

January 1, 2014

Smith's Environmental[®] High Efficiency Handbook

*Get The Best Performance
From High Efficiency Heat
Generators With Smith's
Environmental Products
High Efficiency Heating
Equipment*



Learn The Truth

Many condensing boilers are installed in homes that are fitted with conventional baseboard. Most homeowners who have these boilers installed are under the impression they're getting more for their money. Unfortunately they're not realizing the vast savings they were led to expect. **Why?** In short, because ***the boiler still needs to deliver 180° water to the baseboard in order to heat the house properly.***

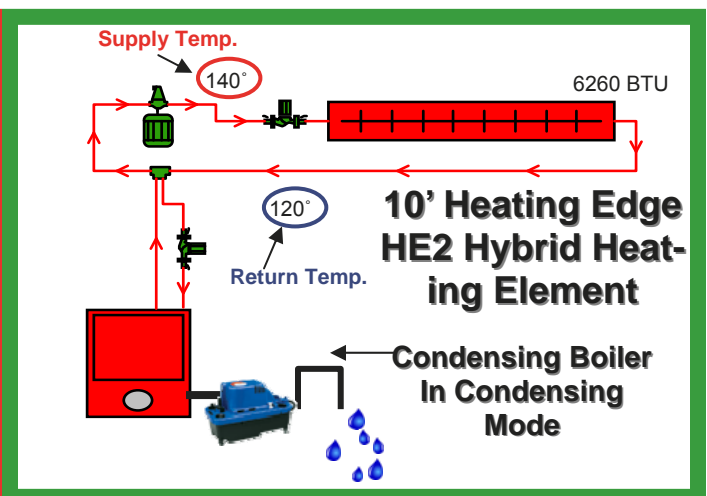
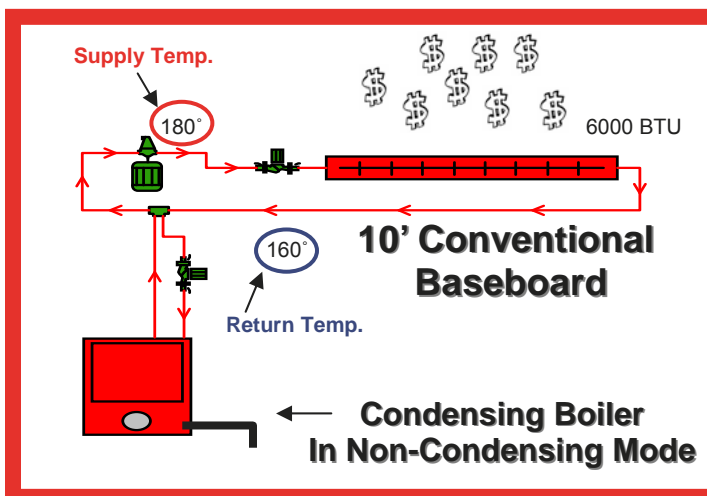
Modulating Condensing boilers achieve their highest efficiencies when delivering low temperature water and receiving low return water temperatures (see figure 1). The actual operating efficiency depends on the temperature of the return water stream: if it's too warm then little condensation takes place and little extra energy is extracted. ***The lower the return water temp in relation to that of the products of combustion, the greater the heat transfer to the water and thus greater efficiency.*** There's no doubt that condensing boilers are much more efficient than conventional boilers, but by sticking with conventional baseboard, they're not realizing their full potential by rarely operating in condensing mode as they were designed to do. To achieve the ultimate high efficiency system that allows the boiler to condense the majority of the time the installer needs to choose the ideal equipment for delivering heat using lower temperature water.

This is where Smith's Environmental comes in. Due to their unique designs, Smith's products have the ability to **deliver comparable BTUH's to conventional equipment using 120° - 140° F supply water.**

For example, a given length of Smith's HE2 High Capacity Hybrid Heating Element can be used to replace the same length of regular baseboard and still deliver comparable BTUH's using much lower temperature water. A 10' length of conventional baseboard has the ability to deliver roughly 600 BTU's per linear foot or 6,000 BTU's total with 180° supply water at 4 GPM. A 10' length of HE2 can deliver more BTUH's with only 140° supply water at 4 GPM* (*when installed with the two supplies in parallel). At a 20° ΔT, the 120° return water temperature will enable the boiler to operate in condensing mode for much greater efficiency.

Also, geothermal heat pumps and solar-thermal collectors are designed to deliver lower temperature water making the proper choice of heating equipment that can deliver the necessary BTUH's even more critical.

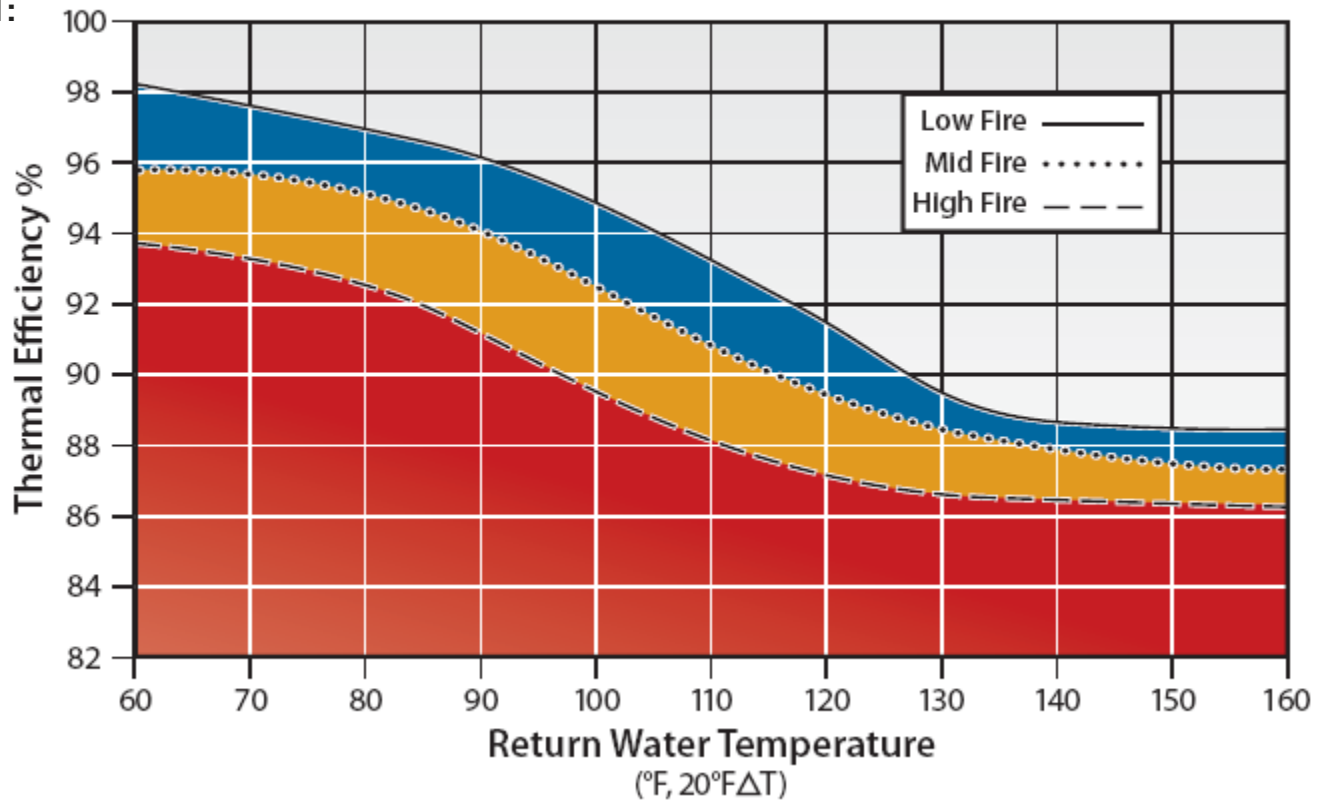
Don't short-change your customers! Give them the highest efficiency system possible by utilizing high efficiency heating components by Smith's Environmental Products when installing Mod Con boilers!



Learn The Truth

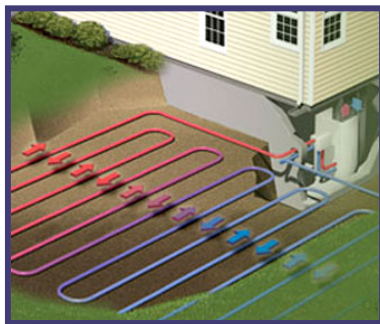
Thermal Efficiency vs. Return Water Temperature

Figure 1:



Smith's Environmental Products are perfect for use with the following high efficiency low temp heat generators:

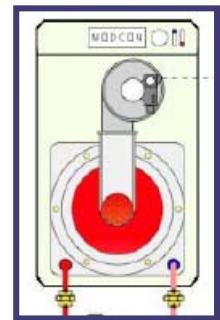
Geothermal



Solar Thermal



Condensing Boilers



High Efficiency Perimeter Heating Equipment

HEATING EDGE

A Unique Perimeter Heating Product

Geothermal Heat Pumps, Solar Thermal Collectors and Condensing Boilers are all great ways to save energy and reduce fossil fuel usage. All three achieve their highest efficiencies when delivering low temperature water. The challenge faced when it comes to heating effectively with traditional baseboard is that supply water temperatures need to be at least 140° F in order to deliver enough BTUH's to sufficiently heat a space at design temperature. Not so with **Heating Edge's HE2 High Capacity Hybrid Element**. Due to HE2's unique two pipe and "washboard" fin design, it's able to deliver comparable BTUH's using 100°-120° F supply water*, all in an attractive package.



Heating Edge

	Flow Rate GPM	PD In FT Of H2O	Average Water Temperature												
			90°F	100°F	110°F	120°F	130°F	140°F	150°F	160°F	170°F	180°F	190°F	200°F	210°F
Two Supplies **	1 **	0.0044	130	205	290	385	460	546	637	718	813	911	1009	1113	1215
Parallel	4	0.0481	134	224*	314*	412*	516*	626*	741*	862*	976*	1115*	1249*	1386*	1,526
Top Supply	1	0.0088	101	165*	226*	289*	356*	426*	498*	572*	647*	725*	805*	885*	970
Bottom Return	4	0.0962	142	201*	271*	341*	415*	492*	569*	648*	728*	811*	894*	979*	1064
Bottom Supply	1	0.0088	99	162	221	283	349	418	488	561	634	710	788	867	957
Top Return	4	0.0962	135	195	259	305	380	464	552	634	710	793	874	959	1039
Bottom Supply	1	0.0044	75	127	169	208	260	311	362	408	470	524	576	629	685
No Return	4	0.0481	85	140	203	265	334	410	472	536	599	662	723	788	850



Where marked* Heating Edge (HE2) output is based on performance tests witnessed by BSRIA. The test data can be verified on the BSRIA website (report 55944/2). This includes calibration information.

The catalogue data above is presented in accordance with the American IBR laboratory testing protocol for baseboard heating. This allows a 15% heating effect factor to be applied to the test values.

Where marked** Installation Notes: HE2's unique design allows performance outputs exceeding those of traditional single pipe baseboard designs. When installed with a parallel supply connection it is recommended that a minimum flow rate of 1.5 gpm be maintained to maximize efficiency and performance.

**Energy Saving
Kickspace Heaters,
Fan Convectors
and Floor Vectors**

QUIET-ONE 2000™

KICKSPACE HEATER & FAN CONVECTOR SERIES

Quiet-One 2000 Series Kickspace Heaters, Fan Convectors and Floor Vectors have highly efficient heat exchangers with low water content that allow the built-in thermostat to respond quickly, saving fuel (because they only operate when the boiler is on) while supplying warm air throughout the room. The combination of the "High E" heat exchanger, a low power motor and a fan with "easy glide" sleeve bearings ensures low electrical usage (equal to a 40 watt light bulb).

The Quiet-One Series heaters amazing low water temperature capabilities enable them to provide ample heat while hooked up to high-efficiency condensing boilers, hot water heaters, ground source heat pumps, geothermal heat sources and reclamation heat sources.

Quiet One 2000 Kickspace Heater Low Temp Hot Water Ratings

Model	Flow (GPM)	Pressure Drop (ft.)	Entering Water Temperature (Deg. F.) – BTU/hrs. @ 65°F Entering Air Temp.				
			100° F	110° F	120° F	130° F	140° F
KS 2004	1	0.06	1150	1450	1735	2095	2410
	3	0.422	1230	1530	1890	2240	2650
	5	1.026	1340	1660	2000	2350	2755
KS 2006	1	0.12	2090	2520	2930	3410	4050
	3	1.19	2390	2790	3190	3735	4395
	5	2.6	2500	2910	3320	3860	4540
KS 2008	1	0.12	2850	3260	3700	4300	5000
	3	1.19	3190	3500	3950	4580	5380
	5	2.6	3300	3680	4180	4760	5625
KS 2010	1	0.41	3580	4200	4880	5530	6350
	3	2.78	3820	4480	5170	5880	6710
	5	3.92	4050	4650	5350	6070	7030



- All capacities are rated by RTS with the kickspace installed under a cabinet. That is, they are not rated in free air.
- For low speed ratings use: .85 for the KS2004, .75 for the KS2006, .70 for the KS2008, and .65 for the KS2010.
- Heat throw: KS2004 = 10 ft. @ 50 CFM; KS2006 = 10 ft. @ 75 CFM; KS2008 = 10 ft. @ 90 CFM; KS2010 = 10 ft. @ 125 CFM.

- All capacities are rated by RTS with the kickspace installed under a cabinet. That is, they are not rated in free air.
- For low speed ratings use: .85 for the KS2004, .75 for the KS2006, .70 for the KS2008, and .65 for the KS2010.
- Heat throw: KS2004 = 10 ft. @ 50 CFM; KS2006 = 10 ft. @ 75 CFM; KS2008 = 10 ft. @ 90 CFM; KS2010 = 10 ft. @ 125 CFM.

FL100 Floor Vector Low Temp Hot Water Ratings

Flow G.P.M	Pres. Drop (Ft.)	Fan Speed	Entering Water Temperature (Deg. F.) – BTU/hrs. @				
			100° F	110° F	120° F	130° F	140° F
1	0.027	max	1850	2620	3240	4049	5208
		min	1000	1450	2100	2808	3571
2	0.093	max	1978	2735	3325	4168	5266
		min	1098	1556	2212	2901	3649
3	0.191	max	2086	2841	3429	4287	5325
		min	1190	1648	2300	2994	3727
5	0.473	max	2150	2950	3490	4330	5343
		min	1245	1690	2334	3027	3741

Max. speed = 85 CFM; min. speed = 65 CFM.



Aquastat set to close on a rise to 130°F and open at 110°F.

All Smiths Environmental Products have been performance tested to ensure maximum efficiency. Every heater is constructed using the highest quality components to ensure a long product lifetime.

Energy Saving
Kickspace Heaters,
Fan Convectors and
Floor Vectors

QUIET-ONE™ 2000

RECESSED POCKET WALL UNIT SERIES

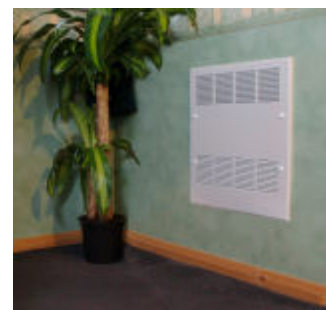
Pocket Wall Unit PWU 4/6, 6/8, 8/10 & 13/15 Low Temp Hot Water Ratings

Model	Flow (GPM)	Entering Water Temperature (Deg. F.) – BTU/hrs. @ 65°F Entering Air Temp.				
		100°F	110°F	120°F	130°F	140°F
PWU 4/6	1	1050	1420	1748	2112	2529
	3	1800	2145	2485	2858	3294
	5	2475	2843	3247	3620	4050
PWU 6/8	1	1620	2090	2580	3035	3525
	3	2442	2950	3425	3900	4435
	5	3325	3875	4380	4825	5292
PWU 8/10	1	2207	2695	3190	3690	4185
	3	3170	3717	4212	4700	5211
	5	4005	4523	5010	5500	6030
PWU 13/15	1	4205	4910	5600	6300	7002
	3	5150	5850	6521	7300	8154
	5	5642	6367	7013	7795	8640



Pacific Contractor Unit Models PCU 5 & PCU 7 Low Temp Hot Water Ratings

Model	Flow (GPM)	Entering Water Temperature (Deg. F.) – BTU/hrs. @ 65°F Entering Air Temp.				
		100°F	110°F	120°F	130°F	140°F
PCU 5	1	2500	2950	3320	3600	3987
	2	2650	3050	3420	3810	4230
	3	2780	3260	3730	4220	4698
	4	2850	3370	3840	4320	4788
	5	2905	3472	3954	4430	4905
PCU 7	1	3047	3528	4013	4513	5013
	2	3250	3766	4301	4890	5490
	3	3400	3950	4500	5180	5880
	4	3625	4237	4811	5487	6210
	5	3877	4512	5152	5874	6550



All capacities are rated upon actual installation.

For low speed ratings use .75 for the PCU-5 and .70 for the PCU-7.

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Energy Saving
Kickspace Heaters,
Fan Convectors
and Floor Vectors

QUIET-ONE  **2000™**

KICKSPACE HEATER & FAN CONVECTOR SERIES

**PSU10, PSU15, PSU23, PSU30 and PSU40 Fan Convector Low
Temp Hot Water Ratings**

Model	Fan Speed	Pres. Drop-ft	Entering Water Temperature (Deg. F.) – BTU/hrs. @ 65°F Entering Air Temp.				
			100° F	110° F	120° F	130° F	140° F
PSU10	MAX	2.75	1350	1850	2650	3307	4278
	MIN		900	1120	1800	2315	2994
PSU 15	MAX	3.07	1700	2500	3250	3983	5120
	MIN		1100	1600	2150	2788	3580
PSU23	MAX	3.82	2000	3100	4700	6645	8790
	MIN		1800	2750	3600	4650	6150
PSU30	MAX	4.6	2200	3400	5250	7550	10050
	MIN		1950	2950	3800	5300	7030
PSU40	MAX	4.6	9000	11500	13500	16500	19720
	MIN		7500	10000	12200	14204	17000



Capacities based on 2 gpm. Correction factors for: .5 gpm = .80; 1.5 gpm = .96; 2.5 gpm = 1.12; and 5 gpm = 1.23.

It is recommended that selections be made at low speed at the desired water temperature

All Smiths Environmental Products have been performance tested to ensure maximum efficiency. Every heater is constructed using the highest quality components to ensure a long product lifetime.

. Enhanced Energy Savings

. Increased Heat Transfer Capability

. Quiet Reliable Delivery Of "Comfort."

