

Creating Friendly Products for Users and the Environment

# IHI Packaged Boiler

# IHI

Realize your dreams

# IHI Once Through Boilers

## Oil-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.

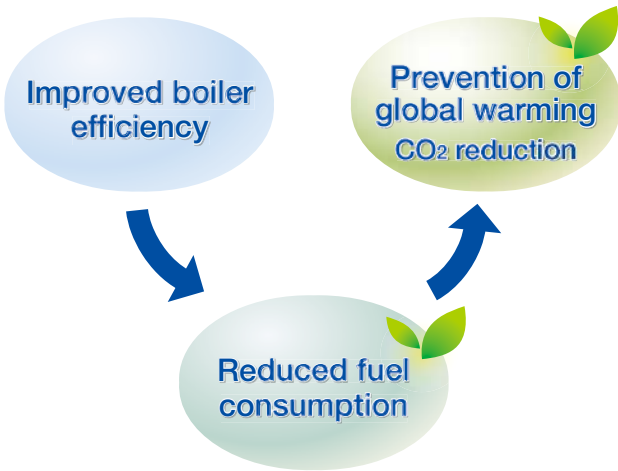


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# Functions of the IHI Once Through Boilers

Featuring



## Merit 1

### Improved efficiency through minimum load reduction

Reducing the number of starts/stops even further during low-load operation by making minimum combustion rate 25%. Actual operation efficiency has been improved by reducing purge loss.

## Merit 2

### Improved load response

Continuous operation is also possible during low-load operation, and load increase can be performed immediately after load suddenly increases, therefore improving load response even further.

## New four stage combustion

[100%–65%–25%–OFF]



Standard **K-RE** **K-L** **K-LH**  
K-2500REX K-2000LX/LEX K-1600LX/LEX

Four stage combustion of once through boilers (oil-fired) is a **unique** control method developed by IHI. Even **higher performance** with **new four stage combustion!**

**No.1 in the Industry**

Minimum combustion rate  
 30% ▶ **25%**

## ● Improved operation efficiency

By adopting the **newly developed oil-fired burner**, it is now possible to **reduce minimum combustion rate to 25%**. (30% for K-2500REX)

### Improved operation efficiency

Reduced the number of starts/stops during low-load operation with new four stage combustion.



**REX** **LX** **LEX** **LHX** **LEHX** Series

**Merit 3**

**Improved efficiency through low O<sub>2</sub> combustion**

Boiler efficiency has been improved as enhanced combustion performance has made it possible to set the air ratio lower than the conventional.

■ Merit calculation result

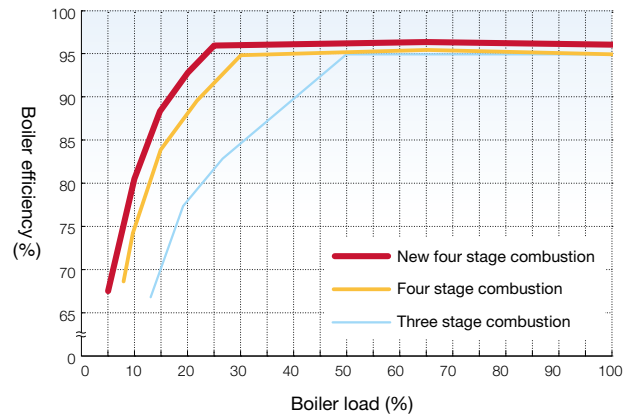
(USD/year)

Average boiler load	25%	30%	40%
Fuel cost savings	<b>12,798 USD</b>	<b>11,613 USD</b>	<b>8,058 USD</b>

Calculation conditions

- Operating time 10 hours/day x 25 days/month x 12 months = 3,000 hours
- Diesel oil price 0.79 USD/ℓ
- Boiler 2,000kg/h (→ Comparison with a three stage boiler)

■ Comparison of operation efficiency



**Ultra-high efficiency**

**High efficiency**

- Standard **K-RE** **K-L** **K-LH**  
 K-2500REX K-2000LX/LEX K-1600LX/LEX

**Boiler efficiency**

<b>K-1600LX</b>	90% → <b>91%</b>
<b>K-1600LEX</b>	95% → <b>96%</b>
<b>K-2000LX</b>	88% → <b>90%</b>
<b>K-2000LEX</b>	95% → <b>96.5%</b>
<b>K-2500REX</b>	95% → <b>96%</b>
<b>K-1600LHX</b>	87% / 86% → <b>88% / 87%</b>
<b>K-1600LEHX</b>	94% / 93% → <b>95% / 94%</b>
<b>K-2000LHX</b>	86% / 85% → <b>87% / 86%</b>
<b>K-2000LEHX</b>	93% / 92% → <b>94% / 93%</b>



● Improved rated efficiency

By adopting the newly developed oil-fired burner, it has become possible to set the air ratio lower than the conventional which has **dramatically improved efficiency.**

**No.1 in the Industry**

**Improved boiler efficiency**  
**96.5%**  
 (K-2000LEX)

\* Current as of November 2014. Small once through boiler. According to IHI's findings.

# Functions of the IHI Once Through Boilers

## Four stage combustion

Patent No. 2942080

Standard **K-RE** K-2500RE5/RE7 **K-L** K-2000LE5/LE7/K-1600LE5/LE7

Four stage combustion – the secret to high efficiency is the minimum combustion rate (30%, specification of low NOx)



### ● Intricate combustion control

Controls combustion rate at four stages to achieve intricate operation.

- High combustion (100%)    ■ Middle combustion (65%)
- Low combustion (30%)     ■ Stop



### ● Reduced fuel consumption

### ● Extended boiler life

### ● Stable operation

Middle combustion priority

Multi-boiler control system

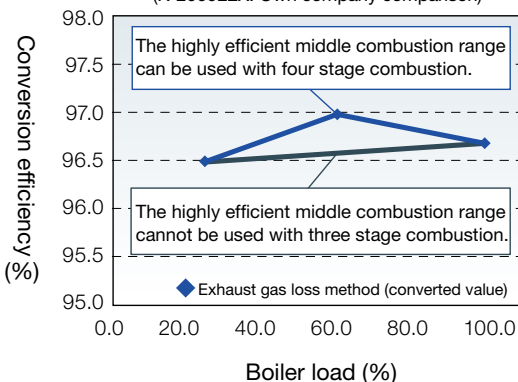
Patent No. 5129627 Patent No. 5352714

With four stage combustion, high efficiency during middle combustion (65%) can be utilized therefore actual operation efficiency is improved.

It is now possible to further improve the operation efficiency of boiler equipment by combining middle combustion priority and multi-boiler control system for multiple boiler installations.

Comparison of the efficiency of three stage vs. four stage combustion

(K-2000LEX: Own company comparison)



In the case of three stage combustion with multi-boiler control system



Equipment efficiency **96.6%**

In the case of four stage combustion with middle combustion priority multi-boiler control system



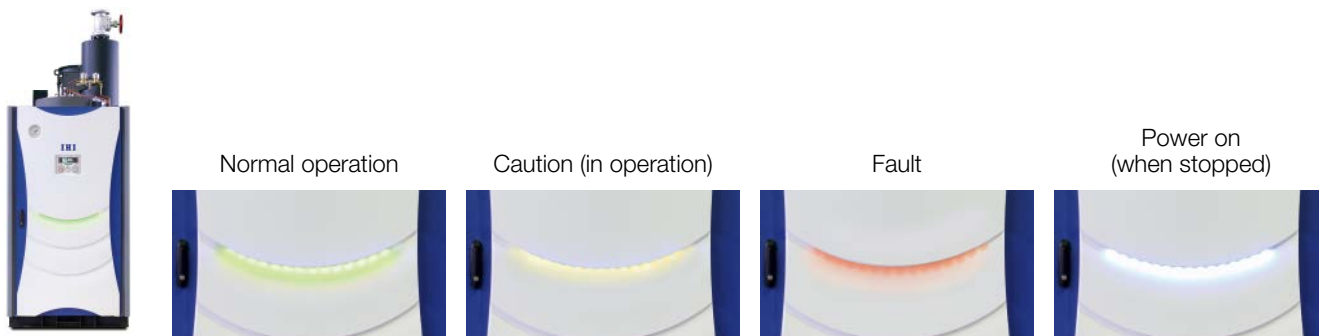
Equipment efficiency **97%**

In the case of six K-2000LEX units at a load rate of 65%



Options **K-RE** **K-L** K-2000LX/LE5/LE7  
K-1600LX/LE5/LE7

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



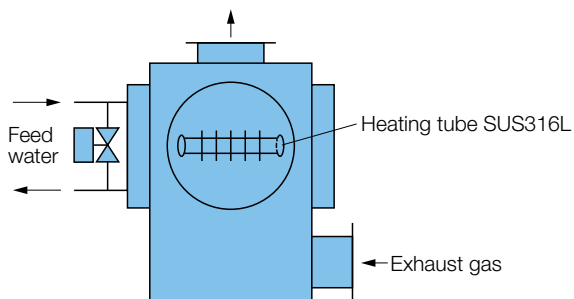
## Economizer

Patent No. 3121172

Standard **K-RE** **K-LH** K-2000LEHX/1600LEHX  
**K-L** K-2000LEX/1600LEX/1000LE  
K-2000LE5/LE7, K-1600LE5/LE7, K-1000LE5/LE7

- Adoption of anticorrosive material and a bypass solenoid valve

SUS316L is used for the heating pipe.  
By equipping a bypass solenoid valve which controls the amount of water to the economizer during low-load operation, corrosion is prevented due to a drop in exhaust gas temperature.



## Low NOx

Standard **K-RE** K-2500RE5/RE7 **K-L** K-2000LE5/LE7  
K-1600LE5/LE7  
K-1000LE5/LE7

### Low pollution with a low NOx burner

- Achieving 60ppm (O<sub>2</sub> = 0% conversion) with a low NOx burner.

\* In the case of kerosene (Diesel oil is 80ppm)

## Low noise

Standard **K-RE** **K-L** **K-LH**

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

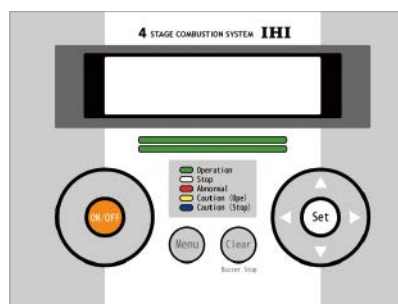
## High functionality micro-controller

Patent No. 4083911

Standard **K-LH**  
Options **K-RE** **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

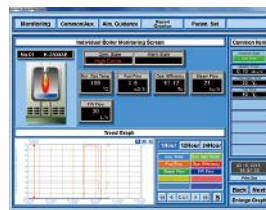
Improved system for heat management

## IBD System

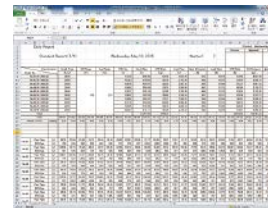
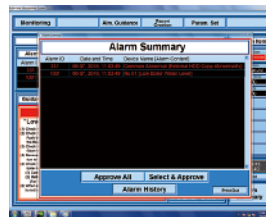
### IHI Boilers Development System

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

### Heat management system

Options **K-RE** **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-RE K-L K-LH

**Constant pressure control system (CPCS)**

For efficient multiple installation boilers

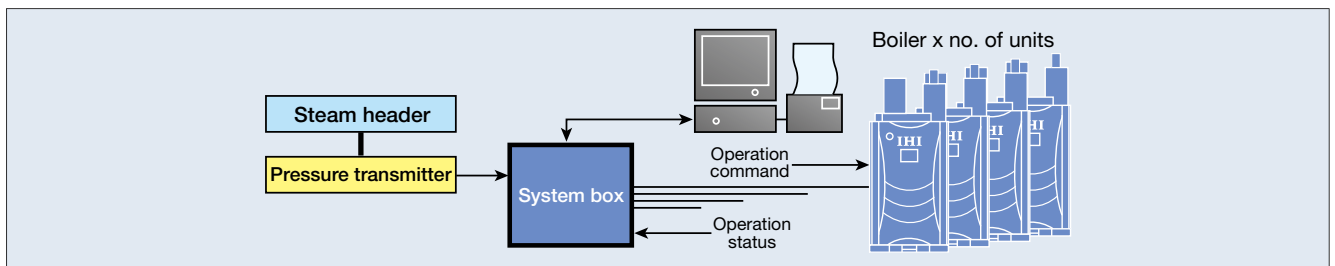
- **IHI's patented new method**
- Also supports **Blue-i SYSTEM**
- **Constant pressure control system (patented)**
- **Controls up to 32 units**  
Control even possible with a mix of three stage combustion and four stage combustion boilers.
- **Arbitrary operating sequence can be set**  
Operating sequence 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-RE Series

Maximum capacity with a small oil-fired boiler  
Achieving even higher efficiency with a new oil-fired burner



K-2500REX    K-2500REX    K-2500RE5/RE7

Options



### Functions and Features

- Dramatically improved operation efficiency and boiler life with four stage combustion
- Environmentally friendly, low noise
- High boiler efficiency
- Good quality steam with high dryness
- Compact and space-saving
- Significant reduction in fuel and electricity costs
- Standardly equipped with an economizer
- Standardly equipped with a continuous blow device



## K-L Series

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



K-2000LX/LEX    K-2000LX/LEX    K-2000LE5/LE7    K-2000LEX/1600LEX  
K-1600LX/LEX    K-1600LX/LEX    K-1600LE5/LE7    K-1000LE  
K-1000LE5/LE7

Options



K-2000LX/LEX  
K-2000LE5/LE7  
K-1600LX/LEX  
K-1600LE5/LE7

### 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



## K-LH Series

High quality, advanced high pressure series demanded by the times



K-2000LEHX  
K-1600LEHX

Options



### 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-RE Series

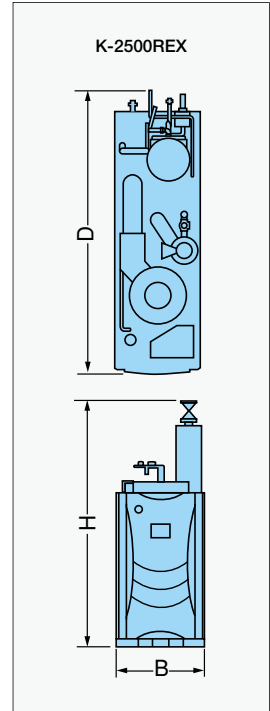


K-2500REX      K-2500RE5      K-2500RE5/RE7

### Items/dimensions

### External view

Model			2500REX	2500RE5	2500RE7
Equivalent evaporation	High combustion	kg/h	2,500	2,500	2,500
	Middle combustion	kg/h	1,625	1,625	1,625
	Low combustion	kg/h	625	750	750
Heat output		kW	1,567	1,567	1,567
Maximum working pressure		MPaG	0.98	0.98	0.98
Heating surface area		m <sup>2</sup>	9.94	9.94	9.94
Control method	Combustion	—	Electrical four stage combustion (100-65-30-OFF)		
	Feed water	—	Electrical ON-OFF		
Combustion method		—	Push ventilation oil-fired		
Fuel used		—	Kerosene/Diesel oil	Kerosene	Diesel oil
Boiler efficiency		%	96	95	95
NOx emission value (O <sub>2</sub> =0% conversion value)	Kerosene	ppm	150	60	—
	Diesel oil	ppm	180	—	80
Fuel consumption	Kerosene	L/h	168.9	170.7	—
	Kerosene	Kg/h	135.1	136.5	—
	Diesel oil	L/h	160.1	—	161.7
	Diesel oil	Kg/h	137.6	—	139.1
Voltage		—	AC200/220V 50/60Hz 3Ø		
Facility power		kW	10.2	13.7	13.7
Dimension	Width B	mm	990	990	990
	Depth D	mm	3,033	3,033	3,033
	Height H	mm	2,890	2,890	2,890
	Boiler body	kg	2,500	2,500	2,500
Weight	Boiler water	kg	150	150	150
	Total	kg	2,650	2,650	2,650
Connector diameter	Steam pipe	Nominal diameter	80A (10K flange)	80A (10K flange)	80A (10K flange)
	Feed water pipe	Nominal diameter	32A (female thread)	32A (female thread)	32A (female thread)
	Fuel pipe	Nominal diameter	20A (male thread)	20A (male thread)	20A (male thread)
	Bottom blower pipe	Nominal diameter	25A (female thread)	25A (female thread)	25A (female thread)
	Safety valve release pipe	Nominal diameter	50A (female thread)	50A (female thread)	50A (female thread)
	Main unit exhaust gas drain pipe	Nominal diameter	40A (female thread)	40A (female thread)	40A (female thread)
	Economizer drain pipe	Nominal diameter	40A (female thread)	40A (female thread)	40A (female thread)
	Exhaust pipe (inner diameter)	∅ mm	400	400	400
	Service power cable	mm <sup>2</sup>	14	22	22



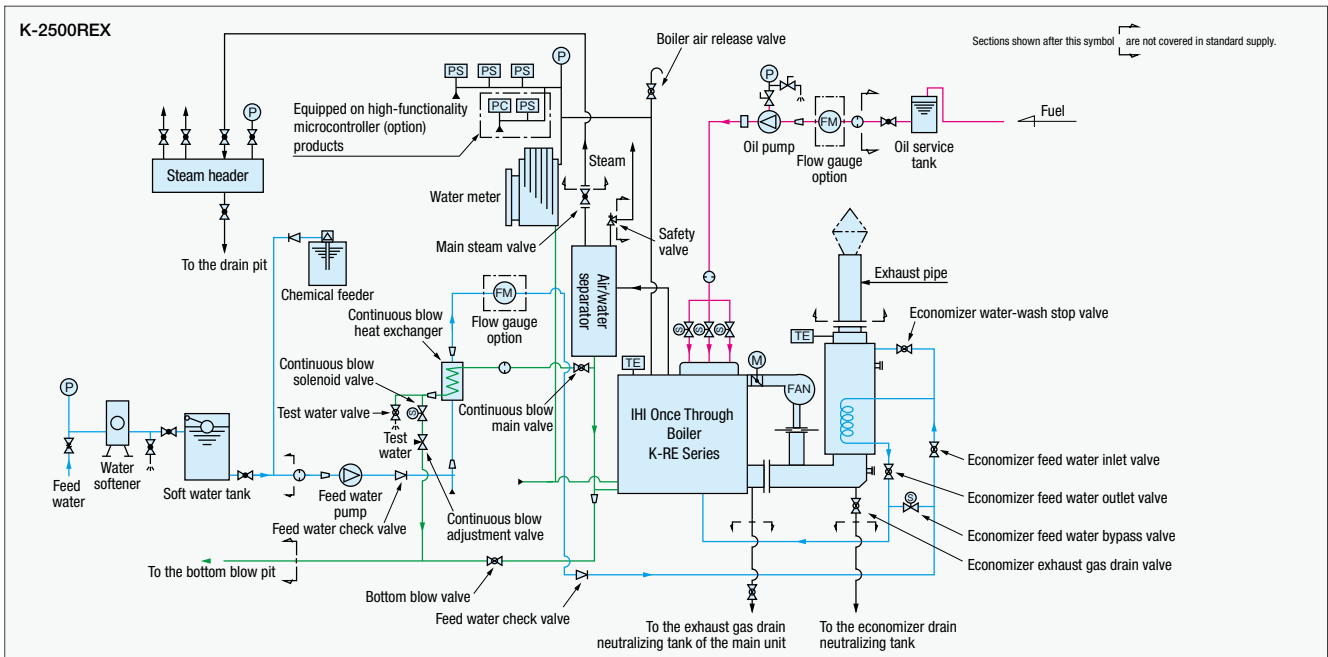
\* Regarding fuel consumption, the fuel LHV and specific gravity (oil) are 43,500kJ/kg-0.80 for kerosene and 42,700kJ/kg-0.86 for diesel oil.

\* 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%.

\* Please make the incoming feed water temperature 55°C or higher.

### Flow sheet





# K-L Series



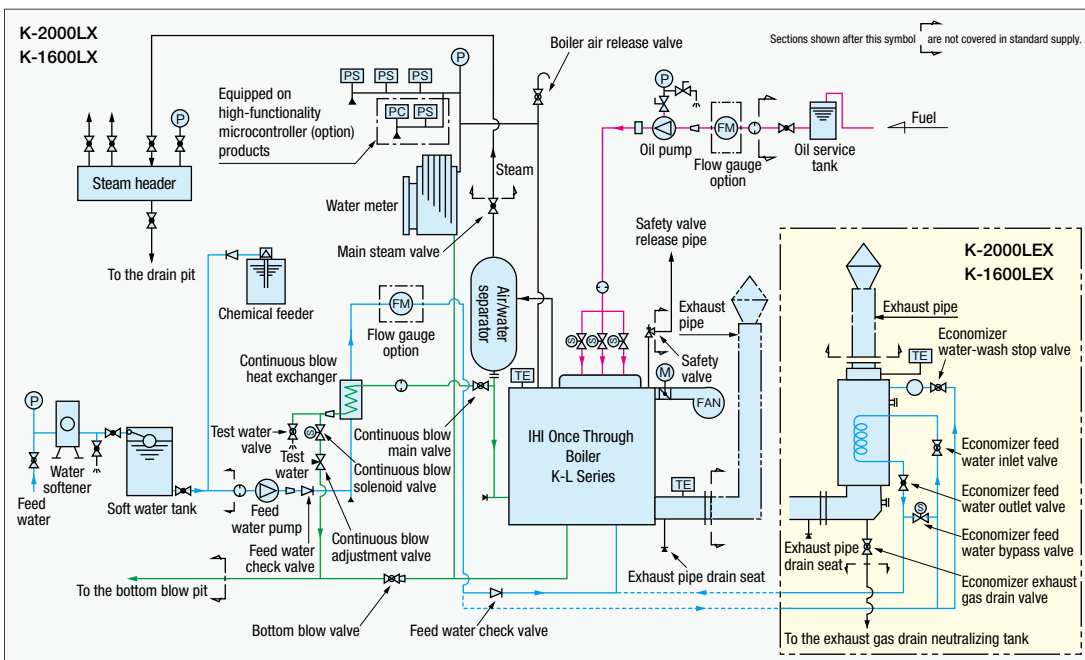
<b>New Four stage combustion</b>	<b>High efficiency</b>	<b>Four stage combustion</b>	<b>Low NOx</b>	<b>Microcontroller control</b>	<b>Low noise</b>	<b>Economizer</b>
K-2000LX/LEX K-1600LX/LEX	K-2000LX/LEX K-1600LX/LEX		K-2000LE5/LE7 K-1600LE5/LE7			K-2000LEX/1600LEX K-2000LE5/LE7 K-1600LE5/LE7

## Items/dimensions

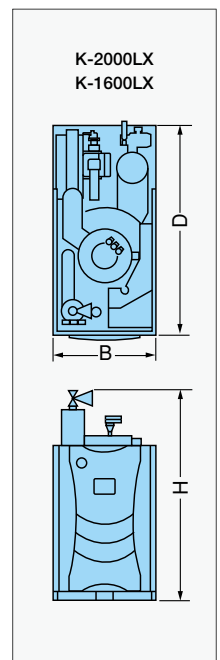
		Model	1600LX	1600LEX	1600LE5	1600LE7	K-2000LX	2000LEX	2000LE5	2000LE7	
Equivalent evaporation	High combustion	kg/h	1,600	1,600	1,600	1,600	2,000	2,000	2,000	2,000	
	Middle combustion	kg/h	1,040	1,040	1,040	1,040	1,300	1,300	1,300	1,300	
	Low combustion	kg/h	400	400	480	480	500	500	600	600	
Heat output		kW	1,003	1,003	1,003	1,003	1,254	1,254	1,254	1,254	
Maximum working pressure		MPaG	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	
Heating surface area		m <sup>2</sup>	9.72	9.72	9.72	9.72	9.76	9.73	9.73	9.73	
Control method	Combustion	—	Electrical four stage combustion (100-65-25-OFF)			Electrical four stage combustion (100-65-30-OFF)		Electrical four stage combustion (100-65-25-OFF)		Electrical four stage combustion (100-65-30-OFF)	
	Feed water	—	Electrical ON-OFF								
Combustion method		—	Push ventilation oil-fired								
Fuel used		—	Kerosene/Diesel oil			Kerosene	Diesel oil	Kerosene/Diesel oil		Kerosene	Diesel oil
Boiler efficiency		%	91	96	95	95	90	96.5	95	95	
NOx emission value (O <sub>2</sub> =0% conversion value)	Kerosene	ppm	170	170	60	—	170	170	60	—	
	Diesel oil	ppm	180	180	—	80	180	180	—	80	
Fuel consumption	Kerosene	L/h	114.0	108.1	109.2	—	144.1	134.4	136.5	—	
	Kerosene	Kg/h	91.2	86.5	87.4	—	115.3	107.5	109.2	—	
	Diesel oil	L/h	108.1	102.4	—	103.5	136.6	127.4	—	129.4	
	Diesel oil	Kg/h	92.9	88.1	—	89.0	117.5	109.5	—	111.3	
Voltage		—	AC200/220V 50/60Hz 3Ø								
Facility power		kW	7.5	7.5	9.5	9.5	8.2	10.2	10.2	10.2	
Dimension	Width B	mm	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	
	Depth D	mm	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	
	Height H	mm	2,445	2,445	2,445	2,445	2,445	2,445	2,445	2,445	
Weight	Boiler body	kg	1,730	1,990	2,010	2,010	1,740	2,050	2,070	2,070	
	Boiler water	kg	135	145	145	145	130	150	150	150	
	Total	kg	1,865	2,135	2,155	2,155	1,870	2,200	2,220	2,220	
Connector diameter	Steam pipe	Nominal diameter	65A (female thread)	65A (female thread)	65A (female thread)	65A (female thread)	65A (female thread)	65A (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)	25A (female thread)	25A (female thread)	25A (female thread)	25A (female thread)	
	Fuel pipe	Nominal diameter	20A (male thread)	20A (male thread)	20A (male thread)	20A (male thread)	20A (male thread)	20A (male thread)	20A (male thread)	20A (male thread)	
	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)	25A (female thread)	
	Safety valve release pipe	Nominal diameter	40A (female thread)	40A (female thread)	40A (female thread)	40A (female thread)	40A (female thread)	40A (female thread)	40A (female thread)	40A (female thread)	
	Main unit exhaust gas drain pipe	Nominal diameter	—	—	—	—	—	—	—	—	
	Economizer drain pipe	Nominal diameter	—	40A (female thread)	40A (female thread)	40A (female thread)	—	40A (female thread)	40A (female thread)	40A (female thread)	
	Exhaust pipe (inner diameter)	Ø mm	350	350	350	350	350	350	350	350	
Service power cable	mm <sup>2</sup>	8	8	14	14	8	14	14	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.
- \* If using an economizer, please make the incoming feed water temperature 55°C or higher.
- \* Boiler efficiency has a tolerance of ±1% due to using the exhaust gas loss method. Combustion rate error is ±3.5%.

## Flow sheet



## External view



# Specifications

## K-L Series



K-1000LE5/LE7

K-1000LE  
K-1000LE5/LE7

### Items/dimensions

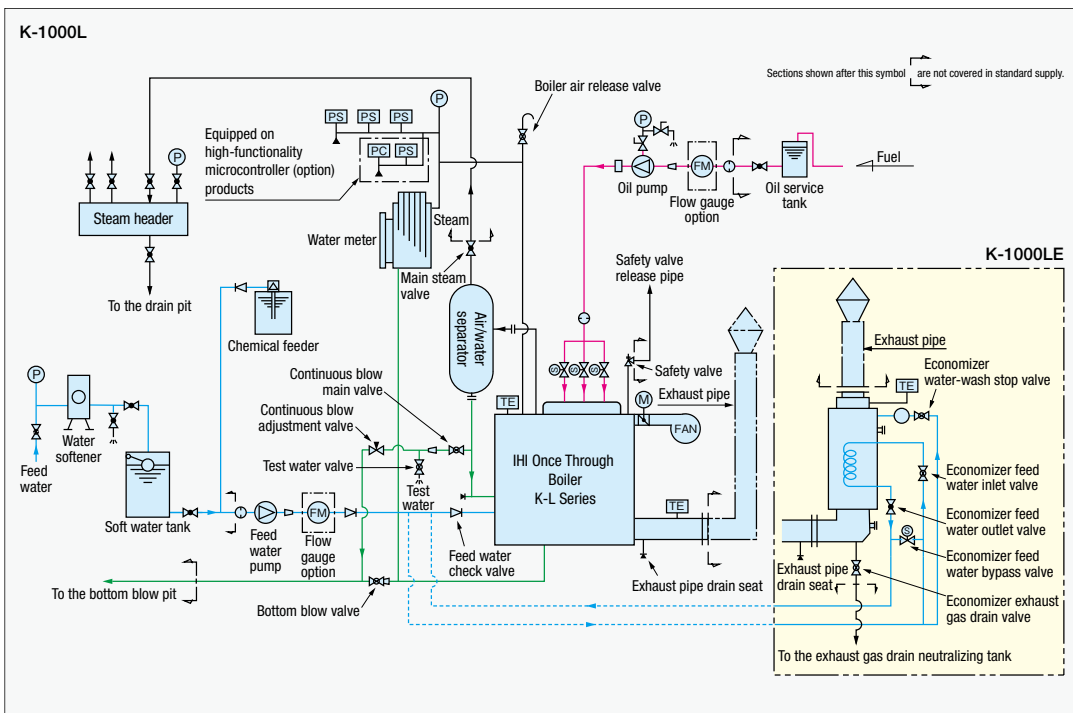
Model		1000L	1000LE	1000LE5	1000LE7	
Equivalent evaporation	High combustion	kg/h	1,000	1,000	1,000	
	Middle combustion	kg/h	650	650	650	
	Low combustion	kg/h	300	300	300	
Heat output		kW	627	627	627	
Maximum working pressure		MPaG	0.98	0.98	0.98	
Heating surface area		m <sup>2</sup>	9.56	9.56	9.56	
Control method	Combustion	—	Electrical four stage combustion (100-65-30-OFF)			
	Feed water	—	Electrical ON-OFF			
Combustion method		—	Push ventilation oil-fired			
Fuel used		—	Kerosene/Diesel oil		Diesel oil	
Boiler efficiency		%	90	95	95	
NOx emission value (O <sub>2</sub> =0% conversion value)	Kerosene	ppm	150	150	60	
	Diesel oil	ppm	180	180	80	
Fuel consumption	Kerosene	L/h	72.1	68.3	—	
	Kerosene	Kg/h	57.7	54.6	—	
	Diesel oil	L/h	68.3	64.7	64.7	
	Diesel oil	Kg/h	58.7	55.6	55.6	
Voltage		—	AC200/220V 50/60Hz 3Ø			
Facility power		kW	4.2	4.2	5.7	
Dimension	Width B	mm	1,130	1,130	1,130	
	Depth D	mm	1,690	2,115	2,115	
	Height H	mm	2,610	2,610	2,655	
Weight	Boiler body	kg	1,320	1,570	1,610	
	Boiler water	kg	115	125	125	
	Total	kg	1,435	1,695	1,735	
Connector diameter	Steam pipe	Nominal diameter	50A (female thread)	50A (female thread)	50A (female thread)	50A (female thread)
	Feed water pipe	Nominal diameter	25A (female thread)	25A (female thread)	25A (female thread)	25A (female thread)
	Fuel pipe	Nominal diameter	20A (male thread)	20A (male thread)	20A (male thread)	20A (male thread)
	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)	32A (female thread)	32A (female thread)
	Main unit exhaust gas drain pipe	Nominal diameter	—	—	—	—
	Economizer drain pipe	Nominal diameter	—	40A (female thread)	40A (female thread)	40A (female thread)
	Exhaust pipe (inner diameter)	∅ mm	300	300	300	300
Service power cable	mm <sup>2</sup>	3.5	3.5	5.5	5.5	

\* 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.

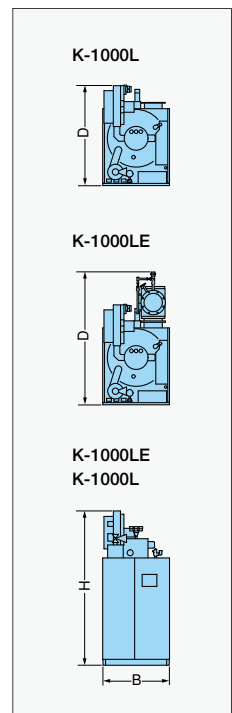
\* If using an economizer, please make the incoming feed water temperature 55°C or higher.

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

### Flow sheet



### External view



# K-LH Series



New Four stage combustion

High efficiency

High functionality micro-controller

Low noise

Economizer

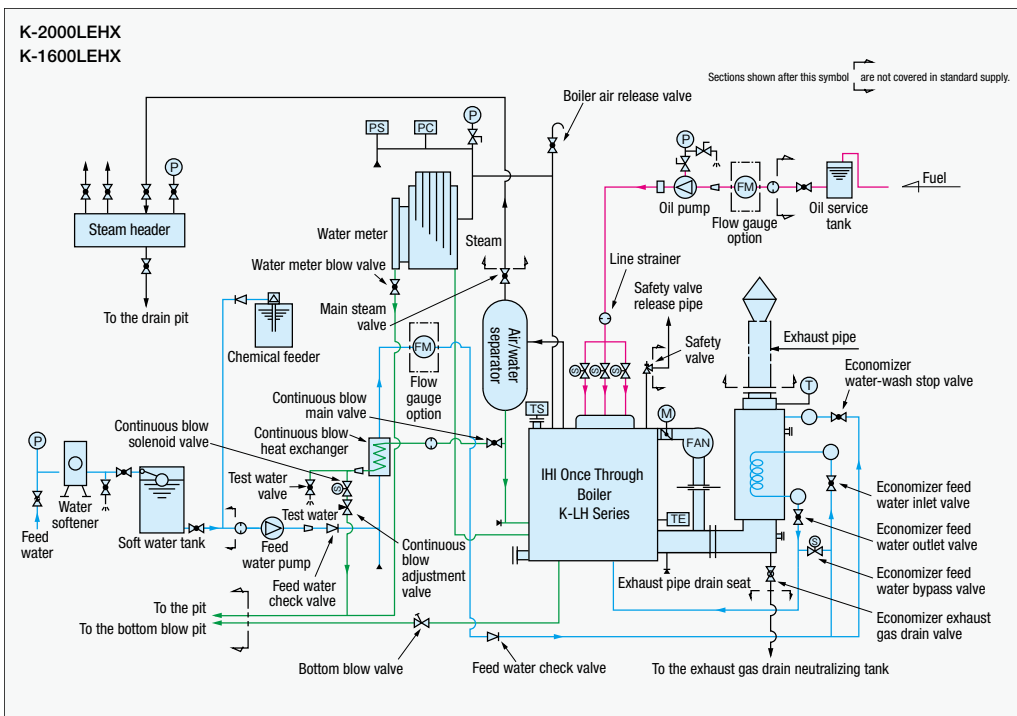
K-2000LHX  
K-1600LHX

## Items/dimensions

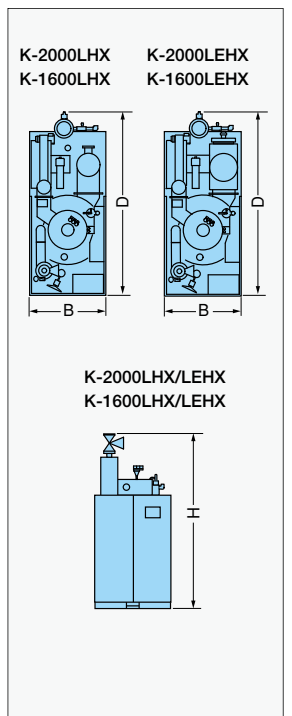
Model		K-1600LHX		K-1600LEHX		K-2000LHX		K-2000LEHX		
Equivalent evaporation	High combustion	kg/h	1,600	1,600	1,600	1,600	2,000	2,000	2,000	2,000
	Middle combustion	kg/h	1,040	1,040	1,040	1,040	1,300	1,300	1,300	1,300
	Low combustion	kg/h	400	400	400	400	500	500	500	500
Heat output		kW	1,003	1,003	1,003	1,003	1,254	1,254	1,254	1,254
Maximum working pressure		MPaG	1.57	1.96	1.57	1.96	1.57	1.96	1.57	1.96
Heating surface area		m <sup>2</sup>	9.85	9.85	9.85	9.85	9.85	9.85	9.85	9.85
Control method	Combustion	—	Electrical four stage combustion (100-65-25-OFF)							
	Feed water	—	Electrical ON-OFF							
Combustion method		—	Push ventilation oil-fired							
Fuel used		—	Kerosene/Diesel oil							
Boiler efficiency		%	88	87	95	94	87	86	94	93
NOx emission value (O <sub>2</sub> =0% conversion value)	Kerosene	ppm	170	170	170	170	170	170	170	170
	Diesel oil	ppm	180	180	180	180	180	180	180	180
Fuel consumption	Kerosene	L/h	117.9	119.3	109.2	110.4	149.1	150.8	138.0	139.5
	Kerosene	Kg/h	94.3	95.4	87.4	88.3	119.3	120.7	110.4	111.6
	Diesel oil	L/h	111.7	113.0	103.5	104.6	141.3	142.9	130.8	132.2
	Diesel oil	Kg/h	96.1	97.2	89.0	90.0	121.5	122.9	112.5	113.7
Voltage		—	AC200/220V 50/60Hz 3Ø							
Facility power		kW	9	11.5/10 (50/60Hz)	9	11.5/10 (50/60Hz)	11	13.5/12 (50/60Hz)	9	11.5/10 (50/60Hz)
Dimension	Width B	mm	1,200	1,200	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	2,600
	Height H	mm	2,750	2,750	2,750	2,750	2,750	2,750	2,750	2,750
Weight	Boiler body	kg	2,500	2,500	2,800	2,800	2,500	2,500	2,800	2,800
	Boiler water	kg	130	130	150	150	130	130	150	150
	Total	kg	2,630	2,630	2,950	2,950	2,630	2,630	2,950	2,950
Connector diameter	Steam pipe	Nominal diameter	65A (20K flange)	65A (20K flange)	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)	32A (female thread)
	Fuel pipe	Nominal diameter	20A (male thread)	20A (male thread)	20A (male thread)	20A (male thread)	20A (male thread)	20A (male thread)	20A (male thread)	20A (male thread)
	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)	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)	32A (female thread)
	Main unit exhaust gas drain pipe	Nominal diameter	—	—	—	—	—	—	—	—
	Economizer drain pipe	Nominal diameter	—	—	40A (female thread)	40A (female thread)	—	—	40A (female thread)	40A (female thread)
	Exhaust pipe (inner diameter)	Ø mm	350	350	350	350	350	350	350	350
	Service power cable	mm <sup>2</sup>	14	22	14	22/14 (50/60Hz)	14	22	14	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%.
- \* If using an economizer, please make the incoming feed water temperature 55°C or higher.

## 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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