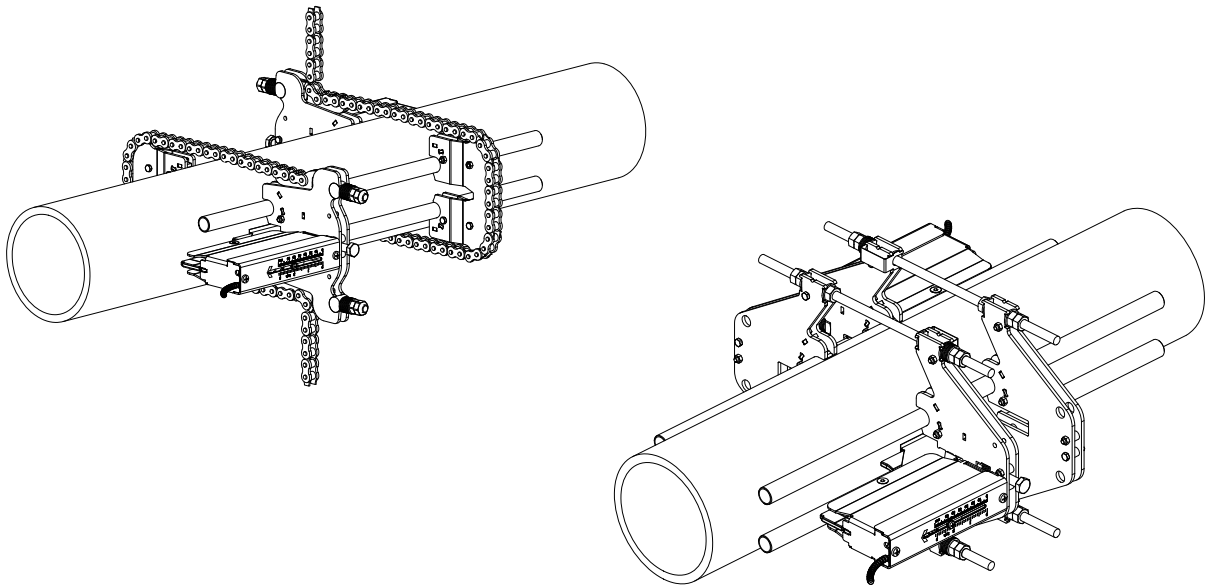


Flexim WaveInjector



Flow Measurement of Liquids and Steam at Extreme Temperatures

The WaveInjector extends the application range of the ultrasonic clamp-on flow measurement to temperatures of $-200...+630\text{ }^{\circ}\text{C}$.

The patented mounting fixture thermally separates the ultrasonic transducers from the hot or cold pipe and at the same time ensures good acoustic contact. Therefore, Flexim's standard transducers are suitable for long-term operation even at extreme temperatures.

Because the transducers are mounted on the outside of the pipe, it is not necessary to cut into the pipe or interrupt the operation of the facility for the setup of a flow measuring point.

Features

- Use of Flexim's standard clamp-on transducers at extreme temperatures of up to $630\text{ }^{\circ}\text{C}$
- Transducers available for flow measurement in explosive atmospheres
- Installation without cutting into the pipe and without interrupting the production process
- Permanent and reliable coupling of the transducers to the pipe
- Operation without wear and therefore maintenance-free, no drift

Applications

Flow measurement of fluids with extreme temperatures in power plants, chemical and petrochemical industry, e.g.:

- Pressurized water
- Steam
- Heat transfer oils
- Molten salt
- Bitumen
- Vacuum gas oils and residuals

Order code

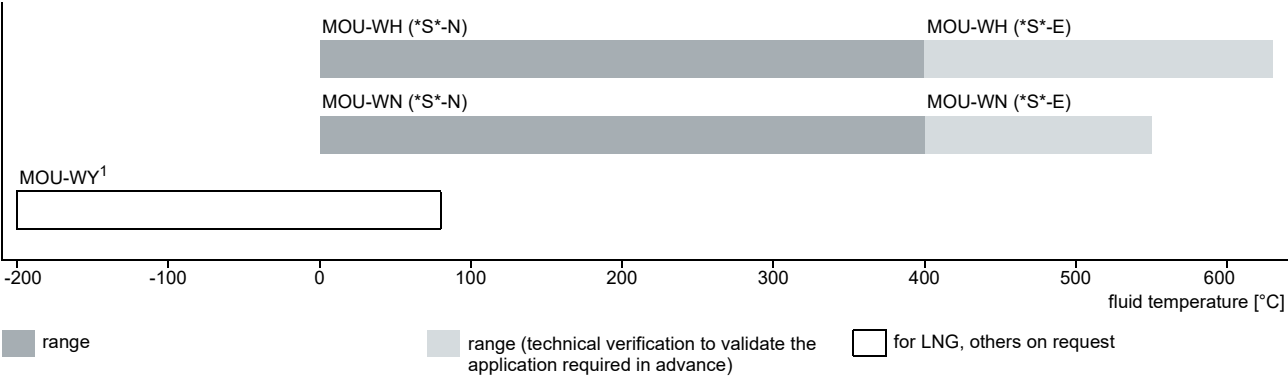
1...3	4...5	6	7	8	9	10...13	14...16	no. of character
transducer mounting fixture	WaveInjector	transducer	measurement arrangement	size	fixation	outer pipe diameter ¹	option	description
MOU	WN							max. 550 °C
	WH							max. 630 °C
	WY							for cryogenic liquids
		G						shear wave transducers with transducer frequency G
		K						shear wave transducers with transducer frequency K
		M						shear wave transducers with transducer frequency M
		P						shear wave transducers with transducer frequency P
		Q						shear wave transducers with transducer frequency Q
			D					reflection arrangement or diagonal arrangement
				S				small
				M				medium
				L				large
				V				very large
					C			chains
					T			threaded rods
						0070		33...70 mm
						0120		70...120 mm
						0170		70...125 mm
						0220		70...220 mm
						0370		70...370 mm
						0520		70...520 mm
						0560		350...560 mm
						0850		560...850 mm
						1000		600...1000 mm
							HNL	connection system NL (nonEx, FM)

¹ outer pipe diameter > 1000 mm on request

Coupling materials

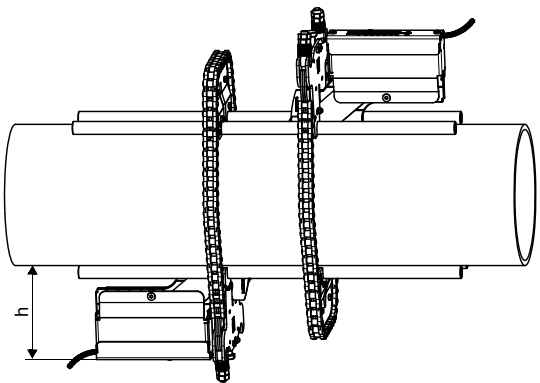
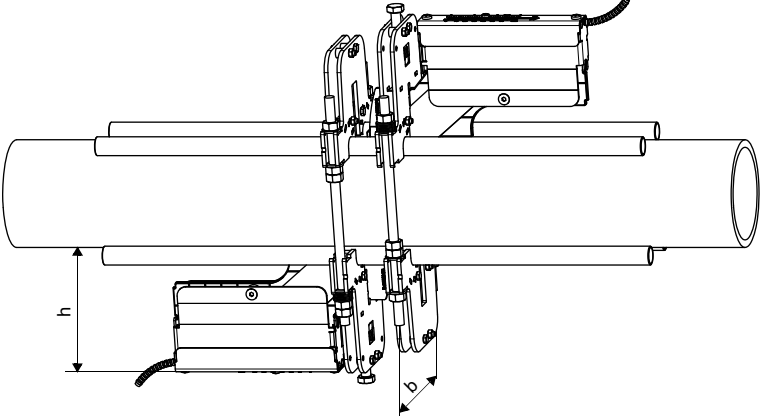
type	ambient temperature °C
coupling foil type A	max. 280
coupling foil type B	280...630
coupling foil type D	-200...+80

Temperature ranges



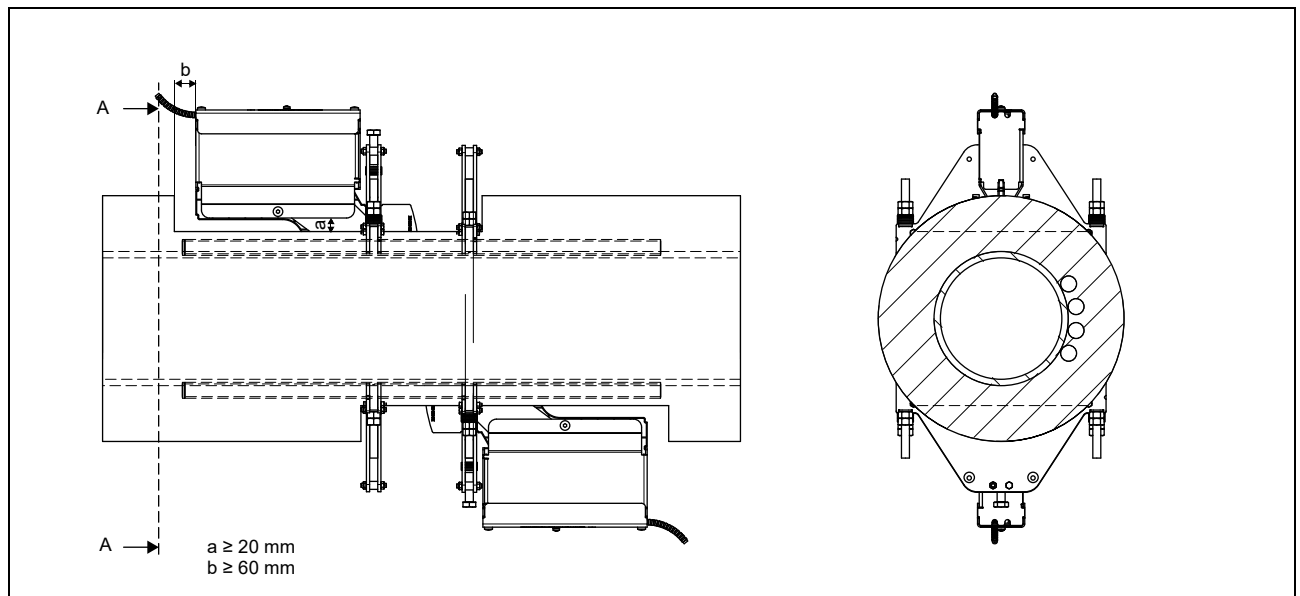
S-N: shear wave transducer, normal temperature range
S-E: shear wave transducer, extended temperature range
¹ see Technical specification TSFLUXUS_CYO_Vx-x

Transducer mounting fixture

<div>chains (MOU-WN*-DL-C)</div> <div></div>	<div>dimensions:</div> <ul style="list-style-type: none">width: outer pipe diameter + 32 mm (min. 200 mm)height: outer pipe diameter + 2 · h MOU-WNG, MOU-WNK: h = 178 mm MOU-WNM, MOU-WNP: h = 151 mm MOU-WNQ: h = 136 mmfluid temperature/material: max. 550 °C: stainless steel 304 (1.4301)outer pipe diameter: 70...1000 mm
<div>threaded rods (MOU-WH*-D*-T, MOU-WN*-D*-T)</div> <div></div>	<div>dimensions:</div> <ul style="list-style-type: none">width b: MOU-***-S: 170 mm MOU-***-M: 270 mm MOU-***-L: 420 mm MOU-***-V: 563 mmheight: outer pipe diameter + 2 · h MOU-**G, MOU-**K: h = 178 mm MOU-**M, MOU-**P: h = 151 mm MOU-**Q: h = 136 mmouter pipe diameter: MOU-***-S: 35...125 mm MOU-***-M: 70...220 mm MOU-***-L: 70...370 mm MOU-***-V: 70...520 mmfluid temperature/material: max. 550 °C: stainless steel 304 (1.4301) max. 630 °C: stainless steel 304 (1.4301), 309 (1.4828)

Pipe insulation (by customer)

If necessary, the work can be supervised by a FLEXIM service technician.



Weather protection (by customer)

If the WaveInjector is used outdoor, it has to be protected against rain and humidity.

The weather protection must not cover the WaveInjector completely. At least 2 sides of the weather protection have to be opened for the exchange of heat with the environment.

None of the parts within the scope of delivery of the WaveInjector must be used for the installation of the weather protection.

The weather protection can be integrated within the pipe insulation.

If necessary, the work can be supervised by a FLEXIM service technician.

horizontal pipe	
	<p>fluid temperature $\leq 400\text{ }^{\circ}\text{C}$:</p> <p>$a \geq 60\text{ mm}$ $b \geq 100\text{ mm}$ $c \geq 100\text{ mm}$</p> <p>fluid temperature $> 400\text{ }^{\circ}\text{C}$:</p> <p>$a \geq 200\text{ mm}$ $b \geq 300\text{ mm}$ $c \geq 300\text{ mm}$</p>
vertical pipe	
	<p>fluid temperature $\leq 400\text{ }^{\circ}\text{C}$:</p> <p>$a \geq 100\text{ mm}$ $b \geq 100\text{ mm}$ $c \geq 100\text{ mm}$</p> <p>fluid temperature $> 400\text{ }^{\circ}\text{C}$:</p> <p>$a \geq 300\text{ mm}$ $b \geq 300\text{ mm}$ $c \geq 300\text{ mm}$</p>

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