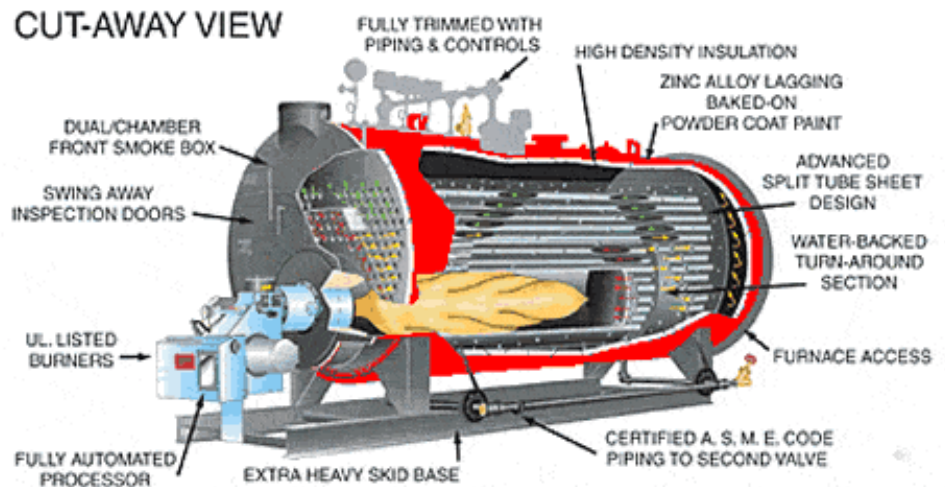


The 4 Pass Wet Back Boiler

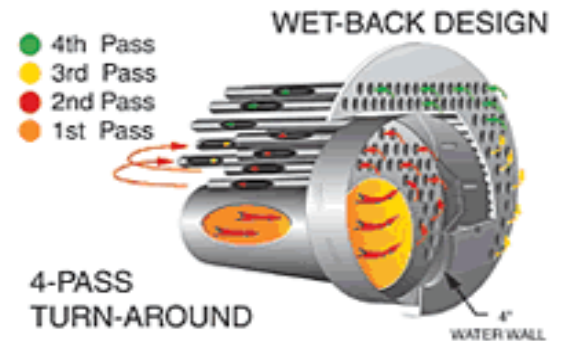
Available in Steam or Hot Water Versions
Ranging from 30 to 1500HP - Pressure to 250 psig.

- Four-pass wet back design eliminates refractory baffles between flue gas passes.
- Minimum maintenance with rugged construction for extra-long life.
- U.L. listed boiler/burner package for firing gas, oil and combination gas/oil.
- Factory tested and checked for optimum operating efficiency.



WET BACK ADVANTAGE

Dry backs are subject to deteriorating rear refractory, leaking baffles, leaking door seals, and often found with a heat-stressed rear tubesheet. Fragile refractory baffling and door seals will require continuous monitoring, maintenance, and replacement, costing thousands of dollars in materials and specialized labor cost over the life of the boiler. In addition, broken baffles and leaking seals will short-circuit boiler efficiency up until repairs can be made, and downtime during repairs can bring your production process to a halt.



All of those frustrating problems have been designed out of the CRG 4 pass wet back Wetback. It has a full wet back radiant heat transfer area that promotes superior internal water circulation and rapid heat absorption. Separate rear tubesheets allow each pass of tubes to expand and contract at its own rate without tube-to-sheet stress. Tubes are mechanically rolled, flared and beaded, making any tube service a simple matter. The only rear refractory is a 18 inch plug which allows access to the furnace for inspection.

STANDARD FEATURES :

Durability

Built in accordance with the ASME Code, the wet back design has proven to give much longer useful life cycles than dry back boilers.

Quality

Each unit is tested and inspected by Hartford and is registered with the National Board of Boiler and Pressure Vessel Inspectors.

Design

State of the art computer design techniques are used in every boiler design. This accounts for accurate calculations of construction materials and optimum utilization of the boiler's performance criteria.

Efficiency

The 4 pass wet back is designed for optimum fuel efficiency and has proven in certified tests to meet and often exceed the efficiencies of 4-pass boilers.

Low Maintenance

There is no refractory rear door, to maintain and no refractory baffles to replace. Elimination of these components results in thousands of dollars of savings.

Tube Sheets

The wet back has independent tube sheets with uniform temperatures. Three and four pass dry back boilers have tube sheets with large temperature variations and this results in premature tube failure and cracks in the tube sheets.

Easy Access

Since there is no large refractory rear door, one man can easily remove the rear cover plates for access to the tubes. Front doors can be opened without removing burner components or controls.

Compact

Computer aided design has made the wet back a space saving workhorse without sacrificing the principle of 5 sq. ft. of heating surface per BHP.

Combustion

CRG uses name brand burner components with proven reliability. Every unit is boiler/burner compatible and tested at the factory prior to shipment.

Standard Steam Trim

- Operating & limit pressure control
- Modulating pressure control (when appl)
- Water column with gauge glass combination low water cutoff& pump control
- Probe type auxiliary low water cutoff with manual reset
- Water column drain valve
- Safety relief valve(s)) per ASME Code
- Steam Gauge
- Stack Thermometer

Standard Water Trim

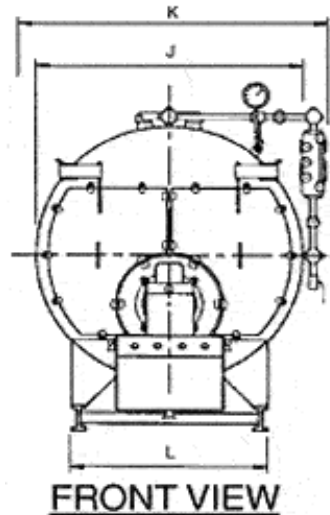
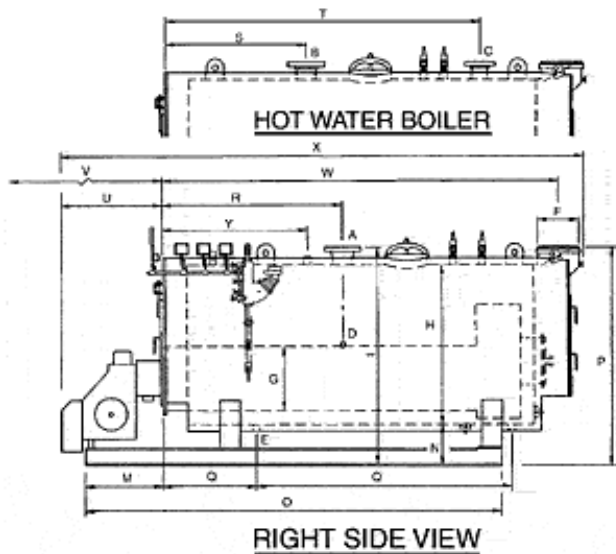
- Operating & limit temperature control
- Modulating temperature control (when appl)
- Low water cutoff control with manual reset
- Combination pressure, temperature gauge
- Hot water return baffle for shock resistance
- Safety relief valve(s)) per ASME Code
- Stack thermometer

Boiler Specifications
(all dimensions are in inches)

BOILER HORSEPOWER			30	40	50	60	70	80		
	HEATING SURFACE	FIRESIDE	SQ. FT.	150	200	250	300	350	400	
	STEAM OUTPUT	FROM & @212°F	LB/HR	1035	1380	1725	2070	2415	2760	
	GROSS OUTPUT		MBH	1004	1339	1674	2009	2343	2678	
	FIRING RATE, GAS	1,000 BTU/CF	CFH	1260	1680	2100	2520	2940	3360	
	FIRING RATE, LP GAS	91,500 BTU	GPH	13.8	18.4	23	27.5	32	36.7	
	FIRING RATE, #2 OIL	140,000 BTU	GPH	9	12	15	18	21	24	
	FIRING RATE, #5 & #6 OIL	150,000 BTU	GPH	8.4	11.2	14	16.8	19.6	22.4	
A	*NOTE: 1 STEAM OUTLET SIZE	150 PSI	IN	1 ½	2	2 1/2	2 ½	3	3	A
A	*NOTE: 2 STEAM OUTLET SIZE	15 PSI	IN	4	4	4	6	6	6	A
B	*NOTE: 2 SUPPLY SIZE	30 PSI	IN	4	4	4	6	6	6	B
C	*NOTE: 2 RETURN SIZE	30 PSI	IN	4	4	4	4	4	4	C
D	FEEDWATER CONNECTION		IN	¾	¾	¾	1	1	1 ¼	D
E	BOTTOM BLOWDOWN SIZE	HIGH PRESS.	IN	1	1 ¼	1 ¼	1 ¼	1 ¼	1 ¼	E
E	BOTTOM BLOWDOWN SIZE	LOW PRESS. & HW	IN	1 ¼	1 ¼	1 ¼	1 ½	1 ½	1 ½	E
F	STACK OUTLET SIZE O.D.		IN	10	10	10	12	12	12	F
G	FURNACE O.D.		IN	14	14	16	18	18	18	G
H	SHELL I.D.		IN	40	40	44	48	48	48	H
I	SUPPLY HEIGHT		IN	60	60	64	68	68	68	I
J	WIDTH WITHOUT TRIM		IN	46	46	50	54	54	54	J
K	WIDTH WITH TRIM		IN	58	58	62	66	66	66	K
L	SKID WIDTH		IN	34	34	36	40	40	40	L
M	END OF SKID TO FRONT PLATE		IN	13 ½	14 ¼	15 ¼	15 ¼	15 ¼	21	M
N	VESSEL SHELL TO FLOOR		IN	12	12	12	12	12	12	N
O	SKID LENGTH		IN	81	99	102	102	102	114	O
P	STACK OUTLET HEIGHT		IN	59	59	63	67	67	67	P
Q	BLOWDOWN LOCATIONS		IN	36	41	32	30	30	30	Q
R	STEAM OUT LOCATION (15 PSI & UP)	FROM C/L OF STACK	IN	38	41	39 ½	48	48	57	R
S	SUPPLY LOCATION	FROM FRONT PLATE	IN	20	21	33	38	44	33	S
T	RETURN LOCATION	C/L TO C/L	IN	39	54	45	48	48	54	T
U	BURNER PROJECTION	FROM FRONT PLATE	IN	32	32	36	36	39 ½	39	U
V	TUBE REMOVABLE	FRONT	IN	61	78	81	82	82	94	V
W	LENGTH FRONT TO REAR	BOILER VESSEL	IN	79	96	100	106	106	118	W
X	APPROX. OVERALL LENGTH (WITH BURNER)	STD. BURNER	IN	111	128	136	142	142	158	X
	APPROX. SHIPPING WEIGHT	150 PSI	IN	3500	4100	4700	6000	6200	7000	
	APPROX. SHIPPING WEIGHT	15 & 30 PSI	LBS	3400	4000	4500	5700	5900	6200	
	WATER CAPACITY @ NWL		GAL	215	272	324	378	359	416	
	WATER CAPACITY FLOODED		GAL	252	3119	382	434	415	479	
BOILER HORSEPOWER				30	40	50	60	70	80	

	BOILER HORSEPOWER			100	125	150	200	250	300	350	400	
	HEATING SURFACE	FIRESIDE	SQ. FT.	500	625	750	1000	1250	1500	1750	2000	
	STEAM OUTPUT	FROM & @212°F	LB/HR	3450	4313	5175	6900	8625	10350	12075	13800	
	GROSS OUTPUT		MBH	3348	4184	5021	6695	8369	10043	11716	13390	
	FIRING RATE, GAS	1,000 BTU/CF	CFH	4200	5250	6300	8400	10500	12600	14700	16800	
	FIRING RATE, LP GAS	91,500 BTU	GPH	46	57	69	92	115	138	160	184	
	FIRING RATE, #2 OIL	140,000 BTU	GPH	29.9	37.4	45	60	75	90	105	120	
	FIRING RATE, #5 & #6 OIL	150,000 BTU	GPH	28	35	42	56	70	84	98	112	
A	*NOTE: 1 STEAM OUTLET SIZE	150 PSI	IN	4	4	4	4	6	6	6	6	A
A	*NOTE: 2 STEAM OUTLET SIZE	15 PSI	IN	8	8	8	8	10	10	10	10	A
B	*NOTE: 2 SUPPLY SIZE	30 PSI	IN	8	8	8	8	10	10	10	10	B
C	*NOTE: 2 RETURN SIZE	30 PSI	IN	6	6	6	6	8	8	8	8	C
D	FEEDWATER CONNECTION		IN	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	2	2	2	D
E	BOTTOM BLOWDOWN SIZE	HIGH PRESS.	IN	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	1 1/2	E
E	BOTTOM BLOWDOWN SIZE	LOW PRESS. & HW	IN	1 1/2	1 1/2	2	2	2	2	2	2	E
F	STACK OUTLET SIZE O.D.		IN	14	14	16	16	18	20	20	24	F
G	FURNACE OD		IN	22	26	26	30	34	34	34	38	G
H	SHELL I.D.		IN	54	60	60	66	84	84	84	90	H
I	SUPPLY HEIGHT		IN	74 3/4	81 3/4	81 3/4	90 3/4	109	109	109	115	I
J	WIDTH WITHOUT TRIM		IN	60	66 1/2	66 1/2	72 1/2	90 3/4	90 3/4	90 3/4	96 1/4	J
K	WIDTH WITH TRIM		IN	72	79	79	84	103	103	103	106	K
L	SKID WIDTH		IN	44	48	48	51	64	64	64	70	L
M	END OF SKID TO FRONT PLATE		IN	21 3/4	25 1/8	25 1/8	21 1/4	28 5/8	28 5/8	34 5/8	30 5/8	M
N	VESSEL SHELL TO FLOOR		IN	14	15	15	18	18	18	18	18	N
O	SKID LENGTH		IN	114	132	156	168	180	180	204	198	O
P	STACK OUTLET HEIGHT		IN	74 3/4	81 3/4	81 3/4	90 3/4	109	109	109	115	P
Q	BLOWDOWN LOCATIONS		IN	29 3/4-66	32 7/8-78	32 7/8-102	33 7/8-120	35 7/8-120	35 7/8-120	41 7/8-132	47 7/8-126	Q
R	STEAM OUT LOCATION (15 PSI & UP)	FROM C/L OF STACK	IN	56	56	75	79 1/2	70	71	84	94 1/2	R
S	SUPPLY LOCATION	FROM FRONT PLATE	IN	32 3/4	32	32	46 1/2	54 3/4	54 3/4	56 1/4	55 7/8	S
T	RETURN LOCATION	C/L TO C/L	IN	58	70	82	84	90	90	95	92	T
U	BURNER PROJECTION	FROM FRONT PLATE	IN	31 3/8	34 3/4	34 3/4	34 3/4	47 1/2	47 1/2	38 1/4	52 1/4	U
V	TUBE REMOVABLE	FRONT	IN	96	108	132	150	150	150	168	168	V
W	LENGTH FRONT TO REAR	BOILER VESSEL	IN	116 3/8	128 3/8	152 1/4	174 1/4	177	177	195	196 1/2	W
X	APPROX. OVERALL LENGTH (WITH BURNER)	STD. BURNER	IN	148	163	187	209	225	225	233	249	X
Y	FACE OF REAR DOORS TO WATER MAKE-UP SUPPLY	15 PSI & UP	IN	60 5/8	72 1/2	78 3/8	93 1/2	105	105	110 1/8	103 1/8	Y

APPROX. SHIPPING WEIGHT	150 PSI	LBS	8200	10400	11800	16600	25700	27100	30200	32200
APPROX. SHIPPING WEIGHT	15 & 30 PSI	LBS	7200	9400	10800	13700	24400	25800	28200	29500
WATER CAPACITY @ NWL		GAL	484	676	785	1126	1890	1844	2068	2440
WATER CAPACITY FLOODED		GAL	578	788	927	1350	2300	2246	2518	3000
BOILER HORSEPOWER			100	125	150	200	250	300	350	400



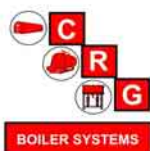
BOILER HORSEPOWER				500	600	700	750	800	900	1000	1200	1500	
HEATING SURFACE	FIRESIDE	SQ. FT.		2500	3000	3500	3750	4000	4500	5000	6000	7500	
STEAM OUTPUT	FROM & @212°F	LB/HR		17250	20700	24150	25875	27600	31050	34500	41400	51750	
GROSS OUTPUT		MBH		16738	200085	23432	25106	26780	30128	33475	40170	50213	
FIRING RATE, GAS	1,000 BTU/CF	CFH		21000	25200	29400	31500	33600	37800	42000	50400	63000	
FIRING RATE, LP GAS	91,500 BTU	GPH		230	275	320	344	368	413	460	550	688	
FIRING RATE, #2 OIL	140,000 BTU	GPH		150	180	210	225	240	270	300	360	450	
FIRING RATE, #5 & #6 OIL	150,000 BTU	GPH		140	168	196	210	224	252	280	336	420	
A *NOTE: 1 STEAM OUTLET SIZE	150 PSI	IN		6	8	8	8	8	8	8	10	10	A
A *NOTE: 2 STEAM OUTLET SIZE	15 PSI	IN		10	12	12	12	12	14	14	14	14	A
B *NOTE: 2 SUPPLY SIZE	30 PSI	IN		10	12	12	12	12	12	12	14	14	B
C *NOTE: 2 RETURN SIZE	30 PSI	IN		8	8	10	10	10	12	12	14	14	C
D FEEDWATER CONNECTION		IN		2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	D
E BOTTOM BLOWDOWN SIZE	HIGH PRESS.	IN		1 1/2	1 1/2	2	2	2	2	2	2	2	E
E BOTTOM BLOWDOWN SIZE	LOW PRESS. & HW	IN		2	2	2	2	2	2	2	2	2 1/2	E
F STACK OUTLET SIZE OD		IN		24	28	28	28	30	30	30	32	32	F

G	FURNACE OD		IN	38	44	52	52	52	52	56	56	G	
H	SHELL ID		IN	96	102	112	112	112	112	126	136	H	
I	SUPPLY HEIGHT		IN	121	127 1/4	138 1/4	138 1/4	138 1/4	138 1/4	152 1/4	162 1/2	I	
J	WIDTH WITHOUT TRIM		IN	102 3/4	108 3/4	119	119	119	119	133 1/2	144	J	
K	WIDTH WITH TRIM		IN	115	121	136	136	136	136	153	165	K	
L	SKID WIDTH		IN	76	78	92	92	92	92	108	114	L	
M	END OF SKID TO FRONT PLATE		IN	31 5/8	62 5/8	35 1/8	34 5/8	36 5/8	50 5/8	64 5/8	61 5/8	59 7/8	M
N	VESSEL SHELL TO FLOOR		IN	18	18	18	18	18	18	18	18	N	
O	SKID LENGTH		IN	212	240	207	218	228	264	288	294	320	O
P	STACK OUTLET HEIGHT		IN	122	128 1/4	138 1/4	138 1/4	138 1/4	138 1/4	152 1/4	162 1/2	P	
Q	BLOWDOWN LOCATIONS		IN	47 3/8-137	46 7/8-146	51 3/8-126	49 7/8-138	49 7/8-149	50 3/8-169	49 7/8-198	53 7/8-190	57 1/8-214	Q
R	STEAM OUT LOCATION (15 PSI & UP)	FROM C/L OF STACK	IN	98	99 1/2	90 1/2	90 1/2	102 1/2	123 1/8	117	124 1/2	135	R
S	SUPPLY LOCATION	FROM FRONT PLATE	IN	60 3/8	60	51 3/8	51 3/8	51 3/8	78	78	81	65 7/8	S
T	RETURN LOCATION	C/L TO C/L	IN	102	100	89	89	102	102	122	125	180	T
U	BURNER PROJECTION	FROM FRONT PLATE	IN	52 1/4	52 1/4	53	53	66	66	66	63	76	U
V	TUBE REMOVABLE	FRONT	IN	184	191	171	182	193	215	237	237	262	V
W	LENGTH FRONT TO REAR	BOILER VESSEL	IN	214 1/2	223 1/2	208	219 1/2	230 1/2	252 1/2	274 1/2	278 1/2	306 1/2	W
X	APPROX. OVERALL LENGTH (WITH BURNER)	STD. BURNER	IN	267	276	261	273	297	319	341	345	383	X
Y	FACE OF REAR DOORS TO WATER MAKE-UP SUPPLY	15 PSI & UP	IN	117 5/8	127 1/8	117 5/8	129 1/8	129 1/8	130 1/2	158 5/8	156 1/8	170 5/8	Y
	APPROX. SHIPPING WEIGHT	150 PSI	LBS	37900	46400	48100	54100	57200	61300	66400	82000	103000	
	APPROX. SHIPPING WEIGHT	15 & 30 PSI	LBS	34400	37400	40100	42500	44900	49700	54600	74000	93000	
	WATER CAPACITY @ NWL		GAL	3243	3313	3092	3307	3537	4013	4401	5865	7743	
	WATER CAPACITY FLOODED		GAL	4004	4076	3940	4204	4486	5071	5530	7295	10069	
	BOILER HORSEPOWER			500	600	700	750	800	900	1000	1200	1500	

(NOTE: 1) 3" & ABOVE ARE 300# ANSI FLANGE

(NOTE: 2) 4" & ABOVE ARE 150# ANSI FLANGE

*NOTE: (U) & (X) dimension subject to change pending burner model



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