MIURA

MIURA'S LX SERIES
ON-DEMAND STEAM BOILERS

The, BL Micro Controller
Boiler Control System

Miura Gas-Fired/
Low NOx LX Series
High Pressure Steam Boiler

U.S. GREEN BUILDING COUNCIL MEMBER

On-Demand Steam Solutions

MIURA'S LOW NOx SERIES ON-DEMAND STEAM BOILERS SAVE 20% on ENERGY COSTS and REDUCE HARMFUL EMISSIONS

LX SERIES

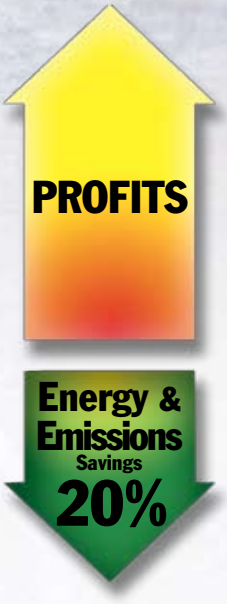
Miura is known world-wide for our commitment to protecting the environment and our innovative and efficient boiler designs. Our low NOx steam and hot water boilers meet and exceed current and proposed regulations for nitrous oxide emissions levels, **as low as 9ppm NOx** at 3%, corrected O2.

- *Gas fired: Natural Gas or Propane*
- *High and low pressure steam options available (300 MAWP, 250 MAWP, 170 MAWP or 15 MAWP)*
- *Hot water boilers are available depending on models (refer to a Miura hot water boiler catalog for details)*
- *Compact, an LX 200 Boiler can fit through a standard doorway*
- *Naturally low NOx (nitrogen oxides) Rating as low as 12ppm depending on model*

ADDITIONAL BENEFITS

Water to Steam in 5 minutes

Miura Boilers produce steam in 5 minutes using their exclusive "**floating header**" design, a revolutionary advance that results in our customers using substantially less gas and oil. On average our customers save 20% on fuel costs and equivalent CO_2 reductions. Given ever-increasing concern with energy costs & CO2 emissions, forward-thinking organizations recognize the value that Miura's technology can bring to their "triple bottom line".



Modular "MI System" offers enhanced design flexibility & energy management

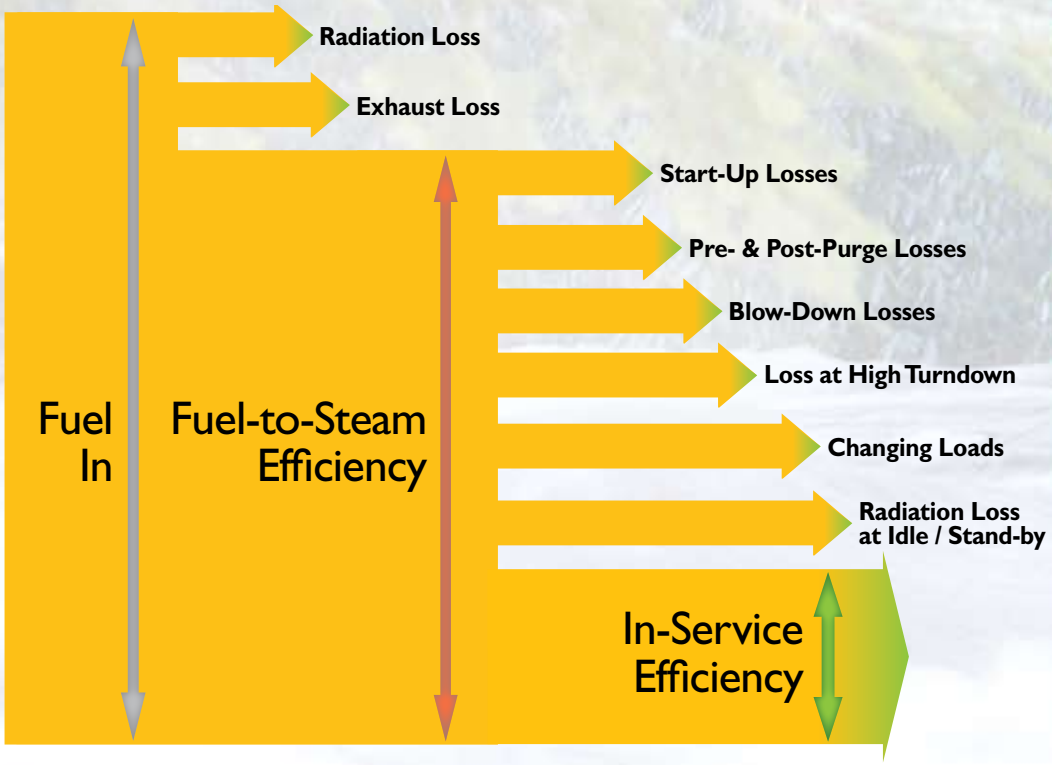
Facilities with larger loads can employ Miura's innovative "MI" (Multiple Installation) system to build an ***On-Demand*** steam plant customized to meet site-specific demand requirements. The MI System provides both the flexibility to build-to-suit current steam loads within very tight tolerances while allowing ease of future expansion of system capacity. In addition, the multiple modular units enhance a facility's energy management capability by providing higher efficiency during part-load / stand-by conditions via the MI System's ability to **stage multiple units on/off in response to demand fluctuations.**

HIGH IN-SERVICE EFFICIENCY

A Standard of Performance that sets Miura apart from other Steam Boiler manufacturers

In-Service Efficiency is a measure of overall boiler system performance, no matter your load profile. High In-Service Efficiency is the level of performance every Miura customer can expect. This standard of excellence has been established based on taking all factors of the boilers operation into account (see chart).

For a further explanation, let's review the common Definitions of Efficiency as related to the Boiler:



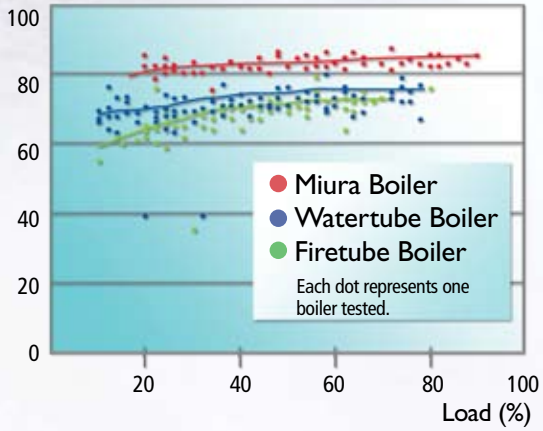
Miura has developed the term "In-Service Efficiency" to include Combustion Efficiency, Thermal Efficiency and all of the other energy losses from a boiler's operational cycle that contribute to operating efficiency including: radiation losses, blow-down losses, pre- and post-purge losses, and other losses that occur during changing loads, high turn-down, part-load and stand-by operation.

In-Service Efficiency is a more comprehensive measure of boiler efficiency. It better reflects a boiler's contribution to a facility's annual energy costs and is a more effective way to compare boiler performance. As a "bottom line" boiler performance indicator, In-Service Efficiency is the best measure of the true cost of steam.

SUPERIOR FUEL SAVINGS & CO_2 REDUCTIONS

Highest In-Service Efficiencies in the commercial / industrial boiler industry

In-Service Efficiencies



Miura's innovative design promises to move boiler technology into the 21st century, providing energy savings averaging 20% over other boiler designs. At 10% to 40% fuel savings, Miura can save about $200,000 per year in fuel for a typical 600 BHP steam system (assuming fuel cost of $0.90 / them) with reduced CO_2 emissions of over 1,100 metric tons per year.

The chart (left) compares in-service efficiencies of Miura boilers with both conventional firetube and watertube boilers. Miura's low volume design results in optimal heat transfer with fuel-to-steam efficiencies of 85% at all load conditions. Although typical firetube designs can deliver up to 83% fuel-to-steam, studies comparing actual operating **In-Service Efficiencies** have shown Miura averages 10% to 40% in fuel savings over standard firetube designs.

Whereas conventional boiler efficiency is significantly reduced during part-load conditions, Miura offers consistently high operating efficiency at all load conditions.

LX SERIES SPECIFICATIONS

FRONT VIEW

(Inches)

	A1	A2	A3	B1	B2	B3	H1	H2	h*
LX-50 SG	39 ½	16 ½	21 ½	95 ½	57	78 ½	96	62	68
LX-100 SG	38	14 ½	17	124	87 ½	109	97	68 ½	69
LX-150 SG	42 ½	16 ½	17	141 ½	72	121	116 ½	82 ½	84 ½
LX-200 SG	42 ½	16 ½	17	141 ½	72	121	116 ½	82 ½	84 ½
**LX-300 SG	63	50 5/8	13 9/16	153 ½	21 13/16	123 3/8	127	95 7/8	106 3/8

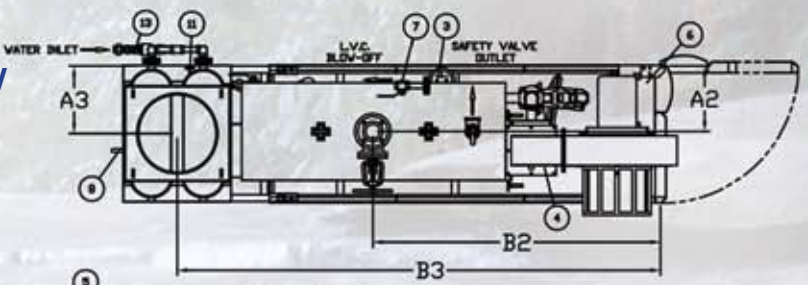
NEW

The drawing illustrated is LX-200 SG

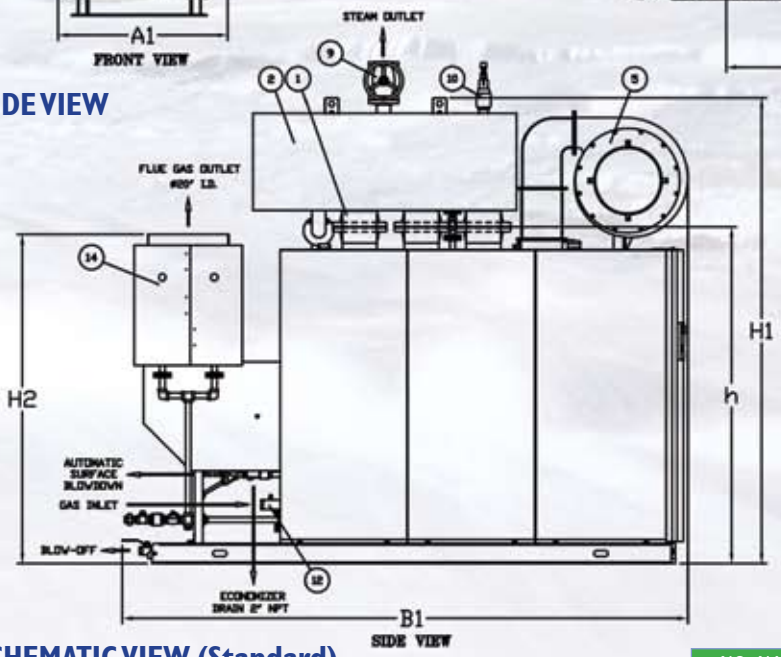
* Minimum height for Boiler Knock Down

** Drawing not applicable for LX-300SG (see new LX-300 insert)

TOP VIEW

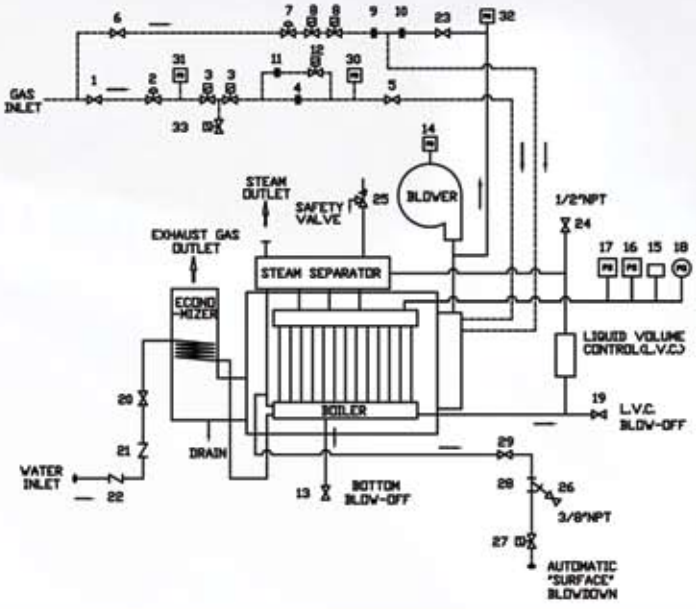


SIDE VIEW



NO.	NAME OF PART
1	BOILER VESSEL
2	STEAM SEPARATOR
3	LIQUID VOLUME CONTROLLER
4	WIND BOX
5	BLOWER
6	CONTROL BOX
7	MANUAL BLOWDOWN VALVE
8	MANUAL BLOWDOWN VALVE
9	STEAM OUTLET VALVE (OPTION)
10	MAIN SAFETY VALVE
11	AUTOMATIC BLOWDOWN
12	MAIN GAS TRAIN
13	FEEDWATER PIPING
14	ECONOMIZER

SCHEMATIC VIEW (Standard)



NO.	NAME OF PART	NO.	NAME OF PART
1	MAIN GAS VALVE	18	PRESSURE GAUGE
2	MAIN GAS REGULATOR	19	L.V.C. BLOW-OFF VALVE
3	GAS CONTROL VALVE	20	VALVE
4	MAIN GAS ORIFICE (LOW)	21	CHECK VALVE
5	TEST FIRING VALVE	22	CHECK VALVE
6	PILOT GAS VALVE	23	AIR CONTROL VALVE
7	PILOT GAS REGULATOR	24	AIR VENT VALVE
8	PILOT GAS CONTROL VALVE	25	SAFETY VALVE
9	PILOT GAS ORIFICE	26	SAMPLE WATER VALVE
10	PILOT AIR ORIFICE	27	BLOWDOWN CONTROL VALVE
11	MAIN GAS ORIFICE (HIGH)	28	BLOWDOWN STRAINER
12	HIGH-LOW CONTROL VALVE	29	BLOWDOWN VALVE
13	BOILER BLOW-OFF VALVE	30	GAS PRESSURE SWITCH
14	PRESSURE SWITCH	31	GAS PRESSURE SWITCH
15	PRESSURE SENSOR	32	AIR PRESSURE SWITCH
16	STEAM PRESSURE SWITCH	33	GAS VENT VALVE*
17	STEAM PRESSURE SWITCH		

* Available if required by local codes, or may not be supplied or optional according to boiler type.

** Numerous options are available upon request.

BL MICRO CONTROLLER
BOILER CONTROL SYSTEM

The new BL Micro Controller Boiler Control System (left), the "brain" behind Miura's enhanced energy management system, offers significant advancements including many new individual monitoring points –an increase of over 60% compared to our popular XJ1 Controller.

The BL Controller provides robust 24/7 boiler Monitoring, Measuring & Verification (MM&V) capabilities and enhances troubleshooting by identifying problems and suggesting solutions via an easy-to-read display that interfaces with Miura Online Maintenance® software. Information is accessible both on site and on-line. The BL Controller features simple, intuitive programming that is easy to set up, program and operate. When combined with our O&M training program, the easy-to-use interface provides your facility with an intelligent boiler system to optimize energy and personnel management for increased productivity, efficiency and a reduced environmental impact.

- *Greater control over steam pressure settings for steadier steam pressure.*
- *Allows for compensated adjustment of high and low fire scale thermocouple settings.*
- *Allows for compensated adjustment of automatic blowdown based upon Total Dissolved Solids (TDS) and/or blowdown rates.*
- *Easily interfaces with the Miura "Colormetry" unit to minimize scale formation due to water softener failure.*

Detailed Boiler Operations

The BL Micro Controller Boiler Control System measures the performance of your boiler in an easy-to-read, user-friendly format:

- *Steam Pressure*
- *Flue Gas Temperature*
- *Feed Water Temperature*
- *Scale Monitor Temperature*
- *Overheat Monitor Temperature*
- *Flame Current*
- *Remaining Time to Blowdown*
- *Automatic Surface Blowdown Valve (On/Off)*
- *Water Conductivity*
- *11-Point Boiler Management Data*

... Plus many more

Top view of Flame Pattern

Burner Head

Low NOx output *(as low as 9 ppm)* reduces harmful emissions

Fuel savings and reduced emissions go hand-in-hand. Miura's "green" technology maximizes energy efficiency to reduce the level of harmful emissions created from every pound of useful steam generated. How does it work? Our unique burner design produces a lower temperature flame and spreads it over a large surface area to enhance heat transfer. This naturally reduces the formation of NOx during combustion.

Reduced Boiler Footprint

Miura's unique compact modular design utilizes a low volume pressure vessel offering output capacities comparable to much larger conventional boilers. The resulting reduced boiler footprint provides design flexibility, reduced construction costs and enhanced utilization of existing space.

Miura offers the most BHP capacity / sq. ft. of boiler footprint.

Built-in Online Monitoring

Miura's MOM / ER "Dashboard" Systems

Efficiency is also measured in consistent, reliable performance and Miura offers a robust suite of "dashboard" monitoring systems integrated with its BL boiler controller to provide real-time, 24/7 monitoring capability. Miura's On-line Maintenance® ("MOM") system provides a unique "sliding window" feature that records cautions / alarms in real time + 4 seconds preceding them to provide enhanced troubleshooting capability. The "MOM" system is standard with every unit and Miura offers monitoring to subscribing customers with a free 6-month trial of the service. Miura offers its ER monitoring system to those facilities that wish to integrate boiler monitoring into their on-site control system rather than subscribe to an off-site monitoring service.

See Miura's MOM / ER brochure for more information.

LX SERIES SPECIFICATIONS

ITEM	LX(L)-50 SG	LX(L)-100 SG	LX-150 SG	LX(L)-200 SG	NEW LX-300 SG *11
Utilization Horsepower (*1)	50HP	100HP	150HP	200HP	300HP
Maximum Pressure	170 PSIG MAWP, 150 PSIG Maximum Operating (15 PSIG MAWP)				
Equivalent Output (*2)	1,725 LB/HR	3,450 LB/HR	5,175 LB/HR	6,900 LB/HR	10,350 LB/HR
Heat Output	1,674,000 BTU/HR	3,348,000 BTU/HR	5,022,000 BTU/HR	6,695,000 BTU/HR	10,050,000 BTU/HR
Efficiency (fuel to steam) (*3)	85% (80% without Economizer)				87%
Heating Surface Area	192.4 FT^2	269.0 FT^2	388.2 FT^2	387.7 FT^2	612 FT^2
Operational Weight	3710 LBS	6,070 LBS	8,620 LBS	8,620 LBS	10,935 LBS
Shipping Weight	3,480 LBS	5,470 LBS	7,820 LBS	7,820 LBS	9,800 LBS
	Dimensions Given are Approximate				
Width	39 ½ in. (50 in.)	38 in. (57 in.)	42 ½ in.	42 ½ in.(70 ½ in.)	63 in.
Length	95 ½ in. (119 in.)	124 in. (154 ½ in.)	141 ½ in.	141 ½ in.	153½ in.
Height	96 in. (147 in.)	97 in. (160 ½ in.)	116 ½ in.	116 ½ in. (190 in.)	127 in.
Combustion System	Forced Draft 4 Position Step-Fired Modulation (Hi-Low-Ignition-Off)				
Ignition System	Electric Spark Ignited, Interrupted Gas Pilot				4 Position Step Burner (Hi-Low-Ignition-Off)
Power Supply	208, 230, 460, 575V, 3 phase, 60Hz				
Max. Electrical Consumption	6.5 KVA (5.0 KVA)	13.3 KVA (10.9 KVA)	22.1 KVA	24.3 KVA (19.0 KVA)	35.2 KVA
Fuel Type (*4)	Natural Gas or Propane (3-5 PSIG)				
Gas Consumption (*5)	1,960 SCFH	3,920 SCFH	5,880 SCFH	7,850 SCFH	11,770 SCFH
Gas Supply Pressure	3-5 PSIG Natural Gas or Propane				
Main Steam Outlet Valve	2 in. (4 in.)	2 in. (6 in.)	3 in. (8 in.)		4 in.
Safety Valve Outlet	One 1 ¼ in.	One 2 in.	One 2 ½ in.		Two 2 ½ in.
Main Water Inlet	¾ in.	1 in.			1 ¼ in.
Fuel Gas Inlet	1 ½ in.	2 in.			2 ½ in.
Automatic Surface Blowdown	One ⅜ in.				Two ⅜ in.
Manual Blowdown	Two 1 in.				One 1 in. & One 1 ¼ in.
Chimney Diameter (ID)	12 in.	12 in.	20 in.	20 in.	20 in.
Flame Detector	Ultraviolet Flame Eye Sensor				
Pressure Control	Adjustable Pressure Transducer and Switch				
Liquid Volume Control	Electric Conductivity Type				
Overheat Protection	Low Water Cut Off & Thermocouple				

Note: *1 Available 49 and 199 BHP rating for L.A. area.
*2 Equivalent output calculated from and at 212°F (100°C) feed water at 212°F (100°C) steam.
*3 Thermal Efficiencies are based on high heating values of fuels and 68°F (20°C) feed water.
*4 UL and c-UL approved for natural gas or propane.
*5 Gas consumption based on natural gas with high heating 1004 BTU/SCF.
*6 All Miura steam boilers are fully packaged and test fired at factory.
*7 Built to meet or exceed UL & ASME standards in U.S.A.; c-UL & B-51 standards in Canada.
*8 Low pressure steam is available in 50, 100 and 200 BHP only.
*9 California Low NOx model(LX100SGI, LX150SGI, LX200SGI) available.
*10 Safety valve outlet size may change depending on the pressure setting.
*11 See Miura's MI System brochure for more on the new LX-300 zero-side-clearance layout offers the highest system capacity per square foot of system footprint that in the industry.

"S" - Economizer
"G" - Natural Gas or Propane Fired
"(L)" - Low Pressure

MIURA

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Miura Steam is Engineered for Greater Efficiency, Lower Costs, and Reduced Environmental Impact.