

Creating Friendly Products for Users and the Environment

IHI Packaged Boiler

IHI

Realize your dreams

IHI Once Through Boilers

Gas-fired



IHI Packaged Boiler Co., Ltd.



User Friendly, Environmentally Friendly

IHI aims to develop futuristic thermal systems hand-in-hand with our customers through user friendly, environmentally friendly products.



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NEW

Blue-i SYSTEM

was born!

Functions of the IHI Once Through Boilers

Newly developed

Blue-i SYSTEM

Advanced four stage combustion with proportional control in middle combustion range

Patent No. 5399427

Standard **K-SE** K-3000SE I/2500SE I/2000SE I/1600SE I

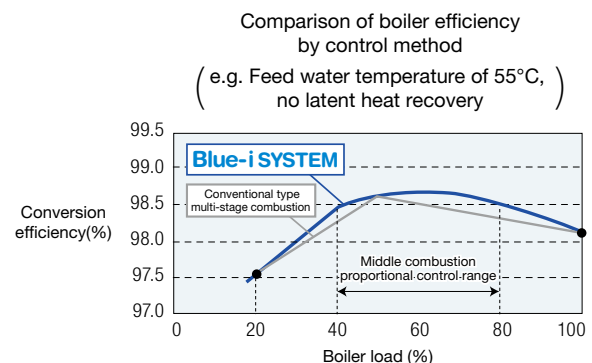
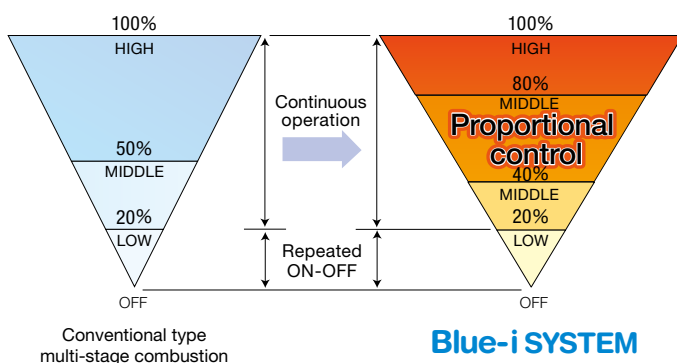
Features of **Blue-i SYSTEM**

● Improvement of response to load change

Blue-i SYSTEM, through a combination of a proportionally controlled middle combustion range (40% to 80%) and fixed high combustion (100%) and low combustion (20%), achieves both prevention of steam pressure change and smooth response to sudden load change. It performs proportional control in the middle combustion range, and when sudden load change occurs, instantly switches over to either high or low combustion, thus enabling load response.

● Effective utilization of the high-efficiency zone

The characteristics of the boiler mean that it has maximum efficiency at intermediate load as opposed to full load. The boiler efficiency in the case of conventional multi-stage combustion ran across a fixed straight line connecting two loads, however with **Blue-i SYSTEM**, the efficiency at 40 to 80% load shifts as a curve, therefore efficiency is expressed as a mountain-shaped curve. As such, it is possible to effectively use the high efficiency zone. For example, in the case of 75% fixed load, the conventional multi-stage control boiler would repeat high combustion (100%) and medium combustion (50%), and the average boiler efficiency would be the 75% load value on the straight line connecting the high combustion and medium combustion. With **Blue-i SYSTEM**, continuous operation at 75% load is possible, and the load value is on a mountain-shaped curve, therefore enabling operation at an even higher efficiency than the average efficiency based on a straight line.



There is a world we wish to show you.

Sky, ocean, water. In order to enrich the lives of people who inhabit this blue planet, IHI has created **Blue-i SYSTEM** as the embodiment of our greatest technological effort so that it may have the power to “Realize your dreams”.

Blue-i SYSTEM (patented by IHI) carries out smooth load response in the middle combustion range, including both high and low load ranges, thus saving on energy and cost, as well as reducing CO₂.

For our customers and for the future of our planet. **Blue-i SYSTEM** is a product we wish to offer to customers who appreciate quality.

● Power-saving benefits

In the case of conventional multi-stage combustion, the shift to the operating frequency of the fan inverter set for each fixed load was repeated therefore power consumption was the average of the power at each frequency, moreover, braking loss would also occur when there was a reduction in load. With **Blue-i SYSTEM**, proportional control is performed at between 40 and 80% of the load range, so the power consumption of the fan accompanying load change is practically a value responding to the operating frequency, and braking loss also becomes minimum, therefore it is possible to reduce power consumption.

● High quality steam across all load ranges

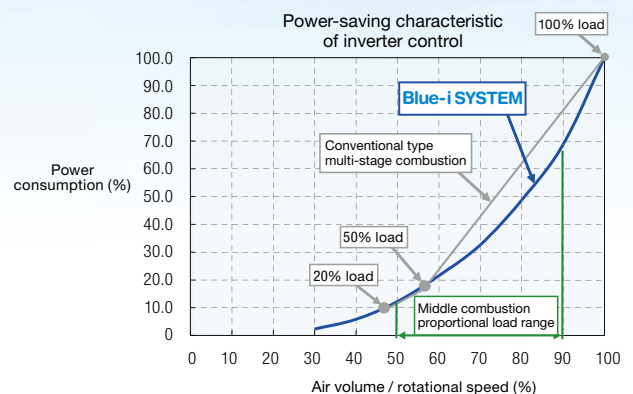
A new water level control system suiting proportional control in the middle combustion range enables high steam dryness to be maintained across all load ranges.

● Reduction of steaming-up time

Starting and warming up from a cold stopped state is performed in the middle combustion range (40%), thereby reducing steaming-up time.

● High-efficiency through latent heat recovery

Latent heat is recovered in the low load range to improve efficiency even further.



Functions of the IHI Once Through Boilers

Middle combustion priority

Multi-boiler control system

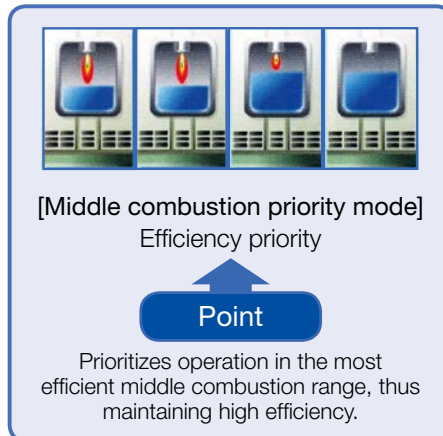
Patent No. 5129627 Patent No. 5352714

- Multi-boiler control system enabling efficient load response in the case of multiple once through boiler systems.

- By combining this system and a boiler equipped with **Blue-i SYSTEM**, it is possible to create a boiler system with the highest efficiency and lowest power consumption.



[Low combustion priority mode]
Load response priority



[High combustion priority mode]
Power-saving priority

Four stage combustion

Patent No. 2942080

Standard **K-SE** K-2500SE/2000SE/1600SE/1000SE **K-L** **K-LH**

Four stage combustion – the secret to high efficiency is the minimum combustion rate (20% to 30%)



- Intricate combustion control
Controls combustion rate at four stages to achieve intricate operation.
- Reduced fuel consumption

- Extended boiler life
- Stable operation



Economizer

Standard **K-SE**

- Achieving ultra-high efficiency by leveraging the features of gas-fired boilers
Achieving an ultra-high efficiency only possible with gas-fired through creative structural and material ideas. Latent heat recovery is also possible during low load, therefore boiler efficiency reaches 102% (actual measurement) in the case of K-1600~3000SE I.

Standard **K-LH** K-2000LEH/1600LEH

- Achieving a boiler efficiency equivalent to a class higher by equipping an economizer

Ultra-low NOx

Option **K-SE** K-2500SE/2000SE

Ultra-low NOx and a wide combustion range thanks to an aurora flame burner

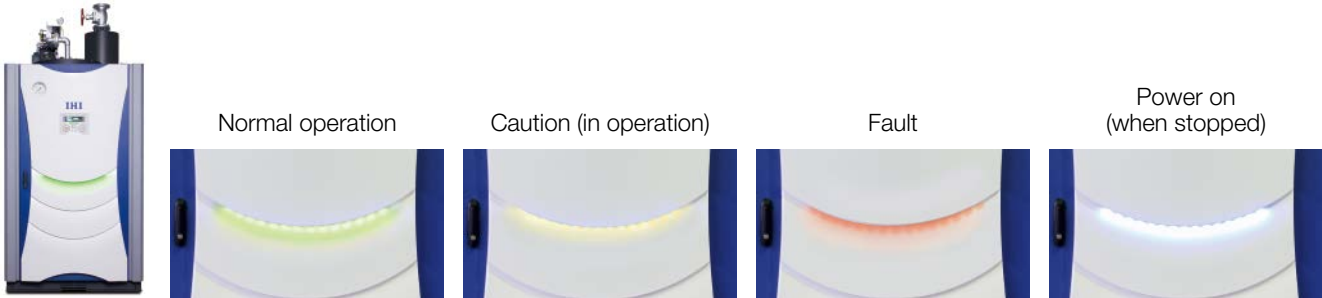


- With an aurora flame burner which combines a self-recirculation effect and a thin film combustion technology, an ultra-low NOx of 21ppm (O₂ = 0% conversion) and wide combustion range (turndown ratio 5:1) has been achieved.



Standard **K-SE** K-3000SE I/2500SE I/2000SE I/1600SE I
 Options **K-SE** K-2500SE/2000SE/1600SE **K-L** K-2000L/1600L

● Assess operation status in a glance with a large LED display



Low NOx

Standard **K-SE** **K-L** **K-LH**

Wide range combustion using a low NOx burner

● Achieving 60ppm (O₂ = 0% conversion) with a standard burner.

3000SEI
2500SEI/SE
2000SEI/SE

98%

97%

1600SEI/SE
1000SE

Boiler efficiency

Patent
Advanced
Four stage combustion

Ultra-low NOx

21 ppm

Actual measurement with natural gas (option)

Low combustion

20%

Low noise

Standard **K-SE** **K-L** **K-LH**

● 75dB (A) or below one meter in front of the boiler

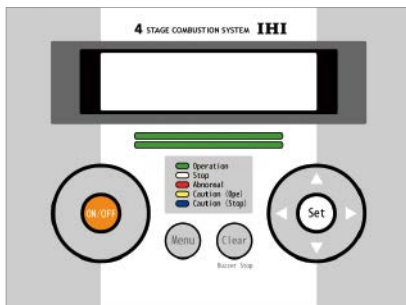
High functionality micro-controller

Patent No. 4083911

Standard **K-SE** K-3000SE I/2500SE I/2000SE I/1600SE I **K-LH**
 Options **K-SE** **K-L**

High-functionality microcontroller control

- Heat management function
- Energy-saving operation function
- Alarm record, input/output recording function
- Integration time, integration count recording function
- Maintenance notification function
- Time-limit LOW operation function
- Multi-boiler control function



Functions of the IHI Once Through Boilers

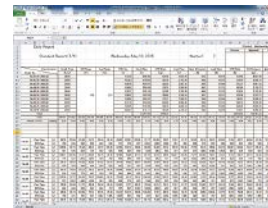
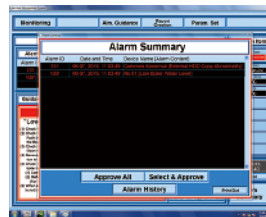
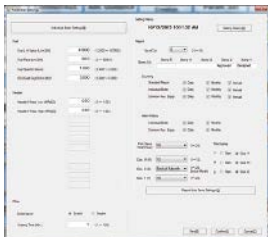
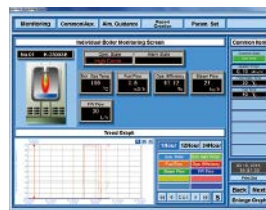
Improved system for heat management

IBD System

IHI Boilers Development System

IHI proudly brings the “IBD System”, which provides even more effective use of multiple installations of small, high-efficiency once through boiler systems that are manufactured using advanced technologies.

This system helps with the rationalization, energy saving, labor saving, and automation of customers' steam systems.



Alarm guidance display

Example of a report



Options **K-SE** **K-L** **K-LH**

For rationalized boiler management

● Features

A system which makes it possible to simultaneously monitor and automatically prepare daily/monthly/yearly reports using a personal computer.

Featuring an abundance of functions from the viewpoint of the person in charge of control.

- Enhanced report preparation function
- Practical assessment of system information
- Strong support of warning alarm response
- Standardly equipped with UPS (uninterrupted power supply) for PCs
- Parameter setting function
- Monitoring function
- Daily/monthly/yearly report function
- Operation help function (alarm guidance display)
- Data backup function using an external HDD

Multi-boiler control system

(CPCS = Constant pressure control system) **Patent** No. 2942075

Options **K-SE** **K-L** **K-LH**

Constant pressure control system (CPCS)

For efficient multiple installation boilers

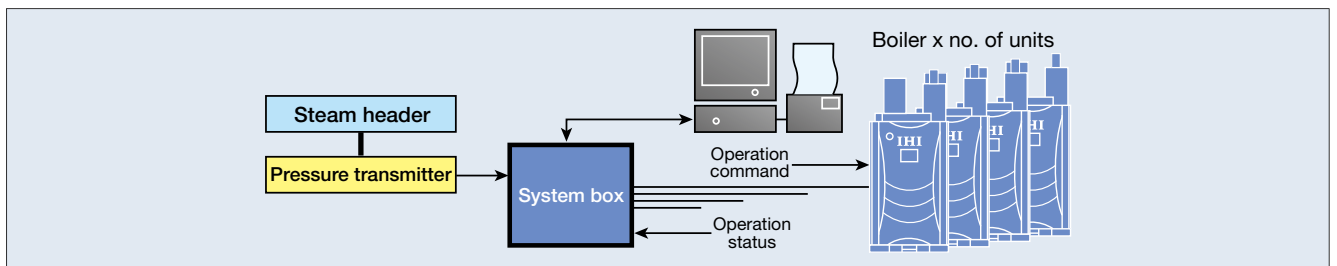
- IHI's patented new method
- Also supports **Blue-i SYSTEM**
- Constant pressure control system (patented)
- Controls up to 32 units
 - Control even possible with a mix of three stage combustion and four stage combustion boilers.
- Arbitrary operating sequence can be set
 - Operating sequence and status (base boiler, standby boiler, etc.)
- Equipped with a cyclic function
 - Equalization of the stop/start count of each boiler
- Forced low combustion function
 - Forces low combustion of boilers which have stopped for a certain period of time in order to speed up steaming and for boiler tube protection purposes, thus maintaining a state close to a hot condition.
- Mid-purge backup function
 - Until the boiler receives a start signal and ignites, the boiler immediately upstream in the sequence which is in a low combustion state switches over to middle combustion and prevents drops in steam pressure during purge.



IHI-CPCS (Constant pressure control system)

Systems with multiple once through boilers can provide a steam supply with a stable pressure equivalent to that of large boiler plants.

* A conceptual image when both a heat management system and multi-boiler control system are adopted



The steam from each boiler is gathered in one steam header, and then supplied to where it is needed. The multi-boiler control system detects the steam header pressure using a sensor and outputs combustion command signals (combustion stop, low combustion, middle combustion, high combustion) to each boiler so that the pressure of the steam inside the steam header can be maintained at the pre-set value. Individual boilers receive this combustion command to determine their operation status. As the control method of this system, IHI developed the constant pressure control system to replace the conventional step type multi-boiler control system.

Lineup



K-SE Series

K-3000SE I, 2500SE I, 2000SE I and 1600SE I are standardly equipped with the newly developed **Blue-i SYSTEM**. Friendly to the environment and higher performance.

Blue-i SYSTEM

Four stage combustion

Low NOx

High functionality micro-controller

Microcontroller control

Low noise

Economizer

LED

K-3000SE I
K-2500SE I
K-2000SE I
K-1600SE I

K-2500SE
K-2000SE
K-1600SE
K-1000SE

K-3000SE I
K-2500SE I
K-2000SE I
K-1600SE I

K-3000SE I
K-2500SE I
K-2000SE I
K-1600SE I

Options

Middle combustion priority
Multi-boiler control system

Ultra-low NOx

K-2500SE
K-2000SE

Heat management system

Multi-boiler control system

High functionality micro-controller

LED

K-2500SE
K-2000SE
K-1600SE

Functions and Features

- Operation efficiency and boiler life are dramatically improved with the newly developed **Blue-i SYSTEM** and advanced four stage combustion.
- Even more intricate control at the lowest combustion of 20% to 25%
- Environmentally friendly, low noise, low NOx
- High boiler efficiency
- Good quality steam with high dryness
- Compact and space-saving
- Significant reduction in fuel and electricity costs
- Standardly equipped with a continuous blow device (Optional for K-1000SE)



K-L Series

Dramatically improved operation efficiency and boiler life with Japan's first four stage combustion

Four stage combustion

Low NOx

Microcontroller control

Low noise

Options

Heat management system

Multi-boiler control system

High functionality micro-controller

LED

K-2000L
K-1600L

Functions and Features

- Dramatically improved operation efficiency and boiler life with four stage combustion
- Environmentally friendly, low noise, low NOx
- High boiler efficiency
- Good quality steam with high dryness
- Compact and space-saving
- Significant reduction in fuel and electricity costs
- Standardly equipped with a continuous blow device (Optional for K-1000L)



K-LH Series

High quality, advanced high pressure series demanded by the times

Four stage combustion

Low NOx

High functionality micro-controller

Low noise

Economizer

Options

Heat management system

Multi-boiler control system

K-2000LH
K-1600LH

Functions and Features

- Dramatically improved operation efficiency and boiler life with four stage combustion
- Low noise
- High boiler efficiency
- Good quality steam with high dryness
- Emphasis on maintenance and operability
- Power-saving, space-saving
- Supports prolonged continuous operation
- Standardly equipped with a continuous blow device
- Standardly equipped with high-functionality microcontroller control



Options

We offer a variety of options that meet your needs.

Automatic Water Softener Auto Softener

This device removes the elements which makes the feed water hard (calcium, magnesium) and prevents scale build-up inside the boilers so that they may be used for a long period of time.



Fan inverter control

The motor rotational speed changes to suit the combustion status, supplying only the necessary amount of air. As such, power consumption is reduced, which in turn reduces rates while suppressing noise at the same time.



Boiler water concentration automatic blow device

Detects boiler water concentration using a sensor and automatically controls boiler water concentration with a blow device in order to constantly maintain good steam at the same time as preventing boiler corrosion, carry over and so on.



Chemical feeder

A device which continuously injects oxygen scavenger to remove oxygen from feed water as well as boiler compound to create an environment in which steel does not easily corrode.



Ishiclean Multi-effective chemical for IHI boilers



Ishiclean is a compound chemical for boilers. Ishiclean offers benefits such as PH adjustment, scale build-up prevention, anti-corrosion, removal of dissolved oxygen and sludge dispersion. Stable and high heat efficient boiler operation is possible, greatly contributing to the improvement of economic performance and extension of boiler life.

Feed water tank



25ℓ - 5,000ℓ
IHI offers a device to heat feed water to 55°C or higher.

Exhaust pipe



120 Ø - 400 Ø

Specifications

K-SE Series

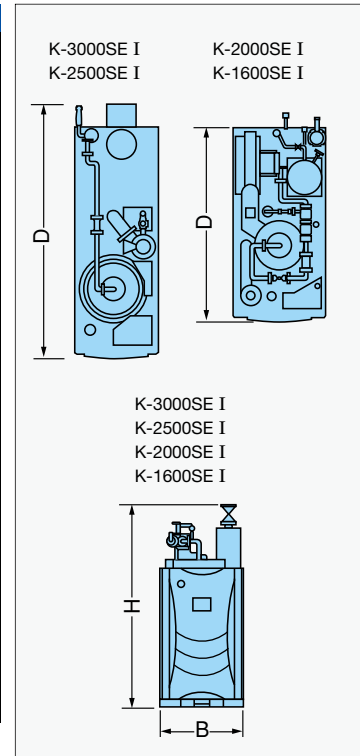


- Blue-i SYSTEM
- Low NOx
- High functionality micro-controller
- Low noise
- Economizer
- LED

Items/dimensions

Model		K-1600SE I	K-2000SE I	K-2500SE I	K-3000SE I	
Supply gas pressure category		Middle pressure	Middle pressure	Middle pressure	Middle pressure	
Equivalent evaporation	High combustion	kg/h	1,600	2,000	2,500	
	Middle combustion	kg/h	640 - 1,280	800 - 1,600	1,000 - 2,000	
	Low combustion	kg/h	320	400	500	
Heat output		kW	1,003	1,254	1,567	
Maximum working pressure		MPaG	0.98	0.98	0.98	
Heating surface area		m ²	9.72	9.73	9.94	
Control method	Combustion	Electrical four stage combustion + middle combustion proportional control (100-80 to 40-20-OFF)				
	Feed water	Electrical ON-OFF				
Combustion method		Push ventilation gas-fired				
Fuel used		Natural gas/LPG				
Supply gas pressure	Natural gas	MPaG	0.05 - 0.15	0.05 - 0.15	0.06 - 0.15	
	LPG	MPaG	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	
Boiler efficiency		%	97	98	98	
NOx emissions value (O ₂ =0% conversion value)	Natural gas	ppm	60	60	60	
	LPG	ppm	100	120	80	
Fuel consumption	Natural gas LHV	m ³ /h	91.7	113.5	141.8	
	LPG LHV	m ³ /h	39.7	49.2	61.4	
Voltage	Natural gas LHV	kJ/m ³	40,600	43,000	46,400	
	LPG LHV	kJ/kg	46,400	46,400	46,400	
Facility power		kW	7.1	7.8	9.8	
Dimension	Width B	mm	1,200	1,200	990	
	Depth D	mm	2,500	2,500	3,033	
	Height H	mm	2,445	2,445	2,890	
Weight	Boiler body	kg	2,070	2,090	2,650	
	Boiler water	kg	145	150	150	
	Total	kg	2,215	2,240	2,800	
Connector diameter	Steam pipe	Nominal diameter	65A (female thread)	65A (female thread)	80A (10K flange)	
	Feed water pipe	Nominal diameter	25A (female thread)	25A (female thread)	32A (female thread)	
	Fuel pipe	Natural gas	Nominal diameter	40A (10K flange)	40A (10K flange)	40A (10K flange)
		LPG	Nominal diameter	40A (10K flange)	40A (10K flange)	40A (10K flange)
	Bottom blower pipe	Nominal diameter	25A (female thread)	25A (female thread)	25A (female thread)	
	Safety valve release pipe	Nominal diameter	40A (female thread)	40A (female thread)	50A (female thread)	
	Economizer drain pipe	Nominal diameter	20A (female thread)	20A (female thread)	20A (female thread)	
	Exhaust pipe (inner diameter)	Ø mm	350	350	400	
	Service power cable	mm ²	8	8	14	

External view

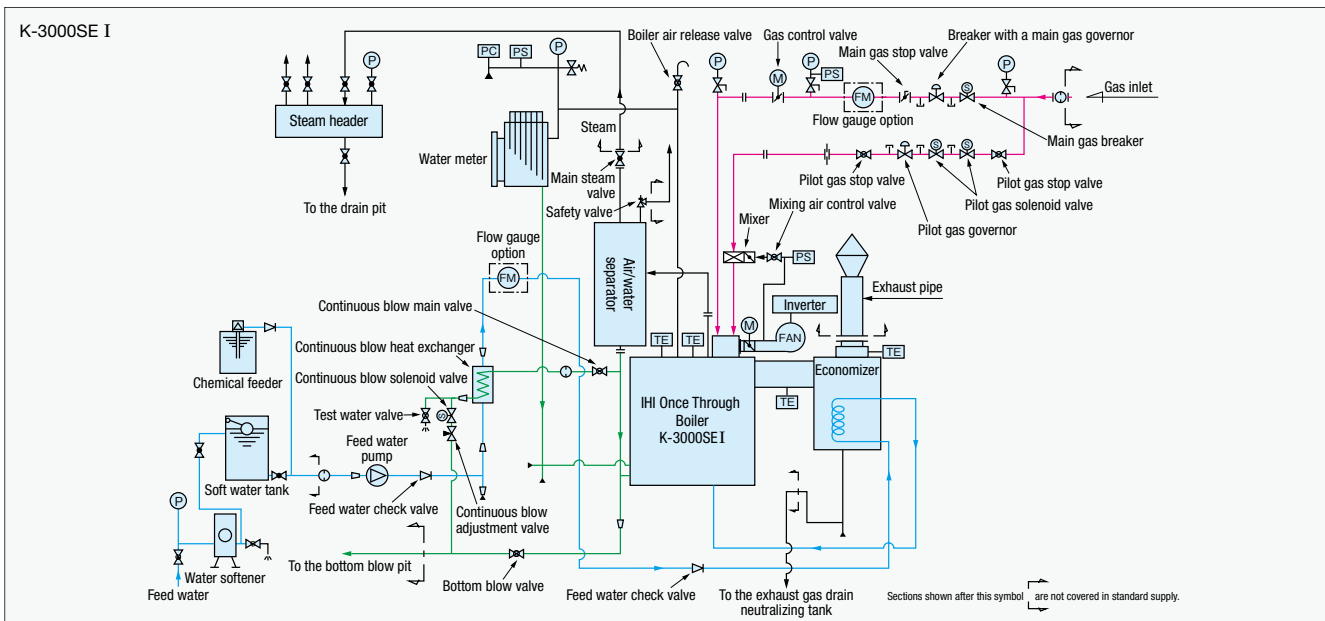


* Boiler efficiency is based on a steam pressure of 0.49MPaG, feed water temperature of 15°C, and an intake air temperature of 35°C.

* Boiler efficiency has a tolerance of ±1% due to using the exhaust gas loss method. Combustion rate error is ±3.5%.

* Condensation water is generated from exhaust gas due to being a high-efficiency device. Please implement a countermeasure for condensation water from flues and exhaust pipes. To reduce exhaust gas condensation, take measures such as heating the feed water (to 55°C or more).

Flow sheet



K-SE Series



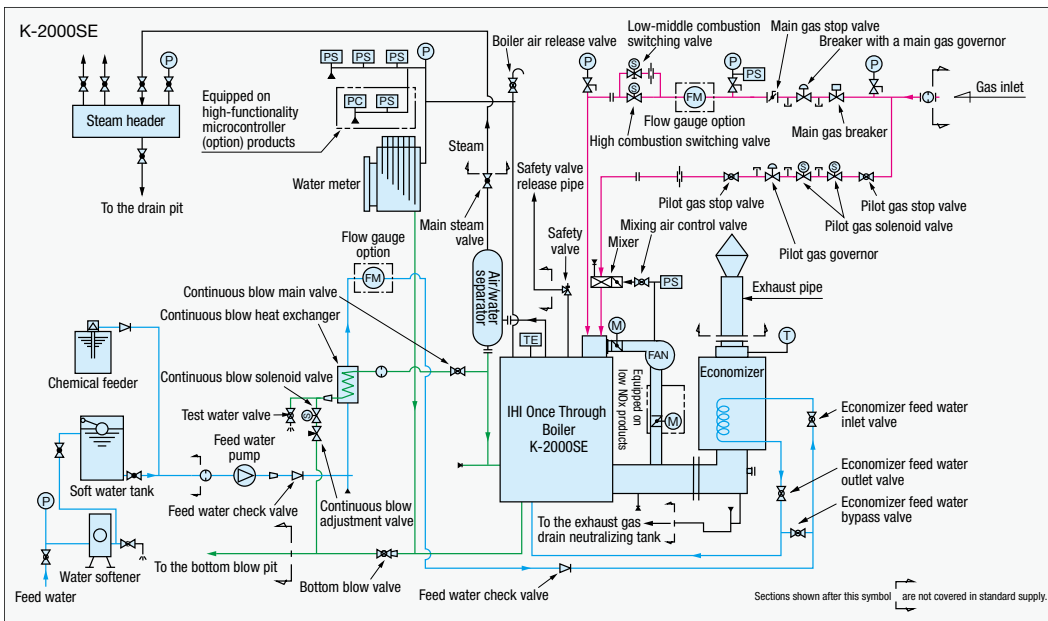
- Four stage combustion
- Low NOx
- Microcontroller control
- Low noise
- Economizer

Items/dimensions

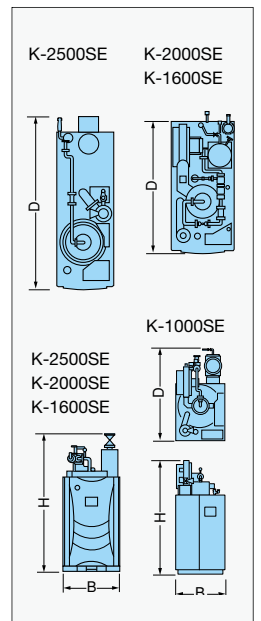
Model		K-1000SE		K-1600SE	K-2000SE	K-2500SE		
Supply gas pressure category		Low pressure	Middle pressure	Middle pressure	Middle pressure	Middle pressure		
Equivalent evaporation	High combustion	kg/h	1,000	1,000	1,600	2,500		
	Middle combustion	kg/h	600	600	960	1,500		
	Low combustion	kg/h	200	200	320	500		
Heat output		kW	627	627	1,003	1,567		
Maximum working pressure		MPaG	0.98	0.98	0.98	0.98		
Heating surface area		m ²	9.67	9.56	9.72	9.73		
Control method		Combustion	Electrical four stage combustion (100-60-20-OFF)					
Feed water		—	Electrical ON-OFF					
Combustion method		—	Push ventilation gas-fired					
Fuel used		—	Natural gas/LPG					
Supply gas pressure	Natural gas	kPaG	2.0	—	—	—		
	LPG	kPaG	2.8	—	—	—		
	Natural gas	MPaG	—	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	0.06 - 0.15	
Boiler efficiency	LPG	MPaG	—	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	
	—	%	97	97	97	98	98	
NOx emission value (O ₂ =0% conversion value)	Natural gas	ppm	60	60	60	60		
	LPG	ppm	90	80	100	120		
Fuel consumption	Natural gas LHV	40,600kJ/m ³ N	m ³ N/h	57.3	57.3	91.7	113.5	141.8
	LPG LHV	93,700kJ/m ³ N	m ³ N/h	24.8	24.8	39.7	49.2	61.4
	LPG LHV	46,400kJ/kg	kg/h	50.1	50.1	80.2	99.3	124.1
Voltage		—	AC200/220V×50/60Hz×3Ø					
Facility power		kW	3.8	3.8	7.1	7.8	9.8	
Dimension	Width B	mm	1,130	1,130	1,200	1,200	990	
	Depth D	mm	2,115	2,115	2,500	2,500	3,033	
	Height H	mm	2,610	2,610	2,445	2,445	2,890	
Weight	Boiler body	kg	1,580	1,580	2,070	2,090	2,650	
	Boiler water	kg	125	125	145	150	150	
	Total	kg	1,705	1,705	2,215	2,240	2,800	
Connector diameter	Steam pipe	Nominal diameter	50A (female thread)	50A (female thread)	65A (female thread)	65A (female thread)	80A (10K flange)	
	Feed water pipe	Nominal diameter	25A (female thread)	25A (female thread)	25A (female thread)	25A (female thread)	32A (female thread)	
	Fuel pipe	Natural gas	Nominal diameter	65A (10K flange)	40A (10K flange)	40A (10K flange)	40A (10K flange)	40A (10K flange)
		LPG	Nominal diameter	40A (10K flange)	40A (10K flange)	40A (10K flange)	40A (10K flange)	40A (10K flange)
	Bottom blower pipe	Nominal diameter	25A (female thread)	25A (female thread)	25A (female thread)	25A (female thread)	25A (female thread)	
	Safety valve release pipe	Nominal diameter	32A (female thread)	32A (female thread)	40A (female thread)	40A (female thread)	50A (female thread)	
	Economizer drain pipe	Nominal diameter	20A (female thread)	20A (female thread)	20A (female thread)	20A (female thread)	20A (female thread)	
	Exhaust pipe (inner diameter)	Ø mm	300	300	350	350	400	
	Service power cable	mm ²	3.5	3.5	8	8	14	

- * Boiler efficiency is based on a steam pressure of 0.49MPaG, feed water temperature of 15°C, and an intake air temperature of 35°C.
- * Boiler efficiency has a tolerance of ±1% due to using the exhaust gas loss method. Combustion rate error is ±3.5%.
- * Condensation water is generated from exhaust gas due to being a high-efficiency device. Please implement a countermeasure for condensation water from flues and exhaust pipes. To reduce exhaust gas condensation, take measures such as heating the feed water (to 55°C or more).

Flow sheet



External view



Specifications

K-L Series



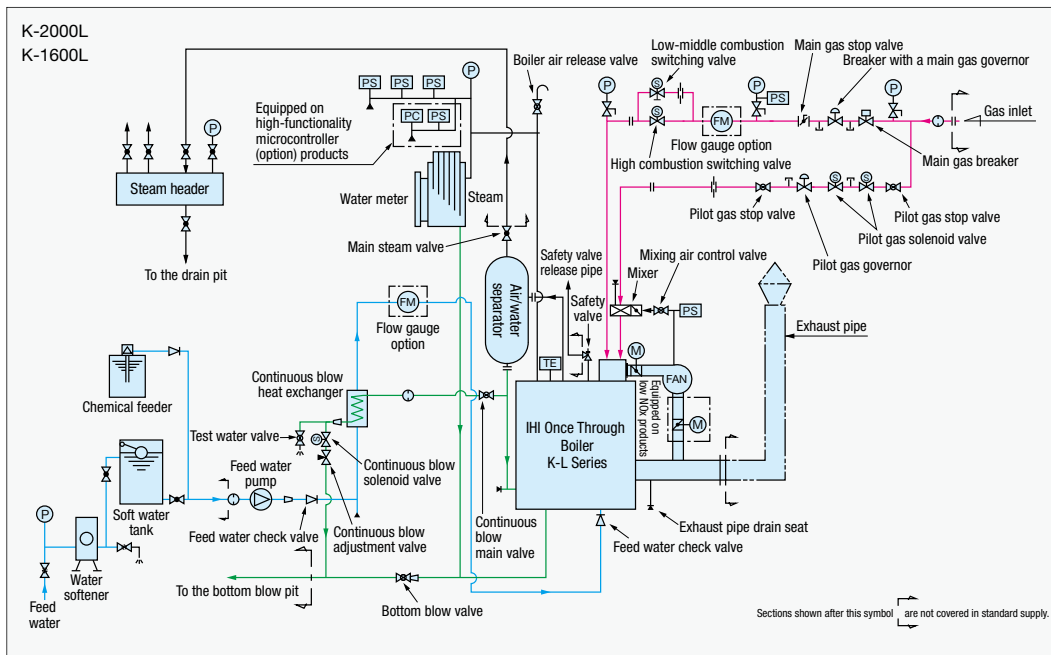
Four stage combustion Low NOx Microcontroller control Low noise

Items/dimensions

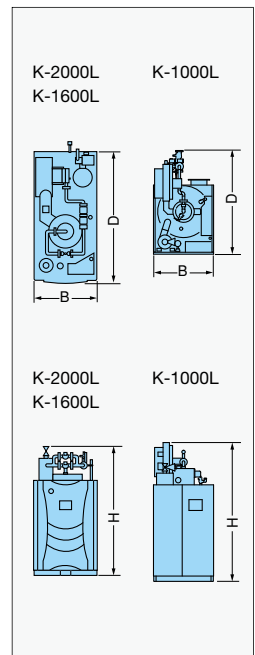
		Model	K-1000L		K-1600L	K-2000L	
		Supply gas pressure category	Low pressure	Middle pressure	Middle pressure	Middle pressure	
Equivalent evaporation	High combustion	kg/h	1,000	1,000	1,600	2,000	
	Middle combustion	kg/h	650	650	1,040	1,300	
	Low combustion	kg/h	300	300	480	600	
Heat output		kW	627	627	1,003	1,254	
Maximum working pressure		MPaG	0.98	0.98	0.98	0.98	
Heating surface area		m ²	9.67	9.56	9.72	9.73	
Control method		Combustion	Electrical four stage combustion (100-65-30-OFF)				
Feed water		—	Electrical ON-OFF				
Combustion method		—	Push ventilation gas-fired				
Fuel used		—	Natural gas/LPG				
Supply gas pressure	Natural gas	kPaG	2.0	—	—	—	
	LPG	kPaG	2.8	—	—	—	
	Natural gas	MPaG	—	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	
	LPG	MPaG	—	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	
Boiler efficiency		%	90	90	90	88	
NOx emission value (O ₂ =0% conversion value)	Natural gas	ppm	60	60	60	60	
	LPG	ppm	90	80	80	80	
Fuel consumption	Natural gas LHV	40,600kJ/m ³ N	m ³ N/h	61.8	61.8	98.8	126.3
	LPG LHV	93,700kJ/m ³ N	m ³ N/h	26.8	26.8	42.8	54.7
	LPG LHV	46,400kJ/kg	kg/h	54.0	54.0	86.5	110.6
Voltage		—	AC200/220V×50/60Hz×3Ø				
Facility power		kW	3.8	3.8	7.1	9.1	
Dimension	Width B	mm	1,130	1,130	1,200	1,200	
	Depth D	mm	1,850	1,850	2,500	2,500	
	Height H	mm	2,610	2,650	2,445	2,445	
Weight	Boiler body	kg	1,420	1,420	1,880	1,890	
	Boiler water	kg	115	115	135	130	
	Total	kg	1,535	1,535	2,015	2,020	
Connector diameter	Steam pipe	Nominal diameter	50A (female thread)	50A (female thread)	65A (female thread)	65A (female thread)	
	Feed water pipe	Nominal diameter	25A (female thread)	25A (female thread)	25A (female thread)	25A (female thread)	
	Fuel pipe	Natural gas	Nominal diameter	65A (10K flange)	40A (10K flange)	40A (10K flange)	40A (10K flange)
		LPG	Nominal diameter	40A (10K flange)	40A (10K flange)	40A (10K flange)	40A (10K flange)
	Bottom blower pipe	Nominal diameter	25A (female thread)	25A (female thread)	25A (female thread)	25A (female thread)	
	Safety valve release pipe	Nominal diameter	32A (female thread)	32A (female thread)	40A (female thread)	40A (female thread)	
	Economizer drain pipe	Nominal diameter	—	—	—	—	
	Exhaust pipe (inner diameter)	Ø mm	300	300	350	350	
	Service power cable	mm ²	3.5	3.5	8	14	

* Boiler efficiency is based on a steam pressure of 0.49MPaG, feed water temperature of 15°C, and an intake air temperature of 35°C.
 * Boiler efficiency has a tolerance of ±1% due to using the exhaust gas loss method. Combustion rate error is ±3.5%.

Flow sheet (Shows the L series)



External view



K-LH Series



- Four stage combustion
- Low NOx
- High functionality micro-controller
- Low noise
- Economizer

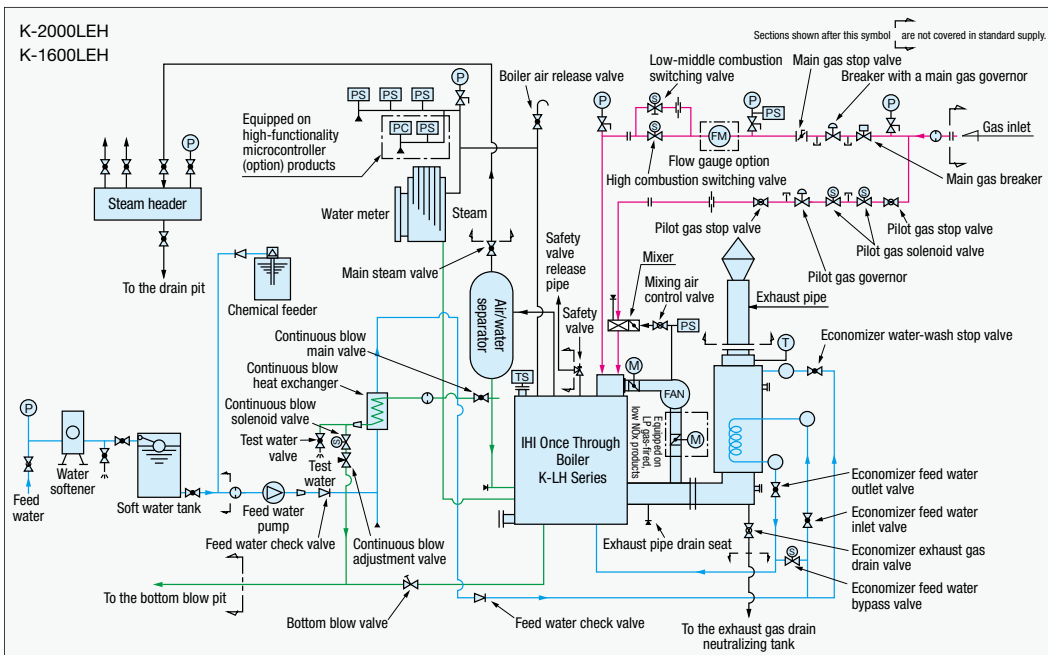
K-2000LEH
K-1600LEH

Items/dimensions

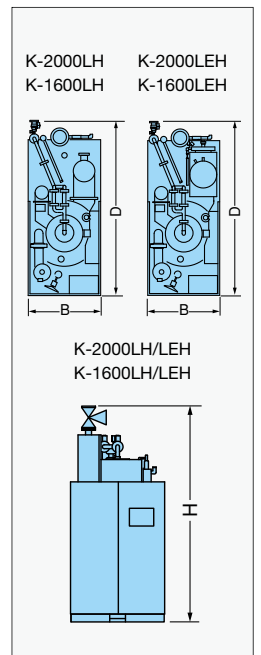
Model		K-1600LH		K-1600LEH		K-2000LH		K-2000LEH		
Supply gas pressure category		Middle pressure	Middle pressure	Middle pressure	Middle pressure	Middle pressure	Middle pressure	Middle pressure	Middle pressure	
Equivalent evaporation	High combustion	kg/h	1,600	1,600	1,600	1,600	2,000	2,000	2,000	
	Middle combustion	kg/h	1,040	1,040	1,040	1,040	1,300	1,300	1,300	
	Low combustion	kg/h	480	480	480	480	600	600	600	
Heat output		kW	1,003	1,003	1,003	1,003	1,254	1,254	1,254	
Maximum working pressure		MPaG	1.57	1.96	1.57	1.96	1.57	1.96	1.57	
Heating surface area		m ²	9.85	9.85	9.85	9.85	9.85	9.85	9.85	
Control method		Combustion	Electrical four stage combustion (100-65-30-OFF)							
Feed water			Electrical ON-OFF							
Combustion method			Push ventilation gas-fired							
Fuel used			Natural gas/LPG							
Supply gas pressure		Natural gas	MPaG	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	
LPG		MPaG	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	0.05 - 0.15	
Boiler efficiency			%	87	86	94	93	86	85	
NOx emission value (O ₂ =0% conversion value)		Natural gas	ppm	60	60	60	60	60	60	
LPG		ppm	80	80	80	80	80	80	80	
Fuel consumption		Natural gas LHV	40,600kJ/m ³ N	m ³ /h	102.2	103.4	94.6	95.6	129.3	
LPG LHV		93,700kJ/m ³ N	m ³ /h	44.3	44.8	41.0	41.4	56.0	56.7	
LPG LHV		46,400kJ/kg	kg/h	89.5	90.5	82.8	83.7	113.1	114.5	
Voltage				AC200/220Vx50/60Hzx3Ø						
Facility power		kW	8.6	11.1/9.6 (50/60Hz)	8.6	11.1/9.6 (50/60Hz)	10.6	13.1/11.6 (50/60Hz)	8.6	
Dimension		Width B	mm	1,200	1,200	1,200	1,200	1,200	1,200	
Depth D		mm	2,600	2,600	2,600	2,600	2,600	2,600	2,600	
Height H		mm	2,750	2,750	2,750	2,750	2,750	2,750	2,750	
Weight		Boiler body	kg	2,600	2,600	2,900	2,900	2,600	2,900	
Boiler water		kg	130	130	150	150	130	130	150	
Total		kg	2,730	2,730	3,050	3,050	2,730	2,730	3,050	
Connector diameter		Steam pipe	Nominal diameter	65A (20K flange)	65A (20K flange)	65A (20K flange)	65A (20K flange)	65A (20K flange)	65A (20K flange)	
Feed water pipe		Nominal diameter	32A (female thread)	32A (female thread)	32A (female thread)	32A (female thread)	32A (female thread)	32A (female thread)	32A (female thread)	
Fuel pipe		Natural gas	Nominal diameter	40A (10K flange)	40A (10K flange)	40A (10K flange)	40A (10K flange)	40A (10K flange)	40A (10K flange)	
LPG		Nominal diameter	40A (10K flange)	40A (10K flange)	40A (10K flange)	40A (10K flange)	40A (10K flange)	40A (10K flange)	40A (10K flange)	
Bottom blower pipe		Nominal diameter	25A (female thread)	25A (female thread)	25A (female thread)	25A (female thread)	25A (female thread)	25A (female thread)	25A (female thread)	
Safety valve release pipe		Nominal diameter	32A (female thread)	32A (female thread)	32A (female thread)	32A (female thread)	32A (female thread)	32A (female thread)	32A (female thread)	
Economizer drain pipe		Nominal diameter	—	—	40A (female thread)	40A (female thread)	—	—	40A (female thread)	
Exhaust pipe (inner diameter)		Ø mm	350	350	350	350	350	350	350	
Service power cable		mm ²	14	22/14 (50/60Hz)	14	22/14 (50/60Hz)	14	22	22/14 (50/60Hz)	

- * Boiler efficiency is based on a steam pressure of 1.2/1.6MPaG, feed water temperature of 15°C, and an intake air temperature of 35°C.
- * Boiler efficiency has a tolerance of ±1% due to using the exhaust gas loss method. Combustion rate error is ±3.5%.
- * Condensation water is generated from exhaust gas due to being a high-efficiency device. Please implement a countermeasure for condensation water from flues and exhaust pipes. To reduce exhaust gas condensation, take measures such as heating the feed water (to 55°C or more).

Flow sheet



External view



IBK Boiler Techno Center

The IBK Boiler Techno Center performs research and development on next-generation heat system equipment that is friendly for users and the environment. This facility comes with hands-on training facilities and technology training rooms for training skilled service personnel on actual boiler equipment, helping to make them experts in IBK products and heat system equipment.



IHI Packaged Boiler is a boiler manufacturer that has obtained certification for the international standard "ISO9001" as defined by the International Organization for Standardization (ISO). With an integrated quality assurance system that oversees all aspects of business from sales, design, development, and manufacture to installation and ancillary services, IHI provides high quality products that can be trusted.

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