

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 -328 to 1166 °F.

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 the pipe or interrupt the operation of the facility for the setup of a flow measuring point.

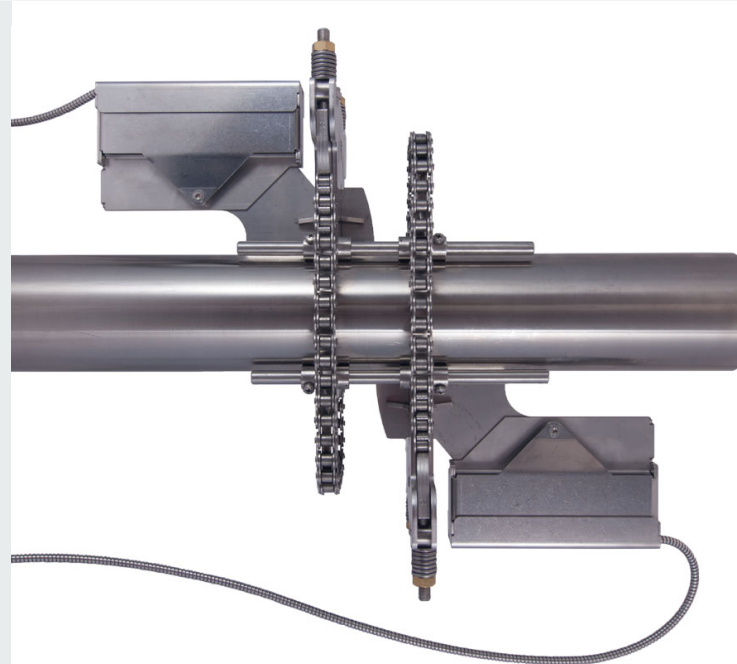
Features

- Use of FLEXIM's standard clamp-on transducers at extreme temperatures of up to -328 to 1166 °F
- Transducers available for flow measurement in explosive atmospheres
- Installation without cutting 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

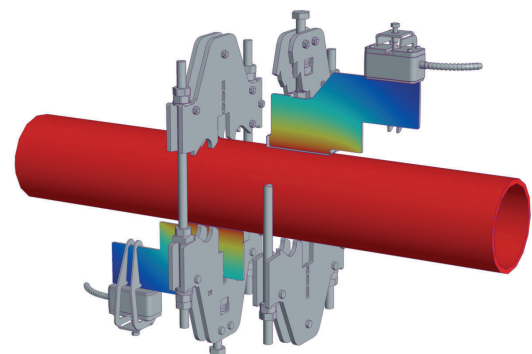
Applications

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



WaveInjector with chains



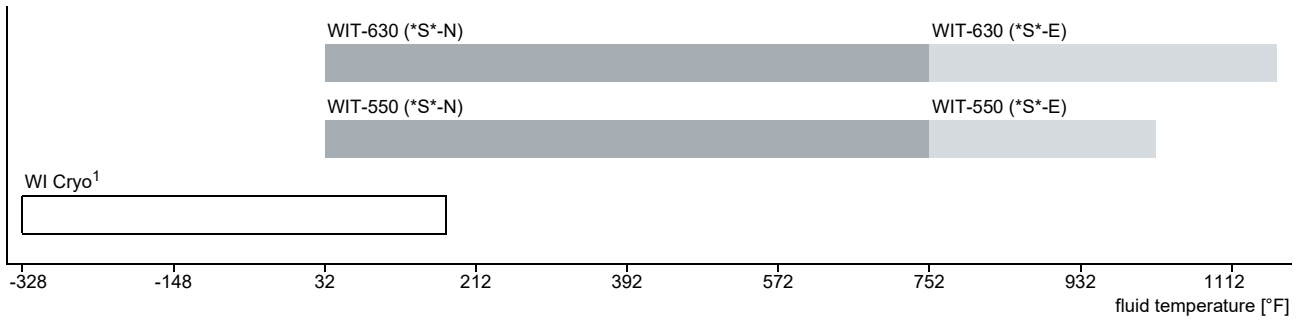
Temperature profile of WIT

Order code

1 to 6	7	8	9	10	11 to 14	15	16	17	no. of character
WavInjector	transducer	measurement arrangement	size	fixation	outer pipe diameter ¹	coupling pad	tool	option	description
WIT-550									max. 1022 °F
WIT-630									max. 1166 °F
WIT-CYO									for cryogenic liquids
	K								shear wave transducers with transducer frequency G, K
	M								shear wave transducers with transducer frequency M, P (connection system TS, T1)
	Q								shear wave transducers with transducer frequency Q (connection system TS, T1)
	1								shear wave transducers with transducer frequency M, P (connection system NL)
	4								shear wave transducers with transducer frequency Q (connection system NL)
		D							reflect arrangement or diagonal arrangement/direct mode
			S						small
			M						medium
			L						large
			V						very large
				C					chains
				T					threaded rods
					012				1.4 to 4.9 inch
					017				2.8 to 6.7 inch
					023				2.8 to 8.7 inch
					038				2.8 to 14.6 inch
					053				2.8 to 20.5 inch
					056				13.8 to 22 inch
					085				22 to 33.5 inch
					100				23.6 to 39.4 inch
						A			coupling pad max. 536 °F
						C			coupling pad max. 536 °F and coupling pad max. 1166 °F
						D			coupling pad min. -328 °F
							A		WIT-A tool
							M		WIT-M tool (pipe planer)
							O		WIT-R tool 110 V
							R		WIT-R tool 230 V
							N		without tool
								Z	special design

¹ outer pipe diameter > 39.4 inch on request

Temperature ranges

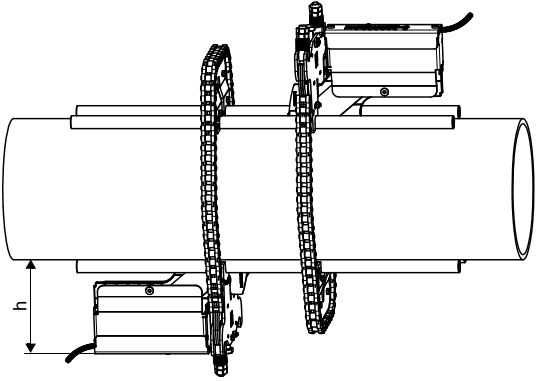
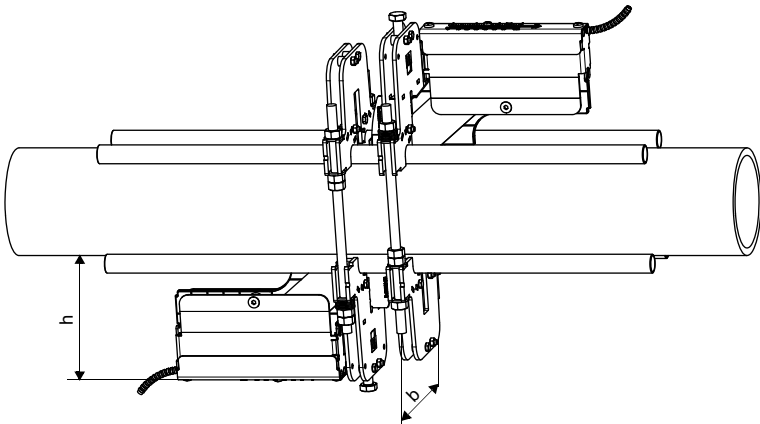


range
 range (technical verification to validate the application required in advance)
 for LNG, others on request

S-N: shear wave transducer, normal temperature range
 S-E: shear wave transducer, extended temperature range

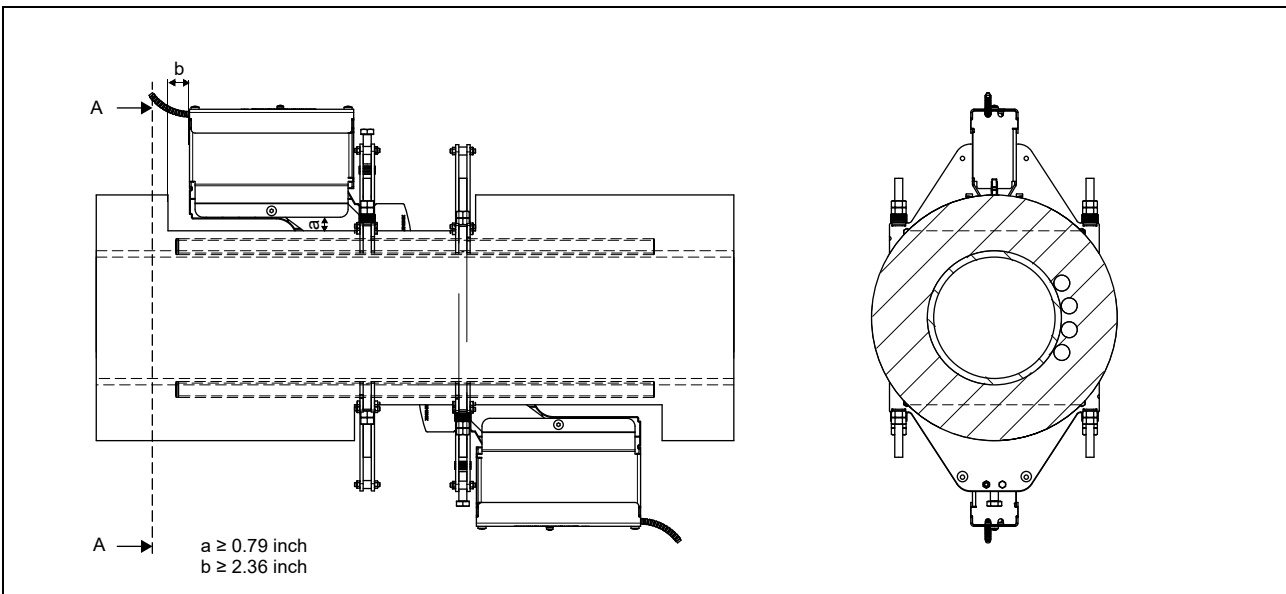
¹ see Technical specification TSFLUXUS_CYO_Vx-x

Transducer mounting fixture

<p>chains</p> 	<p>dimensions:</p> <ul style="list-style-type: none"> width: outer pipe diameter + 1.26 inch (min. 7.9 inch) height: outer pipe diameter + 2 · h WIT-550K: h = 7.01 inch WIT-550M, WIT-5501: h = 5.94 inch WIT-550Q, WIT-5504: h = 5.35 inch fluid temperature/material: max. 1022 °F: stainless steel 304
<p>threaded rods</p> 	<p>dimensions:</p> <ul style="list-style-type: none"> width b: WIT-***-S: 6.69 inch WIT-***-M: 10.63 inch WIT-***-L: 16.54 inch WIT-***-V: 22.17 inch height: outer pipe diameter + 2 · h WIT-***K: h = 7.01 inch WIT-***M, WIT-***4: h = 5.94 inch WIT-***Q, WIT-***4: h = 5.35 inch outer pipe diameter: WIT-***-S: 1.4 to 4.9 inch WIT-***-M: 2.8 to 8.7 inch WIT-***-L: 2.8 to 14.6 inch WIT-***-V: 2.8 to 20.5 inch fluid temperature/material: max. 1022 °F: stainless steel 304 max. 1166 °F: stainless steel 304, 309

Pipe insulation (by customer)

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



Weather protection (by customer)

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

The weather protection must not cover the Wavelnjector 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 Wavelnjector 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 ≤ 752 °F: $a \geq 2.4$ inch $b \geq 3.9$ inch $c \geq 3.9$ inch</p> <p>fluid temperature > 752 °F: $a \geq 7.9$ inch $b \geq 11.8$ inch $c \geq 11.8$ inch</p>
vertical pipe	
	<p>fluid temperature ≤ 752 °F: $a \geq 3.9$ inch $b \geq 3.9$ inch $c \geq 3.9$ inch</p> <p>fluid temperature > 752 °F: $a \geq 11.8$ inch $b \geq 11.8$ inch $c \geq 11.8$ inch</p>



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