

Cleaver Brooks Start-up

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testo 330-1
V1.21 01330786/USA
FIBERWEB 11/11/11
LOW
-----
Protocol: 1/4
Start: 11/11/11 10:39:39
-----
12.5 % Oxygen
4.78 % CO2
65 ppm CO
131.5 °F ExhAir
364.7 °F T stack
79.1 % EFF
141 ppm Undiluted CO
inh20 Draft
79.9 °F Ambient temp
84.8 °F Instr. temp
°F Diff. temp.
mbar Diff. Press.
ppm CO2amb
ppm aCO
Fuel: Natural gas
O2ref.: 3.82
CO2max: 11.72
Heat transf.*F: °F
-----
Protocol: LOW #1 2/4
Start: 11/11/11 10:40:55
-----
12.8 % Oxygen
5.88 % CO2
66 ppm CO
119.2 °F ExhAir
365.5 °F T stack
79.6 % EFF
154 ppm Undiluted CO
inh20 Draft
78.9 °F Ambient temp
84.9 °F Instr. temp.
°F Diff. temp.
mbar Diff. Press.
ppm CO2amb
ppm aCO
Fuel: Natural gas
O2ref.: 3.82
CO2max: 11.72
Heat transf.*F: °F
-----
Protocol: Low #2 3/4
Start: 11/11/11 10:41:37
-----
11.5 % Oxygen
5.28 % CO2
108.2 ppm CO
366.1 °F ExhAir
89.1 % EFF
155 ppm Undiluted CO
inh20 Draft
78.7 °F Ambient temp
85.0 °F Instr. temp.
°F Diff. temp.
mbar Diff. Press.
ppm CO2amb
ppm aCO
Fuel: Natural gas
O2ref.: 3.82
CO2max: 11.72
Heat transf.*F: °F
-----
Protocol: 2/4 FIRE 4/4
Start: 11/11/11 10:47:39
-----
7.8 % Oxygen
7.34 % CO2
92 ppm CO
52.8 °F ExhAir
369.0 °F T stack
82.3 % EFF
147 ppm Undiluted CO
inh20 Draft
78.7 °F Ambient temp
85.3 °F Instr. temp.
°F Diff. temp.
mbar Diff. Press.
ppm CO2amb
ppm aCO
Fuel: Natural gas
O2ref.: 3.82
CO2max: 11.72
Heat transf.*F: °F
    
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BEFORE:
Cleaver Brooks Boiler
Cleaver Brooks Burner
Cleaver Brooks Controls

- Proprietary Parts
- Lower Efficiencies
- Before: 82.9% Efficiency



AFTER:
Cleaver Brooks Boiler
Riello Burner
Siemens Linkageless Controls

- Boiler retro-fitted with new door
- Non-Proprietary Parts
- High Efficiency Burner
- Siemens is the World Leader in Combustion Controls
- After: 86.5% Efficiency



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Start-up after the Riello Burner Retrofit

Field	Fuel, Gas Fired													
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Combustion Settings	5	10	15	20	25	30	40	50	60	70	80	90	100	
Servo Settings														
	Load	10	12.5	15	19	24	29	33.5	39	44	50	55	60	64
	Fuel	10	12.5	15	19	24	29	33.5	39	44	50	55	60	64
	Air	22	23	26	30	37.5	44	50	56	63	69.5	76	82	90
	VSD	70	72	74	79	85	88	89.5	92	94	95.5	97	98.5	100
O2	4.4	4.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3	2.9	2.4	2.3	
Smoke or CO (ppm)	0	0	3	0	0	0	0	0	0	0	0	0	3	
CO2	9.25	9.5	9.97	9.97	9.97	9.97	9.97	9.97	9.97	10	10.1	10.4	10.4	
NOx (ppm)	22	24	28	31	36	41	41	43	47	29	50	51	52	
Stack Temp. °F	324	321	319	316	359	358	358	353	366	362	367	348	361	
Room Temperature °F	92	92	92	92	96	96	96	96	95	95	93	92	92	
Combustion Efficiency	85.6	85.7	86.1	86.1	85.4	85.4	85.4	85.5	85.3	85.3	85.2	85.7	86.5	
Oil noz press/manifold gas press	0.3	0.5	0.9	1.2	1.8	3	3.5	5	7.6	10.7	13	15.2	17	
Running Motor Amps & Volts	L1	480	23a	L2	480	23a	L3	480	23a					