

# SELLERS

SPECIFICATION SHEET NO.

# 7100

January 1, 2006

## MODEL TP – TWO PASS IMMERSION WATER HEATER

### GENERAL DESCRIPTION

The Sellers Model TP Two Pass Immersion Water Heater is a rugged, commercial industrial gas fired unit. It combines storage and recovery in a single factory package assembly. The heater is Immersion fired using a premix forced draft burner and ENERGY X-TRACTORS to provide high efficiency with minimum maintenance. The two pass design allows for a short, compact, horizontal water heater requiring a minimum of floor space. The horizontal design provides for a cool bottom to accumulate scale. The bottom is protected against burnout because no heat is applied to it.

### SHELL SPECIFICATIONS

All Sellers Water Heaters are built to conform with Section IV of the ASME code and stamped with the "H" cloverleaf. Licensed inspectors check construction and witness final pressure testing. An ASME Inspection Data Report is furnished. The pressure vessels are available for standard maximum design pressures of 100, 125 or 150 psi Handhole openings are provided at front and bottom of the shells for inspection and cleaning.

Pressure vessel quality is used throughout. Heads are 3/4" thick in all sizes. Ligaments between the tubes are 1". Tubes are covered with .028" of seamless copper. The shell interior is sandblasted then covered with multiple coats of epoxy phenolic protection. Two magnesium anodes are installed for additional corrosion protection.

Two inch thick insulation covers the shell and all portions of the heads not used for heating surfaces. Radiation losses are minimized. A "walk on" hard top aids top access.. The insulation is covered with a sheet metal jacket, primed both sides and coated with jade green heavy machinery enamel.

The shell is mounted on a welded, structural steel skid type base to facilitate moving and installing the water heater. Lifting lugs are provided for ease of handling.

### BURNER ASSEMBLY

A hinge mounted burner is factory installed and tested to fire efficiently into horizontal tubes. The combustion air is supplied by a motor driven blower unit. The combustion chamber is pressurized by secondary air which is controlled by an adjustable valve.

The primary air is premixed with the fuel supply in a jet air gas mixer. An adjustable shutter allows complete control of the total air to match particular installation requirements

Flame retention burner nozzles are located at the first pass inlet of each tube. The flame is characterized for efficient immersion firing.



### COMBUSTION SAFEGUARD

An electronic flame safeguard is provided with each burner. The standard flame safeguard provides automatic sequencing and checking of each step of the burner operation.

### EFFICIENCY

Immersion firing, in conjunction with the forced draft premixed burner, permits achievement of low excess air combustion on a constant and dependable basis. Combined with low flue temperatures, high combustion efficiencies result.

An intra-tank circulating pump provides a full tank of hot water without the common cool bottom. This provides more usable stored hot water. It also allows higher combustion efficiencies by preventing the formation of condensate from the chilled flue gases in the lower tubes.

### EMISSIONS

Optional Low NOx emission package will allow the unit to operate at less than 30 ppm of NOx to meet low emission demands. This is achieved without flue gas recirculation and for very little additional cost.

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



# WATER HEATER STORAGE AND RECOVERY CAPACITIES

SEA LEVEL TO 3000 FEET ALTITUDE

CATALOG NUMBER	HOURLY BTU INPUT	HOURLY RECOVERY CAPACITY – GPH / F.			STORAGE CAPACITY (U.S. GAL)	SHIPPING WEIGHTS (POUNDS)		
		40-120°	40-140°	40-180°		100#	125#	150#
TP-8-160	800,000	1,000	800	568	163	2,390	2,480	2,480
TP-8-290					300	3,190	3,300	3,450
TP-8-460					476	4,090	4,450	4,600
TP-8-560					579	4,680	4,930	5,310
TP-8-790					814	6,040	6,340	7,150
TP-12-290	1,200,000	1,500	1,200	852	293	3,390	3,480	3,650
TP-12-460					470	4,270	4,630	4,780
TP-12-560					572	4,860	5,110	5,460
TP-12-790					807	6,220	6,520	7,300
TP-12-1060					1,082	7,890	8,070	8,760
TP-16-290	1,600,000	2,000	1,600	1,136	287	3,540	3,630	3,810
TP-16-460					463	4,450	4,810	4,960
TP-16-560					566	5,040	5,280	5,640
TP-16-790					801	6,400	6,700	7,480
TP-16-1060					1,075	8,070	8,250	8,910
TP-20-290	2,000,000	2,500	2,000	1,420	280	3,750	3,810	3,960
TP-20-460					456	4,630	4,990	5,140
TP-20-560					559	5,240	5,460	5,790
TP-20-790					794	6,580	6,880	7,640
TP-20-1060					1,068	8,250	8,430	9,070
TP-24-460	2,400,000	3,000	2,400	1,704	450	4,810	5,160	5,290
TP-24-560					553	5,420	5,640	5,970
TP-24-790					788	6,760	7,060	7,820
TP-24-1060					1,062	8,430	8,600	9,220
TP-32-460	3,200,000	4,000	3,200	2,272	437	5,170	5,520	5,650
TP-32-560					540	5,780	6,030	6,330
TP-32-790					775	7,140	7,420	8,150
TP-32-1060					1,049	8,810	8,960	9,580
TP-40-560	4,000,000	5,000	4,000	2,840	527	6,190	6,390	6,690
TP-40-790					762	7,500	7,780	8,480
TP-40-1060					1,036	9,170	9,320	9,940
TP-50-790	5,000,000	6,250	5,000	3,550	745	7,960	8,240	8,920
TP-50-1060					1,020	9,630	9,780	10,400

## Standard Gas Pressure Requirements (Natural Gas at 0-3000 ft. Elevation)

Water Heater Model Prefix Number	Pressure required at gas train inlet		
	Min. (3)	Std Range	Max.
TP-8	6" w.c.	8" to 1 PSI	10 PSI
BT-12 through BT-32	7" w.c.	12" to 1 PSI	10 PSI
BT-40 through BT-50	10" w.c.	14" to 1 PSI	10 PSI

(3) Special gas trains required at additional cost. Consult the Factory.

## STANDARD EQUIPMENT FURNISHED

**Pressure Vessel:** ASME stamped with "H" cloverleaf.

**Copper Clad Tubes:** Seamless .028" copper drawn over steel.

**Manholes:** Standard on shells over 60" diameter.

**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.

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

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

**Epoxy Lining:** Epoxy phenolic lining applied to sand blasted surface and baked at high temperature.

**Magnesium Anodes:** Two (2) 1-5/16" x 82 or longer.

**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:

	TP-8 TP-12	TP-16 TP-24	TP-32 TP-40	TP-50
Solenoid gas valve	2	-	-	-
Motorized gas valve	-	1	1	2
Proof of closure	-	1	1	1
Pilot solenoid valves	1	1	1	1
Gas pressure switches	-	-	2	2

**Rear Door:** Davitted for easy access.

**Operating Temperature Control**

**High Limit Temperature Control:** Manual reset.

**UL Labeled:** Packaged water heaters.

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

**Low Water Cutoffs:** Probe type with manual reset.

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

**Temperature Gauge:** 5" dial type.

**Temperature and Pressure 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.

**Circulating Pump:** Bronze or stainless steel.

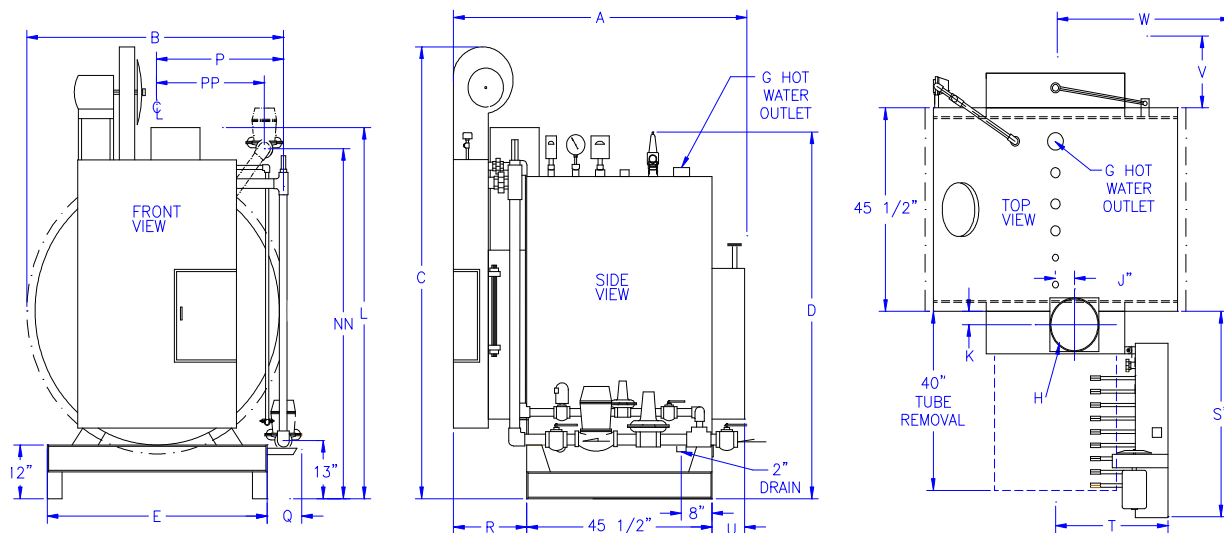
**Factory fire test report.**

**Five year limited burner warranty.**

**Ten year warranty on pressure vessel.**

**Finished with heavy jade green machinery enamel.**

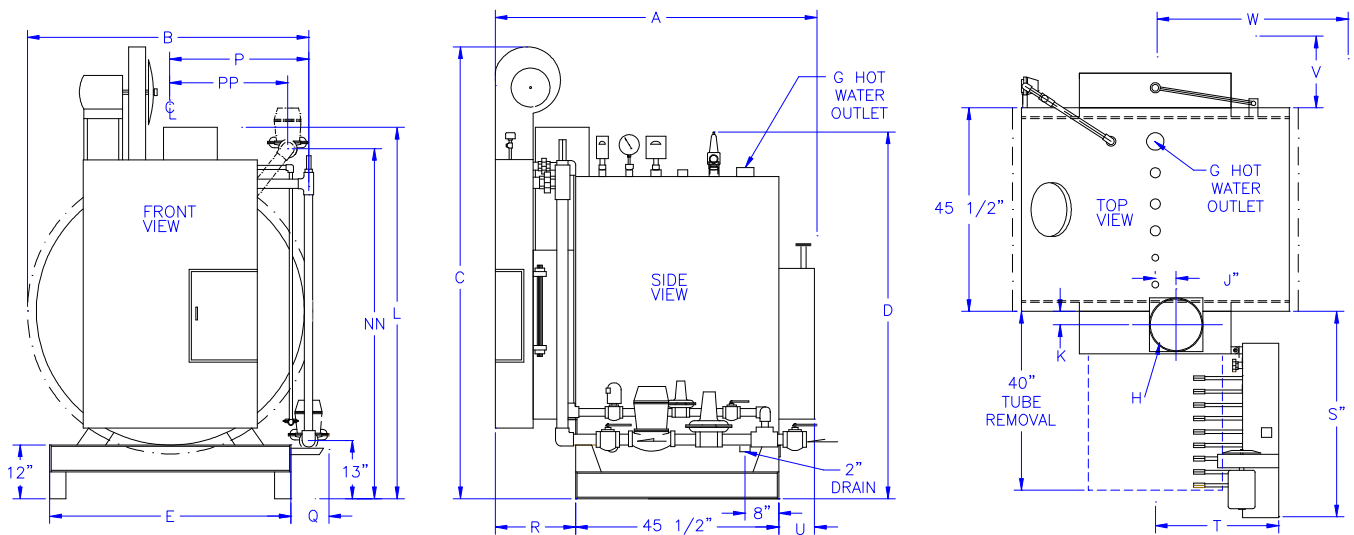
**Initial start-up and operator's instruction provided by a company representative.**



## WATER HEATER DIMENSIONS

MODEL NUMBER:		TP-8-160	TP-8-290	TP-8-460	TP-8-560	TP-8-790	TP-12-290	TP-12-460	TP-12-560	TP-12-790	TP-12-1060	TP-16-290
<b>OVERALL DIMENSIONS:</b>												
LENGTH	A	72	72	72	72	72	72	72	72	72	72	72
WIDTH	B	41	53	65	71	83	53	65	71	83	95	53
HEIGHT TO BLOWER	C	90	90	90	90	90	94	94	94	94	94	94
HEIGHT TO T&P VALVE	D	58	70	82	88	100	70	82	88	100	112	70
<b>BASE:</b>												
LENGTH	E	30	42	54	57	66	42	54	57	66	78	42
<b>SHELL:</b>												
DIAMETER INSIDE	F	36	48	60	66	78	48	60	66	78	90	48
HOT OR COLD IPS	G	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.5
<b>FLUE CONNECTION:</b>												
SIZE – OUTSIDE DIAMETER	H	6	6	6	6	6	8	8	8	8	8	10
HORIZONTAL SIDE LOCATION	J	5	5	5	5	5	6	6	6	6	6	5
HORIZONTAL FORWARD LOCATION	K	4	4	4	4	4	4	4	4	4	4	4
HEIGHT TO TOP OF FLUE	L	72	72	78	84	96	76	78	84	96	108	76
<b>GAS CONNECTION:</b>												
VERTICAL HIGH LOCATION (Optional)	NN	51	60	68	72	81	63	72	76	85	93	63
HORIZONTAL STANDARD LOCATION	P	20	24	29	32	38	26	31	33	37	43	26
HORIZONTAL HIGH LOCATION (Optional)	PP	17	23	29	32	38	22	28	31	37	43	22
<b>INSTALLATION CLEARANCES:</b>												
VALVE PROJECTION (LOW TRAIN)	Q	3	1	0	0	0	4	3	2	0	0	4
BURNER EXTENSION	R	18	18	18	18	18	18	18	18	18	18	18
BURNER SWING TO FRONT	S	39	39	39	39	39	39	39	39	39	39	44
BURNER SWING TO SIDE (OPEN 90°)	T	25	25	25	25	25	25	25	25	25	25	28
TURNBOX EXTENSION	U	8	8	8	8	8	8	8	8	8	8	8
TURNBOX DOOR SWING TO REAR	V	21	21	21	21	21	21	21	21	21	21	24
TURNBOX DOOR SWING TO SIDE	W	44	44	44	44	44	44	44	44	44	44	53
<b>BLOWER HP:</b>		1.5	1.5	1.5	1.5	1.5	2	2	2	2	2	2

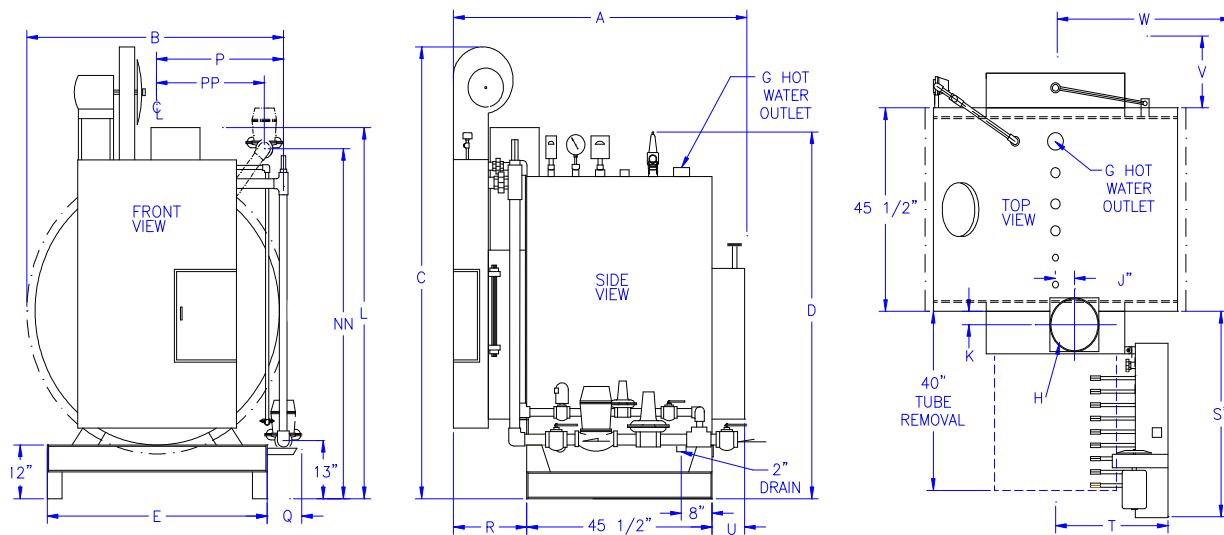
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## WATER HEATER DIMENSIONS

MODEL NUMBER:		TP-16-460	TP-16-560	TP-16-790	TP-16-1060	TP-20-290	TP-20-460	TP-20-560	TP-20-790	TP-20-1060	TP-24-460	TP-24-560
<b>OVERALL DIMENSIONS:</b>												
LENGTH	A	72	72	72	72	72	72	72	72	72	72	72
WIDTH	B	65	71	83	95	53	65	71	83	95	65	71
HEIGHT TO BLOWER	C	94	94	94	94	98	98	98	98	98	101	101
HEIGHT TO T&P VALVE	D	82	88	100	112	70	82	88	100	112	82	88
<b>BASE:</b>												
LENGTH	E	54	57	66	78	42	54	57	66	78	54	57
<b>SHELL:</b>												
DIAMETER INSIDE	F	60	66	78	90	48	60	66	78	90	60	66
HOT OR COLD IPS	G	1.5	1.5	1.5	1.5	2	2	2	2	2	2	2
<b>FLUE CONNECTION:</b>												
SIZE – OUTSIDE DIAMETER	H	10	10	10	10	10	10	10	10	10	12	12
HORIZONTAL SIDE LOCATION	J	5	5	5	5	5	5	5	5	5	4.5	4.5
HORIZONTAL FORWARD LOCATION	K	4	4	4	4	4	4	4	4	4	3	3
HEIGHT TO TOP OF FLUE	L	78	84	96	108	80	80	84	96	108	80	84
<b>GAS CONNECTION:</b>												
VERTICAL HIGH LOCATION (Optional)	NN	72	76	85	93	63	72	76	85	93	72	76
HORIZONTAL STANDARD LOCATION	P	31	33	37	43	26	31	33	37	43	31	33
HORIZONTAL HIGH LOCATION (Optional)	PP	28	31	37	43	22	28	31	37	43	28	31
<b>INSTALLATION CLEARANCES:</b>												
VALVE PROJECTION (LOW TRAIN)	Q	3	2	0	0	4	3	2	0	0	3	2
BURNER EXTENSION	R	18	18	18	18	18	18	18	18	18	18	18
BURNER SWING TO FRONT	S	44	44	44	44	44	44	44	44	44	47	47
BURNER SWING TO SIDE (OPEN 90°)	T	28	28	28	28	28	28	28	28	28	30	30
TURNBOX EXTENSION	U	8	8	8	8	8	8	8	8	8	8	8
TURNBOX DOOR SWING TO REAR	V	24	24	24	24	24	24	24	24	24	26	26
TURNBOX DOOR SWING TO SIDE	W	53	53	53	53	53	53	53	53	53	57	57
<b>BLOWER HP:</b>		2	2	2	2	3	3	3	3	3	3	3

See Notes on Last Page.



## WATER HEATER DIMENSIONS

MODEL NUMBER:		TP-24-790	TP-24-1060	TP-32-460	TP-32-560	TP-32-790	TP-32-1060	TP-40-560	TP-40-790	TP-40-1060	TP-50-790	TP-50-1060
<b>OVERALL DIMENSIONS:</b>												
LENGTH	A	72	72	72	72	72	72	81	81	81	81	81
WIDTH	B	83	95	65	71	83	95	71	83	95	83	95
HEIGHT TO BLOWER	C	101	101	113	113	113	113	113	113	113	119	119
HEIGHT TO T&P VALVE	D	88	112	85	91	103	115	88	100	112	103	115
<b>BASE:</b>												
LENGTH	E	57	78	54	57	66	78	57	66	78	66	78
<b>SHELL:</b>												
DIAMETER INSIDE	F	78	90	60	66	78	90	66	78	90	78	90
HOT OR COLD IPS	G	2	2	2	2	2	2	2.5	2.5	2.5	2.5	2.5
<b>FLUE CONNECTION:</b>												
SIZE – OUTSIDE DIAMETER	H	12	12	12	12	12	12	14	14	14	16	16
HORIZONTAL SIDE LOCATION	J	4.5	4.5	4.5	4.5	4.5	4.5	7	7	7	7.5	7.5
HORIZONTAL FORWARD LOCATION	K	3	3	3	3	3	3	7	7	7	7	7
HEIGHT TO TOP OF FLUE	L	96	108	92	92	96	108	92	96	108	96	108
<b>GAS CONNECTION:</b>												
VERTICAL HIGH LOCATION (Optional)	NN	76	93	78	82	91	100	82	91	100	91	100
HORIZONTAL STANDARD LOCATION	P	33	43	31	33	36	41	33	36	41	36	41
HORIZONTAL HIGH LOCATION (Optional)	PP	31	43	26	29	35	41	29	35	41	35	41
<b>INSTALLATION CLEARANCES:</b>												
VALVE PROJECTION (LOW TRAIN)	Q	2	0	5	4	1	0	4	1	0	1	0
BURNER EXTENSION	R	18	18	18	18	18	18	27	27	27	27	27
BURNER SWING TO FRONT	S	47	47	47	47	47	47	57	57	57	63	63
BURNER SWING TO SIDE (OPEN 90°)	T	30	30	30	30	30	30	33	33	33	36	36
TURNBOX EXTENSION	U	8	8	8	8	8	8	8.5	8.5	8.5	8.5	8.5
TURNBOX DOOR SWING TO REAR	V	26	26	26	26	26	26	27	27	27	30	30
TURNBOX DOOR SWING TO SIDE	W	57	57	57	57	57	57	62	62	62	71	71
<b>BLOWER HP:</b>		3	3	3	3	3	3	5	5	5	5	5

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 are not shown on drawing. The manhole, when furnished, is not shown.
3. Outside diameter and dimensions are shown.
4. Tubes may be removed from the front or rear.
5. Standard train location is low near the skid.
6. Dotted lines indicate 2" insulation.

## Installation Requirements

### ELECTRICAL REQUIREMENTS

Water Heaters are pre-wired (105° C color coded wire) to numbered terminal strips. The wiring diagram is provided in the control panel and with the owners manual. Panels include a control transformer to provide 5 Amp., 120 Volt service. Boilers are wired for jobsite supply power characteristics.

### 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.

### STACK REQUIREMENTS

Design stack to provide .02" to .04" water column draft at flue outlet. Smooth transitions and bends are required. Generally full sized rectangular or equivalent round stacks should be used. Maximum stack weight on water heater should not exceed 1000 pounds.

### 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.

## Advantages

### Reduced Floor Space

Long lasting horizontal design fits in the same floor space as most vertical units.

### Low NOx Emissions

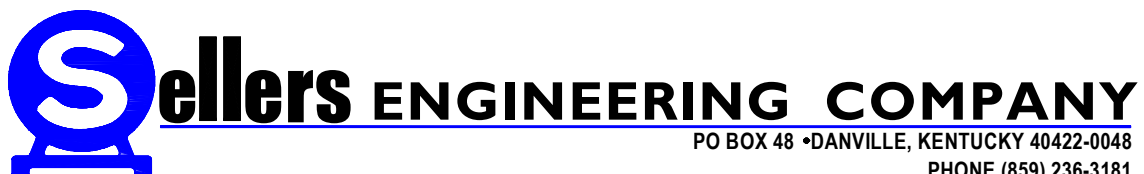
Sellers Two Pass units can easily be fitted to achieve less than 30 ppm NOx emissions at very little additional cost and without flue gas recirculation or increased maintenance.

### Low Life Cycle Cost

Design is based on the Immersion Firing principle which provides the same Low Life Cycle Cost as our other Immersion products.

### Horizontal Firing Tubes

Provides for a "cool bottom" that allows scale to accumulate without the fear of "burnout" that is common in units that utilize a vertical firing tube.



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