

Dimensions [mm]

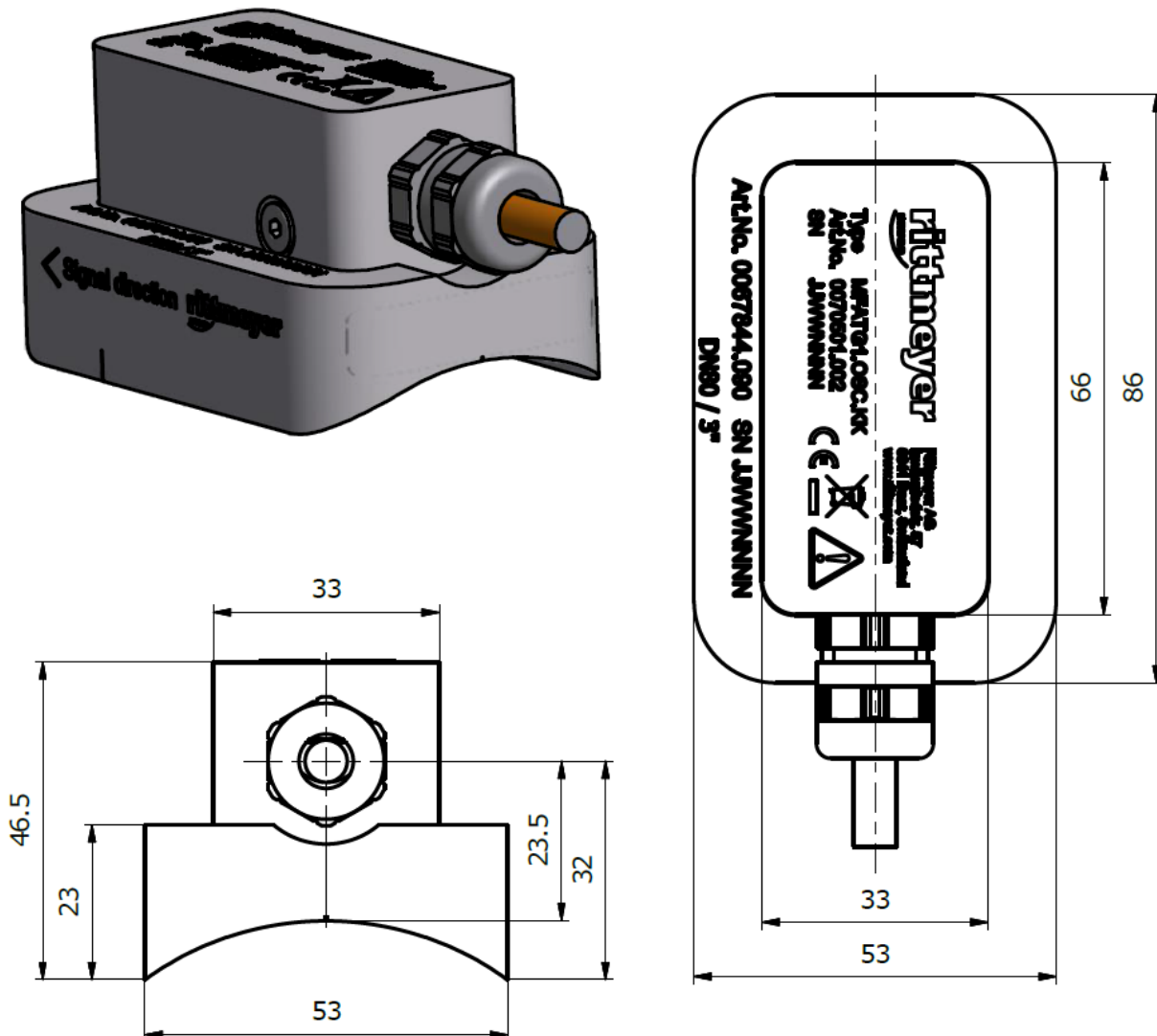


Figure 1: Oscillator insert and magnetic frame of transducer MFATG1

Short description

The RISONIC modular transducers MFATG1 serve alternately as transmitter and receiver. A voltage surge excites the piezo ceramic oscillator. The ultrasonic sound pulses propagate through the transducer insert, through the pipe wall and into the medium to be measured. On the end of the sound path (either on the same or the opposite site of the pipe), the sound pulses are received, converted into an electrical signal and further processed by the RISONIC Ultrasonic Transit Time and Controller modules.

The RISONIC modular transducers can be placed away at a maximum distance of 30 m from the RISONIC Ultrasonic Transit Time module. To prevent cables from damages, we suggest applying protection tubes and/or flexible conduits.

Layout for clamp-on measurement

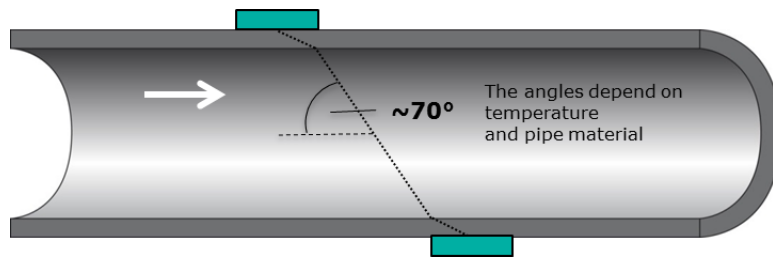


Figure 2: Layout of a Z clamp-on measurement

Measurement arrangements

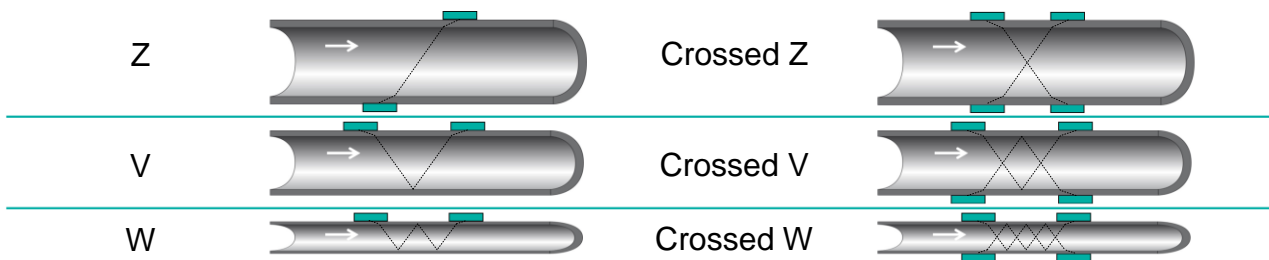


Figure 3: Supported measurement arrangements

Measurement arrangements vs. approved pipe diameter

Measurement arrangement	Outer pipe diameter ¹	Min. needed installation space ²
W	0.08 m – 0.20 m	0.51 m – 0.73 m
V	0.10 m – 0.30 m	0.46 m – 0.64 m
Z	0.20 m – 0.60 m	0.46 m – 0.64 m

Table 1: Measurement arrangements vs. approved outer pipe diameter and min. needed installations space

¹ The sensors cannot be mounted on pipes smaller than 0.08 m. The precise range of allowed pipe diameters depends on wall thickness and material of the pipe, and additional coatings on the inner/outer side of the pipe (e.g. coating for corrosion protection).

² Min. needed installation space for a steel pipe with wall thickness of 5 mm, without inner/outer coating and a water temperature of 18°C.

Ordering information

Main components for a clamp-on measurement

The RICTRL.020, as opposed to the RICTRL.010, supports mathematical functions which for example could be used for simple pipe rupture monitoring.

Important notes:

- Transducers are shipped as one pair (1P) incl. magnetic frames and coaxial cables for a one-path measurement. For a crossed-Z measurement arrangement, you need to order 2 MFATG1.xxx sensor pairs!
- Depending on the pipe diameter, suitable transducers must be ordered!
- Starting from 2017, the oscillator inserts are available with pre-mounted coaxial cables (length of 30 m). Therefore the standard coaxial cables with plug MFATZ.KKL are not needed anymore.

Type	Description	Order No.
RICTRL.010	Instrumentation Controller 010	0067760.010
RIMOUSTT	RISONIC modular USTT module	0067751.001
MFATG1.090.KK.030	RISONIC transducer G1 1P 1 MHz (Ø 90), for outer pipe diameter 0.080 ... 0.100 m (3" ... 4"), with 30m coaxial cable	0070479.101
MFATG1.120.KK.030	RISONIC transducer G1 1P 1 MHz (Ø 120), for outer pipe diameter 0.100 ... 0.125 m (4" ... 5"), with 30m coaxial cable	0070479.102
MFATG1.150.KK.030	RISONIC transducer G1 1P 1 MHz (Ø 150), for outer pipe diameter 0.125 ... 0.200 m (5" ... 8"), with 30m coaxial cable	0070479.103
MFATG1.250.KK.030	RISONIC transducer G1 1P 1 MHz (Ø 250), for outer pipe diameter 0.200 ... 0.300 m (8" ... 12"), with 30m coaxial cable	0070479.104
MFATG1.400.KK.030	RISONIC transducer G1 1P 1 MHz (Ø 400), for outer pipe diameter 0.300 ... 0.600 m (12" ... 24"), with 30m coaxial cable	0070479.105

Table 2: Ordering information - main components

Mounting accessories for a clamp-on measurement

Type	Description	Order No.
MFATGZ.GEL	Ultrasonic coupling gel	6001101
MFATGZ.ADH1	Adhesive set: Araldite, cleaner, 10 nozzles	6001100
MFATGZ.ADH.DISP	Adhesive dispenser	6001102

Table 3: Ordering information - mounting accessories

Spare parts for clamp-on transducer type G1

Type	Description	Order No.
MFATG1.OSC.KK.030	Oscillator insert of MFATG1 with 30m cable	0070501.002
MFATG1.FRM090	Magnetic frame for MFATG1.090 (Ø 090)	0067844.090
MFATG1.FRM120	Magnetic frame for MFATG1.120 (Ø 120)	0067844.120
MFATG1.FRM150	Magnetic frame for MFATG1.150 (Ø 150)	0067844.150
MFATG1.FRM250	Magnetic frame for MFATG1.250 (Ø 250)	0067844.250
MFATG1.FRM400	Magnetic frame for MFATG1.400 (Ø 400)	0067844.400
MFATG1.OSC	Obsolete type: oscillator insert of MFATG1 with connector	0070501.001

Table 4: Ordering information - spare parts

Technical data

- Transducer protection class:..... IP65
- Frequency of oscillator:..... 1 MHz
- Max. cable length to RIMOUSTT:... 30 m / 98 ft.
- Minimum sound path length:..... 250 mm / 9.84"
- Maximum sound path length:..... 650 mm / 25.59"
- Penstock wall dimension: 1 to 60 mm / 0.3" to 2.36" (thicker on request)
- Transducer material:..... PEEK and Aluminum
- Operating temperature:..... -20 °C to +70 °C / -4 °F to +158 °F
- Storage temperature:..... -40 °C to +85 °C / -40 °F to +185 °F
- Humidity: 95% r. humidity
- Pipe coatings (inner/outer):..... Small layers (1 to 2 mm) of paint or anticorrosive coating. Thicker layers on request (refer to gluing section below for additional information).
- Supported pipe materials:..... refer to tables 5.1 and 5.2

Supported pipe materials (others on request)

Steel types
Mild steel
Carbon steel
Steel 1% carbon
Steel 1% carbon (hardened)
Stainless steel 302
Stainless steel 303
Stainless steel 304
Stainless steel 316
Stainless steel 347
Stainless steel 410
Stainless steel 430

Table 5.1: Steel types

Other materials
Aluminum
Aluminum (rolled)
Copper
Copper (annealed)
Copper (rolled)
Zinc (rolled)
Brass (naval)
CuNi (70%Cu 30%Ni)
CuNi (90%Cu 10%Ni)
Monel
Nickel
Inconel

Table 5.2: Other materials

Other materials (cont'd)
Cast iron
Ductile iron
Iron (Armco)
Iron (electrolytic)
Tin (rolled)
Titanium
Tungsten (annealed)
Tungsten (drawn)
Tungsten (carbide)
Cement, on request
Tar Epoxy, on request
GFRP (glass-fibre reinforced plastic), on request

