MODEL FLX

Packaged Watertube Boiler - 5 Pass Hot Water

1.5 MMBTU/hr - 12.0 MMBTU/hr

Dimensions and Ratings

Figure 1. FLX HW Dimension Drawing

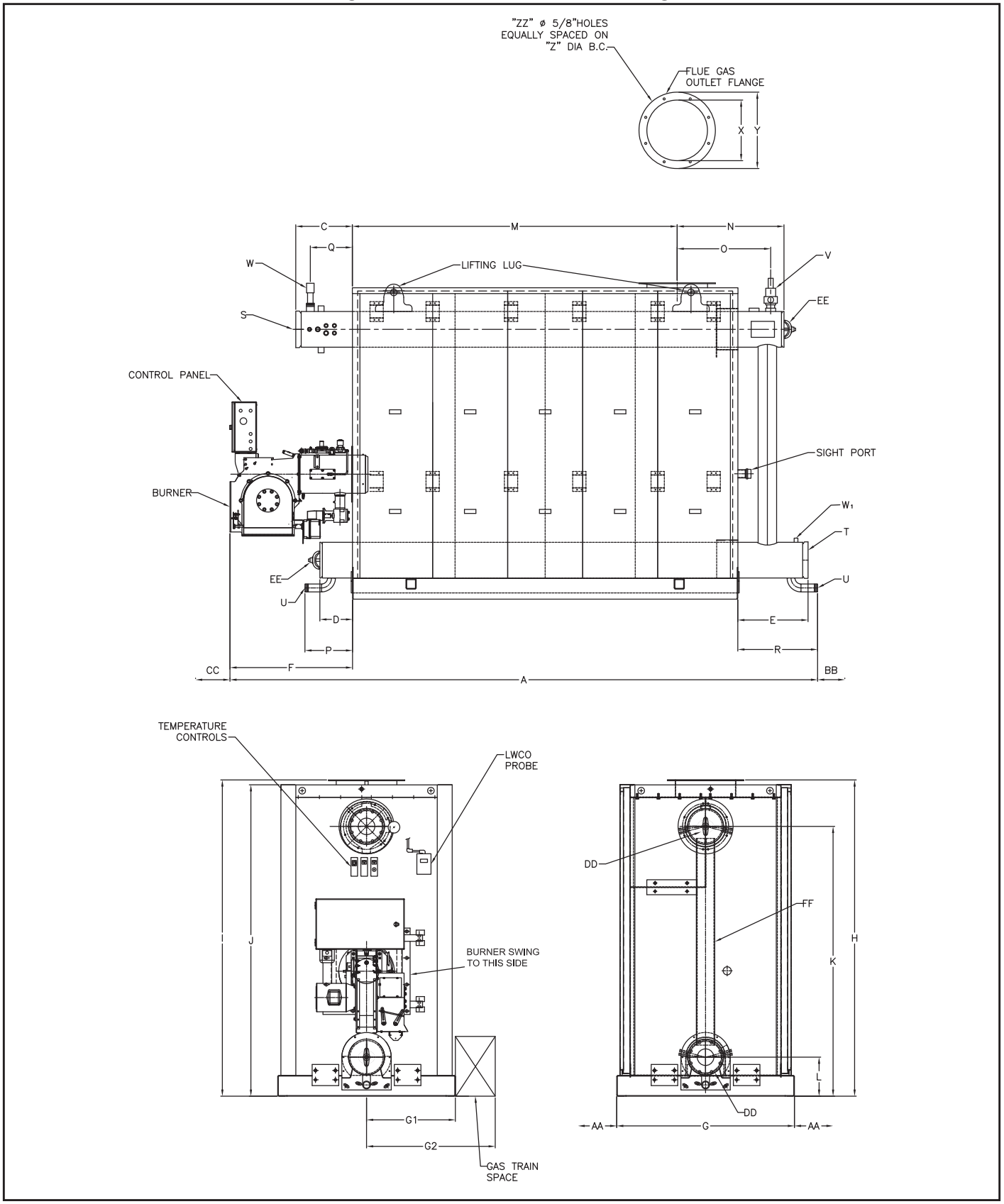

Table 1. FLX HW Dimensions Sizes 150-500

		BOILER SIZE [SEE NOTE 1]							
		150	200	250	300	350	400	450	500
LENGTHS Inches	**Dim.**								
Overall Length of Boiler	**A**	115	115	115	120	120	146	146	146
Boiler Base Frame	**B**	68	68	68	74	74	95	95	95
Front Extension Upper	**C**	17	17	17	17	17	17	17	17
Front Extension Lower	**D**	11	11	11	11	11	11	11	11
Rear Extension Lower	**E**	20	20	20	20	20	21	21	21
Burner Extension	**F**	27	27	27	27	27	31	31	31
WIDTHS Inches									
Boiler Base Frame [Note	**G**	42	42	42	46	46	48	48	48
Centerline to Casing	**G_1**	21	21	21	23	23	24	24	24
Centerline to outside Gas	**G_2**	33	33	33	35	35	36	36	36
HEIGHTS Inches									
Base to Stack Flange	**H**	78	78	78	82	82	86	86	86
Base to Lifting Lug	**I**	78	78	78	82	82	86	86	86
Base to Top of Casing	**J**	76	76	76	80	80	85	85	85
Base to Supply Nozzle	**K**	65	65	65	69	69	73	73	73
Base to Return Nozzle	**L**	9	9	9	9	9	10	10	10
LOCATIONS Inches									
Flue Outlet Centerline	**M**	54	54	54	62	62	81	81	81
Rear Extension Upper	**N**	28	28	28	26	26	28	28	28
Safety Valves	**O**	24	24	24	22	22	24	24	24
Bottom Drain see Note 3	**P**	15	15	15	15	15	15	15	15
Boiler Air Vent	**Q**	12	12	12	13	13	13	13	13
Bottom Drain Rear see	**R**	N/A	N/A	N/A	N/A	N/A	24	24	24
PIPING CONNECTIONS									
Supply Nozzle [Note 4]	**S**	3 FLG	3 FLG	3 FLG	4 FLG	4 FLG	6 FLG	6 FLG	6 FLG
Return Nozzle [Note 4]	**T**	3 FLG	3 FLG	3 FLG	4 FLG	4 FLG	6 FLG	6 FLG	6 FLG
Bottom Drain see Note 2	**U**	1½	1½	1½	1½	1½	2 @ 2	2 @ 2	2 @ 2
Safety Valves, 30 psig	**V**	2	2	2	2	2	2½	2½	2½
Safety Valves, 60 psig	**V**	1½	1½	1½	1½	1½	2	2	2
Safety Valves, 125 psig	**V**	1	1	1	1¼	1¼	1½	1½	1½
Safety Valves, 160 psig	**V**	¾	¾	¾	¾	¾	1¼	1¼	1¼
Boiler Air Vent	**W**	1	1	1	1	1	1	1	1
Tapping for optional	**W_1**	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Flue Gas ID	**X**	10	10	10	12	12	16	16	16
Flue Gas Outlet Flange	**Y**	15	15	15	17	17	21	21	21
Flange Bolt Circle	**Z**	12½	12½	12½	14½	14½	18½	18½	18½
Number of holes in bolt	**ZZ**	4	4	4	4	4	6	6	6
MINIMUM SERVICE									
Tube removal each side	**AA**	28	28	28	32	32	34	34	34
Rear service area	**BB**	24	24	24	24	24	24	24	24
Front service area -	**CC**	36	36	36	36	36	36	36	40
PERIPHERAL DATA									
Upper/Lower Drum OD	**DD**	8-5/8"	8-5/8"	8-5/8"	8-5/8"	8-5/8"	10-3/4"	10-3/4"	10-3/4"
Handhole Inspection	**EE**	4" x 5"	4"x 5"	4" x 5"	4" x 5"	4"x 5"	4" x 5"	4" x 5"	4"x 5"
Rear Downcomer (NPS)	**FF**	4	4	4	4	4	5	5	5

NOTES:

1. For Btu/hr input rating, multiply model designation by 10,000.
2. Add 4" to each side of the base frame dimension to account for optional seismic anchor pads.
3. For Models 150 to 350 a single drain connection is provided at the front bottom drum; for Models 400 and greater, an additional drain
4. Supply and return nozzle flanges are 150# Flat Face.
5. Standard safety valve setting is 160 psig and options for reduced settings are noted.

Table 2. FLX HW Dimensions Sizes 550-1200

		BOILER SIZE [SEE NOTE 1]							
		550	600	700	800	900	1000	1100	1200
LENGTHS Inches	**Dim.**								
Overall Length of Boiler	**A**	146	153	174	174	174	206	206	206
Boiler Base Frame	**B**	95	95	116	116	116	140	140	140
Front Extension Upper	**C**	17	17	17	17	17	17	17	17
Front Extension Lower	**D**	11	11	11	11	11	12	12	12
Rear Extension Lower	**E**	21	21	21	21	21	22	22	22
Burner Extension	**F**	31	37	37	37	37	44	44	44
WIDTHS Inches									
Boiler Base Frame [Note	**G**	48	48	54	54	54	54	54	54
Centerline to Casing	**G_1**	24	24	27	27	27	27	27	27
Centerline to outside Gas	**G_2**	36	36	39	39	39	39	39	39
HEIGHTS Inches									
Base to Stack Flange	**H**	86	86	95	95	95	95	95	95
Base to Lifting Lug	**I**	86	86	95	95	95	95	95	95
Base to Top of Casing	**J**	85	85	94	94	94	94	94	94
Base to Supply Nozzle	**K**	73	73	81	81	81	81	81	81
Base to Return Nozzle	**L**	10	10	10	10	10	12	12	12
LOCATIONS Inches									
Flue Outlet Centerline	**M**	81	81	102	102	102	122	122	122
Rear Extension Upper	**N**	28	28	28	28	28	33	33	33
Safety Valves	**O**	24	24	24	24	24	29	29	29
Bottom Drain see Note 3	**P**	15	15	15	15	15	15	15	15
Boiler Air Vent	**Q**	13	13	13	13	13	7	7	7
Bottom Drain Rear see	**R**	24	24	24	24	24	19	19	19
PIPING CONNECTIONS									
Supply Nozzle [Note 4]	**S**	6 FLG	6 FLG	6 FLG	6 FLG	6 FLG	8 FLG	8 FLG	8 FLG
Return Nozzle [Note 4]	**T**	6 FLG	6 FLG	6 FLG	6 FLG	6 FLG	8 FLG	8 FLG	8 FLG
Bottom Drain see Note 2	**U**	2 @ 2	2 @ 2	2 @ 2	2 @ 2	2 @ 2	2 @ 2	2 @ 2	2 @ 2
Safety Valves, 30 psig	**V**	2½	2½	2 @ 2½	2 @ 2½	2 @ 2½	2 @ 2½	2 @ 2½	2 @ 2½
Safety Valves, 60 psig	**V**	2	2	2½	2½	2½	2½	2½	2½
Safety Valves, 125 psig	**V**	1½	1½	1½	1½	1½	1½	1½	1½
Safety Valves, 160 psig	**V**	1¼	1¼	1½	1½	1½	1½	1½	1½
Boiler Air Vent	**W**	1	1	1	1	1	1	1	1
Tapping for optional	**W_1**	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Flue Gas ID	**X**	16	16	18	18	18	24	24	24
Flue Gas Outlet Flange	**Y**	21	21	23	23	23	29	29	29
Flange Bolt Circle	**Z**	18½	18½	20½	20½	20½	26½	26½	26½
Number of holes in bolt	**ZZ**	6	6	8	8	8	8	8	8
MINIMUM SERVICE									
Tube removal each side	**AA**	34	34	40	40	40	40	40	40
Rear service area	**BB**	24	24	24	24	24	24	24	24
Front service area -	**CC**	40	40	40	40	45	45	45	45
PERIPHERAL DATA									
Upper/Lower Drum OD	**DD**	10-3/4"	10-3/4"	10-3/4"	10-3/4"	10-3/4"	10-3/4"	10-3/4"	10-3/4"
Handhole Inspection	**EE**	4" x 5"	4" x 5"	4"x 5"	4" x 5"	4" x 5"	4"x 5"	4" x 5"	4" x 5"
Rear Downcomer (NPS)	**FF**	5	5	5	5	5	5	5	5

NOTES:

1. For Btu/hr input rating, multiply model designation by 10,000.
2. Add 4" to each side of the base frame dimension to account for optional seismic anchor pads.
3. For Models 150 to 350 a single drain connection is provided at the front bottom drum; for Models 400 and greater, an additional drain
4. Supply and return nozzle flanges are 150# Flat Face.
5. Standard safety valve setting is 160 psig and options for reduced settings are noted.

Table 3. FLX HW Ratings Sizes 150-550

Boiler SIZE	150	200	250	300	350	400	450	500	550
Ratings [Notes A and B]									
Output Btu/hr	1,205,100	1,606,800	2,008,500	2,410,200	2,811,900	3,213,600	3,615,300	3,983,525	4,385,225
Output Kcal/Hr	303,696	404,928	506,160	607,392	708,624	809,856	911,088	1,003,884	1,105,116
Output kW	353	471	589	706	824	942	1,060	1,168	1,285
Output Boiler Horsepower	36	48	60	72	84	96	108	119	131
Approximate Fuel Consumption [Input - Note C]									
Natural Gas [ft^3/hr] - 180 F Supply Water	1,435	1,936	2,420	2,904	3,388	3,826	4,304	4,742	5,221
Natural Gas Therms/Hour - 180 F Supply Water	14.3	19.4	24.2	29.0	33.9	38.3	43.0	47.4	52.2
Natural Gas [m^3/hr] - 82C Water Supply	40.63	54.82	68.52	82.23	95.93	108.33	121.87	134.28	147.84
Propane Gas [ft^3/hr] - 180 F Supply Water	574	774	968	1,162	1,355	1,530	1,722	1,897	2,088
Propane Gas [m^3/hr] - 82C Water Supply	16.25	21.92	27.41	32.89	38.37	43.33	48.75	53.72	59.13
No.2 Oil Fuel - gph, 180 F Supply Water	10.4	13.9	17.4	20.9	24.3	27.8	31.3	34.5	38.0
No.2 Oil Fuel - liters/hour, 82C Water Supply	39.4	52.6	65.7	78.9	92.0	105.2	118.3	130.4	143.5
Power Requirements - Uncontrolled Emissions [Notes A and D]									
Blower Motor HP - Gas Firing	1/2	3/4	3/4	3/4	1	1	2	2	3
Blower Motor kW - Gas Firing	0.378	0.5595	.5595	.5595	0.746	0.746	1.492	1.492	2.238
Blower Motor HP - Oil or Combination	3/4	1	1	1	1-1/2	1-1/2	2	3	3
Blower Motor kW - Oil or Combination	.5595	0.746	0.746	0.746	1.119	1.119	1.492	2.238	2.238
Oil Pump for Oil or Combination	Direct Drive from the Blower Motor								
Minimum Ampacity - Standard									
Blower Motor - Gas Firing Only, [115]230/1/60	[9.8] 4.9	[13.8] 6.9	[13.8] 6.9	[13.8] 6.9	[16] 8	[16] 8	[24] 12		
Blower Motor - Oil or Combination, [115]230/1/60	[13.8] 6.9	[16] 8	[16] 8	[16] 8	[20] 10	[20] 10	[24] 12		
Blower Motor - Gas, 230/3/60								6.8	9.6
Blower Motor - Oil or Combination, 230/3/60								9.6	9.6
Blower Motor - Gas, 460/3/60								3.4	4.8
Blower Motor - Oil or Combination, 460/3/60								4.8	4.8
Blower Motor - Gas, Oil or Combination, 400/3/50								2.8	4.2
Blower Motor - Gas, 575/3/60								2.7	3.9
Blower Motor - Oil or Combination, 575/3/60								3.9	3.9
Remote Oil Pump, [230]460/3/60									
Control Circuit @115/1/60	1.7	1.7	1.7	1.9	1.9	1.9	2.4	2.4	2.4
Weights									
Operating Weight, lbs.	4,700	4,700	4,700	5,900	5,900	7,600	7,600	7,600	7,600
Operating Weight, kg	2,132	2,132	2,132	2,676	2,676	3,447	3,447	3,447	3,447
Water Content Normal, gallons	96	96	96	108	108	180	180	180	180
Water Content Normal, liters	363	363	363	409	409	681	681	681	681
Water Content Flooded, gallons	96	96	96	108	108	180	180	180	180
Water Content Flooded, liters	363	363	363	409	409	681	681	681	681
Shipping Weight, approximate lbs.	3,900	3,900	3,900	5,000	5,000	6,100	6,100	6,100	6,100
Shipping Weight, approximate kg	1,769	1,769	1,769	2,268	2,268	2,767	2,767	2,767	2,767

Notes:

A. Ratings shown for elevation to 1000 Feet. For ratings above 1000 Feet, contact your local Cleaver-Brooks Representative.

B. Input calculated with Nat. Gas @ 1000 Btu/ft^3, Propane @ 2500 Btu/ft^3, and Oil @ 140,000Btu/gal.

C. Standard Motors meet the requirements of UL & NEMA and include the following:

Open drip proof design	NEMA Design “B”
1.15 Service Factor	Ball Bearing
Class “B” Insulation	Continuous Duty, 40^0 C ambient

October, 2015

Table 4. FLX HW Ratings Sizes 600-1200

Boiler SIZE	600	700	800	900	1000	1100	1200
Ratings [Notes A and B]							
Output Btu/hr	4,786,925	5,590,325	6,393,725	7,197,125	8,000,525	8,803,925	9,607,325
Output Kcal/Hr	1,206,348	1,408,812	1,611,276	1,813,740	2,016,204	2,218,668	2,421,132
Output kW	1,403	1,638	1,874	2,109	2,345	2,580	2,816
Output Boiler Horsepower	143	167	191	215	239	263	287
Approximate Fuel Consumption [Input - Note B]							
Natural Gas [ft^3/hr] - 180 F Supply Water	5,699	6,735	7,703	8,671	9,639	10,607	11,575
Natural Gas Therms/Hour - 180 F Supply Water	57.0	67.4	77.0	86.7	96.4	106.1	115.8
Natural Gas [m^3/hr] - 82C Water Supply	161.37	190.72	218.13	245.54	272.95	300.36	327.77
Propane Gas [ft^3/hr] - 180 F Supply Water	2,279	2,694	3,081	3,468	3,856	4,243	4,630
Propane Gas [m^3/hr] - 82C Water Supply	64.54	76.29	87.25	98.21	109.18	120.14	131.11
No.2 Oil Fuel - gph, 180 F Supply Water	40.7	47.0	53.7	60.5	68.0	74.9	81.7
No.2 Oil Fuel - liters/hour, 82C Water Supply	153.9	177.6	203.1	228.6	257.2	283.0	308.8
Power Requirements - Uncontrolled Emissions [Notes A and C]							
Blower Motor HP - Gas Firing	5	5	5	7.5	10	10	15
Blower Motor kW - Gas Firing	3.73	3.73	3.73	5.595	7.46	7.46	11.19
Blower Motor HP - Oil or Combination	5	5	5	7.5	10	10	15
Blower Motor kW - Oil or Combination	3.73	3.73	3.73	5.595	7.46	7.46	11.19
Oil Pump for Oil or Combination	0.75	0.75	1	1.5	1.5	1.5	1.5
Oil Pump for Oil or Combination	0.5595	0.5595	0.746	1.119	1.119	1.119	1.119
Minimum Ampacity - Standard							
Blower Motor - Gas, 230/3/60	15.2	15.2	15.2	22	28	28	42
Blower Motor - Oil or Combination, 230/3/60	15.2	15.2	15.2	22	28	28	42
Blower Motor - Gas, 460/3/60	7.6	7.6	7.6	11	14	14	17
Blower Motor - Oil or Combination, 460/3/60	7.6	7.6	7.6	11	14	14	17
Blower Motor - Gas, Oil or Combination, 400/3/50	8	8	8	12	16	16	16
Blower Motor - Gas, 575/3/60	6.1	6.1	6.1	9	11	11	17
Blower Motor - Oil or Combination, 575/3/60	6.1	6.1	6.1	9	11	11	17
Remote Oil Pump, [230]460/3/60	[3.2] 1.6	[3.2] 1.6	[4.2] 2.1	[6] 3	[6] 3	[6] 3	[6] 3
Remote Oil Pump, 575/3/60	1.3	1.3	1.7	2.4	2.4	2.4	2.4
Control Circuit @115/1/60	1.7	1.7	1.7	1.9	1.9	1.9	2.4
Weights							
Operating Weight, lbs.	7,600	10,500	10,500	10,500	12,300	12,300	12,300
Operating Weight, kg	3,447	4,763	4,763	4,763	5,579	5,579	5,579
Water Content Normal, gallons	180	240	240	240	276	276	276
Water Content Normal, liters	681	908	908	908	1,045	1,045	1,045
Water Content Flooded, gallons	180	240	240	240	276	276	276
Water Content Flooded, liters	681	908	908	908	1045	1045	1045
Shipping Weight, approximate lbs.	6,100	8,500	8,500	8,500	10,000	10,000	10,000
Shipping Weight, approximate kg	2,767	3,856	3,856	3,856	4,536	4,536	4,536

Notes:

A. Ratings shown for elevation to 1000 Feet. For ratings above 1000 Feet, contact your local Cleaver-Brooks Representative.

B. Input calculated with Nat. Gas @ 1000 Btu/ft^3, Propane @ 2500 Btu/ft^3, and Oil @ 140,000Btu/gal.

C. Standard Motors meet the requirements of UL & NEMA and include the following:

Open drip proof design	NEMA Design "B"
1.15 Service Factor	Ball Bearing
Class "B" Insulation	Continuous Duty, 40^0 C ambient

October, 2015

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