

# SELLERS

IMMERSION FIRED STEAM BOILER

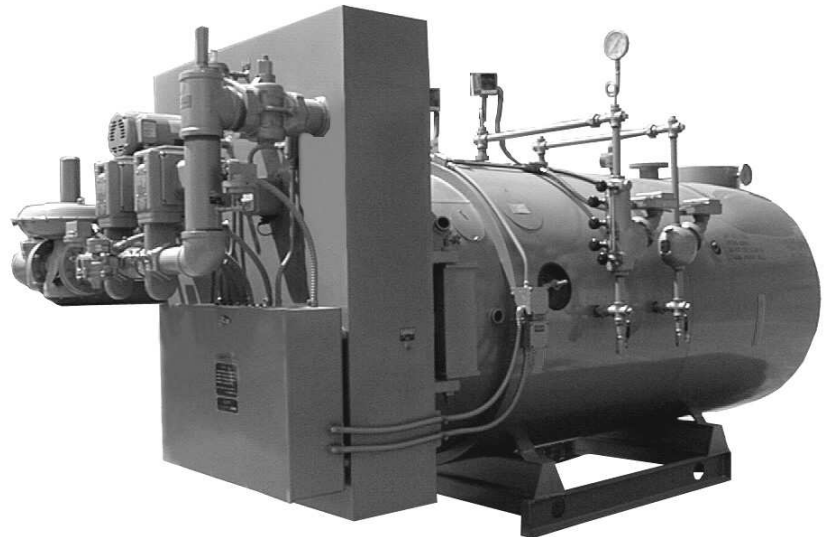
SPECIFICATION SHEET

# 8102

January 1, 2006

## GENERAL DESCRIPTION

The Sellers immersion fired steam boiler is a horizontal, single pass, firetube boiler designed to burn natural gas. The unique burner assembly delivers pre-mixed air and gas through multiple nozzles. The air-gas mixture is ignited as it exits each flame retaining nozzle at high velocity. The resulting flames are long and small in diameter. The flame from each of these nozzles is directed into a 2" O.D. tube that is completely immersed in liquid. There is a separate tube for each flame with the same amount of heat going into each tube. These small diameter flames burn in the first half of the tube lengths. Therefore, the "fire shines" on half of the heating surface in the single pass boiler – 50% of the total heating surface is radiant heating surface.



The high percentage of radiant heating surface, the low heat input into each tube, and the even distribution of heat

throughout the multiple tubes virtually eliminate thermal stress that are common in multiple pass boilers.

## XID ENHANCEMENT SYSTEM

## IMPROVED EFFICIENCY AND PERFORMANCE

- ◆ Five Year Non Pro-rated Thermal Shock Warranty
- ◆ High Efficiency Performance (See Chart Below)
- ◆ Single Source Burner - Boiler Package
- ◆ Five Year Non Pro-rated Burner Warranty
- ◆ Lower Emissions. Less Than 50 PPM NOx Standard (30 PPM NOx Available)
- ◆ Lower Maintenance Costs
- ◆ Absolutely No Refractory
- ◆ U.L. Labeled Packaged Boiler

## NET STACK TEMPERATURE AND EFFICIENCY RATING

BOILER HORSEPOWER	OPERATING PRESSURE			
	10 PSI	50 PSI	100 PSI	125 PSI
10 – 200	289° (83.5%)	345° (82.1%)	384° (81.2%)	399° (80.8%)
250 – 800	267° (84.0%)	321° (82.7%)	359° (81.8%)	373° (81.4%)

When unit is in proper adjustment. Net stack temperature based on 70 degree ambient air temperature.  
Addition of 30 PPM NOx option will lower efficiencies slightly.

**SELLERS ENGINEERING CO., MANUFACTURING STEAM AND HOT WATER BOILERS SINCE 1931.**



# STEAM BOILER RATINGS, CAPACITIES, WEIGHTS

## SEA LEVEL TO 3000 FEET ALTITUDE

BOILER HORSE POWER	HOURLY GAS INPUT (1000BTU)	GROSS HOURLY OUTPUT (1)	POUNDS OF STEAM PER HOUR (1)	NORMAL WATER CAPACITY (U.S. GAL)	FLOODED WATER WEIGHT (LBS)	SHIPPING WEIGHT (POUNDS)	
						15 PSI	150 PSI
10	418	335	345	125	1,301	2,260	2,330
15	628	502	518	125	1,273	2,380	2,400
20	837	670	690	123	1,254	2,430	2,450
30	1,255	1,004	1,035	192	1,966	2,910	2,960
40	1,674	1,339	1,380	186	1,919	3,120	3,120
50	2,092	1,674	1,725	180	1,863	3,250	3,250
60	2,511	2,009	2,070	175	1,825	3,330	3,330
70	2,929	2,343	2,415	265	2,702	4,200	4,240
80	3,348	2,678	2,760	259	2,655	4,380	4,420
100	4,184	3,348	3,450	374	3,655	5,020	5,480
125	5,231	4,184	4,313	333	3,519	5,430	5,800
150	6,277	5,021	5,175	435	4,662	7,230	7,490
175	7,323	5,858	6,038	406	4,541	7,480	7,740
200	8,369	6,695	6,900	553	5,853	8,980	9,310
250	10,461	8,369	8,625	679	7,238	10,230	10,550
300	12,553	10,043	10,350	830	8,982	11,200	12,320
350	14,645	11,716	12,075	779	8,753	11,740	12,990
400	16,738	13,390	13,800	958	10,707	13,750	14,610
500	20,922	16,738	17,250	1,083	12,596	16,690	17,310
600	25,107	20,085	20,700	1,233	14,676	17,410	18,990
700	29,291	23,433	24,150	1,418	16,987	22,330	22,960
800	33,475	26,780	27,600	1,622	19,521	26,300	26,930

(1) From 212 degrees F. feed water to atmospheric pressure.

### GAS REQUIREMENTS

Main and pilot gas pressure regulators are supplied with each boiler. Refer to the chart below for gas pressure requirements. Pressures shown are with the unit running. For pressure above 10 PSI, install a second regulator to reduce the pressure to the standard range.

Boiler Horsepower	Pressure required at gas train inlet		
	Min. (3)	Std Range	Max.
10-20	7"	8" to 1 PSI	10 PSI
30-80	8"	12" to 1 PSI	10 PSI
100-150	10"	16" to 1 PSI	10 PSI
175-200	14"	20" to 1 PSI	10 PSI
250	14"	2 to 10 PSI	10 PSI
300-350	14"	1.5 TO 10 PSI	10 PSI
400-800	1 PSI	2 TO 10 PSI	10 PSI

(3) Special gas trains required at additional cost. For low NOx application with low gas pressure, consult the factory.

### ELECTRICAL REQUIREMENTS

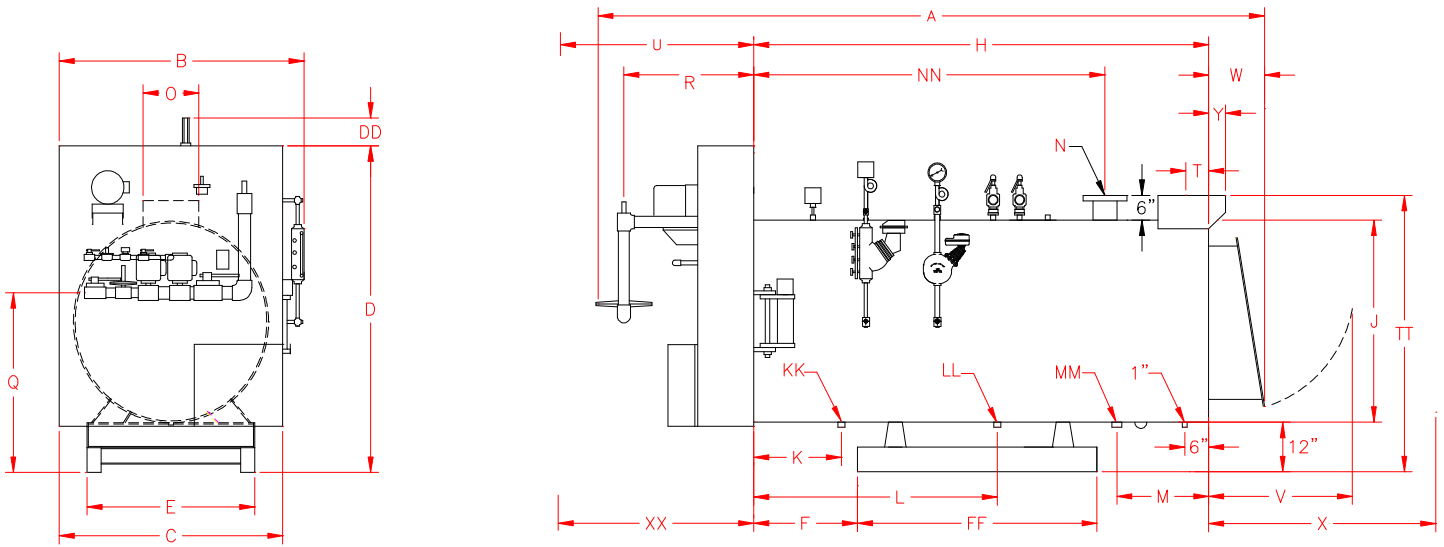
A single incoming power connection is required to the junction box provided at the hinge of all boilers. Boilers are pre-wired (105° C color coded wire) to numbered terminal strips. Panels include a control transformer to provide 5 Amp., 120 Volt service. Boilers are wired for jobsite supply power characteristics.

### STACK REQUIREMENTS

Design stack to provide .02" to .04" water column draft at flue outlet. Smooth transitions and bends are required. Maximum stack weight on boiler should be 1000 pounds on 10 to 80 HP and 2000 pounds for 100 to 800 HP units.

### AIR REQUIREMENTS

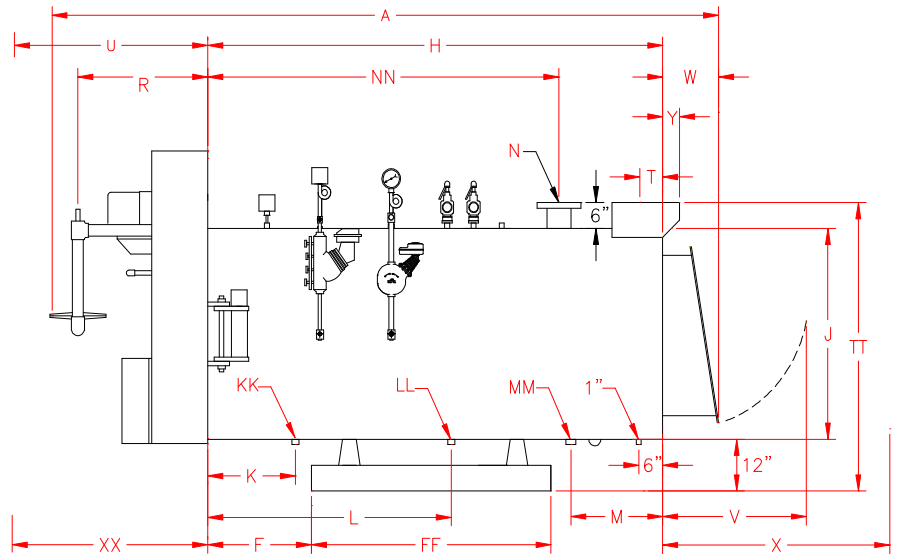
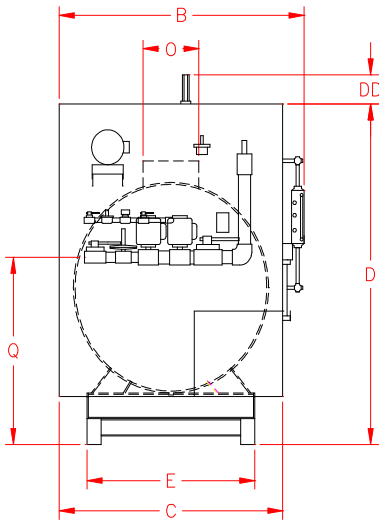
Provide 1/2 square foot of free air inlet area per 1,000,000 BTU input to the burner. Cross ventilation is preferred in lieu of a single opening.



## STEAM BOILER DIMENSIONS

HORSEPOWER		10	15	20	30	40	50	60	70	80	100	125
<b>OVERALL DIMENSIONS:</b>												
LENGTH	A	141	141	141	142	144	143	145	149	149	160	160
WIDTH	B	36	36	36	42	42	42	42	48	48	55	55
BURNER WIDTH	C	30	30	30	35	35	35	35	41	41	47	47
BURNER HEIGHT	D	56	56	56	61	65	65	65	70	70	75	75
SECONDARY AIR CAP HEIGHT	DD	6	6	6	6	6	6	6	6	6	6	6
<b>BASE:</b>												
WIDTH	E	24	24	24	24	24	24	24	30	30	36	36
LOCATION	F	20	20	20	20	20	20	20	20	20	26	26
LENGTH	FF	60	60	60	60	60	60	60	60	60	60	60
<b>SHELL:</b>												
LENGTH	H	108	108	108	108	108	108	108	108	108	114	114
DIAMETER INSIDE	J	24	24	24	30	30	30	30	36	36	42	42
<b>SHELL CONNECTIONS:</b>												
BLOWDOWN SIZE	KK	1	1	1	1	1.25	1.25	1.25	1.25	1.5	1.5	1.5
BLOWDOWN LOCATION	K	16	16	16	16	16	16	16	16	16	22	22
MANUAL FILL SIZE	LL											
MANUAL FILL LOCATION	L											
FEEDWATER INLET SIZE	MM	1	1	1	1.25	1.5	1.5	1.5	1.5	1.5	1.5	1.5
FEEDWATER INLET LOCATION	M	23	23	23	23	23	23	23	23	23	23	23
STEAM OUTLET LOCATION	NN	82	82	82	82	82	82	82	82	82	88	88
<b>LOW PRESSURE (15 PSI) BOILERS:</b>												
STEAM OUTLET SIZE (NOTE 3)	N	3	3	4f	4f	6f	6f	6f	8f	8f	8f	8f
<b>HIGH PRESSURE (150 PSI) BOILERS:</b>												
STEAM OUTLET SIZE (NOTE 3)	N	1.5	1.5	1.5	2	3	3	3	3	3	4F	4F
SURFACE BLOWDOWN SIZE	P	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
<b>GAS CONNECTIONS:</b>												
VERTICAL LOCATION (NOTE 10)	Q	33	33	33	36	36	36	36	39	39	42	42
HORIZONTAL LOCATION (NOTE 4)	R	20	20	20	20	20	20	22	24	24	28	28
PILOT BURNER VALVE IPS	S	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
<b>FLUE CONNECTIONS:</b>												
FLUE SIZE (NOTES 6 & 9)	O	6	6	8	8	10	10	10	12	12	14	14
FLUE LOCATION	T	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	4.75	4.75
FLUE HEIGHT	TT	43	43	43	49	49	49	49	55	55	61	61
<b>INSTALLATION CLEARANCES:</b>												
COMBUSTION ASSEMBLY SWING	U	35	35	35	39	39	39	40	46	46	53	53
RELIEF DOOR SWING (NOTE 7)	V	18	18	18	21.5	21.5	21.5	21.5	25.5	25.5	29.5	29.5
TUBE REMOVAL, FRONT (NOTE 8)	XX	73	73	73	73	73	73	73	73	73	66	66
TUBE REMOVAL, REAR (NOTE 8)	X	71	71	71	71	71	71	71	71	71	72	72
RELIEF DOOR ASSEMBLY	VV	10	10	10	11	11	11	11	12	12	13	13
FLUE OUTLET PROJECTION	Y										2.25	2.25
<b>BLOWER HORSEPOWER:</b>												
		1	1.5	1.5	2	2	3	5	5	5	7.5	7.5

See Notes on Last Page.



## STEAM BOILER DIMENSIONS

HORSEPOWER		150	175	200	250	300	350	400	500	600	700	800
<b>OVERALL DIMENSIONS:</b>												
LENGTH	A	167	167	168	194	197	211	214	215	218	220	228
WIDTH	B	61	61	67	67	75	77	83	90	96	102	108
BURNER WIDTH	C	56	56	62	62	72	76	82	90	96	102	108
BURNER HEIGHT	D	79	79	87	87	90	102	107	111	116	124	129
SECONDARY AIR CAP HEIGHT	DD											
<b>BASE:</b>												
WIDTH	E	42	42	48	48	54	54	57	63	66	72	78
LOCATION	F	26	26	26	3	3	3	3	3	3	3	3
LENGTH	FF	60	60	60	104	104	104	104	104	104	104	104
<b>SHELL:</b>												
LENGTH	H	114	114	114	140	140	140	140	140	140	140	140
DIAMETER INSIDE	J	48	48	54	54	60	60	66	72	78	84	90
<b>SHELL CONNECTIONS:</b>												
BLOWDOWN SIZE	KK	1.5	1.5	2	2	2	2	2	2	2	2	2
BLOWDOWN LOCATION	K	22	22	22	34	34	34	34	34	34	34	34
MANUAL FILL SIZE	LL	2	2	2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3
MANUAL FILL LOCATION	L	61	61	61	82	82	82	82	82	82	82	82
FEEDWATER INLET SIZE	MM	2	2	2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3
FEEDWATER INLET LOCATION	M	23	23	23	28	28	28	28	28	28	28	28
STEAM OUTLET LOCATION	NN	88	88	88	111	111	111	111	111	111	111	111
<b>LOW PRESSURE (15 PSI) BOILERS:</b>												
STEAM OUTLET SIZE (NOTE 3)	N	8f	10f	10f	10f	12f	12f	12f	12f	12f	12f	14f
<b>HIGH PRESSURE (150 PSI) BOILERS:</b>												
STEAM OUTLET SIZE (NOTE 3)	N	4F	6F	6F	6F	6F	8F	8F	8F	8F	8F	10F
SURFACE BLOWDOWN SIZE	P	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
<b>GAS CONNECTIONS:</b>												
VERTICAL LOCATION (NOTE 10)	Q	45	45	48	48	48	48	48	48	48	48	48
HORIZONTAL LOCATION (NOTE 4)	R	32	32	32	34	34	48	50	50	50	50	56
PILOT BURNER VALVE IPS	S	0.75	0.75	0.75	0.75	1	1	1	1	1.25	1.25	1.25
<b>FLUE CONNECTIONS:</b>												
FLUE SIZE (NOTES 6 & 9)	O	16	18	18	20	22	24	26	28	32	34	36
FLUE LOCATION	T	3.75	2.75	2.75	5.75	4.5	3.5	2.5	1.5	-0.5	-1.5	-2.5
FLUE HEIGHT	TT	67	67	73	73	79	79	85	91	97	103	109
<b>INSTALLATION CLEARANCES:</b>												
COMBUSTION ASSEMBLY SWING	U	62	62	67	67	74	88	90	96	101	106	114
RELIEF DOOR SWING (NOTE 7)	V	35.5	35.5	40	40	43	43	46	50	48	50	52
TUBE REMOVAL, FRONT (NOTE 8)	XX	66	66	66	88	88	88	88	88	88	88	88
TUBE REMOVAL, REAR (NOTE 8)	X	72	72	72	90	90	90	90	90	90	90	90
RELIEF DOOR ASSEMBLY	VV	14	14	15	15	16	16	17	18	17	18	18
FLUE OUTLET PROJECTION	Y	4.25	6.25	6.25	4.25	8.5	10.5	12.5	14.5	18.5	20.5	22.5
<b>BLOWER HORSEPOWER:</b>		7.5	7.5	10	10	15	15	15	20	20	25	25

See Notes on Last Page.

## NOTES

1. Dimensions are accurate for layout but are subject to change. Certified prints are available upon request.
2. Lifting lugs and insulation are not shown on drawing. The manhole, when furnished, is not shown.
3. Openings are threaded unless indicated:  
f = Class 150 ASA flange. F = Class 300 ASA flange.  
Threaded couplings project 2" or less.
4. Provide "R + 12" clearance from the right side of burner box to the right side wall to open hinged burner.
5. Gas train may change with gas type and pressure.
6. Outside diameter and dimensions are shown. (see note 10)
7. Provide "J + 7" clearance from the rear end of the shell to swing the hinged back plate on 200 HP and larger boilers.
8. Tubes may be removed from the front or rear.
9. Dip tube (2" min.) provided on hot water outlet.
10. Flue outlet dimension on 300 HP and larger boilers are inside diameter with angle iron flanged connection.
11. Horizontal gas train dimension will vary based on required gas train components and addition of Low NOx option. Gas train may extend beyond burner manifold dimension C.

Model Number Designations

	PRESSURE	15 PSI	150 PSI
SIZE			
10-125 HP 150-800 HP		MODEL 15C MODEL 15SR	MODEL 77C MODEL 105E

## STANDARD EQUIPMENT FURNISHED

**Pressure Vessel:** 15 PSI ASME stamped with "H" cloverleaf. 150 PSI ASME stamped with "S" cloverleaf.

**Manholes:** Standard on 400 HP or larger low pressure boilers and 200 Hp and larger high pressure boilers.

**Handholes:** Five (5) furnished, 3-1/2" x 4-1/2".

**Energy X-tractors:** High temperature stainless steel to provide high efficiency. Installed in each tube.

**Insulation:** 2" fiberglass with double painted steel jacket with precast hardtop walkway.

**Relief Door:** Gravity operated for rear access and safety.

**Burner Assembly:** Hinged to shell including:

- ◆ Blower assembly with drip proof motor.
- ◆ Air gas mixer.
- ◆ Individual burner nozzles.
- ◆ Air proving switch.
- ◆ Ignition transformer, spark and flame rods.
- ◆ Gas control trains with dual main shutoff cocks, pilot and main gas pressure regulators, gas volume adjustment and other components as follows:

**Operating Pressure Control:** Controls temperature.

**High Limit Pressure Control:** Manual reset limit control.

**UL Labeled:** Packaged boiler.

**Low Water Cutoffs:** MM157 with pump control switch. MM150-M secondary with manual reset (Probe on 15 PSI).

**Pressure Gauge:** 4-1/2" dial type mounted on pigtail.

**Lifting lugs:** One or more provided on each boiler.

**Base:** Heavy duty structural steel skid.

**Relief Valve(s):** ASME rated for full boiler nozzle output at design pressure rating.

**Flame observation ports:** Two or more provided in combustion chamber to view burners.

**Control Panel:** With motor starter, control transformer with primary and secondary fuses, flame safeguard control (Honeywell RM7840), six (6) indicating lights. Optional flame safeguard controls available are Honeywell RM7800 and Fireye E110.

	10-40HP	50HP	60-100HP	125HP	150-250HP	300-800HP
Solenoid gas valve	2	-	-	-	-	-
Motorized gas valve	-	1	1	2	2	2
Proof of closure switch	-	1	1	1	1	1
Pilot solenoid valves	1	1	1	1	2	2
Gas pressure switches	-	-	2	2	2	2
Vent valve	-	-	-	-	-	1



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