

Stationary Ultrasonic Flow Measurement of Gas

Features

Transducers

- non-invasive (no contact with the medium, no need for expensive materials)
- wearfree
- no pressure drop (no operational costs)
- low installation costs
- explosion proof transducers (FM or ATEX) available
- not sensitive to dust or humidity
- advantageous price for large pipe diameters and high pressure stages

Flowmeter

- stationary installation:
 - FLUXUS G704: for wall mounting
 - FLUXUS G709: for 19" rack mounting
- simple operation due to clearly structured user dialog
- calculation of standard volume flow

Measurement

- stable and reliable measuring results even under difficult conditions
- measurement is unaffected by density, viscosity and composition of the gas and by dust and humidity
- precise bi-directional flow measurement with high measurement dynamics
- long-term stable measurement results
- high measurement rate, fast response time

Common Applications

- operative measurement on natural gas pipelines
- operative measurement in natural gas production
- operative measurement for the gas supply
- measurement of injection gas in the oil industry
- measurement of synthesis gas in plastic production
- measurement of N₂, O₂, H₂



FLUXUS G704



FLUXUS G709

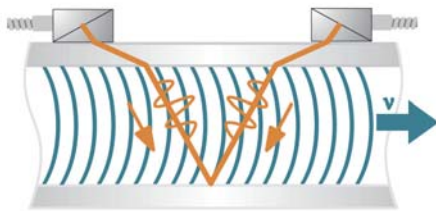
Measuring Principle

For the flow measurement of the medium, ultrasonic signals are used, employing the transit time method. Ultrasonic signals are emitted by a transducer installed on one side of a pipe, reflected on the opposite side and received by a second transducer. These signals are emitted alternatively in flow direction and against it.

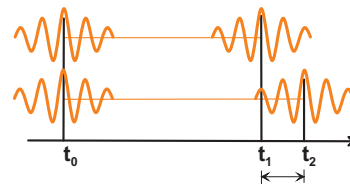
As the medium in which the signals propagate is flowing, the transit time of the ultrasonic signals in flow direction is shorter than against the flow direction.

The transit time difference Δt is measured and allows to determine the average flow velocity on the propagation path of the ultrasonic signals. A flow profile correction is then performed in order to obtain the area average of the flow velocity, which is proportional to the volume flow.

The received ultrasonic signals will be checked for their usefulness for the measurement and the plausibility of the measured values will be evaluated. The complete measuring cycle is controlled by the integrated microprocessors. Disturbance signals will be eliminated by statistical signal processing.



Path of the ultrasonic signal



Transit time difference Δt

Calculation of the Flow Velocity

$$v = k_{\alpha} \cdot \Delta t / (2 \cdot t_t)$$

with:

v - flow velocity

k_{α} - flowmeter constant

Δt - transit time difference

t_t - transit time of the medium

Number of Sound Paths

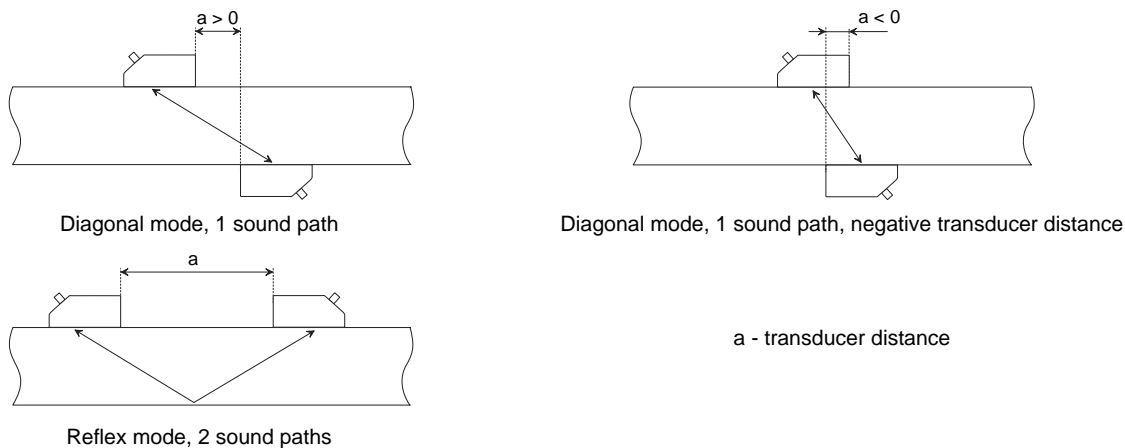
The number of sound paths is the number of transits of the ultrasonic signals through the medium in the pipe.

reflection mode: number of sound paths = 2, the transducers are mounted on the same side of the pipe, correct positioning of the transducers easier

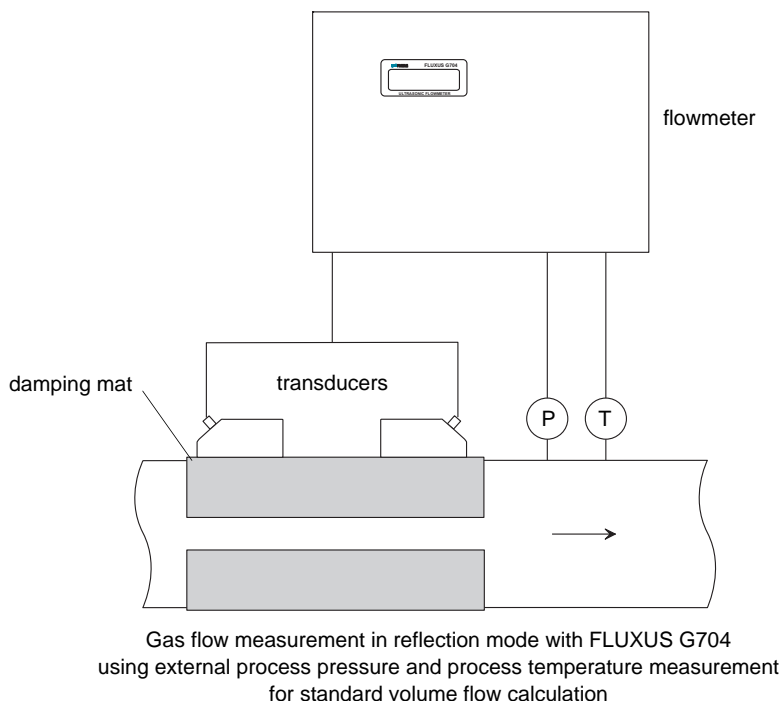
diagonal mode: number of sound paths = 1, the transducers are mounted on opposite sides of the pipe

The mode to be used depends on the application. If the number of sound paths is increased, the accuracy of the measurement will be better, but the signal attenuation is increased.

In case of a high signal attenuation by medium, pipe and coatings, diagonal mode with 1 sound path will be used.



Typical Measurement Setup



Standard Volume Flow

The standard volume flow of the medium can be selected as physical quantity to be measured. It will be calculated internally by:

$$V_N = V \cdot p/p_N \cdot T_N/T \cdot 1/K$$

with:

V_N - standard volume flow

V - operational volume flow

p_N - standard pressure (absolute value)

p - operational pressure (absolute value)

T_N - standard temperature in K

T - operational temperature in K

K - gas compressibility factor

The operational pressure p and the operational temperature T of the medium will be entered directly as fixed values into the flowmeter.

Or:



If inputs are installed (option), pressure and temperature can be measured by the customer and fed in the flowmeter.

The gas compressibility factor K will be entered in the flowmeter:

- by input of a fixed value or
- as approximation according to e.g. AGA8 or GERG

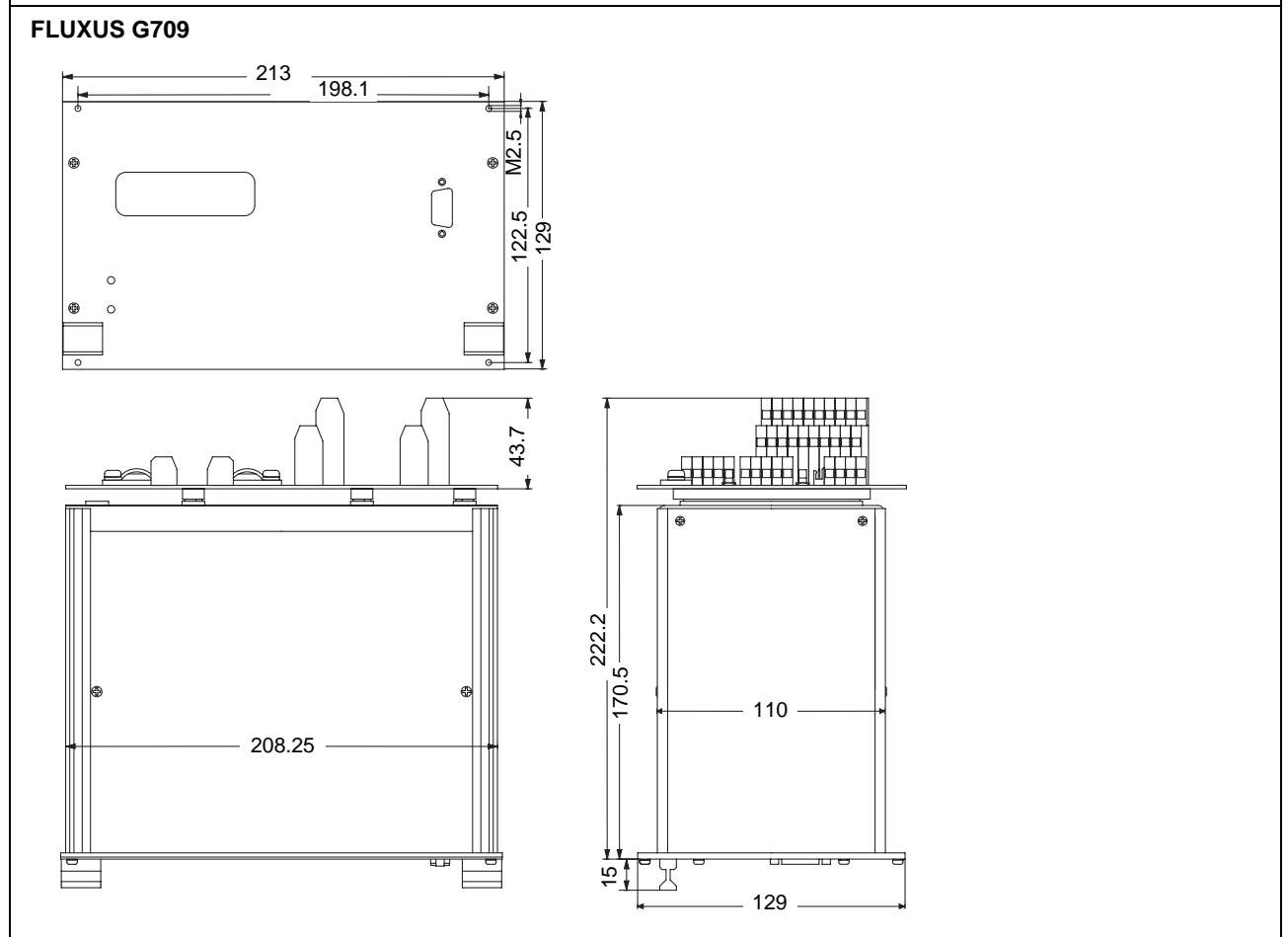
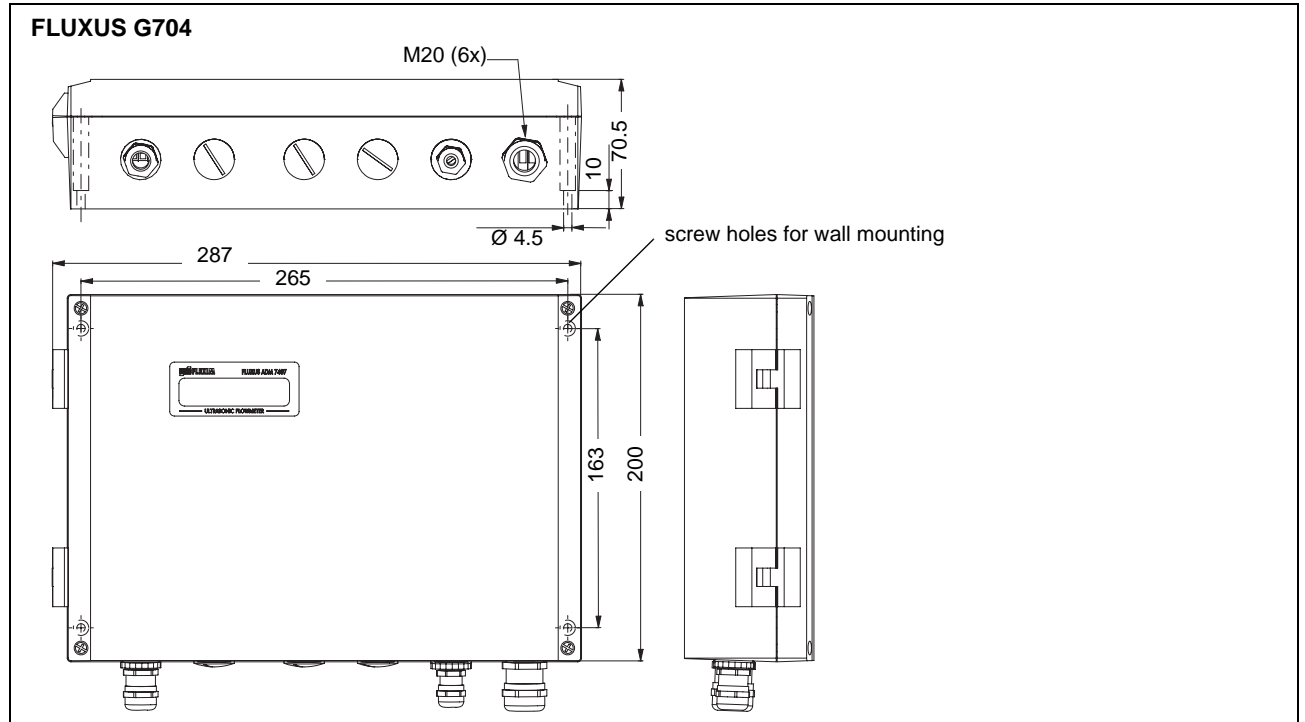
Flowmeter

Technical Data

FLUXUS	G704	G704 A2	G709
design	standard field device	field device for ATEX zone 2	19 " module
			
measurement			
measuring principle	transit time difference correlation principle		
flow velocity	0.01...35 m/s, pipe diameter dependent		
repeatability	0.15 % of reading ±0.01 m/s		
accuracy	± 1...3 % of reading ± 0.01 m/s depending on application ± 0.5 % of reading ± 0.01 m/s with field calibration		
medium	gases with a ratio of the characteristic acoustic impedances of pipe wall and gas < 3000		
flowmeter			
power supply	100...230 V/50...60 Hz or 20...32 V DC		
power consumption	< 15 W		
flow channels	1, option: 2		
signal damping	0...100 s, adjustable		
measuring cycle (1 channel)	100...1000 Hz		
response time	1 s (1 channel), option: 70 ms		
material	aluminum, powder coated		aluminum
degree of protection according to EN 60529	IP 65		IP 20
dimensions	see dimensional drawing		42TE x 3HE (without back panel) see dimensional drawing
weight	2.8 kg		1.7 kg
installation	wall mounting, option: 2 " pipe mounting		19 " rack mounting
operating temperature	-10...+60 °C		
display	2 x 16 characters, dot matrix, backlit		
menu language	English, German, French, Dutch, Spanish		
explosion protection			
ATEX zone marking	-	2 CE Ex II 3G Ex nA II T4 T _a -20...+60 °C Ex II 3D Ex tD A22 IP66 T100 °C	-
measuring functions			
physical quantities	operational volume flow, standard volume flow, mass flow, flow velocity		
totalizers	volume, mass		
calculation functions	average, difference, sum		
data logger			
loggable values	all physical quantities and totalized values		
capacity	> 100 000 measured values		

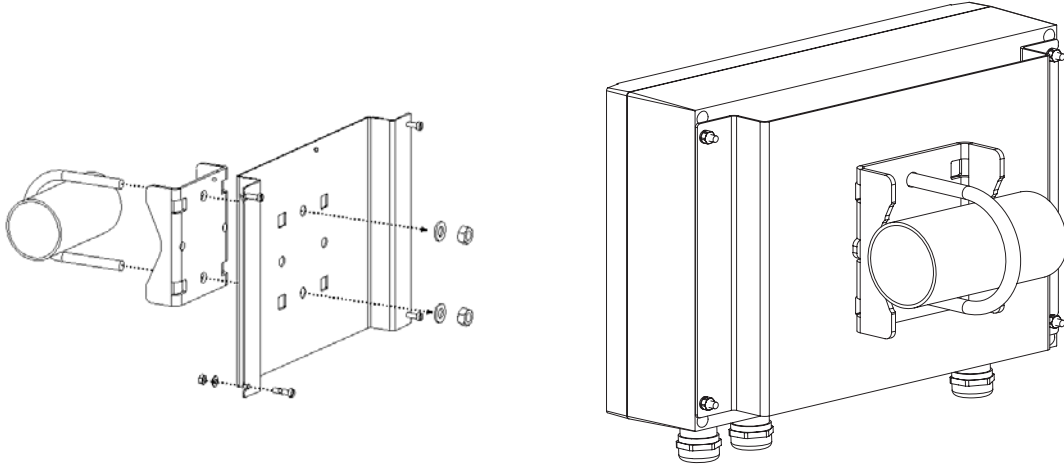
FLUXUS	G704	G704 A2	G709
communication			
interface	- process connection: option: RS485 (Modbus, emitter) - diagnosis: RS232		
serial data kit (option)			
software (all Windows™ versions)	- FluxData: download of measured data, graphical presentation, conversion to other formats - FluxKoeff: creating medium data sets		
cable	RS232		
adapter	RS232 to USB		
outputs (option)			
	The outputs are galvanically isolated from the main device.		
number	on request		
current output			
range	0/4...20 mA		
accuracy	0.1 % of reading ±15 µA		
active output	$R_{ext} < 500 \Omega$		
passive output	$U_{ext} < 24 V, R_{ext} < 1 k\Omega$		
voltage output			
range	0...1 V or 0...10 V		
accuracy	0...1 V: 0.1 % of reading ±1 mV 0...10 V: 0.1 % of reading ±10 mV		
internal resistance	$R_i = 500 \Omega$		
frequency output			
range	0...1 kHz or 0...10 kHz		
open collector	24 V/4 mA		
binary output			
Reed relay	48 V/0.25 A		48 V/0.25 A
open collector (OC)	24 V/4 mA		24 V/4 mA
optorelay	32 V/100 mA		-
binary output as limit detector			
- function as state output	limit, sign change or error		limit, sign change or error
binary output (OC) as pulse output			
- value	0.01...1000 units		0.01...1000 units
- width	1...1000 ms		80...1000 ms
inputs (option)			
	The inputs are galvanically isolated from the main device.		
number	max. 4, on request		
temperature input			
designation	Pt100/Pt1000		Pt100
design	4-wire		4-wire
range	-150...+560 °C		-50...+400 °C
resolution	0.01 K		0.1 K
accuracy	±0.01 % of reading ±0.03 K		±0.1 % of reading ±0.2 K
current input			
accuracy	0.1 % of reading ±10 µA		
range	active : 0...20 mA passive : -20...+20 mA		
active input	$U_i = 24 V, R_i = 50 \Omega, P_i < 0.5 W$, not short circuit proof		
passive input	$R_i = 50 \Omega, P_i < 0.3 W$		
voltage input			
range	0...1 V		0...1 V or 0...10 V
accuracy	0.1 % of reading ±1 mV		0...1 V: 0.1 % of reading ±1 mV 0...10 V: 0.1 % of reading ±10 mV
internal resistance	$R_i = 1 M\Omega$		$R_i = 1 M\Omega$

Dimensions and Mounting Dimensions (in mm)



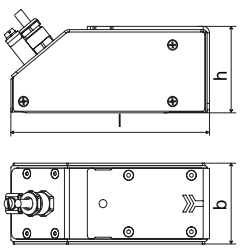
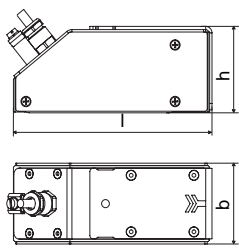
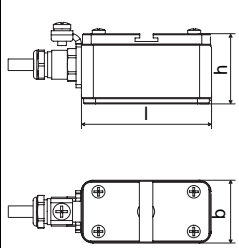
2 " Pipe Mounting Kit (option)

FLUXUS G704



Transducers

Shear Wave Transducers (for ATEX zone 1)

technical type		GDG1N31	GDK1N31	GDM1N31
order code		GSG-NA1TS	GSK-NA1TS	GSM-NA1TS
transducer frequency	MHz	0.2	0.5	1
min. operating pressure ¹	bar	30	30	40
outer pipe diameter ²				
min. extended	mm	250	70	30
min. recommended	mm	380	80	40
max. recommended	mm	810	500	80
max. extended	mm	1100	720	120
pipe wall thickness				
min.	mm	14	5	2.5
max.	mm	-	-	-
material				
housing		PEEK with stainless steel cap	PEEK with stainless steel cap	stainless steel
contact surface		PEEK	PEEK	PEEK
degree of protection according to EN 60529		IP 65	IP 65	IP 65
dimensions				
length l	mm	129.5	126.5	60
depth b	mm	50	50	30
height h	mm	64	53.5	33.5
dimensional drawing				
operating temperature				
min.	°C	-40	-40	-20
max.	°C	+130	+130	+120
explosion protection				
ATEX zone marking		1 CE 0044; Ex q II T6...T3 Ta -40...+180 °C Ex II 2D Ex tD A21 IP65 TX	1 CE 0044; Ex q II T6...T3 Ta -40...+180 °C Ex II 2D Ex tD A21 IP65 TX	1 CE 0044; Ex q II T6...T4 Ta -20...+120 °C
certification		IBExU04ATEX1011 X	IBExU04ATEX1011 X	IBExU98ATEX1012 X
type of protection		powder filling	powder filling	encapsulation
FM marking		-	-	-
type of protection		-	-	-

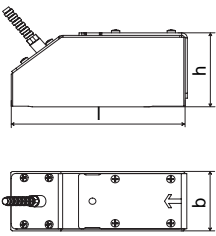
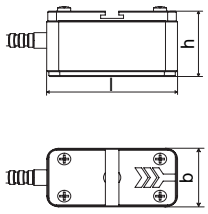
¹ depending on application, typical value for natural gas

² shear wave transducers:

typical values for natural gas, N₂, O₂, pipe diameters for other gases on request

pipe diameter min. recommended/max. recommended/max. extended: in diagonal mode and for a flow velocity of 15 m/s

Shear Wave Transducers (for ATEX zone 2, FM or without Explosion Protection)

technical type		GDG1N52	GDK1N52	GDM1N52
order code		GSG-NA2TS GSG-NF2TS GSG-NNNTS	GSK-NA2TS GSK-NF2TS GSK-NNNTS	GSM-NA2TS GSM-NF2TS GSM-NNNTS
transducer frequency	MHz	0.2	0.5	1
min. operating pressure ¹	bar	30	30	40
outer pipe diameter ²				
min. extended	mm	250	70	30
min. recommended	mm	380	80	40
max. recommended	mm	810	500	80
max. extended	mm	1100	720	120
pipe wall thickness				
min.	mm	14	5	2.5
max.	mm	-	-	-
material				
housing		PEEK with stainless steel cap	PEEK with stainless steel cap	stainless steel
contact surface		PEEK	PEEK	PEEK
degree of protection according to EN 60529		IP 67	IP 67	IP 67
dimensions				
length l	mm	129.5	126.5	60
depth b	mm	47	47	30
height h	mm	66.4	55.9	33.5
dimensional drawing				
operating temperature				
min.	°C	-40	-40	GSM-NA2TS: -20 GSM-NF2TS: -40 GSM-NNNTS: -40
max.	°C	GSG-NA2TS: +130 GSG-NF2TS: +125 GSG-NNNTS: +130	GSK-NA2TS: +130 GSK-NF2TS: +125 GSK-NNNTS: +130	GSM-NA2TS: +130 GSM-NF2TS: +125 GSM-NNNTS: +130
explosion protection				
ATEX zone marking		GSG-NA2TS: 2 CE II 3G Ex nA II T6...T3 Ta -55...+190 °C II 3D Ex tD A22 IP67 TX	GSK-NA2TS: 2 CE II 3G Ex nA II T6...T3 Ta -55...+190 °C II 3D Ex tD A22 IP67 TX	GSM-NA2TS: 2 CE II 3G Ex nA II T6...T4 Ta -20...+130 °C II 3D Ex tD A22 IP67 TX
certification type of protection		- non incensive, protection by enclosure	- non incensive, protection by enclosure	- non incensive, protection by enclosure
FM marking		GSG-NF2TS: NI/Cl. I, II, III/Div. 2/ Gp A-G/T4 Ta = 125 °C	GSK-NA2TS: NI/Cl. I, II, III/Div. 2/ Gp A-G/T4 Ta = 125 °C	GSM-NA2TS: NI/Cl. I, II, III/Div. 2/ Gp A-G/T4 Ta = 125 °C
type of protection		non incensive	non incensive	non incensive

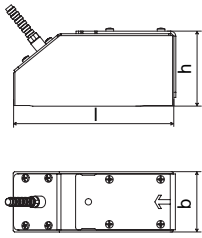
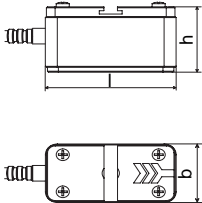
¹ depending on application, typical value for natural gas

² shear wave transducers:

typical values for natural gas, N₂, O₂, pipe diameters for other gases on request

pipe diameter min. recommended/max. recommended/max. extended: in diagonal mode and for a flow velocity of 15 m/s

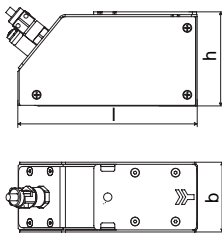
Shear Wave Transducers (without Explosion Protection and with Connection System AS)

technical type		GDG1NZ7	GDK1NZ7	GDM1NZ7
order code		GSG-NNNAS	GSK-NNNAS	GSM-NNNAS
transducer frequency	MHz	0.2	0.5	1
min. operating pressure ¹	bar	30	30	40
outer pipe diameter ²				
min. extended	mm	250	70	30
min. recommended	mm	380	80	40
max. recommended	mm	810	500	80
max. extended	mm	1100	720	120
pipe wall thickness				
min.	mm	14	5	2.5
max.	mm	-	-	-
material				
housing		PEEK with stainless steel cap	PEEK with stainless steel cap	stainless steel
contact surface		PEEK	PEEK	PEEK
degree of protection according to EN 60529		IP 65	IP 65	IP 65
dimensions				
length l	mm	129.5	126.5	60
depth b	mm	47	47	30
height h	mm	66.4	55.9	33.5
dimensional drawing				
operating temperature				
min.	°C	-40	-40	-40
max.	°C	+130	+130	+130
explosion protection				
ATEX zone		-	-	-
marking		-	-	-
certification		-	-	-
type of protection		-	-	-
FM marking		-	-	-
type of protection		-	-	-

¹ depending on application, typical value for natural gas

² shear wave transducers:
 typical values for natural gas, N₂, O₂, pipe diameters for other gases on request
 pipe diameter min. recommended/max. recommended/max. extended: in diagonal mode and for a flow velocity of 15 m/s

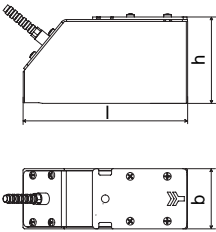
Lamb Wave Transducers (for ATEX Zone 1)

technical type		GRG1N33	GRH1N33	GRK1N33
order code		GLG-NA1TS	GLH-NA1TS	GLK-NA1TS
transducer frequency	MHz	0.2	0.3	0.5
min. operating pressure ¹	bar	30	30	30
outer pipe diameter ²				
min. extended	mm	190	120	60
min. recommended	mm	220	140	80
max. recommended	mm	900	600	300
max. extended	mm	1600	1000	500
pipe wall thickness				
min.	mm	11	7	4
max.	mm	23	15	9
material				
housing		PPSU with stainless steel cap	PPSU with stainless steel cap	PPSU with stainless steel cap
contact surface		PPSU	PPSU	PPSU
degree of protection according to EN 60529		IP 65	IP 65	IP 65
dimensions				
length l	mm	128.5	128.5	128.5
depth b	mm	50	50	50
height h	mm	67.5	67.5	67.5
dimensional drawing				
operating temperature				
min.	°C	-40	-40	-40
max.	°C	+140	+140	+140
explosion protection				
ATEX zone marking		1 CE 0044; Ex II 2G Ex q II T6...T3 Ta -40...+140 °C Ex II 2D Ex tD A21 IP65 TX	1 CE 0044; Ex II 2G Ex q II T6...T3 Ta -40...+140 °C Ex II 2D Ex tD A21 IP65 TX	1 CE 0044; Ex II 2G Ex q II T6...T3 Ta -40...+140 °C Ex II 2D Ex tD A21 IP65 TX
certification type of protection		IBExU04ATEX1011 X powder filling	IBExU04ATEX1011 X powder filling	IBExU04ATEX1011 X powder filling
FM marking type of protection		-	-	-

¹ depending on application, typical value for natural gas

² Lamb wave transducers:
 typical values for natural gas, N₂, O₂, pipe diameters for other gases on request
 pipe diameter min. recommended/max. recommended: in reflection mode and for a flow velocity of 15 m/s
 pipe diameter max. extended: in diagonal mode and for a flow velocity of 25 m/s

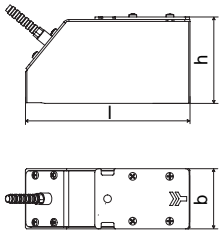
Lamb Wave Transducers (for ATEX Zone 2, FM or without Explosion Protection)

technical type		GRG1N52	GRH1N52	GRK1N52
order code		GLG-NA2TS GLG-NF2TS GLG-NNNTS	GLH-NA2TS GLH-NF2TS GLH-NNNTS	GLK-NA2TS GLK-NF2TS GLK-NNNTS
transducer frequency	MHz	0.2	0.3	0.5
min. operating pressure ¹	bar	30	30	30
outer pipe diameter ²				
min. extended	mm	190	120	60
min. recommended	mm	220	140	80
max. recommended	mm	900	600	300
max. extended	mm	1600	1000	500
pipe wall thickness				
min.	mm	11	7	4
max.	mm	23	15	9
material				
housing		PPSU with stainless steel cap	PPSU with stainless steel cap	PPSU with stainless steel cap
contact surface		PPSU	PPSU	PPSU
degree of protection according to EN 60529		IP 67	IP 67	IP 67
dimensions				
length l	mm	128.5	128.5	128.5
depth b	mm	47	47	47
height h	mm	69.9	69.9	69.9
dimensional drawing				
operating temperature				
min.	°C	-40	-40	-40
max.	°C	GLG-NA2TS: +150 GLG-NF2TS: +125 GLG-NNNTS: +170	GLH-NA2TS: +150 GLH-NF2TS: +125 GLH-NNNTS: +170	GLK-NA2TS: +150 GLK-NF2TS: +125 GLK-NNNTS: +170
explosion protection				
ATEX zone marking		GLG-NA2TS: 2 GLG-NA2TS: CE II 3G Ex nA II T6...T3 Ta -55...+150 °C II 3D Ex tD A22 IP67 TX	GLH-NA2TS: 2 GLH-NA2TS: CE II 3G Ex nA II T6...T3 Ta -55...+150 °C II 3D Ex tD A22 IP67 TX	GLK-NA2TS: 2 GLK-NA2TS: CE II 3G Ex nA II T6...T3 Ta -55...+150 °C II 3D Ex tD A22 IP67 TX
certification		-	-	-
type of protection		non incandive, protection by enclosure	non incandive, protection by enclosure	non incandive, protection by enclosure
FM marking		GLG-NF2TS: NI/Cl. I, II, III/Div. 2/ Gp A-G/T4 Ta = 125 °C	GLH-NF2TS: NI/Cl. I, II, III/Div. 2/ Gp A-G/T4 Ta = 125 °C	GLK-NF2TS: NI/Cl. I, II, III/Div. 2/ Gp A-G/T4 Ta = 125 °C
type of protection		non incandive	non incandive	non incandive

¹ depending on application, typical value for natural gas

² Lamb wave transducers:
typical values for natural gas, N₂, O₂, pipe diameters for other gases on request
pipe diameter min. recommended/max. recommended: in reflection mode and for a flow velocity of 15 m/s
pipe diameter max. extended: in diagonal mode and for a flow velocity of 25 m/s

Lamb Wave Transducers (without Explosion Protection)

technical type		GRG1NC3	GRH1NC3	GRK1NC3
order code		GLG-NNNAS	GLH-NNNAS	GLK-NNNAS
transducer frequency	MHz	0.2	0.3	0.5
min. operating pressure ¹	bar	30	30	30
outer pipe diameter ²				
min. extended	mm	190	120	60
min. recommended	mm	220	140	80
max. recommended	mm	900	600	300
max. extended	mm	1600	1000	500
pipe wall thickness				
min.	mm	11	7	4
max.	mm	23	15	9
material				
housing		PPSU with stainless steel cap	PPSU with stainless steel cap	PPSU with stainless steel cap
contact surface		PPSU	PPSU	PPSU
degree of protection according to EN 60529		IP 65	IP 65	IP 65
dimensions				
length l	mm	128.5	128.5	128.5
depth b	mm	47	47	47
height h	mm	69.9	69.9	69.9
dimensional drawing				
operating temperature				
min.	°C	-40	-40	-40
max.	°C	+170	+170	+170
explosion protection				
ATEX zone marking		-	-	-
certification		-	-	-
type of protection		-	-	-
FM marking		-	-	-
type of protection		-	-	-

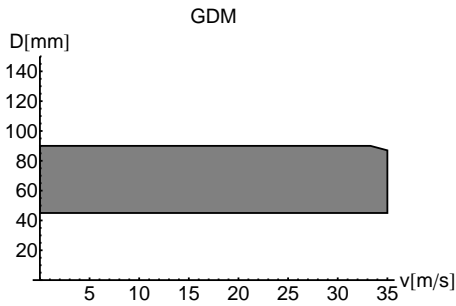
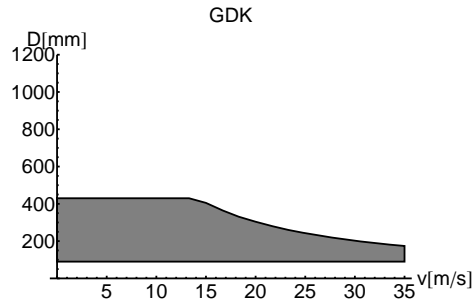
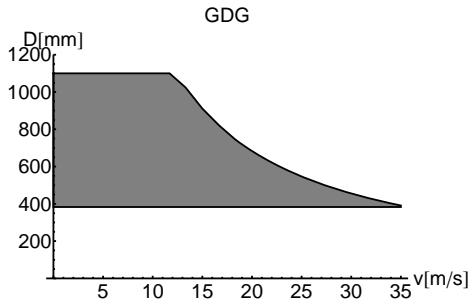
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 pipe diameter max. extended: in diagonal mode and for a flow velocity of 25 m/s

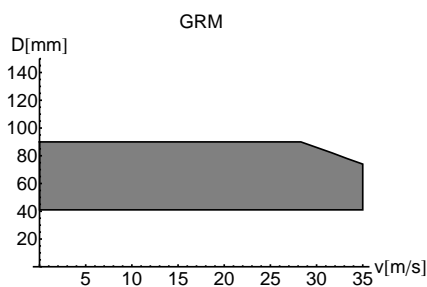
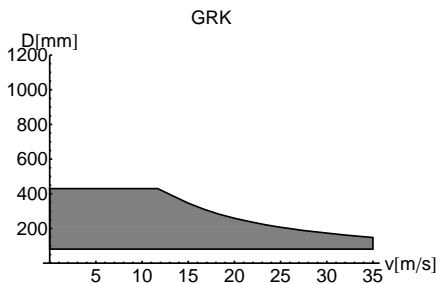
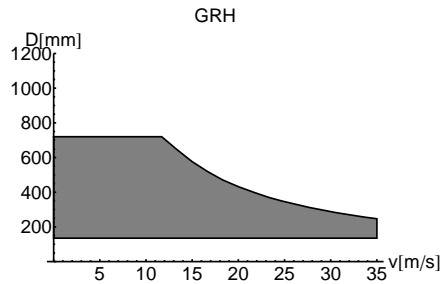
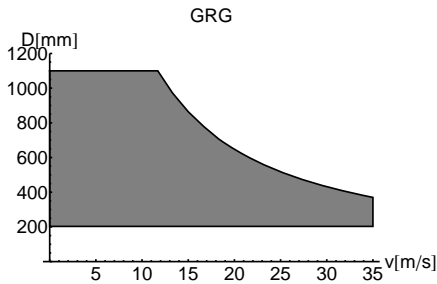
Max. Flow Velocity

for a typical application with natural gas, N₂, O₂ in reflection mode with 2 sound paths (Lamb wave transducers)/1 sound path (shear wave transducers)

Shear Wave Transducers



Lamb Wave Transducers

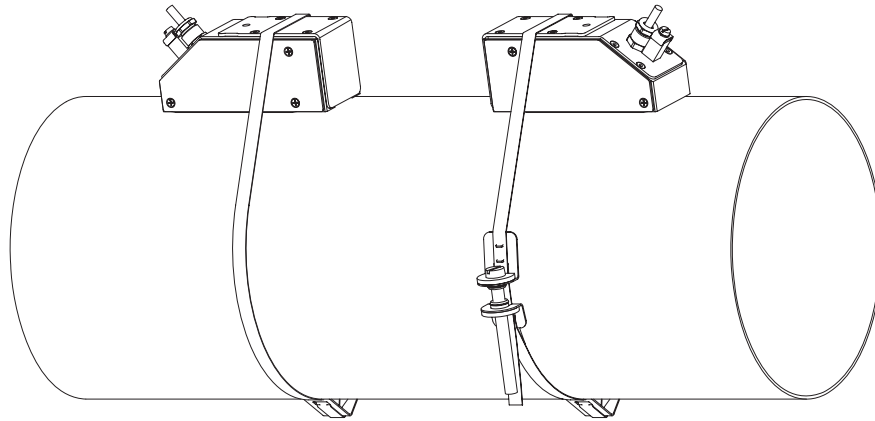


Order Code Key for Transducers

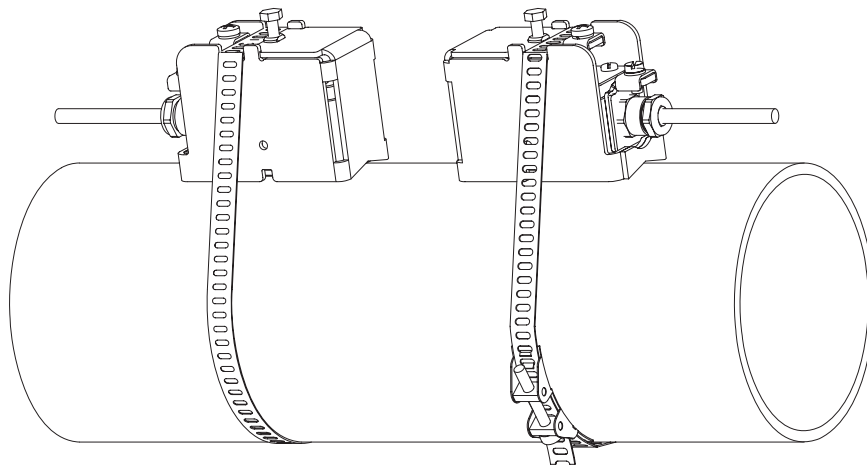
transducer model	frequency	-	temperature	explosion protection	connection system	-	extension cable	description						
GL								set of ultrasonic flow transducers for gas measurement, Lamb wave						
GS								set of ultrasonic flow transducers for gas measurement, shear wave						
	G								0.2 MHz					
	H								0.3 MHz (Lamb wave only)					
	K								0.5 MHz					
	M								1 MHz (shear wave only)					
		N								normal temperature range				
			A1								ATEX zone 1 (with connection system TS)			
			A2								ATEX zone 2 (with connection system TS)			
			F2								FM Class I Div. 2 (G704 with connection system TS)			
			NN								not explosion proof			
				AS								with Amphenol connector		
				TS								direct connection or connection via junction box		
						XXX								cable length in m, for max. length of extension cable see page 19
														connection system TS: 0 m: without junction box > 0 m: with junction box JB01 (ATEX zone 1) or JB02 (ATEX zone 2, FM, not explosion proof)
example														
GS	G	-	N	A1	TS	-	030	shear wave transducer 0.2 MHz, normal temperature range, for ATEX zone 1, connection system TS with junction box JB01 and 30 m extension cable						
		-				-								

Transducer Pipe Mounting Fixtures

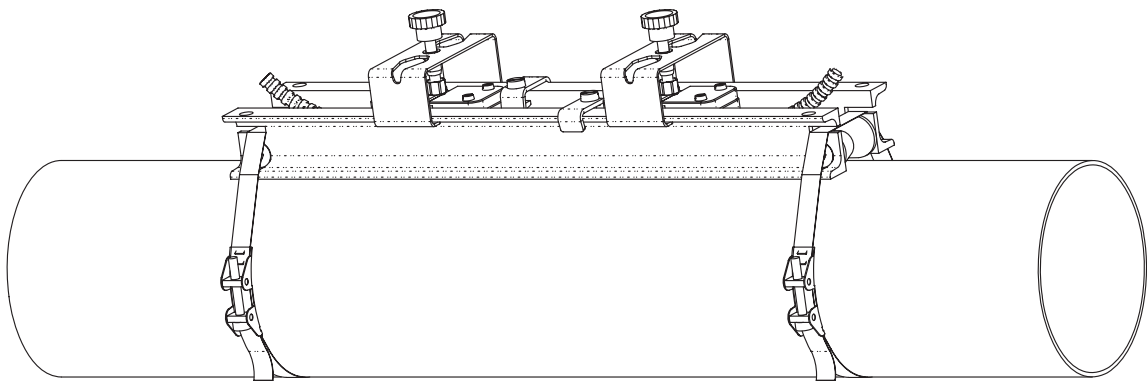
Tension Straps and Clasps



Tension Straps, Clasps and Mounting Shoes



Variofix Mounting Fixture VFX with Tension Straps and Clasps

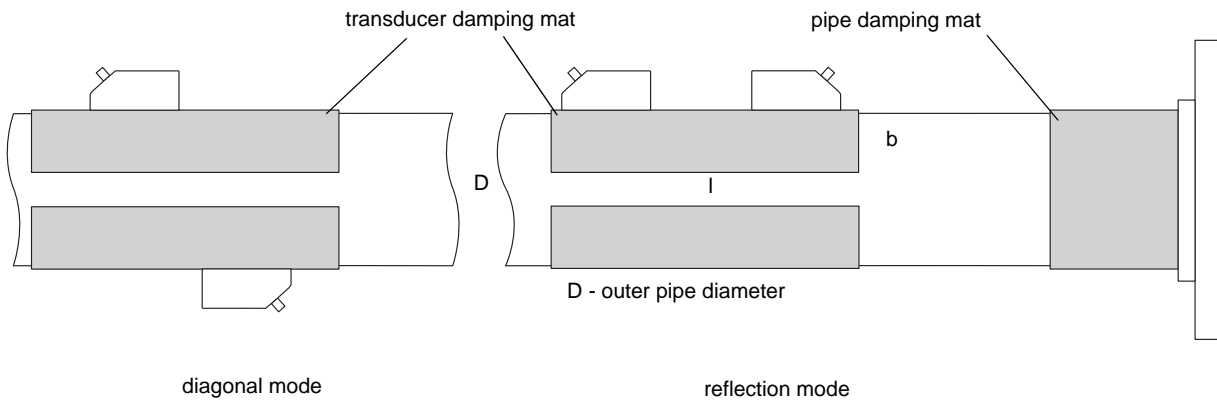


Damping Mats (Option)

Damping mats will be used for the gas measurement to reduce noise influences on the measurement.

Transducer damping mats will be installed below the transducers.

Pipe damping mats will be installed at reflection points, e.g. flange, welding.



Selection of Damping Mats

type	description	outer pipe diameter mm	dimensions l x b x h mm	transducer frequency					technical type	temperature °C	remark
				G	H	K	M	P			
transducer damping mat											
C	self-adhesive, for stationary installation	< 80	450 x 115 x 0.5	-	-	-	x	x	C20S3	-25...+60	
		≥ 80	900 x 230 x 0.5	-	-	x	x	-	C20S2		
		900 x 230 x 1.3	x	x	-	-	-	C50S2			
pipe damping mat											
B	self-adhesive, for stationary installation		l x 100 x 0.9	x	x	x	x	x	B35R2	-35...+50	l - see table below

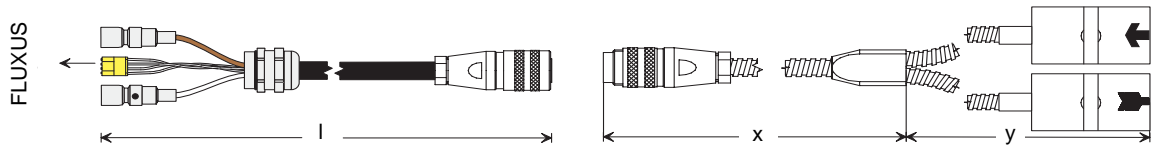
Pipe Damping Mat Type B: Length l Depending on Transducer Frequency and Outer Pipe Diameter

outer pipe diameter D mm	transducer frequency	
	G, H	K, M, P
100	2 m	1 m
200	6 m	3 m
300	12 m	6 m
500	32 m	16 m
1000	126 m	63 m

Connection Systems

Connection System AS (not explosion proof transducers)

transducer frequency		G, H, K			M, P			Q			S		
cable length	m	x	y	l	x	y	l	x	y	l	x	y	l
		2	3	≤ 100	2	2	≤ 100	2	1	≤ 50	1	1	≤ 20



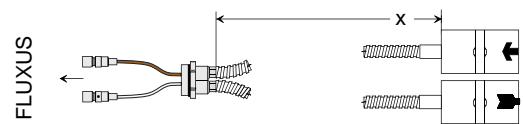
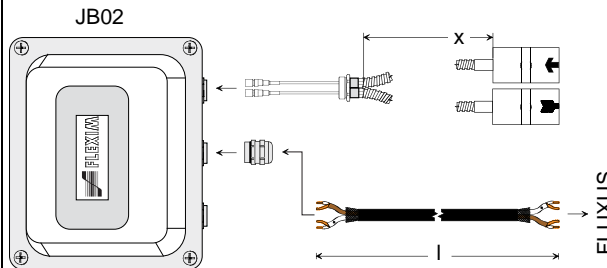
Connection System TS

transducer frequency		G, H, K		M, P		Q		S	
cable length	m	x	l	x	l	x	l	x	l
		5	≤ 300	4	≤ 300	3	≤ 90	2	≤ 40

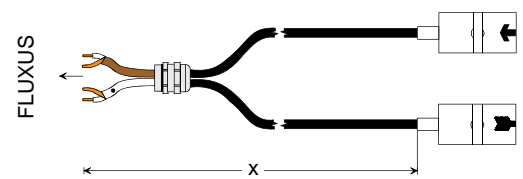
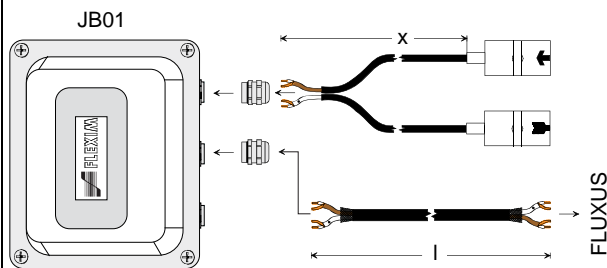
connection via junction box

direct connection

ATEX zone 2, FM and not explosion proof transducers



ATEX zone 1



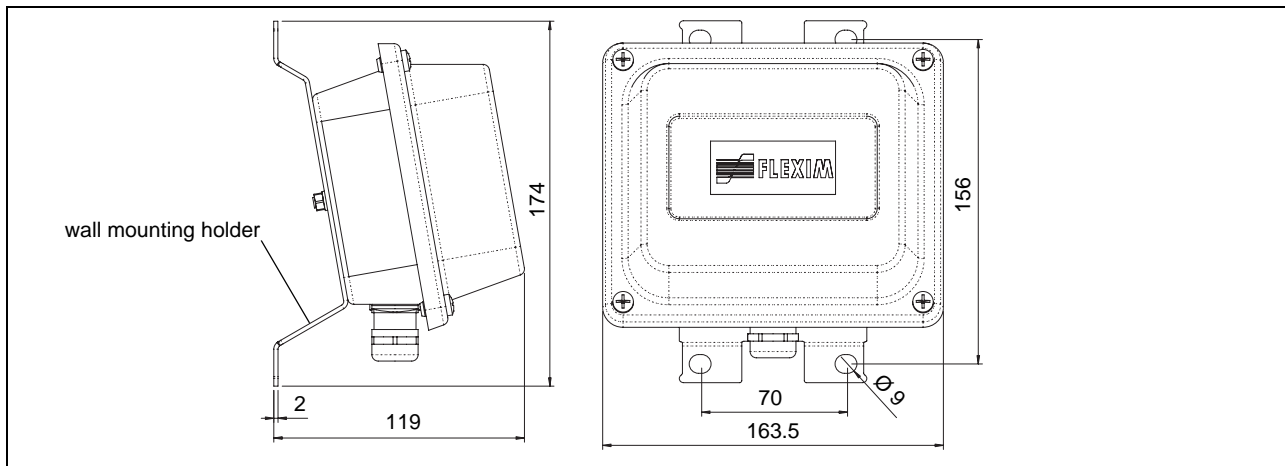
x, y - transducer cable length
l - max. length of extension cable

Junction Box

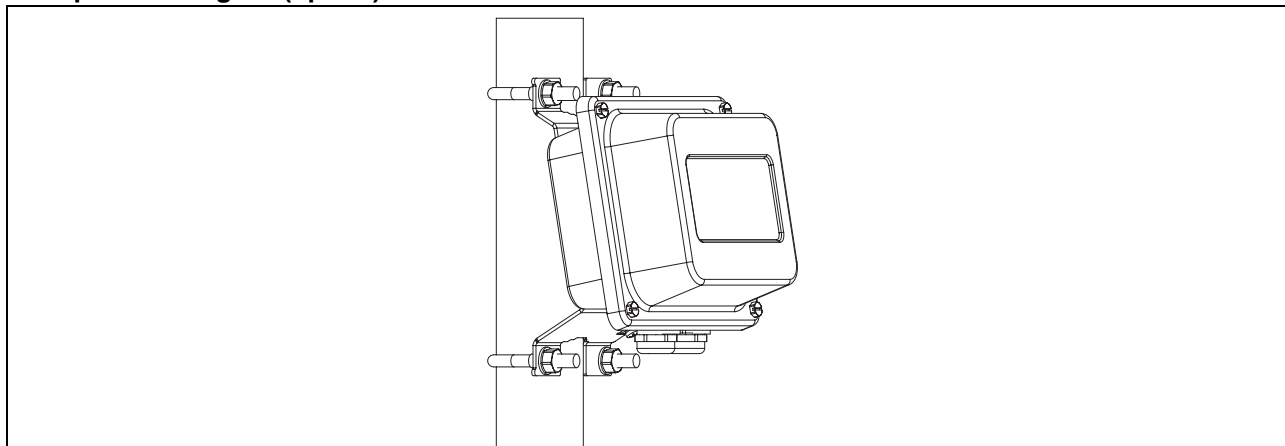
Technical Data

technical type		JB01S4E3M	JB02
dimensions		see dimensional drawing	see dimensional drawing
installation		wall mounting option: 2 " pipe mounting	wall mounting option: 2 " pipe mounting
material			
housing		stainless steel 316L (1.4404)	stainless steel 304 (1.4301)
gasket		silicone	silicone
degree of protection according to EN 60529		IP 67	IP 67
operating temperature			
min.	°C	-40	-40
max.	°C	+80	+80
explosion protection			
ATEX zone		1	2
marking		CE 0044 Ex II2G Ex e mb II T6...T4 T _a -40...+80 °C	CE Ex II3G Ex nA II T6...T4 T _a -40...+80 °C
certification		IBExU06ATEX1161	-
type of protection		junction box: increased safety decoupled network: encapsulation	non incensive

Dimensions



2 " Pipe Mounting Kit (option)





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