Modular Steam Boiler Central Utility Plant

EnviroSep MSBP, Modular Steam Boiler Central Utility Plant, is a UL-Listed, factory engineered and manufactured Mechanical Room utilized in conventional building heating and process steam systems. The Model MSBP provides a UL listed outdoor steam plant packaged unit alternative to site-built Central Plants while avoiding costly project delays. All components required to integrate a stand-alone Steam Boiler Plant are included, eliminating site coordination, and negating start-up irregularities. Being pre-engineered by EnviroSep, enables the owner to specify key components from a range of manufacturers that meet performance needs. EnviroSep factory service personnel, who have followed the project from inception, perform Site Start-up eliminating errors from multiple hand-offs. The Model MSBP is controlled by a non-proprietary, Boiler Plant Optimization Controller, providing the best system operating efficiency. A User-friendly, Color Touch Screen Operator Interface is utilized for simple operation. Factory Engineering staff are available to assist facility owners or engineers in conceptual development.

### TYPICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Steam Load</td>
<td>500 to 30,000 lb/hr</td>
</tr>
<tr>
<td>Steam System Pressure</td>
<td>LP, MP, or HP</td>
</tr>
<tr>
<td>Feedwater System</td>
<td>Constant or Variable Speed</td>
</tr>
<tr>
<td>Standard Power</td>
<td>460 V (Other Voltages Available)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Based Upon Customer Requirements</td>
</tr>
<tr>
<td>Working Pressure</td>
<td>15 to 300 psig (1.0 to 21 barg)</td>
</tr>
<tr>
<td>Working Temperature</td>
<td>&lt; 550 deg F (&lt; 290 deg C)</td>
</tr>
</tbody>
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### Standard Features:

- Energy-Efficient Parker, Clayton, Bryan, or Fulton Steam Boilers
- Integrated Boiler Feedwater Pumping System
- Jet Spray Deaerator complete with Steam Pressure Reducing Valve, Make-up Water Assembly, and Controller
- Bottom and Surface Blowdown with Blowdown Separator and Aftercooler
- Boiler Plant Optimization Controller, with Touchscreen Interface
- Combustion Air Intake Louvers and Flue Gas Exhaust Stacks
- Communication Interface to Building Management System
- Environmentally-controlled Building Enclosure with Single-point Power Connection

### Options:

- Separate Condensate Return Surge Tank with Transfer Pumps
- Internet Connectivity for Remote System Monitoring
- Boiler Water Conductivity Controller
- Boiler Stack Economizer
- Chemical Treatment and Control System
- System without Building Enclosure
- Specific Performance Criteria (Upon Request)

“We are very pleased with the two EnviroSep packaged systems. These systems installed faster, required significantly less floor space, and started up easier than previous field assembled systems. I plan to use EnviroSep for our next project.”

BRUCE EAKINS, MANUFACTURING ENGINEER, FACILITIES DESIGN NISSAN NORTH AMERICA

“We had a problem related to our steam system. EnviroSep provided an innovative system that solved the problem. They understood our complete system, not just their own equipment. I would highly recommend them.”

WILLIAM J. GRABOWSKI, PRESIDENT AND CEO HEALTHSTAR, INC.

“On-time delivery and smooth job-site installations are critical in my business. EnviroSep's thorough engineering approach and timely delivery of quality equipment packages consistently save us time during field installation and give us a competitive advantage.”

TRACY COFFEY, P.E., VP PROJECT MANAGEMENT PIEDMONT MECHANICAL, INC.

www.envirosep.com
Model MSBP
Modular Steam Boiler Plant Order Form

Specify the following parameters:

I. System Steam Load = __________ lb/hr
II. System Pressure Required = _____ psig
III. Condensate Return = ____ %
IV. Max. Dimensions = _______________
V. Boiler Size = _______ bHp
VI. Boiler Quantity = ________________
VII. System Electrical = _______ V ______ Hz
VIII. Feedwater Pump Qty = __________

Note: System medium assumed to be softened water, unless otherwise specified.

SYSTEM OPTIONS

Boiler Type
- Parker Atmospheric
- Parker LowNox
- Clayton Helical Coil
- Fulton Vertical
- Bryan Bent Tube

Stand-by Pump
- Vertical Multistaged Pump
- Split-coupled Vertical Multistaged Pump
- Closed-coupled end-suction Centrifugal Pump
- Auto standby pump start on lead pump failure
- Auto Pump Alternation
- Remote start connection
- Variable Frequency Drives
  - Manual Bypass
  - Automatic Bypass
- Remote System Monitoring
  - Ethernet
  - Dial-up Modem
- Communication Protocol
  - Ethernet I/P
  - Modbus RTU
  - Siemens FLN
  - Johnson Controls N2
  - BACnet (MS/TP)
  - Lon Works
  - Profbus
  - DeviceNet

Deaerator System
- ASME Pressurized Jet Spray
- Atmospheric Sparge
- 100% Process Make-up

Blowdown Separator System
- Flash Steam Separator with Aftercooler
- Blow-off Tank with Aftercooler
- Conductivity Control System
  - Thornton Processor
  - Myron-L Controller
  - Auto Surface Blowdown
- Flexible Connectors
- Steam Pressure Reducing Valve Station
- System Controller
  - Hand-Off-Auto Operation
  - Auto Boiler Sequencing
  - Optimized Controller
- Chemical Treatment System w/ Blowdown Control
- Non-chemical Treatment System
- System Flow Meter
- Differential Pressure Transmitter across Pump suction/discharge

Regardless of system size, temperature, pressure, fluid medium, or space requirements, EnviroSep can provide solutions to all specialized needs.
Typical Specifications for MSBP

Furnish and install one EnviroSep Model MSBP- [A] - [B] - [C] - [D] Modular Steam Boiler Central Utility Plant with the system capacity to produce ________ lb/hr of _______ psig Saturated Steam.

KEY:
[A] = Model # (lb/hr)
[B] = # of Boilers (1,2,3,12, etc.)
[C] = Parallel (P) or Stand-by (S) N+1 designation
[D] = Manual (M) or Automatic (A) sequencing for multiple boilers

GENERAL - This Modular Steam Boiler Central Utility Plant package shall be factory assembled with Boiler(s), Deaerator, Feedwater Pump(s), Blowdown Separator, PRV Station, instrumentation, valves, piping accessories, fabricated steel frame, interconnection piping (welded per ASME Section IX certified welders), UL-listed Central System Industrial Control Panel factory wired for single-point field connection per NEC, (and including Variable Speed Pump Controller).

FEEDWATER PUMPS - Pump size shall be based on pump schedule and be able to pump into the boiler. The pump shall be a vertical multistage pump with Stainless Steel impellers and a minimum of 250 deg F seals. The pump motors shall be 3-phase, TEFC motors. Impeller shaft shall be 416SS fitted with a SS shaft sleeve and be supported by two heavy duty ball bearings. The design shall allow servicing, enabling the complete rotating assembly to be removed without disturbing casing piping connections. The pump shall be mounted on a rigid, single base plate and by flexible or rigid coupling with guard to the motor. Seal shall be rated for continuous duty at 270°F, motor shall be NEMA MG-1 with 1.15 service factor and be able to pump into the boiler. The pump shall be pre-piped and installed into system suction header; in-plant systems shall also provide all utilities required to supply water to the boiler/pump (s) are used, the standby boiler/pump(s) shall manually automatically (customer specified) start on primary failure.

DEAERATOR – The Deaerator capacity rating shall exceed the capacity of the steam system it is servicing and have a minimum of 10 minutes storage capacity to the overflow. The Deaerator shall be designed for oxygen removal to 0.005 cc/l or less and carbon dioxide removal to a zero measurable level in the effluent throughout all load conditions between 0% and 100% of rated capacity. The deaeration process will take place in a 5-7 psig steam environment that will heat the water to 227-229°F requiring a pressurized vessel. The Deaerator shall be manufactured in strict accordance with the ASME Section VIII, Div. 1 code and bare the ASME stamp for a maximum working pressure of 50 psig at 450 deg F. A minimum of 1/16" corrosion allowance shall be added to the ASME calculated material thickness for heads and shell and will be noted on the ASME data report (form U-1). The control valve shall be pilot-actuated, diaphragm-operated, and shall be single-seated, with hardened stainless steel trim and cast steel or cast iron body. The pilot shall be bolted directly to the valve body and shall be removable without disturbing control connections. The setting shall be field adjustable and valve shall be capable of being electrically disabled from operation.

STEAM SEPARATION - Steam separation stations shall be employed on Inlet/Outlet of Steam Control Valve to ensure complete removal of condensed liquid from steam supply to deaerator. Stations shall utilize steam trap of the mechanical ball float type with cast iron body, with all stainless steel internals. A stainless steel balanced pressure thermostatic air vent shall be incorporated into the trap body withstanding 45°F of superheat. Inlet/Outlet isolation valves, cast Y-strainer with 100 mesh, and check valves shall be incorporated.

CONTROL PANEL - System shall include one (1) UL- Listed, NEMA 12, Industrial Control Panel with single-point power connection, pre-wired to all electrical components. Panel shall have thru-the-door fused disconnect; magnetic circuit breaker supplementary motor protector with fast-closing contacts, non-reversing 3-pole contactor, and variable setting, bi-metallic over-load relay for each motor; control transformer; Automatic Alternator (if required). System Controller shall be Programmable Controller with 14" Color Touch Screen Operator Interface. Controller have capability of Remote network communication interface for remote system monitoring and logic maintenance/ troubleshooting by factory personnel with Managed Ethernet Switch. Acceptance of up to 16 remote 4-20 ma signals shall be provided for modulation of pump speed, and other optional control functions. Operation of each boiler/pump shall be Hand-Off-Auto with external connection to terminal blocks. When standby boiler/pump(s) are used, the standby boiler/pump(s) shall manually automatically (customer specified) start on primary failure. All internal wiring shall be placed in conduit.

BOILER - Steam Generating Boiler for Low Pressure (15 psig) shall be Horizontal Drum, Serpentine Sectional Water Tube, with Low NOx, Natural Gas burner; rated for xxxx lb/hr; equal to EnviroSep ED105-xxxL; furnished with 20 year warranty against thermal shock; double-welded, 0.133” boiler tubing. Enclosed Boiler Control Panel, compliance to ASME and local jurisdictional codes and regulations.

MAKE-UP WATER ASSEMBLY - Make-up Water Assembly shall be pre-piped and installed into system suction header; including, Self-contained, Cast Iron Pressure Reducing Valve, set @ 12 psig; Bronze isolation and bypass valves; Cast Iron Y-strainer; Bronze Backflow Preventer; System Pressure Relief Valve, set @ 75 psig; and Liquid Filled Pressure Gauge with Bronze Isolation Valve.

INDUSTRIAL GRADE ENCLOSURE—The mechanical and electrical equipment, without compromising reasonable maintenance access, shall be housed inside a factory fabricated industrial grade enclosure. The enclosure shall be assembled from pre-fabricated panels on a fabricated support structure by the same manufacturer as the steel base, pipe work, and pipe supports to ensure structural integrity of the entire Central Plant. Future removal of any panel shall not affect the structural integrity of the enclosure and shall not require flame and/or saw cutting. The enclosure systems shall also provide all utilities required to support the various functions and services of the plant.

MANUFACTURER - Shall assume system liability, and performance guarantee and warranty all equipment on system for 12 months after initial start-up.