FLEXIM

Technical specification

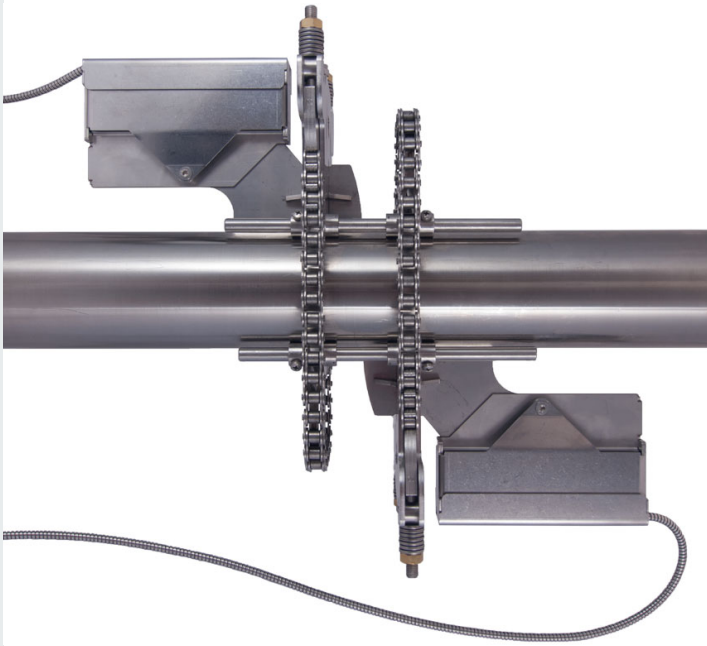
WaveInjector

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 °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.

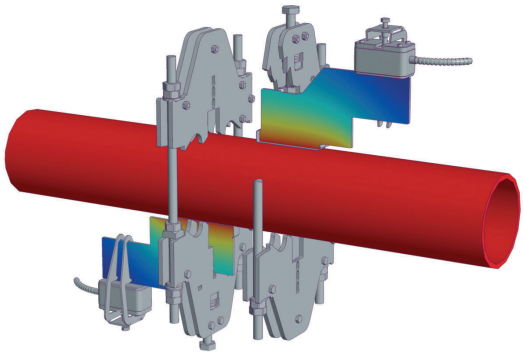
Because the transducers are mounted on the outside of the pipe, it is not necessary to cut into the pipe or interrupt the operation of the facility for the setup of a flow measuring point.



WaveInjector with chains

Features

- Use of FLEXIM's standard clamp-on transducers at extreme temperatures of up to 630 °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



Temperature profile of WIT

Applications

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

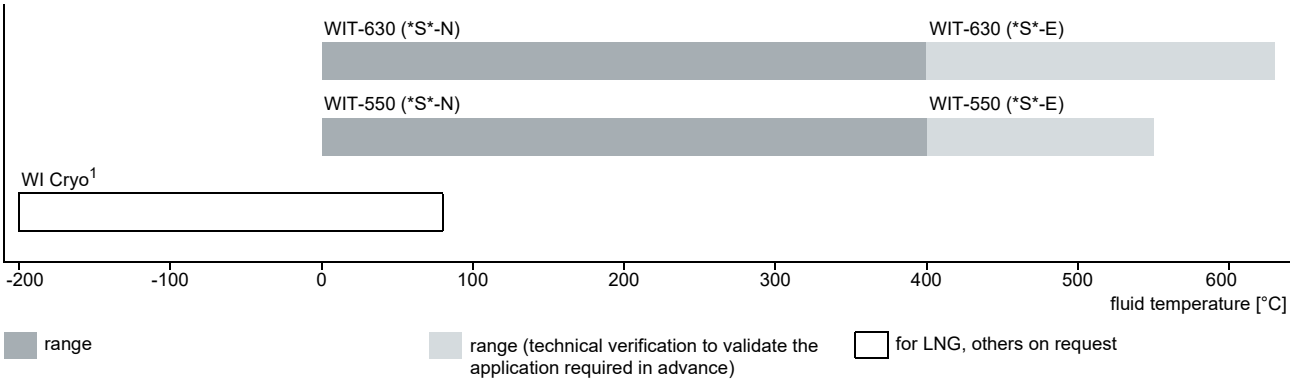
- Pressurized water
- Steam
- Heat transfer oils
- Molten salt
- Bitumen
- Vacuum gas oils and residuals

Order code

1...6	7		8	9		10	11...14		15	16		17	no. of character
WaveInjector	**transducer**	**-**	**measurement arrangement**	**size**	**-**	**fixation**	**outer pipe diameter[1]**	**-**	**coupling foil**	**tool**	**/**	**option**	**description**
WIT-550													max. 550 °C
WIT-630													max. 630 °C
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, AS)
	Q												shear wave transducers with transducer frequency Q (connection system TS, T1, 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 arrangement or diagonal arrangement
				S									small
				M									medium
				L									large
				V									very large
						C							chains
						T							threaded rods
							012						35...125 mm
							017						70...170 mm
							023						70...220 mm
							038						70...370 mm
							053						70...520 mm
							056						350...560 mm
							085						560...850 mm
							100						600...1000 mm
									A				coupling foil max. 280 °C
									C				coupling foil max. 280 °C and coupling foil max. 630 °C
									D				coupling foil min. -200 °C
										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 > 1000 mm on request

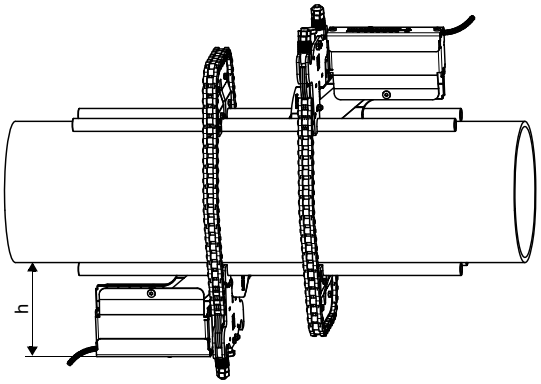
Temperature ranges



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

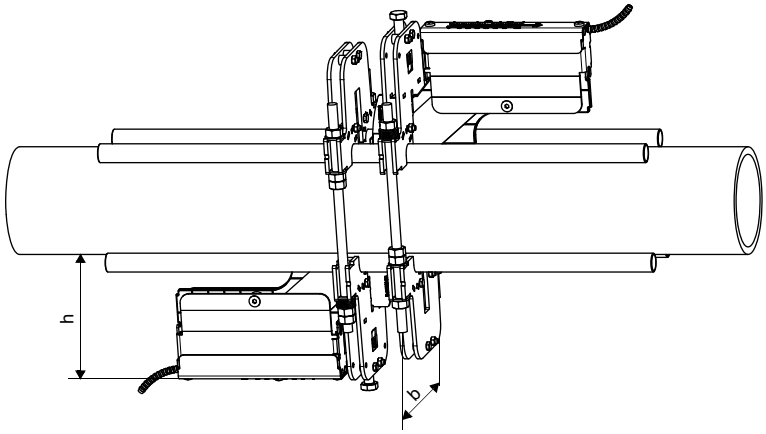
chains



dimensions:

- width:
  outer pipe diameter + 32 mm
  (min. 200 mm)
- height:
  outer pipe diameter + 2 · h
  WIT-550K: h = 178 mm
  WIT-550M, WIT-5501: h = 151 mm
  WIT-550Q, WIT-5504: h = 136 mm
- fluid temperature/material:
  max. 550 °C: stainless steel 304 (1.4301)

threaded rods

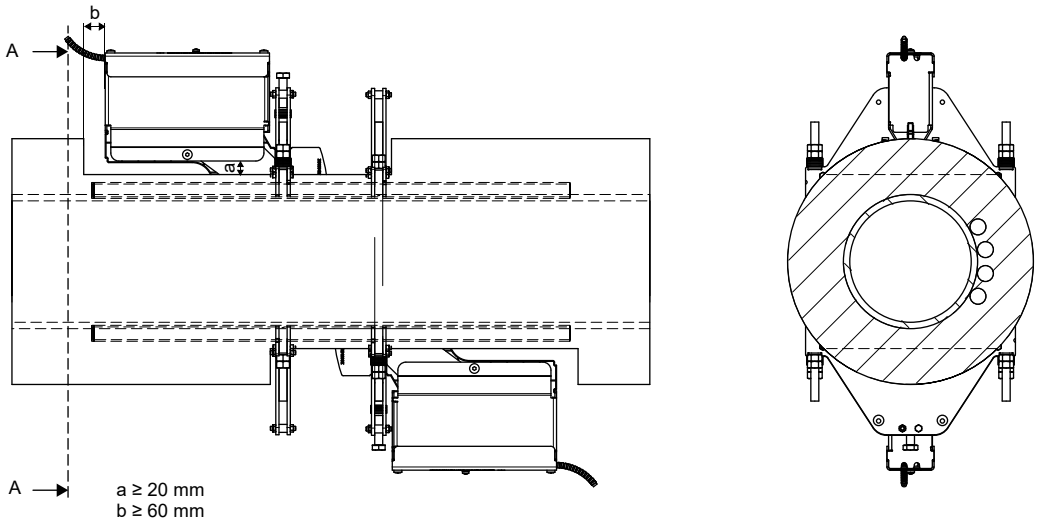


dimensions:

- width b:
  WIT-**-*S**: 170 mm
  WIT-**-*M**: 270 mm
  WIT-**-*L**: 420 mm
  WIT-**-*V**: 563 mm
- height: outer pipe diameter + 2 · h
  WIT-*K**: h = 178 mm
  WIT-*M, WIT-***1**: h = 151 mm
  WIT-*Q, WIT-***4**: h = 136 mm
- outer pipe diameter:
  WIT-**-*S**: 35...125 mm
  WIT-**-*M**: 70...220 mm
  WIT-**-*L**: 70...370 mm
  WIT-**-*V**: 70...520 mm
- fluid 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.

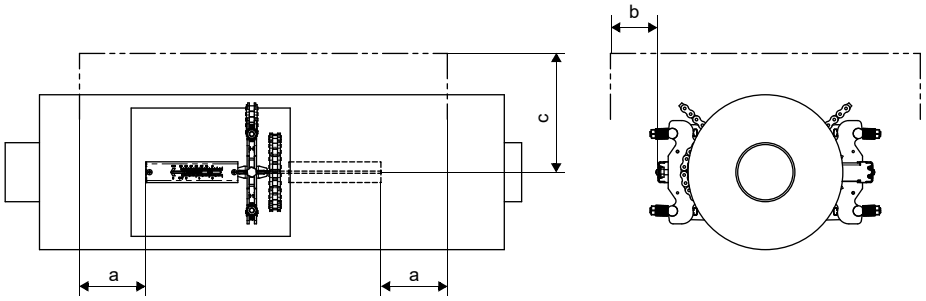
The weather protection must not cover the WaveInjector completely. At least 2 sides of the weather protection have to be opened for the exchange of heat with the environment.

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.

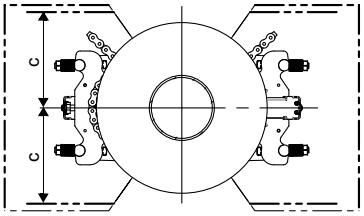
horizontal pipe

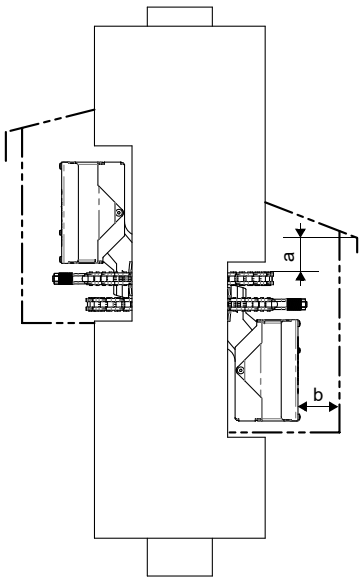


fluid temperature ≤ 400 °C:
a ≥ 60 mm
b ≥ 100 mm
c ≥ 100 mm

fluid temperature > 400 °C:
a ≥ 200 mm
b ≥ 300 mm
c ≥ 300 mm

vertical pipe





fluid temperature ≤ 400 °C:
a ≥ 100 mm
b ≥ 100 mm
c ≥ 100 mm

fluid temperature > 400 °C:
a ≥ 300 mm
b ≥ 300 mm
c ≥ 300 mm

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