

### Flow Measurement of Liquids at High Temperatures

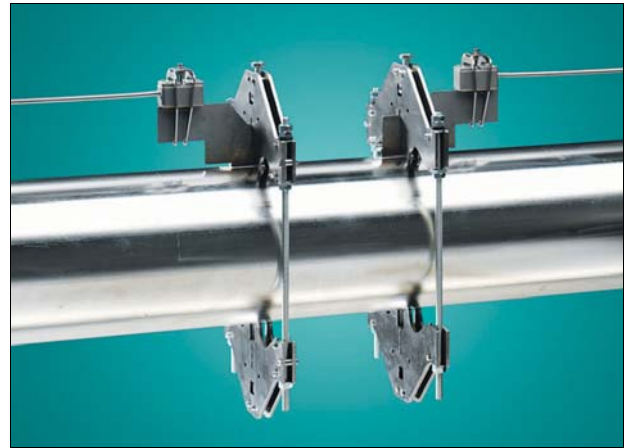
The Wavelnjector is a special transducer mounting fixture for clamp-on ultrasonic flow measurement. It allows continuous flow measurement with the standard FLEXIM transducers at medium temperatures up to max. 400 °C, even in an explosive atmosphere. Since the transducers are clamp-on, no cutting of the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

A typical application of the Wavelnjector is explosion-proof flow measurement in the chemical industry at process temperatures higher than 200 °C. Volumetric flow measurement of heat transfer oil is another frequent application.

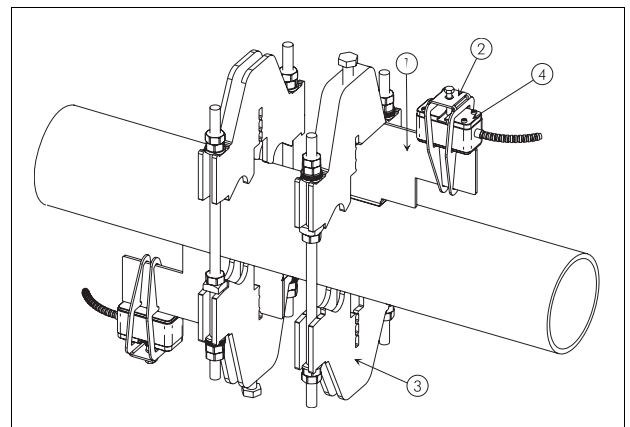
A Wavelnjector is composed of the coupling plate (1), the transducers clamping fixtures (2), a pipe mounting clamp (3), together with an acoustic coupling foil. The metallic coupling plate between the transducer (4) and the pipe provides nearly loss-free ultrasonic coupling. At the same time, its cooling effect maintains a temperature gradient between the surface of the pipe and the transducer contact surface. This guarantees that the max. permissible transducer temperature is not exceeded.

#### Features

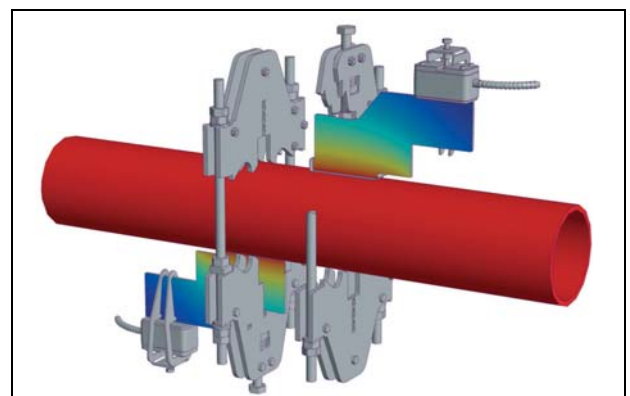
- Ultrasonic flow measurement at high temperatures (max. 400 °C) with standard clamp-on transducers
- Flexible mounting system allows mounting on pipes of different diameters
- Permanent and reliable coupling of the transducers to the pipe
- Fine tuning of the transducer distance is possible while instrument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



Wavelnjector WI-400



Parts of the Wavelnjector



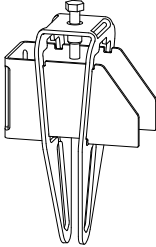
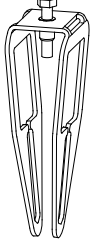
Temperature profile of WI-400

**Order Codes**

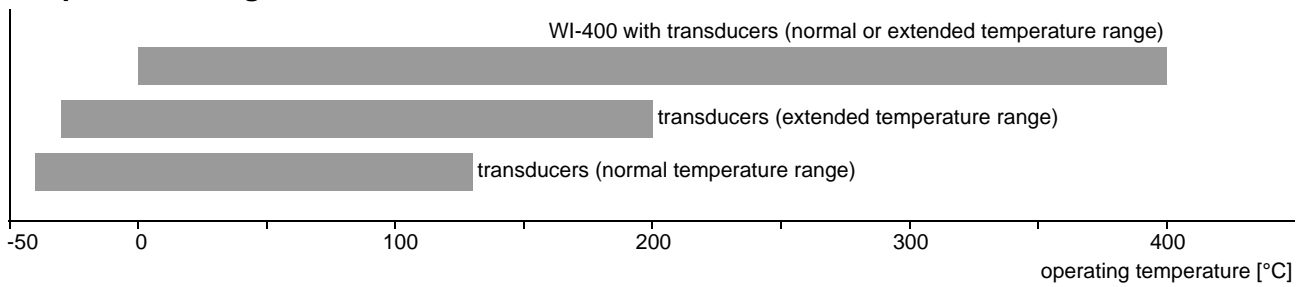
1...6	7	8	9	10	11...14	15	16	17	no. of character	description			
WaveInjector	transducer	-	measuring mode	size	-	fixation	outer pipe diameter <sup>1</sup>	-	coupling foil	WI tool	/	option	
WI-400										type			
K										shear wave transducers with transducer frequency G, K			
M										shear wave transducers with transducer frequency M, P (connection system TS, AS)			
Q										shear wave transducers with transducer frequency Q (connection system TS, AS)			
1										shear wave transducers with transducer frequency M, P (connection system NL)			
4										shear wave transducers with transducer frequency Q (connection system NL)			
D										reflection mode or diagonal mode			
S										small			
M										medium			
L										large			
V										very large			
C										chains			
T										threaded rods			
012										40...120 mm			
023										80...230 mm			
038										80...380 mm, WI-400x-X: 220...380 mm			
060										350...600 mm			
100										600...1000 mm			
A										280 °C			
B										400 °C			
C										280 °C and 400 °C			
N										without coupling foil			
M										WI tool (pipe planer)			
N										without tool			
Z										special design			
example													
WI-400	M	-	D	M	-	T	023	-	C	M	/		WaveInjector for transducers with transducer frequency M, with threaded rods, coupling foil and mechanical tool
		-			-			-			/		

<sup>1</sup> outer pipe diameter > 1000 mm on request

**Technical Data**

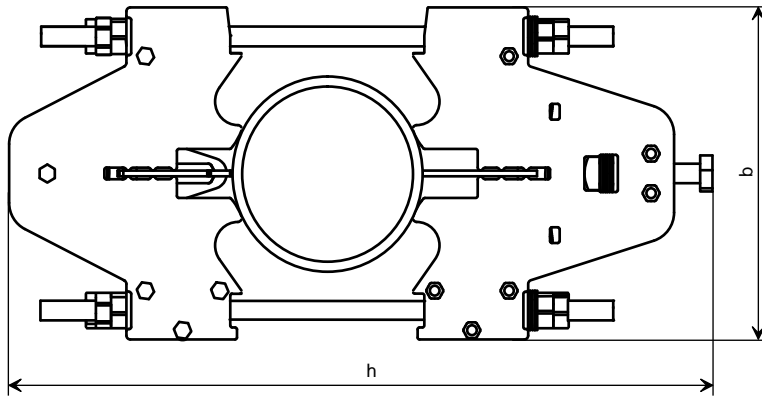
WaveInjector		WI-400K WI-400M WI-400Q	WI-4001 WI-4004
medium temperature	°C	0...400	
material		stainless steel 304 (1.4301)	
transducer clamping fixture			
remark		upgrade of a transmitter for the use with WaveInjector at the factory	

**Temperature Range**



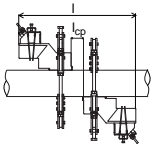
## Dimensions

### Pipe Mounting Fixtures with Threaded Rods WI-400x-xx-T

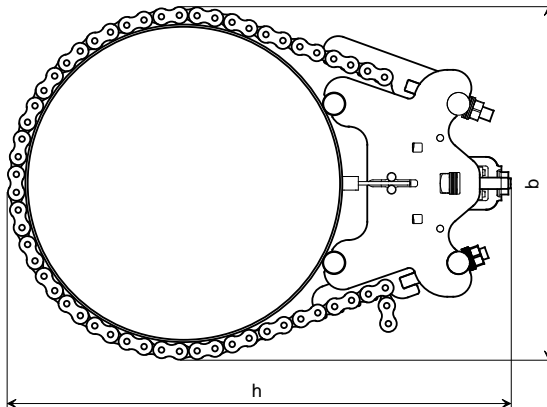


dimensions with mounted transducer:

- length  $l$ :  $2 \cdot 180 \text{ mm} + l_{cp}$   
(depending on application)
- width  $b$ :  
**WI-400x-xS**: 170 mm  
**WI-400x-xM**: 270 mm  
**WI-400x-xL**: 420 mm
- height  $h$ :  
 outer pipe diameter + 264 mm



### Pipe Mounting Fixtures und Chains WI-400x-xx-C



dimensions with mounted transducer:

- length  $l$ :  $2 \cdot 220 \text{ mm} + l_{cp}$   
(depending on application)
- width  $b$ :  
**WI-400x-xV**:  
 outer pipe diameter + 32 mm
- height  $h$ :  
 outer pipe diameter + 163 mm



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