Flow Monitoring

For pipes with a diameter of more than half a meter, acoustic flow measurement systems have long established themselves as a reliable and convenient measurement method. Measurements in several planes are a recommended method to determine the efficiency of the turbine without the need for calibration meeting the latest international standards. Fixed installed equipment form the basis for verifying the efficiency. A deterioration of efficiency can be detected right away and therefore corrections can be initiated at an early stage.

The transmitter can handle up to 8 acoustic paths, arranged in one pipe (max. 8 paths per pipe) or spread over up to 4 pipes (max. 2 paths per pipe). When installed in multiple pipes, the flow meter measures the flow in each pipe and calculates the total flow.

A further area of application is the detection of burst pipes. Here at least 2 systems have to be permanently installed in the pipelines to be monitored. Because of the accuracy of our products, even small leakages can be detected instantaneously.

Advantages

A flow meter using clamp-on transducers makes measuring flow non-intrusive and easy from the outside of the pipe. The transducers are installed with little technical effort and without process interruption on the pipeline.

Rotationally symmetric flow profiles can be determined with a single acoustic path; non-symmetric profiles require the use of several acoustic paths.

Non-parallel planes

The arrangement of acoustic paths is dependent on the flow profile, the pipe diameter and the measuring principle. A differentiation is made between single path and multi-path arrangements.

Arrangement of the single path or multi-paths is theoretically possible in the entire range of the angle of inclination $0° < \varphi < 90°$.

Measurement with a crosswise arrangement of acoustic paths reduces the influence of cross flows. Further improvement in the measuring result can be obtained by arranging an appropriate number of acoustic crossed paths in various planes.

These arrangements have special advantages under unfavourable flow conditions or if the lengths of inlet and outlet sections are insufficient thereby preventing the creation of specific flow profiles.

In the case of primary measuring systems with single paths in several non-parallel planes, the signal paths are frequently lengthened by reflection. Reflection may also be necessary when the pipe is accessible from only one side or the acoustic path has to be extended in the case of small pipe diameters.

Typical Applications

» Pipes - partially and full-filled
» HydroPower plants
» Turbine efficiency
» Leakage Detection
System Components

Ductus TT COHP IE
stationary transmitter

Transducer & Straps
for easy mounting

Ductus TT COHP ME
portable transmitter

The flowmeter is available both as a stationary version or as a portable unit for temporary measurements in a watertight and rugged transport case on wheels and inclusive automatic pressure equalization valve.

Advantages

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The transducers are installed with little technical effort and without process interruption on the pipeline. Rotationally symmetric flow profiles can be determined with a single acoustic path; non-symmetric profiles require the use of several acoustic paths.

Path Arrangements

single paths
crossed paths

Single path (V-Shape)
Single path (W-Shape)
Technical Data

TD-200/8 CO

Ductus TT COHP

Specifications Transmitter
- Acoustic Paths: 1-8 (in up to 4 pipes simultaneously)
- Accuracy: ± 0,5% with 8 paths
- Range: ± 20 m/s
- Display: 4 lines, 20 characters
- Pipe Diameter: 0,3 to 10 m
- Data logger: internal, sampling interval user selectable
- Communication: RS232, MODBUS, Ethernet, USB
- Inputs: max. 8 x 4-20 mA
- Outputs: max. 4 x 4-20 mA, 2x Relay, 2x Pulse
- Power Supply: 85-264 V_{AC} (50-60 Hz) or 24 V_{DC}
- Battery Backup: integrated, 2 Ah
- Enclosure: Aluminum, wall mounted
- Dimensions: 600 x 400 x 170 mm

Specifications Sensor
- Pipe Diameter: 0,3 m to 10 m
- Pipe Wall Thickness: up to 100 mm (steel, plastic, glass fiber)
- Frequency: 200 kHz
- Beam Width: 8° (-3 dB)
- Material: Stainless Steel, Polyamid
- Dimensions: 270 x 115 x 100 mm
- Mounting: non intrusive, from the outside of the pipe

Specifications Transmitter

TD-200/8 CO portable

Specifications Transmitter
- Range: ± 20 m/s
- Power Supply: 12 V_{DC}
- Display: 4 lines, 20 characters
- Keyboard/ LEDs: 4 LED control lights, 2 keys
- Housing Material: Aluminium
- Communication: 2x RS232, 4x USB, 2x Ethernet (100Mbit)
- Dimensions incl. case: 850 x 700 x 450 mm (LxWxH)

Specifications Sensor

Sensor TD 200/8 CO

Specifications
- Pipe Diameter: 0,3 m to 10 m
- Pipe Wall Thickness: up to 100 mm (steel, plastic, glass fiber)
- Frequency: 200 kHz
- Beam Width: 8° (-3 dB)
- Material: Stainless Steel, Polyamid
- Dimensions: 270 x 115 x 100 mm
- Mounting: non intrusive, from the outside of the pipe

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