FLEXIM

Technical specification

FLUXUS G722ST-HT

Superheated steam flow measurement

Permanently installed non-invasive ultrasonic measuring system

Features

- Exact and highly reliable measurement of superheated steam up to 400 °C
- Installation and start-up do not require any pipe work nor any process interruptions
- Volumetric and mass flow rate available without additional steam calculator
- Non-invasive and wear-free measurement without pressure loss
- Maintenance-free acoustic coupling using permanent coupling foil
- Bi-directional measurement over a wide turndown ratio - up to 25:1
- Advanced self-diagnosis and possibilities for event-based triggering of data recording
- Bidirectional communication and support of common bus technologies
- Transmitter and transducers are separately calibrated (traceable to national standards)
- The measurement is zero point stable and drift free

Applications

- Process control
- Consumption metering
- Check metering

FLUXUS G722ST-HT (aluminum housing)

FLUXUS G722ST-HT (stainless steel housing)

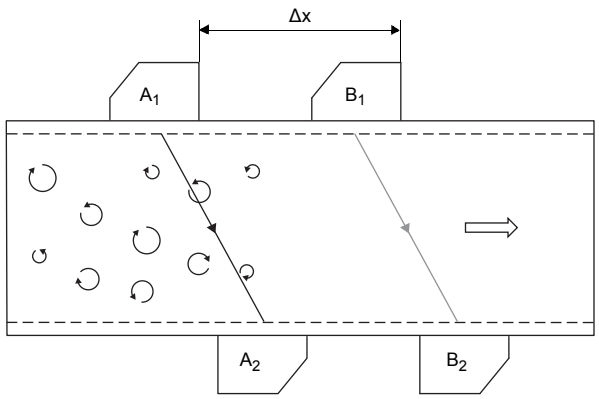
WaveInjector

Function

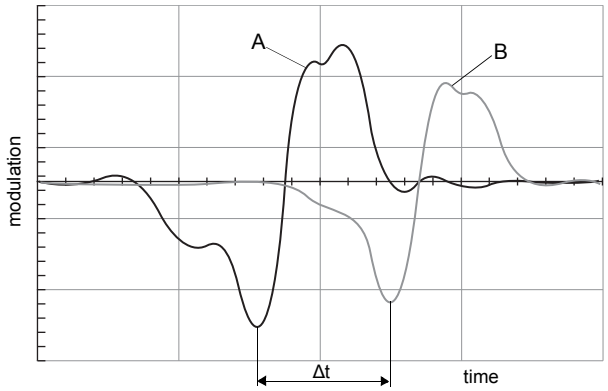
Measurement principle

The flow velocity of the fluid is measured using the correlation principle. 2 pairs of ultrasonic transducers are mounted one after the other at a distance Δx on the pipe. The transducer pairs form the measuring barriers A and B. Ultrasonic signals are alternately emitted by the emitters A_1 and B_1 and received by the respective receivers A_2 and B_2. The ultrasonic signals are modulated regarding amplitude and phase by the swirls of the turbulent flowing fluid. Since the swirls move with the flow, they pass the measuring barriers A und B with a time offset Δt, so that the modulation patterns of the ultrasonic signals of measuring barrier A and B are also offset by Δt. This time offset Δt is measured by means of cross correlation of the modulation signals.

Measuring setup



Time offset of the modulation patterns Δt



Calculation of volumetric flow rate

$$\dot{V} = A \cdot v = A \cdot k_{Re} \cdot \frac{\Delta x}{\Delta t}$$

where

$\dot{V}$	-	operating volumetric flow rate
A	-	cross-sectional pipe area
v	-	flow velocity
k_{Re}	-	fluid mechanics calibration factor
Δx	-	distance between measuring barriers
Δt	-	time offset of the modulation patterns

Transmitter

Technical data

		FLUXUS G722ST-NN0*A	FLUXUS G722ST-NN0*S	FLUXUS G722ST-A20*S	FLUXUS G722ST-F20*S
					
design		standard field device nonEx	field device with stainless steel housing nonEx	field device with stainless steel housing zone 2	field device with stainless steel housing FM Class I Div. 2
application		high-temperature steam measurement[1]			
measurement					
measurement principle		cross correlation			
flow velocity	m/s	depending on the application			
repeatability		±1 % MV (Re > 60 000) ±3 % MV (Re 10 000…60 000)			
Reynolds number		Re > 10 000			
fluid		saturated steam, superheated steam			
fluid pressure	bar (a)	1...110			
fluid temperature	°C	100...400			
measurement uncertainty (volumetric flow rate)					
measurement uncertainty at the measuring point		±3 % MV (Re > 60 000) ±4 % MV (Re 10 000…60 000)			
transmitter					
power supply		• 100...230 V/50...60 Hz or • 20...32 V DC or • 11...16 V DC			
power consumption	W	< 15			
number of measuring channels		1 (2 transducer pairs of the same type required according to measuring setup, see section "Measurement principle")			
damping	s	0...100 (adjustable)			
measuring cycle	Hz	0.7...2 (depending on the application)			
response time	s	10...35 (depending on the application)			
housing material		aluminum, powder coated	stainless steel 316L (1.4404)		
degree of protection		IP66	IP66	IP66	IP65
dimensions	mm	see dimensional drawing			
weight	kg	5.4	5.1		
fixation		wall mounting, optional: 2" pipe mounting			
ambient temperature	°C	-40...+60 (< -20 °C without operation of the display)	-40...+60 (< -20 °C without operation of the display)	-40...+60 (< -20 °C without operation of the display)	-20...+55/60
display		128 x 64 dots, backlight			
menu language		English, German, French, Spanish, Dutch, Russian, Polish, Turkish, Italian			
explosion protection					
• ATEX/IECEx					
marking		-	-	CE 0637 Ex II3G II2D Ex nA nC ic IIC T4 Gc Ex tb IIIC T120 °C Db T_a -40...+60 °C	-
certification ATEX		-	-	IBExU11ATEX1015	-
certification IECEx		-	-	IECEx IBE 11.0008	-
• FM					
marking		-	-	-	G722**-F20*S2, G722**-F20*S3: FM APPROVED NI/Cl. I,II,III/Div. 2/ GP. A,B,C, D,E,F,G/ T5 G722**-F20*S1: FM APPROVED NI/Cl. I,II,III/Div. 2/ GP. A,B,C, D,E,F,G/ T4A
measuring functions					
physical quantities		operating volumetric flow rate, mass flow rate, flow velocity			
totaliser		volume, mass			
diagnostic functions		crest factor, peak width, symmetry of amplification			

[1] test measurement to validate the application required in advance

[2] outside the explosive atmosphere (housing cover open)

[3] with inputs and including parametrisation of the transmitter

		FLUXUS G722ST-NN0*A	FLUXUS G722ST-NN0*S	FLUXUS G722ST-A20*S	FLUXUS G722ST-F20*S
communication interfaces					
service interfaces		measured value transmission, parametrisation of the transmitter: • USB[2] • LAN[2]			
process interfaces		max. 1 option: • RS485 (ASCII sender) • Modbus RTU[3] • BACnet MS/TP • HART[3] • Profibus PA[3] • FF H1[3] • Modbus TCP[3] • BACnet IP	max. 1 option: • RS485 (ASCII sender) • Modbus RTU[3] • BACnet MS/TP • HART[3] • Profibus PA[3] • FF H1[3] • Modbus TCP[3] • BACnet IP	max. 1 option: • RS485 (ASCII sender) • Modbus RTU[3] • BACnet MS/TP • HART[3] • Profibus PA[3] • FF H1[3] • Modbus TCP[3] • BACnet IP	max. 1 option: • RS485 (ASCII sender) • Modbus RTU[3] • BACnet MS/TP • HART[3] • Profibus PA[3] • FF H1[3] • Modbus TCP[3] • BACnet IP
accessories					
data transmission kit		USB cable			
software		• FluxDiagReader: reading of measured values and parameters, graphical presentation • FluxDiag (optional): reading of measurement data, graphical presentation, report generation, parametrisation of the transmitter			
data logger					
loggable values		all physical quantities, totalised physical quantities and diagnostic values			
capacity		max. 800 000 measured values			
outputs					
		The outputs are galvanically isolated from the transmitter.			
number		on request			
• switchable current output					
		All switchable current outputs are jointly switched to active or passive.			
range	mA	4...20 (3.2...22)			
accuracy		0.04 % MV ±3 µA			
active output		R_{ext} < 350 Ω			
passive output		U_{ext} = 8...30 V, depending on R_{ext} (R_{ext} < 1 kΩ at 30 V)			
• HART					
range	mA	4...20			
accuracy		0.1 % MV ±15 µA			
active output		U_{int} = 24 V, R_{ext} < 500 Ω			
passive output		U_{ext} = 10...24 V DC, depending on R_{ext} (R_{ext} < 1 kΩ at 24 V)			
• voltage output					
range	V	0...1 or 0...10			
accuracy		0...1 V: 0.1 % MV ±1 mV 0...10 V: 0.1 % MV ±10 mV			
internal resistance		R_{int} = 500 Ω			
• digital output					
Function		• frequency output • binary output • pulse output			
number		3			
operating parameters		5...30 V/< 100 mA			
frequency output • range	kHz	0...5			
binary output • binary output as alarm output		limit, change of flow direction or error			
pulse output • functions • pulse value • pulse width	 units ms	 mainly for totalising 0.01...1000 0.05...1000			

[1] test measurement to validate the application required in advance

[2] outside the explosive atmosphere (housing cover open)

[3] with inputs and including parametrisation of the transmitter

		FLUXUS G722ST-NN0*A	FLUXUS G722ST-NN0*S	FLUXUS G722ST-A20*S	FLUXUS G722ST-F20*S
inputs					
		The inputs are galvanically isolated from the transmitter.			
number		max. 4, on request			
• temperature input					
type		Pt100/Pt1000			
connection		4-wire			
range	°C	-150...+560			
resolution	K	0.01			
accuracy		±0.01 % MV ±0.03 K			
• current input					
accuracy		0.1 % MV ±10 µA			
active input • range	 mA	U_{int} = 24 V, R_{int} = 50 Ω, P_{int} < 0.5 W, not short-circuit proof 0...20			
passive input • range	 mA	R_{int} = 50 Ω, P_{int} < 0.3 W -20...+20			
• voltage input					
range	V	0...1			
accuracy		0.1 % MV ±1 mV			
internal resistance		R_{int} = 1 MΩ			

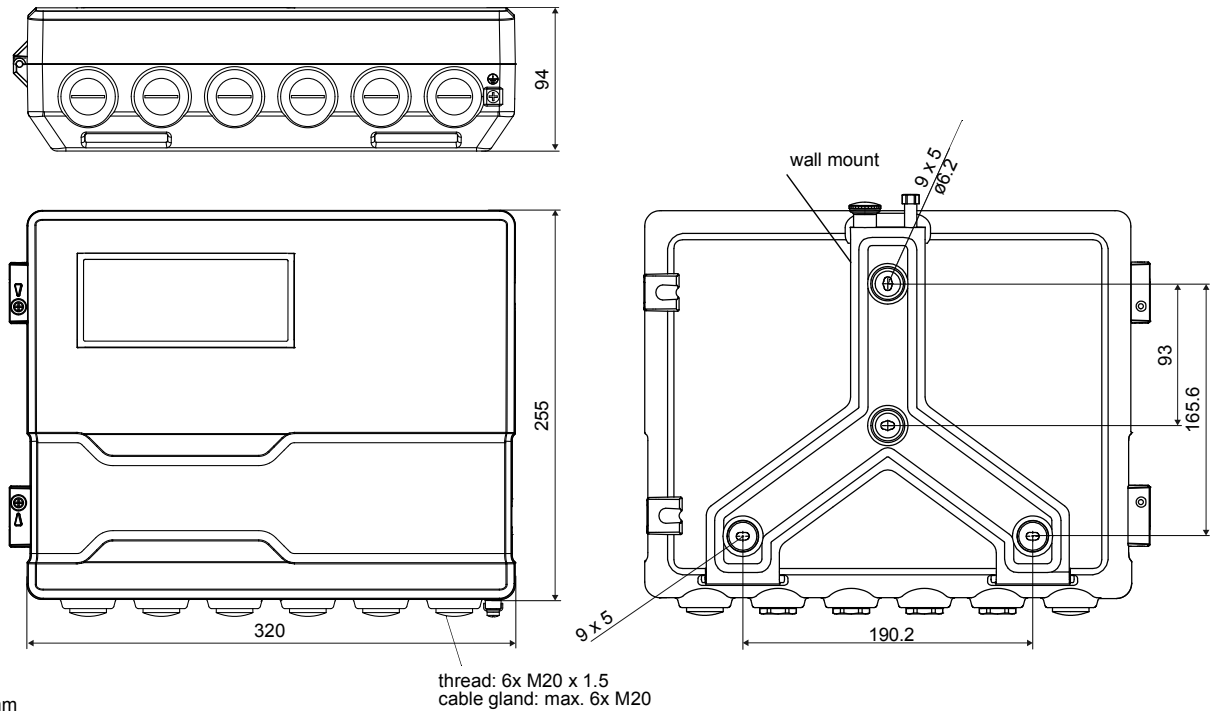
[1] test measurement to validate the application required in advance

[2] outside the explosive atmosphere (housing cover open)

[3] with inputs and including parametrisation of the transmitter

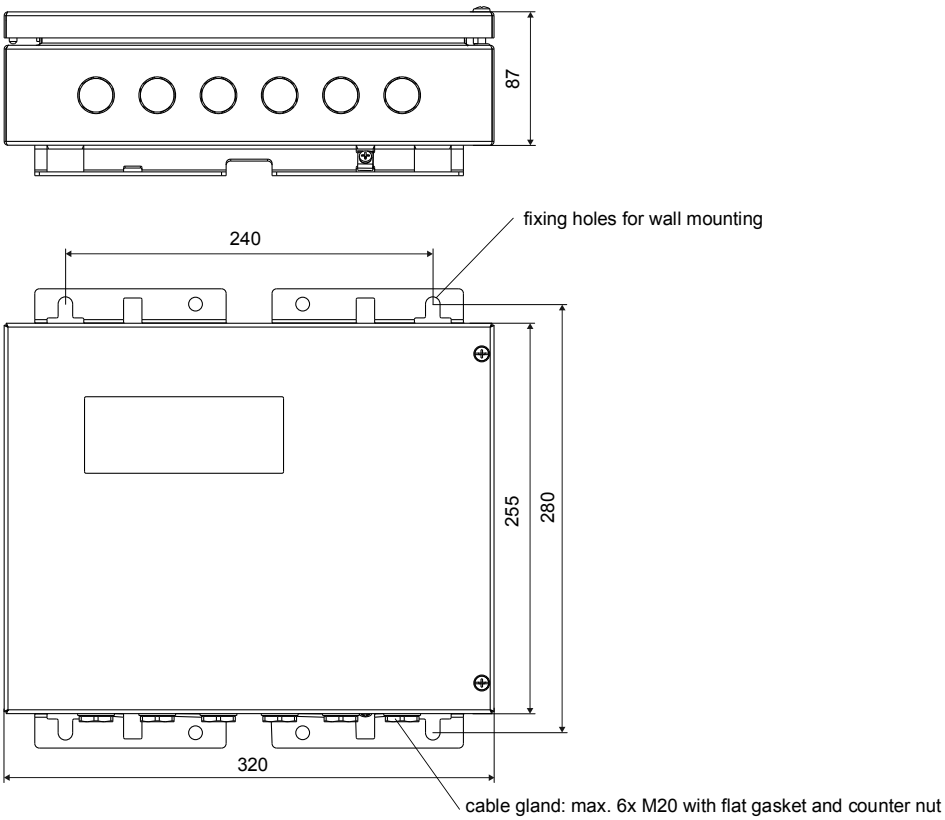
Dimensions

721**-*A**



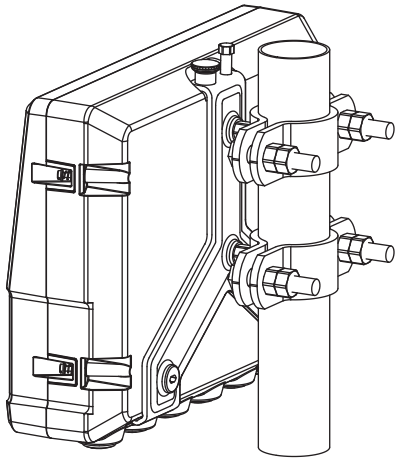
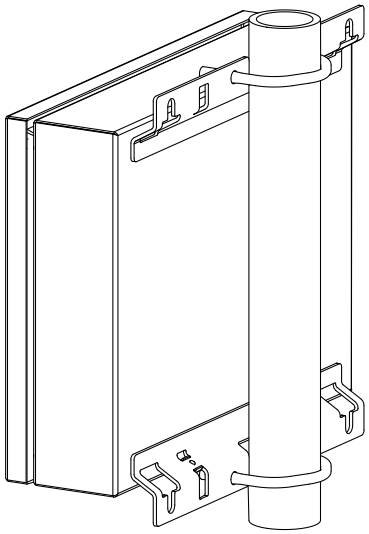
in mm

721**-*S**

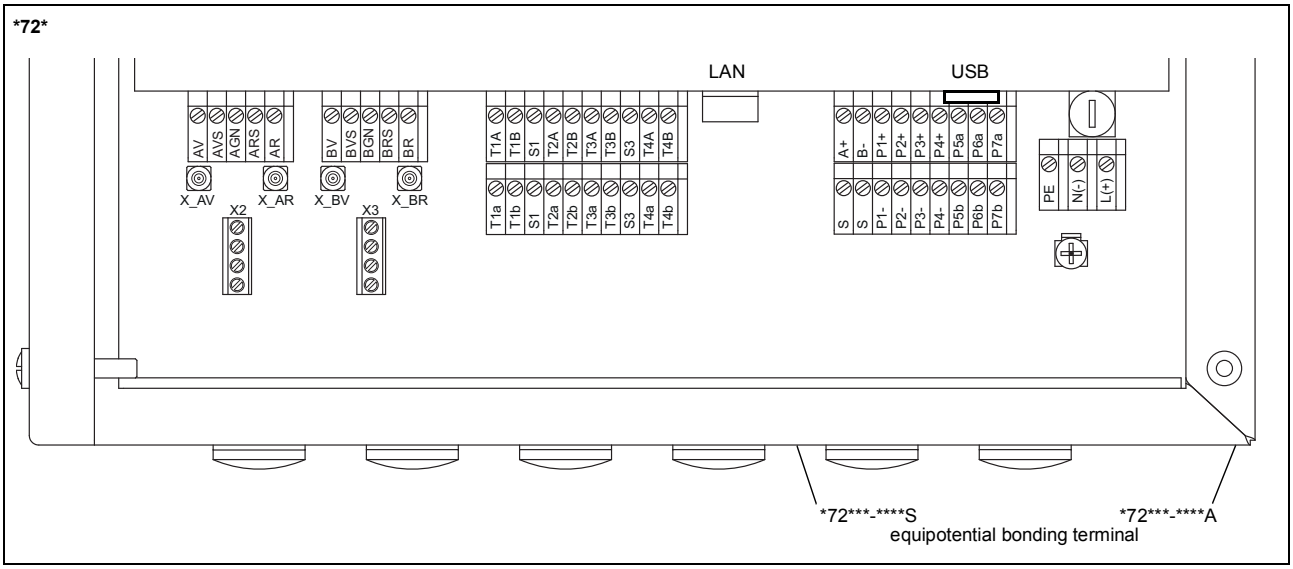


in mm

2" pipe mounting kit

721**-*A** 	order code: ACC-PE-G721-/PMK4
721**-*S** 	order code: ACC-PE-G721-/PMK6

Terminal assignment



power supply[1]		
terminal	**connection (AC)**	**connection (DC)**
PE	earth	earth
N(-)	neutral	-
L(+)	phase	+

transducers

transducer cable (transducers *****8*, ****LI*), extension cable					transducer cable (transducers *****52)		
measuring channel A		**measuring channel B**			**measuring channel A**	**measuring channel B**	
terminal	**connection**	**terminal**	**connection**	**transducer**	**terminal**		**connection**
AV	signal	BV	signal		X_AV	X_BV	SMB connector
AVS	shield	BVS	shield				
ARS	shield	BRS	shield		X_AR	X_BR	SMB connector
AR	signal	BR	signal				

outputs[1, 2]

terminal	**connection**
P1+...P4+ P1-...P4-	current output, voltage output, HART (P1)
P5a...P7a P5b...P7b	digital output

terminal	**connection**	**communication interface**
A+	signal +	• RS485[1] • Modbus RTU[1] • BACnet MS/TP[1] • M-Bus[1] • Profibus PA[1] • FF H1[1]
B-	signal -	
S	shield	
USB	type B Hi-Speed USB 2.0 Device	• service (FluxDiag/ FluxDiagReader)
LAN	RJ45 10/100 Mbps Ethernet	• service (FluxDiag/ FluxDiagReader) • BACnet IP • Modbus TCP

analog inputs[1, 2]

	temperature probe		**passive sensor**	**active sensor**
terminal	**direct connection**	**connection with extension cable**	**connection**	**connection**
T1a...T4a	red	red	not connected	not connected
T1A...T4A	red/blue	grey	-	+
T1b...T4b	white/blue	blue	+	not connected
T1B...T4B	white	white	not connected	-
S1, S3	shield	shield	not connected	not connected

binary inputs[1, 2]

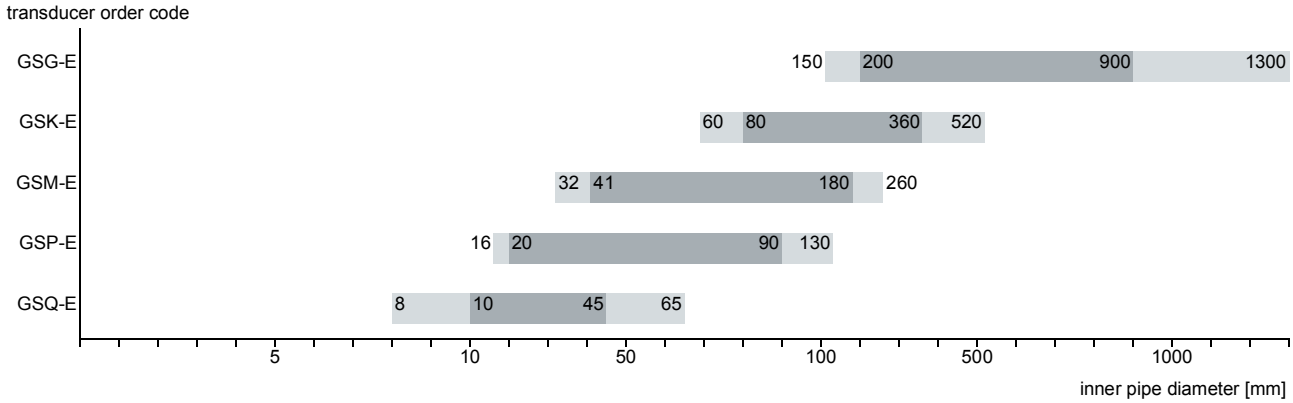
terminal
P1+...P2+, P1-...P2-

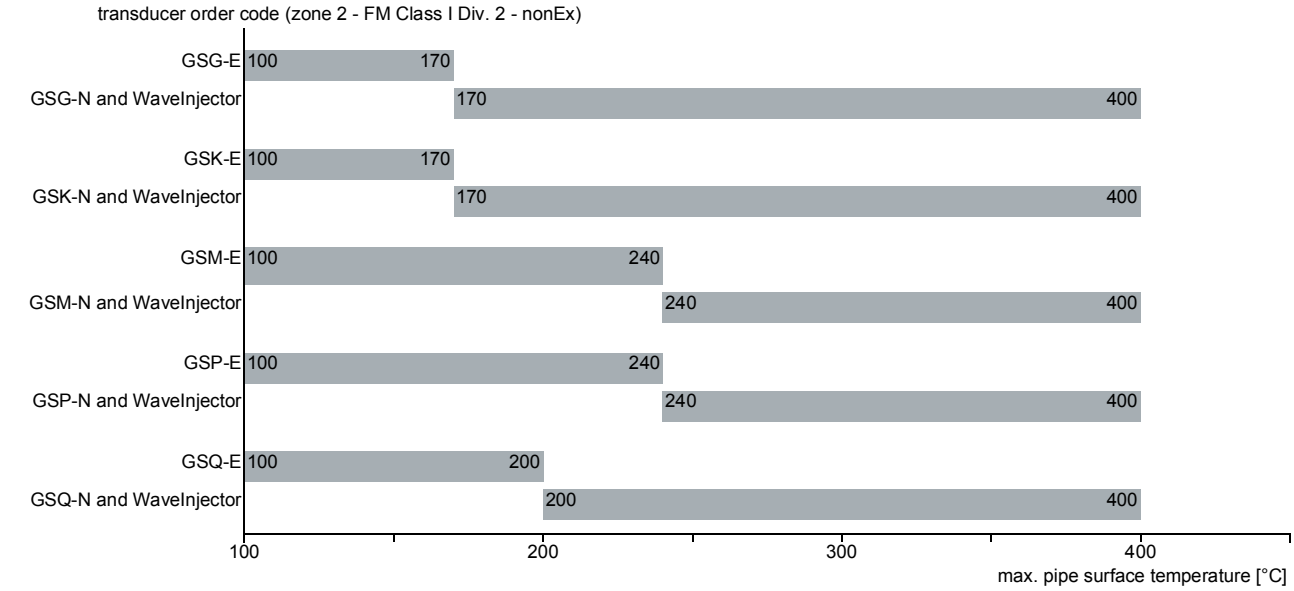
[1] cable (by customer):
- e.g. flexible wires, with insulated wire ferrules, wire cross-section: 0.25...2.5 mm^2
- outer diameter of the cable (*721**-****S with ferrite nut): max. 7.6 mm

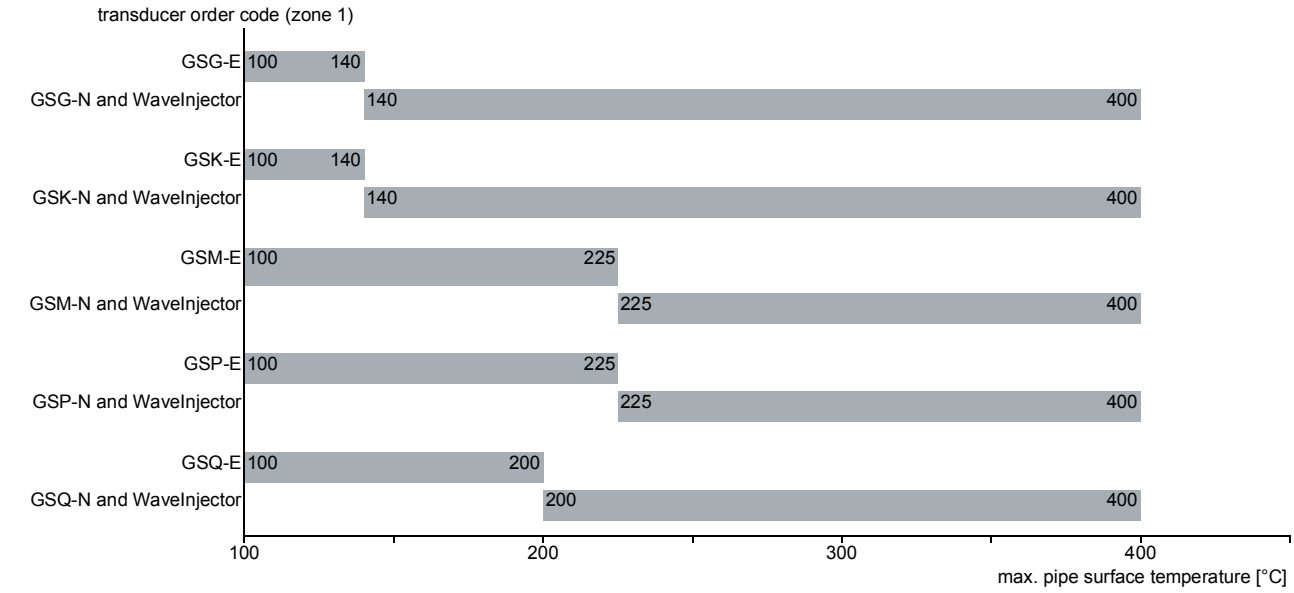
[2] The number, type and terminal assignment are customised.

Transducers

Transducer selection







recommended possible

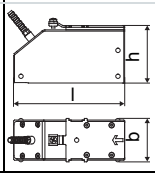
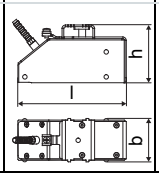
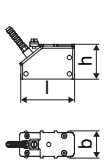
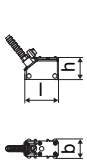
Transducer order code

1, 2	3		4	5, 6	7, 8		9...11			no. of character
transducer	**transducer frequency**	**-**	**ambient temperature**	**explosion protection**	**connection system**	**-**	**extension cable**	**/**	**option**	**description**
GS										set of ultrasonic flow transducers, shear wave
	G									0.2 MHz
	K									0.5 MHz
	M									1 MHz
	P									2 MHz
	Q									4 MHz
			N							normal temperature range
			E							extended temperature range
				NN						not explosion-proof
				A2						ATEX zone 2/IECEx zone 2
				A1						ATEX zone 1/IECEx zone 1
				F2						FM Class I Div. 2
					TS					direct connection or connection via junction box
							XXX			0 m: without extension cable > 0 m: with extension cable
									LC	long transducer cable
									OS	housing with stainless steel 316

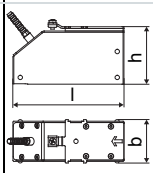
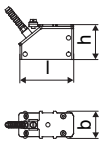
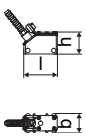
Each measuring system requires 2 sets of ultrasonic transducers of the same type.

Technical data

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

order code		GSG-N**TS/**	GSK-N**TS/**	GSM-N**TS/**	GSP-N**TS/**	GSQ-N**TS/**
technical type		G(DL)G1N52	G(DL)K1N52	G(DL)M2N52	G(DL)P2N52	G(DL)Q2N52
transducer frequency	MHz	0.2	0.5	1	2	4
inner pipe diameter d						
min. extended	mm	180	70	37	18	9
min. recommended	mm	240	100	48	24	12
max. recommended	mm	920	370	180	90	46
max. extended	mm	1300	520	260	130	66
pipe wall thickness						
min.	mm	11.1	4.4	2.2	1.1	0.6
material						
housing		PEEK with stainless steel cover 304 (1.4301), ***-*****/OS: 316L (1.4404)				
contact surface		PEEK				
degree of protection		IP67				
transducer cable						
type		1699				
length	m	5		4		3
length (***-*****/LC)	m	9				
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						
min.	°C	-40				
max.	°C	+130				
ambient temperature						
min.	°C	-40				
max.	°C	+130				
temperature compensation		x				
explosion protection						
• ATEX/IECEx						
order code		GSG-NA2TS/**	GSK-NA2TS/**	GSM-NA2TS/**	GSP-NA2TS/**	GSQ-NA2TS/**
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 ATEX		IBExU10ATEX1163 X				
certification IECEx		IECEx IBE 12.0005X				
• FM						
order code		GSG-NF2TS/**	GSK-NF2TS/**	GSM-NF2TS/**	GSP-NF2TS/**	GSQ-NF2TS/**
pipe surface temperature (Ex)						
• min.	°C	-40				
• max.	°C	+125		+190		
degree of protection		IP66				
marking		FM APPROVED NI/Cl. 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, TS, extended temperature range)

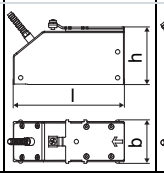
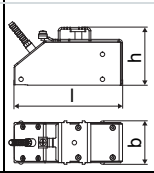
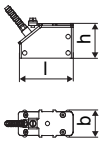
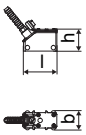
order code		GSG-ENNTS/**	GSK-ENNTS/**	GSM-E**TS/**	GSP-E**TS/**	GSQ-E**TS/**
technical type		G(DL)G1E52	G(DL)K1E52	G(DL)M2E52	G(DL)P2E52	G(DL)Q2E52
transducer frequency	MHz	0.2	0.5	1	2	4
inner pipe diameter d						
min. extended	mm	150	60	32	16	8
min. recommended	mm	200	80	41	20	10
max. recommended	mm	900	360	180	90	45
max. extended	mm	1300	520	260	130	65
pipe wall thickness						
min.	mm	11.1	4.4	2.2	1.1	0.6
material						
housing		PPSU with stainless steel cover 304 (1.4301), ***-*****/OS: 316L (1.4404)		PI with stainless steel cover 304 (1.4301), ***-*****/OS: 316L (1.4404)		
contact surface		PPSU		PI		
degree of protection		IP65		IP56		
transducer cable						
type		1699		6111		
length	m	5		4		3
length (***-*****/LC)	m	9		9		
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						
min.	°C	100		100		100
max.	°C	170		240[1]		200
ambient temperature						
min.	°C	-40		-30		-30
max.	°C	+170		+40 +60[2] +200[3]		+200
temperature compensation		x		x		
explosion protection						
• **ATEX/IECEx**						
order code		-	-	GSM-EA2TS/**	GSP-EA2TS/**	GSQ-EA2TS/**
pipe surface temperature (Ex)						
• min.	°C	-	-	-45		
• max.	°C	-	-	gas: +235[1], dust: +225[1]		
marking		-	-	CE 0637 Ex II3G II2D Ex nA IIC T6...T2 Gc Ex tb IIIA T80 °C...230 °C Db		
certification ATEX		-	-	IBExU10ATEX1163 X		
certification IECEx		-	-	IECEx IBE 12.0005X		
• **FM**						
order code		-	-	GSM-EF2TS/**	GSP-EF2TS/**	GSQ-EF2TS/**
pipe surface temperature (Ex)						
• min.	°C	-	-	-40		
• max.	°C	-	-	+235[1]		
degree of protection		-	-	IP66		
marking		-	-	FM APPROVED NI/Cl. I,II,III/Div. 2 / GP A,B,C,D,E,F,G/ Temp. Codes dwg 3860		

[1] > +200 °C:
Variofix C without cover
observe the insulation instruction
Ex: ambient temperature max. +40 °C

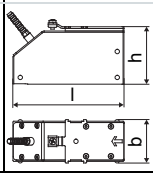
[2] pipe surface temperature +200...+240 °C: Variofix C without cover

[3] pipe surface temperature max. +200 °C

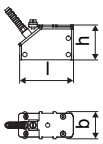
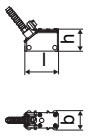
Shear wave transducers (zone 1, TS)

order code		GSG-N*1TS/**	GSK-N*1TS/**	GSM-N*1TS/**	GSP-N*1TS/**	GSQ-N*1TS/**
technical type		G(DL)G1N81	G(DL)K1N81	G(DL)M2N81	G(DL)P2N81	G(DL)Q2N81
transducer frequency	MHz	0.2	0.5	1	2	4
inner pipe diameter d						
min. extended	mm	180	70	37	18	9
min. recommended	mm	240	100	48	24	12
max. recommended	mm	920	370	180	90	46
max. extended	mm	1300	520	260	130	66
pipe wall thickness						
min.	mm	11.1	4.4	2.2	1.1	0.6
material						
housing		PEEK with stainless steel cover 304 (1.4301), ***-*****/OS: 316L (1.4404)				
contact surface		PEEK				
degree of protection		IP65	IP66			IP65
transducer cable						
type		1699				
length	m	5		4		3
length (***-*****/LC)	m	9				
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						
min.	°C	-40				
max.	°C	+130				
ambient temperature						
min.	°C	-40				
max.	°C	+130				
temperature compensation		x				
explosion protection						
• **ATEX/IECEx**						
order code		GSG-NA1TS/**	GSK-NA1TS/**	GSM-NA1TS/**	GSP-NA1TS/**	GSQ-NA1TS/**
pipe surface temperature (Ex)						
• min.	°C	-55				
• max.	°C	+180				
marking		CE 0637 Ex II2G II2D Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T185 °C Db				
certification ATEX		IBExU07ATEX1168 X				
certification IECEx		IECEx IBE 08.0007X				

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

order code		GSG-E*1TS/**	GSK-E*1TS/**
technical type		G(DL)G1E83	G(DL)K1E83
transducer frequency	MHz	0.2	0.5
inner pipe diameter d			
min. extended	mm	150	60
min. recommended	mm	200	80
max. recommended	mm	900	360
max. extended	mm	1300	520
pipe wall thickness			
min.	mm	11.1	4.4
material			
housing		PPSU with stainless steel cover 304 (1.4301), ***-*****/OS: 316L (1.4404)	
contact surface		PPSU	
degree of protection		IP65	
transducer cable			
type		1699	
length	m	5	
length (***-*****/LC)	m	9	
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			
min.	°C	100	
max.	°C	170	
ambient temperature			
min.	°C	-40	
max.	°C	+170	
temperature compensation		x	
explosion protection			
• **ATEX/IECEx**			
order code		GSG-EA1TS/**	GSK-EA1TS/**
pipe surface temperature (Ex)			
• min.	°C	-50	
• max.	°C	+140	
marking		CE 0637 Ex II2G II2D Ex q IIC T6...T3 Gb Ex tb IIIC T80 °C...T145 °C Db	
certification ATEX		IBExU07ATEX1168 X	
certification IECEx		IECEx IBE 08.0007X	

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

order code		GSM-E*1TS/**	GSP-E*1TS/**	GSQ-E*1TS/**
technical type		G(DL)M2E85	G(DL)P2E85	G(DL)Q2E85
transducer frequency	MHz	1	2	4
inner pipe diameter d				
min. extended	mm	32	16	8
min. recommended	mm	41	20	10
max. recommended	mm	180	90	45
max. extended	mm	260	130	65
pipe wall thickness				
min.	mm	2.2	1.1	0.6
material				
housing		PI with stainless steel cover 304 (1.4301), ***-*****/OS: 316L (1.4404)		
contact surface		PI		
degree of protection		IP66		IP56
transducer cable				
type		6111		
length	m	4		3
length (***-*****/LC)	m	9		
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				
min.	°C	100		100
max.	°C	240[1]		200
ambient temperature				
min.	°C	-30		-30
max.	°C	+40 +200[2]		+200
temperature com-pensation		x		
explosion protection				
• **ATEX/IECEx**				
order code		GSM-EA1TS/**	GSP-EA1TS/**	GSQ-EA1TS/**
pipe surface temperature (Ex)				
• min.	°C	-45		
• max.	°C	+225[1]		
marking		CE 0637 Ex II2G II2D Ex q IIC T6...T2 Gb Ex tb IIIA T80 °C...T230 °C Db		
certification ATEX		IBExU07ATEX1168 X		
certification IECEx		IECEx IBE 08.0007X		

[1] > +200 °C :
Variofix C
observe the insulation instruction
ambient temperature max. +40 °C

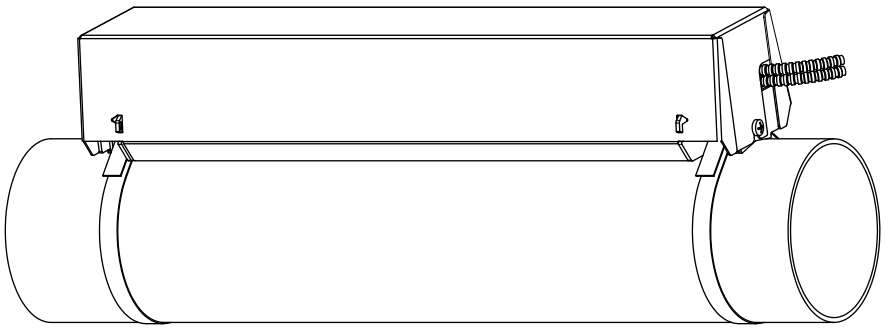
[2] pipe surface temperature max. +200 °C

Transducer mounting fixture

Order code

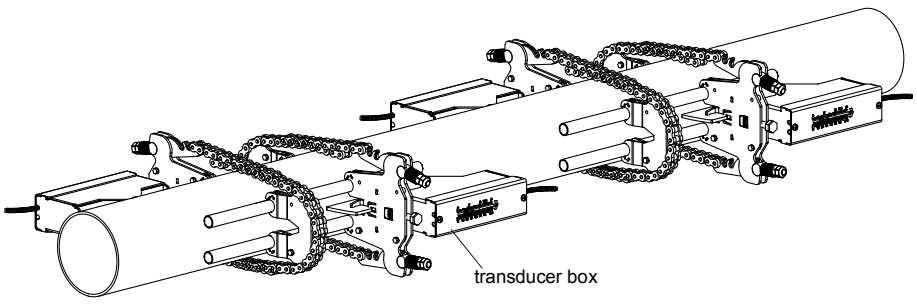
1, 2	3		4	5		6	7...9			no. of character
transducer mounting fixture	**transducer**	**-**	**measurement arrangement**	**size**	**-**	**fixation**	**outer pipe diameter**	**/**	**option**	**description**
VC										Variofix C
WI										transducer box for WaveInjector
	K									transducers with transducer frequency G, K
	M									transducers with transducer frequency M, P
	Q									transducers with transducer frequency Q
			D							diagonal arrangement
				S						small
				L						large
						S				tension straps
							002			10...20 mm
							004			20...40 mm
							T36			40...360 mm
							013			10...130 mm
							036			130...360 mm
							092			360...920 mm
							200			920...2000 mm
									OS	housing with stainless steel 316
									Z	special design

Variofix C (VC)



material: stainless steel 304 (1.4301), 301 (1.4310)
inner length:
VCK-*L: 500 mm
VCK-*S: 350 mm
VCM: 400 mm
VCQ: 250 mm
dimensions:
VCK-*L: 560 x 122 x 102 mm,
VCK-*S: 410 x 122 x 102 mm,
VCM: 460 x 96 x 80 mm
VCQ: 310 x 85 x 62 mm

transducer box WI for WaveInjector

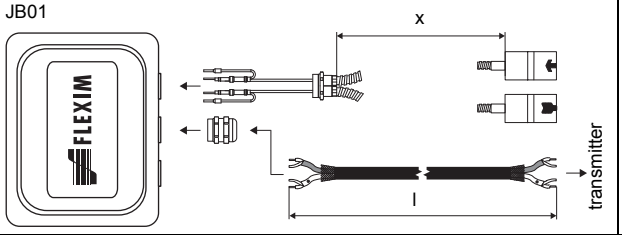
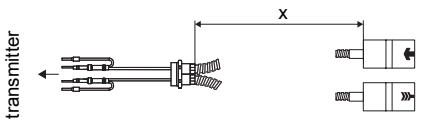
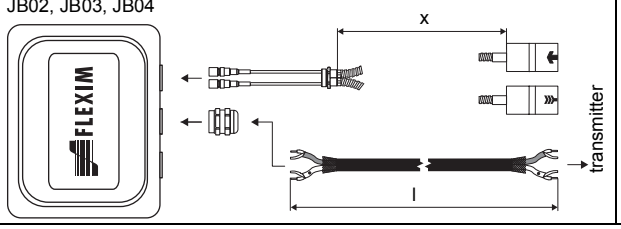
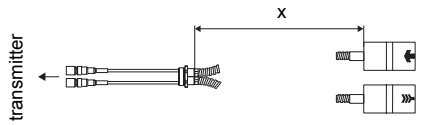


see Technical specification TSWaveInjectorVx-x

Coupling materials for transducers

type	ambient temperature °C	remark
coupling foil type VT	-10...+200	fluid temperature 200 °C: min. 2 years
coupling foil type TF	200...240	
coupling compound type E	-30...+200	in combination with type VT only
coupling compound type H	-30...+250	in combination with type TF only
coupling foil type A	max. 280	WaveInjector
coupling foil type B	280...400	WaveInjector

Connection systems

connection system TS		
connection with extension cable	direct connection	transducers technical type
JB01 		*****8*
JB02, JB03, JB04 		*****52

Cable

transducer cable			
type		**1699**	**6111**
weight	kg/m	0.094	0.092
ambient temperature	°C	-55...+200	-100...+225
properties			
cable jacket			
material		PTFE	PFA
outer diameter	mm	2.9	2.7
thickness	mm	0.3	0.5
colour		brown	white
shield		x	x
sheath			
material		stainless steel 304 (1.4301) option OS: 316Ti (1.4571)	stainless steel 304 (1.4301) option OS: 316Ti (1.4571)
outer diameter	mm	8	8

extension cable			
type		**2615**	**5245**
order code		ACC-PE- GNNN-/EXEXXXX	ACC-PE- GNNN-/EXA1XXX
weight	kg/m	0.18	0.38
ambient temperature	°C	-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		PUR	PUR
outer diameter	mm	max. 12	max. 12
thickness	mm	2	2
colour		black	black
shield		x	x
sheath			
material		-	steel wire braid with copolymer sheath
outer diameter	mm	-	max. 15.5

XXX - cable length inch m

Cable length

transducer frequency		**F, G, H, K**		**M, P**		**Q**		**S**	
connection system TS									
transducers technical type		x	l	x	l	x	l	x	l
*(DR)***8*	m	5	≤ 300	4	≤ 300	3	≤ 90	-	-
option LC: *(LT)***8*	m	9	≤ 300	9	≤ 300	9	≤ 90	-	-
*(DR)***5*	m	5	≤ 300	4	≤ 300	3	≤ 90	2	≤ 40
option LC: *(LT)***5*	m	9	≤ 300	9	≤ 300	9	≤ 90	-	-

x - transducer cable length

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

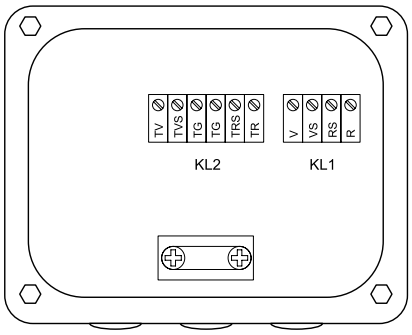
Junction box

Technical data

JB01S4E3M, JBP2, JBP3

weight	kg	1.2 kg
fixation		wall mounting optional: 2" pipe mounting
material		
housing		stainless steel 316L (1.4404)
gasket		silicone
degree of protection		IP67
ambient temperature		
min.	°C	-40
max.	°C	+80
explosion protection		
• ATEX/IECEx (zone 1)		
junction box		JB01S4E3M
marking		CE 0637 Ex II2G II2D Ex eb mb IIC T6...T4 Gb Ex tb IIIC T100 °C Db Ta -40...+70/80 °C
certification ATEX		IBExU06ATEX1161
certification IECEx		IECEx IBE 08.0006
type of protection		gas: increased safety decoupled network: encapsulation dust: protection by enclosure
• ATEX (zone 2)		
junction box		JBP2
marking		CE Ex II3G Ex nA IIC (T6)...T4 Gc II3D Ex tc IIIC T 100 °C Dc Ta -40...+(70)80 °C

Connection



Transducers

terminal strip	terminal	connection	transducer
KL1	V	signal	↑
	VS	internal shield	
	RS	internal shield	⇈
	R	signal	

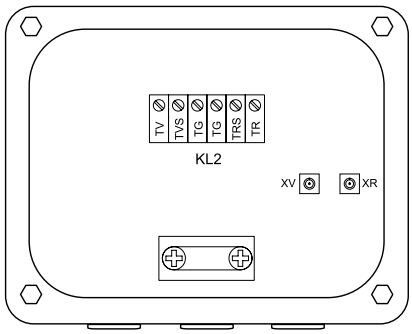
Extension cable

terminal strip	terminal	connection
KL2	TV	signal
	TVS	internal shield
	TRS	internal shield
	TR	signal

JB02, JB03, JB04

weight	kg	1.2 kg
fixation		wall mounting optional: 2" pipe mounting
material		
housing		stainless steel 316L (1.4404)
gasket		silicone
degree of protection		IP67
ambient temperature		
min.	°C	-40
max.	°C	+80
explosion protection		
• ATEX		
junction box		JB02
marking		CE Ex II3G Ex nA IIC (T6)...T4 Gc II3D Ex tc IIIC T 100 °C Dc Ta -40...+(70)80 °C
• FM		
junction box		JB04
marking		FM APPROVED NI/Cl. I,II,III/Div. 2 / GP A,B,C,D,E,F,G/ T6 Ta = -40...+60 °C

Connection



Transducers

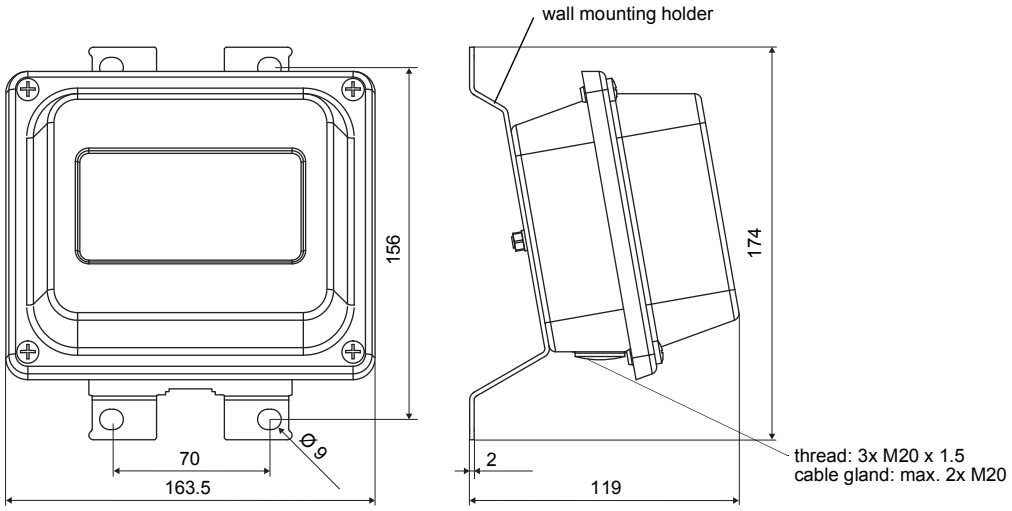
	terminal	connection	transducer
	XV	SMB connector	↑
	XR	SMB connector	⇈

Extension cable

terminal strip	terminal	connection
KL2	TV	signal
	TVS	internal shield
	TRS	internal shield
	TR	signal

Dimensions

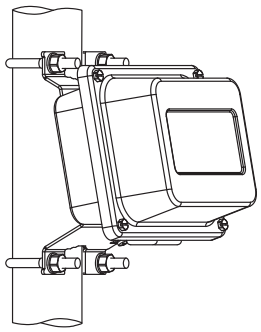
JB0*, JBP*



in mm

2" pipe mounting kit

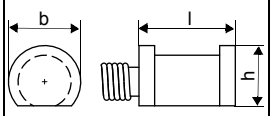
JB**



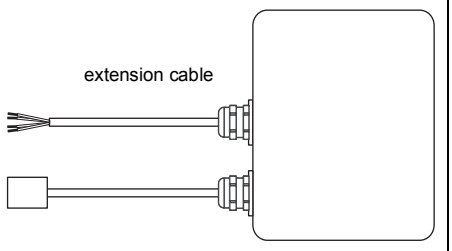
order code:
ACC-PE-GNNN-/JBPMK4

Clamp-on temperature probe (optional)

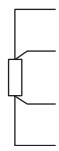
Technical data

PT12N		
order code		**PT12N (nonEx)**: • ACC-PE-GNNN-/T312 **PT12N (ATEX)**: • ACC-PE-GNNN-/T322
design		clamp-on nonEx or ATEX
type		Pt100
connection		4-wire
measuring range	°C	-30...+250
accuracy T		±(0.15 °C + 2 · 10^{-3} · |T [°C]|) class A
response time	s	50
housing		aluminum
degree of protection		IP66
dimensions		
length l	mm	20
width b	mm	15
height h	mm	13
dimensional drawing		
weight	kg	0.25
accessories		
thermal conductivity foil 250 °C		x
explosion protection (optional)		
• **ATEX**		
marking		CE Ex II3G Ex nA IIC T6...T2 Gc Ta -30...+250 °C

Connection system

connection with extension cable	**direct connection**
	

Connection

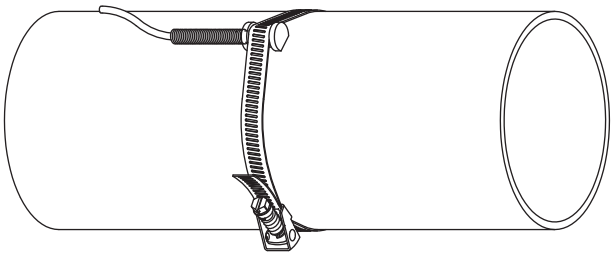
	temperature probe
	red
	red/blue
	white/blue
	white

Cable

		temperature probe	**extension cable**
type		4 x 0.25 mm² black	LIYCY 8 x 0.14 mm² grey
standard length	m	3	5/10/25
max. length	m	-	200
cable jacket		PTFE	PVC

Fixation

tension strap PT12N

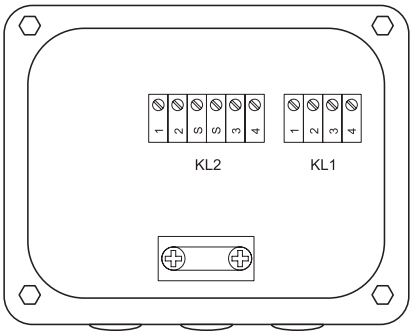


material: stainless steel 301 (1.4310), 410 (1.4006)
thermal insulation necessary

Junction box

JBT2, JBT3		
order code		• JBT2: ACC-PE-GNNN-/JB4 • JBT3: ACC-PE-GNNN-/JB6
weight	kg	1.2 kg
fixation		wall mounting optional: 2" pipe mounting
material		
housing		stainless steel 316L (1.4404)
gasket		silicone
degree of protection		IP67
ambient temperature		
min.	°C	-40
max.	°C	+80
explosion protection		
• ATEX		
junction box		JBT2
marking		CE Ex II3G Ex nA IIC (T6)...T4 Gc II3D Ex tc IIIC T 100 °C Dc Ta -40...+(70)80 °C

Connection



Temperature probe

terminal strip	terminal	connection
KL1	1	red
	2	red/blue
	3	white
	4	white/blue

Extension cable

terminal strip	terminal	connection
KL2	1	red
	2	grey
	3	white
	4	blue

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2020-10-01, TSFLUXUS_G722ST-HTV1-0EN_Leu