Cutting energy waste with VPINSTRUMENTS' smart flow meters

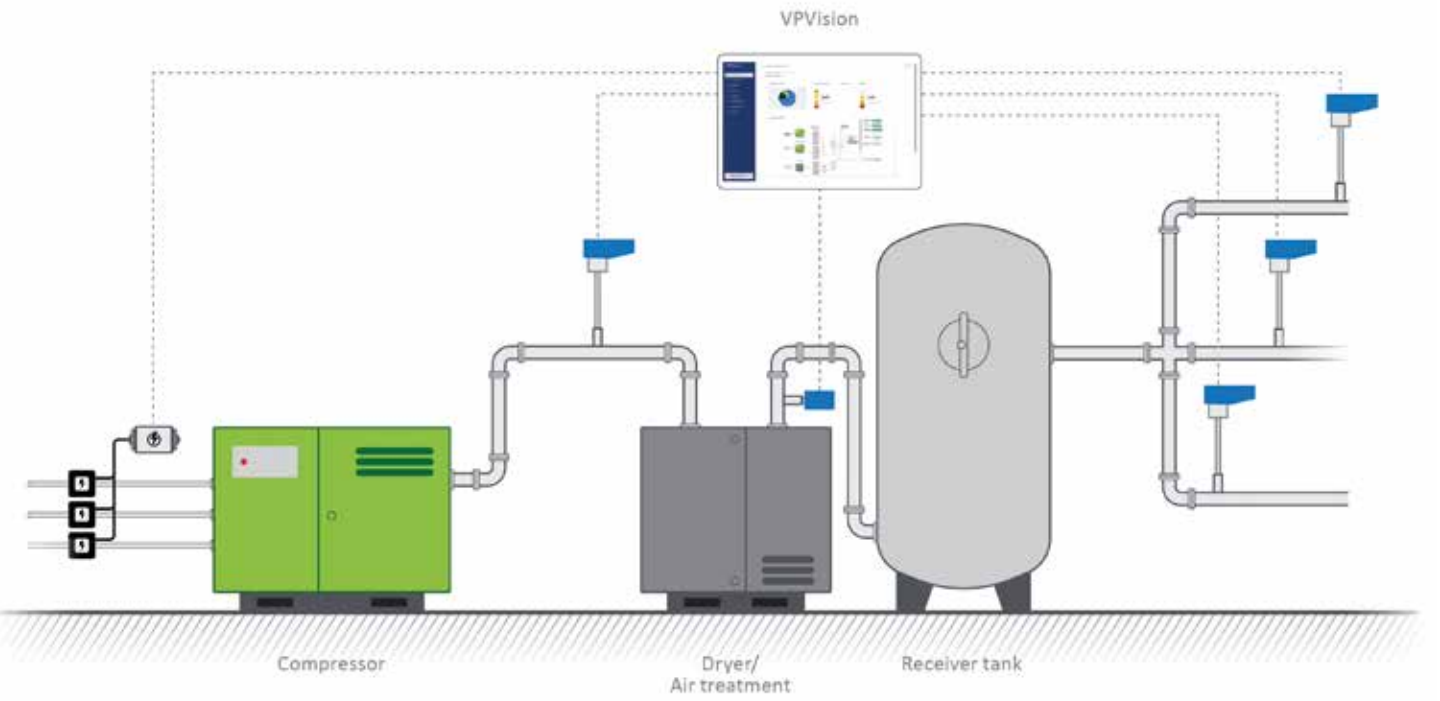
Compressed air may be invisible, but its costs are 'anything but'. VPINSTRUMENTS' groundbreaking flow meters offer real-time insight into air usage, leaks and inefficiencies - helping factories slash energy bills while optimizing production. Here we read how measurement leads to meaningful savings in compressed air systems.

REDUCING ENERGY COSTS WITH A COMPRESSED AIR FLOW METER

Consider the following situation. A person finds out they have been using way too much water at home. They discover a leaking gasket and there is water all over the basement. What is their course of action? Of course, it is to fix the leak right away. But what if this happened at a plant? And instead of water, it involves compressed air? Probably nothing, because compressed air is 'free' and the leak does not bother anyone because it remains invisible. This situation is not as hypothetical as one might think. Most factories make use of compressed air in their production process and leakages in the system are unfortunately common. Compared to electricity or gas, however, factories usually have little insight into their usage of compressed air. It is crucial that plant managers gain insight into the compressed air system. Because contrary to what some people think, air is not free at all. In an average production plant, compressed air costs are 10 to 30 percent of the electricity bill! That much money should not allow for leakages or an inefficient production process. Fortunately, there is an easy way to detect losses in a compressed air system. The solution: a compressed air flow meter. Here we'll be examining how this instrument works and what a company can gain from it.

GAINING INSIGHT INTO ENERGY FLOW: NO MERE PIPE DREAM

First things first. What exactly is a compressed air flow meter? It can be compared to an electricity or gas metre. It shows how much energy is used (in this case compressed air). The flow meter is placed in a strategic place. For example, on the main line, right where the compressed air enters the factory. Or at a department level, to measure how much air goes to a specific department. VPInstruments compressed air flow meters measure flow, pressure,



temperature and total flow at the same time, providing a complete picture. With the display, one can have a direct reading and the built-in data logger can store measurements for a longer period of time. In this way, data from the sensors can be analyzed and action taken, if necessary. VPVision even provides real-time insight into energy flows, wherever the user may be.

FOUR FOR THE PRICE OF ONE

VPInstruments' flow meters are 4-in-1: they measure bi-directional mass flow, temperature, pressure and total flow. A complete picture is needed to understand what is really going on. For example: a pressure drop can be caused by excessive flow through an undersized pipe, or air demand that exceeds compressor capacity. So, in order to understand (and solve) certain issues, the combination of these signals is required.A sudden rise in temperature indicates something may be wrong with the compressed air drier. There is a risk of overheating in summer, especially, which can result in drier malfunction. Information about the pressure level is important as well. It might be critical to maintain a steady pressure for the production process or to keep pressure at a certain level. Just 'to keep it safe', this has resulted in some cases in a higher pressure than really necessary. In those cases, it would be much better to eliminate the pressure fluctuations, which enables lowering the overall pressure of the entire plant. As a rule of thumb, 1 bar lower pressure equals an energy savings of 7 percent! But in order to optimize the production process, insight must first be gained. This is exactly what installing a four-in-one compressed air flow meter provides.

GETTING TO KNOW THE PRODUCTION PROCESS

No production process is the same. It is a long, winding route from the compressor to the production hall.

In most factories the system looks like this:

It starts with a compressor room. This is the 'energy plant' of the factory. This is often a place no one likes to visit, because it is noisy and warm. However, it is worth a visit, because a lot of savings opportunities can be found.

In the compressor room, there will be one or more compressors. The running hours, offload hours and nameplates should be checked. These numbers should be written

down and used to calculate energy costs.

After the compressors, some filters and driers are usually found. This equipment removes water from the compressed air. Why? Too much water is detrimental to the pipes and machines. The floor should be inspected: is there water? If so, the drains in the driers might be failing and require immediate action. Payback: 6 months.

After the driers, additional filters might be present, such as a particle filter or a carbon filter, depending on the type of factory. Cleanliness and dryness are extremely important in industries like pharmaceuticals and food.

After the filters, there is usually a 'header' that distributes the air to various departments, the 'demand' side of the factory. This header is the ideal place to install flow meters for cost allocation and leakage monitoring.

Through a myriad of pipes, the air will arrive at the intended machine. These pipes should be inspected, as they can hold surprises, like branches that were never documented in the P&ID after the plant was built. One of these branches could lead to a large consumer, causing pressure problems for the rest of the plant.

AIR FLOW METER: INSIDE INFORMATION

At every step in the production process, something can go haywire. This does not always mean a big leak in the pipes (though it is certainly possible). There can also be smaller issues, like leaking compressed air drains or excessive demand events. If a factory runs 24/7, however, all those issues add up to a lot of wasted air. It is basically money thrown away. It is impossible to detect the weak spots in the pipes by just looking at them daily. None of us has x-ray vision. Neither do we have time to walk around all day. A flow meter, however, provides all the necessary information - and more.

By installing one or multiple flow meters at strategic places, crucial information is gained that helps set priorities and back up decisions with numbers. For example: how much energy is used on weekdays versus weekends. Some factories are surprised to discover that compressed air is used on Sundays, even though their machines do not run that day. One week's data can also be compared to the next using advanced monitoring software. In this way, an excessive leak may be discovered to have caused an increase in the baseline. This

knowledge enables swift corrective action. Here one can only imagine how many weak spots can be discovered (and solved) thanks to a compressed air flow meter.

A FLOW METER FOR EVERY SITUATION

Any production process consists of many different steps, as previously explained. This warrants different types of flow meters. Fortunately, VPInstruments offers flow meters for every part of the compressed air system - from supply side to demand side. These flow meters are all part of the same 'product family', so the way to use them is mostly the same. However, each can be used in different situations. VPFlowScope DP is especially designed for wet and dirty compressed air flow measurement. When there is no need for such precautions, the VPFlowScope M is a great choice. This flow meter is suited to measure dry compressed air and technical gas (after a drier). In-line flow meters, meanwhile, are built for small pipes up to 2".

VP INSTRUMENTS 25 YEARS

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