

## Multiple Installation System of High-efficiency Small Once-through Boilers

- Boiler system pursuing high efficiency and safety/high functionality

### Features

- Our multiple installation system of high-efficiency once-through boilers realize higher operational efficiency than conventional boilers.
- Our once-through boilers have original safety functions in addition to high safety, providing safer use.
- Our once-through boilers have full automatic control and high performance display / communication functions\*, providing easier management.

\*Depends on boiler model and service territory.

### Overview (Technical principles, actions, etc.)

#### 1. Overview of once-through boilers

##### ■ High efficiency

Boiler efficiency was thoroughly pursued with a  $\omega$  flow structure using special heating fins and an economizer.  
A maximum boiler efficiency of 98% has been achieved.

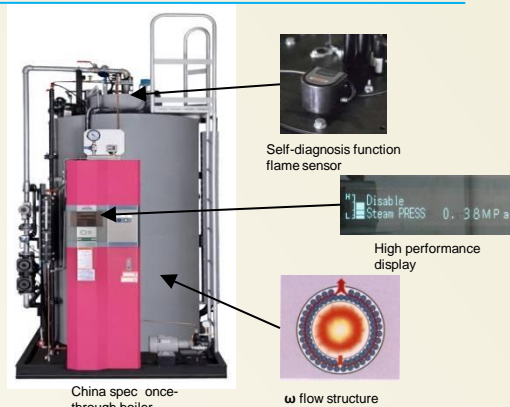
\*Japan spec.

##### ■ High safety and high performance

Simple and robust structure without steam drum consisting mainly of water tubes.

Original safety device to support full automatic control.

Display of boiler condition, heat management data and failure prediction.



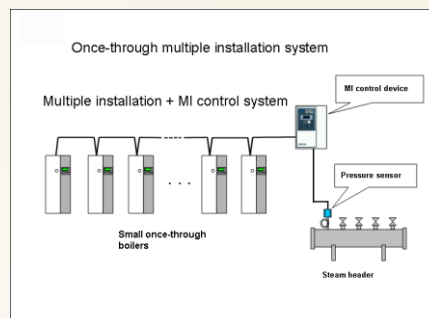
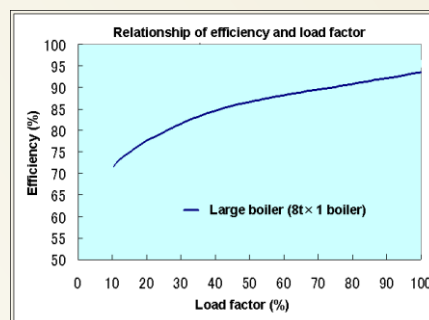
#### 2. Outline of multiple installation system

✓ The operational efficiency of boiler decreases in the range of low load due to variations in steam load as shown in the figure.

✓ In Japan as well as other countries, there is a tendency to operate boiler equipment at this range of low load.

✓ Therefore, it is important for efficiency improvement of boiler equipment to improve the operational efficiency in this range of low load.

✓ The multiple installation system of once-through boilers allows for installation of multiple boilers according to steam consumption, adopts the variations of steam load, and operates the necessary number of boilers automatically at a constant optimum operation in a range with high efficiency.



## Installation Record

MIURA Steam Boiler Sales Result

Country	Present (End of 2011) Miura Boiler in operating	2011 Sales Result
Japan	Approx. 115,000	5,723
Korea	12,375	1,203
Russia	138	52
China	2,848	328
Taiwan	2,357	173
Singapore	112	8
Vietnam	214	47
Thailand	894	72
Malaysia	162	9
Philippine	130	9
Sri Lanka	124	3
Indonesia	1,410	99
USA	1,824	159
Canada	758	45
Mexico	85	12
Brazil	15	14
India	0	0
Australia	0	0
Oversea Total	23,446	2,233
Grand Total	138,446	7,956

MIURA has established local corporations in 9 countries, such as South Korea, China, Taiwan, Singapore, Indonesia, Canada, the USA, Mexico and Brazil, and our customers in 16 countries including Japan use approximately 140,000 once-through boilers.



## Effects

- The multiple installation system of high-efficiency once-through boilers that became the standard in Japan has contributed to improvement in boiler system efficiency and environmental conservation, making it highly valued not only in Japan but also overseas.

◆ New case of equipment renewal in China (Fuel: coal ⇒ natural gas)

	Before	After
Equipment view		
Model	Fire - tube boilers	Once - through Boilers
Capacity	10 ton/h	2 ton/h
Units	3	12
Fuel	Coal	Natural gas
Operating efficiency	72%	93% (Improvement of 29%)
Reduction of CO <sub>2</sub>		63%
Reduction of SO <sub>x</sub>		99%
Reduction of NO <sub>x</sub>		82%

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