

OIL HEATING AIRFLOW MEASUREMENTS

WHEN WE NEED TO CALCULATE THE SENSIBLE BTU OUTPUT OF A FORCED WARM AIR APPLIANCE, SUCH AS AN OIL FURNACE, THE FOLLOWING FORMULA IS USED:

$$\text{BTUhs (OUTPUT)} = 1.08 \times \text{CFM} \times \text{CHANGE IN AIR TEMPERATURE}$$

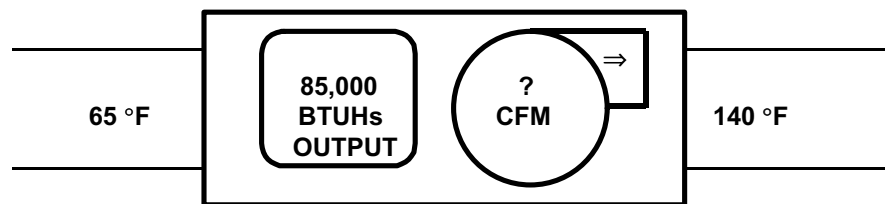
THIS FORMULA CAN BE REARRANGED IN SUCH A WAY AS TO ALLOW US TO CALCULATE THE AIRFLOW OF A SIMILAR TYPE UNIT WHENEVER WE KNOW THE SENSIBLE BTU OUTPUT OF THAT UNIT.

$$\text{CFM} = \frac{\text{BTUhs (OUTPUT)}}{1.08 \times \text{CHANGE IN AIR TEMPERATURE}}$$

ALTHOUGH MEASURING THE TEMPERATURE RISE ACROSS A HEAT EXCHANGER IS RELATIVELY EASY, PRECISELY CALCULATING THE BTUhs OUTPUT OF THE UNIT WITHOUT KNOWING IT'S ACTUAL CFM IS NOT VERY EASY AT ALL. FOR THIS REASON IT IS BETTER TO DETERMINE THE HEATING CFM BY USING AIR MEASUREMENT DEVICES SUCH AS MANOMETERS OR AIR VELOCITY METERS. IF THIS IS NOT POSSIBLE THEN THE FOLLOWING PROCEDURE CAN BE USED:

1. CONFIRM THAT THE UNIT IS OPERATING AT IT'S NAMEPLATE INPUT RATING BY USING ONE OF THE FOLLOWING METHODS:
 - DETERMINE THE OIL NOZZLE FLOW RATE BY COMPARING OIL PUMP PRESSURE VS. NOZZLE SIZE. (MORE ACCURATE METHOD)
 - USE THE NAMEPLATE RATING OF THE APPLIANCE (LEAST ACCURATE)
2. SET THE OIL BURNER TO OPERATE AT ALL OF THE KNOWN MANUFACTURER'S SPECIFICATIONS.
3. AFTER LETTING THE SYSTEM RUN FOR APPROXIMATELY 10 MINUTES, TEST THE OPERATING EFFIECNCY OF THE OIL FURNACE.
4. CALCULATE THE BTU OUTPUT OF THE UNIT USING THE ABOVE INFORMATION.
5. MEASURE THE TEMPERATURE RISE ACROSS THE HEAT EXCHANGER.
6. USING THE ABOVE FORMULA, CALCULATE THE CFM OF THE UNIT.

EXAMPLE



$$\text{CFM} = \frac{85,000}{1.08 \times (140^\circ\text{F} - 65^\circ\text{F})}$$

$$\text{CFM} = \frac{85,000}{1.08 \times 75}$$

$$\text{CFM} = 1049$$