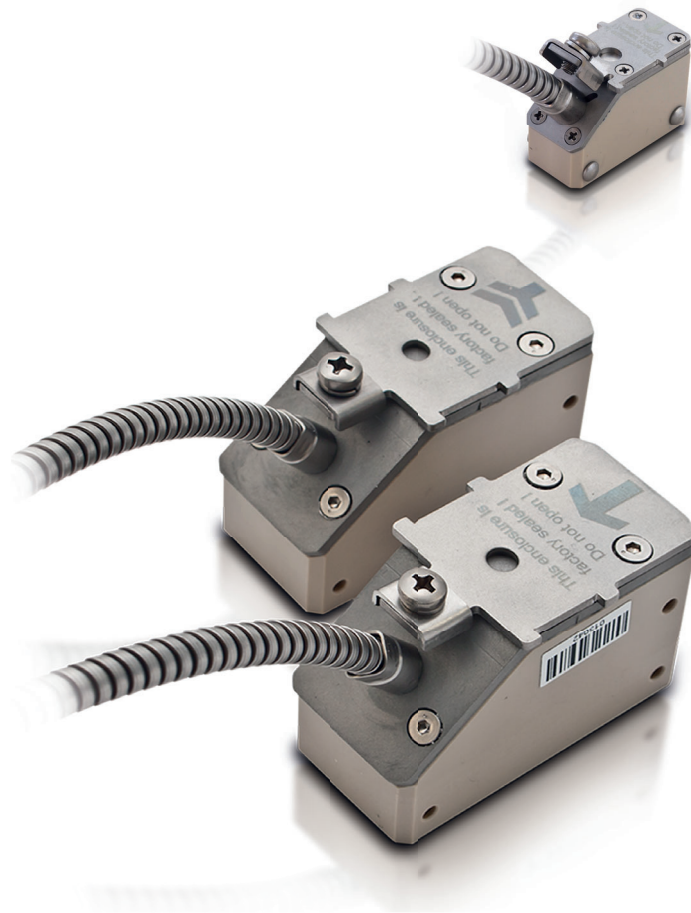


Flexim Clamp-on Ultrasonic Transducers for Measurement of Liquids



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Transducers for Measurement of Liquids

Overview

explosion protection	ambient temperature	connection system	IP68	radiation-hardened	shear wave transducers			Lamb wave transducers			
					order code	page	technical type	order code	page	technical type	
nonEx	N	TS			FS*-NNNN-**TS	15	C(DL)**N52	FL*-NNNN-**TS	33	C(RT)*1N52	
					FS*-NNNN-**T1	16	C(DL)**N53	FL*-NNNN-**T1	34	C(RT)*1N53	
		AS			FS*-NNNN-**T1/HRH	12	CD*2R53				
					FS*-NNNN-**AS	7	C(DL)**N27	FL*-NNNN-**AS	31	C(RT)*1NC3	
		NL			FS*-NNNN-**NL	9	C(DL)*1N27	FL*-NNNN-**NL	31	C(RT)*1NC3	
					FS*-LNNN-**T1/H68	17	CD**LI8	FL*-LNNN-**T1/H68	36	CR*1LI8	
	L	T1	x		FS*-LNNN-**T1	6	CDK1LZ7, CD*2LZ1				
					FSQ-LNNN-**T1/HSC	14	CDQ2LK1				
		KL	x		FS*-LNNN-**KL/H68	11	CD**LI7				
					FS*-ENNN-**TS	18	C(DL)**E52				
		TS			FS*-ENNN-**T1	19	C(DL)**E53				
					FS*-ENNN-**T1/HRH	13	CD*2W53				
	AS			FS*-ENNN-**AS	8	C(DL)*2EZ7					
				FS*-ENNN-**NL	10	C(DL)*1EZ7					
	S	TS						FL*-SNNN-**TS	37	C(RT)*1S52	
								FL*-SNNN-**T1	38	C(RT)*1S53	
		T1						FL*-SNNN-**NL	32	C(RT)*1SC3	
NL											
ATEX/IECEx zone 2	N	TS			FS*-NA2N-**TS	15	C(DL)**N52	FL*-NA2N-**TS	33	C(RT)*1N52	
					FS*-NA2N-**T1	16	C(DL)**N53	FL*-NA2N-**T1	34	C(RT)*1N53	
		NL			FS*-NA2N-**NL	20	C(DL)**NH1	FL*-NA2N-**NL	39	C(RT)*1NH3	
					FS*-LA2N-**T1/H68	17	CD**LI8	FL*-LA2N-**T1/H68	36	CR*1LI8	
		E	TS		FS*-EA2N-**TS	18	C(DL)**E52				
					FS*-EA2N-**T1	19	C(DL)**E53				
	NL			FS*-EA2N-**NL	21	C(DL)*2EH5					
	S	TS						FL*-SA2N-**TS	37	C(RT)*1S52	
								FL*-SA2N-**T1	38	C(RT)*1S53	
		T1						FL*-SA2N-**NL	40	C(RT)*1SH3	
NL											
ATEX/IECEx zone 1	N	T1			FS*-NA1N-**T1	24	C(DL)**N81	FL*-NA1N-**T1	42	C(RT)*1N83	
					FS*-NA1N-**NL	26	C(DL)**NW1	FL*-NA1N-**NL	46	C(RT)*1NW3	
		T1	x		FS*-LA1N-**T1/H68	25	CD**LI1	FL*-LA1N-**T1/H68	44	CR*1LI3	
	E	T1			FS*-EA1N-**T1	27	C(DL)*1E83				
						28	C(DL)*2E85				
		NL			FS*-EA1N-**NL	29	C(DL)*2EW5				
S	T1						FL*-SA1N-**T1	45	C(RT)*1S83		
							FL*-SA1N-**NL	47	C(RT)*1SW3		
	NL										
inmetro	N	T1			FS*-NS1N-**T1	24	C(DL)**N81	FL*-NS1N-**T1	42	C(RT)*1N83	
					FS*-LS1N-**T1/H68	25	CD**LI1	FL*-LS1N-**T1/H68	44	CR*1LI3	
		E	T1		FS*-EA1N-**T1	27	C(DL)*1E83				
	S	T1				28	C(DL)*2E85				
								FL*-SA1N-**T1	45	C(RT)*1S83	
		NL									
KOSHA	N	T1			FS*-NK1N-**T1	24	C(DL)**N81	FL*-NK1N-**T1	42	C(RT)*1N83	
					FS*-EK1N-**T1	28	C(DL)*2E85				
	E										
	EAC zone 2	N	TS			FS*-NE2N-**TS	15	C(DL)**N52	FL*-NE2N-**TS	33	C(RT)*1N52
						FS*-NE2N-**T1	16	C(DL)**N53	FL*-NE2N-**T1	34	C(RT)*1N53
NL					FS*-NE2N-**NL	20	C(DL)**NH1	FL*-NE2N-**NL	39	C(RT)*1NH3	
					FS*-LE2N-**T1/H68	17	CD**LI8	FL*-LE2N-**T1/H68	36	CR*1LI8	
E			TS		FS*-EE2N-**TS	18	C(DL)**E52				
					FS*-EE2N-**T1	19	C(DL)**E53				
NL				FS*-EE2N-**NL	21	C(DL)*2EH5					
S		TS						FL*-SE2N-**TS	37	C(RT)*1S52	
								FL*-SE2N-**T1	38	C(RT)*1S53	
		T1						FL*-SE2N-**NL	40	C(RT)*1SH3	
	NL										
EAC zone 1	N	T1			FS*-NE1N-**T1	24	C(DL)**N81	FL*-NE1N-**T1	42	C(RT)*1N83	
					FS*-NE1N-**NL	26	C(DL)**NW1	FL*-NE1N-**NL	46	C(RT)*1NW3	
		T1	x		FS*-LE1N-**T1/H68	25	CD**LI1	FL*-LE1N-**T1/H68	44	CR*1LI3	
	E	T1			FS*-EE1N-**T1	27	C(DL)*1E83				
						28	C(DL)*2E85				
		NL			FS*-EE1N-**NL	29	C(DL)*2EW5				
S	T1						FL*-SE1N-**T1	45	C(RT)*1S83		
							FL*-SE1N-**NL	47	C(RT)*1SW3		
	NL										

technical type *D****, *R****: standard transducer
 technical type *L****, *T****: transducer with long cable

continued on next page

explosion protection	ambient temperature	connection system	IP68	radiation-hardened	shear wave transducers			Lamb wave transducers		
					order code	page	technical type	order code	page	technical type
JPEX zone 1	N	T1			FS*-NJ1N-**T1	24	C(DL)**N81	FL*-NJ1N-**T1	42	C(RT)*1N83
	L		x		FS*-LJ1N-**T1/H68	25	CD**LI1	FL*-LJ1N-**T1/H68	44	CR*1LI3
	E				FS*-EJ1N-**T1	27	C(DL)*1E83			
FM Class I Div. 2	N	TS			FS*-NF2N-**TS	15	C(DL)**N52	FL*-NF2N-**TS	33	C(RT)*1N52
		T1			FS*-NF2N-**T1	16	C(DL)**N53	FL*-NF2N-**T1	34	C(RT)*1N53
		NL			FS*-NF2N-**NL	22	C(DL)*1N51	FL*-NF2N-**NL	41	C(RT)*1N51
	E	TS			FS*-EF2N-**TS	18	C(DL)**E52			
		T1			FS*-EF2N-**T1	19	C(DL)**E53			
		NL			FS*-EF2N-**NL	23	C(DL)*1E51			
	S	TS						FL*-SF2N-**TS	37	C(RT)*1S52
		T1						FL*-SF2N-**T1	38	C(RT)*1S53
FM Class I Div. 1	N	T1			FS*-NF1N-**T1	30	C(DL)*1N62	FL*-NF1N-**T1	48	C(RT)*1N62

technical type *D****, *R****: standard transducer

technical type *L****, *T****: transducer with long cable

Transducer order code

1, 2	3	4	5...7	8, 9	10, 11	12...14	no. of character
transducer	transducer frequency	-	ambient temperature	explosion protection	-	certification	connection system
						cable length	/
							option
							description
FS							set of ultrasonic flow transducers for measurement of liquids, shear wave
FL							set of ultrasonic flow transducers for measurement of liquids, Lamb wave
	F						0.15 MHz
	G						0.2 MHz
	H						0.3 MHz
	K						0.5 MHz
	M						1 MHz
	P						2 MHz
	Q						4 MHz
	S						8 MHz
		L					low temperature range
		N					normal temperature range
		E					extended temperature range
		S					higher temperatures
			NNN				not explosion-proof
			A2N				ATEX zone 2/IECEX zone 2
			A1N				ATEX zone 1/IECEX zone 1
			S1N				inmetro zone 1
			K1N				KOSHA zone 1
			E2N				EAC zone 2
			E1N				EAC zone 1
			J1N				Japanese Ex certification zone 1
			F1N				FM Class I Div. 1
			F2N				FM Class I Div. 2
				**			
					AS		with Amphenol connector
					NL		with LEMO connector
					KL		with LEMO connector
					TS		with SMB connector
					T1		with stripped cable ends
						***	in m
						H68	degree of protection IP68
						HRH	radiation-hardened
						HSC	metal-free

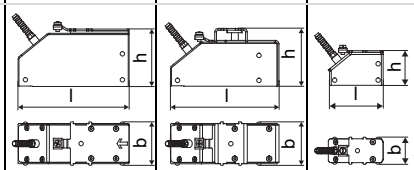
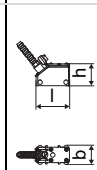
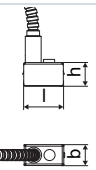
Technical data

Shear wave transducers

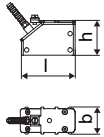
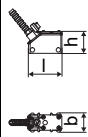
Shear wave transducers (nonEx, T1, low temperature range)

order code		FSK-LNNN-**T1	FSM-LNNN-**T1	FSP-LNNN-**T1	FSQ-LNNN-**T1
technical type		CDK1LZ7	CDM2LZ1	CDP2LZ1	CDQ2LZ1
transducer frequency	MHz	0.5	1	2	4
inner pipe diameter d					
min. extended	mm	100	50	25	10
min. recommended	mm	200	100	50	25
max. recommended	mm	2000	1000	400	150
max. extended	mm	2400	1200	480	240
pipe wall thickness					
min.	mm	5	2.5	1.2	0.6
material					
housing		PEEK with stainless steel cover 316Ti (1.4571)			
contact surface		PEEK			
degree of protection		IP66			
transducer cable					
type		2606			
length	m	10			
dimensions					
length l	mm	126.5	64	40	
width b	mm	51	32	22	
height h	mm	67.5	40.5	25.5	
dimensional drawing					
weight (without cable)	kg	0.36	0.066	0.016	
pipe surface temperature	°C	-40...+100			
ambient temperature	°C	-40...+100			

Shear wave transducers (nonEx, AS)

order code		FSG-NNNN-**AS	FSK-NNNN-**AS	FSM-NNNN-**AS	FSP-NNNN-**AS	FSQ-NNNN-**AS	FSS-NNNN-**AS	
technical type		C(DL)G1NZ7	C(DL)K1NZ7	C(DL)M2NZ7	C(DL)P2NZ7	C(DL)Q2NZ7	CDS1NZ7	
transducer frequency	MHz	0.2	0.5	1	2	4	8	
inner pipe diameter d								
min. extended	mm	400	100	50	25	10	6	
min. recommended	mm	500	200	100	50	25	10	
max. recommended	mm	4000	2000	1000	400	150	70	
max. extended	mm	6500	2400	1200	480	240	70	
pipe wall thickness								
min.	mm	11	5	2.5	1.2	0.6	0.3	
material								
housing		PEEK with stainless steel cover 304 (1.4301)			PEEK with stainless steel cover 304 (1.4301)		stainless steel 304 (1.4301)	
contact surface		PEEK			PEEK		PEI	
degree of protection		IP66			IP66/IP67		IP66	
transducer cable								
type		1699						
length	m	5			4	3	2	
dimensions								
length l	mm	129.5	126.5	64		40	25	
width b	mm	51	51	32		22	13	
height h	mm	67	67.5	40.5		25.5	17	
dimensional drawing								
weight (without cable)	kg	0.47	0.36	0.066		0.016	0.004	
pipe surface temperature	°C	-40...+130					-30...+130	
ambient temperature	°C	-40...+130					-30...+130	
temperature compensation		x						

Shear wave transducers (nonEx, AS, extended temperature range)

order code		FSM-ENNN-**AS	FSP-ENNN-**AS	FSQ-ENNN-**AS
technical type		C(DL)M2EZ7	C(DL)P2EZ7	C(DL)Q2EZ7
transducer frequency	MHz	1	2	4
inner pipe diameter d				
min. extended	mm	50	25	10
min. recommended	mm	100	50	25
max. recommended	mm	1000	400	150
max. extended	mm	1200	480	240
pipe wall thickness				
min.	mm	2.5	1.2	0.6
material				
housing		PI with stainless steel cover 304 (1.4301)		
contact surface		PI		
degree of protection		IP66/IP67		
transducer cable				
type		6111		
length	m	4		3
dimensions				
length l	mm	64		40
width b	mm	32		22
height h	mm	40.5		25.5
dimensional drawing				
weight (without cable)	kg	0.066		0.017
pipe surface temperature	°C	-30...+240 ¹		-30...+200
ambient temperature	°C	-30...+40 -30...+60 ² -30...+200 ³		-30...+200
temperature compensation		x		

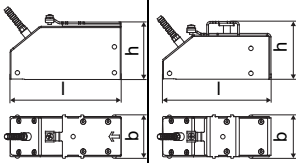
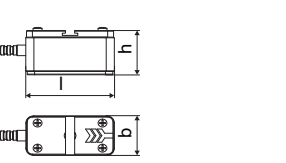
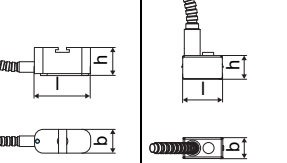

¹ > +200 °C:

Variofix C without cover or Variofix L
observe the insulation instruction

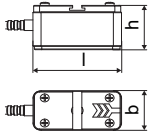
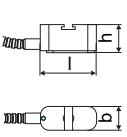
² pipe surface temperature +200...+240 °C: Variofix C without cover

³ pipe surface temperature max. +200 °C

Shear wave transducers (nonEx, NL)

order code		FSG-NNNN-**NL	FSK-NNNN-**NL	FSM-NNNN-**NL	FSP-NNNN-**NL	FSQ-NNNN-**NL	FSS-NNNN-**NL	
technical type		C(DL)G1NZ7	C(DL)K1NZ7	C(DL)M1NZ7	C(DL)P1NZ7	C(DL)Q1NZ7	CDS1NZ7	
transducer frequency	MHz	0.2	0.5	1	2	4	8	
inner pipe diameter d								
min. extended	mm	400	100	50	25	10	6	
min. recommended	mm	500	200	100	50	25	10	
max. recommended	mm	4000	2000	1000	400	150	70	
max. extended	mm	6500	6500	3400	600	400	70	
pipe wall thickness								
min.	mm	11	5	2.5	1.2	0.6	0.3	
material								
housing		PEEK with stainless steel cover 304 (1.4301)			stainless steel 304 (1.4301)		stainless steel 304 (1.4301)	
contact surface		PEEK			PEEK		PEI	
degree of protection		IP66			IP66		IP66	
transducer cable								
type		1699						
length	m	5			4		3	
dimensions								
length l	mm	129.5	126.5	60		42.5	25	
width b	mm	51	51	30		18	13	
height h	mm	67	67.5	33.5		21.5	17	
dimensional drawing								
weight (without cable)	kg	0.47	0.36	0.035		0.011	0.004	
pipe surface temperature	°C	-40...+130					-30...+130	
ambient temperature	°C	-40...+130					-30...+130	
temperature compensation		x						

Shear wave transducers (nonEx, NL, extended temperature range)

order code		FSM-ENNN-**NL	FSP-ENNN-**NL	FSQ-ENNN-**NL
technical type		C(DL)M1EZ7	C(DL)P1EZ7	C(DL)Q1EZ7
transducer frequency	MHz	1	2	4
inner pipe diameter d				
min. extended	mm	50	25	10
min. recommended	mm	100	50	25
max. recommended	mm	1000	400	150
max. extended	mm	3400	600	400
pipe wall thickness				
min.	mm	2.5	1.2	0.6
material				
housing		stainless steel 304 (1.4301)		
contact surface		Sintimid		
degree of protection		IP66		
transducer cable				
type		1699		
length	m	4		3
dimensions				
length l	mm	60		42.5
width b	mm	30		18
height h	mm	33.5		21.5
dimensional drawing				
weight (without cable)	kg	0.042		0.011
pipe surface temperature	°C	-30...+200		
ambient temperature	°C	-30...+200		
temperature compensation		x		

Shear wave transducers (nonEx, KL)

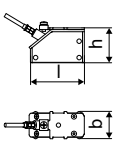
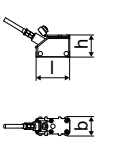
order code		FSK-LNNN-**KL/ H68	FSM-LNNN-**KL/ H68	FSP-LNNN-**KL/ H68
technical type		CDK1L17	CDM2L17	CDP2L17
transducer frequency	MHz	0.5	1	2
inner pipe diameter		see transducer recommendation		
pipe wall thickness				
min.	mm	5	2.5	1.2
material				
housing		PEEK with stainless steel cover 316Ti (1.4571)		
contact surface		PEEK		
degree of protection		IP68 ¹		
transducer cable				
type		7819		
length	m	6		
dimensions				
length l	mm	130	72	
width b	mm	54	32	
height h	mm	83.5	46	
dimensional drawing				
weight (without cable)	kg	0.43	0.085	
pipe surface temperature	°C	-40...+100		
ambient temperature	°C	-40...+100		

¹ test conditions: 3 months/2 bar (20 m)/20 °C

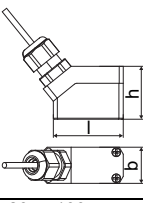
Shear wave transducers (nonEx, T1, radiation-hardened)

order code	FSM-NNNN- **T1/HRH	FSP-NNNN- **T1/ HRH	FSQ-NNNN- **T1/HRH
technical type	CDM2R53	CDP2R53	CDQ2R53
transmitter	F721		
transducer frequency /MHz	1	2	4
inner pipe diameter d			
min. extended	mm	50	25
min. recommended	mm	100	50
max. recommended	mm	1000	400
max. extended	mm	1200	480
pipe wall thickness			
min.	mm	2.5	1.2
material			
housing	PEEK with stainless steel cover		
contact surface	PEEK		
degree of protection	IP66/IP67		
transducer cable			
type	2619		
length	m	4	3
dimensions			
length l	mm	64	40
width b	mm	32	22
height h	mm	40.5	25.5
dimensional drawing			
weight (without cable)	kg	0.066	0.017
pipe surface temperature	°C	-40...+130	
ambient temperature	°C	-40...+130	
temperature compensation		x	
absorbed dose	Gy	max. 500 000	

Shear wave transducers (nonEx, T1, radiation-hardened, extended temperature range)

order code		FSM-ENNN- **T1/HRH	FSP-ENNN- **T1/ HRH	FSQ-ENNN- **T1/ HRH
technical type		CDM2W53	CDP2W53	CDQ2W53
transmitter		F721		
transducer frequency	MHz	1	2	4
inner pipe diameter d				
min. extended	mm	50	25	10
min. recommended	mm	100	50	25
max. recommended	mm	1000	400	150
max. extended	mm	1200	480	240
pipe wall thickness				
min.	mm	2.5	1.2	0.6
material				
housing		PI with stainless steel cover		
contact surface		PI		
degree of protection		IP66/IP67		
transducer cable				
type		2619		
length	m	4		3
dimensions				
length l	mm	64		40
width b	mm	32		22
height h	mm	40.5		25.5
dimensional drawing				
weight (without cable)	kg	0.066		0.017
pipe surface temperature	°C	-30...+200		
ambient temperature	°C	-30...+200		
temperature compensation		x		
absorbed dose	Gy	max. 500 000		

Shear wave transducers (nonEx, T1, metal-free)

order code	FSQ-LNNN-**T1/ HSC	
technical type	CDQ2LK1	
transducer frequency	MHz	4
inner pipe diameter d		
min. extended	mm	8
min. recommended	mm	12
max. recommended	mm	51
pipe wall thickness		
min.	mm	0.6
material	PEEK	
degree of protection	IP67	
transducer cable		
type	1699	
length	m	10
dimensions		
length l	mm	40
width b	mm	18
height h	mm	26.5
dimensional drawing		
pipe surface temperature	°C	-20...+100
ambient temperature	°C	-20...+100

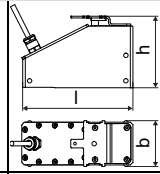
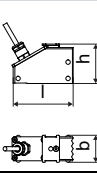
Shear wave transducers (zone 2 - FM Class I Div. 2 - nonEx, TS)

order code		FSG-N***-**TS	FSK-N***-**TS	FSM-N***-**TS	FSP-N***-**TS	FSQL-N***-**TS	FSS-N***-**TS
technical type		C(DL)G1N52	C(DL)K1N52	C(DL)M2N52	C(DL)P2N52	C(DL)Q2N52	CDS1N52
transducer frequency	MHz	0.2	0.5	1	2	4	8
inner pipe diameter d							
min. extended	mm	400	100	50	25	10	6
min. recommended	mm	500	200	100	50	25	10
max. recommended	mm	4000	2000	1000	400	150	70
max. extended	mm	6500	2400	1200	480	240	70
pipe wall thickness							
min.	mm	11	5	2.5	1.2	0.6	0.3
material							
housing		PEEK with stainless steel cover 316L (1.4404)					stainless steel 304 (1.4301)
contact surface		PEEK					PEI
degree of protection		IP66			IP66/IP67		IP66
transducer cable							
type		1699					
length	m	5			4	3	2
dimensions							
length l	mm	129.5	126.5	64		40	25
width b	mm	51	51	32		22	13
height h	mm	67	67.5	40.5		25.5	17
dimensional drawing							
weight (without cable)	kg	0.47	0.36	0.066		0.016	0.004
pipe surface temperature							
min.	°C	-40					-30
max.	°C	+130					+130
ambient temperature							
min.	°C	-40					-30
max.	°C	+130					+130
temperature compensation		x					
explosion protection							
• ATEX/IECEX							
order code		FSG-NA2N-**TS	FSK-NA2N-**TS	FSM-NA2N-**TS	FSP-NA2N-**TS	FSQL-NA2N-**TS	-
pipe surface temperature (Ex)							-
• min.	°C	-55					-
• max.	°C	gas: +190, dust: +180					-
marking		CE 0637 (Ex) II3G II2D Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T185 °C Db					-
certification		IBExU10ATEX1163 X, IECEX IBE 12.0005X					-
• EAC							
order code		FSG-NE2N-**TS	FSK-NE2N-**TS	FSM-NE2N-**TS	FSP-NE2N-**TS	FSQL-NE2N-**TS	-
marking		2Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T185 °C Db от -55 °C до +190 °C Пыль: до +180 °C					-
certification		EAC EA9C KZ 7500525.01.01.01830					-
• FM							
order code		FSG-NF2N-**TS	FSK-NF2N-**TS	FSM-NF2N-**TS	FSP-NF2N-**TS	FSQL-NF2N-**TS	FSS-NF2N-**TS
pipe surface temperature (Ex)							-
• min.	°C	-40					-
• max.	°C	+125			+190		+125
degree of protection		IP66					
marking		FM APPROVED NI/CI, I, II, III/Div. 2 / GP A,B,C,D,E,F,G/ Temp. Codes dwg 3860					

Shear wave transducers (zone 2 - FM Class I Div. 2 - nonEx, T1)

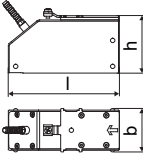
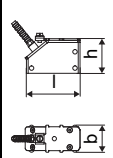
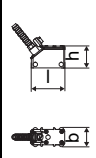

order code	FSG-N***-**T1	FSK-N***-**T1	FSM-N***-**T1	FSP-N***-**T1	FSQ-N***-**T1	FSS-N***-**T1
technical type	C(DL)G1N53	C(DL)K1N53	C(DL)M2N53	C(DL)P2N53	C(DL)Q2N53	CDS1N53
transducer frequency	0.2 MHz	0.5	1	2	4	8
inner pipe diameter d						
min. extended	mm 400	100	50	25	10	6
min. recommended	mm 500	200	100	50	25	10
max. recommended	mm 4000	2000	1000	400	150	70
max. extended	mm 6500	2400	1200	480	240	70
pipe wall thickness						
min.	mm 11	5	2.5	1.2	0.6	0.3
material						
housing	PEEK with stainless steel cover 316L (1.4404)					stainless steel 304 (1.4301)
contact surface	PEEK					PEI
degree of protection	IP66					IP66
transducer cable						
type	1699					
length	m 5	4			3	2
dimensions						
length l	mm 129.5	126.5	64		40	25
width b	mm 51	51	32		22	13
height h	mm 67	67.5	40.5		25.5	17
dimensional drawing						
weight (without cable)	kg 0.47	0.36	0.066		0.016	0.004
pipe surface temperature	°C -40...+130					-30...+130
ambient temperature	°C -40...+130					-30...+130
temperature compensation	x					-
explosion protection						
• ATEX/IECEx						
order code	FSG-NA2*-**T1	FSK-NA2*-**T1	FSM-NA2*-**T1	FSP-NA2*-**T1	FSQ-NA2*-**T1	-
pipe surface temperature (Ex)	°C gas: -55...+190 dust: -55...+180					-
marking	 Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T185 °C Db					-
certification	IBExU10ATEX1163 X, IECEx IBE 12.0005X					-
• EAC						
order code	FSG-NE2*-**T1	FSK-NE2*-**T1	FSM-NE2*-**T1	FSP-NE2*-**T1	FSQ-NE2*-**T1	-
marking	 2Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T185 °C Db от -55 °C до +190 °C Пыль: до +180 °C					-
certification	EAC Ex EA3C KZ 7500525.01.01.01830					-
• FM						
order code	FSG-NF2*-**T1	FSK-NF2*-**T1	FSM-NF2*-**T1	FSP-NF2*-**T1	FSQ-NF2*-**T1	FSS-NF2*-**T1
pipe surface temperature (Ex)	°C -40...+125		-40...+190			-40...+125
degree of protection	IP66					
marking	 NI/CI, I,II,III/Div. 2 / GP A,B,C,D,E,F,G/ Temp. Codes dwg 3860					

Shear wave transducers (zone 2 - nonEx, T1, IP68)

order code		FSG-L***-**T1/H68	FSK-L***-**T1/H68	FSM-L***-**T1/H68	FSP-L***-**T1/H68
technical type		CDG1LI8	CDK1LI8	CDM2LI8	CDP2LI8
transducer frequency	MHz	0.2	0.5	1	2
inner pipe diameter d					
min. extended	mm	400	100	50	25
min. recommended	mm	500	200	100	50
max. recommended	mm	4000	2000	1000	400
max. extended	mm	6500	2400	1200	480
pipe wall thickness					
min.	mm	11	5	2.5	1.2
material					
housing		PEEK with stainless steel cover 316Ti (1.4571)			
contact surface		PEEK			
degree of protection		IP68 ¹			
transducer cable					
type		2550			
length	m	12			
dimensions					
length l	mm	130		72	
width b	mm	54		32	
height h	mm	83.5		46	
dimensional drawing					
weight (without cable)	kg	0.43		0.085	
pipe surface temperature	°C	-40...+100 (*S*-LNN*-**T1/H68) -40...+90 (*S*-L*2*-**T1/H68)			
ambient temperature	°C	-40...+100 (*S*-LNN*-**T1/H68) -40...+90 (*S*-L*2*-**T1/H68)			
temperature compensation		x			
explosion protection					
• ATEX/IECEx					
order code		FSG-LA2N-**T1/H68	FSK-LA2N-**T1/H68	FSM-LA2N-**T1/H68	FSP-LA2N-**T1/H68
pipe surface temperature (Ex)	°C	gas: -40...+90 dust: -40...+80			
marking		CE 0637 Ex II 3G II 2D Ex nA IIC T6...T5 Gc Ex tb IIIC T80 °C...T85 °C Db			
certification		IBExU10ATEX1163 X, IECEx IBE 12.0005X			
• EAC					
order code		FSG-LE2N-**T1/H68	FSK-LE2N-**T1/H68	FSM-LE2N-**T1/H68	FSP-LE2N-**T1/H68
marking		2Ex nA IIC T6...T5 Gc Ex tb IIIC T80 °C...T85 °C Db от -40 °C до +90 °C Пыль: до +80 °C			
certification		EAC KZ 7500525.01.01.01830			

¹ test conditions: 3 months/2 bar (20 m)/20 °C

Shear wave transducers (zone 2 - FM Class I Div. 2 - nonEx, TS, extended temperature range)

order code		FSG-E***-**TS	FSK-E***-**TS	FSM-E***-**TS	FSP-E***-**TS	FSQ-E***-**TS
technical type		C(DL)G1E52	C(DL)K1E52	C(DL)M2E52	C(DL)P2E52	C(DL)Q2E52
transducer frequency	MHz	0.2	0.5	1	2	4
inner pipe diameter d						
min. extended	mm	400	100	50	25	10
min. recommended	mm	500	200	100	50	25
max. recommended	mm	4000	2000	1000	400	150
max. extended	mm	6500	2400	1200	480	240
pipe wall thickness						
min.	mm	11	5	2.5	1.2	0.6
material						
housing		PPSU with stainless steel cover 316L (1.4404)		PI with stainless steel cover 316L (1.4404)		
contact surface		PPSU		PI		
degree of protection		IP66		IP66/IP67		
transducer cable						
type		1699		6111		
length	m	5		4		3
dimensions						
length l	mm	129.5		64		40
width b	mm	51		32		22
height h	mm	67		40.5		25.5
dimensional drawing						
weight (without cable)	kg	0.82		0.066		0.017
pipe surface temperature	°C	-40...+180		-30...+240 ¹		-30...+200
ambient temperature	°C	-40...+180		-30...+40 -30...+60 ² -30...+200 ³		-30...+200
temperature compensation		x		x		
explosion protection						
• ATEX/IECEx						
order code		-	-	FSM-EA2*-**TS	FSP-EA2*-**TS	FSQ-EA2*-**TS
pipe surface temperature (Ex)	°C	-	-	gas: -45...+235 dust: -45...+225		
marking		-	-	CE 0637 Ex II 3G II 2D Ex nA IIC T6...T2 Gc Ex tb IIIA T80 °C...T230 °C Db IBExU10ATEX1163 X, IECEx IBE 12.0005X		
certification		-	-	IBExU10ATEX1163 X, IECEx IBE 12.0005X		
• EAC						
order code		-	-	FSM-EE2*-**TS	FSP-EE2*-**TS	FSQ-EE2*-**TS
marking		-	-	2Ex nA IIC T6...T2 Gc Ex tb IIIA T80 °C...T230 °C Db от -45 °C до +235 °C Пыль: до +225 °C		
certification		-	-	EAC Ex EAЭC KZ 7500525.01.01.01830		
• FM						
order code		FSG-EF2*-**TS	FSK-EF2*-**TS	FSM-EF2*-**TS	FSP-EF2*-**TS	FSQ-EF2*-**TS
pipe surface temperature (Ex)	°C	-40...+165		-40...+235		
degree of protection		IP66				
marking		 NI/CI. I,II,III/Div. 2 / GP A,B,C,D,E,F,G/ Temp. Codes dwg 3860				

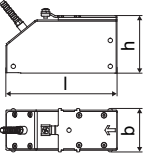
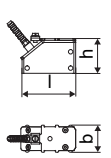
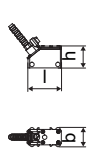

¹ > +200 °C:

nonEx: Variofix C without cover or Variofix L
Ex: Variofix C or Variofix L, ambient temperature max. +40 °C
observe the insulation instruction

² nonEx: pipe surface temperature +200...+240 °C: Variofix C without cover

³ nonEx: pipe surface temperature max. +200 °C

Shear wave transducers (zone 2 - FM Class I Div. 2 - nonEx, T1, extended temperature range)

order code		FSG-E***-**T1	FSK-E***-**T1	FSM-E***-**T1	FSP-E***-**T1	FSQ-E***-**T1
technical type		C(DL)G1E53	C(DL)K1E53	C(DL)M2E53	C(DL)P2E53	C(DL)Q2E53
transducer frequency	MHz	0.2	0.5	1	2	4
inner pipe diameter d						
min. extended	mm	400	100	50	25	10
min. recommended	mm	500	200	100	50	25
max. recommended	mm	4000	2000	1000	400	150
max. extended	mm	6500	2400	1200	480	240
pipe wall thickness						
min.	mm	11	5	2.5	1.2	0.6
material						
housing		PPSU with stainless steel cover 316L (1.4404)		PI with stainless steel cover 316L (1.4404)		
contact surface		PPSU		PI		
degree of protection		IP66		IP66/IP67		
transducer cable						
type		1699		6111		
length	m	5		4		3
dimensions						
length l	mm	129.5		64		40
width b	mm	51		32		22
height h	mm	67		40.5		25.5
dimensional drawing						
weight (without cable)	kg	0.82		0.066		0.017
pipe surface temperature	°C	-40...+180		-30...+240 ¹		-30...+200
ambient temperature	°C	-40...+180		-30...+40 -30...+60 ² -30...+200 ³		-30...+200
temperature compensation		x		x		
explosion protection						
• ATEX/IECEx						
order code		-	-	FSM-EA2*-**T1	FSP-EA2*-**T1	FSQ-EA2*-**T1
pipe surface temperature (Ex)	°C	-	-	gas: -45...+235 dust: -45...+225		
marking		-	-	CE 0637 Ex II 3G II 2D Ex nA IIC T6...T2 Gc Ex tb IIIA T80 °C...T230 °C Db		
certification		-	-	IBExU10ATEX1163 X, IECEx IBE 12.0005X		
• EAC						
order code		-	-	FSM-EE2*-**T1	FSP-EE2*-**T1	FSQ-EE2*-**T1
marking		-	-	2Ex nA IIC T6...T2 Gc Ex tb IIIA T80 °C...T230 °C Db от -45 °C до +235 °C Пыль: до +225 °C		
certification		-	-	[EAC] EA9C KZ 7500525.01.01.01830		
• FM						
order code		FSG-EF2*-**T1	FSK-EF2*-**T1	FSM-EF2*-**T1	FSP-EF2*-**T1	FSQ-EF2*-**T1
pipe surface temperature (Ex)	°C	-40...+165		-40...+235		
degree of protection		IP66				
marking		 NI/CI. I,II,III/Div. 2 / GP A,B,C,D,E,F,G/ Temp. Codes dwg 3860				

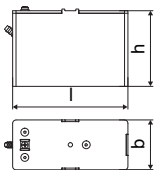
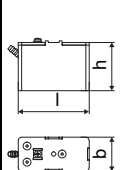
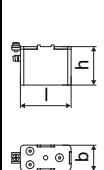
¹ > +200 °C:

nonEx: Variofix C without cover or Variofix L
Ex: Variofix C or Variofix L, ambient temperature max. +40 °C
observe the insulation instruction

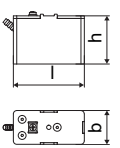
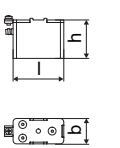
² nonEx: pipe surface temperature +200...+240 °C: Variofix C without cover

³ nonEx: pipe surface temperature max. +200 °C

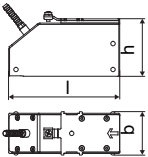
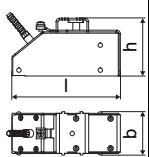
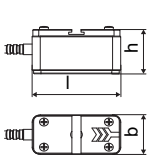
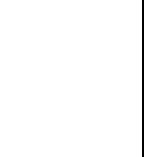
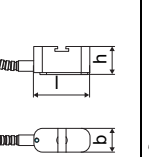

Shear wave transducers (zone 2, NL)

order code		FSG-N*2*-*NL	FSK-N*2*-*NL	FSM-N*2*-*NL	FSP-N*2*-*NL	FSQ-N*2*-*NL
technical type		C(DL)G1NH1	C(DL)K1NH1	C(DL)M2NH1	C(DL)P2NH1	C(DL)Q2NH1
transducer frequency	MHz	0.2	0.5	1	2	4
inner pipe diameter d						
min. extended	mm	400	100	50	25	10
min. recommended	mm	500	200	100	50	25
max. recommended	mm	4000	2000	1000	400	150
max. extended	mm	6500	6500	3400	600	400
pipe wall thickness						
min.	mm	11	5	2.5	1.2	0.6
material						
housing		PEEK with stainless steel cover and transducer shoe 304 (1.4301)				
contact surface		PEEK				
degree of protection		IP66		IP66/IP67		
transducer cable						
type		1699				
length	m	5		4	3	
dimensions						
length l	mm	136.5		84	70	
width b	mm	59		40	30	
height h	mm	90.5		59	47.5	
dimensional drawing						
weight (without cable)	kg	1.674		0.504	0.251	
pipe surface temperature	°C	-40...+130				
ambient temperature	°C	-40...+130				
temperature compensation		x				
explosion protection						
• ATEX/IECEX						
order code		FSG-NA2*-*NL	FSK-NA2*-*NL	FSM-NA2*-*NL	FSP-NA2*-*NL	FSQ-NA2*-*NL
pipe surface temperature (Ex)	°C	gas: -55...+190 dust: -55...+180				
marking		CE 0637 Ex II 3G II 2D Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T185 °C Db				
certification		IBExU10ATEX1163 X, IECEx IBE 12.0005X				
• EAC						
order code		FSG-NE2*-*NL	FSK-NE2*-*NL	FSM-NE2*-*NL	FSP-NE2*-*NL	FSQ-NE2*-*NL
marking		2Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T185 °C Db от -55 °C до +190 °C Пыль: до +180 °C				
certification		EAC EAЭС KZ 7500525.01.01.01830				

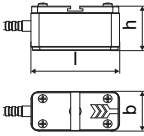
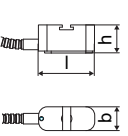

Shear wave transducers (zone 2, NL, extended temperature range)

order code		FSM-E*2*-**NL	FSP-E*2*-**NL	FSQ-E*2*-**NL
technical type		C(DL)M2EH5	C(DL)P2EH5	C(DL)Q2EH5
transducer frequency	MHz	1	2	4
inner pipe diameter d				
min. extended	mm	50	25	10
min. recommended	mm	100	50	25
max. recommended	mm	1000	400	150
max. extended	mm	3400	600	400
pipe wall thickness				
min.	mm	2.5	1.2	0.6
material				
housing		PI with stainless steel cover and transducer shoe 304 (1.4301)		
contact surface		PI		
degree of protection		IP66/IP67		
transducer cable				
type		6111		
length	m	4		3
dimensions				
length l	mm	84		70
width b	mm	40		30
height h	mm	59		47.5
dimensional drawing				
weight (without cable)	kg	0.505		0.252
pipe surface temperature	°C	-30...+200		
ambient temperature	°C	-30...+200		
temperature compensation		x		
explosion protection				
• ATEX/IECEX				
order code		FSM-EA2*-**NL	FSP-EA2*-**NL	FSQ-EA2*-**NL
pipe surface temperature (Ex)	°C	gas: -45...+235 dust: -45...+225		
marking		CE 0637 (Ex) II3G II2D Ex nA IIC T6...T2 Gc Ex tb IIIA T80 °C...230 °C Db		
certification		IBExU10ATEX1163 X, IECEx IBE 12.0005X		
• EAC				
order code		FSM-EE2*-**NL	FSP-EE2*-**NL	FSQ-EE2*-**NL
marking		2Ex nA IIC T6...T2 Gc Ex tb IIIA T80 °C...T230 °C Db от -45 °C до +235 °C Пыль: до +225 °C		
certification		EAC KZ 7500525.01.01.01830		

Shear wave transducers (FM Class I Div. 2, NL)

order code		FSG-NF2N-**NL	FSK-NF2N-**NL	FSM-NF2N-**NL	FSP-NF2N-**NL	FSQ-NF2N-**NL	FSS-NF2N-**NL	
technical type		C(DL)G1N51	C(DL)K1N51	C(DL)M1N51	C(DL)P1N51	C(DL)Q1N51	CDS1N51	
transducer frequency	MHz	0.2	0.5	1	2	4	8	
inner pipe diameter d								
min. extended	mm	400	100	50	25	10	6	
min. recommended	mm	500	200	100	50	25	10	
max. recommended	mm	4000	2000	1000	400	150	70	
max. extended	mm	6500	6500	3400	600	400	70	
pipe wall thickness								
min.	mm	11	5	2.5	1.2	0.6	0.3	
material								
housing		PEEK with stainless steel cover 304			stainless steel 304		stainless steel 304	
contact surface		PEEK			PEEK		PEI	
degree of protection		IP66						
transducer cable								
type		1699						
length	m	5			4	3	2	
dimensions								
length l	mm	129.5	126.5	60		42.5	25	
width b	mm	51	51	30		18	13	
height h	mm	67	67.5	33.5		21.5	17	
dimensional drawing								
weight (without cable)	kg	0.47	0.36	0.035		0.011	0.004	
pipe surface temperature	°C	-40...+130					-30...+130	
ambient temperature	°C	-40...+130					-30...+130	
temperature compensation		x						
explosion protection								
• FM								
pipe surface temperature (Ex)	°C	-40...+125						
degree of protection		IP66						
marking		 NI/CI. I,II,III/Div. 2 / GP A,B,C,D,E,F,G/ Temp. Codes dwg 3860						

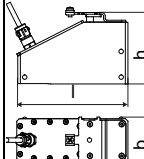
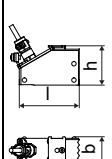

Shear wave transducers (FM Class I Div. 2, NL, extended temperature range)

order code		FSM-EF2N-**NL	FSP-EF2N-**NL	FSQ-EF2N-**NL
technical type		C(DL)M1E51	C(DL)P1E51	C(DL)Q1E51
transducer frequency	MHz	1	2	4
inner pipe diameter d				
min. extended	mm	50	25	10
min. recommended	mm	100	50	25
max. recommended	mm	1000	400	150
max. extended	mm	3400	600	400
pipe wall thickness				
min.	mm	2.5	1.2	0.6
material				
housing		stainless steel 304		
contact surface		Sintimid		
degree of protection		IP66		
transducer cable				
type		1699		
length	m	4		3
dimensions				
length l	mm	60		42.5
width b	mm	30		18
height h	mm	33.5		21.5
dimensional drawing				
weight (without cable)	kg	0.042		0.011
pipe surface temperature	°C	-30...+200		
ambient temperature	°C	-30...+200		
temperature compensation		x		
explosion protection				
• FM				
pipe surface temperature (Ex)	°C	-40...+190		
degree of protection		IP66		
marking		 NI/Cl. I,II,III/Div. 2 / GP A,B,C,D,E,F,G/ Temp. Codes dwg 3860		

Shear wave transducers (zone 1, T1)

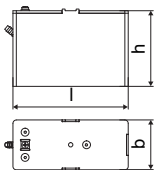
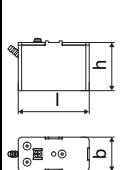
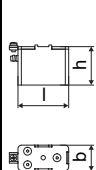


order code	FSG-N*1*-*T1	FSK-N*1*-*T1	FSM-N*1*-*T1	FSP-N*1*-*T1	FSQ-N*1*-*T1
technical type	C(DL)G1N81	C(DL)K1N81	C(DL)M2N81	C(DL)P2N81	C(DL)Q2N81
transducer frequency MHz	0.2	0.5	1	2	4
inner pipe diameter d					
min. extended	mm 400	100	50	25	10
min. recommended	mm 500	200	100	50	25
max. recommended	mm 4000	2000	1000	400	150
max. extended	mm 6500	2400	1200	480	240
pipe wall thickness					
min.	mm 11	5	2.5	1.2	0.6
material					
housing	PEEK with stainless steel cover 316L (1.4404)				
contact surface	PEEK				
degree of protection	IP66		IP66/IP67		
transducer cable					
type	1699				
length	m 5		4		3
dimensions					
length l	mm 129.5	126.5	64		40
width b	mm 51	51	32		22
height h	mm 67	67.5	40.5		25.5
dimensional drawing					
weight (without cable)	kg 0.47	0.36	0.066		0.016
pipe surface temperature	°C -40...+130				
ambient temperature	°C -40...+130				
temperature compensation	x				
explosion protection					
• ATEX/IECEx					
order code	FSG-NA1*-*T1	FSK-NA1*-*T1	FSM-NA1*-*T1	FSP-NA1*-*T1	FSQ-NA1*-*T1
pipe surface temperature (Ex)	°C -55...+180				
marking	CE 0637 (Ex) II2G II2D Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T185 °C Db				
certification	IBExU07ATEX1168 X, IECEx IBE 08.0007X				
• EAC					
order code	FSG-NE1*-*T1	FSK-NE1*-*T1	FSM-NE1*-*T1	FSP-NE1*-*T1	FSQ-NE1*-*T1
marking	1Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T185 °C Db от -55 °C до +180 °C				
certification	EACEx EA9C KZ 7500525.01.01.01830				
• inmetro					
order code	FSG-NS1*-*T1	FSK-NS1*-*T1	FSM-NS1*-*T1	FSP-NS1*-*T1	FSQ-NS1*-*T1
pipe surface temperature (Ex)	°C -55...+180				
marking	Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T185 °C Db				
certification	TÜV 15.0616 X				
• KOSHA					
order code	FSG-NK1*-*T1	FSK-NK1*-*T1	FSM-NK1*-*T1	FSP-NK1*-*T1	FSQ-NK1*-*T1
marking	Ex eq IIC T3...T6 Tamb = -55 °C - +180 °C				
certification	KCC 14-AV4BO-0510		KCC 14-AV4BO-0509		
• Japanese Ex certification					
order code	FSG-NJ1*-*T1	FSK-NJ1*-*T1	FSM-NJ1*-*T1	FSP-NJ1*-*T1	FSQ-NJ1*-*T1
marking	Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T185 °C Db				
certification	CML 21JPN5217X				

Shear wave transducers (zone 1, T1, IP68)

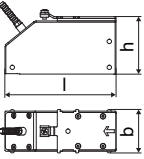


order code		FSG-L*1*-**T1/ H68	FSK-L*1*-**T1/H68	FSM-L*1*-**T1/ H68	FSP-L*1*-**T1/H68
technical type		CDG1LI1	CDK1LI1	CDM2LI1	CDP2LI1
transducer frequency	MHz	0.2	0.5	1	2
inner pipe diameter d					
min. extended	mm	400	100	50	25
min. recommended	mm	500	200	100	50
max. recommended	mm	4000	2000	1000	400
max. extended	mm	6500	2400	1200	480
pipe wall thickness					
min.	mm	11	5	2.5	1.2
material					
housing		PEEK with stainless steel cover 316Ti (1.4571)			
contact surface		PEEK			
degree of protection		IP68 ¹			
transducer cable					
type		2550			
length	m	12			
dimensions					
length l	mm	130		72	
width b	mm	54		32	
height h	mm	83.5		46	
dimensional drawing					
weight (without cable)	kg	0.43		0.085	
pipe surface temperature	°C	-40...+80			
ambient temperature	°C	-40...+80			
temperature compensation		x			
explosion protection					
• ATEX/IECEx					
order code		FSG-LA1*-**T1/ H68	FSK-LA1*-**T1/ H68	FSM-LA1*-**T1/ H68	FSP-LA1*-**T1/ H68
pipe surface temperature (Ex)	°C	-40...+80			
marking		CE 0637 Ex II2G II2D Ex q IIC T6...T5 Gb Ex tb IIIC T80 °C...T85 °C Db			
certification		IBExU07ATEX1168 X, IECEx IBE 08.0007X			
• EAC					
order code		FSG-LE1*-**T1/ H68	FSK-LE1*-**T1/ H68	FSM-LE1*-**T1/ H68	FSP-LE1*-**T1/ H68
marking		1Ex q IIC T6...T5 Gb Ex tb IIIC T80 °C...T85 °C Db от -40 °C до +80 °C			
certification		EAC KZ 7500525.01.01.01830			
• inmetro					
order code		FSG-LS1*-**T1/ H68	FSK-LS1*-**T1/ H68	FSM-LS1*-**T1/ H68	FSP-LS1*-**T1/ H68
pipe surface temperature (Ex)	°C	-40...+80			
marking		Ex q IIC T6...T5 Gb Ex tb IIIC T80 °C...T85 °C Db			
certification		 TÜV 15.0616 X			
• Japanese Ex certification					
order code		FSG-LJ1*-**T1/ H68	FSK-LJ1*-**T1/ H68	FSM-LJ1*-**T1/ H68	FSP-LJ1*-**T1/ H68
marking		Ex q IIC T6...T5 Gb Ex tb IIIC T80 °C...T85 °C Db			
certification		CML 21JPN5217X			

¹ test conditions: 3 months/2 bar (20 m)/20 °C

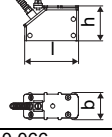
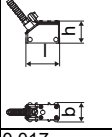




Shear wave transducers (zone 1, NL)

order code	FSG-N*1*-**NL	FSK-N*1*-**NL	FSM-N*1*-**NL	FSP-N*1*-**NL	FSQL-N*1*-**NL
technical type	C(DL)G1NW1	C(DL)K1NW1	C(DL)M2NW1	C(DL)P2NW1	C(DL)Q2NW1
transducer frequency	MHz 0.2	0.5	1	2	4
inner pipe diameter d					
min. extended	mm 400	100	50	25	10
min. recommended	mm 500	200	100	50	25
max. recommended	mm 4000	2000	1000	400	150
max. extended	mm 6500	6500	3400	600	400
pipe wall thickness					
min.	mm 11	5	2.5	1.2	0.6
material					
housing	PEEK with stainless steel cover and transducer shoe 304 (1.4301)				
contact surface	PEEK				
degree of protection	IP66		IP66/IP67		
transducer cable					
type	1699				
length	m 5	4		3	
dimensions					
length l	mm 136.5	84		70	
width b	mm 59	40		30	
height h	mm 90.5	59		47.5	
dimensional drawing					
weight (without cable)	kg 1.674	0.504		0.251	
pipe surface temperature	°C -40...+130				
ambient temperature	°C -40...+130				
temperature compensation	x				
explosion protection					
• ATEX/IECEx					
order code	FSG-NA1*-**NL	FSK-NA1*-**NL	FSM-NA1*-**NL	FSP-NA1*-**NL	FSQL-NA1*-**NL
pipe surface temperature (Ex)	°C -55...+180				
marking	CE 0637  II2G II2D Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T185 °C Db				
certification	IBExU07ATEX1168 X, IECEx IBE 08.0007X				
• EAC					
order code	FSG-NE1*-**NL	FSK-NE1*-**NL	FSM-NE1*-**NL	FSP-NE1*-**NL	FSQL-NE1*-**NL
marking	1Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T185 °C Db от -55 °C до +180 °C				
certification	 EA3C KZ 7500525.01.01.01830				

Shear wave transducers (zone 1, T1, extended temperature range)

order code		FSG-E*1*-**T1	FSK-E*1*-**T1
technical type		C(DL)G1E83	C(DL)K1E83
transducer frequency	MHz	0.2	0.5
inner pipe diameter d			
min. extended	mm	400	100
min. recommended	mm	500	200
max. recommended	mm	4000	2000
max. extended	mm	6500	2400
pipe wall thickness			
min.	mm	11	5
material			
housing		PPSU with stainless steel cover 316L (1.4404)	
contact surface		PPSU	
degree of protection		IP66	
transducer cable			
type		1699	
length	m	5	
dimensions			
length l	mm	129.5	
width b	mm	51	
height h	mm	67	
dimensional drawing			
weight (without cable)	kg	0.82	
pipe surface temperature	°C	-40...+155	
ambient temperature	°C	-40...+155	
temperature compensation		x	
explosion protection			
• ATEX/IECEx			
order code		FSG-EA1*-**T1	FSK-EA1*-**T1
pipe surface temperature (Ex)	°C	-50...+155	
marking		CE 0637 Ex II2G II2D Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T160 °C Db	
certification		IBExU07ATEX1168 X, IECEx IBE 08.0007X	
• EAC			
order code		FSG-EE1*-**T1	FSK-EE1*-**T1
marking		1Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T160 °C Db от -50 °C до +155 °C	
certification		 EA3C KZ 7500525.01.01.01830	
• inmetro			
order code		FSG-ES1*-**T1	FSK-ES1*-**T1
pipe surface temperature (Ex)	°C	-50...+155	
marking		Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T160 °C Db	
certification		 TÜV 15.0616 X	
• Japanese Ex certification			
order code		FSG-EJ1*-**T1	FSK-EJ1*-**T1
marking		Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T160 °C Db	
certification		CML 21JPN5217X	

Shear wave transducers (zone 1, T1, extended temperature range)

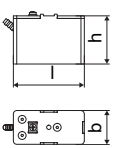
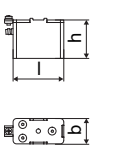
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technical type		C(DL)M2E85	C(DL)P2E85	C(DL)Q2E85
transducer frequency	MHz	1	2	4
inner pipe diameter d				
min. extended	mm	50	25	10
min. recommended	mm	100	50	25
max. recommended	mm	1000	400	150
max. extended	mm	1200	480	240
pipe wall thickness				
min.	mm	2.5	1.2	0.6
material				
housing		PI with stainless steel cover 316L (1.4404)		
contact surface		PI		
degree of protection		IP66/IP67		
transducer cable				
type		6111		
length	m	4		3
dimensions				
length l	mm	64		40
width b	mm	32		22
height h	mm	40.5		25.5
dimensional drawing				
weight (without cable)	kg	0.066		0.017
pipe surface temperature	°C	-30...+240 ¹		-30...+200
ambient temperature	°C	-30...+40 -30...+200 ²		-30...+200
temperature compensation		x		
explosion protection				
• ATEX/IECEx				
order code		FSM-EA1*.*T1	FSP-EA1*.*T1	FSQ-EA1*.*T1
pipe surface temperature (Ex)	°C	-45...+225		
marking		CE 0637  II2G II2D Ex q IIC T6...T2 Gb Ex tb IIIA T80 °C...T230 °C Db		
certification		IBExU07ATEX1168 X, IECEx IBE 08.0007X		
• EAC				
order code		FSM-EE1*.*T1	FSP-EE1*.*T1	FSQ-EE1*.*T1
marking		1Ex q IIC T6...T2 Gb Ex tb IIIA T80 °C...T230 °C Db от -40 °C до +225 °C		
certification		 EA3C KZ 7500525.01.01.01830		
• inmetro				
order code		FSM-ES1*.*T1	FSP-ES1*.*T1	FSQ-ES1*.*T1
pipe surface temperature (Ex)	°C	-45...+225		
marking		Ex q IIC T6...T2 Gb Ex tb IIIA T80 °C...T230 °C Db		
certification		 TUV 15.0616 X		
• KOSHA				
order code		FSM-EK1*.*T1	FSP-EK1*.*T1	FSQ-EK1*.*T1
marking		Ex eq IIC T2...T6 Tamb = -45 °C - +225 °C		
certification		 14-AV4BO-0511		
• Japanese Ex certification				
order code		FSM-EJ1*.*T1	FSP-EJ1*.*T1	FSQ-EJ1*.*T1
marking		Ex q IIC T6...T2 Gb Ex tb IIIA T80 °C...T230 °C Db		
certification		CML 21JPN5217X		

¹ > +200 °C :

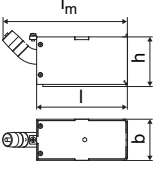
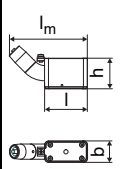

Variofix L or Variofix C
observe the insulation instruction
ambient temperature max. +40 °C

² pipe surface temperature max. +200 °C

Shear wave transducers (zone 1, NL, extended temperature range)

order code		FSM-E*1*-**NL	FSP-E*1*-**NL	FSQ-E*1*-**NL
technical type		C(DL)M2EW5	C(DL)P2EW5	C(DL)Q2EW5
transducer frequency	MHz	1	2	4
inner pipe diameter d				
min. extended	mm	50	25	10
min. recommended	mm	100	50	25
max. recommended	mm	1000	400	150
max. extended	mm	3400	600	400
pipe wall thickness				
min.	mm	2.5	1.2	0.6
material				
housing		PI with stainless steel cover and transducer shoe 304 (1.4301)		
contact surface		PI		
degree of protection		IP66/IP67		
transducer cable				
type		6111		
length	m	4		3
dimensions				
length l	mm	84		70
width b	mm	40		30
height h	mm	59		47.5
dimensional drawing				
weight (without cable)	kg	0.505		0.252
pipe surface temperature	°C	-30...+200		
ambient temperature	°C	-30...+200		
temperature compensation		x		
explosion protection				
• ATEX/IECEx				
order code		FSM-EA1*-**NL	FSP-EA1*-**NL	FSQ-EA1*-**NL
pipe surface temperature (Ex)	°C	-45...+225		
marking		CE 0637 Ex II2G II2D Ex q IIC T6...T2 Gb Ex tb IIIA T80 °C...T230 °C Db		
certification		IBExU07ATEX1168 X, IECEx IBE 08.0007X		
• EAC				
order code		FSM-EE1*-**NL	FSP-EE1*-**NL	FSQ-EE1*-**NL
marking		1Ex q IIC T6...T2 Gb Ex tb IIIA T80 °C...T230 °C Db от -40 °C до +225 °C		
certification		EAC EA9C KZ 7500525.01.01.01830		

Shear wave transducers (FM Class I Div. 1, T1)

order code		FSG-NF1N-**T1	FSK-NF1N-**T1	FSM-NF1N-**T1	FSP-NF1N-**T1	FSQ-NF1N-**T1
technical type		C(DL)G1N62	C(DL)K1N62	C(DL)M1N62	C(DL)P1N62	C(DL)Q1N62
transducer frequency	MHz	0.2	0.5	1	2	4
inner pipe diameter d						
min. extended	mm	400	100	50	25	10
min. recommended	mm	500	200	100	50	25
max. recommended	mm	4000	2000	1000	400	150
max. extended	mm	6500	2400	1200	480	240
pipe wall thickness						
min.	mm	11	5	2.5	1.2	0.6
material						
housing		stainless steel 316L (1.4404)				
contact surface		PEEK				
degree of protection		IP66				
transducer cable						
type		2549				
length	m	10				
dimensions						
length l	mm	132		60		
width b	mm	60		30		
height h	mm	72		43		
mounting length l _m	mm	185		110		
thread		1/2 NPT		1/2 NPT		
dimensional drawing						
weight (without cable)	kg	1.09		0.285		
pipe surface temperature	°C	-40...+110				
ambient temperature	°C	-40...+110				
temperature compensation		x				
explosion protection						
• FM						
pipe surface temperature (Ex)	°C	-40...+125				
marking		 S/Cl. I, II, III / Div. 1 / GP A, B, C, D, E, F, G / Temperature Codes dwg 3831				

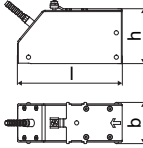
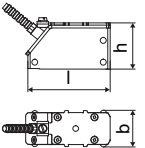
Lamb wave transducers

Lamb wave transducers (nonEx, NL, AS)

order code	FLF-NNNN-**NL FLF-NNNN-**AS	FLG-NNNN-**NL FLG-NNNN-**AS	FLH-NNNN-**NL FLH-NNNN-**AS	FLK-NNNN-**NL FLK-NNNN-**AS	FLM-NNNN-**NL FLM-NNNN-**AS	FLP-NNNN-**NL FLP-NNNN-**AS	FLQ-NNNN-**NL FLQ-NNNN-**AS
technical type	C(RT)F1NC3	C(RT)G1NC3	C(RT)H1NC3	C(RT)K1NC3	C(RT)M1NC3	C(RT)P1NC3	C(RT)Q1NC3
transducer frequency	MHz 0.15	0.2	0.3	0.5	1	2	4
inner pipe diameter d¹							
min. extended	mm 640	400	350	100	50	25	10
min. recommended	mm 800	500	450	200	100	50	25
max. recommended	mm 5500	4000	3000	2000	1000	400	150
max. extended	mm 6600	4800	3600	2400	1200	480	240
pipe wall thickness							
min.	mm 15	11	8	5	2.5	1.2	0.6
max.	mm 32	24	16	10	5	3	1.2
material							
housing	PPSU with stainless steel cover 316Ti (1.4571)		PPSU with stainless steel cover 304 (1.4301)				
contact surface	PPSU						
degree of protection	IP66/IP67		IP66				
transducer cable							
type	1699						
length	m 5					4	3
dimensions							
length l	mm 163	128.5			74		42
width b	mm 54	51			32		22
height h	mm 91.3	67.5			40.5		25.5
dimensional drawing							
weight (without cable)	kg 0.935	0.471			0.077		0.019
pipe surface temperature	°C -40...+130						
ambient temperature	°C -40...+130						
temperature compensation	x						

¹ Lamb wave transducer:
 typical values for water; pipe diameters for other fluids on request
 inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)
 inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

Lamb wave transducers (nonEx, higher temperatures, NL)

order code		FLG-SNNN-**NL	FLH-SNNN-**NL	FLK-SNNN-**NL	FLM-SNNN-**NL	FLP-SNNN-**NL
technical type		C(RT)G1SC3	C(RT)H1SC3	C(RT)K1SC3	C(RT)M1SC3	C(RT)P1SC3
transducer frequency	MHz	0.2	0.3	0.5	1	2
inner pipe diameter d¹						
min. extended	mm	400	350	100	50	25
min. recommended	mm	500	450	200	100	50
max. recommended	mm	4000	3000	2000	1000	400
max. extended	mm	4800	3600	2400	1200	480
pipe wall thickness						
min.	mm	10.6	7.1	4.2	2.1	1.1
max.	mm	23.7	15.8	9.5	4.7	2.4
material						
housing		PPSU with stainless steel cover 316Ti (1.4571)				
contact surface		PPSU				
degree of protection		IP66				
transducer cable						
type		1699				
length	m	5				4
dimensions						
length l	mm	128.5			74	
width b	mm	51			32	
height h	mm	67.5			40.5	
dimensional drawing						
weight (without cable)	kg	0.8			0.16	
storing temperature	°C	-40...+180				
operating temperature	°C	100...180				
warm-up time	h	3				1
temperature compensation		x				

completely thermally insulated transducer installation necessary

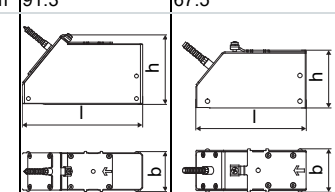
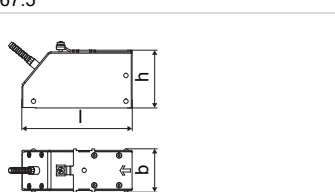
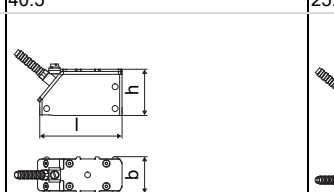
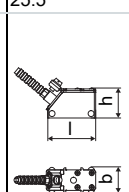

¹ Lamb wave transducer:

typical values for water; pipe diameters for other fluids on request

inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)

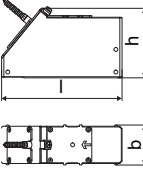
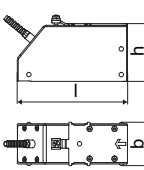
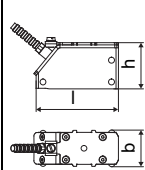
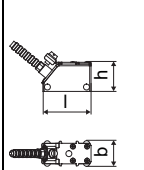
inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

Lamb wave transducers (zone 2 - FM Class I Div. 2 - nonEx, TS)

order code		FLF-N***-**TS	FLG-N***-**TS	FLH-N***-**TS	FLK-N***-**TS	FLM-N***-**TS	FLP-N***-**TS	FLQ-N***-**TS	
technical type		C(RT)F1N52	C(RT)G1N52	C(RT)H1N52	C(RT)K1N52	C(RT)M1N52	C(RT)P1N52	C(RT)Q1N52	
transducer frequency	MHz	0.15	0.2	0.3	0.5	1	2	4	
inner pipe diameter d¹									
min. extended	mm	640	400	350	100	50	25	10	
min. recommended	mm	800	500	450	200	100	50	25	
max. recommended	mm	5500	4000	3000	2000	1000	400	150	
max. extended	mm	6600	4800	3600	2400	1200	480	240	
pipe wall thickness									
min.	mm	15	11	8	5	2.5	1.2	0.6	
max.	mm	32	24	16	10	5	3	1.2	
material									
housing		PPSU with stainless steel cover 316Ti (1.4571)	PPSU with stainless steel cover 316L (1.4404)						
contact surface		PPSU							
degree of protection		IP66/IP67		IP66					
transducer cable									
type		1699							
length	m	5				4		3	
dimensions									
length l	mm	163		128.5		74		42	
width b	mm	54		51		32		22	
height h	mm	91.3		67.5		40.5		25.5	
dimensional drawing									
weight (without cable)	kg	0.935		0.471		0.077		0.019	
pipe surface temperature	°C	-40...+130							
ambient temperature	°C	-40...+130							
temperature compensation		x							
explosion protection									
• ATEX/IECEx									
order code		FLF-NA2N-**TS	FLG-NA2N-**TS	FLH-NA2N-**TS	FLK-NA2N-**TS	FLM-NA2N-**TS	FLP-NA2N-**TS	FLQ-NA2N-**TS	
pipe surface temperature (Ex)	°C	gas: -50...+165 dust: -50...+155							
marking		CE 0637 (Ex) II 3G II 2D Ex nA IIC T6...T3 Gc Ex tb IIIA T80 °C...T160 °C Db		CE 0637 (Ex) II 3G II 2D Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T160 °C Db					
certification		IBExU10ATEX1163 X, IECEx IBE 12.0005X							
• EAC									
order code		FLF-NE2N-**TS	FLG-NE2N-**TS	FLH-NE2N-**TS	FLK-NE2N-**TS	FLM-NE2N-**TS	FLP-NE2N-**TS	FLQ-NE2N-**TS	
marking		2Ex nA IIC T6...T3 Gc Ex tb IIIA T80 °C...T160 °C Db от -50 °C до +165 °C Пыль: до +155 °C		2Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T160 °C Db от -50 °C до +165 °C Пыль: до +155 °C					
certification		[EAC] EAЭC KZ 7500525.01.01.01830							
• FM									
order code		FLF-NF2N-**TS	FLG-NF2N-**TS	FLH-NF2N-**TS	FLK-NF2N-**TS	FLM-NF2N-**TS	FLP-NF2N-**TS	FLQ-NF2N-**TS	
pipe surface temperature (Ex)	°C	-40...+165							
degree of protection		IP66							
marking		 NI/Cl. I,II,III/Div. 2 / GP A,B,C,D,E,F,G/ Temp. Codes dwg 3860							

¹ Lamb wave transducer:
 typical values for water; pipe diameters for other fluids on request
 inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)
 inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

Lamb wave transducers (zone 2 - FM Class I Div. 2 - nonEx, T1)


order code		FGLF-N***-**T1	FGLG-N***-**T1	FGLH-N***-**T1	FGLK-N***-**T1	FGLM-N***-**T1	FGLP-N***-**T1	FGLQ-N***-**T1
technical type		CG(RT)F1N53	CG(RT)G1N53	CG(RT)H1N53	CG(RT)K1N53	CG(RT)M1N53	CG(RT)P1N53	CG(RT)Q1N53
transducer frequency	MHz	0.15	0.2	0.3	0.5	1	2	4
fluid pressure¹								
min. extended	bar	metal pipe: 10			metal pipe: 10 (d > 120 mm) 3 (d < 120 mm)	metal pipe: 3 (d < 60 mm)	metal pipe: 3 (d < 35 mm)	metal pipe: 3 (d < 15 mm)
min.	bar	metal pipe: 15 plastic pipe: 1			metal pipe: 15 (d > 120 mm) 10 (d < 120 mm) plastic pipe: 1	metal pipe: 10 (d > 60 mm) 5 (d < 60 mm) plastic pipe: 1	metal pipe: 10 (d > 35 mm) 5 (d < 35 mm) plastic pipe: 1	metal pipe: 10 (d > 15 mm) 5 (d < 15 mm) plastic pipe: 1
inner pipe diameter d^{1,2}								
min. extended	mm	640	400	350	100	50	25	10
min. recommended	mm	800	500	450	200	100	50	25
max. recommended	mm	5500	4000	3000	2000	1000	400	150
max. extended	mm	6600	4800	3600	2400	1200	480	240
min. extended	mm	220	180	110	60	30	15	7
min. recommended	mm	270	220	140	80	40	20	10
max. recommended	mm	1200	900	600	300	150	50	22
max. extended	mm	1600	1400	1000	360	180	60	30
pipe wall thickness								
min.	mm	15	11	8	5	2.5	1.2	0.6
max.	mm	32	24	16	10	5	3	1.2
material								
housing		PPSU with stainless steel cover 316Ti (1.4571)		PPSU with stainless steel cover 316L (1.4404)				
contact surface		PPSU						
degree of protection		IP66/IP67		IP66				
transducer cable								
type		1699						
length	m	5			4		3	
dimensions								
length l	mm	163		128.5		74		42
width b	mm	54		51		32		22
height h	mm	91.3		67.5		40.5		25.5
dimensional drawing								
weight (without cable)	kg	0.935		0.471		0.077		0.019
pipe surface temperature	°C	-40...+130						
ambient temperature	°C	-40...+130						
temperature compensation		x						
explosion protection								
• ATEX/IECEx								
order code		FLF-NA2*-**T1	FLG-NA2*-**T1	FLH-NA2*-**T1	FLK-NA2*-**T1	FLM-NA2*-**T1	FLP-NA2*-**T1	FLQ-NA2*-**T1
pipe surface temperature (Ex)	°C	gas: -50...+165 dust: -50...+155						
marking		CE 0637 (Ex) II 3G II 2D Ex nA IIC T6...T3 Gc Ex tb IIIA T80 °C...T160 °C Db		CE 0637 (Ex) II 3G II 2D Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T160 °C Db				
certification		IBExU10ATEX1163 X, IECEx IBE 12.0005X						

¹ depending on the application, typical absolute value for natural gas, nitrogen, compressed air

² Lamb wave transducer:
typical values for natural gas, nitrogen, oxygen; pipe diameters for other fluids on request
inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 15 m/s (30 m/s)
inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 12 m/s (25 m/s)

¹ Lamb wave transducer:
typical values for water; pipe diameters for other fluids on request
inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)
inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

continued on next page

order code		FGLF-N***-**T1	FGLG-N***-**T1	FGLH-N***-**T1	FGLK-N***-**T1	FGLM-N***-**T1	FGLP-N***-**T1	FGLQ-N***-**T1
technical type		CG(RT)F1N53	CG(RT)G1N53	CG(RT)H1N53	CG(RT)K1N53	CG(RT)M1N53	CG(RT)P1N53	CG(RT)Q1N53
• EAC								
order code		FLF-NE2*-**T1	FLG-NE2*-**T1	FLH-NE2*-**T1	FLK-NE2*-**T1	FLM-NE2*-**T1	FLP-NE2*-**T1	FLQ-NE2*-**T1
marking		2Ex nA IIC T6...T3 Gc Ex tb IIIA T80 °C...T160 °C Db от -50 °C до +165 °C Пыль: до +155 °C	2Ex nA IIC T6...T3 Gc Ex tb IIC T80 °C...T160 °C Db от -50 °C до +165 °C Пыль: до +155 °C					
certification		EAC EAЭС KZ 7500525.01.01.01830						
• FM								
order code		FLF-NF2*-**T1	FLG-NF2*-**T1	FLH-NF2*-**T1	FLK-NF2*-**T1	FLM-NF2*-**T1	FLP-NF2*-**T1	FLQ-NF2*-**T1
pipe surface temperature (Ex)	°C	-40...+165						
degree of protection		IP66						
marking		 NI/Cl. I,II,III/Div. 2 / GP A,B,C,D,E,F,G/ Temp. Codes dwg 3860						

¹ depending on the application, typical absolute value for natural gas, nitrogen, compressed air

² Lamb wave transducer:
 typical values for natural gas, nitrogen, oxygen; pipe diameters for other fluids on request
 inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 15 m/s (30 m/s)
 inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 12 m/s (25 m/s)

¹ Lamb wave transducer:
 typical values for water; pipe diameters for other fluids on request
 inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)
 inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

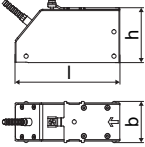
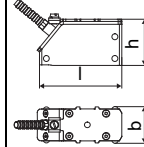

Lamb wave transducers (zone 2 - nonEx, T1, IP68)

order code	FLF-L***-**T1/ H68	FLG-L***-**T1/ H68	FLH-L***-**T1/ H68	FLK-L***-**T1/ H68	FLM-L***-**T1/ H68	FLP-L***-**T1/ H68
technical type	CRF1LI8	CRG1LI8	CRH1LI8	CRK1LI8	CRM1LI8	CRP1LI8
transducer frequency	MHz 0.15	0.2	0.3	0.5	1	2
inner pipe diameter d¹						
min. extended	mm 640	400	350	100	50	25
min. recommended	mm 800	500	450	200	100	50
max. recommended	mm 5500	4000	3000	2000	1000	400
max. extended	mm 6600	4800	3600	2400	1200	480
pipe wall thickness						
min.	mm 15	11	8	5	2.5	1.2
max.	mm 32	24	16	10	5	3
material						
housing	PPSU with stainless steel cover 316Ti (1.4571)					
contact surface	PPSU					
degree of protection	IP68 ²					
transducer cable						
type	2550					
length	m 12					
dimensions						
length l	mm 173	143.5			73	
width b	mm 54	54			31.6	
height h	mm 91.5	83.5			46	
dimensional drawing						
weight (without cable)	kg 1.36	0.639			0.093	
pipe surface temperature	°C -40...+100 (*L*-LNN*-**T1/H68) -40...+90 (*L*-L*2*-**T1/H68)					
ambient temperature	°C -40...+100 (*L*-LNN*-**T1/H68) -40...+90 (*L*-L*2*-**T1/H68)					
temperature compensation	x					
explosion protection						
• ATEX/IECEx						
order code	FLF-LA2N-**T1/ H68	FLG-LA2N-**T1/ H68	FLH-LA2N-**T1/ H68	FLK-LA2N-**T1/ H68	FLM-LA2N-**T1/ H68	FLP-LA2N-**T1/ H68
pipe surface temperature (Ex)	°C gas: -40...+90 dust: -40...+80					
marking	CE 0637 Ex II 3G II 2D Ex nA IIC T6...T5 Gc Ex tb IIIC T80 °C...T85 °C Db					
certification	IBExU10ATEX1163 X, IECEx IBE 12.0005X					
• EAC						
order code	FLF-LE2N-**T1/ H68	FLG-LE2N-**T1/ H68	FLH-LE2N-**T1/ H68	FLK-LE2N-**T1/ H68	FLM-LE2N-**T1/ H68	FLP-LE2N-**T1/ H68
marking	2Ex nA IIC T6...T5 Gc Ex tb IIIC T80 °C...T85 °C Db от -40 °C до +90 °C Пыль: до +80 °C					
certification	EACEx EAЭC KZ 7500525.01.01.01830					

¹ Lamb wave transducer:
 typical values for water; pipe diameters for other fluids on request
 inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)
 inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

² test conditions: 3 months/2 bar (20 m)/20 °C

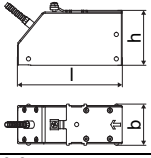
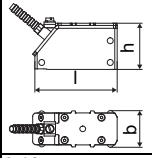

Lamb wave transducers (zone 2 - FM Class I Div. 2 - nonEx, TS, higher temperatures)

order code		FLG-S***-**TS	FLH-S***-**TS	FLK-S***-**TS	FLM-S***-**TS	FLP-SNNN-**TS
technical type		C(RT)G1S52	C(RT)H1S52	C(RT)K1S52	C(RT)M1S52	C(RT)P1S52
transducer frequency	MHz	0.2	0.3	0.5	1	2
inner pipe diameter d¹						
min. extended	mm	400	350	100	50	25
min. recommended	mm	500	450	200	100	50
max. recommended	mm	4000	3000	2000	1000	400
max. extended	mm	4800	3600	2400	1200	480
pipe wall thickness						
min.	mm	10.6	7.1	4.2	2.1	1.1
max.	mm	23.7	15.8	9.5	4.7	2.4
material						
housing		PPSU with stainless steel cover 316Ti (1.4571)				
contact surface		PPSU				
degree of protection		IP66				
transducer cable						
type		1699				
length	m	5				4
dimensions						
length l	mm	128.5			74	
width b	mm	51			32	
height h	mm	67.5			40.5	
dimensional drawing						
weight (without cable)	kg	0.8			0.16	
storing temperature	°C	-40...+165				
operating temperature	°C	100...180 (*L*-SNN*-**TS) 100...165 (*L*-S*2*-**TS)				
warm-up time	h	3				1
temperature compensation		x				
explosion protection						
• ATEX/IECEX						
order code		FLG-SA2N-**TS	FLH-SA2N-**TS	FLK-SA2N-**TS	FLM-SA2N-**TS	-
pipe surface temperature (Ex)	°C	gas: -50...+165 dust: -50...+155				
marking		CE 0637 Ex II 3G II 2D Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T160 °C Db				
certification		IBExU10ATEX1163 X, IECEx IBE 12.0005X				
• EAC						
order code		FLG-SE2N-**TS	FLH-SE2N-**TS	FLK-SE2N-**TS	FLM-SE2N-**TS	-
marking		2Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T160 °C Db от -50 °C до +165 °C Пыль: до +155 °C				
certification		[Eurasian Conformity Mark] EAЭС KZ 7500525.01.01.01830				
• FM						
order code		FLG-SF2N-**TS	FLH-SF2N-**TS	FLK-SF2N-**TS	FLM-SF2N-**TS	-
pipe surface temperature (Ex)	°C	-40...+165				
degree of protection		IP66				
marking		 NI/Cl. I,II,III/Div. 2 / GP A,B,C,D,E,F,G/ Temp. Codes dwg 3860				

completely thermally insulated transducer installation necessary

¹ Lamb wave transducer:
 typical values for water; pipe diameters for other fluids on request
 inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)
 inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

Lamb wave transducers (zone 2 - FM Class I Div. 2 - nonEx, T1, higher temperatures)

order code		FLG-S***-**T1	FLH-S***-**T1	FLK-S***-**T1	FLM-S***-**T1	FLP-S***-**T1
technical type		C(RT)G1S53	C(RT)H1S53	C(RT)K1S53	C(RT)M1S53	C(RT)P1S53
transducer frequency	MHz	0.2	0.3	0.5	1	2
inner pipe diameter d¹						
min. extended	mm	400	350	100	50	25
min. recommended	mm	500	450	200	100	50
max. recommended	mm	4000	3000	2000	1000	400
max. extended	mm	4800	3600	2400	1200	480
pipe wall thickness						
min.	mm	10.6	7.1	4.2	2.1	1.1
max.	mm	23.7	15.8	9.5	4.7	2.4
material						
housing		PPSU with stainless steel cover 316Ti (1.4571)				
contact surface		PPSU				
degree of protection		IP66				
transducer cable						
type		1699				
length	m	5				4
dimensions						
length l	mm	128.5			74	
width b	mm	51			32	
height h	mm	67.5			40.5	
dimensional drawing						
weight (without cable)	kg	0.8			0.16	
storing temperature	°C	-40...+165				
operating temperature	°C	100...180 (*L*-SNN*-**T1) 100...165 (*L*-S*2*-**T1)				
warm-up time	h	3				1
temperature compensation		x				
explosion protection						
• ATEX/IECEx						
order code		FLG-SA2*-**T1	FLH-SA2*-**T1	FLK-SA2*-**T1	FLM-SA2*-**T1	-
pipe surface temperature (Ex)	°C	gas: -50...+165 dust: -50...+155				
marking		CE 0637 Ex II 3G II 2D Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T160 °C Db				
certification		IBExU10ATEX1163 X, IECEx IBE 12.0005X				
• EAC						
order code		FLG-SE2*-**T1	FLH-SE2*-**T1	FLK-SE2*-**T1	FLM-SE2*-**T1	-
marking		2Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T160 °C Db от -50 °C до +165 °C Пыль: до +155 °C				
certification		EAC Ex EA3C KZ 7500525.01.01.01830				
• FM						
order code		FLG-SF2*-**T1	FLH-SF2*-**T1	FLK-SF2*-**T1	FLM-SF2*-**T1	-
pipe surface temperature (Ex)	°C	-40...+165				
degree of protection		IP66				
marking		 NI/CI. I,II,III/Div. 2 / GP A,B,C,D,E,F,G/ Temp. Codes dwg 3860				

completely thermally insulated transducer installation necessary

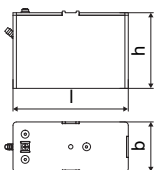
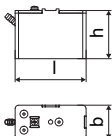
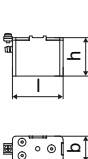
¹ Lamb wave transducer:

typical values for water; pipe diameters for other fluids on request

inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)

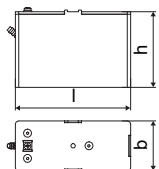
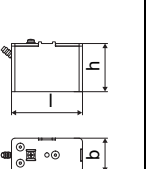


inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

Lamb wave transducers (zone 2, NL)

order code		FLG-N*2*-**NL	FLH-N*2*-**NL	FLK-N*2*-**NL	FLM-N*2*-**NL	FLP-N*2*-**NL	FLQ-N*2*-**NL
technical type		C(RT)G1NH3	C(RT)H1NH3	C(RT)K1NH3	C(RT)M1NH3	C(RT)P1NH3	C(RT)Q1NH3
transducer frequency	MHz	0.2	0.3	0.5	1	2	4
inner pipe diameter d¹							
min. extended	mm	400	350	100	50	25	10
min. recommended	mm	500	450	200	100	50	25
max. recommended	mm	4000	3000	2000	1000	400	150
max. extended	mm	4800	3600	2400	1200	480	240
pipe wall thickness							
min.	mm	11	8	5	2.5	1.2	0.6
max.	mm	24	16	10	5	3	1.2
material							
housing		PPSU with stainless steel cover and transducer shoe 304 (1.4301)					
contact surface		PPSU					
degree of protection		IP66					
transducer cable							
type		1699					
length	m	5			4		3
dimensions							
length l	mm	136.5			84		70
width b	mm	59			40		30
height h	mm	90.5			59		47.5
dimensional drawing							
weight (without cable)	kg	1.652			0.504		0.251
pipe surface temperature	°C	-40...+130					
ambient temperature	°C	-40...+130					
temperature compensation		x					
explosion protection							
• ATEX/IECEx							
order code		FLG-NA2*-**NL	FLH-NA2*-**NL	FLK-NA2*-**NL	FLM-NA2*-**NL	FLP-NA2*-**NL	FLQ-NA2*-**NL
pipe surface temperature (Ex)	°C	gas: -50...+165 dust: -50...+155					
marking		CE 0637 Ex II 3G II 2D Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T160 °C Db					
certification		IBExU10ATEX1163 X, IECEx IBE 12.0005X					
• EAC							
order code		FLG-NE2*-**NL	FLH-NE2*-**NL	FLK-NE2*-**NL	FLM-NE2*-**NL	FLP-NE2*-**NL	FLQ-NE2*-**NL
marking		2Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T160 °C Db от -50 °C до +160 °C Пыль: до +155 °C					
certification		EAC KZ 7500525.01.01.01830					

¹ Lamb wave transducer:
 typical values for water; pipe diameters for other fluids on request
 inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)
 inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

Lamb wave transducers (zone 2, higher temperatures, NL)

order code		FLG-S*2N-**NL	FLH-S*2N-**NL	FLK-S*2N-**NL	FLM-S*2N-**NL	
technical type		C(RT)G1SH3	C(RT)H1SH3	C(RT)K1SH3	C(RT)M1SH3	
transducer frequency	MHz	0.2	0.3	0.5	1	
inner pipe diameter d¹						
min. extended	mm	400	350	100	50	
min. recommended	mm	500	450	200	100	
max. recommended	mm	4000	3000	2000	1000	
max. extended	mm	4800	3600	2400	1200	
pipe wall thickness						
min.	mm	10.6	7.1	4.2	2.1	
max.	mm	23.7	15.8	9.5	4.7	
material						
housing		PPSU with stainless steel cover and transducer shoe 304 (1.4301)				
contact surface		PPSU				
degree of protection		IP66				
transducer cable						
type		1699				
length	m	5			4	
dimensions						
length l	mm	136.5			84	
width b	mm	59			40	
height h	mm	90.5			59	
dimensional drawing						
weight (without cable)	kg	1.652			0.504	
storing temperature	°C	-40...+130				
operating temperature	°C	100...165				
warm-up time	h	3			1	
temperature compensation		x				
explosion protection						
• ATEX/IECEX						
order code		FLG-SA2N-**NL	FLH-SA2N-**NL	FLK-SA2N-**NL	FLM-SA2N-**NL	
pipe surface temperature (Ex)	°C	gas: -50...+165 dust: -50...+155				
marking		CE 0637  I13G I12D Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T160 °C Db				
certification		IBExU10ATEX1163 X, IECEx IBE 12.0005X				
• EAC						
order code		FLG-SE2N-**NL	FLH-SE2N-**NL	FLK-SE2N-**NL	FLM-SE2N-**NL	
marking		2Ex nA IIC T6...T3 Gc Ex tb IIIC T80 °C...T160 °C Db от -50 °C до +165 °C Пыль: до +155 °C				
certification		EAC  EAЭC KZ 7500525.01.01.01830				

completely thermally insulated transducer installation necessary

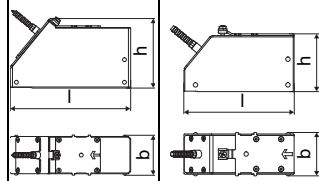
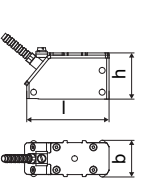
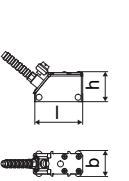

¹ Lamb wave transducer:

typical values for water; pipe diameters for other fluids on request

inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)

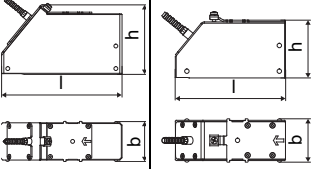
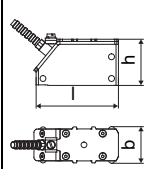
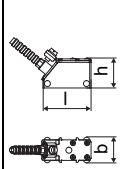
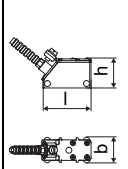


inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

Lamb wave transducers (FM Class I Div. 2, NL)

order code		FLF-NF2N-**NL	FLG-NF2N-**NL	FLH-NF2N-**NL	FLK-NF2N-**NL	FLM-NF2N-**NL	FLP-NF2N-**NL	FLQ-NF2N-**NL	
technical type		C(RT)F1N51	C(RT)G1N51	C(RT)H1N51	C(RT)K1N51	C(RT)M1N51	C(RT)P1N51	C(RT)Q1N51	
transducer frequency	MHz	0.15	0.2	0.3	0.5	1	2	4	
inner pipe diameter d¹									
min. extended	mm	640	400	350	100	50	25	10	
min. recommended	mm	800	500	450	200	100	50	25	
max. recommended	mm	5500	4000	3000	2000	1000	400	150	
max. extended	mm	6600	4800	3600	2400	1200	480	240	
pipe wall thickness									
min.	mm	15	11	8	5	2.5	1.2	0.6	
max.	mm	32	24	16	10	5	3	1.2	
material									
housing		PPSU with stainless steel cover 316Ti	PPSU with stainless steel cover 304						
contact surface		PPSU							
degree of protection		IP66/IP67	IP66						
transducer cable									
type		1699							
length	m	5				4		3	
dimensions									
length l	mm	163	128.5			74	42		
width b	mm	54	51			32	22		
height h	mm	91.3	67.5			40.5	25.5		
dimensional drawing									
weight (without cable)	kg	0.935	0.471			0.077	0.019		
pipe surface temperature	°C	-40...+130							
ambient temperature	°C	-40...+130							
temperature compensation		x							
explosion protection									
• FM									
pipe surface temperature (Ex)	°C	-40...+165							
degree of protection		IP66							
marking		 NI/Cl. I,II,III/Div. 2 / GP A,B,C,D,E,F,G/ Temp. Codes dwg 3860							

¹ Lamb wave transducer:
 typical values for water; pipe diameters for other fluids on request
 inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)
 inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

Lamb wave transducers (zone 1, T1)

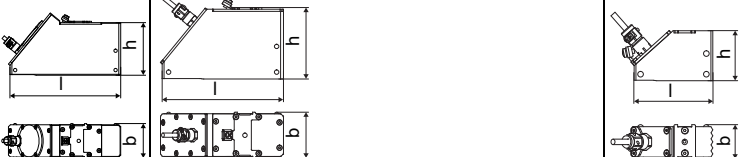
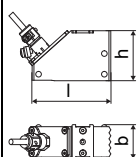



order code		FLF-N*1*-**T1	FLG-N*1*-**T1	FLH-N*1*-**T1	FLK-N*1*-**T1	FLM-N*1*-**T1	FLP-N*1*-**T1	FLQ-N*1*-**T1
technical type		C(RT)F1N83	C(RT)G1N83	C(RT)H1N83	C(RT)K1N83	C(RT)M1N83	C(RT)P1N83	C(RT)Q1N83
transducer frequency	MHz	0.15	0.2	0.3	0.5	1	2	4
inner pipe diameter d¹								
min. extended	mm	640	400	350	100	50	25	10
min. recommended	mm	800	500	450	200	100	50	25
max. recommended	mm	5500	4000	3000	2000	1000	400	150
max. extended	mm	6600	4800	3600	2400	1200	480	240
pipe wall thickness								
min.	mm	15	11	8	5	2.5	1.2	0.6
max.	mm	32	24	16	10	5	3	1.2
material								
housing		PPSU with stainless steel cover 316L, 316Ti (1.4404, 1.4571)			PPSU with stainless steel cover 316L (1.4404)			
contact surface		PPSU						
degree of protection		IP66/IP67		IP66				
transducer cable								
type		1699						
length	m	5			4		3	
dimensions								
length l	mm	163		128.5		74		42
width b	mm	54		51		32		22
height h	mm	91.3		67.5		40.5		25.5
dimensional drawing								
weight (without cable)	kg	0.935		0.471		0.077		0.019
pipe surface temperature	°C	-40...+130						
ambient temperature	°C	-40...+130						
temperature compensation		x						
explosion protection								
• ATEX/IECEX								
order code		FLF-NA1N-**T1	FLG-NA1N-**T1	FLH-NA1N-**T1	FLK-NA1N-**T1	FLM-NA1N-**T1	FLP-NA1N-**T1	FLQ-NA1N-**T1
pipe surface temperature (Ex)	°C	-50...+155						
marking		CE 0637 (Ex) II2G II2D Ex q IIC T6...T3 Gb Ex tb IIIA T80 °C...T160 °C Db		CE 0637 (Ex) II2G II2D Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T160 °C Db				
certification		IBExU07ATEX1168 X, IECEx IBE 08.0007X						
• EAC								
order code		FLF-NE1N-**T1	FLG-NE1N-**T1	FLH-NE1N-**T1	FLK-NE1N-**T1	FLM-NE1N-**T1	FLP-NE1N-**T1	FLQ-NE1N-**T1
marking		1Ex q IIC T6...T3 Gb Ex tb IIIA T80 °C...T160 °C Db от -50 °C до +155 °C		1Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T160 °C Db от -50 °C до +155 °C				
certification		EAC Ex EA3C KZ 7500525.01.01.01830						
• inmetro								
order code		FLF-NS1N-**T1	FLG-NS1N-**T1	FLH-NS1N-**T1	FLK-NS1N-**T1	FLM-NS1N-**T1	FLP-NS1N-**T1	FLQ-NS1N-**T1
pipe surface temperature (Ex)	°C	-50...+155						
marking		Ex q IIC T6...T3 Gb Ex tb IIIA T80 °C... T160 °C Db		Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T160 °C Db				
certification		 TÜV 15.0616 X						
• KOSHA								
order code		-	FLG-NK1N-**T1	FLH-NK1N-**T1	FLK-NK1N-**T1	FLM-NK1N-**T1	FLP-NK1N-**T1	FLQ-NK1N-**T1
marking		-	Ex eq IIC T3...T6 Tamb = -50 °C - +155 °C					
certification		-	 14-AV4BO-0510					

¹ Lamb wave transducer:
typical values for water; pipe diameters for other fluids on request
inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)
inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

order code	FLF-N*1*-**T1	FLG-N*1*-**T1	FLH-N*1*-**T1	FLK-N*1*-**T1	FLM-N*1*-**T1	FLP-N*1*-**T1	FLQ-N*1*-**T1
technical type	C(RT)F1N83	C(RT)G1N83	C(RT)H1N83	C(RT)K1N83	C(RT)M1N83	C(RT)P1N83	C(RT)Q1N83
• Japanese Ex certification							
order code	FLF-NJ1N-**T1	FLG-NJ1N-**T1	FLH-NJ1N-**T1	FLK-NJ1N-**T1	FLM-NJ1N-**T1	FLP-NJ1N-**T1	FLQ-NJ1N-**T1
marking	Ex q IIC T6...T3 Gb Ex tb IIIA T80 °C...T160 °C Db	Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T160 °C Db					
certification	CML 21JPN5217X						

¹ Lamb wave transducer:
 typical values for water; pipe diameters for other fluids on request
 inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)
 inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

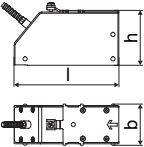
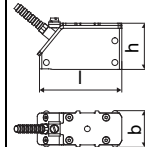

Lamb wave transducers (zone 1, T1, IP68)

order code	FLF-L*1*-**T1/ H68	FLG-L*1*-**T1/ H68	FLH-L*1*-**T1/ H68	FLK-L*1*-**T1/ H68	FLM-L*1*-**T1/ H68	FLP-L*1*-**T1/ H68
technical type	CRF1LI3	CRG1LI3	CRH1LI3	CRK1LI3	CRM1LI3	CRP1LI3
transducer frequency	MHz 0.15	0.2	0.3	0.5	1	2
inner pipe diameter d¹						
min. extended	mm 640	400	350	100	50	25
min. recommended	mm 800	500	450	200	100	50
max. recommended	mm 5500	4000	3000	2000	1000	400
max. extended	mm 6600	4800	3600	2400	1200	480
pipe wall thickness						
min.	mm 15	11	8	5	2.5	1.2
max.	mm 32	24	16	10	5	3
material						
housing	PPSU with stainless steel cover 316Ti (1.4571)	PPSU with stainless steel cover 316Ti (1.4571)				
contact surface	PPSU	PPSU				
degree of protection	IP68 ²	IP68 ²				
transducer cable						
type	2550	2550				
length	m 12	12				
dimensions						
length l	mm 173	143.5				73
width b	mm 54	54				31.6
height h	mm 91.5	83.5				46
dimensional drawing						
weight (without cable)	kg 1.36	0.639				0.093
pipe surface temperature	°C -40...+80	-40...+80				
ambient temperature	°C -40...+80	-40...+80				
temperature compensation	x	x				
explosion protection						
• ATEX/IECEx						
order code	FLF-LA1N-**T1/ H68	FLG-LA1N-**T1/ H68	FLH-LA1N-**T1/ H68	FLK-LA1N-**T1/ H68	FLM-LA1N-**T1/ H68	FLP-LA1N-**T1/ H68
pipe surface temperature (Ex)	°C -40...+80	-40...+80				
marking	CE 0637  II2G II2D Ex q IIC T6...T5 Gb Ex tb IIIC T80 °C...T85 °C Db					
certification	IBExU07ATEX1168 X, IECEx IBE 08.0007X					
• EAC						
order code	FLF-LE1N-**T1/ H68	FLG-LE1N-**T1/ H68	FLH-LE1N-**T1/ H68	FLK-LE1N-**T1/ H68	FLM-LE1N-**T1/ H68	FLP-LE1N-**T1/ H68
marking	1Ex q IIC T6...T5 Gb Ex tb IIIC T80 °C...T85 °C Db or -40 °C до +80 °C					
certification	 EA3C KZ 7500525.01.01.01830					
• inmetro						
order code	FLF-LS1N-**T1/ H68	FLG-LS1N-**T1/ H68	FLH-LS1N-**T1/ H68	FLK-LS1N-**T1/ H68	FLM-LS1N-**T1/ H68	FLP-LS1N-**T1/ H68
pipe surface temperature (Ex)	°C -40...+80	-40...+80				
marking	Ex q IIC T6...T5 Gb Ex tb IIIC T80 °C...T85 °C Db					
certification	 TÜV 15.0616 X					
Japanese Ex certification						
order code	FLF-LJ1N-**T1/ H68	FLG-LJ1N-**T1/ H68	FLH-LJ1N-**T1/ H68	FLK-LJ1N-**T1/ H68	FLM-LJ1N-**T1/ H68	FLP-LJ1N-**T1/ H68
marking	Ex q IIC T6...T5 Gb Ex tb IIIC T80 °C...T85 °C Db					
certification	CML 21JPN5217X					

¹ Lamb wave transducer:
 typical values for water; pipe diameters for other fluids on request
 inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)
 inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

² test conditions: 3 months/2 bar (20 m)/20 °C

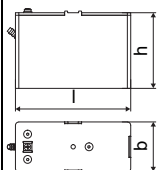
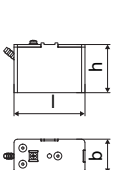
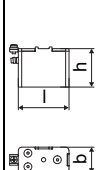
Lamb wave transducers (zone 1, higher temperatures, T1)

order code		FLG-S*1N-**T1	FLH-S*1N-**T1	FLK-S*1N-**T1	FLM-S*1N-**T1
technical type		C(RT)G1S83	C(RT)H1S83	C(RT)K1S83	C(RT)M1S83
transducer frequency	MHz	0.2	0.3	0.5	1
inner pipe diameter d¹					
min. extended	mm	400	350	100	50
min. recommended	mm	500	450	200	100
max. recommended	mm	4000	3000	2000	1000
max. extended	mm	4800	3600	2400	1200
pipe wall thickness					
min.	mm	10.6	7.1	4.2	2.1
max.	mm	23.7	15.8	9.5	4.7
material					
housing		PPSU with stainless steel cover 316Ti (1.4571)			
contact surface		PPSU			
degree of protection		IP66			
transducer cable					
type		1699			
length	m	5			4
dimensions					
length l	mm	128.5			74
width b	mm	51			32
height h	mm	67.5			40.5
dimensional drawing					
weight (without cable)	kg	0.8			0.16
storing temperature	°C	-40...+155			
operating temperature	°C	100...155			
warm-up time	h	3			1
temperature compensation		x			
explosion protection					
• ATEX/IECEX					
order code		FLG-SA1N-**T1	FLH-SA1N-**T1	FLK-SA1N-**T1	FLM-SA1N-**T1
pipe surface temperature (Ex)	°C	-50...+155			
marking		CE 0637 Ex II2G II2D Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T160 °C Db			
certification		IBExU07ATEX1168 X, IECEx IBE 08.0007X			
• EAC					
order code		FLG-SE1N-**T1	FLH-SE1N-**T1	FLK-SE1N-**T1	FLM-SE1N-**T1
marking		1Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T160 °C Db от -50 °C до +155 °C			
certification		[EAC] EA9C KZ 7500525.01.01.01830			
• inmetro					
order code		FLG-SS1N-**T1	FLH-SS1N-**T1	FLK-SS1N-**T1	FLM-SS1N-**T1
pipe surface temperature (Ex)	°C	-50...+155			
marking		Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T160 °C Db			
certification		 TUV 15.0616 X			

completely thermally insulated transducer installation necessary

¹ Lamb wave transducer:
 typical values for water; pipe diameters for other fluids on request
 inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)
 inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

Lamb wave transducers (zone 1, NL)

order code		FLG-N*1*~**NL	FLH-N*1*~**NL	FLK-N*1*~**NL	FLM-N*1*~**NL	FLP-N*1*~**NL	FLQ-N*1*~**NL
technical type		C(RT)G1NW3	C(RT)H1NW3	C(RT)K1NW3	C(RT)M1NW3	C(RT)P1NW3	C(RT)Q1NW3
transducer frequency	MHz	0.2	0.3	0.5	1	2	4
inner pipe diameter d¹							
min. extended	mm	400	350	100	50	25	10
min. recommended	mm	500	450	200	100	50	25
max. recommended	mm	4000	3000	2000	1000	400	150
max. extended	mm	4800	3600	2400	1200	480	240
pipe wall thickness							
min.	mm	11	8	5	2.5	1.2	0.6
max.	mm	24	16	10	5	3	1.2
material							
housing		PPSU with stainless steel cover and transducer shoe 304 (1.4301)					
contact surface		PPSU					
degree of protection		IP66					
transducer cable							
type		1699					
length	m	5			4		3
dimensions							
length l	mm	136.5			84		70
width b	mm	59			40		30
height h	mm	90.5			59		47.5
dimensional drawing							
weight (without cable)	kg	1.652			0.504		0.251
pipe surface temperature	°C	-40...+130					
ambient temperature	°C	-40...+130					
temperature compensation		x					
explosion protection							
• ATEX/IECEx							
order code		FLG-NA1*~**NL	FLH-NA1*~**NL	FLK-NA1*~**NL	FLM-NA1*~**NL	FLP-NA1*~**NL	FLQ-NA1*~**NL
pipe surface temperature (Ex)	°C	-50...+155					
marking		CE 0637 Ex II 2G II 2D Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T160 °C Db					
certification		IBExU07ATEX1168 X, IECEx IBE 08.0007X					
• EAC							
order code		FLG-NE1*~**NL	FLH-NE1*~**NL	FLK-NE1*~**NL	FLM-NE1*~**NL	FLP-NE1*~**NL	FLQ-NE1*~**NL
marking		1Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T160 °C Db от -50 °C до +155 °C					
certification		EAC EA3C KZ 7500525.01.01.01830					


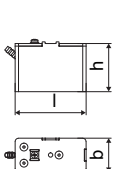
¹ Lamb wave transducer:

typical values for water; pipe diameters for other fluids on request

inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)

inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

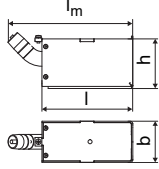
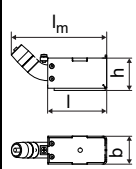

Lamb wave transducers (zone 1, higher temperatures, NL)

order code		FLG-S*1N-**NL	FLH-S*1N-**NL	FLK-S*1N-**NL	FLM-S*1N-**NL
technical type		C(RT)G1SW3	C(RT)H1SW3	C(RT)K1SW3	C(RT)M1SW3
transducer frequency	MHz	0.2	0.3	0.5	1
inner pipe diameter d¹					
min. extended	mm	400	350	100	50
min. recommended	mm	500	450	200	100
max. recommended	mm	4000	3000	2000	1000
max. extended	mm	4800	3600	2400	1200
pipe wall thickness					
min.	mm	10.6	7.1	4.2	2.1
max.	mm	23.7	15.8	9.5	4.7
material					
housing		PPSU with stainless steel cover and transducer shoe 304 (1.4301)			
contact surface		PPSU			
degree of protection		IP66			
transducer cable					
type		1699			
length	m	5			4
dimensions					
length l	mm	136.5			84
width b	mm	59			40
height h	mm	90.5			59
dimensional drawing					
weight (without cable)	kg	1.652			0.504
storing temperature	°C	-40...+130			
operating temperature	°C	100...155			
warm-up time	h	3			1
temperature compensation		x			
explosion protection					
• ATEX/IECEX					
order code		FLG-SA1N-**NL	FLH-SA1N-**NL	FLK-SA1N-**NL	FLM-SA1N-**NL
pipe surface temperature (Ex)	°C	-50...+155			
marking		CE 0637 Ex II2G II2D Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T160 °C Db			
certification		IBExU07ATEX1168 X, IECEx IBE 08.0007X			
• EAC					
order code		FLG-SE1N-**NL	FLH-SE1N-**NL	FLK-SE1N-**NL	FLM-SE1N-**NL
marking		1Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T160 °C Db от -50 °C до +155 °C			
certification		[EAC] EA9C KZ 7500525.01.01.01830			

completely thermally insulated transducer installation necessary

¹ Lamb wave transducer:
 typical values for water; pipe diameters for other fluids on request
 inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)
 inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

Lamb wave transducers (FM Class I Div. 1, T1)

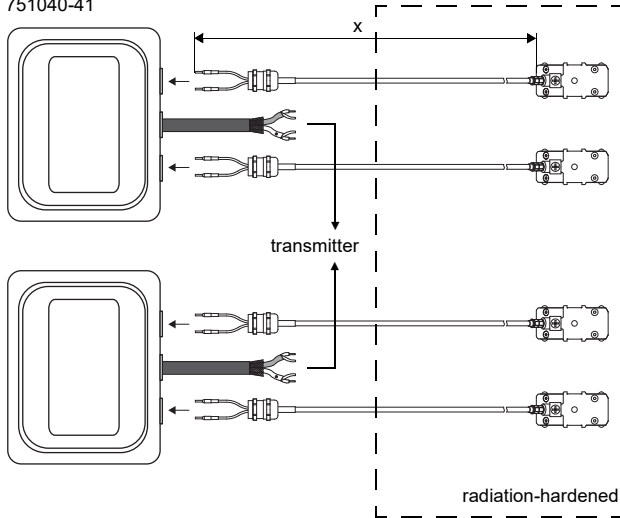
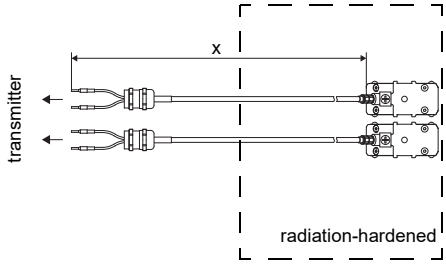
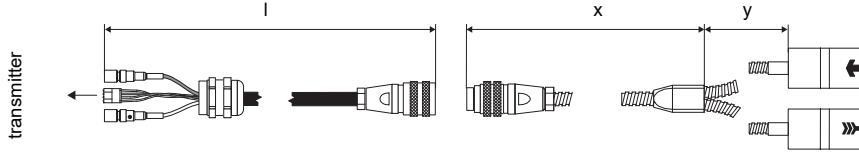
order code		FLG-NF1N-**T1	FLH-NF1N-**T1	FLK-NF1N-**T1	FLM-NF1N-**T1	FLP-NF1N-**T1	FLQ-NF1N-**T1
technical type		C(RT)G1N62	C(RT)H1N62	C(RT)K1N62	C(RT)M1N62	C(RT)P1N62	C(RT)Q1N62
transducer frequency	MHz	0.2	0.3	0.5	1	2	4
inner pipe diameter d¹							
min. extended	mm	400	350	100	50	25	10
min. recommended	mm	500	450	200	100	50	25
max. recommended	mm	4000	3000	2000	1000	400	150
max. extended	mm	4800	3600	2400	1200	480	240
pipe wall thickness							
min.	mm	11	8	5	2.5	1.2	0.6
max.	mm	24	16	10	5	3	1.2
material							
housing		stainless steel 316L (1.4404)					
contact surface		PPSU					
degree of protection		IP66					
transducer cable							
type		2549					
length	m	10					
dimensions							
length l	mm	132			80		
width b	mm	60			38		
height h	mm	72			44		
mounting length l _m	mm	185			135		
thread		1/2 NPT			1/2 NPT		
dimensional drawing							
weight (without cable)	kg	0.305			0.470	0.475	0.479
pipe surface temperature	°C	-40...+110					
ambient temperature	°C	-40...+110					
temperature compensation		x					
explosion protection							
• FM							
pipe surface temperature (Ex)	°C	-40...+125					
marking		 S/Cl. I, II, III / Div. 1 / GP A, B, C, D, E, F, G / Temperature Codes dwg 3831					

¹ Lamb wave transducer:
 typical values for water; pipe diameters for other fluids on request
 inner pipe diameter max. recommended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 7 m/s (14 m/s)
 inner pipe diameter max. extended: in reflection arrangement (diagonal arrangement) and for a flow velocity of 5 m/s (10 m/s)

Connection systems

connection system NL		
direct connection/connection with extension cable		transducers technical type
		*****Z7 *****C3
		*****W* *****H*
		*****51
direct connection		transducers technical type
		****L17
connection system TS		
connection with extension cable	direct connection	transducers technical type
		*****52

connection system T1		
connection with extension cable	direct connection	transducers technical type
<p>JB05, JBP2, JBP3, JB06</p>		<p>****N53 ****E53 ****S53</p>
<p>JB01</p>		<p>****G*</p>
<p>JB01, JBP2, JBP3</p>		<p>****L*</p>
<p>terminal board for junction box KFM1 (junction box by customer)</p>		<p>****62</p>
<p>JB05</p>		<p>****LZ*</p>
		<p>CDQ2LK1</p>

connection system T1		
connection via junction box • 2 measuring channels (inputs possible)	direct connection • 1 measuring channel (inputs possible) or • 2 measuring channels (without inputs)	transducers technical type
751040-41 		****R53 ****W53
connection system AS		
connection with extension cable		transducers technical type
		****Z7 ****C3

Cable

transducer cable								
type		7819	2606	1699	2550	6111	2549	2619
transducers technical type		****L17	****LZ*	****N** ****E** ****S** CDQ2LK1 (without sheath)	****L1*	***2E**	****62	****R** ****W**
weight	kg/m		0.033	0.094	0.035	0.092	0.065	0.03
ambient temperature	°C	-40...+100	-40...+100	-55...+200	-40...+100	-100...+225	-100...+200	-55...+200
min. bend radius								7.5x outer diameter recommended: 12x outer diameter
properties					longitudinal watertight			teflon free, radiation-hardened fire propagation test according to IEC 60332-1 NF-C32-070 C1/2
cable jacket								
material		PUR	PUR	PTFE	PUR	PFA	PTFE	PEEK
outer diameter	mm	5.2 ±0.2	5	2.9	5.2 ±0.2	2.7	5.3	4.2
thickness	mm	0.9		0.3	0.9	0.5	0.5	0.5
colour		grey	grey	brown	grey	white	black	grey
shield		x	x	x	x	x	x	x
sheath 1								
material		PUR	-	stainless steel 316Ti (1.4571)	-	stainless steel 316Ti (1.4571)	-	-
outer diameter	mm	13 ±0.4	-	8	-	8	-	-
colour		grey	-	-	-	-	-	-
sheath 2								
material		stainless steel 316Ti (1.4571)	-	-	-	-	-	-
outer diameter	mm	8	-	-	-	-	-	-
connector								
type		Lemo 3K	-	-	-	-	-	-
extension cable								
type		1750	2551	2615	5245			
connection system		NL	AS	TS, T1	TS, T1			
standard length	m	5 10	1 10	-	-			
weight	kg/m	0.12	0.083	0.18	0.38			
ambient temperature	°C	< 80	-25...+80	-30...+70	-30...+70			
properties				halogen-free fire propagation test according to IEC 60332-1 combustion test according to IEC 60754-2	halogen-free fire propagation test according to IEC 60332-1 combustion test according to IEC 60754-2			
cable jacket								
material		PE	TPE-O	PUR	PUR			
outer diameter	mm	6	8	max. 12	max. 12			
thickness	mm	0.5		2	2			
colour		black	black	black	black			
shield		x	x	x	x			
sheath								
material		stainless steel 304 (1.4301)	-	-	steel wire braid with copolymer sheath			
outer diameter	mm	9	-	-	max. 15.5			
remark		optional						

Cable length

transducer frequency		F, G, H, K			M, P			Q			S		
connection system NL													
transducers technical type		x	y	l	x	y	l	x	y	l	x	y	l
*D***Z7 ¹ *R***C3 ¹	m	2	3	≤ 25	2	2	≤ 25	2	1	≤ 25	1	1	≤ 20
*L***Z7 ¹ *T***C3 ¹	m	2	7	≤ 25	7	2	≤ 25	8	1	≤ 25	-	-	-
*(DR)***W* *(DR)***H*	m	2	3	≤ 10	2	2	≤ 10	2	1	≤ 10	-	-	-
*(LT)***W* *(LT)***H*	m	2	7	≤ 10	7	2	≤ 10	8	1	≤ 10	-	-	-
*(DR)***51	m	2	3	≤ 10	2	2	≤ 10	2	1	≤ 10	1	1	≤ 10
*(LT)***51	m	2	7	≤ 10	7	2	≤ 10	8	1	≤ 10	-	-	-
****LI7	m	3	3	-	3	3	-	-	-	-	-	-	-
connection system TS													
transducers technical type		x		l	x		l	x		l	x		l
*(DR)***52 *(DR)***53	m	5		≤ 300	4		≤ 300	3		≤ 90	2		≤ 40
*(LT)***52 *(LT)***53	m	9		≤ 300	9		≤ 300	9		≤ 90	-		-
connection system T1													
transducers technical type		x		l	x		l	x		l	x		l
*(DR)***8*	m	5		≤ 300	4		≤ 300	3		≤ 90	-		-
*(LT)***8*	m	9		≤ 300	9		≤ 300	9		≤ 90	-		-
*(DR)***62	m	10		≤ 300	10		≤ 300	10		≤ 90	-		-
*(LT)***62	m	46		≤ 300	46		≤ 300	46		≤ 90	-		-
option H68: ****LI*	m	12		≤ 300	12		≤ 300	-		-	-		-
CDK1LZ7	m	10		≤ 300	-		-	-		-	-		-
***2LZ1	m	-		-	10		≤ 300	10		≤ 90	-		-
CDQ2LK1	m	-		-	-		-	10		-	-		-
****R** ****W**	m	-		-	≤ 300		-	≤ 90		-	-		-
connection system AS													
transducers technical type		x	y	l	x	y	l	x	y	l	x	y	l
*D***Z7 *R***C3	m	2	3	≤ 100	2	2	≤ 100	2	1	≤ 50	1	1	≤ 20
*L***Z7 *T***C3	m	2	7	≤ 100	2	7	≤ 100	2	7	≤ 50	-	-	-

¹ l > 25...100 m on request

x, y - transducer cable length

l - max. length of extension cable (depending on the application)

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