



## Calculator instructions and guidance notes MAHU V's Re-circulating AHU – Adiabatic humidifiers

The Gibbons calculators use accurate ideal gas equations to provide a realistic calculation to demonstrate the energy savings that can be achieved by installing our humidification system. The calculations required to model the operation of the air system are complex and make use of iterative mathematics.

### **Circular references**

If a circular reference warning is displayed it is because the iteration function in Excel is not enabled. To cure the problem, see below.

### **Using the calculator**

Enter your data in the white squares and the calculator will produce the results from the air system model. The results reflect the energy savings that are possible according to the data you have entered.

The calculator displays the energy usage of the existing system and the energy used when the Gibbons humidifiers are installed in the re-circulating AHUs.

### **How energy savings are achieved**

When humidifying fresh air, there is a large temperature drop across the adiabatic humidifier, sometimes in excess of 14C. The heaters in the MAHU have to heat the incoming air up to the supply air temperature leaving the MAHU, plus the temperature drop across the humidifier. This is very expensive.

With Gibbons humidifiers installed in the re-circulating AHUs, the heating load on the MAHUs reduces considerably saving large amounts of energy.

Our model of the air system assumes that there is a cooling load on the re-circulating AHUs. The amount of cooling from the Gibbons system installed in the re-circulating AHUs will normally be in the region of 2-3C. The difference between the supply air temperature (leaving the re-circulating AHU) and the mixed air temperature in the re-circulating AHUs should be more than 2-3C. In these circumstances, the Gibbons humidifier will use the excess heat energy in the humidification process and take load off of the cooling system for the re-circulating AHUs.

### **Outside air data**

We have made use of MET office data for Kew in London to give an accurate representation of the outside air conditions that would be encountered by the air system. For locations where the meteorological conditions are significantly different from those at Kew, caution should be exercised with the results of the energy saving calculations.

### **Efficiencies**

The calculator assumes that the efficiency of the heating system is 100%. The coefficient of performance for the cooling system is taken into account.

### **Energy Prices**

The energy prices are set by the user and can be put in at today's values. It is widely reported that energy prices are set to increase for the foreseeable future. The monetary value of the savings will increase with energy prices so it is possible to see how big the savings will be in the future by adjusting the energy prices accordingly.

It is entirely normal for the Gibbons humidification system to pay for its self in one to two years. The results from the energy savings calculators are very much in line with our years of experience.

Please feel free to contact Steve Rix (07966 423165) or [steve.rix@gibbonsgroup.co.uk](mailto:steve.rix@gibbonsgroup.co.uk) if you should have any questions or queries.

### **Circular references**

If a circular reference warning is displayed it is because the iteration function in Excel is not enabled. To cure the problem, enable iteration and set the maximum iterations to 1000 and the minimum change to 0.0001. We recommend that the workbook calculation is set to Automatic.

Go to File, Excel options and formulas to make these adjustments.

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## Information about Humidifier selector

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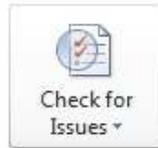


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- Humidifier Selector [Unprotect](#)



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