Compressed Air Flow Measurement: The Power Is in the Combination

Compressed air flow meters are becoming increasingly more popular. Many flow measurement devices are available, and every technology has its own unique features and benefits, which can make it difficult to choose the right flow meter for your application. Now, however, your choice has just been made much simpler.

Technologies

Many flow meters and measurement principles are available on the market. In this overview, we will discuss the principles that can be used to measure compressed air flow.

Most compressed air equipment is specified under normalized conditions, for example, 1013.25 mbar and 0 degrees C.

For this reason, many companies find significant benefits from a direct mass flow readout for compressed air flow measurement. Direct mass flow readout enables you to relate the flow directly to the compressor and machine specifications.

Vortex Flow Meters
Vortex flow meters are ideally suited for high-temperature and high-humidity applications. Most vortex flow meters require additional pressure and temperature sensors to calculate the mass flow rate. Also, the measurement range of a vortex meter is limited, which means that they are unable to detect small leaks.

Differential Pressure Meters
Orifice-based differential pressure measurement meters are the prescribed technology to test compressors (ISO1217). However, based on their tendency to cause permanent pressure losses, differential pressure meters are not suitable for permanent compressed air monitoring installations.

Mechanical Flow Meters
Turbine meters and positive displacement meters can be a good choice for fiscal monitoring, but use caution when dealing with humidity, high pressure and flow pulsations, which can reduce the accuracy and life expectancy of the meter. Also note that a blocked positive displacement meter requires a potential shutdown of your air supply, unless you have an automatic bypass valve installed. The flow meters can be connected to a flow computer, which calculates the mass flow rate.

Thermal Mass Flow Meters
Thermal mass flow meters can be utilised in approximately 80 per cent of applications. Thermal flow meters convert heat loss to a mass flow signal, and generally use one or more heated and non-heated temperature sensor elements. Be aware that not every thermal mass flow meter can be used for compressed air. Some flow meters are only intended to be use for air at atmospheric pressure, while others might use a bypass principle, which causes considerable pressure loss.

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VP*FlowScope* ®

The Power Is in the Combination!

Let's compare the new VP*FlowScope* to some other thermal mass flow meters and their usability for compressed air flow audits. As you can see in the following table, the VP*FlowScope* is the only product that offers the powerful combination of mass flow, pressure and temperature measurement in one convenient probe. This powerful combination provides a direct relation to energy consumption in kilowatts.

	mass flow	pressure	temperature	totalizer	integrated data logger	integrated display	12.7 mm probe	4..20 mA	RS485 (Modbus)	easy to use software	total score
Next generation											
VPFlowScope®	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	**10**
Existing generation											
VPFlowMate®	✔			✔		✔	✔	✔		✔	**6**
Other industrial thermal mass flow meters.	✔			✔			*	✔			**3**

* Thanks to its small probe diameter (12.7mm instead of 15mm or even larger) the VP*FlowScope* can be installed without the need to drill a large hole in your pipe. Larger holes can cause increased turbulence and require more expensive ball valves.

The complete package

A good sensor is only part of the solution. Which is why the VP*FlowScope* is fitted with an easy-to-use display/data logger.

The display provides all the information you need to set up your audit in the field…and without the need to carry a laptop into the field! And with the built-in data logger, you can record consumption profiles over a longer period of time.

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VP*FlowScope* Simplifies Your Choice

As shown in the table, the VP*FlowScope* has greatly simplified your choice. It offers all the features you need, in a convenient small package.

Quick Installation Procedure
The VP*FlowScope* probe is inserted through a ball valve and can be retracted after use. During this procedure, the VP*FlowScope* is secured with a safety line.

Easy Configuration
The VP*FlowScope* needs to know the inner pipe diameter to calculate the actual mass flow. You can enter the diameter via the keypad or via the convenient VPStudio™ software. And there is no need to browse through complicated tables: the VP*FlowScope* has a built-in correction algorithm for flow-profile-related effects.

Installation Effects: Read the Manual
Here on planet Earth, the same laws of physics apply to every single point insertion probe. Therefore, it is important to bear in mind that installation effects and flow-profile effects will influence the measurement uncertainty.

To use the probe, you must have basic knowledge of fluid flow through pipes (as described, for example, on www.efunda.com or www.engineeringtoolbox.com) and you must adhere to the installation guidelines precisely. By following these guidelines, and performing the installation in accordance with the specified methods, you can achieve a measurement uncertainty of as low as +/- 5%.

Data Readout: All Inclusive!
The VP*FlowScope* offers both 4.20 mA and RS485 (Modbus). These interfaces are part of the standard configuration, which help keep choices simple and keep investment costs transparent.

Combination is the Key to Savings

If savings are your goal, let VP*FlowScope* be your guide.

The powerful combination of mass flow, pressure and temperature provides a direct relation to energy consumption in kilowatts.

The VP*FlowScope* can even show you the euros, dollars or yen per hour that flow through a particular pipe. Nothing could be a more powerful incentive to raise energy awareness!

The sooner you start, the more you can save. So contact us today for more information about the VP*FlowScope*. We will be happy to help you further.

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Savings Examples

Chemical plant:
Amount: 60,500 euros/year
How: Leak management and compressor management system

Glass factory:
Amount: 40,000 euros/year
How: Maintenance management

Water plant:
Amount: 100,000 euros/year
How: Leak management

Steel factory:
Amount: 35,000 euros/year
How: Process adjustment

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