

### Improving compressed air efficiency using no-pressure-loss ultrasonic flow measurement

Glassworks,  
Automotive,  
Chemical, Steel,  
Food & beverage

#### Key words

- Energy saving
- Air
- Energy efficiency
- Environmental impact
- Flow metering
- Compressed air system
- Improving compressed air
- Ultrasonic flowmeter

#### Context

**Efficiency in energy use helps to control production costs and reduce negative environmental impact.**

The process of metering flow across a use can help control utility costs.

At multiple locations, meter flow helps to provide data that may be used to balance energy sources and supply points, to detect leaks and other unusual changes in consumption, and to help prioritize energy-saving actions.

Communication of KPIs to plant personnel can help increase personnel awareness of efficient practices.



#### Challenges

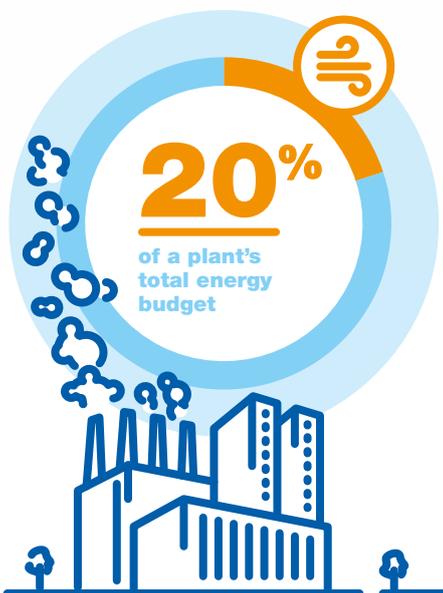
**A compressed air system can use up to 20% of a plant's total energy budget.**

Compressed air systems can typically have significant leak rates, high startup and shutdown times, and other issues leading to waste. Measurement of compressed air flow helps identify areas of excessive use and better manage the overall flow of the compressed air system.

Flow meters are used in compressed air systems to provide a measure of flow together with pressure and temperature. The number of points of flow measurement should be appropriate for the size and usage of the system (generally, the more points of measurement, the easier is the air management).

For a compressed air system, it is best to have multiple flow measurements. Compressor, main supply, and branch line flow meters can tell you if leaks are present in the system and if you are wasting energy.

The installation of traditional flow meters like orifice plate, or vortex meter, or mass flow meter into a compressed air system will cause permanent pressure losses. These pressure losses add up to a large waste of the energy that the compressor is drawing.



**Pressure losses resulting from the installation of multiple flow measurements in a compressed air system can be eliminated by using the ultrasonic measurement method, resulting in a more efficient compressed air system.**

A southern European food and beverage plant reduced electricity costs and achieved an increase of compressed air system efficiency by switching to FWD ultrasonic flow meters.

The bottling plant manufactures, packages and ships bottles of natural mineral water. Compressed air usage had been rising rapidly, raising operational costs to levels that increased risk of shortages that would stop pneumatic equipment from operating.

Usage was being monitored through the use of orifice plate flowmeters. Engineers found that they were creating high permanent pressure loss in the compressed air system.

Their solution involved removing orifice plate flow meters and installing ultrasonic flow instruments: five to monitor output of each of the five compressors, and one to measure flow on the main header.

6 points of flow measurement allowed operators to identify increased usage and to detect system leaks early without unnecessary pressure loss caused by orifice plates. In addition to greatly reducing system pressure loss, the installation of no-pressure-loss FWD air ultrasonic flow meters at this plant has improved overall compressed air system efficiency by 15%, and has saved the company €52,000 per year in electricity costs.



## **Ultrasonic flow meter is the latest development in air flow meter technology.**

The FWD air ultrasonic flow meter is an accurate and user-friendly device. It allows to measure the volume of air flowing through a pipe, using the principle of transit time, which makes it more reliable and substantially more accurate than the old meters.

The big advantage is that the FWD Ultrasonic flow meter has no impact on pressure compared to other air flow measurement instruments. It has zero effect on energy consumed in the compressed air system.

Installed in the available space, these FWD ultrasonic flow meters have been added to ensure the optimisation of compressed air supply services for this bottling plant.

The FWD ultrasonic flow meters are performing to optimize energy efficiency and require minimal maintenance. They are known for their superior robustness.

## Your Benefits

- Manage the compressors operating load and control the air consumption.
- Reduce your production costs by decreasing permanent pressure loss.
- Detect and stop air leaks on your air compressor network.



## Ultrasonic Flowmeters FWD

- **Easy, quick and economical installation**  
No wiring work (autonomous battery) or modification of the pipe configuration
- **Clear viewing of compressed air and nitrogen consumption**  
Fast real-time measurement on large rotating LCD display
- **Early detection of air leaks**  
Large measurement dynamic and excellent repeatability
- **Measurement data you can trust**  
Mass flow (Build-in pressure and temperature correction)
- **Maximum flexibility and wide range of applications**  
No filter required. High resistance to contaminated fluids
- **Low maintenance**  
No filter required. High resistance to contaminated fluids
- **Build to last in harsh industrial environments**  
Robust and waterproof design



FWD for medium diameter pipes  
Diameter: 40, 50, 65, 80 mm

FWD for small diameter pipes  
Diameter: 25 mm, 32 mm



FWD for large pipes  
Diameter: 100, 150, 200 mm



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