running costs

Reduces CO_2 emissions, contributing to improvement of the environment

The electric type heat pump technique realizes over three times higher efficiency than that of the combustion type.
In addition to this, it reduces CO_2 emissions and provides eco-friendly energy.



Comparison of CO_2 emissions

MEMO