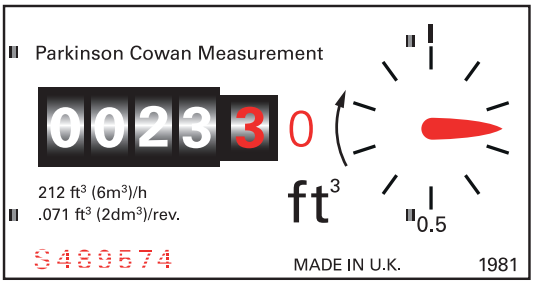
GAS RATING – NATURAL GAS

A FUNDAMENTAL TEST TO confirm the quantity of gas burned by an appliance over a specific time frame, typically one hour (3600 seconds).

For practicality the test is conducted over a shorter time frame – either one complete revolution of the test dial (ft^3) or 2 minutes plus number of seconds until the next whole number on test drum (m^3). Once the quantity of gas used is established, the appliance heat input can be determined using a simple calculation to factor in the fuels Calorific Value (CV).

Gas rating – imperial (ft^3/hr)

An imperial gas meter utilises a test dial with one complete revolution indicating the amount of gas used in ft^3/hr. The test dial may be 1, 2, 5 or 10 ft^3, depending on meter size.

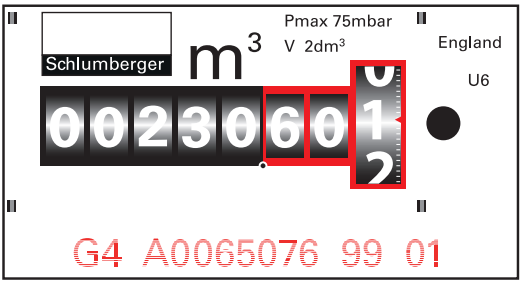


The following formula is used to determine the amount of gas used:

$$\text{Gas rate } (ft^3/hr) = \frac{3600 \times \text{Number of } ft^3 \text{ per revolution of test dial}}{\text{Time taken for one complete revolution (sec)}}$$

Gas rating – metric (m^3/hr)

A modern metric gas meter utilises a test drum which is split into the first 5 digits representing m^3 and a further 3 digits (within the red surround) in dm^3 (one tenth of a m^3).



To gas rate a metric meter, note the first reading and run the appliance for 2 minutes (see Note) the end of which you take the second reading. Subtract the first reading from the second to establish the amount of gas used.

Note: Additional seconds may be needed after the 2 minute period until the next whole digit appears. Include these additional seconds within the formula.

The following formula is used to determine the amount of gas used:

$$\text{Gas rate } (m^3/hr) = \frac{3600 \times m^3}{120 + \text{any additional seconds}}$$

Heat input

With a known quantity of gas used in either ft^3/hr or m^3/hr the heat input for the appliance (the energy produced from that quantity of fuel burned) can be calculated in either:

- btu/hr (imperial)
- kW (metric)

For Natural Gas an average* CV is used:

- $ft^3/hr \times 1040 = btu/ft^3$
- $m^3/hr \times 38.76 = MJ/m^3$

**A more accurate result will be obtained by using the CV as stated on the customers' gas bill.*

Imperial (ft^3)

Use the following formula to establish the heat input in btu:

Heat input (btu/hr) = $ft^3/hr \times 1040$ (btu/ft^3)

To convert btu/hr to kW, divide by 3412

Metric (m^3)

Use the following formula to establish the heat input in kW

$$\text{Heat input (kW)} = \frac{m^3/hr \times 38.76\ (MJ/m^3)}{3.6}$$

The reading obtained from either of the above calculations will be a gross figure and so, where the appliance manufacturer quotes a net heat input this will require to be converted – dividing the final figure by 1.1 (a conversion factor for Natural gas) will provide a net value.