

Dimensions

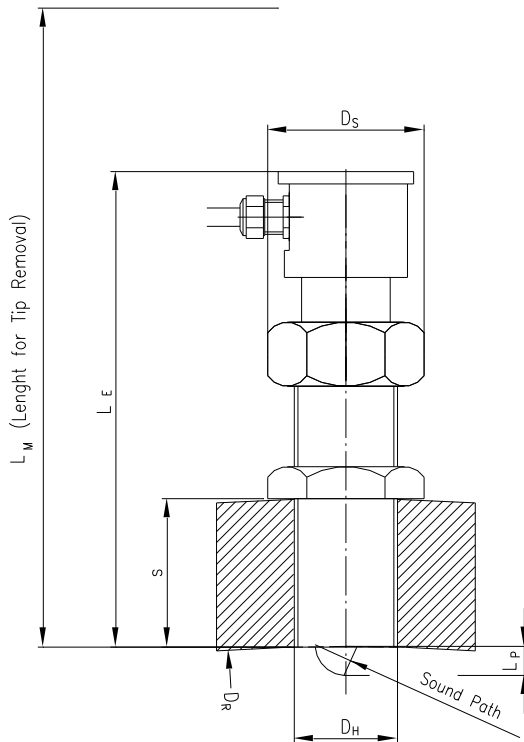


Figure 2: Spare transducer type MFATZ.x

Figure 1: Transducer type C mounted

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

Dimensions of Transducer referring to Figure 1 [mm / "]							
Type Frequency	Pipe Dimensions		Transducer Dimensions				
	$D_R^{1)}$	S	D_S	L_E	L_P	L_M	D_H
MFATC1x.60 1 MHz	250 - 2000 0.8 - 6.6 ft.	8 - 60 0.3" - 2.4"	52 2.05"	185 7.28"	12 0.47"	230 9.1"	G 1"
MFATC2x 1 MHz	1400 - 10000 4.6 - 32.8 ft.		64 2.52"	192 7.56"	18 0.71"	240 9.4"	G 1 1/4"

Table 1: Dimensions of transducers

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

Short description

The RISONIC modular transducers MFATCxx.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 of 1 MHz, the RISONIC modular transducers can be placed away at a maximum distance of 300 m from the RISONIC Ultrasonic Transit Time module.

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

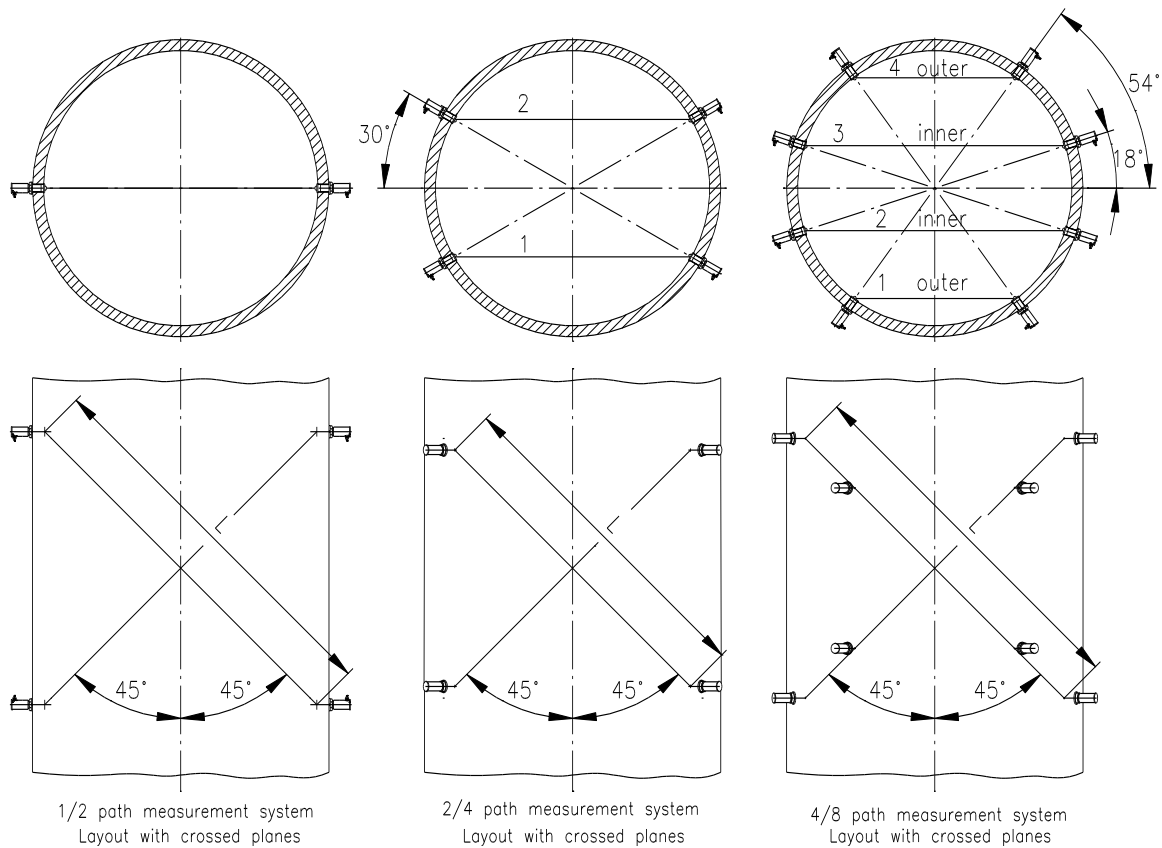


Figure 3: Layouts for single and multiple path measurement

Type of transducers

With the transducers there are a small (MFATC1x.60) and a large (MFATC2x) size of the piezoceramic oscillator which lead to an according shape of the transducers.

The piezoceramic oscillator 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 22.210.0066625.xxx.10.4.4</p>
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Transducer type vs. approved pipe diameter

Type	Pipe diameter at 1E1P and 45° path angle		Pipe diameter at 1E2P and 45° path angle		Pipe diameter at 1E4P and 45° path angle	
	Min.	Max.	Min.	Max.	Min.	Max.
MFATC1x	0.20 m 0.66 ft.	2.00 m 6.56 ft.	0.20 m 0.66 ft.	2.45 m 8.04 ft.	0.20 m 0.66 ft.	2.20 m 7.22 ft.
MFATC2x	0.70 m 2.30 ft.	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.

Table 2: Transducer type vs. approved pipe diameter

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)				Spare Transducers (Figure 2)		
	Type	Order-No.	Transducer Qty.	Weight [kg, lb.] ¹⁾	Type	Order-No.	Path Pos. ²⁾
1	MFATC11.60	00 66 627.002	2	3.3 7.3 lb.	MFATZ.1	00 66 509.001	single
	MFATC21	00 66 632.001		4.5 9.9 lb.	MFATZ.2	00 66 559.001	
2	MFATC12.60	00 66 626.002	4	6.3 13.9 lb.	MFATZ.3	00 66 508.001	
	MFATC22	00 66 631.001		8.7 19.2 lb.	MFATZ.4	00 66 558.001	
4	MFATC14.60	00 66 625.002	8	13.1 28.9 lb.	MFATZ.5	00 66 507.001	inner (2+3)
	MFATC24	00 66 630.001		18.4 40.6 lb.	MFATZ.6	00 66 506.001	outer (1+4)
					MFATZ.7	00 66 557.001	inner (2+3)
					MFATZ.8	00 66 556.001	outer (1+4)

Table 3: Ordering information

¹⁾ Weight of transducers including box

²⁾ Refer to layout in Figure 3

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
- Max. cable length to RIMOUSTT: 300 m / 984 ft.
- Minimum Sound Path Length: 250 mm / 9.8"
- Maximum Sound Path Length: 15 000 mm / 591"
- Penstock wall Dimension:..... 8 to 60 mm / 0.3" 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 liquid must be permeable to sound. It must not contain too high concentration of air bubbles or entrained particles and sediments.
- The transducers are screwed into the penstock and glued to the pipe wall.
- 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.x	00 66 5xx.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

	<p>Data Sheet Hardware</p>	<p>DG DKap Stamm-Bez. Var Ind F Sp</p>
		<p>22.210.0066625.xxx.10.4.4</p>