

Flow Measurement at High Temperatures

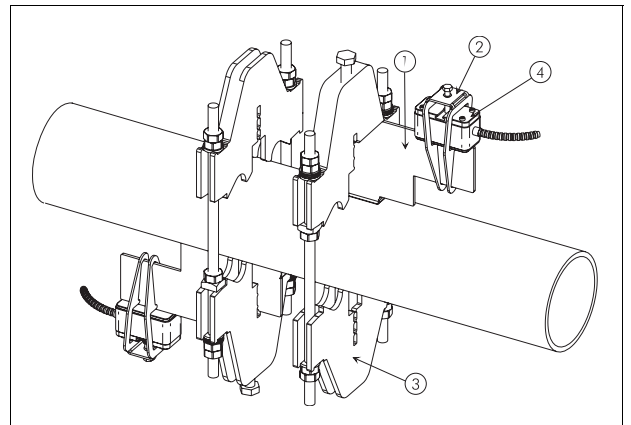
The WaveInjector® is a special transducer mounting fixture for clamp-on ultrasonic flow measurement. It allows continuous flow measurement with the standard FLEXIM transducers at temperatures as high as 400°C, even in an explosive atmosphere. Since the transducers are clamp-on, no cutting of the pipe is necessary for installation and the measurement can be added to an existing installation without process interruption.

A typical application of the WaveInjector is explosion-proof flow measurement in the chemical industry at process temperatures over 120°C. Volumetric flow measurement of heat transfer oil is another frequent application.

A WaveInjector is composed of the WaveInjector coupling plate (1), the transducers clamping fixtures (2), a pipe mounting clamp (3), together with an acoustic coupling foil (4). The metallic coupling plate between the transducer (4) and the pipe provides nearly loss-free ultrasonic coupling. At the same time, its cooling effect maintains a temperature gradient between the surface of the pipe and the coupling surface of the transducer. This guarantees that the maximum permissible transducer temperature is never exceeded.



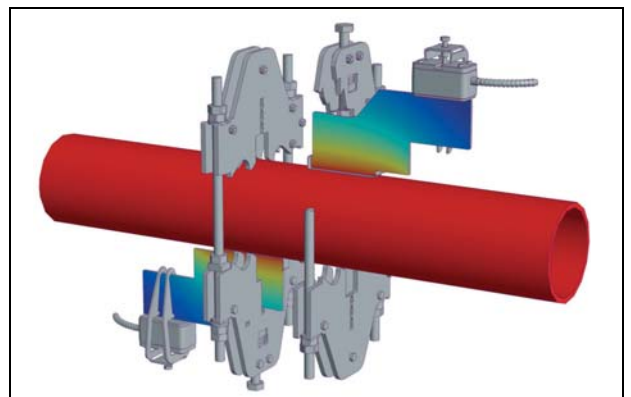
WaveInjector WI-400



The different parts of the WaveInjector

Features

- Ultrasonic flow measurement at high temperatures (up to 400°C) with standard clamp-on transducers
- Flexible mounting system allows mounting on pipes of different diameters
- Permanent and reliable coupling of the transducers to the pipe
- Fine tuning of the transducer distance is possible while instrument is working
- Problem-free retrofitting on existing installations
- Excellent acoustic efficiency
- Flow measurement in explosive atmospheres now possible up to 400°C



Temperature profile of the WaveInjector WI-400

Technical Data

WavInjector® Type WI-200

| | |
|----------------------|------------------------------------|
| For the transducers: | M4N7 Ex, Q4N7 Ex, CDM1#52, CDQ1#52 |
| Temperature range: | 0°C...200°C |
| Diameter range: | 40mm...380mm |
| Mounting: | WI-200 pipe clamp |

WavInjector® Type WI-400

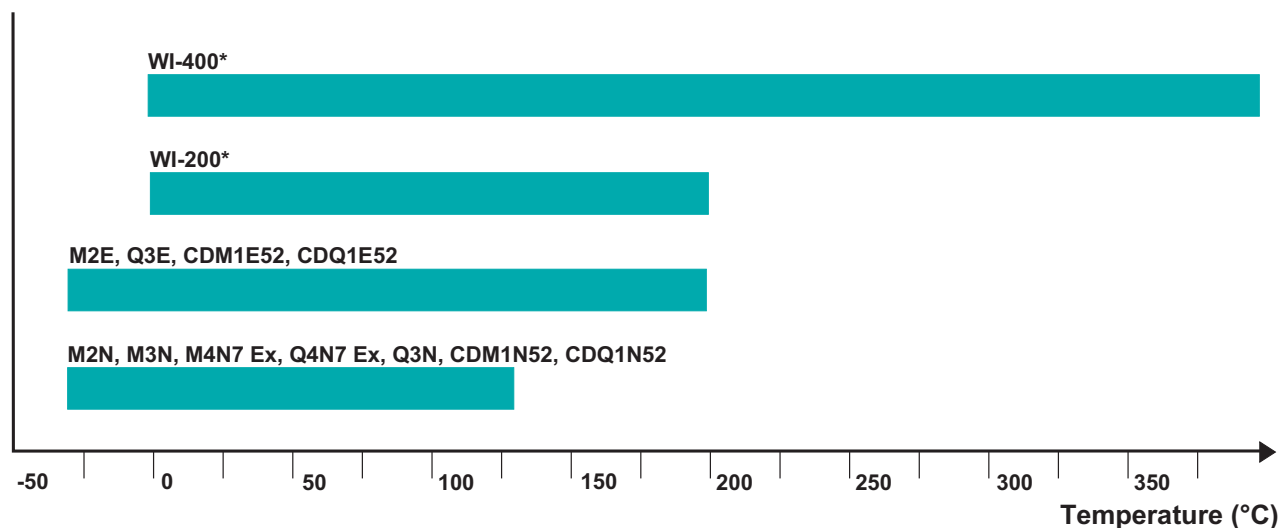
| | |
|------------------------------|--|
| For the transducers: | CDM1, CDQ1, all M and Q transducers except M5 and Q5 |
| Temperature range: | 0°C...400°C |
| Diameter range: | 40mm...1000mm |
| Dimensions with transducers: | (190 x 130 x 40)mm |
| Material: | Coupling plate: stainless steel 1.4301 / 304 Pipe clamp: stainless steel 1.4301 / 304 (except WI400S: galvanized steel) |
| Coupling: | Metal foil |
| Mounting: | WI400 pipe clamp |

WI Pipe Clamp

| | |
|----------------------|--|
| Pipe outer diameter: | WI-400S, WI-200S: 40 mm ...130 mm |
| | WI-400Q, WI-200Q: 80 mm ...230 mm |
| | WI-400M, WI-200M: 80 mm ...380 mm |
| | WI-400L: 350 mm...1000 mm (fixation with chains) |
| | >1000 mm consult FLEXIM |

Important: The upgrade of a FLUXUS with a WavInjector® can only take place at the factory.

Temperature Range



* You will find in the table above which transducers can be used with which type of WavInjector®.