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Tips & Tricks
Measure accurately at supply air, exhaust air and swirl outlets.

Ventilation systems play a key role in the comfort level of employees, customers and residents in companies, public facilities and, increasingly, also in residential buildings. In order to optimize the ventilation technology, it is essential to accurately measure the volume flow at the individual supply and exhaust air outlets in the building.

The 100 mm vane anemometer for testo 440 or the testo 417 vane anemometer are ideal for carrying out your measurements at the supply and exhaust air outlets of indoor ventilation systems. Both anemometers can be combined with the two measurement funnels in the testovent 417 funnel kit for plate outlets and ventilation grilles, and are also suitable for swirl outlets thanks to the volume flow straightener.

But having the right equipment is only completing half the job. On the following pages, we show you how to measure correctly and accurately, namely

- at large supply air outlets
- at standard supply air outlets
- at exhaust air outlets
- at swirl outlets with turbulent flows

Measurements at large supply air outlets.

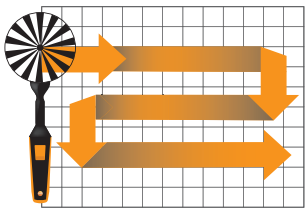
The right way to take measurements at large supply air outlets:
when taking measurements at large supply air outlets, please take into account that there are different flow rates at the outlet area due to the air outlet grille.
To accurately measure the volume flow, you therefore need to measure the entire surface area of the outlet grille with the vane and calculate the timed mean value.

If you cover the air outlet with your body, you will change the flow resistance and therefore distort the measurement result.

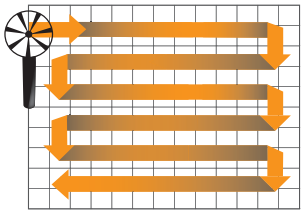
The right way to measure: the air outlet is only concealed by your arm and the measuring instrument, so that the air can flow out largely unobstructed.

To measure the mean value of the volume flow as accurately as possible, scan the outlet grille in loops with the vane. In the process, make sure not to block the air outlet unnecessarily because any flow resistance will affect the measurement result. Maintain a constant speed and an even distance between vane and grille. A distance of 5 cm has proven to be ideal in practice. At the end of the measurement, testo 440 calculates the mean value at the push of a button and this enables accurate recording of the volume flow.

For measurement at large air outlets, measuring instruments such as the testo 440, in combination with a vane anemometer with a diameter of 100 mm, or the testo 417 are more suitable than instruments with a smaller diameter, since the flow values are integrated and averaged over a larger area. In order to traverse the same outlet area with a smaller vane, you need considerably more time.



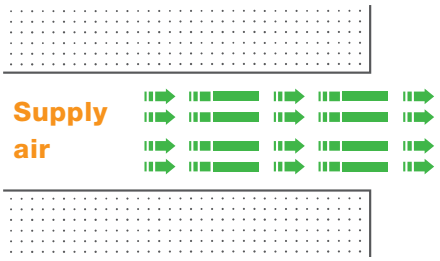
With the 100 mm vane anemometer for testo 440, you can cover the surface area of the air outlet grille in next to no time.



For anemometers with smaller vanes, the travel distance and thus the time required for the measurement is considerably longer.

Measurements at standard supply air outlets.

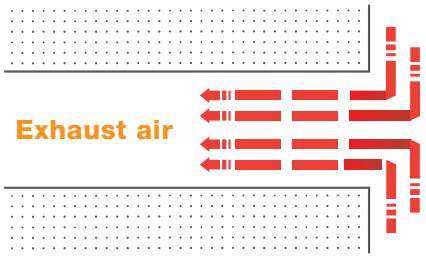
The right way to measure at standard supply air outlets:
At standard supply air outlets, use the testovent 417 measurement funnel to measure even more accurately and, crucially, faster. Scanning the ventilation outlet via the loop method is not necessary, because the funnel channels the air flow and thus averages the different air velocities. The funnel therefore enables you to measure much faster and more accurately.



Supply air:
In the case of supply air outlets, there is a directed air flow, which you can accurately record using the testo 417 or using the testo 440 and compatible vane anemometer.

Measurements at exhaust air outlets.

The right way to measure at exhaust air outlets:
A funnel is essential for measuring the exhaust air. The reason: there is no directed flow profile available for exhaust air as the air is sucked out of the room in a funnel-like pattern. This means there is no definable area in the room via which the volume flow can be determined. This challenge is easily solved with the aid of the testovent 417 funnel. This is because the funnel creates defined flow conditions at some distance from the plate outlet in a fixed cross-section.

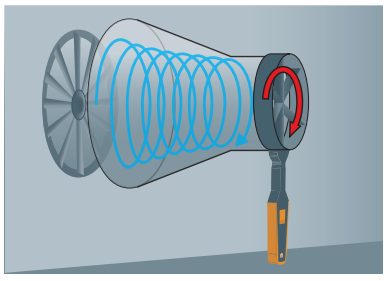


Exhaust air:
In the case of exhaust air outlets, the air is drawn in from all directions. To generate an air flow that can be measured accurately, a funnel must therefore be used.

Measurements at swirl outlets.

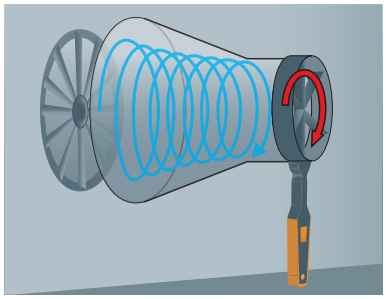
The right way to measure at swirl outlets:
Recording the volume flow accurately at swirl outlets is a challenging task. This is because the supply air is fed into the room in a circular motion, making an accurate measurement difficult. Measurement using a vane is the reason for this. Vane anemometers can only record the flow accurately if the air flow hits the vane vertically. However, this is not the case with swirl outlets. Here, the air rotates either with or against the vane's direction of rotation. This has a major impact on the measurement:

Case 1: The direction the swirl rotates is the same as that of the vane. The flow hits a larger cross-sectional area of the individual blades of the vane. This causes the vane to accelerate faster than if the same volume flow were to hit the vane vertically.



The direction the swirl rotates is the same as that of the vane.

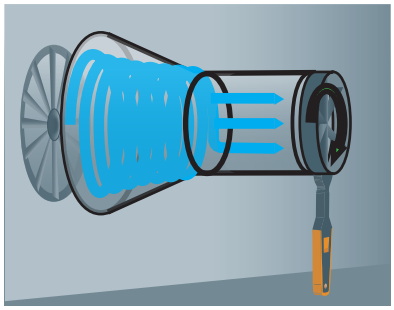
Case 2: The direction the swirl rotates is the opposite to that of the vane. The flow passes between the individual blades of the vane. This causes the vane to accelerate incorrectly and indicates a flow velocity that is too low.



The direction the swirl rotates is the opposite to that of the vane.

The measurement inaccuracy that results when measuring the volume flow at swirl outlets is not a negligible effect. Due to the rotation of the air, the displayed reading can deviate significantly from the actual volume flow. This may cause you to make incorrect assumptions when adjusting the ventilation system.

So how do you achieve accurate measurement results at swirl outlets? The answer is quite simple: by using the testovent 417 volume flow straightener. This patented flow straightener is used in conjunction with a funnel from the testovent 417 funnel kit and the testo 440. It calms the rotary motion of the air and converts the rotation into a linear flow. This directed air flow then hits the vane vertically and can be accurately determined. Use the testovent 417 volume flow straightener to achieve accurate measurement results quickly and easily - even at swirl outlets.



The direction of rotation of the air is channelled into a straight flow by the flow straightener.

Simplify your day-to-day measuring tasks by using

- 100 mm vane kit with Bluetooth for testo 440
- testo 417
- testovent 417 funnel kit
- testovent 417 volume flow straightener

Measure more effectively during the following applications:

- Detect the correct mean volume flow at large supply air outlets in next to no time.
- Measure faster and more accurately at standard supply air outlets.
- The correct values at exhaust air outlets can be attained by using the funnel.
- Thanks to the funnels and volume flow straightener, you can achieve maximum accuracy at swirl outlets, even with turbulent flow.

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