

Manage energy effectively using non-invasive measuring technology

## FLUXUS® Energy

Heat usage, chilled flows and compressed air flow rate

### Heating and air-conditioning technology

- Non-invasive power measurement of thermal consumers:
  - Heating systems
  - Refrigeration and air-conditioning systems
  - Refrigeration compressors

### Heat exchanger for industrial processes

- Non-invasive determination of efficiency
- Simultaneous measurement on both circuits
- High temperature circuits with heat transfer oils and molten salts

### Compressed air networks

- Consumption measurement
- Leakage detection
- Plant optimisation

### Pump monitoring

### External measurement of internal flow



# Measuring data is required for energy management.

## FLUXUS<sup>®</sup> measures non-invasively.

**Energy counts.** In every respect. Whether for heating in the household, air-conditioning in the office, when transporting people and goods or in industrial production: energy is a key factor for human life, work and the economy. Safe supply and efficient management of this limited resource is just as important.

**Saving energy pays off.** Savings in energy consumption promise first-class returns. Every kilowatt hour saved is subject to interest several times over. Whoever is able to use energy more efficiently saves on procurement costs and protects the environment – and anyone who sets up a certified energy management system will reap the financial benefits.

**Management requires knowledge.** According to the requirements set out in ISO 50001:2011, energy management is a top priority. Top management establishes an energy policy and lays down operative and strategic energy goals as part of an energy planning process. This requires comprehensive recording and measurement of the current amounts of energy used. Energy efficiency begins with transparency in consumption.

**Knowledge comes from measuring.** FLUXUS<sup>®</sup> Energy ultrasonic systems are the ideal measurement solution for non-invasive determination of energy consumed during the transport of liquids or gases in pipes. FLUXUS<sup>®</sup> measures the flow rate non-invasively using clamp-on ultrasonic transducers which are mounted on the outside of the pipe. There is no need to carry out any pipework modification or interrupt operation. If the temperatures in the flow and return lines are recorded simultaneously, the FLUXUS<sup>®</sup> Energy calculates the current thermal power of heating or cooling systems. Due to the totaliser function, the clamp-on ultrasonic systems can also be used as energy meters.

**Measure non-invasively.** Before deciding on any measures, simply begin with non-invasive measurements. The portable versions of FLUXUS<sup>®</sup> Energy are your best companion on the road to an energy management system. Extremely flexible and versatile, they are also suitable for temporary measurement of large amounts of heat in district heating transport, for the lowest flow rates of coolants in refrigeration units or for analysing compressed air supplies. Stationary FLUXUS<sup>®</sup> Energy measuring systems are used to permanently monitor consumption.





### Permanent and portable measuring systems for

- Facility management
- Energy consulting / audits
- Energy-Contracting

### Non-invasive performance and energy measurements on

- Heating systems
- Boilers
- Refrigeration and air-conditioning systems
- Refrigeration compressors (also in the gas phase)
- Absorption chillers
- District heating transport pipelines and transfer stations

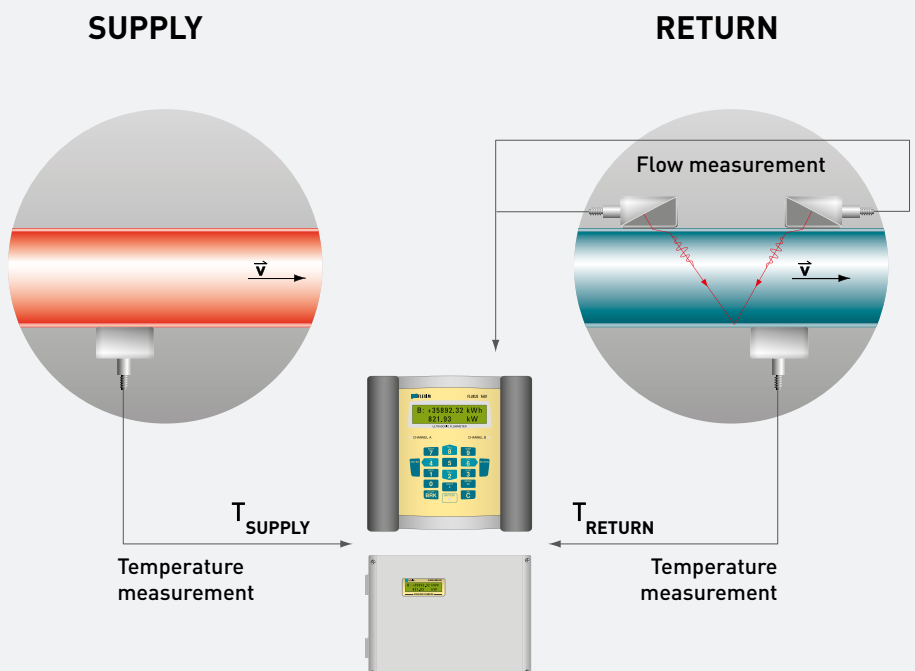
### Advantages

- Reliable and wear-free measurement from outside
- Accurate energy measurement due to
  - + highly accurate flow measurement with paired and traceable calibrated ultrasonic transducers
  - + highly accurate temperature measurement with paired and traceable calibrated temperature sensors (DIN EN 1434-1)
- Extremely high measuring dynamics from the lowest to the highest flow velocities
- Simple, cost-effective retrofitting without any disruption to supply
- Tamper-proof storage of measuring data

### ... in heating and air-conditioning technology

Whether in the boiler room of a family home or in the central air-conditioning unit of a major airport – measuring points can be set up easily and non-invasively with FLUXUS® Energy ultrasonic systems. These measuring points are used to measure energy consumption or to evaluate the efficiency of energy conversion processes.

The FLUXUS® Energy combines all the functions of a heat meter: flow sensor, a pair of temperature sensors and a calculator which calculates the thermal output or the energy transported by integration. It does so using recorded measured values and by taking into account substance-specific data (enthalpy, thermal coefficient). Since clamp-on ultrasonic transducers are simply mounted on the outside of the pipe, a reliable heating and cooling supply is ensured at all times.

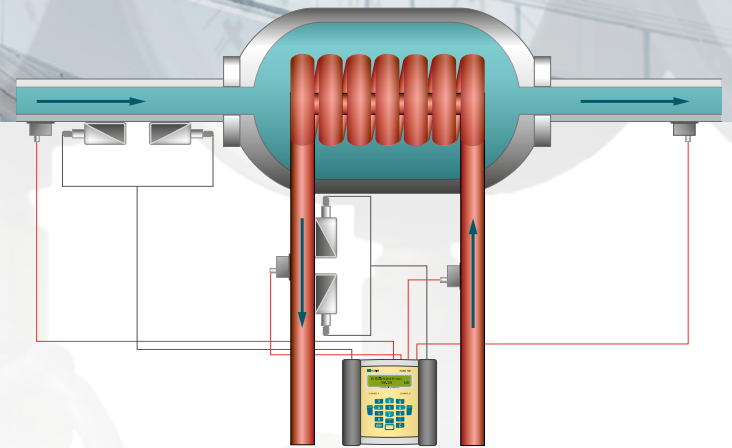


# Non-invasive performance and energy measurement

## ... in industrial processes

In the industrial sector, energy has long been a key competitive factor. Clamp-on ultrasonic measurement with FLUXUS® Energy also offers impressive and unique solutions which can be used to tap efficiency potential non-invasively.

Energy use on an industrial scale often goes hand in hand with particularly challenging conditions for people and technology. This is where the reliability of FLUXUS® can be seen. Particularly sturdy versions of transducers and measuring transmitters mean that this measuring method, which is wear-free as a matter of principle, can be used even under extreme conditions. Regardless of whether they are installed in potentially explosive areas as well as at extreme temperatures from -170 °C to over 400 °C, permanently submerged under water or on the smallest and largest of pipes – FLUXUS® Energy ultrasonic systems have proven themselves in the most demanding applications, e.g.:



*Simultaneous heat quantity measurement on both circuits of a heat exchanger  
(2 flow channels, 4 temperature inputs)*

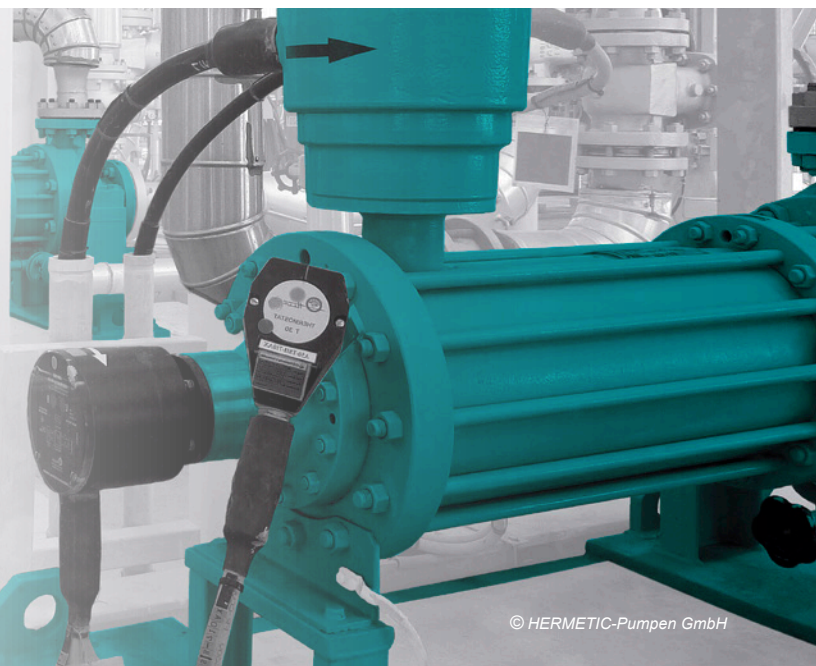
- Efficiency monitoring on heat exchangers in line with preventative maintenance
- Comparison of the amount of energy produced and primary energy used in boilers and burners
- Permanent monitoring of energy flows
- Quantification and use of residual heat
- High temperature flow measurements of heat transfer oils or molten salts

## Pump monitoring

Pumps are also the focus of attention when considering energy efficiency:

- Is the pump correctly dimensioned?
- Is it operating optimally?

With FLUXUS® ultrasonic systems, it is easy and quick to determine the actual performance of the pump empirically and to relate it to the recorded performance.



# Consumption balancing and leakage detection in compressed air networks



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## Mobile and non-invasive. Compressed air measurement.

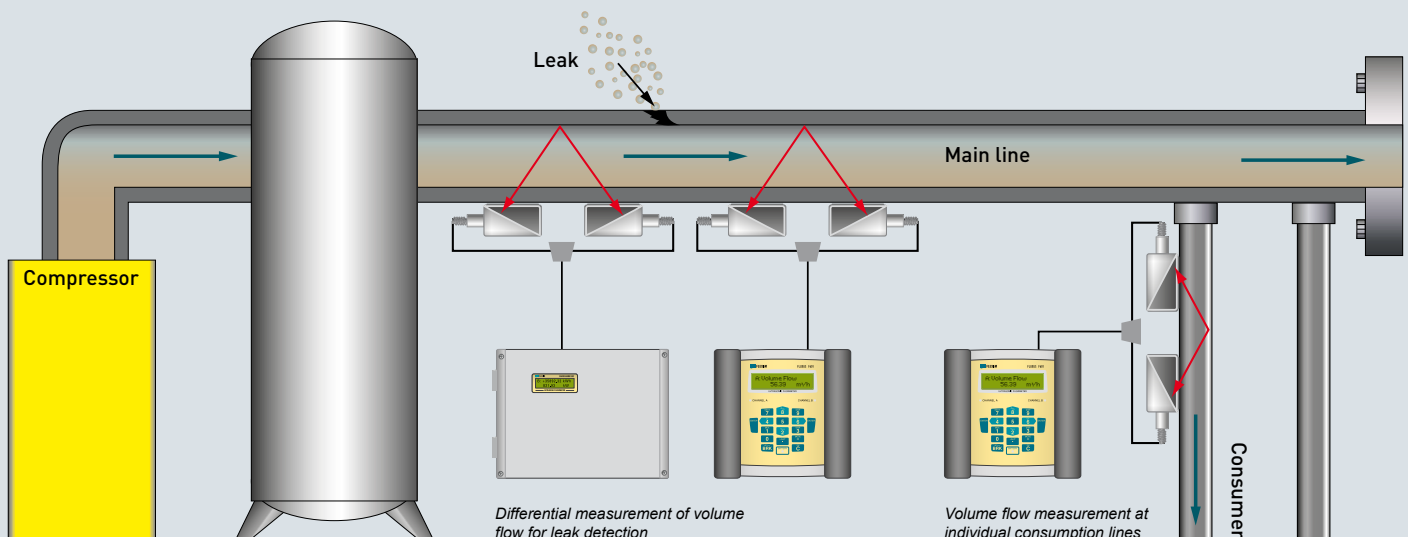
Compressed air is a very expensive form of energy. This is due to its efficiency: for every joule of mechanical work which is done with a pneumatic tool, approximately twenty times the amount of electrical energy must be spent. However, despite this poor yield, compressed air is practically indispensable in many industries because of its production-related advantages. This makes it all the more important to use the valuable medium as efficiently as possible.

## Measurement creates Transparency

If you want to avoid waste it's necessary to measure. The reduction of losses caused by leaks comprises the biggest energy saving potential. Of secondary importance is the adaptation and alignment of the whole system and its processes to the real demands. But how do you best measure at an existing compressed air plant - e.g. the consumption of the pneumatic system connected to it? Non-invasively, of course!

The portable FLUXUS® G601 CA Energy ultrasonic system is an all-purpose instrument, which can be used to non-invasively measure the flow rate of liquids, gases and liquid-based heat or cold quantities. FLEXIM's clamp-on ultrasonic technology is unique in that it can be applied to measure gas flow rates even at low pressures. For this reason, the FLUXUS® G601 CA Energy is particularly suitable for non-invasively detecting leaks in compressed air networks or for measuring quantities drawn off at individual points of consumption. Of course, the FLUXUS® G601 CA Energy can also be used to measure the flow of typical process gases such as nitrogen or ammonia.

For continuous monitoring and balancing of compressed air networks, fixed installation Fluxus G700® series gas flowmeters are available.



# FLEXIM

In Partnership



## Energy. Measurement. Knowledge. For you.

Develop new energy sources non-invasively: a source of savings. We can help you with that. Using our measuring technology and our know-how.

FLEXIM can help you optimise energy efficiency in your buildings, plants and processes. Our application engineers will be happy to advise you in selecting a suitable measuring system.

You don't necessarily have to buy to measure. If the building or plant size do not warrant purchasing one or more measuring systems, we're still happy to be by your side. Of course, you can also rent our measuring systems.

We also offer measurement services tailored specifically to your needs. Our experienced service technicians carry out flow measurements of heat and cold quantities or in the compressed air network – from occasional test measurements to comprehensive measuring campaigns. We provide you with detailed reports with traceable measurement results, which give specific information and recommendations for optimising energy efficiency.

As the user, you are at the centre of all our efforts. Our company motto is to offer you the most suitable and highest quality measuring system for your measuring task and to be a reliable partner at all times, providing you with the best possible support and service.

