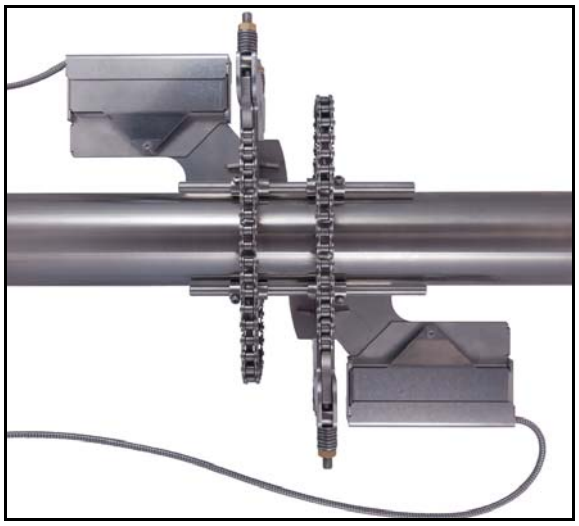
Flow Measurement of Liquids at Extreme Temperatures

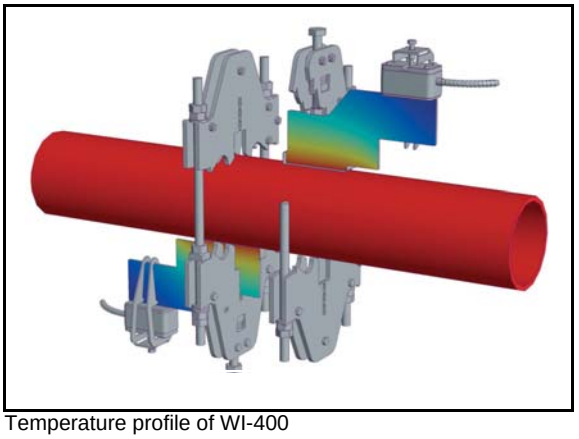
The WaveInjector extends the application range of the ultrasonic clamp-on flow measurement to temperatures of over 200 °C and below -40 °C.

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



WaveInjector WI-400 with chains



Temperature profile of WI-400

Features

- Use of FLEXIM's standard clamp-on transducers at extreme temperatures of up to 400 °C
  - Special solutions for temperatures of max. 600 °C possible
  - Special solutions for temperatures of min. -200 °C possible
- 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

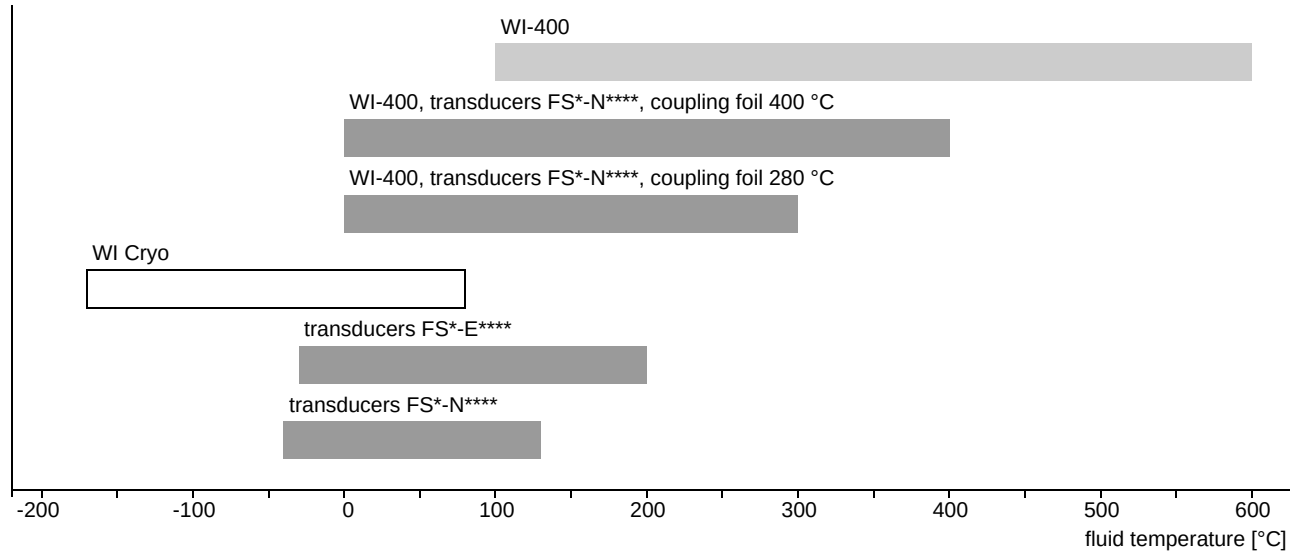
- Flow measurement in the chemical industry and petrochemical industries, e.g.
  - Bitumen
  - Vacuum distillate
  - Pressurized water
  - Heat transfer oils

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
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 arrangement or diagonal arrangement
				S									small
				M									medium
				L									large
						C							chains
						T							threaded rods
							004						12...70 mm
							010						70...130 mm
							012						40...120 mm
							015						70...230 mm
							017						70...170 mm
							022						70...380 mm
							023						80...230 mm
							038						80...380 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. 400 °C
										A			automatic WI tool
										M			mechanical WI tool (pipe planer)
										O			WIT-R tool 110 V DC
										R			WIT-R tool 230 V DC
										N			without tool
												Z	special design
example													
WI-400	M	-	D	L	-	C	017	-	C	M			WaveInjector for shear wave transducers with transducer frequency M, with chains, coupling foil and mechanical WI tool
		-			-			-			/		

[1] outer pipe diameter > 1000 mm on request

Application ranges



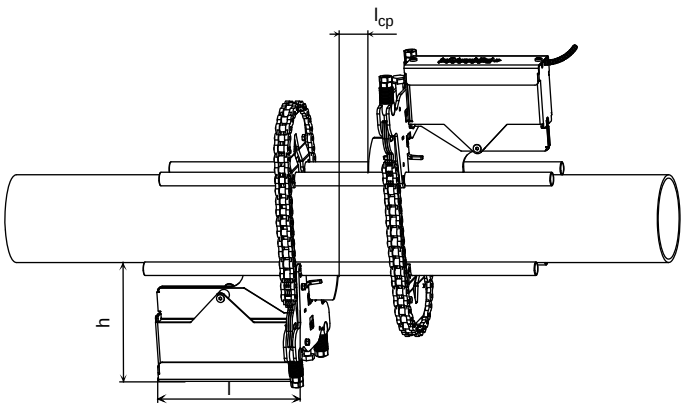
FS*-N**** - shear wave transducer, normal temperature range

FS*-E**** - shear wave transducer, extended temperature range

recommended | depending on application, on request | for LNG, others on request

Transducer mounting fixture

pipe mounting fixtures und chains WI-400*-*L-C



dimensions:

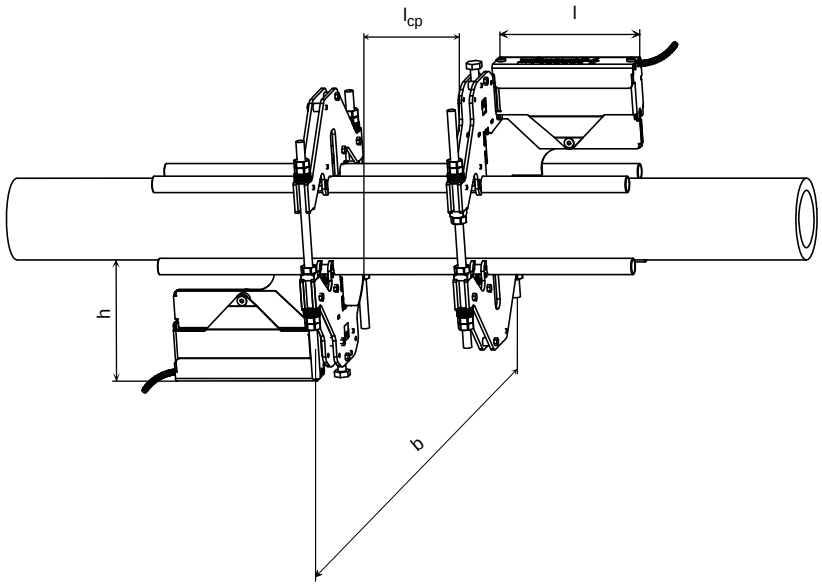
- length: $2 \cdot l + l_{cp}$
  WI-400K: l = 279 mm
  WI-400M, WI-400Q, WI-4001, WI-4004: l = 243 mm
  l_{cp} = depending on application

- width:
  outer pipe diameter + 32 mm
  (min. 200 mm)

- height:
  outer pipe diameter + $2 \cdot h$
  WI-400K: h = 178 mm
  WI-400M, WI-4001, **WI-400Q, WI-4004**: h = 200 mm

material: stainless steel 304 (1.4301)

pipe mounting fixtures with threaded rods WI-400*--T**



dimensions:

- length: $2 \cdot l + l_{cp}$
  WI-400K: l = 279 mm
  WI-400M, WI-400Q, WI-4001, WI-4004: l = 243 mm
  l_{cp} = depending on application

- width b:
  WI-400*-*S: 170 mm
  WI-400*-*M: 270 mm
  WI-400*-*L: 420 mm

- height: outer pipe diameter + $2 \cdot h$
  WI-400K: h = 178 mm
  WI-400M, WI-4001: h = 151 mm
  WI-400Q, WI-4004: h = 147 mm

material: stainless steel 304 (1.4301)

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