

Dimensions

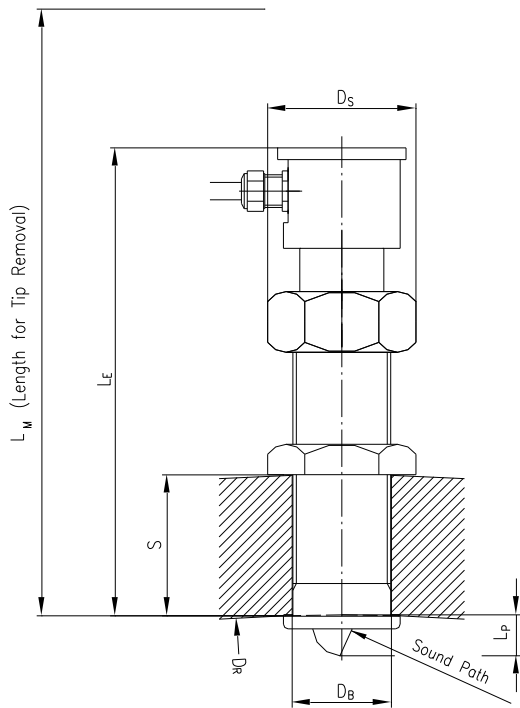


Figure 2: Spare transducer type MFATZ.xx

Figure 1: RISONIC transducer type A mounted

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

Dimensions referring to Figure 1 [ft., " / mm]							
Type Frequency	Pipe Dimensions		Transducer Dimensions				
	D_R^1	S	D_S	L_E	L_P	L_M	D_B
MFATA1x.60 1 MHz	2.5 – 6.9 ft. 750 – 2100	0.4" – 2.36"	2.05" 52	7.28" 185	0.47" 12	9.1" 230	1.34" 34
MFATA2x 1 MHz	2.5 – 34 ft. 750 – 10600		2.52" 64	7.56" 192	0.71" 18	9.4" 240	1.69" 43
MFATA05x 500 kHz	10.8 – 148 ft. 3600 ² - 45000	10 – 60	3.54" 90	7.56" 192	1.57" 40	9.4" 240	2.36" 60

Table 1: RISONIC transducer dimensions

¹ In practice suitable corresponding diameter at 1E1P and 45° path angle.

² Smaller pipe diameters are possible on request.

Short description

The RISONIC modular transducers MFATAxxx.xx serve alternately as transmitter and/or receiver. A voltage surge excites the piezo ceramic 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, a special replacement kit required.

Layouts for single and multiple path measurement

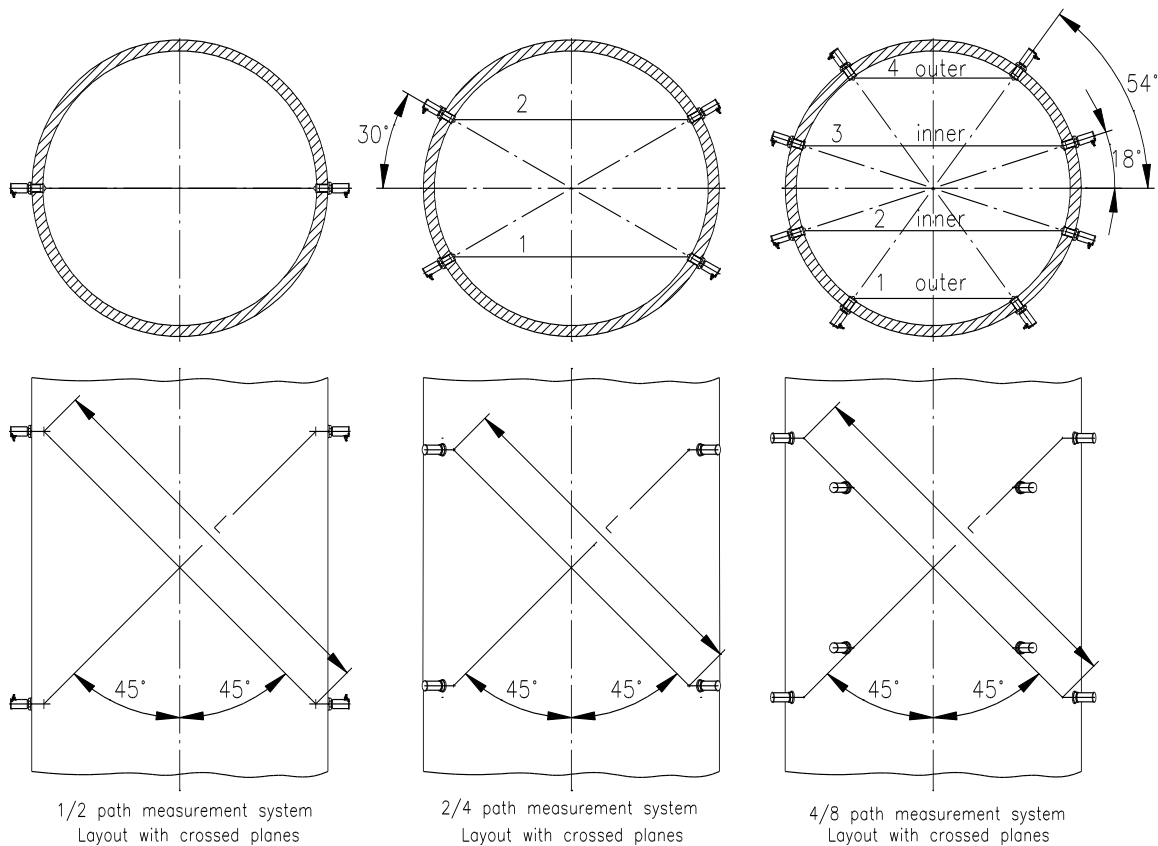


Figure 3: Layouts for single and multiple path measurement (45° path layer angle)

Type of transducers

Available are 1 MHz transducers with small (MFATA1x.60) and large (MFATA2x) sizes of the piezo ceramic oscillator and also a 500 kHz transducers (MFATA05x), which lead to according shapes of the transducers. The piezo ceramic oscillator frequency and size as well as the path arrangement define the min. and max. pipe diameter to be measured.

	<p>Data Sheet Hardware</p>	<p>DG DKap Stamm-Bez. Var Ind F Sp 22.210.00665xx.xxx.07.4.4</p>
---	----------------------------	---

Transducer type vs. approved pipe diameter

Type	Path layer angle	Pipe diameter at 1E1P		Pipe diameter at 1E2P		Pipe diameter at 1E4P	
		Min.	Max.	Min.	Max.	Min.	Max.
MFATA1x	45°	2.5 ft. ³ 0.75 m ³	6.9 ft. 2.10 m	2.5 ft. ³ 0.75 m ³	8.0 ft. 2.40 m	2.5 ft. ³ 0.75 m ³	7.3 ft. 2.20 m
MFATA2x	45°	2.5 ft. ³ 0.75 m ³	34.0 ft. 10.60 m	2.8 ft. ³ 0.84 m ³	40.0 ft. 12.20 m	4.1 ft. ³ 1.24 m ³	36.0 ft. 11.10 m
MFATA05x	45°	11.7 ft. 3.60 m	116.0 ft. 35.00 m	13.6 ft. 4.20 m	134.0 ft. 40.00 m	20.0 ft. 6.10 m	122.0 ft. 37.00 m
MFATA1x.065 ⁴	65°	2.50 ft. 0.75 m	8.90 ft. 2.70 m	2.50 ft. 0.75 m	10.30 ft. 3.10 m	2.50 ft. 0.75 m	9.40 ft. 2.80 m
MFATA2x.065 ⁴	65°	3.10 ft. 0.92 m	44.00 ft. 13.60 m	3.50 ft. 1.07 m	51.00 ft. 15.70 m	5.20 ft. 1.58 m	46.00 ft. 14.30 m
MFATA05x.065 ⁴	65°	15.0 ft. 4.60 m	148.0 ft. 45.00 m	17.3 ft. 5.30 m	171.0 ft. 52.00 m	25.6 ft. 7.80 m	156.0 ft. 47.00 m

Table 2: Transducer type vs. approved pipe diameter

Technical data

- Protection class transducer sleeve: IP68 (NEMA 6) up to 1160 psi / 80 bar, (higher pressure on request)
- Protection class PCB housing: IP68 (NEMA 6) up to 145 psi / 10 bar
- Frequency of oscillator: | 1 MHz | 500 kHz |
- Max. cable length to RIMOUSTT: | 984 ft. / 300 m | 1640 ft. / 500 m |
- Minimum Sound Path Length: | 9.8" / 250 mm | 197" / 5 000 mm² |
- Maximum Sound Path Length: | 591" / 15 000 mm | 1969" / 50 000 mm |
- Penstock wall Dimension: 0.4" to 2.36" / 10 to 60 mm (thicker on request, thinner have to be reinforced with a sleeve/flange)
- Material Transducer: Stainless steel 316L
- Suitable for: Fresh / potable water
- Operating Temperature: -22 °F to +158 °F / -30 °C to +70 °C
- 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 specifications 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 installations can be installed by Rittmeyer specialists.
- The guidelines in the assembly and setup instructions are to be followed for the 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 $\pm 1^\circ$ or better is necessary. To get the most accurate survey on the transducer positions a theodolite or other similar 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.

³ Min. internal pipe access is necessary for transducer installation. For smaller diameters use type MFATC

⁴ Attention: special version with 65° path layer-angle!

- The client is responsible for a suitable cable protection.
- 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.

Ordering information

Transducers (order number set) are packed as sets for a complete single plane 1ExP flow measurement system and include transducers for a one, two or four path measurement application (=2, 4 or 8 transducers).

For 2ExP crossed plane systems twice the amount of transducers have to be ordered!

Default measurement setup 45° (articles marked in orange only on request)

Path qty.	RISONIC transducer (Figure 1)			Weight ⁵	Spare transducer insert (Figure 2)		Path position ⁶
	Type	Order number (set)	Transd. qty.		Type	Order number (single)	
1	MFATA11.60	00 66 503.002	2	7.7 lb., 3.5 kg	MFATZ.1	00 66 509.001	single
	MFATA21	00 66 553.001		10.8 lb., 4.9 kg	MFATZ.2	00 66 559.001	
	MFATA051	00 68 001.001		24.7 lb., 11.2 kg	MFATZ.34	00 68 007.001	
2	MFATA12.60	00 66 502.002	4	15.0 lb., 6.8 kg	MFATZ.3	00 66 508.001	
	MFATA22	00 66 552.001		20.9 lb., 9.5 kg	MFATZ.4	00 66 558.001	
	MFATA052	00 68 002.001		41.0 lb., 18.6 kg	MFATZ.31	00 68 008.001	
4	MFATA14.60	00 66 501.002	8	30.9 lb., 14.0 kg	MFATZ.5	00 66 507.001	inner (2+3)
					MFATZ.6	00 66 506.001	outer (1+4)
	MFATA24	00 66 551.001		43.0 lb., 19.5 kg	MFATZ.7	00 66 557.001	inner (2+3)
					MFATZ.8	00 66 556.001	outer (1+4)
	MFATA054	00 68 003.001		84.4 lb., 38.3 kg	MFATZ.32	00 68 009.001	inner (2+3)
					MFATZ.33	00 68 010.001	outer (1+4)

Table 3: Ordering information default measurement setup 45°

Special measurement setup 65° (articles marked in orange only on request)

Path qty.	RISONIC transducer (Figure 1)			Weight ⁵	Spare transducer insert (Figure 2)		Path position ⁶
	Type	Order number (set)	Transd. qty.		Type	Order number (single)	
1	MFATA11.065	00 66 432.001	2	7.7 lb., 3.5 kg	MFATZ.40	00 66 427.001	single
	MFATA21.065	00 66 435.001		10.8 lb., 4.9 kg	MFATZ.41	00 66 425.001	
	MFATA051.065	00 68 015.001		24.7 lb., 11.2 kg	MFATZ.54	00 68 020.001	
2	MFATA12.065	00 66 431.001	4	15.0 lb., 6.8 kg	MFATZ.42	00 66 424.001	
	MFATA22.065	00 66 434.001		20.9 lb., 9.5 kg	MFATZ.43	00 66 426.001	
	MFATA052.065	00 68 016.001		41.0 lb., 18.6 kg	MFATZ.51	00 68 021.001	
4	MFATA14.065	00 66 430.001	8	30.9 lb., 14.0 kg	MFATZ.44	00 67 047.001	inner (2+3)
					MFATZ.45	00 67 046.001	outer (1+4)
	MFATA24.065	00 66 433.001		43.0 lb., 19.5 kg	MFATZ.46	00 67 043.001	inner (2+3)
					MFATZ.47	00 67 042.001	outer (1+4)
	MFATA054.065	00 66 420.001		84.4 lb., 38.3 kg	MFATZ.52	00 66 428.001	inner (2+3)
					MFATZ.53	00 66 429.001	outer (1+4)

Table 4: Ordering information special measurement setup 65°

⁵ Weight of transducers including packaging

⁶ Refer to layout in Figure 3

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 and Table 4	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	MFATZASxx	On request

Table 5: Accessories

	Data Sheet Hardware	DG DKap Stamm-Bez. Var Ind F Sp
		22.210.00665xx.xxx.07.4.4