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Data Acquisition System for Fan Testing – Overview

The Custom Data Acquisition System (“TestMac for Fans”) was developed over the past 4 years as a technology upgrade for existing Fan Testing Installations. It can be summarized as a practical implementation of data acquisition technology, where the extent of technology has been weighed up against the benefits and resultant complexity.

The decision to focus on dynamic (changing) values is in line with the approach above.

Core Requirements:

- Measurements to be compliant with BS 848 Part 1.
- Measurements to include:
 - a) Stated Test Density (actual, wet bulb, dry bulb barometric pressure; calculated test density)
 - b) All corrections to bring the **test curve** to standard density (as prescribed, 1,0 kg/m³; 1,2 kg/m³, 1,34 kg/m³ or 1,44 kg/m³)
 - c) Test curve to show:
 - Air Quantity in m³/s
 - Fan Static Pressure in Pa
 - Fan Total Pressure in Pa
 - Absorbed motor power in kW
 - Air power in kW
 - Fan Efficiency in %

Additional requirements:

- Simple to operate
- Reference envelopes or manufacturers curves on Test Curve.

Calibration information.

None of the data acquisition based instrumentation needs to be removed for calibration. Calibration is done on site. The software is “taught” values which are then used as reference. Suitable (calibrated) references are, however, required such as Water Gauge manometer for Pressure and calibrated handheld clamp meter for current and voltage.

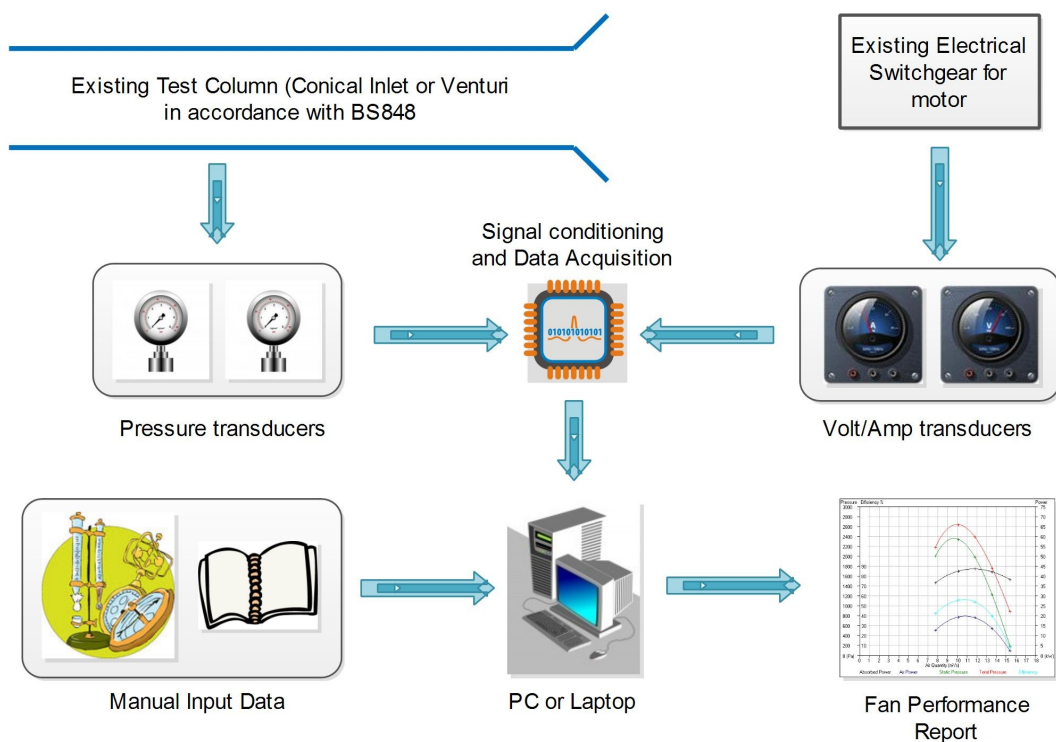
The computer records dynamic readings (those that change during a test), however, also requires manual input of some static values for use during the test.

The source of static values are not within our scope of supply, nor is the calibration or integrity of these sources. These instruments or values should, however, already be in place at an existing Fan Testing Installation.

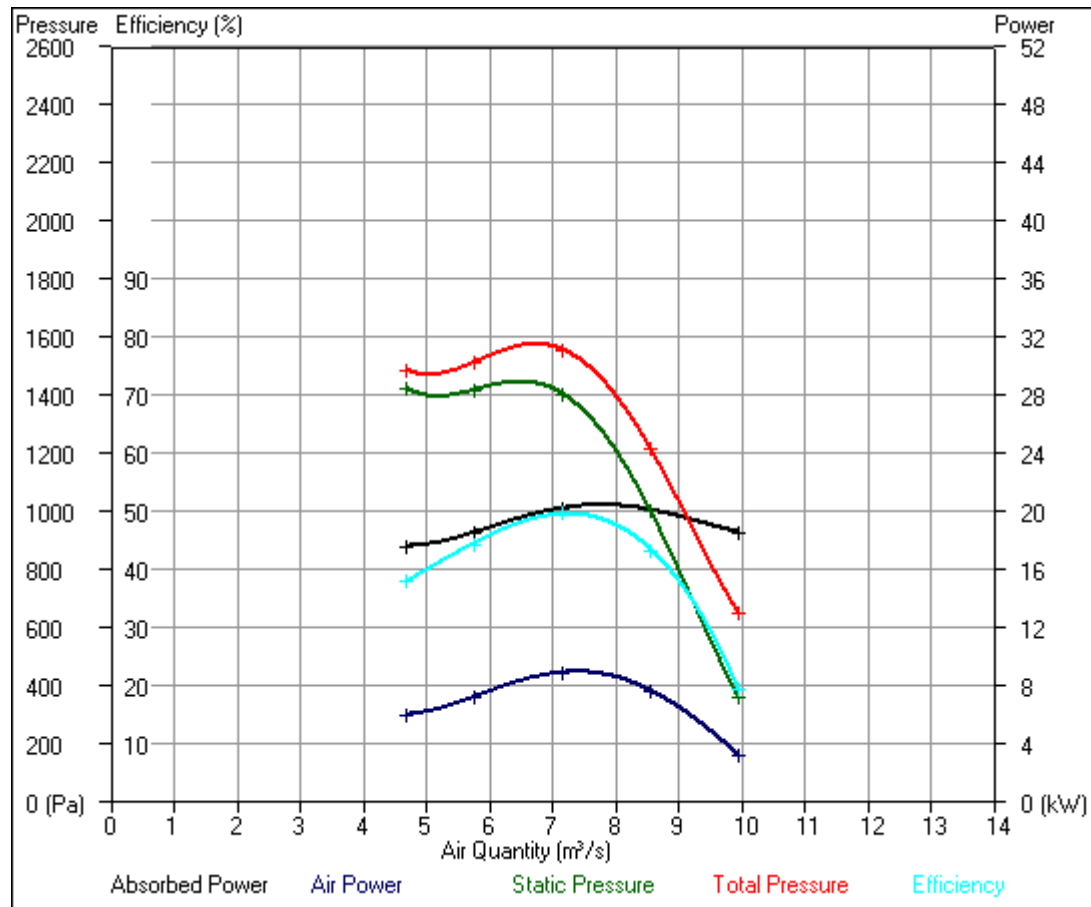
These include:

- Barometric pressure
- Wet bulb temperature
- Dry bulb temperature
- Power Factor

Fan Testing System General Layout



Below is a typical Performance Curve as reported. This curve is plotted live during the test, giving the operator full control on the end of test mark. In some cases it has been requested that the fan be run well beyond the stall during the test – which is not the norm.



Some benefits to be considered.

- Simplification of fan testing and reporting.
- Higher throughput of tests – excluding fitting of fan to column, the test can be completed in a minute or two – with the report in hand.
- Consistent reporting – Computer takes readings, processes them and reports with graph aspect ratio the same on all installations.
- Can be operated from a laptop, which can be used elsewhere when not testing. The laptop can also be locked away much easier than a standard PC.
- Annual Instrumentation Calibration is done on-site without having to remove and send transducers away.

Reported Air Quantity readings can be verified by a Ventilation Consultant and Registered Professional Engineer.