Thermal Leverage

COMMERCIAL & INDUSTRIAL

TRI-FUEL BOILERS
(GAS/OIL/ELECTRIC)

When you have Leverage use it!

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THERMAL LEVERAGE INTRODUCES THE LATEST IN BOILER DESIGN WITH THE NEW TRI-FUEL BOILER

Based on the proven 3 & 4 Pass design this upgraded Scotch Marine STEAM and HOT WATER Boiler has been redesigned to incorporate the latest technology in Electric heating elements.

This Wet Back design features GAS or OIL Firing along with equally balanced state-of-the-art electric resistive heating elements that surpass the Hydrocarbon Firing capacity as they are rated at near 100% efficiency.

Specifically designed for the emerging ZERO Emissions markets with a compact Scotch Marine design able to fit inside existing buildings and maintain the tube and electric element pull space. The Thermal Leverage design also still utilizes a furnace access door for Service, Cleaning and Inspection.

The Boiler can be Factory Packaged or Field Erected in various configurations to accommodate some of the most difficult site conditions.

Major Features:

- **Close to 100% Efficiency when in the electric heating Mode of operation**
- **100% Reduction in Green House Gas Emissions**
- **Specialized design for field erection into existing buildings with Steam and Hot water Pipe system**
- **Gas / Oil Burner Bio-Diesel and Hydrogen fuel options**

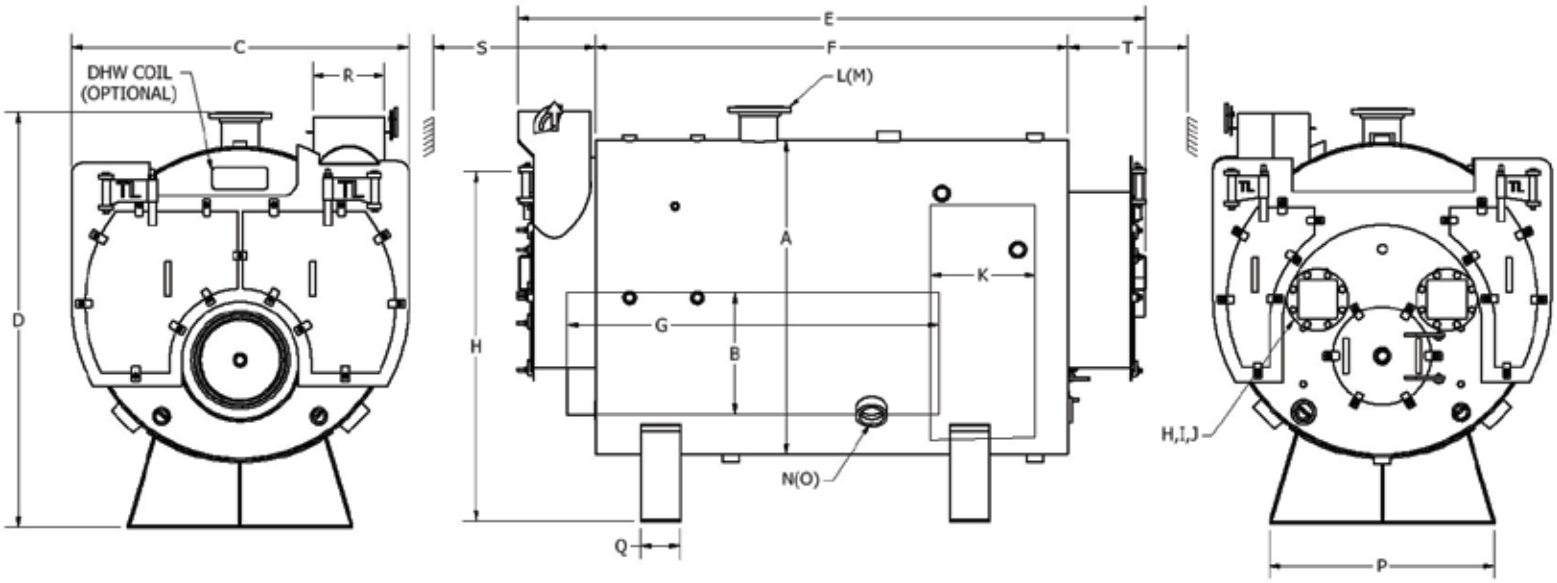
THERMAL LEVERAGE TRI-FUEL BOILER - RATINGS

BOILER SIZE		HP	20	30	40	50	60	70	80	90	100	125S	125	150	175	200	250	300
GROSS OUTPUT	STEAM	LBS/HR	690	1,104	1,380	1,725	2,070	2,415	2,760	3,105	3,450	4,313	4,313	5,175	6,038	6,900	8,625	10,350
	STEAM/ WATER	MBH	670	1,071	1,339	1,674	2,009	2,343	2,678	3,013	3,348	4,184	4,184	5,021	5,858	6,695	8,369	10,043
NET RATINGS	STEAM	MBH	520	832	1,040	1,299	1,559	1,819	2,079	2,339	2,599	3,249	3,249	3,898	4,548	5,198	6,497	7,797
	WATER	MBH	582	931	1,164	1,455	1,747	2,038	2,329	2,620	2,911	3,639	3,639	4,366	5,094	5,822	7,277	8,733
	STEAM	SQ. FT	2,875	4,600	5,750	7,188	8,625	10,063	11,500	12,938	14,375	17,969	17,969	21,563	25,156	28,750	35,938	43,125
FIRING RATE	NATURAL GAS	CFH	807	1,291	1,613	2,017	2,420	2,823	3,227	3,630	4,033	5,041	5,041	6,050	7,058	8,066	10,083	12,099
	#2 OIL	GPH	6	9	12	14	17	20	23	26	29	36	36	43	50	58	72	86
ELECTRICAL		KW	196	294	392	490	588	687	785	883	981	1,226	1,226	1,471	1,716	1,962	2,452	2,942
FIRESIDE HEATING SURFACE		SQ. FT	100	150	200	250	300	350	400	450	500	625	625	750	875	1,000	1,250	1,500

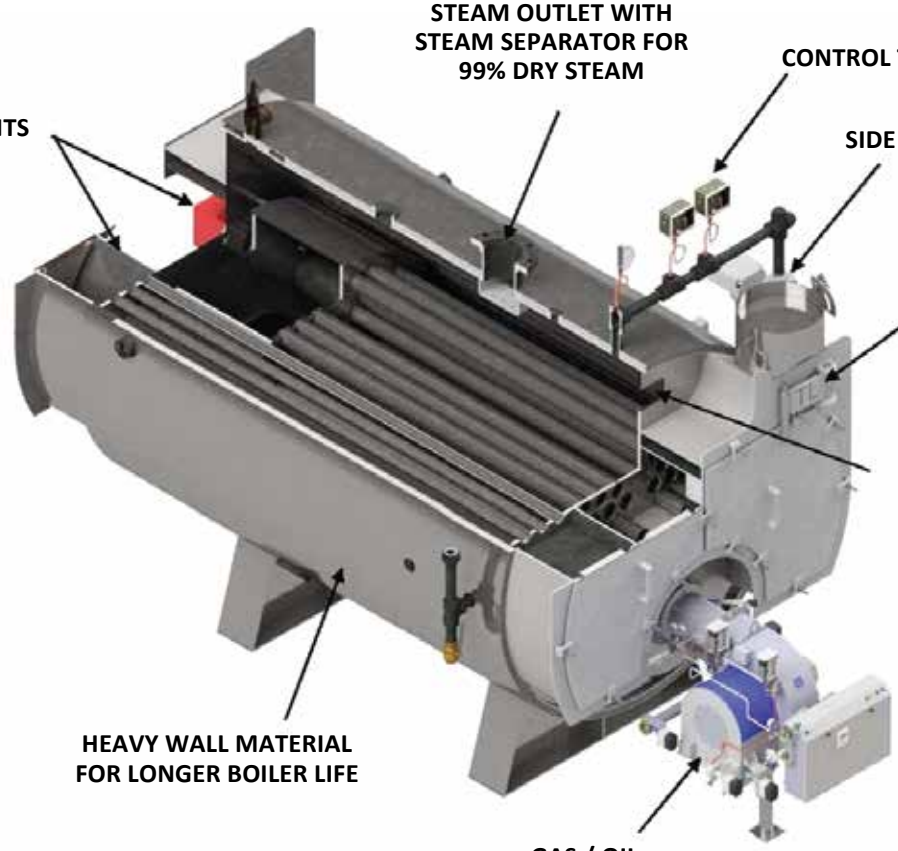
THERMAL LEVERAGE TRI-FUEL BOILER - DIMENSIONS

BOILER SIZE		20	30	40	50	60	70	80	90	100	125S	125	150	175	200	250	300
A	INSIDE DIAMETER SHELL	45	45	45	55	55	55	55	60	60	60	72	72	72	84	84	84
B	INSIDE DIAMETER FURNACE	18	18	18	21	21	21	21	30	30	30	37-1/4	37-1/4	37-1/4	41	41	41
C	BOILER WIDTH OVERALL	49-7/8	49-7/8	49-7/8	59-7/8	59-7/8	59-7/8	59-7/8	64-7/8	64-7/8	64-7/8	76-7/8	76-7/8	76-7/8	88-7/8	88-7/8	88-7/8
D	BOILER HEIGHT OVERALL	62-7/8	62-7/8	62-7/8	72-3/4	72-3/4	72-3/4	72-3/4	78-3/4	78-3/4	78-3/4	90-3/4	90-3/4	90-3/4	102-3/4	102-3/4	102-3/4
E	BOILER LENGTH OVERALL	84 -7/8	106 -7/8	127-7/8	111-9/16	126-9/16	141-9/16	125-9/16	136-7/8	148-7/8	176-7/8	137-7/8	157-7/8	177-7/8	146-7/8	171-7/8	196-7/8
F	LENGTH OF SHELL	53	75	96	79	94	109	124	103	115	143	104	124	144	111	136	161
G	LENGTH OF FURNACE	37	59	80	61	76	91	106	85	97	125	86	106	126	80	105	130
H	NO OF ELEMENT	2	2	2	2	2	2	2	2	2	2	4	4	4	6	6	6
I	ELEMENT LENGTH	30	52	62	56	70	85	100	79	91	119	80	100	120	87	112	137
J	ELEMENT SIZE	4	4	4	6	6	6	6	8	8	8	6	6	6	8	8	8
H	NORMAL WATER LINE	49	49	49	58	58	58	58	61	61	61	73	73	73	80	80	80
K	LENGTH REVERSING CHAMBER	17	17	17	18-3/4	18-3/4	18-3/4	18-3/4	18-3/4	18-3/4	18-3/4	18-3/4	18-3/4	18-3/4	32	32	32
L	STEAM SUPPLY SIZE (NPS)	6	6	6	6	6	6	6	6	8	8	8	8	8	8	10	10
M	WATER SUPPLY SIZE (NPS)	3	3	3	3	3	4	4	4	4	4	4	6	6	6	6	6
N	STEAM RETURN SIZE(NPS)	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	6
O	WATER RETURN SIZE(NPS)	3	3	3	3	3	4	4	4	4	4	4	6	6	6	6	6
P	LENGTH OF SADDLE	38	38	38	40	40	40	40	46	46	46	56	56	56	62	62	62
Q	WIDTH OF SADDLE	6	6	6	7	7	7	7	8	8	8	8	8	8	8	8	8
R	VENT DIAMETER	12	12	12	12	12	12	14	16	16	16	18	18	18	20	20	20
S	TUBE PULL	53	75	96	79	94	109	124	103	115	143	104	124	144	111	136	161
T	ELEMENT PULL	42	64	84	68	82	97	112	91	103	131	92	112	132	99	124	149

*NOTES: DIMENSIONS ARE IN INCHES
DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE
LARGER CAPACITIES AVAILABLE, CONSULT FACTORY



THERMAL LEVERAGE TRI-FUEL BOILER - DIAGRAM



Electric Mode Key Benefits:

- Reduces or eliminates need for a dedicated step-down transformer
- Suitable for large heating demands in large buildings
- Supplies exactly what is needed for the facility
- Reduces amperage draw for same heat output
- Minimal maintenance, fast turnaround, minimal downtime
- Offers precise temperature and pressure control to within 1˚F or 1 PSI
- Zero on-site emissions with electric heating
- Flame-less heating offers clean operation
- Safe and reliable design backed by 100-year heating experience
- Significant installation, operation and maintenance cost savings
- Overall heating efficiency approaching 99%
- Significant savings in life cycle costs

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MANUFACTURED UNDER LICENSE BY
INDUSTRIAL STEAM BOILER CORPORATION
COPAIGUE, NY
Publication - 1/2024

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