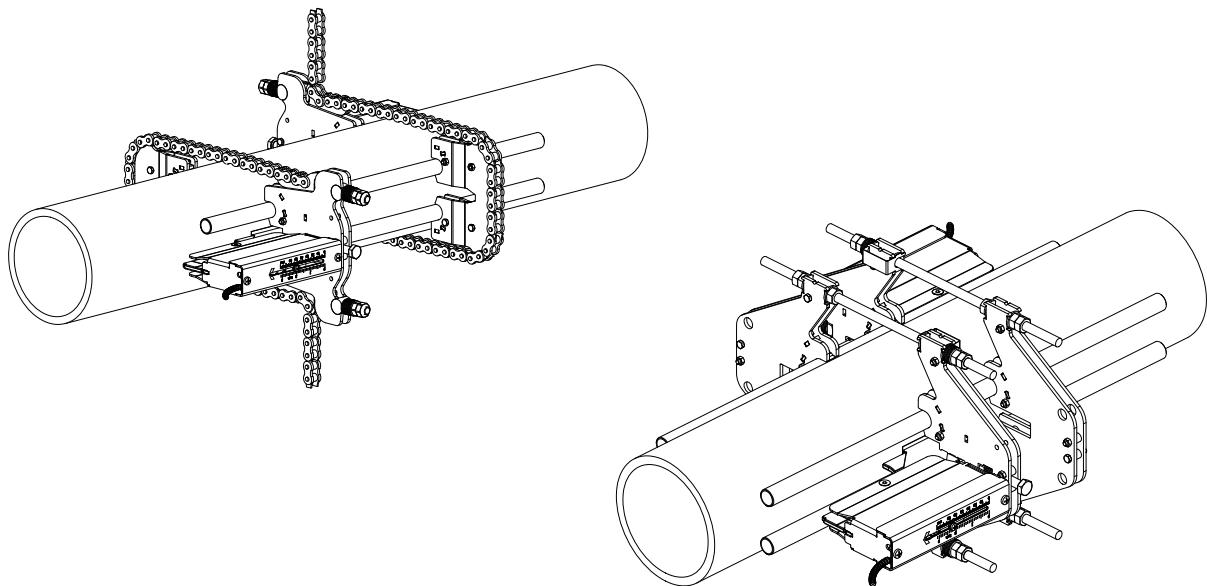


Flexim WaveInjector



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 °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 °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

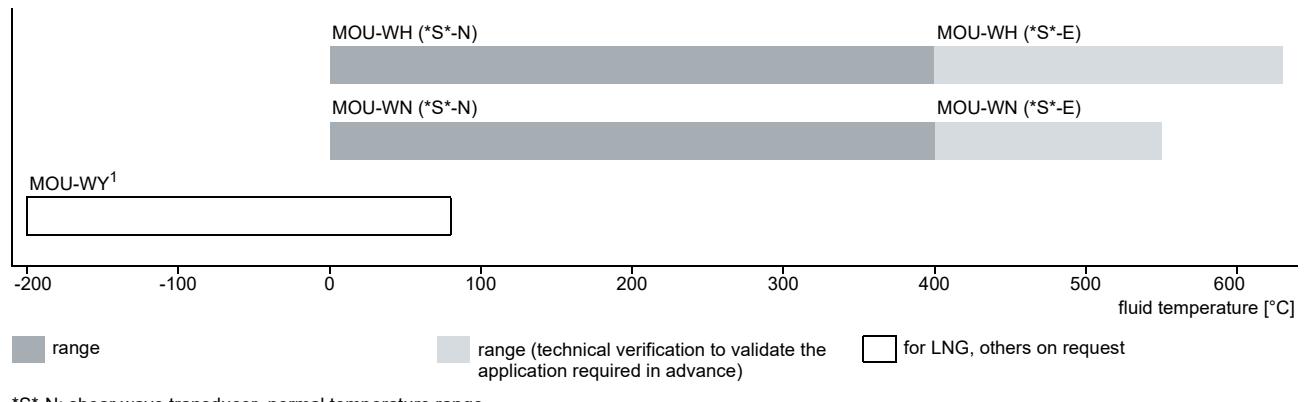
| 1...3 transducer mounting fixture | 4...5 WaveInjector transducer | 6 | 7 | 8 | 9 | 10...13 outer pipe diameter ¹ | 14...16 | no. of character description |
|---|-------------------------------------|------|-----|---|---|---|---------|--|
| MOU | | | | | | | | |
| | WN | | | | | | | max. 550 °C |
| | 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



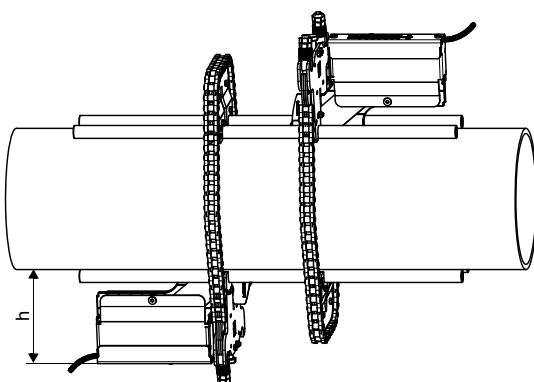
S-N: shear wave transducer, normal temperature range

S-E: shear wave transducer, extended temperature range

¹ see Technical specification TSFLUXUS_CYO_Vx-x

Transducer mounting fixture

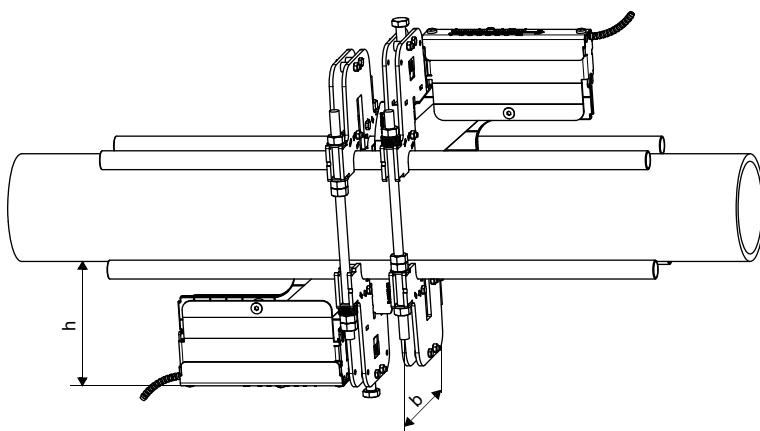
chains (MOU-WN*-DL-C)



dimensions:

- 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 mm
- fluid temperature/material:
max. 550 °C: stainless steel 304 (1.4301)
- outer pipe diameter:
70...1000 mm

threaded rods (MOU-WH*-D*-T, MOU-WN*-D*-T)

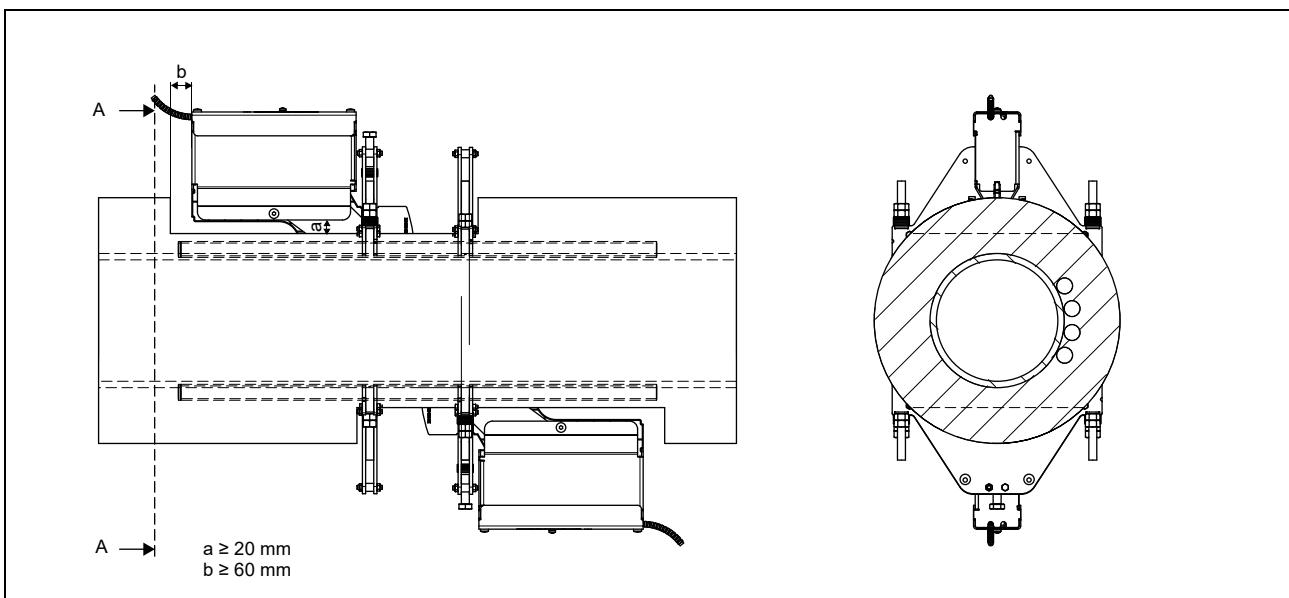


dimensions:

- width b:
MOU-*-S:** 170 mm
MOU-*-M:** 270 mm
MOU-*-L:** 420 mm
MOU-*-V:** 563 mm
- height: outer pipe diameter + 2 · h
MOU-G, MOU-**K:** h = 178 mm
MOU-M, MOU-**P:** h = 151 mm
MOU-Q:** h = 136 mm
- outer pipe diameter:
MOU-*-S:** 35...125 mm
MOU-*-M:** 70...220 mm
MOU-*-L:** 70...370 mm
MOU-*-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)

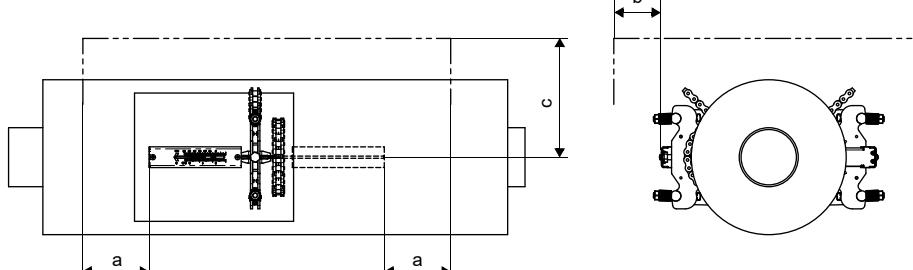
If the WavelInjector is used outdoor, it has to be protected against rain and humidity.

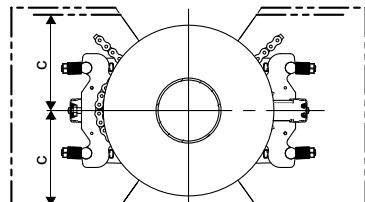
The weather protection must not cover the WavelInjector completely. At least 2 sides of the weather protection have to be opened for the exchange of heat with the environment.

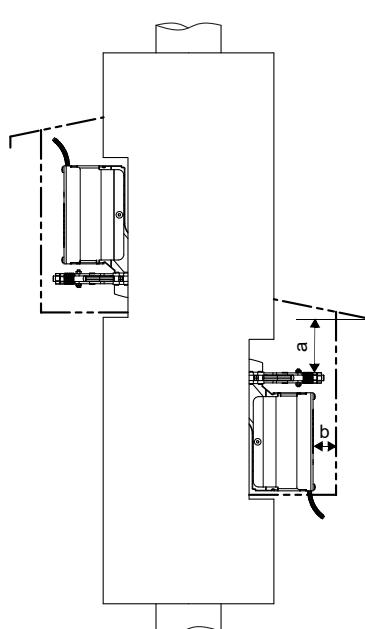
None of the parts within the scope of delivery of the WavelInjector must be used for the installation of the weather protection.

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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