Dimensions

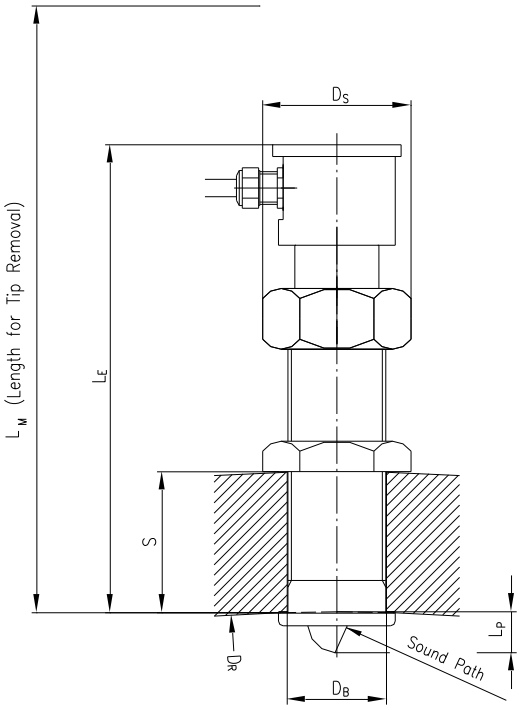

Figure 1*: Transducer type A mounted*

Figure 2: Spare transducer type MFATZ.xx

D_R = Diameter of pipe
D_S = Max. diameter of transducer
D_B = Diameter of bore
S = Pipe wall thickness
L_E = Height of installed transducer
L_P = Distance between tip of transducer and pipe wall

Dimensions of Transducers referring to Figure 1 [mm / ft., ”]							
	Pipe Dimensions		Transducer Dimensions				
Type Frequency	**D_R**	**S**	**D_S**	**L_E**	**L_P**	**L_M**	**D_B**
MFATA1x.60 1 MHz	750 - 2000[1)] 2.5 - 6.6 ft.[1)]	10 - 60 0.4” - 2.36”	52 2.05”	185 7.28”	12 0.47”	230 9.1”	34 1.34”
MFATA2x 1 MHz	1400 - 10000[1)] 4.6 - 32.8 ft.[1)]		64 2.52”	192 7.56”	18 0.71”	240 9.4”	43 1.69”
MFATA05x 500 kHz	4550 - 45000[2)] 14.9 - 147.6 ft.[2)]		90 3.54”	192 7.56”	40 1.57”	240 9.4”	60 2.36”

Table 1: Dimensions of transducers

[1)] In practice suitable corresponding diameter at 1E1P and **45°** path angle.
[2)] In practice suitable corresponding diameter at 1E1P and **65°** path angle.

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Short description

The RISONIC modular transducers MFATAxxx.xx serve alternately as transmitter and/or receiver. A voltage surge excites the piezoceramic oscillator. The ultrasonic sound pulses propagate through the transducer insert and into the medium to be measured. On the opposite side 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.

Given by the operating frequency, the RISONIC modular transducers can be placed away at a maximum distance from the RISONIC Ultrasonic Transit Time module of 300 m at 1 MHz or 500 m at 500 kHz.
To prevent cables from damages, protection tubes and/or flexible conduits are to be used.

Transducer insert changeable under pressure, replacement kit required.

Layouts for single and multiple path measurement

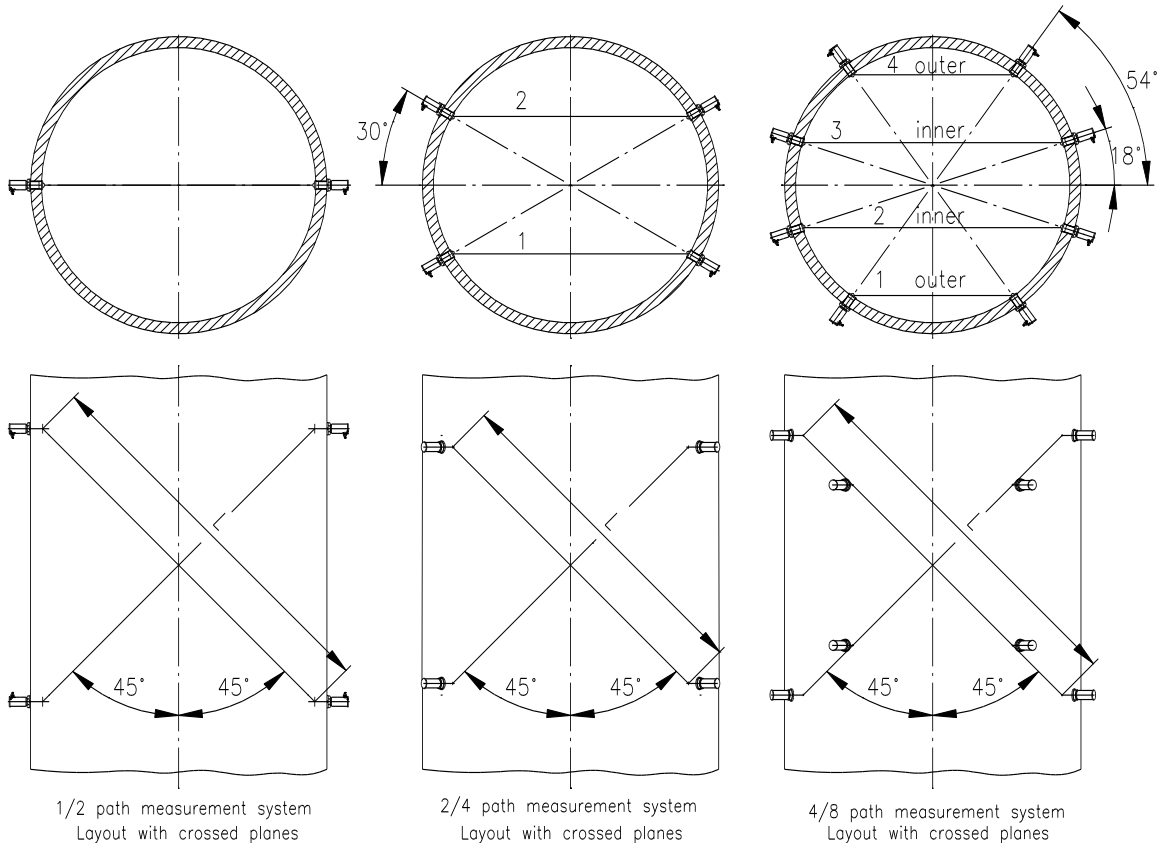

Figure 3: Layouts for single and multiple path measurement

Type of transducers

With the 1 MHz transducers there are a small (MFATA1x.60) and a large (MFATA2x) size of the piezoceramic oscillator which lead to an according shape of the transducers.

The piezoceramic oscillator frequency and size as well as the path arrangement define the min. and max. pipe diameter to be measured.

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Transducer type vs. approved pipe diameter

Type	Path angle	Pipe diameter at 1E1P		Pipe diameter at 1E2P		Pipe diameter at 1E4P	
		Min.	Max.	Min.	Max.	Min.	Max.
MFATA1x	45°	0.75 m[1)] 2.46 ft.[1)]	2.00 m 6.56 ft.	0.75 m[1)] 2.46 ft.[1)]	2.45 m 8.04 ft.	0.75 m[1)] 2.46 ft.[1)]	2.20 m 7.22 ft.
MFATA2x	45°	0.75 m[1)] 2.46 ft.[1)]	10.00 m 32.81 ft.	0.85 m 2.79 ft.	12.25 m 40.19 ft.	0.75 m 2.46 ft.	11.15 m 36.58 ft.
MFATA05	65°	4.55 m 14.93 ft.	45.00 m 147.64 ft	5.25 m 17.22 ft.	52.00 m 170.60 ft.	4.80 m 15.75 ft.	47.50 m 155.84 ft.

Table 2: Transducer type vs. approved pipe diameter

[1)] Mind: Internal pipe access is necessary for transducer installation. For smaller diameters use transducers type C.

Ordering information

Transducers ordered under order number are packed as a set for a complete single plane flow measurement system and content transducers for a one, two or four path measurement. For crossed plane systems twice the amount of transducers has to be ordered.

Path Qty.	RISONIC Transducers (Figure 1) Type	Order-No	Transducer Qty.	Weight [kg, lb.][1)]		Spare Transducers (Figure 2) Type	Order-No	Path Pos.[2)]
1	MFATA11.60	00 66 503.002	2	3.5 7.7 lb.		MFATZ.1	00 66 509.001	single
	MFATA21	00 66 553.001		4.9 10.8 lb.		MFATZ.2	00 66 559.001	
	MFATA051	TBD		11.2 24.7 lb.		MFATZ.50	TBD	
2	MFATA12.60	00 66 502.002	4	6.8 15.0 lb.		MFATZ.3	00 66 508.001	
	MFATA22	00 66 552.001		9.5 20.9 lb.		MFATZ.4	00 66 558.001	
	MFATA052	TBD		18.6 41.0 lb.		MFATZ.51	TBD	
4	MFATA14.60	00 66 501.002	8	14.0 30.9 lb.		MFATZ.5	00 66 507.001	inner (2+3)
						MFATZ.6	00 66 506.001	outer (1+4)
	MFATA24	00 66 551.001		19.5 43.0 lb.		MFATZ.7	00 66 557.001	inner (2+3)
						MFATZ.8	00 66 556.001	outer (1+4)
	MFATA054	00 66 420.001 65° path angle!		38.3 84.4 lb.		MFATZ.52	00 66 428.001	inner (2+3)
						MFATZ.53	00 66 429.001	outer (1+4)

Table 3: Ordering information

[1)] Weight of transducers including box
[2)] Refer to layout in Figure 3

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Technical data

- Protection class Transducer Sleeve: IP68 (NEMA 6) up to 80 bar / 1160 psi, (higher pressure on request)
- Protection class PCB housing: ..... IP68 (NEMA 6) up to 10 bar / 145 psi
- Frequency of oscillator: ..... | 1 MHz | 500 kHz |
- Max. cable length to RIMOUSTT: .... | 300 m / 984 ft. | 500 m / 1640 ft. |
- Minimum Sound Path Length: ..... | 250 mm / 9.8" | 5 000 mm / 197" |
- Maximum Sound Path Length: ..... | 15 000 mm / 591" | 50 000 mm / 1969" |
- Penstock wall Dimension:..... 10 to 60 mm / 0.4" to 2.36" (larger on request, smaller has to be reinforced with a sleeve/block flange)
- Material Transducer:..... Stainless steel 316L
- Operating Temperature: ..... -30 °C to +70 °C / -22 °F to +158 °F
- Humidity:..... 100 % r. humidity

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. IEC 60041 / ASME PTC 18 will to be executed by Rittmeyer specialists. However, the guidelines in the assembly and setup instructions are to be followed for survey of the transducer positions, installation and setting up of the RISONIC flow measurement transducers.
- For all diameters a transducer alignment accuracy under operating conditions of ±1° or better is necessary. To get the most accurate survey on the transducer positions a theodolite system is usually required.
- The fresh / potable water must not contain too high concentration of air bubbles or entrained particles and sediments.
- Surface on the inner wall of the pipe shall be prepared around the feedthrough hole for the use of the transducer gasket.
- On pipe diameters < 3m the gasket surface has to be countersunk.
- For the use of protection tubing for the cables the client is responsible.
- The layout and the position of the transducers depends on the hydraulic conditions and the influences of the elements upstream like valves, bends and restrictions.
- On request transducers with other sound path angles than 45° could be ordered.

Accessories (optional)

Description	Type	Order No.
Coaxial cable 75 ohm (Refer to data sheet 22.210.04649xx.001)	RIMOZKKxx	04 64 90x
Spare Transducer according to Table 3	MFATZ.xx	00 66 xxx.001
Reduction for Protection Tubing (M14x1.5 / NPT 1/2")	00 66 590.003	00 66 590.003
Tool case for transducer installation MFATA/B/C	MFATZMK3	00 66 575.003
Transducer insert replacement kit		On request

Table 4: Accessories

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