SELLERS

SELLER-YGNIS HOT WATER BOILER

GENERAL DESCRIPTION

The Sellers-Ygnis boiler is a unique design developed and perfected in Switzerland. It is a three pass, horizontal fire tube, water backed boiler. The first two passes take place in a large diameter closed end furnace. Combustion is produced by a burner, factory mounted at the open end of the furnace. Its flame travels full length to the rear. The closed rear water backed end forces the hot products of combustion to reverse direction. The second pass is made back through the furnace around the radiant flame. This re-exposure of the hot gases to the flame insures complete combustion. Finally, the hot gases are reversed again by the front door monoblock insulation where they enter the third pass convection tubes.

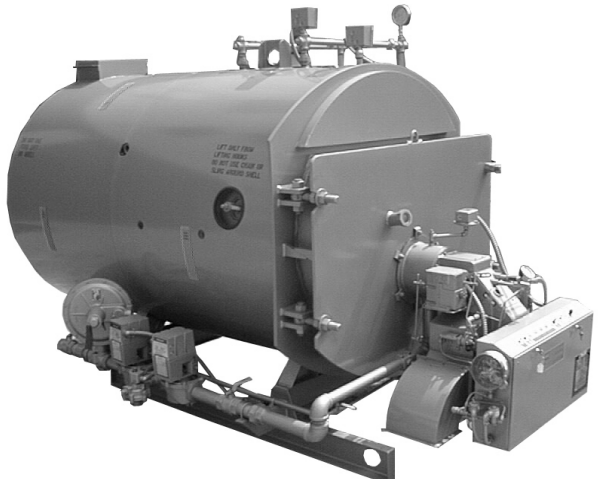
The Sellers-Ygnis Boiler shell design over-comes thermal shock problems common to other multi-pass boilers. Thermal stress is greatly reduced because of two unique features of the furnace.

1. The larger diameter, shorter furnace produces less thermal expansion than a furnace of an ordinary boiler.
2. The furnace end is supported by stays which are attached to the rear tube sheet.

The unique design offers several benefits:

Shear stress between the furnace and the rear tube sheet is greatly reduced.

Tube sheet fatigue failures are eliminated.



Unequal thermal expansion between the hot furnace and the cooler tubes is decreased.

The key design features of the Sellers-Ygnis boiler are:

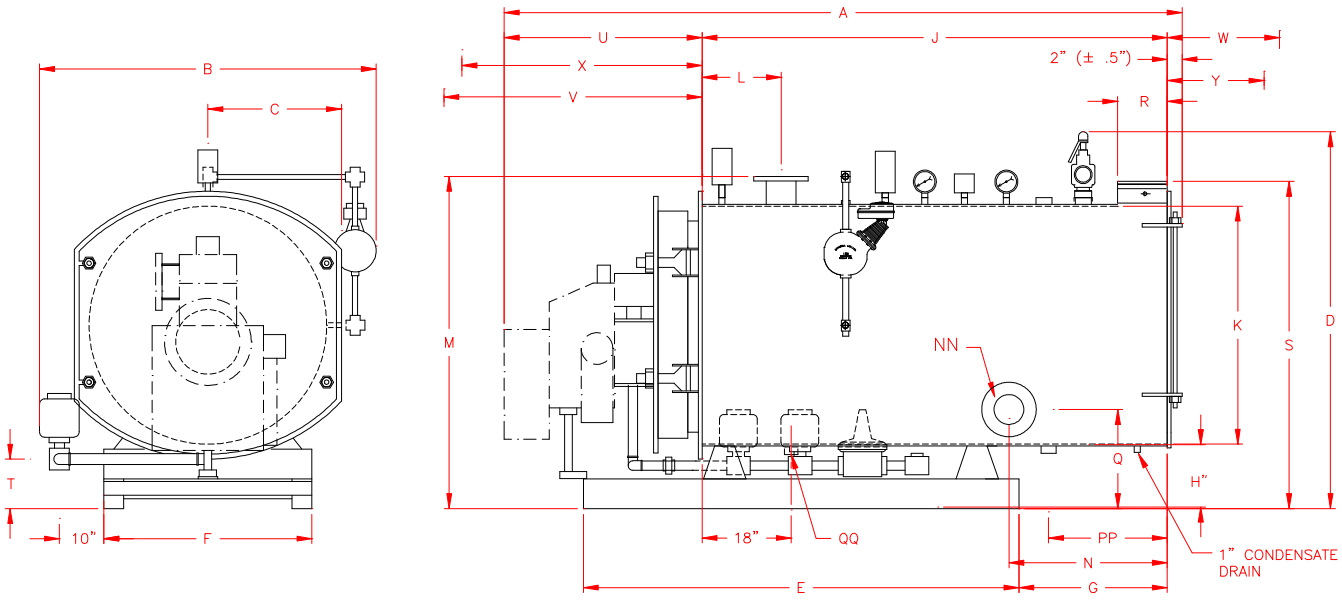
1. Water backed design with no rear refractory.
2. Assurance of complete combustion due to double burning of the fuel.
3. Elimination of tube sheet failures due to thermal expansion stresses.
4. Saves valuable floor space.

RATINGS AND FUEL CONSUMPTION

BOILER HORSE POWER	OUTPUT 1000 BTU PER HOUR	EDR WATER GROSS (150 BTU)	FUEL CONSUMPTION		APPROXIMATE SHIPPING WEIGHT[3]
			GAS CFH[1]	LIGHT OIL GPH[2]	
20	670	4,466	837	6.0	3,000
30	1,004	6,694	1,255	9.0	3,200
40	1,339	8,932	1,674	12.0	4,000
50	1,674	11,167	2,092	15.0	4,300
60	2,009	13,400	2,511	17.9	4,650
80	2,678	17,864	3,348	23.9	6,400
100	3,348	22,334	4,185	29.9	7,000
125	4,185	27,900	5,231	37.4	9,000
150	5,022	33,500	6,277	44.8	10,100
175	5,859	39,083	7,323	52.7	12,500
200	6,696	44,660	8,370	59.8	13,200
250	8,370	55,800	10,462	74.7	17,100
300	10,044	67,000	12,555	89.7	19,000
350	11,718	78,130	14,647	104.6	22,400
400	13,392	89,330	16,739	119.6	24,200
500	16,739	111,600	20,924	149.5	32,500
600	20,087	134,000	25,109	179.4	37,900

1. Natural gas at 1000 BTU/f^3 2. Based on 140,000 BTU/gal. 3. Based on 150 PSI.

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

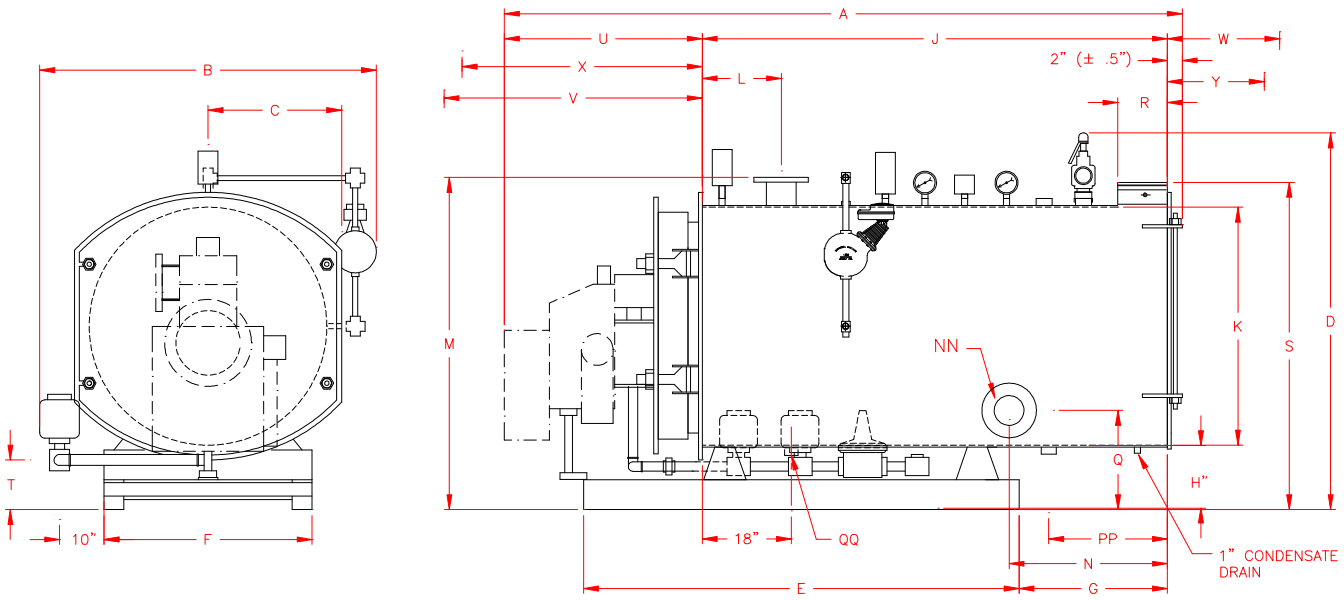


HOT WATER BOILER DIMENSIONS

HORSEPOWER OVERALL DIMENSIONS:		20	30	40	50	60	80	100	125
LENGTH	A	107	110	114	117	120	130	136	143
WIDTH	B	56	56	62	62	62	68	68	74
CENTERLINE TO RIGHT	C	21	21	24	24	24	27	27	30
HEIGHT	D	60	60	66	66	66	76	76	82
BASE:									
LENGTH	E	55	58	64	67	70	82	88	97
WIDTH	F	30	30	36	36	36	42	42	48
LOCATION	G	30	30	30	30	30	30	30	30
HEIGHT	H	12	12	12	12	12	12	12	12
SHELL:									
LENGTH	J	67	70	74	77	80	88	94	101
DIAMETER INSIDE	K	36	36	42	42	42	48	48	54
SHELL CONNECTIONS:									
HOT WATER OUTLET LOCATION	L	9	11	12	12	13	14	16	18
HOT WATER OUTLET HEIGHT	M	50	51	57	57	61	67	67	73
HOT WATER OUTLET — IPS	MM	2	3	3	3	4F	4F	6f	6f
RETURN WATER INLET LOCATION	N	24	24	24	24	26	30	32	32
RETURN WATER INLET — IPS	NN	2	3	3	3	4f	4f	6f	6f
FEED WATER INLET LOCATION	P	24	24	24	24	24	24	24	24
RETURN WATER INLET LOCATION	Q	30	30	33	33	19	20	20	21
FEED WATER INLET — IPS	PP	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
DRAIN & BLOWDOWN — IPS	QQ	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
FLUE CONNECTION:									
OUTSIDE DIAMETER	R	8	8	10	10	10 X 10	10 X 15	10 x 18	10 x 20
HEIGHT	S	54	54	60	60	60	66	66	72
GAS TRAIN LOCATION (if specified)									
VERTICAL FROM FLOOR	T	9	9	9	9	9	10	10	10
INSTALLATION CLEARANCES:									
COMBUSTION ASSEMBLY EXTENSION	U	38	38	38	38	39	40	40	40
COMBUSTION ASSEMBLY SWING (NOTE 5)	V	50	50	56	56	56	62	62	67
REAR DOOR SWING	W	42	42	48	48	48	54	54	60
TUBE REMOVAL, FRONT (NOTE 3)	X	53	56	59	61	64	69	75	80
TUBE REMOVAL, REAR (NOTE 3)	Y	43	46	48	51	55	59	66	72
NORMAL WATER CAPACITY (US GALLONS)		164	161	251	249	245	366	367	524

All dimensions are in inches except as noted.

Notes: 1. Dimensions are sufficiently accurate for layout purposes.
2. Lifting eyes and manholes are not shown on drawing,
3. Full 90° rear door swing not required if tube removal to the rear is not required.
4. Openings are threaded unless indicated: f = 150 PSI ASA Flange.
5. For 90° combustion assembly opening, provide (C + U) - 3 from centerline to wall.



HOT WATER BOILER DIMENSIONS

HORSEPOWER OVERALL DIMENSIONS:		150	200	250	300	350	400	500	600
LENGTH	A	161	173	190	203	203	211	225	234
WIDTH	B	74	80	85	85	89	89	101	107
CENTERLINE TO RIGHT	C	30	33	36	36	39	39	45	48
HEIGHT	D	87	93	99	101	107	107	119	125
BASE:									
LENGTH	E	101	115	132	145	145	153	165	174
WIDTH	F	48	54	57	57	60	60	72	78
LOCATION	G	33	33	36	36	36	36	36	36
HEIGHT	H	16	16	16	16	16	16	16	16
SHELL:									
LENGTH	J	108	120	136	149	149	157	165	174
DIAMETER INSIDE	K	54	60	66	66	72	72	84	90
SHELL CONNECTIONS:									
HOT WATER OUTLET LOCATION	L	18	18	22	22	22	24	24	26
HOT WATER OUTLET HEIGHT	M	77	83	89	89	95	95	107	113
HOT WATER OUTLET — IPS	MM	6f	6f	8f	8f	8f	10f	10f	12f
RETURN WATER INLET LOCATION	N	32	32	42	42	42	48	48	54
RETURN WATER INLET — IPS	NN	6f	6f	8f	8f	8f	10f	10f	12f
FEED WATER INLET LOCATION	P	25	25	30	30	30	30	30	30
RETURN WATER INLET LOCATION	Q	25	26	27	25	28	28	30	31
FEED WATER INLET — IPS	PP	1.5	2	2	2	2.5	2.5	2.5	2.5
DRAIN & BLOWDOWN — IPS	QQ	1.5	2	2	2	2	2	2	2
FLUE CONNECTION:									
OUTSIDE DIAMETER	R	10 x 22	10 x 28	14 x 26	14 x 30	14 x 36	14 x 40	14 x 50	14 x 60
HEIGHT	S	76	82	88	88	94	94	106	112
GAS TRAIN LOCATION (if specified)									
VERTICAL FROM FLOOR	T	12	12	12	12	12	12	12	12
INSTALLATION CLEARANCES:									
COMBUSTION ASSEMBLY EXTENSION	U	51	51	52	52	52	52	58	58
COMBUSTION ASSEMBLY SWING (NOTE 5)	V	68	73	79	79	84	84	95	101
REAR DOOR SWING	W	60	66	72	72	78	78	90	96
TUBE REMOVAL, FRONT (NOTE 3)	X	86	97	109	122	122	128	135	143
TUBE REMOVAL, REAR (NOTE 3)	Y	77	89	98	111	111	118	126	134
NORMAL WATER CAPACITY (US GALLONS)		512	713	990	989	1213	1146	1835	2188

All dimensions are in inches except as noted.

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Advantages of Sellers Ygnis Boilers

Sample Installations:

- *Ball Aerospace Systems*
- *Bryan Memorial Hospital*
- *Emma Willard School*
- *Flagstaff Medical Center*
- *Freemont County Justice Center*
- *Garrett Turbine Engine*
- *Hughes Aircraft*
- *Louden Hospital Center*
- *Maple Heights BOE*
- *McConnell AFB – B1B SupFac*
- *O K Tool*
- *Praxair*
- *Russell Research Center*
- *Shriners Hospital*
- *Soil & Water Conservation District*
- *Stillwater HS*
- *Sunland Training Center*
- *Troy Water District*

Advantages vs. Fire tube Boilers

- No hard cast refractory = less weight and lower maintenance costs
- 3-year non-prorated warranty on pressure vessel (labor & materials)
- Large diameter, short furnace reduces thermal stress
- Unique furnace design assures complete combustion
- Smaller footprint
- No proprietary parts
- Factory fire test included in base price

Advantages vs Cast Iron Boilers

- No hard cast refractory = less weight and lower maintenance costs
- 3-year non-prorated warranty on pressure vessel (labor & materials)
- No field erection required – factory PRE-ASSEMBLED is standard
- Smaller footprint
- Induced draft fans NOT required
- Factory fire test included in base price

Advantages vs. Copperfin Boilers

- Ample thermal storage with rapid response to load changes
- Inexpensive to Maintain
- No proprietary parts
- Heavy duty industrial control systems
- No potential for flame rollout

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