SUGGESTED SPECIFICATIONS

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Series GM/Flex-Heat Modular Atmospheric Natural Gas Hot Water Boilers

I. GENERAL REQUIREMENTS

A. A modular boiler system shall consist of two or more compact boilers that offer significant advantages in terms of install cost, efficiency, and reliability. These systems are based on step-firing just enough modules to meet domestic hot water or space heating demands. Systems are available in 456,000 to multi-million Btuh gross input. For additional information, see page 3 and 4 excerpts from the Series GM Flex-Heat Application Guide, #GM8022.

B. HOT WATER/GAS-GM/Flex-Heat Series Modular boiler Plant Engineering Specifications: Furnish and install, where indicated on plans, a gas-fired, modular hot water heating plant with a net output of_____btu/hr. (per Table 1), for use with natural gas (5.5" WC MIN./13.5" WC MAX). Installation shall be made in accordance with the manufacturer's recommendations and shall comply with requirements for modular boilers in Section IV of the ASME Boiler and Pressure Vessel Code and all other regulations of authorities having jurisdiction. The system shall consist of FH-_____(per Table 1) or approved equivalent, which shall meet or exceed all of the following specifications:

II. BOILER CONSTRUCTION FEATURES

A. HEAT EXCHANGER: The heat exchanger for each module shall be fabricated from cast iron vertical sections. Water seal between sections shall be metal to metal, gasket material is not acceptable.

B. BURNER: Each boiler module shall be equipped with aluminized steel main burners of a one piece slotted port design to provide quiet ignition and extinction.

C. COMBUSTION CHAMBER: Each boiler module shall have a corrosion resistant, aluminized steel base assembly lined with a ceramic fiber refractory type combustion chamber.

D. FLUE COLLECTOR: Flue collector on each module shall be fabricated of corrosion resistant aluminized steel.

E. DRAFT HOOD: A CSA Design Certified draft hood shall be supplied for each module.

F. CONSTRUCTION: Each boiler module shall be supplied fully assembled, including burners and factory installed jacket on each module to ease installation and service. Individual boiler shall be equipped with corrosion resistant base. Modules shall be assembled in a fashion that will provide top and front access to all piping and controls.

G. VENT DAMPER: (Optional on 342 mbh input and up) Each boiler shall be supplied with a motorized vent damper in either the horizontal or vertical position to close on shut-down and prove open on start-up.

IV. BOILER TRIM AND CONTROLS

A. MODULE OPERATING CONTROLS: Each module shall be equipped with an intermittent pilot or standing-pilot (only under 342 mbh input) ignition system, combination redundant gas valve with manual shut off, pressure regulator, pilot adjustment and 100% automatic shut off.

B. MODULE SAFETY CONTROLS: Each module shall be equipped with a high temperature limit control, flame rollout safety shut off switch and blocked vent safety shut off switch to interrupt power to the gas valve in the event of related unsafe condition.

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C. CONTROL HEADER: Manufacturer shall provide a control manifold for installation in the supply piping to the system. The control header shall have four tappings for the installation of a manual reset high temperature limit, probe low water cut-off, combination pressure/temperature gauge and system water temperature sensor or other system controls that may be required.

D. SYSTEM SAFETY CONTROLS: the manufacturer shall supply a manual reset probe low water cut-off field installation in the common header. A high limit control with manual reset shall also be supplied by the manufacturer and field mounted in the control header.

E. PRESSURE RATING: All modules shall be constructed for 100 PSI maximum working pressure and shall be tested in accordance with section IV of the ASME code (specify 100, 80, 50 or 30 PSI relief valves).

Pressure relief valve: Each module shall be supplied with an ASME rated pressure relief valve. Relief valve shall be field piped to floor at a location that will show visible signs of relief.

F. WEIGHT: The heating plant floor load shall not exceed 160 pounds/square foot when equipped with factory headers and filled with water.

G. MAINTENANCE: Module design shall permit complete access to controls, burners, and heat exchanger for inspection and maintenance by removal of not more than two jacket panels.

H. APPROVALS: The following approvals shall be clearly marked on each module; CSA design certified, I=B=R and ASME.

I. DOMESTIC HOT WATER (Optional): Manufacturer shall provide an external domestic hot water heat exchanger Model PP-_____with First Hour Rating of_____Gallons at_____°F Temperature Rise (per Table 3). Domestic heat exchanger shall utilize cupronickle construction to minimize mineral buildup and discolored water. Installing contractor shall furnish circulator of appropriate size.

V. SYSTEM OPERATING CONTROLS

A. SEQUENCING CONTROL (Optional): Boiler modules shall fire in sequence as determined by a tekmar® CONTROL SYSTEM suitable for the number of modules and desired stages.

B. SUPPLY AND RETURN HEADERS (Optional): Manufacturer shall provide as optional equipment, prefabricated supply and return headers together with adjustable coupling, unions, nipples and fitting as required to interconnect all modules with a common supply and return connection.

TABLE 1

(OTHER COMBINATIONS ALSO AVAILABLE)

TYPICAL FLEX-HEAT® MODULAR BOILER SYSTEM RATINGS						
System Number	Module Quantity & Size	Input (MBH)	Gross Output (MBH)	Gross Output (H.P.)	Net Output (MBH)	Combustion Efficiency
FH-456	2-5	456	374	11.2	325	82%
FH-513	1-5, 1-6	513	421	12.6	366	82%
FH-570	2-6	570	467	14.0	406	82%
FH-627	1-6, 1-7	627	514	15.4	447	82%
FH-684	2-7	684	561	16.8	488	82%
FH-741	1-7, 1-8	741	608	18.2	528	82%
FH-798	2-8	798	654	19.5	569	82%
FH-855	3-6	855	701	20.9	610	82%
FH-912	2-6, 1-7	912	748	22.3	650	82%
FH-969	1-6, 2-7	969	795	23.7	691	82%
FH-1026	3-7	1026	841	25.1	732	82%
FH-1140	1-7, 2-8	1140	935	27.9	813	82%
FH-1197	3-8	1197	982	29.3	854	82%
FH-1254	2-6, 2-7	1254	1028	30.7	894	82%
FH-1368	4-7	1368	1122	33.5	975	82%
FH-1482	2-7, 2-8	1482	1215	36.3	1057	82%
FH-1539	1-7, 3-8	1539	1262	37.7	1097	82%
FH-1596	4-8	1596	1309	39.1	1138	82%
FH-1710	5-7	1710	1402	41.9	1209	82%
FH-1824	3-7, 2-8	1824	1496	44.7	1301	82%
FH-1881	2-7, 3-8	1881	1542	46.1	1341	82%
FH-1938	1-7, 4-8	1938	1589	47.5	1382	82%
FH-1995	5-8	1995	1636	48.9	1423	82%
FH-2052	6-7	2052	1683	50.3	1463	82%
FH-2166	4-7, 2-8	2166	1776	53.1	1544	82%
FH-2280	2-7, 4-8	2280	1870	55.9	1626	82%
FH-2394	6-8	2394	1963	58.6	1707	82%
FH-2508	5-7, 2-8	2508	2057	61.4	1788	82%
FH-2622	3-7, 4-8	2622	2150	64.2	1870	82%
FH-2736	1-7, 6-8	2736	2244	67.0	1951	82%
FH-2793	7-8	2793	2290	68.4	1992	82%
FH-2850	6-7, 2-8	2850	2337	69.8	2032	82%
FH-2964	4-7, 4-8	2964	2430	72.6	2113	82%
FH-3021	3-7, 5-8	3021	2477	74.0	2154	82%
FH-3078	2-7, 6-8	3078	2524	75.4	2195	82%
FH-3192	8-8	3192	2617	78.2	2276	82%
FH-3306	5-7, 4-8	3306	2711	81.0	2357	82%
FH-3363	4-7, 5-8	3363	2758	82.4	2398	82%
FH-3420	3-7, 6-8	3420	2804	83.8	2439	82%
FH-3534	1-7, 8-8	3534	2898	86.6	2520	82%
FH-3591	9-8	3591	2945	88.0	2561	82%
FH-3648	6-7, 4-8	3648	2991	89.4	2601	82%
FH-3762	4-7, 6-8	3762	3085	92.2	2682	82%
FH-3876	2-7, 8-8	3876	3178	94.9	2764	82%
FH-3990	10-8	3990	3272	97.7	2845	82%

TABLE 2

SERIES GM RATINGS							
Boiler Model Number	Input (MBH)	Output/DOE Heating Capacity (MBH)[1]	Net I=B=R Rating, Water (MBH)[2]	Combustion Efficiency (%)3	AFUE (%) Standing Pilot w/ Vent Damper	AFUE (%) Intermittent Ignition w/ Vent Damper	Water Content (Gallons)
GM-05	228	187	163		81.0	82.1	6.15
GM-06	285	231	201		80.0	81.1	7.2
GM-07	342	280	243	82.0			8.25
GM-08	399	327	284	82.0			9.3

(1) DOE Heating Capacity applies to models GM-05 and GM-06 only.
(2) The Net I=B=R Water Ratings shown are based on a piping and pick-up allowance factor of 1.15. Consult Peerless Heater Company before selecting a boiler for installations having unusual piping and pickup requirements, such as intermittent system operation, extensive piping systems, etc.
(3) Combustion efficiency determined in accordance with ANSI 221.13: *Gas-Fired Low-Pressure Steam and Hot Water Boilers,* and certified by CSA.

TABLE 3

PEERLESS PARTNER RATINGS AND FLOW SPECIFICATIONS								
	Peerless Partner Ratings					Peerless Partner Flow Specifications		
Model Number	First Hour Ratmg[1] (Gallons)		Minimum Boiler Output2 to Achieve First Hour Rating (Btu per hour)	Useable Hot Water (U.S. Gallons)[3]	Heat Exchanger Surface Area (ft 2)	Recommended Flow Rate	Heat Exchanger Pressure Drop	Domestic Water Connection Sizes
	140°F	115°F						
PP-40	200	295	150,000	28	15	6gpm	4.6 ft.	¾NPT
PP-60	255	347	200,000	46	15	7 gpm	6.8 ft.	1 NPT
PP-80	300	400	225,000	64	34	10gpm	12 ft.	1-1/2 NPT
PP-120	385	513	300,000	94	34	10gpm	12 ft.	1-1/2 NPT

(1) First hour rating based on healing water from 50°F to 140/115°F with 180°F boiler water temperature. Gas- and Oil-fired and electric water heater first hour ratings based on DOE test procedure using 90°F temperature rise (55°F to 145°F).
(2) Net I=B=R Output, Water
(3) Useable hot water based on recent completion of recovery period, but no additional boiler input after draw begins.