

GTS SERIES SUGGESTED SPECIFICATION LANGUAGE **(HIGH AND LOW PRESSURE
STEAM CONTAINED HEREIN)**

SELLERS-YGNIS LOW PRESSURE STEAM BOILER
SUGGESTED SPECIFICATION

PART 1. – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section

1.02 SUMMARY

- A. This Section includes packaged, factory-assembled and tested, fuel-fired, fire-tube boilers and accessories used for low-pressure steam systems.
- B. Related Sections include the following:
 - 1. Division 15 Section “Breechings, Chimneys and Stacks” for connections to breechings, chimneys and stacks.
 - 2. Division 15 Section “Automatic Temperature Controls” for control wiring for automatic temperature control system.

1.03 SUBMITTALS

- A. Product Data: Include rated capacities; shipping, installed and operating weights, specialties furnished, and accessories for each model indicated.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, required clearances, size and location of each field connection.
 - 1. Wiring Diagram: Detail wiring for power, signal and control systems. Differentiate between factory installed and field installed wiring.
- C. Factory Fire Test Report: Include motor data, amperages, setting pressures, diagram of sensing locations, combustion analysis and flue gas temperatures obtained under simulated field conditions.
- D. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.
- E. Maintenance Data: Include in the owner’s manuals complete maintenance instructions, parts list, troubleshooting instructions and wiring diagrams for each boiler.

1.04 QUALITY ASSURANCE

- A. Listing and Labeling: Provide electrically operated components specified in this Section that are listed and labeled.
 - 1. The Terms “Listed” and “Labeled”: As defined in NFPA 70, Article 100.

2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.
- B. ASME Compliance: Fabricate and label boilers in compliance with the ASME Boiler and Pressure Vessel Code, Section IV, "Heating Boilers".
- C. National Board Registration: Unit shall be hydrostatically tested and registered with the "National Board of Boiler and Pressure Vessel Inspectors." Two (2) copies of the "Manufacturers' Data Report" shall be furnished
- D. FM Compliance: Control Devices and control sequences in accordance with the requirements of FM.

or

IRI Compliance: Control Devices and control sequences in accordance with the requirements of IRI

- E. Comply with NFPA 70 for electrical components and installation.

1.05 COORDINATION

- A. Coordinate size and location of concrete bases. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete".

1.06 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Warranty: The manufacturer shall assume undivided responsibility for the boiler and burner.
 - 1 The pressure vessel shall carry a 3-year warranty against leakage. Warranty shall cover 100 % of labor and material required for the repair of damage such as loosened tubes, cracked ligaments or welds.
 - 2 The manufacturer shall warrant all parts furnished for eighteen (18) months from date of boiler shipment.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include the following:

Sellers Engineering Co.
- B. Substitutions: Alternate but equal equipment may be offered provided written approval is obtained a minimum of ten (10) days prior to bid opening.

2.02 PACKAGED BOILERS

- A. Boiler shall have an Output of _____ Lbs./hour from and at 212°F at the nozzle when fired with natural gas with a minimum pressure of _____ inwc (PSI) or No. 2 fuel oil having a heat content of 140,000 Btu/Gal.
- B. Electrical power available will be _____ Volts, _____ Hertz, _____ Phase
- C. Boiler overall dimensions shall not exceed _____ “ wide X _____ “ long X _____ “ high.
- D. Boilers shall be factory assembled and wired to require only supply, blowdown, fuel, makeup, drain, vent and electrical connections.
- E. The boiler shall be a three-pass, horizontal, firetube, wet-back design.
- F. There shall be no refractories in the high temperature zone between the first and second passes.
- G. The furnace cylinder shall not be attached directly to the rear tubesheet. The first two passes shall be completed within the furnace to assure complete combustion.
- H. Front and rear tube sheets and all flues shall be fully accessible for inspection or cleaning when doors are swung open.
- I. Observation ports shall be installed through the front door to inspect the flame.
- J. Exhaust Gas Vent shall be on top centerline, near the rear of the boiler, complete with flue gas thermometer.
- K. Handholes shall be furnished for cleaning and inspection. Number of handholes shall be in accordance with ASME requirements. A manhole shall be provided on 66” diameter or larger shells.
- L. The boiler shall be insulated with 2” of fiberglass and covered with a steel jacket. A precast hardtop walkway shall be furnished to allow personnel to walk on top of boiler without denting steel jacket.
- M. Lifting eyes shall be welded on the top of the boiler.

2.02 STEAM BOILER TRIM

- A. Boiler trim shall include the following components:
 1. Combination water column and feedwater pump control with trycocks, redline gauge glass set with valves and low water cutoff.
 2. Second low water cutoff with manual reset
 3. Steam pressure gauge
 4. Operating pressure controls
 5. High limit steam pressure control with manual reset
 6. Pop safety valve(s) in accordance with the ASME Boiler and Pressure Vessel Code.

2.03 BURNER

- A. Natural gas (Oil) (Combination) Burner shall be factory mounted on hinged door to swing cut for easy Inspection and shall include the following:
1. Forced draft combustion air blower.
 2. Control panel in a NEMA 1 enclosure complete with the following controls and accessories:
 - a. Honeywell RM7800 combustion control with digital readout
 - b. Motor starters for burner and oil pump
 - c. Control voltage transformer
 - d. Indicator lights for main flame, low water, call for heat and pilot.
 3. Gas trim shall include:
 - a. Main and pilot fuel valves
 - b. Main and pilot Gas Pressure regulators
 - c. High and Low gas pressure switches.
 4. Oil trim shall include:
 - a. Oil pump with capacity of twice the firing rate. Oil pump shall be mounted to the boiler frame. Burner mounted oil pump driven by combustion air fan motor is not acceptable.
 - b. Pressure atomizing on 200 HP or smaller burners.
 - c. Air atomizing burner with compressor and controls on 250 HP and larger systems.
 - d. Oil metering valve
 - e. Dual oil valves
 - f. Strainer
 - g. Pressure gauge
 - h. Check valve.
 5. 50 HP and larger boilers shall be equipped with modulating burners, fuel selector switch and manual damper positioning switch.
 6. Ignition transformer with electrode
 7. Flame monitoring ultraviolet scanner.
 8. Air pressure-proving switch.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine area to receive boiler for compliance with requirements for installation tolerances and other conditions affecting boiler performance. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install boiler level and plumb, according to manufacturer's written instructions and referenced standards.

- B. Install gas-fired boilers in accordance with NFPA 54.
- C. Install oil fired boilers in accordance with NFPA 31.
- D. Support boilers on 4-inch thick concrete base, 6 inches larger on all sides than base of unit. Dowel base to floor on 18" centers along perimeter of base. Cast anchor bolt inserts through the base into floor.
- E. Assemble boiler trim according to manufacturer's written instructions.
- F. Install electrical devices furnished with boiler, but not specified to be factory mounted.

3.03 CONNECTIONS

- A. Connect gas piping full size to boiler gas-train inlet with union.
- B. Connect oil piping full size to boiler oil pump suction inlet with shutoff valve and union.
- C. Connect steam supply piping to boiler steam outlet with dual shutoff valves.
- D. Install piping from safety relief valves to vent in accordance with ASME Code and local codes.
- E. Connect breeching to boiler exhaust outlet, full size of outlet or as indicated on plans.
- F. Electrical: Comply with applicable requirements of Division 16 Sections.

3.04 FIELD QUALITY CONTROL

- A. Manufacturer's field service: Engage a factory authorized service representative to perform startup and test of boilers. Provide a written report of the startup and testing results to include the following:
 - 1. Hydrostatically test boiler and piping systems in accordance with the applicable sections of the ASME Boiler and Pressure Vessel Code and all local codes.
 - 2. Verify that the boiler is installed correctly and that all connections are in accordance with manufacturer's instructions.
 - 3. Adjust combustion at a minimum of three (3) operating points (100%, 66% and 33% of full load).
 - 4. Perform and record the results of boiler flue gas analysis.
 - 5. Check limits, operating controls and safeties to assure proper operation.

3.05 CLEANING

- A. Prior to placing the boilers in service, clean and flush the boilers in accordance with manufacturer's written instructions.

- B. After completing installation and prior to final acceptance, inspect exposed finish and remove burrs, dirt and construction debris. Repair damaged finishes, including chips, scratches and abrasions with manufacturer's touchup paint.

SELLERS-YGNIS HIGH PRESSURE STEAM BOILER
SUGGESTED SPECIFICATION

PART 1. – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section

1.07 SUMMARY

- C. This Section includes packaged, factory-assembled and tested, fuel-fired, fire-tube boilers and accessories used for high-pressure steam systems.
- D. Related Sections include the following:
 - 3. Division 15 Section "Breechings, Chimneys and Stacks" for connections to breechings, chimneys and stacks.
 - 4. Division 15 Section "Automatic Temperature Controls" for control wiring for automatic temperature control system.

1.08 SUBMITTALS

- F. Product Data: Include rated capacities; shipping, installed and operating weights, specialties furnished, and accessories for each model indicated.
- G. Shop Drawings: Detail equipment assemblies and indicate dimensions, required clearances, size and location of each field connection.
 - 3. Wiring Diagram: Detail wiring for power, signal and control systems. Differentiate between factory installed and field installed wiring.
- H. Factory Fire Test Report: Include motor data, amperages, setting pressures, diagram of sensing locations, combustion analysis and flue gas temperatures obtained under simulated field conditions.
- I. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.
- J. Maintenance Data: Include in the owner's manuals complete maintenance instructions, parts list, troubleshooting instructions and wiring diagrams for each boiler.

1.09 QUALITY ASSURANCE

- F. Listing and Labeling: Provide electrically operated components specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.

4. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.

G. ASME Compliance: Fabricate and label boilers in compliance with the ASME Boiler and Pressure Vessel Code, Section I, "Power Boilers".

H. National Board Registration: Unit shall be hydrostatically tested and registered with the "National Board of Boiler and Pressure Vessel Inspectors." Two (2) copies of the "Manufacturers' Data Report" shall be furnished

I. FM Compliance: Control Devices and control sequences in accordance with the requirements of FM.

or

IRI Compliance: Control Devices and control sequences in accordance with the requirements of IRI

J. Comply with NFPA 70 for electrical components and installation.

1.10 COORDINATION

B. Coordinate size and location of concrete bases. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete".

1.11 WARRANTY

C. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

D. Special Warranty: The manufacturer shall assume undivided responsibility for the boiler and burner.

3 The pressure vessel shall carry a 3-year warranty against leakage. Warranty shall cover 100 % of labor and material required for the repair of damage such as loosened tubes, cracked ligaments or welds.

4 The manufacturer shall warrant all parts furnished for eighteen (18) months from date of boiler shipment.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

C. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include the following:

Sellers Engineering Co.

D. Substitutions: Alternate but equal equipment may be offered provided written approval is obtained a minimum of ten (10) days prior to bid opening.

2.04 PACKAGED BOILERS

- N. Boiler shall have an Output of _____ Lbs./hour from and at 212°F at the nozzle when fired with natural gas with a minimum pressure of _____ inwc (PSI) or No. 2 fuel oil having a heat content of 140,000 Btu/Gal.
- O. Boiler shall be designed, built and stamped for a maximum allowable working pressure of ____ (150, 250 or 300)PSIG.
- P. Electrical power available will be _____ Volts, _____ Hertz, _____ Phase
- Q. Boiler overall dimensions shall not exceed _____ “ wide X _____ “ long X _____ “ high.
- R. Boilers shall be factory assembled and wired to require only supply, blowdown, fuel, makeup, drain, vent and electrical connections.
- S. The boiler shall be a three-pass, horizontal, firetube, wet-back design.
- T. There shall be no refractories in the high temperature zone between the first and second passes.
- U. The furnace cylinder shall not be attached directly to the rear tubesheet. The first two passes shall be completed within the furnace to assure complete combustion.
- V. Front and rear tube sheets and all flues shall be fully accessible for inspection or cleaning when doors are swung open.
- W. Observation ports shall be installed through the front door to inspect the flame.
- X. Exhaust Gas Vent shall be on top centerline, near the rear of the boiler, complete with flue gas thermometer.
- Y. Handholes shall be furnished for cleaning and inspection. Number of handholes shall be in accordance with ASME requirements. A manhole shall be provided on 66” diameter or larger shells.
- Z. The boiler shall be insulated with 2” of fiberglass and covered with a steel jacket. A precast hardtop walkway shall be furnished to allow personnel to walk on top of boiler without denting steel jacket.
- AA. Lifting eyes shall be welded on the top of the boiler.

2.02 STEAM BOILER TRIM

- B. Boiler trim shall include the following components:
 - 7. Combination water column and feedwater pump control with trycocks, redline gauge glass set with valves and low water cutoff.
 - 8. Float type second low water cutoff with manual reset
 - 9. Steam pressure gauge
 - 10. Operating and modulating pressure controls
 - 11. High limit steam pressure control with manual reset

12. Pop safety valve(s) in accordance with the ASME Boiler and Pressure Vessel Code.

2.05 BURNER

- A. Natural Gas (Oil) (Combination) Burner shall be factory mounted on hinged door to swing cut for easy inspection and shall include the following:

9. Forced draft combustion air blower.
10. Control panel in a NEMA 1 enclosure complete with the following controls and accessories:
 - e. Fireeye E110 combustion control with digital readout
 - f. Motor starters for burner and oil pump
 - g. Control voltage transformer
 - h. Indicator lights for main flame, low water, call for heat and pilot.
11. Gas trim shall include:
 - d. Main and pilot fuel valves
 - e. Main and pilot Gas Pressure regulators
 - f. High and Low gas pressure switches.
12. Oil trim shall include:
 - i. Oil pump with capacity of twice the firing rate. Oil pump shall be mounted to the boiler frame. Burner mounted oil pump driven by combustion air fan motor is not acceptable.
 - j. Pressure atomizing on 200 HP or smaller burners.
 - k. Air atomizing burner with compressor and controls on 250 HP and larger systems.
 - l. Oil metering valve
 - m. Dual oil valves
 - n. Strainer
 - o. Pressure gauge
 - p. Check valve.
13. 50 HP and larger boilers shall be equipped with modulating burners, fuel selector switch, auto-manual selector switch and manual firing rate potentiometer.
14. Ignition transformer with electrode
15. Flame monitoring ultraviolet scanner.
16. Air pressure-proving switch.

- B. Burner shall be set up for a turndown ratio of 3 to 1.

PART 3 – EXECUTION

3.06 EXAMINATION

- B. Examine area to receive boiler for compliance with requirements for installation tolerances and other conditions affecting boiler performance. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.07 INSTALLATION

- G. Install boiler level and plumb, according to manufacturer's written instructions and referenced standards.
- H. Install gas-fired boilers in accordance with NFPA 54.
- I. Install oil fired boilers in accordance with NFPA 31.
- J. Support boilers on 4-inch thick concrete base, 6 inches larger on all sides than base of unit. Dowel base to floor on 18" centers along perimeter of base. Cast anchor bolt inserts through the base into floor.
- K. Assemble boiler trim according to manufacturer's written instructions.
- L. Install electrical devices furnished with boiler, but not specified to be factory mounted.

3.08 CONNECTIONS

- G. Piping shall conform to the requirements of Section 15____, STEAM AND CONDENSATE PIPING and Section 15____ FUEL PIPING.
- H. Connect gas piping full size to boiler gas-train inlet with union.
- I. Connect oil piping full size to boiler oil pump suction inlet with shutoff valve and union.
- J. Connect steam supply piping to boiler steam outlet with dual shutoff valves.
- K. Install piping from safety relief valves to vent in accordance with ASME Code and local codes.
- L. Connect breeching to boiler exhaust outlet, full size of outlet or as indicated on plans.
- M. Electrical: Comply with applicable requirements of Division 16 Sections.

3.09 FIELD QUALITY CONTROL

- B. Manufacturer's field service: Engage a factory authorized service representative to perform startup and test of boilers. Provide a written report of the startup and testing results to include the following:
 - 6. Hydrostatically test boiler and piping systems in accordance with the applicable sections of the ASME Boiler and Pressure Vessel Code and all local codes.
 - 7. Verify that the boiler is installed correctly and that all connections are in accordance with manufacturer's instructions.

8. Adjust combustion at a minimum of three (3) operating points (100%, 66% and 33% of full load).
9. Perform and record the results of boiler flue gas analysis.
10. Check limits, operating controls and safeties to assure proper operation.

3.10 CLEANING

- C. Prior to placing the boilers in service, clean and flush the boilers in accordance with manufacturer's written instructions.
- D. After completing installation and prior to final acceptance, inspect exposed finish and remove burrs, dirt and construction debris. Repair damaged finishes, including chips, scratches and abrasions with manufacturer's touchup paint.