Boiler Model

EX-250SGOF-07

Boiler Output		
Description	-	Standard Pressure, FGR
Boiler Type	-	Multiple water tube, once through, forced flow, steam boiler
Boiler Capacity	BHP	250
Operating Pressure Range	PSIG	70-150
Equivalent Output[1]	lb/hr	8630
Maximum Heat Output	MMBTU/hr	8.369
Boiler Heating Surface Area	ft^2	389
Turn-Down	-	2:1
Turn-Down	%	50.0%

Air and Fuel Requirements				
Fuel	-	Natural Gas	Propane	#2 Oil
Fuel Supply Pressure	PSIG	3-5	3-5	0-3
Heat Input	MMBTU/hr	9.846	9.846	9.620
Efficiency[2]	%	85.0%	85.0%	87.0%
Flue Gas Excess Oxygen	%	5.0%	5.0%	7.0%
Flue Gas Temperature[2]	°F	270	270	320
Fuel Consumption[3]	SCFH/GPH	9,650.0	107.6	68.7
Combustion Air Volume	SCFH	121,770	121,770	139,350
Flue Gas Volume - Wet	SCFH	131,420	131,420	144,640
Flue Gas Volume - Dry[4]	SCFH	112,730	112,730	132,930
Flue Gas Velocity	ft/s	24.1	24.1	28.3

Emissions[5, 6]				
Fuel	-	Natural Gas	Propane	#2 Oil
NOx	ppm	50.0	65.0	120.0
NOx	lbs/MMBTU	0.0607	0.0789	0.1536
CO	ppm	100.0	100.0	300.0
CO	lbs/MMBTU	0.0739	0.0739	0.2338
CO2	lbs/MMBTU	117.6	136.6	159.3
VOC	lbs/MMBTU	0.0054	0.0054	N/A
TOC	lbs/MMBTU	0.0108	0.0109	0.0018
SO2	lbs/MMBTU	0.0006	0.0005	0.0015
PMt	lbs/MMBTU	0.0075	0.0077	0.0236
PMf	lbs/MMBTU	0.0019	0.0022	0.0143
PMc	lbs/MMBTU	0.0056	0.0055	0.0093

Weights & Capacities		
Shipping Weight	lbs	9,000
Operational Weight	lbs	9,900
Operational Water Content[7]	Gallons	
Fully Flooded Water Content[8]	Gallons	290

Inlet & Outlet Connections		
Economizer Drain (If Equipped)	in NPT	2
Main Steam Outlet	NPT Flange	4 (150#)
Safety Valve Outlet[9]	in NPT	2-1/2
Drip Pan Elbow Vent	in NPT	4
Drip Pan Elbow Drain	in NPT	3/4
Feedwater Inlet	in NPT	1-1/4
Fuel Gas Inlet	in NPT	2-1/2
#2 Oil Inlet	in NPT	3/4
Automatic "Surface" Blowdown	in NPT	3/8
Bottom Blow-Off	in NPT	1
LVC Blow-Off	in NPT	1
Chimney Diameter	in OD	20

Electrical Ratings at 460V[10]				
Feedwater Configuration[11]	-	Std. Check Valve	MI Check Valve	No Pump
Electrical Rating	A	49.1	49.1	38.1
Min. Circuit Ampacity	A	58.0	58.0	47.0
Max. Circuit Protective Device[12]	A	70.0	70.0	60.0

Electrical Components & Controls		
Power Supply	-	575, 460, 380, 230 or 208 Volts, 3 Phase, 60 Hz
Blower Motor	HP	25
Water Pump Motor[13]	HP	7-1/2
Oil Pump Motor	HP	1-1/2
Combustion Control	-	3-Position Step Burner (High - Low - Off)
Combustion System	-	Forced Draft Burner
Ignition System	-	Electric Spark Ignited, Interrupted Gas Pilot
Flame Safeguard	-	Miura BL Microcontroller with Miura ZUV Flame Sensor
Low Water Protection	-	Primary and Secondary Low Water Cutoff Electrodes
Miura Online Maintenance (M.O.M)	-	Analog Phone Line or 3G Cellular, Optional

Notes
1) Equivalent output is calculated based on conversion of 212°F feedwater to 212°F steam
2) Flue gas temperatures and efficiencies are based on 68°F feedwater and 80°F combustion air and calculated using the higher heating value
3) Fuel consumption assumes 1,020 BTU/SCF for natural gas, 91,500 BTU/gal for LPG, and 140,000 BTU/gal for #2 oil
4) Dry flue gas volume is corrected for the operating O_2 percentage and assumes F-factor of 8,710 SCF/MMBTU for natural gas/LPG and 9,190 SCF/MMBTU for #2 oil
5) NOx and CO emissions are based on empirical test data corrected to 3% excess oxygen, all others are calculated using EPA factors
6) SO_2 factor assumes 0.002 grains/SCF for natural gas, 0.005 grains/SCF for LPG, 15ppm for #2 oil
7) The operational water content is the average water content during normal operation for the entire boiler assembly including economizer
8) The fully flooded water content is the total water and steam capacity for the entire boiler assembly including economizer
9) Boiler safety valve outlet size is subject to change based on specific operating pressure
10) To convert to amps at a different voltage, multiply given amps by ratio of 460V/new voltage
11) Multiple installation (MI) check valve is required with higher feedwater pressures (i.e. when using DA tank) and may require a larger pump
12) For time-delay fuse protective device, value will be larger for time-delay circuit breaker
13) Water pump output may vary by feedwater piping options