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REPORT NUMBER: 1404-02

**TEST REPORT ON
 PATTERSON-KELLEY NATURAL GAS-FIRED
 HOT WATER/HEATING BOILER (CONDENSING TYPE)**

BRAND : NEW P-K SONIC™
MODEL : SC-3000
SERIAL NO : S300-13-00502A

APRIL 2, 2014

TEST PROCEDURE: BAAQMD Test Method 9-7-307.1, NITROGEN OXIDES EMISSIONS COMPLIANCE TESTING FOR NATURAL GAS-FIRED BOILERS AND WATER HEATER.

CONCLUSIONS: PATTERSON-KELLEY Hot Water/Heating Boiler Model: SC-3000 met the 3% O₂ corrected 30 PPM NO_x and 400 PPM CO requirements of BAAQMD Reg 9-7 with the following results:

Input, Rating	:	<u>High</u>	<u>Mid</u>	<u>Low</u>
3% O ₂ Corrected NO _x , PPM	:	7.5	7.7	4.3
3% O ₂ Corrected CO, PPM	:	27	16.4	8.8
Load, %	:	85.9	56.6	29.1
Appliance	:	<u>Hot Water Boiler</u>		

PASS

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SUMMARY OF NO_x & CO EMISSION TEST RESULTS

- **PATTERSON-KELLEY NEW P-K SONIC™ Model: SC-3000 Hot Water Boiler**
Input: 3.0 MMBTU/hr

	High Fire	Mid Fire	Low Fire	Pass/Fail
Appliance S/N	S300-13-0502A	S300-13-0502A	S300-13-0502A	
Fuel	Natural Gas	Natural Gas	Natural Gas	
Test Location	BR Labs	BR Labs	BR Labs	
Test Date	03/17/14	03/17/14	03/17/14	
Test Duration (mins.)	30	30	30	
Ambient Temperature, °F	66	69	71	
Load, %	85.9	56.6	29.1	
Load MMBTU/hr	2.576	1.699	0.872	
O ₂ %	7.50	6.89	7.80	
CO ₂ %	7.66	8.00	7.48	
NO _x , ppm	5.59	6.0	3.11	
NO_x, ppm @ 3% O₂	7.5	7.7	4.3	PASS
NO _x , lbs/hr	0.023	0.016	0.0045	
NO _x , lbs/day	0.552	0.384	0.108	
NO _x , lbs/MMBTU	0.009	0.009	0.005	
CO, ppm	20.11	12.82	6.41	
CO, ppm @ 3% O₂	27	16.4	8.8	PASS
CO, lbs/hr	0.0512	0.0206	0.0056	
CO, lbs/day	1.228	0.4944	0.1344	
CO, lbs/MMBTU	0.020	0.012	0.065	

NO_x = Oxides of Nitrogen as NO₂ (MW = 46)
CO = Carbon Monoxide (MW = 28)
O₂ = Oxygen
Lbs/MMBTU = Pounds per Million BTU
Lbs/MMBTU = Fd * MW * ppm * 2.59E-9 * 20.9 / (20.9 - % O₂)
Fd = 8710 (EPA F Factor for Natural Gas)
3% O₂ correction = ppm of pollutant * 17.9 / (20.9 - % O₂)

Comments: PATTERSON-KELLEY NEW P-K SONIC™ 4.0MMBTUH Natural Gas-Fired Hot Water Boiler Model SC-3000 met the 3% O₂ Corrected NO_x and CO emissions requirements of BAAQMD Regulations 9-7:

3% O₂ Corrected NO_x ≤ 30 PPM
3% O₂ Corrected CO ≤ 400 PPM

TEST RESULT = **PASS**

