Dimensions

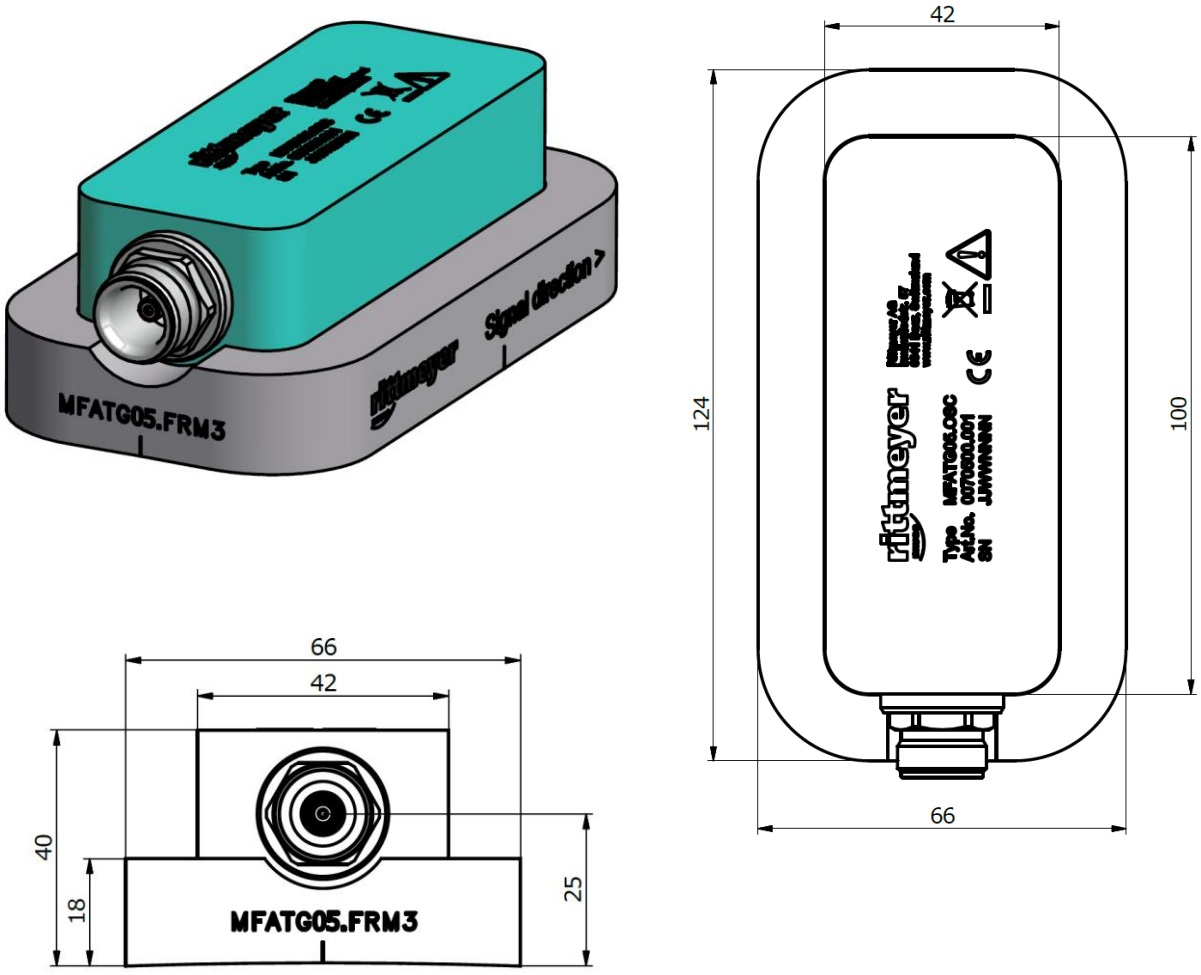

Figure 1: Oscillator insert and magnetic frame of transducer MFATG05

Short description

The RISONIC modular transducers MFATG05 serve alternately as transmitter and receiver. A voltage surge excites the piezoceramic 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, protection tubes and/or flexible conduits are to be used.

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Layout for clamp-on measurement

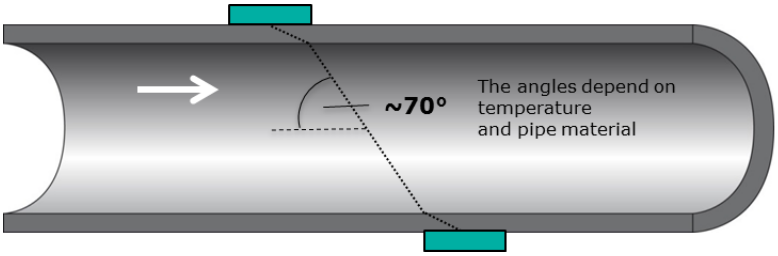

Figure 2: Layout of a one-path clamp-on measurement

Measurement arrangements

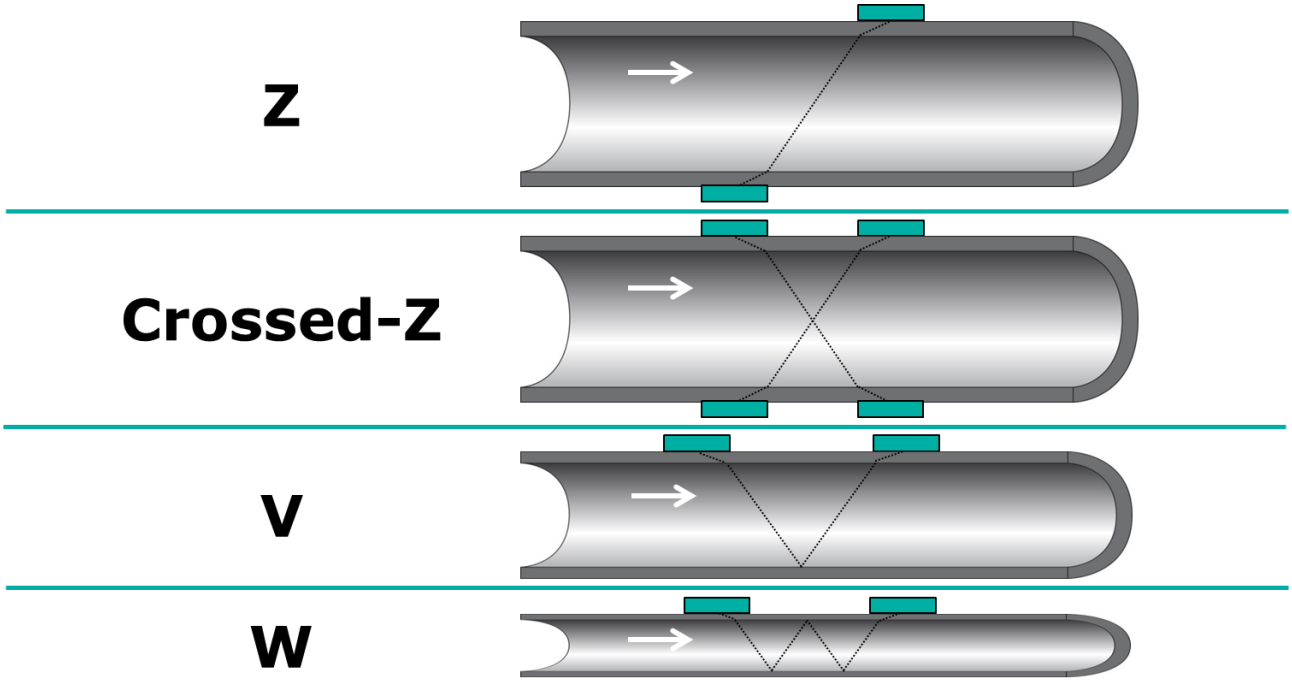

Figure 3: Measurement arrangements for different measurements

Measurement arrangements vs. approved pipe diameter

Sensor	Measurement arrangement	Pipe diameter*	Mounting depth**
MFATG05	W	0.3 m – 0.6 m	0.76 m – 1.24 m
MFATG05	V	0.5 m – 1.0 m	0.69 m – 1.08 m
MFATG05	Z, crossed-Z	0.9 m – 3.0 m	0.65 m – 1.55 m

Table 1: Measurement arrangements vs. approved pipe diameter

* The sensors should not be mounted on pipes smaller than 0.3 m
** Mounting depth for a pipe wall thickness of 20 mm

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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. Transducers are shipped as one pair (1P) for a one-path measurement. For a crossed-Z measurement arrangement, you need to order two MFATG05 sensor pairs.

Type	Description	Order No.
RICTRL.010	Instrumentation Controller 010	0067760.010
RICTRL.020	Instrumentation Controller 020	0067760.020
RIMOUSTT	RISONIC modular USTT module	0067751.001
MFATG05	RISONIC transducer G05 1P 500kHz (1 pair)	0070480.001

Table 2: Ordering information - main components

Mounting accessories for a clamp-on measurement

Type	Description	Order No.
MFATGZ.GEL	Ultrasonic coupling gel	6001101
MFATZ.KKL.015	Standard coax cable with plug L, 15m	0464870
MFATZ.KKL.030	Standard coax cable with plug L, 30m	0464875
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 G05

Type	Description	Order No.
MFATG05.OSC	Oscillator insert of MFATG05	0070500.001
MFATG05.FRM3	Magnetic frame of MFATG05	0067809.001
MFATG05.CAP	Protection cap of MFATG05	0067815.001
MFATG05.LIP-SEAL	Lip-seal of MFATG05	0067816.001

Table 4: Ordering information - spare parts

Technical data

- Transducer protection class IP65
- Frequency of oscillator ..... 500 kHz
- Max. cable length to RIMOUSTT ..... 30 m / 98 ft
- Minimum sound path length ..... 400 mm / 15.75″
- Maximum sound path length ..... 3200 mm / 126″ (larger on request)
- Penstock wall dimension ..... 8 to 60 mm / 0.3″ to 2.36″ (larger on request)
- Transducer material..... PEEK and Aluminium
- 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 coating..... Small layer (1 to 2 mm) of paint or anticorrosive coating. Larger layers on request. (See gluing section below for additional information.)
- Supported pipe materials..... See tables 5.1, 5.2 and 5.3

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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
Aluminium
Aluminium (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)
Lead
FRP
Tar Epoxy
Asbestos-cement

Table 5.3: Other materials

Gluing

If the pipe is not magnetic or a permanent mounting of the transducers is required, the magnetic frame will be glued to the pipe. Below you will find additional technical data for the proposed adhesive (Araldite 2047-1) and the gluing of the magnetic frame. For additional information, see the data sheet of the applied adhesive and read the corresponding working instructions carefully:

- Adhesive storage temperature ..... 2 °C to 8 °C / 35.6 °F to 46.4 °F (for a duration of 2 years)
  ..... 15 °C to 25 °C / 59.0 °F to 77.0 °F (for a duration of 6 month)
- Expiration date..... See product label on the product*
  (Do not reuse the adhesive once it has been opened)
- Application temperature..... 3 °C to 40 °C / 37.4 °F to 104 °F
- Open time ..... 10 minutes*
- Fixing time ..... 30 minutes in average*
- Loading time / full cure ..... 2 hours*
- Pipe coating..... See table below, others on request

Supported materials with good adhesion	• Epoxid • Polyurethane • PVC
Supported materials where adhesion only functions if the coating is abraded	• Polyamide • Rubber • FRP (if material is not porose)
Not supported materials	• Polyethylene • Polypropylene • Acryl

Table 6: Supported pipe coating material for gluing

* The times are valid for an application temperature of 10°C . The warmer the application temperature, the shorter the open, fixing and loading time.

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Notes on the correct use of ultrasonic flow measurement units

- The RISONIC modular transducers have to be mounted according to the preferences of Rittmeyer Ltd.. The positions of the transducers depend on the hydraulic conditions and the water pollution. Depending on the application and the required accuracy, the installation can be carried out by the customer. However, the guidelines in the assembly and setup instructions are to be followed for installation and setting up of the RISONIC flow measurement transducers.
- The liquid must be permeable to sound. It must not contain too high concentration of air bubbles or entrained particles and sediments.
- For the use of protection tubing for the cables, the client is responsible.

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