Modular Boiler Steam Solutions
Miura America Co., Ltd.

- Headquarters: Rockmart, Georgia
- Two Manufacturing Facilities
- 9 U.S. Sales & Service Offices
  - Atlanta
  - Chicago
  - Dallas
  - New York
  - Virginia
  - Los Angeles
  - Orange County
  - San Francisco
  - Utah

Four International Offices
- Mexico City
- Guadalajara
- Sao Paulo
- Toronto
Global

- Worldwide Headquarters: Matsuyama, Japan
- Sales & Service Offices: 15+ Countries
- Over 140,000 boilers in operation
- One of the Largest Boiler Manufacturers in the World
- Founded in 1927
- American Operations Founded in 1987
Driving Forces Behind the Design

• **Limited Natural Resources**
  – Natural gas prices 2 to 4 times greater than the U.S.

• **Limited Space**
  – Nearly 50% of U.S. population in a space the size of California
  – One square foot in Tokyo can be as much as $80,000
Driving Forces Behind the Design

- **Physical Footprint:**
  - Reduced space requirements
  - Reduced energy plant construction costs

- **Energy Footprint:**
  - Reduced energy consumption / wasted energy
  - Reduced potential energy

- **Environmental Footprint**
  - Reduced consumption of natural resources
  - Reduced harmful emissions
  - Reduced carbon footprint
Available Models:

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

Miura Gas/Oil-Fired
EX Series
High Pressure Steam Boiler
LX Series

- Gas Only – Natural Gas / Propane
- 50, 100, 150, 200, 250, 300 BHP Models
- Steam in 5 min. from Cold Start
- Naturally Low NOx Design
- Vertical Water Tube
- Horizontal Flame Path
- 70-150 PSI Standard Operating Pressure
- Low and high pressure options available
- Also Available in Hot Water Version
LX Series

- Patented Self-Quenching Burner Design
  - Flame Temp ~ 2,200 °F
- Flame in Direct Contact w/ Water Tubes (Non Furnace Style)
- Low NOx Leader: 20 ppm standard
  - 12 & 9 ppm models available

Boiler Vessel – Side View

Top View - Detail View

Burner Element – Detail View
DRY STEAM
COMBUSTION AIR
NATURAL GAS
EXHAUST GAS

SW-On ⇒ Max Steam Output 3 min
Pre-Purge 12 Sec
Ignition 16Sec
Low Fire 6 Sec
Low ⇒ High Fire 8 Sec
High Fire
PV-Evaporation 2 min
Steam Output Start
MAX Steam Output
EX Series

- **Dual Fuel** – Natural Gas, Propane, & Oil
- 100, 150, 200, 250, 300 BHP Models
- Steam in 5mins From Cold Start
- Vertical Water Tube
- Vertical Flame Path (top down)
- 70-150 PSI Standard Operating Pressure
- High Pressure Option Available
- Also Available in Hot Water version
- Now can also burn Bio-Gas
EX Series

- Miura’s First Innovation
- Dual Fuel (gas & oil)
- Vertical Flame Path

Floating Header Design – Side View

Combustion Path – Top View
Boiler Construction (EX & LX)

“Floating Header” design eliminates thermal stresses because tubes can expand.
Boiler Construction (EX & LX)

Fire-Tube Boiler

Miura Water Tube Boiler
Boiler Construction (EX & LX)

• Fully welded tube to tube-sheet construction
  o X-ray Tested
  o Dye Penetrant Tested
  o Hydrostatic Tested
  o Post Weld Heat Treated

• Water tubes have swaged ends for close proximity

• Robotic welds
Miura Boilers
Miura Boilers (cutaway)
M.I. Systems

Multiple Installations
Low Water Content → Fast Response → Modular System

- Senses Steam Demand and Responds Immediately
- Rotates boilers to balance load
- Controls back-up boilers
- Programming modes match your load requirements
- Maintains 82 to 83% efficiency across all loads
- Extremely high turndown
M.I. System Advantages

- Modularity / Flexibility
- Risk Reduction (N+1 and Safe Design)
- Load Matching
- Small Footprint / Space Savings
- High Efficiency
- Quick Startup
- Emission Permitting
- Single Source Provider
- Engineering Support
Boiler Ancillaries

- M.I. Controls – MP1/MT1
- Chemicals – Boilermate
- Water Softener – MW/MS
- Hardness Monitoring – Colormetry
- Steam Headers
- Hotwell
- More to come…
**Codes / Regulations:**

1) **ASME Boiler & Pressure Vessel Code**
   - Section 1: Power Boilers
   - REQUIREMENT BY MARKET AND/OR LAW
   - STAMPED ON THE BOILER

2) **ASME CSD-1**
   - Controls and Safety Devices for Automatically Fired Boilers
   - Miura meets the intent
   - NO CERTIFICATION AVAILABLE
   - Letter available per customer

3) **Underwriter’s Laboratory (UL)**
   - Package system approval
   - Specific to Miura products (EX, LX, BL)
   - Pay to update our files & test
   - STICKER ON THE BOILER

4) **ASME B31.1: Power Piping**
   - Boiler and Non-Boiler External Piping
Common Boiler Questions:

1) **What materials do we use?**
   - All Carbon Steel
   - Water tubes are SA-178A, wall thickness 0.125

2) **What is your burner controller?**
   - Miura BL Controller
   - Circuit Board (not PLC)

3) **What is your flame safeguard?**
   - Miura ZUV-II Ultraviolet flame scanner
   - Miura BL Controller

4) **What safety interlocks do you have?**
   - Gas Pressure (High and Low – Dungs or Antunes)
   - Air Pressure (Dungs or Antunes)
   - Air Damper Micro-Switch (Honeywell)
   - Purge Time Confirmation (Miura BL)
   - Low Water Cut-off (L, L2 Conductance Probes - Miura)
   - Steam Pressure (BL, Backup, High Limit, & Safety Relief Valve – Miura, Honeywell, and Kunkle)
Specific ASME BPVC, Section 1 Topics:

1) Why no gauge glass?
   - PG-60.1 Water Level Indicators: “...Boilers not having a fixed water level, such as forced-flow steam generators and high-temperature water boilers of the forced circulation type, are not required to have a gage glass.”

2) Why do we include the first steam valve?
   - PG 58.3.1: “…The steam piping connected to the boiler drum or to the superheater outlet header shall extend up to and including the first stop valve in each connections…”
   - PG 58.3 Boiler External Piping: “…The following defines the Code Jurisdictional Limits of the boiler external piping systems, ...The materials, design, fabrication, installation, and testing shall be in accordance with ASME B31.1, Power Piping.”

3) Only one feed water pumps is required.
   - PG-61.1.1: “Except as provided for in PG-61.2 and PG-61.4, boilers having more than 500 ft² of water-heating surface shall have at least two means of feeding water.”
   - PG-61.2: “Except as provided for in PG-61.1, a boiler fired by gaseous, liquid, or solid fuel in suspension, or heated by combustion turbine engine exhaust, may be equipped with a single means of feeding water, provided means are furnished for shutting off its heat input prior to the water level reaching the lowest permissible level established by PG-60.”
Specific ASME BPVC, Section 1 Topics:

1) **Single or Multiple Safety Relief Valves?**
   - **PG-67.1:** "Each boiler shall have at least one pressure relief valve and if it has more than 500 ft² of bare tube water-heating surface, ...it shall have two or more pressure relief valves."

2) **What are the ASME Data Sheets?**
   - **P-3:** Primary form for our Boilers, LVC, Separator, and Economizer
   - **P-6:** Extension of the P-3 Forms (rare case)
   - **P-4:** Pipe spools (rare case)

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**Form P-3 MANUFACTURER'S DATA REPORT FOR WATERTUBE BOILERS, SUPERHEATERS, WATERWALLS, AND ECONOMIZERS**

As Required by the Provisions of the ASME Code Rules, Section I

<table>
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<th>MASTER DATA REPORT</th>
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1. Manufactured by
   - (Name and address of manufacturer)
2. Manufactured for
   - (Name and address of purchaser)
3. Location of installation
   - (Name and address)
4. Unit identification
   - (Complete boiler, superheater, waterwall, economizer, etc.)
   - (Manufacturer's Serial No.)
   - (Drawing No.)
   - (Part, Board No.)
   - (Year built)
5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design conforms to Section I of the ASME BOILER AND PRESSURE VESSEL CODE.

Addenda to
- (Addendum code and Code Case)
- (Number)

Supporting Manufacturer's Data Reports properly identified and signed by Commissioned Inspectors are attached for the following items of this report:
- (Name of part, item number, manufacturer's name, and identifying Designator)

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THANK YOU!