


Eclipse Vortometric

Burners

Series HI

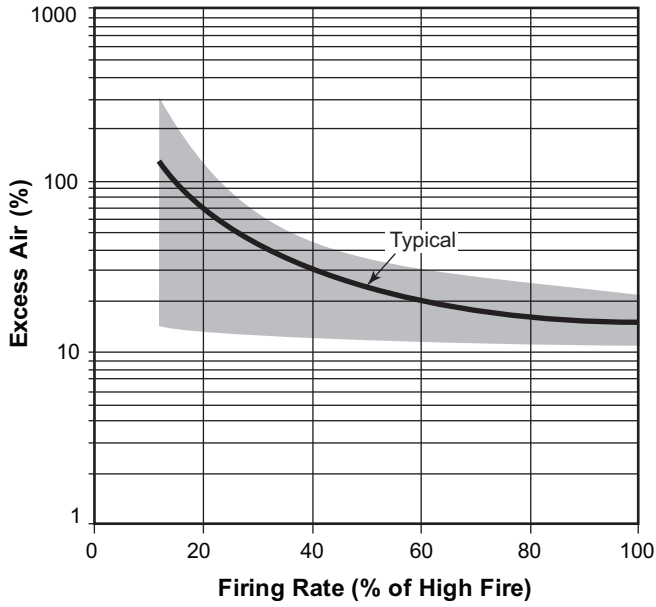
Version 4

Parameter	Burner Model												
	6V	8V	10V	12V	14V	16V	18V	22V	24V	28V	32V	36V	
Max. Input MM Btu/h (MW)	6.0 (1.8)	10.5 (3.1)	17 (5.0)	23 (6.7)	32 (9.4)	42 (12)	55 (16.1)	78 (23)	90 (26)	125 (37)	160 (47)	210 (62)	
Min. Input MM Btu/h (MW) (Natural Gas)	0.3 (0.1)	0.5 (0.1)	0.8 (0.2)	1.0 (0.3)	1.3 (0.4)	1.5 (0.4)	2.0 (0.6)	2.7 (0.8)	3.0 (0.9)	5.0 (1.5)	6.0 (1.8)	7.0 (2.1)	
Min. Input MM Btu/h (MW) #2 Oil	1.0 (0.3)	1.5 (0.4)	2.5 (0.7)	3.0 (0.9)	4.0 (1.2)	5.5 (1.6)	7.0 (2.1)	10 (2.9)	12 (3.5)	16 (4.7)	20 (5.9)	26.0 (7.6)	
Gas Inlet Pressure Required, " w.c. (mbar) ¹	24 (59)	24 (59)	24 (59)	24 (59)	24 (59)	24 (59)	45 (112)	45 (112)	45 (112)	45 (112)	45 (112)	45 (112)	
Air Inlet Pressure Required " w.c. (mbar) ²	6.0 (15)	7.5 (19)	7.5 (19)	7.5 (19)	7.5 (19)	7.5 (19)	7.5 (19)	7.5 (19)	7.5 (19)	7.5 (19)	7.5 (19)	7.5 (19)	
Combustion Air Flow, scfm (m ³ /min) ²	1127 (32)	1972 (56)	3193 (90)	4320 (122)	6011 (170)	7889 (223)	10331 (292)	14651 (415)	16905 (479)	23479 (665)	30053 (851)	39445 (1117)	
Natural Gas Flow scfh x 1000 (m ³ /hr) ¹	6.0 (169)	10.5 (296)	17.0 (479)	23 (649)	32 (903)	42 (1185)	55 (1551)	78 (2200)	90 (2538)	125 (3526)	160 (4513)	210 (5923)	
No. 2 Fuel Oil ³	Oil Flow GPH (m ³ /hr)	43 (0.16)	75 (0.28)	121 (0.46)	164 (0.62)	229 (0.87)	300 (1.14)	393 (1.49)	557 (2.11)	643 (2.43)	893 (3.38)	1143 (4.33)	1500 (5.68)
	Nozzle ΔP psig (bar)	25 (1.7)	35 (2.4)	55 (3.8)	55 (3.8)	55 (3.8)	60 (4.1)	60 (4.1)	60 (4.1)	60 (4.1)	60 (4.1)	60 (4.1)	60 (4.1)
Atomizing Air ⁴	Flow scfm (m ³ /hr)	25 (42)	39 (66)	63 (107)	85 (144)	118 (200)	155 (263)	202 (343)	288 (489)	332 (564)	461 (783)	590 (1002)	775 (1316)
	ΔP psig (bar)	45 (3.1)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)
Atomizing Steam ⁵	Flow lbs/hr (kg/hr)	72 (33)	113 (51)	184 (83)	248 (112)	345 (156)	454 (206)	594 (269)	842 (382)	972 (441)	1350 (612)	1728 (784)	2268 (1029)
	ΔP psig (bar)	45 (3.1)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)	55 (3.8)
Combustion Air Temp., °F (°C) ⁶	< 500 (260)												
Process Temperature, °F (°C)	Refractory Lined Combustor					< 2,200 (1200)							
High Fire Flame Length, Feet (m) ⁷	5.0 (1.6)	6.0 (1.9)	7.0 (2.1)	8.0 (2.5)	9.0 (2.8)	10 (3.1)	11 (3.4)	13 (4.0)	14 (4.3)	16 (4.9)	17 (5.2)	20 (6.1)	
High Fire Flame Diameter, Inches (m)	30 (0.8)	32 (0.8)	36 (0.9)	40 (1.0)	46 (1.2)	52 (1.3)	58 (1.5)	64 (1.6)	68 (1.8)	78 (2.0)	86 (2.2)	96 (2.5)	
Fuel Lance Configurations	Gas Only		Gas lance only supplied. Fuel ports sized for natural gas. For other gases, contact Eclipse.										
	Oil Only		Oil lance is supplied with support tube arrangement.										
	Gas and Oil		CGO (Combined Gas and Oil) lances are provided for burning both gas and oil.										
Pilot	All Burners		Natural gas or propane ⁸										
Approvals													

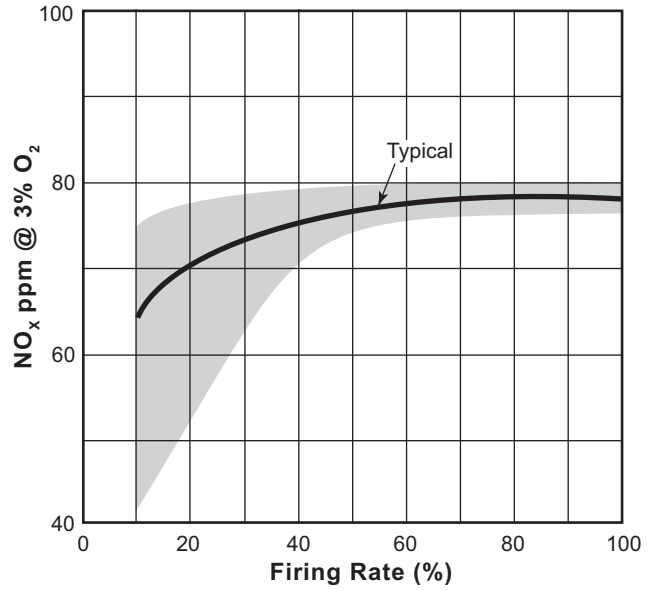
- Natural gas capacities are based on gross heating value (1000 BTU/scf, 0.6 specific gravity).
- Combustion air flows and pressure drops at 15% excess air through the mixing tube at standard conditions (70° F, 14.7 psia).
- Oil firing capacities for No. 2 fuel oil with gross heating value of 140,000 BTU/gal. Maximum 150 SSU viscosity required for all oils.
- Atomizing air must be supplied in a clean/dry condition.
- Steam must be supplied at a minimum 20° F (-6.7° C) above saturated temperature.
- Contact Eclipse for burner sizing and recommendations for preheated air over 300° F (150° C).
- Flame lengths provided are estimates based on general operating conditions and are useful for design purposes. Actual flame lengths will depend on chamber size and presence of secondary air.
- See Design Guide 128 for more information about typical fuel composition and properties.
 - Burner minimum inputs stated for modulating combustion air.
 - Air and natural gas pressure drops should be taken as a differential pressure between the air/gas at the burner and the chamber pressure.
 - Eclipse reserves the right to change the construction and/or configuration of our products at any time without being obligated to adjust earlier supplies accordingly.

Performance Graphs

Operational Envelope



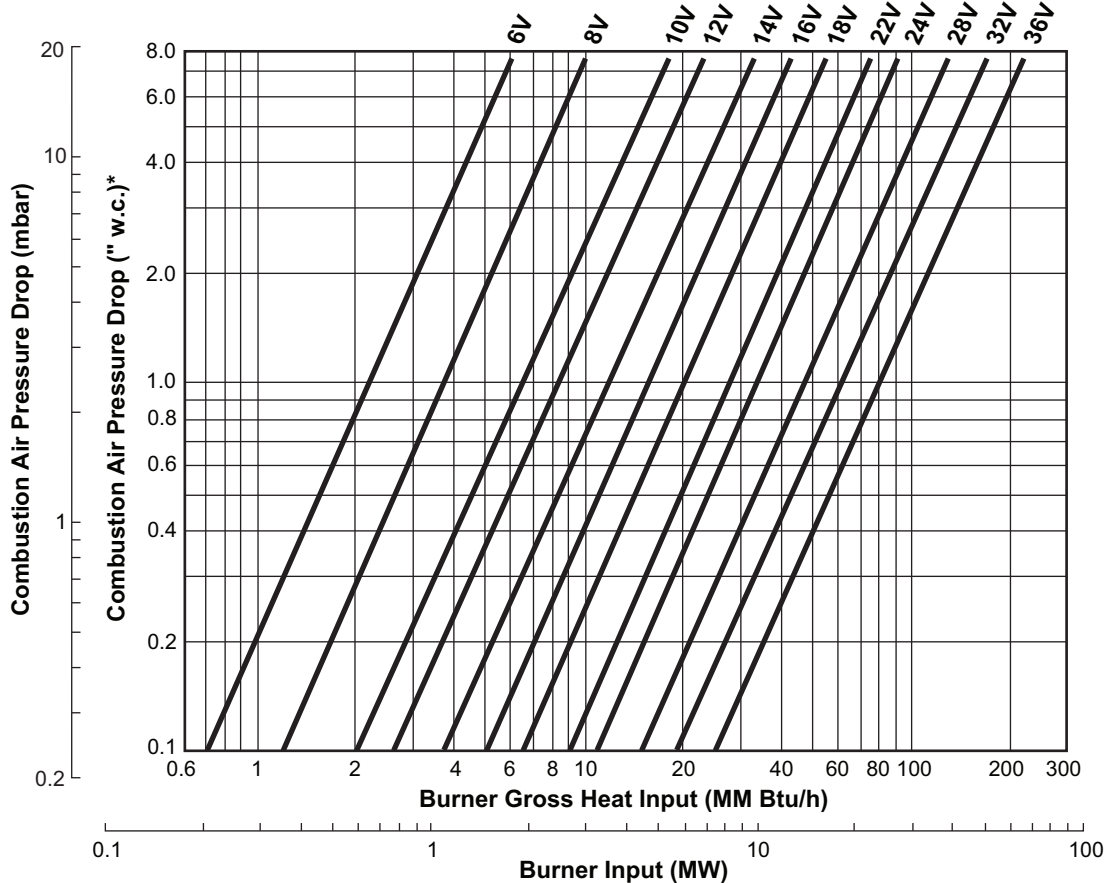
NO_x Emissions, Natural Gas vs. Firing Rate



Burner emissions depend on and are affected by operational and applicational conditions. Contact Eclipse for specific emissions estimates for your application.

Combustion Air Pressure Drop vs. Burner Heat Input for High Intensity Burners (HI)

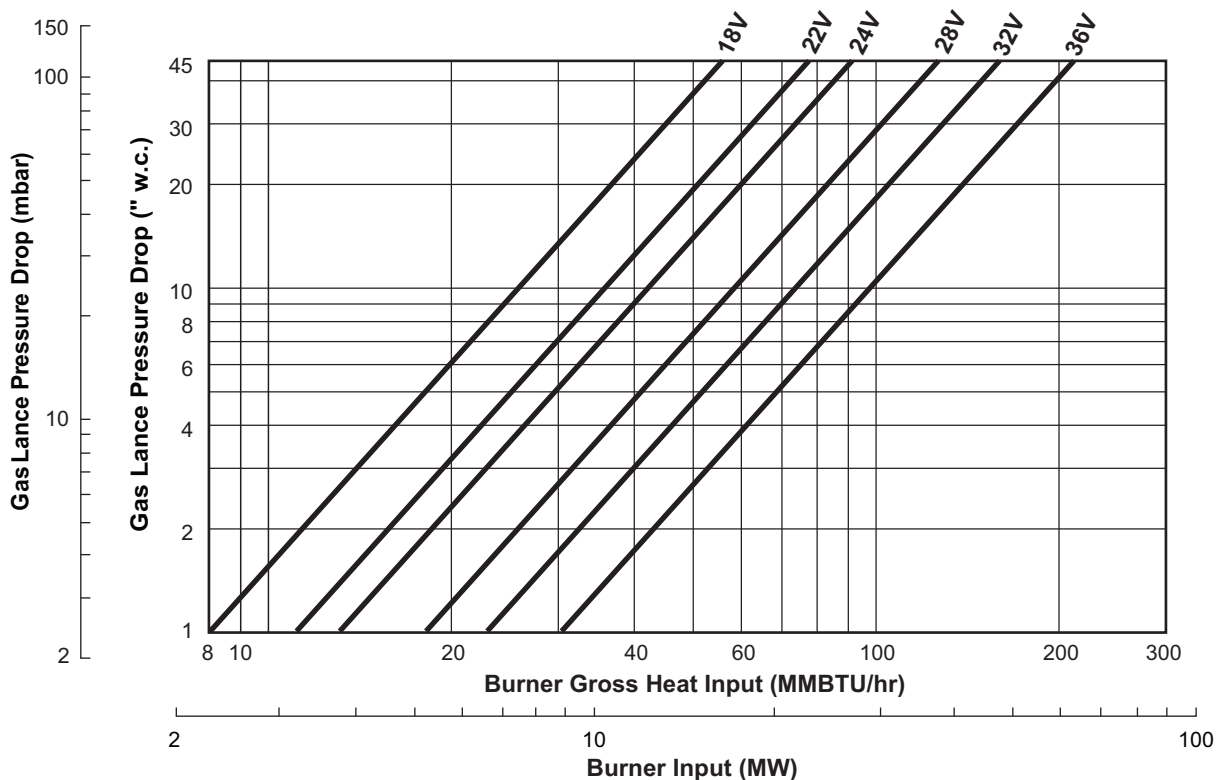
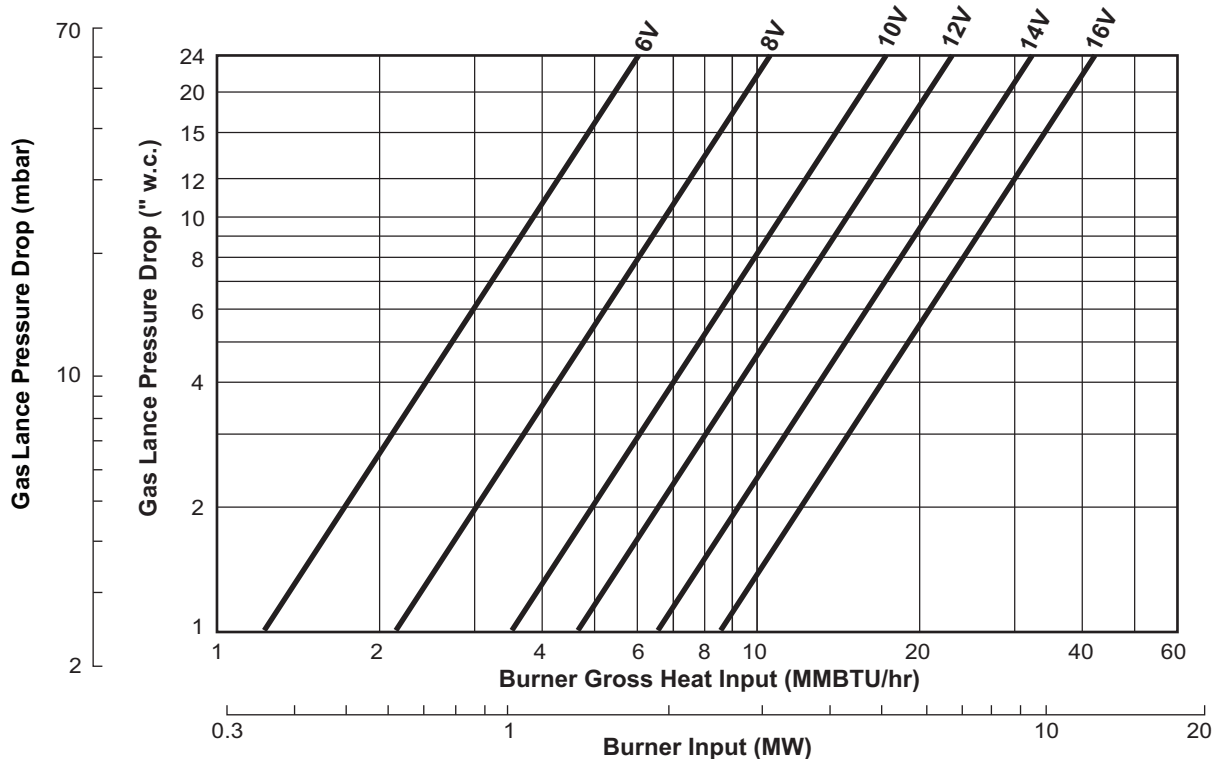
Operation with 15% excess air on natural gas or #2 oil under standard conditions, 14.7 psia, 70°F (1013 mbar, 21°C)
 Pressure drop should be taken between the chamber and windbox pressure tap (tap A).



Gas Lance Pressure Drop vs. Burner Heat Input

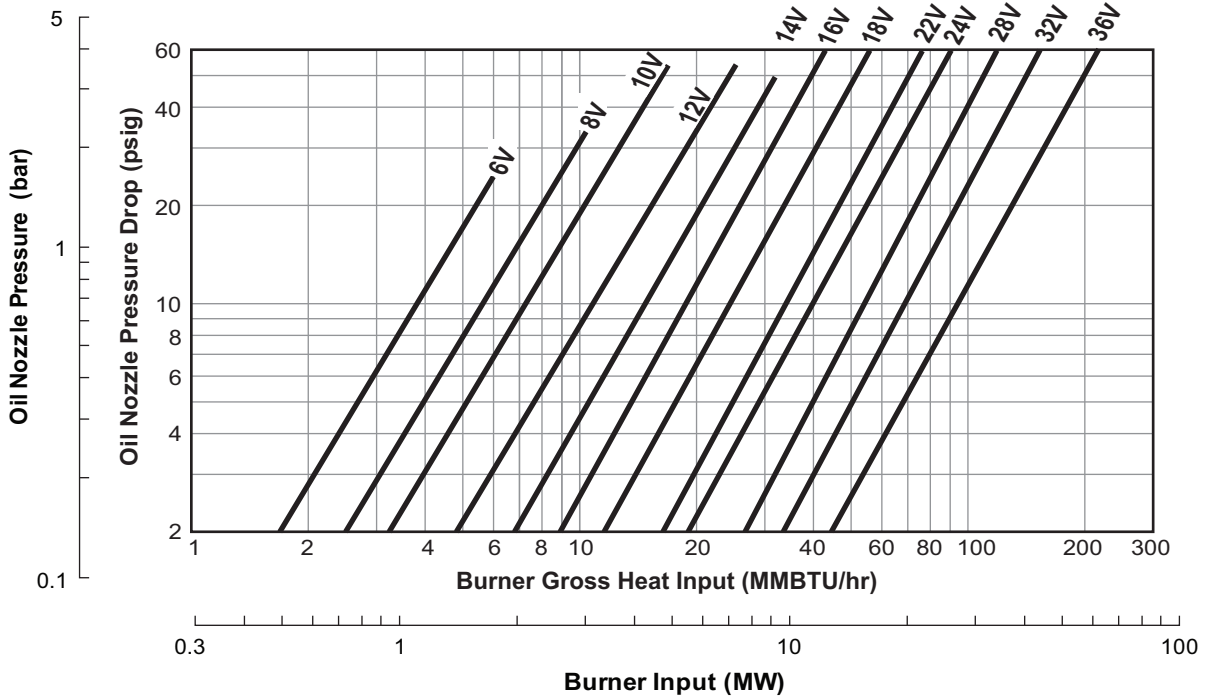
Pressure drops for natural gas, 1,000 BTU/scf gross(0.28 kW/m²), 0.6 specific gravity. Pressure drop should be taken as differential between the chamber and gas lance pressure tap (tap B).

Note: Fuel pressure drop curves should be used as a guide for setting up burner. It is recommended to use a direct fuel flow measurement (orifice plate or flow meter) for determining actual fuel flows.



Oil Nozzle Pressure Drop Vs. Burner Heat Input

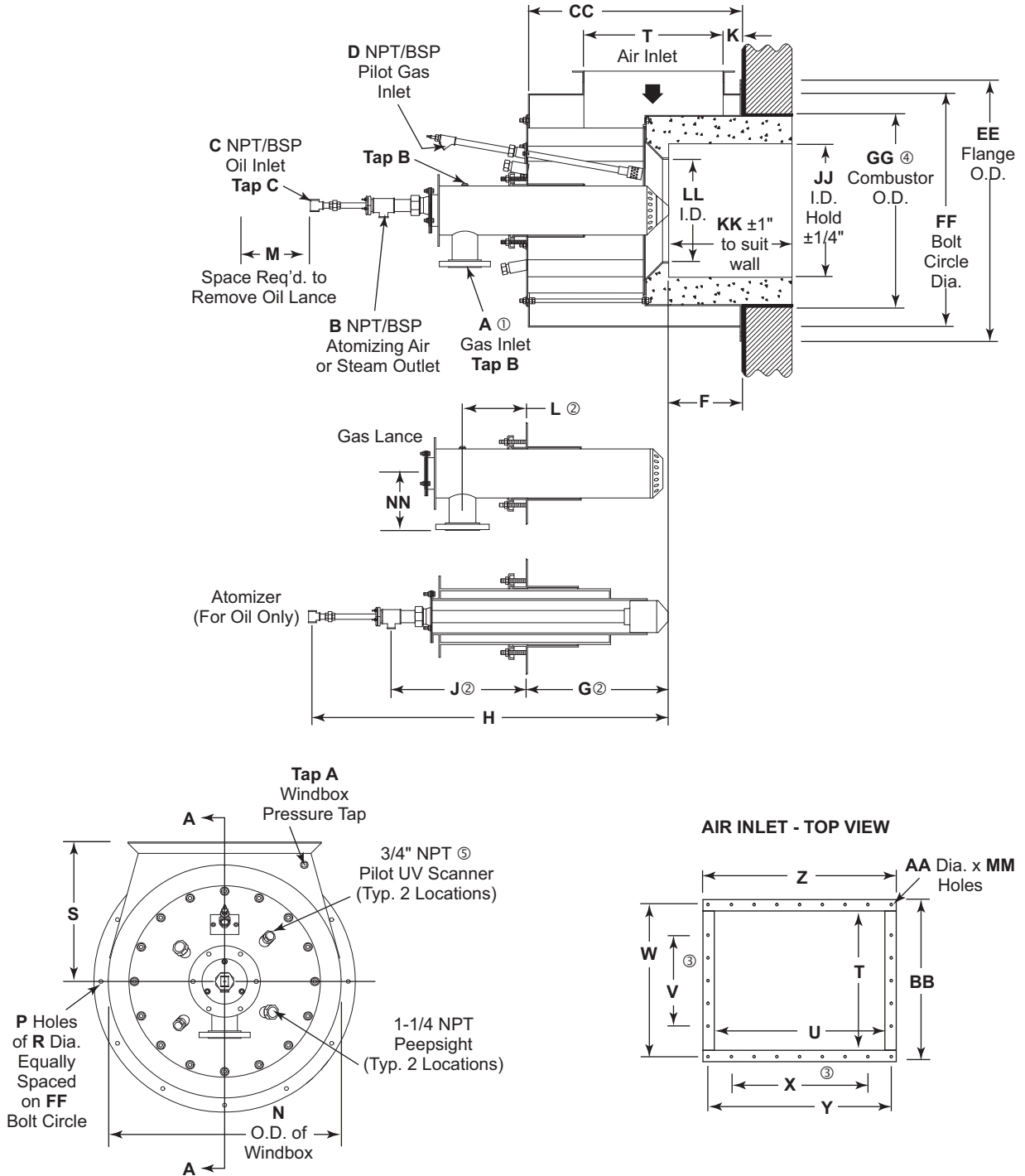
Pressure drops for #2 Oil with 140,000 BTU/gal (32,500 kJ/L). gross heating value (tap C).



NOTE: Fuel pressure drop curves should be used as a guide for setting up burner. It is recommended to use a direct fuel flow measurement (orifice plate or flow meter) for determining actual fuel flows.

Dimensions

SECTION A-A REFRACTORY COMBUSTOR



Burner Size												
Dim	6V	8V	10V	12V	14V	16V	18V	22V	24V	28V	32V	36V
A	2	2-1/2	3	3	3	4 (DIN100)	4 (DIN100)	4 (DIN100)	6 (DIN150)	6 (DIN150)	6 (DIN150)	8 (DIN200)
B	3/4	3/4	1	1	1	1	1	1-1/2	2	2	2	2-1/2
C	1/2	1/2	3/4	3/4	3/4	1	1	1	1-1/4	1-1/4	1-1/4	2-1/2
D	3/4	3/4	3/4	3/4	3/4	3/4	3/4	1-1/4	1-1/4	1-1/4	1-1/4	1-1/2
F	5 (127)	12-5/8 (321)	17-1/8 (435)	20-5/8 (524)	25-1/2 (648)	28-5/8 (726)	33-5/8 (854)	40-5/8 (1032)	43 (1092)	50-1/2 (1283)	55-3/4 (1416)	65 (1651)
G	13-3/4 (349)	12-5/8 (321)	15-7/8 (403)	18-1/8 (462)	21-3/4 (553)	24-1/2 (623)	27-3/8 (695)	32-3/8 (822)	35 (887)	41-3/8 (1050)	46-5/8 (1185)	53 (1347)
H	43 (1090)	43-1/8 (1094)	47-1/8 (1197)	49 (1246)	55-1/8 (1401)	60 (1524)	64 (1627)	70-7/8 (1800)	76 (1930)	84-7/8 (2156)	91 (2310)	102 (2590)
J	19-1/2 (494)	22-3/8 (568)	23 (582)	23-1/8 (587)	21-5/8 (549)	24-1/8 (614)	25-1/4 (642)	27-3/8 (696)	29-5/8 (752)	28 (711)	29-3/8 (745)	32-3/4 (853)
K	5-5/16 (135)	5-5/16 (135)	5-5/16 (135)	5-5/16 (135)	5-5/16 (135)	7-3/4 (197)	9-1/8 (232)	10-1/2 (267)	10 (254)	12-1/4 (311)	11-3/4 (298)	13-1/2 (337)
L	9 (227)	11-3/4 (298)	12-1/4 (312)	11-3/4 (296)	11-1/8 (284)	11-3/4 (298)	11-7/8 (302)	12 (304)	12-1/4 (312)	13-1/8 (335)	14-3/8 (365)	14 (355)
M	28 (708)	29-1/2 (750)	33-1/2 (848)	36-1/4 (922)	38 (964)	43-1/4 (1100)	46-1/4 (1175)	50-1/2 (1284)	56-1/2 (1437)	61 (1547)	68 (1728)	77 (1950)
N	29 (737)	34 (864)	40 (1016)	45 (1143)	52 (1321)	57 (1448)	64-1/8 (1629)	75 (1905)	80 (2032)	94-1/8 (2391)	104 (2642)	118 (2997)
P	12	12	12	12	16	16	24	24	32	32	40	48
R	11/16 (17)	11/16 (17)	11/16 (17)	11/16 (17)	11/16 (17)	11/16 (17)	11/16 (17)	11/16 (17)	11/16 (17)	11/16 (17)	11/16 (17)	11/16 (17)
S	18 (457)	20-3/4 (527)	24-1/2 (622)	28 (711)	32 (813)	35 (889)	39 (991)	46-1/2 (1181)	49 (1245)	58 (1473)	65 (1651)	74 (1880)
T	9 (229)	9 (229)	12 (305)	15 (381)	18 (457)	21 (533)	24-1/2 (622)	30 (762)	33 (838)	38-1/2 (978)	45 (1143)	51-1/2 (1308)
U	21 (533)	21 (533)	25 (635)	28 (711)	32 (813)	36 (914)	40 (1016)	47 (1194)	50 (1270)	59 (1499)	65 (1651)	74 (1880)
V	1	1	2	2	3	3	4	6	6	8	9	11
W	10-3/4 (273)	10-3/4 (273)	13-3/4 (349)	16-3/4 (425)	20-1/4 (514)	23-1/4 (591)	26-3/4 (679)	32-3/4 (832)	35-3/4 (908)	41-1/4 (1048)	47-3/4 (1213)	54-1/4 (1378)
X	4	4	4	5	6	7	8	10	11	13	14	17
Y	22-3/4 (578)	22-3/4 (578)	26-3/4 (679)	29-3/4 (756)	34-1/4 (870)	38-1/4 (972)	42-1/2 (1073)	49-3/4 (1264)	52-3/4 (1340)	61-3/4 (1568)	67-3/4 (1721)	79 (2007)
Z	24 (610)	24 (610)	28 (711)	31 (787)	36 (914)	40 (1016)	44 (1118)	52 (1321)	55 (1321)	64 (1626)	64 (1626)	69 (1752)
AA	7/16 (11)	7/16 (11)	7/16 (11)	7/16 (11)	7/16 (11)	7/16 (11)	7/16 (11)	9/16 (14)	9/16 (14)	9/16 (14)	9/16 (14)	9/16 (14)
BB	12 (305)	12 (305)	15 (381)	18 (457)	22 (559)	25 (635)	28-1/2 (724)	35 (889)	38 (965)	43-1/2 (1105)	50 (1270)	56-1/2 (1436)
CC	18-3/4 (476)	25-1/4 (641)	33 (838)	38-3/4 (984)	47-3/8 (1203)	53-1/8 (1349)	61-5/16 (1557)	73-3/16 (1859)	77-7/8 (1978)	91-3/4 (2330)	102-1/2 (2604)	118 (2998)
EE	34 (864)	39 (991)	45 (1143)	50 (1270)	58 (1473)	63 (1600)	70 (1778)	81 (2057)	89 (2261)	100 (2540)	110 (2794)	124 (3150)
FF	31-1/2 (800)	36-1/2 (927)	42-1/2 (1080)	47-1/2 (1207)	55 (1397)	60 (1524)	67 (1702)	78 (1981)	83 (2108)	97 (2464)	107 (2718)	121 (3073)
GG	24-1/4 (616)	30-3/8 (772)	35-3/8 (899)	39-3/8 (1000)	45-3/8 (1153)	50-3/8 (1280)	55-3/8 (1407)	64-3/8 (1635)	67-3/8 (1711)	80-3/8 (2042)	88-3/8 (2245)	98-1/3 (2498)
JJ	16 (406)	21 (533)	26 (660)	30 (762)	36 (914)	41 (1041)	46 (1168)	55 (1397)	58 (1473)	68 (1727)	76 (1930)	86 (2184)
KK	14-1/2 (368)	22 (559)	26-1/2 (673)	30 (762)	36 (914)	41 (1041)	46 (1168)	55 (1397)	58 (1473)	68 (1727)	76 (1930)	74 (1880)
LL	6 (152)	8 (203)	10 (254)	12 (305)	14 (356)	16 (406)	18 (458)	22 (559)	24 (610)	28 (711)	32 (813)	36 (914)
MM	18	18	20	22	26	28	32	40	42	50	54	64
NN	3 (81)	5 (129)	5.75 (147)	5.75 (147)	10 (254)	10 (254)	10 (254)	10 (254)	11 (280)	12 (305)	12 (305)	14 (356)

•Burner size 8V through 14V are NPT or BSP threaded; all other sizes are ANSI, RF, or DIN 150 lbs flanged.

•These dimensions can vary $\pm 1.5"$ (38 mm) since gas lance position is adjustable.

•Indicates number of spaces, 4" (102 mm) apart.

•Ensure that furnace wall inside diameter is 1" (25 mm) greater than GG. See Section 3 of Installation Guide 128.

•An ultraviolet flame sensing device (UV scanner) may be mounted to two locations. Two scanner mounting ports (3/4" NPT) are located near the gas assembly adjacent to the pilot. The pilot scanner location can be used to prove both the pilot and the main flame.

Pilot Capacity

Burner Size	Input BTU/hr (kW)	
	Main Burner	Pilot
6V	6,000,000 (1,757)	60,000 (17.6)
8V	10,500,000 (3,075)	105,000 (30.7)
12V	23,000,000 (6,735)	230,000 (67.3)
14V	32,000,000 (9,370)	320,000 (93.7)
16V	42,000,000 (12,298)	420,000 (123.0)
18V	55,000,000 (16,105)	550,000 (161.0)
22V	78,000,000 (22,839)	780,000 (228.4)
24V	90,000,000 (26,353)	900,000 (263.5)
28V	125,000,000 (36,601)	1,250,000 (366.0)
32V	160,000,000 (46,850)	1,600,000 (468.5)
36V	210,000,000 (61,490)	2,100,000 (614.9)

Burner Weights

Burner Size	Less Refractory/Air Cooled lbs (kg)	Refractory lbs (kg)
6V	440 (200)	948 (430)
8V	635 (288)	1673 (759)
10V	851 (386)	2390 (1084)
12V	1100 (499)	3100 (1406)
14V	1468 (666)	4292 (1947)
16V	1860 (844)	5400 (2449)
18V	2485 (1127)	7114 (3227)
22V	3360 (1524)	9844 (4465)
24V	4255 (1930)	11365 (5155)
28V	5515 (2502)	18120 (8219)
32V	6490 (2944)	22161 (10052)
36V	8583 (3893)	29198 (13244)

