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## **Application Note: Energy Measurement Using Ultrasonic Flow**

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ABSTRACT Multipath ultrasonic transit time flow meters (USMs) are today extensively used by industry for volumetric flow metering of natural gas, for fiscal measurement, check metering, etc. As natural gas is typically sold on basis of mass or energy, the density and/or calorific value (GCV) of the gas is measured in addition.

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## **DENSITY AND CALORIFIC VALUE MEASUREMENT IN NATURAL GAS ...**

Heat meters using ultrasonic flow measurement. July 20, 2020 Editor. Clamp-on ultrasonic flow meters are tricky things to deploy and I always get a sinking feeling when somebody says they're going to use them. In this case

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they were fitted to measure cooling energy as part of a measurement and verification project.

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Using an ultrasonic transit time flow meter, building operators can measure energy costs for both hydronic chilled

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## **HVAC Applications ...**

When traveling in the same direction as a flowing medium, ultrasonic waves move faster than waves traveling against the flow. Ultrasonic flowmeters use this principle to accurately measure the volume of many liquids and gases - and also to derive parameters like density and viscosity. Watch the video to

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learn more!

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Although the four technologies mentioned above may be used to measure flow, we recommend only ultrasonic or magnetic flow meters for energy flow meter applications.



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AlsonicEG family When a non-intrusive installation solution is required for combined heating and cooling applications, the AlsonicEG ultrasonic technology is the best choice.

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Ultrasonic flow measurement improves energy efficiency. To meet environmental goals, a university upgrades its HVAC monitoring system with ultrasonic flow measurement.

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Management, Building Services and Group or District heating schemes. Identifying waste, optimising use and accurate sub-metering and billing of energy and water are a key requirement for the efficient operation of existing and new buildings. Whether you're operating a shopping centre, office block, hospital, school or housing/accommodation,

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private or public ...

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ONICON ultrasonic flow meters are designed to deliver highly accurate flow measurement in hydronic and domestic water applications. Ultrasonic technology is used to measure the flow

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## **Ultrasonic Flow Measurement**

The energy flow rate is the volumetric flow rate multiplied by the energy content per unit volume or mass flow rate multiplied by the energy content per unit mass. ... The principle behind this flow measurement is the use of underwater acoustics. ... Ultrasonic Doppler flowmeters measure the

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Doppler shift resulting from reflecting an ultrasonic ...

## **Flow measurement - Wikipedia**

industrial project - realize traceable and accredited gas energy and quality measurement by ultrasonic gas flow meters (USMs) in subsea fiscal metering systems. The approach is based on use



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of the sound velocity (VOS) measurement already available in relevant USM technologies. However, no method is available today to ensure necessary traceability and

## **Subsea gas energy and quality measurement using ultrasonic ...**

Ultrasonic waves travel at the speed of

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sound (343 m/s at 20°C). The distance between the object and the sensor is half of the distance traveled by the sound wave.[iv] The following equation calculates the distance to an object placed in front of an ultrasonic sensor: Applications. Multiple areas of engineering use ultrasonic sensors.

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## **The working principle, applications and limitations of ...**

The Doppler flow meter use reflected ultrasonic noise to determine the liquid velocity. 5). Who invented ultrasonic flow meter? It was developed by Shigeo Satomura in the year 1959 for analysis of blood flow and in 1963, the first meter was developed for industrial

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applications. Thus, this is all about an overview of the ultrasonic flow meter. From the above information finally, we can conclude that these meters are becoming more popular because they are very simple to use and it is not ...

## **Ultrasonic Flow Meter : Working Principle, Advantages ...**

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TFX-5000 ultrasonic clamp-on flow and energy meters are a versatile solution for measuring volumetric flow and heating/cooling rates in clean liquids as well as those with small amounts of suspended solids or aeration, such as surface water or raw sewage.

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