

Heat Metering Pellet Stoves

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PELLETSTOVESERVICE.COM



Boilers utilized a closed system



Heat can be metered because the flow rate is dictated by the pipe's diameter. All we need to know is the temperature of the water and the total BTUs sent through the system can be known.

Pellet Stoves are an “Open System”



- Heat output is omnidirectional
- High in radiant qualities
- Systems heat the open air of the home from a zone within the house

Abstract ways to measure heat output

- Fuel Receipts
- Power Cycles
- Auger Revolutions
 - Ash Weight

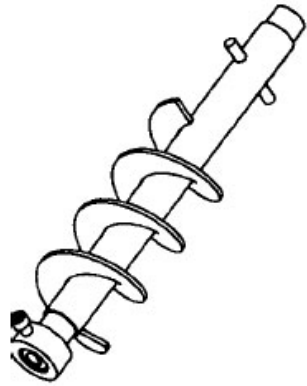
Problems with abstract metering



Fuel Receipts

Buying fuel doesn't necessarily mean you are burning it. People hoard pellets when prices are low and could cash in when payback benefits are higher.

Problems with abstract metering



Power Cycles & Auger Revolutions

Just because the auger is turning, doesn't mean there are actually pellets feeding through the system or that the fuel being delivered is actually burning and creating heat.

Just because the unit is on...doesn't mean there is heat.

Stoves can be modified to feed faster with a restricted fuel opening thus paying more benefits.

Difference in Pellet Quality

What fuel are they using?

LOW GRADE PREMIUM PELLET

< 8000 BTUS PER POUND



HIGH GRADE PREMIUM PELLET

> 9000 BTUS PER POUND



How does pellet quality factor in?

Is the fuel you are using is actually 8000 BTUs per pound?

Many softwood pellets may contain upwards of 9100 BTUs and many cheaper hardwood pellets may contain as little as 6800 BTUs. That could be a swing of as much as 13,000,000 BTUs over an entire heating season, which equals out to be about 22 bags of fuel or just shy of a half-ton, or more simply...perhaps a month's worth of fuel pre and post season.

Uh oh, it's a dirty Pellet Stove



A pellet stove **MUST** be clean to be efficient at transferring heat. A dirty stove may lose 40% or more of its efficiency.

How well the stove is cared for directly affects the stove's output potential.

How do we solve these problems?

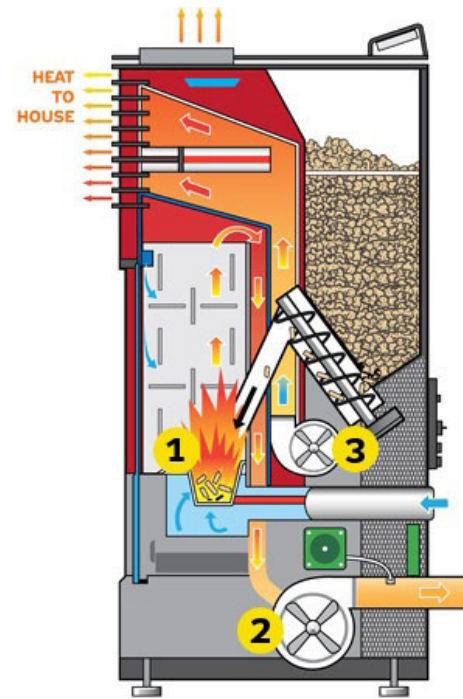


Wait for it.....

**MEASURE THE TRANSFER
EFFICENCY!**

What needs to be measured?

1. Firebox temp
2. Exhaust temp leaving the appliance
3. Air temp within the room



Firebox Temperature

Using a type “K” thermocouple a reading can be taken of the fire temperature

Quadra-fire and Heatilator (same parent company) already measure this.



Exhaust Temperature

Using a type “K” thermocouple a reading can be taken of the exhaust temperature



Data can be logged with a controller



A hobby board such as the Raspberry PI can be programmed to log data and push it across a WiFi or downloadable via SD card.

A whole season worth of efficiency can be logged and thus an appropriate benefit.

All of this could be adopted by manufacturers with the right incentives but could also be developed in the public arena if there is a worthy market to adopt it.