

Stationary ultrasonic clamp-on system for flow measurement of compressed air and other industrial gases

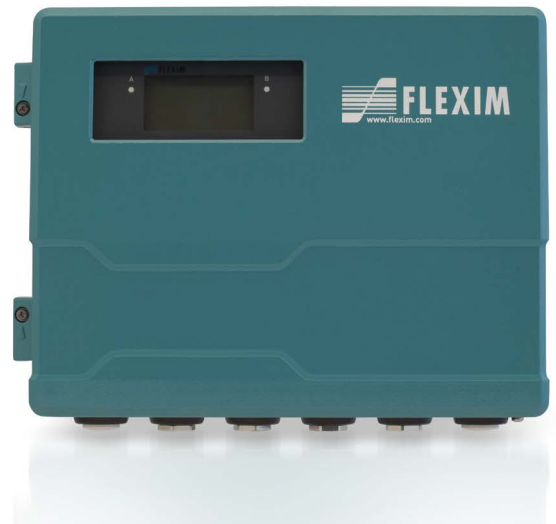
Transmitter for permanent outdoor wall or pipe mounting

Features

- Accurate and reliable flow measurement
- Bidirectional measurement for flow direction detection in compressed-air networks
- Installation and start-up do not require any pipe work nor any process interruptions
- Measurement unaffected by gas density, viscosity, dust content and humidity
- Measurement at extremely low pressure:
 - min. 3 bar(a) in metal pipes
 - 1 bar(a) in plastic pipes
- Extremely high turndown ratio > 1000:1
- High measuring accuracy, even at low flow velocities down to 0.01 m/s
 - Monitoring of small flows (e.g. during the night)
 - Leakage detection
- For pipe diameters of DN 15...DN 250
- Maintenance-free acoustic coupling using permanent coupling material
- Support of numerous fieldbus systems
- ATEX, IECEx, FM Class I Div. 2 approved transducers for hazardous areas available

Applications

- Industrial manufacturing facilities:
 - Air compressors and compressed-air distribution networks
 - Pressure generators and distribution networks for inert or purge gases
 - Pressure generators and distribution networks for oxygen, e.g. for steel production
- Measurement of atmospheric gases consumption: compressed air, nitrogen, oxygen, argon, helium



FLUXUS G721CA-*****-A



FLUXUS G721CA-*****-S



Variofix L

Function 3
 Measurement principle 3
 Calculation of volumetric flow rate 3
 Calculation of standard volumetric flow rate 4
 Number of sound paths 5
 Typical measurement setup 5

Transmitter 6
 Technical data 6
 Dimensions 8
 2" pipe mounting kit 9
 Terminal assignment 10

Transducers 11
 Technical data 11

Transducer mounting fixture 13

Coupling materials for transducers 13

Damping mats (optional) 14

Connection systems 15

Junction box 16
 Technical data 16
 Dimensions 16
 2" pipe mounting kit 17

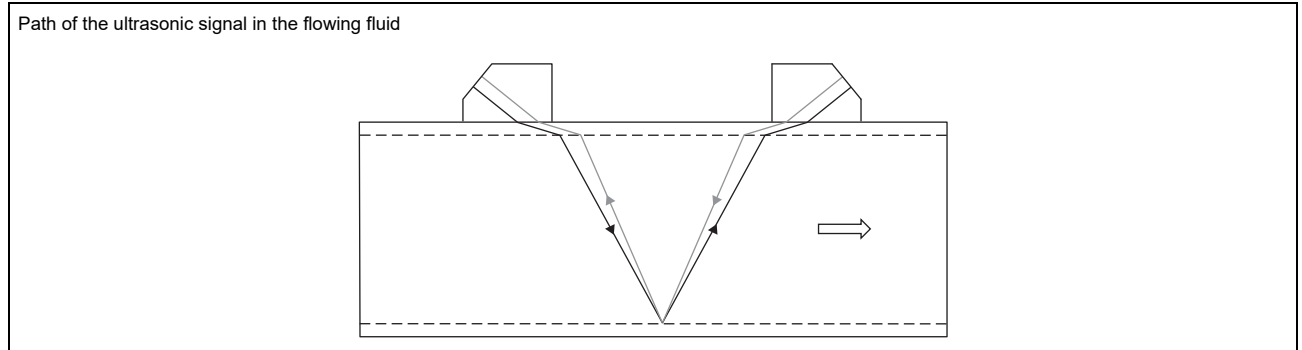
Clamp-on temperature probe (optional) 18
 Technical data 18
 Fixation 19
 Junction box 20

Pressure transmitter (optional) 22
 Technical data 22

Function

Measurement principle

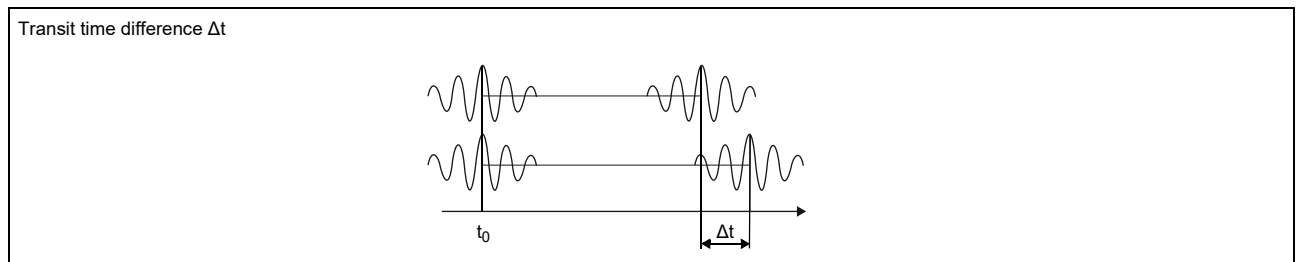
The transducers are mounted on the pipe which is completely filled with the fluid. The ultrasonic signals are emitted alternately by a transducer and received by the other. The physical quantities are determined from the transit times of the ultrasonic signals.



As the fluid where the ultrasound propagates is flowing, the transit time of the ultrasonic signal in flow direction is shorter than the one against the flow direction.

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

The integrated microprocessors control the entire measuring cycle. The received ultrasonic signals are checked for measurement usability and evaluated for their reliability. Noise signals are eliminated.



Calculation of volumetric flow rate

$$\dot{V} = k_{Re} \cdot A \cdot k_a \cdot \frac{\Delta t}{2 \cdot t_v}$$

where

- \dot{V} - volumetric flow rate
- k_{Re} - fluid mechanics calibration factor
- A - cross-sectional pipe area
- k_a - acoustical calibration factor
- Δt - transit time difference
- t_v - average of transit times in the fluid

Calculation of standard volumetric flow rate

The standard volumetric flow rate can be selected as physical quantity. It is calculated with the following formula:

$$\dot{V}_N = \dot{V} \cdot \frac{p}{p_N} \cdot \frac{T_N}{T} \cdot \frac{1}{K}$$

where

\dot{V}_N - standard volumetric flow rate

\dot{V} - operating volumetric flow rate

p_N - standard pressure (absolute value)

p - operating pressure (absolute value)

T_N - standard temperature in K

T - operating temperature in K

K - compressibility coefficient of gas: ratio of the compressibility factors of the gas at operating conditions and at standard conditions Z/Z_N

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

or:

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

Number of sound paths

The number of sound paths is the number of transits of the ultrasonic signal through the fluid in the pipe. Depending on the number of sound paths, the following methods of installation exist:

- **reflection arrangement**

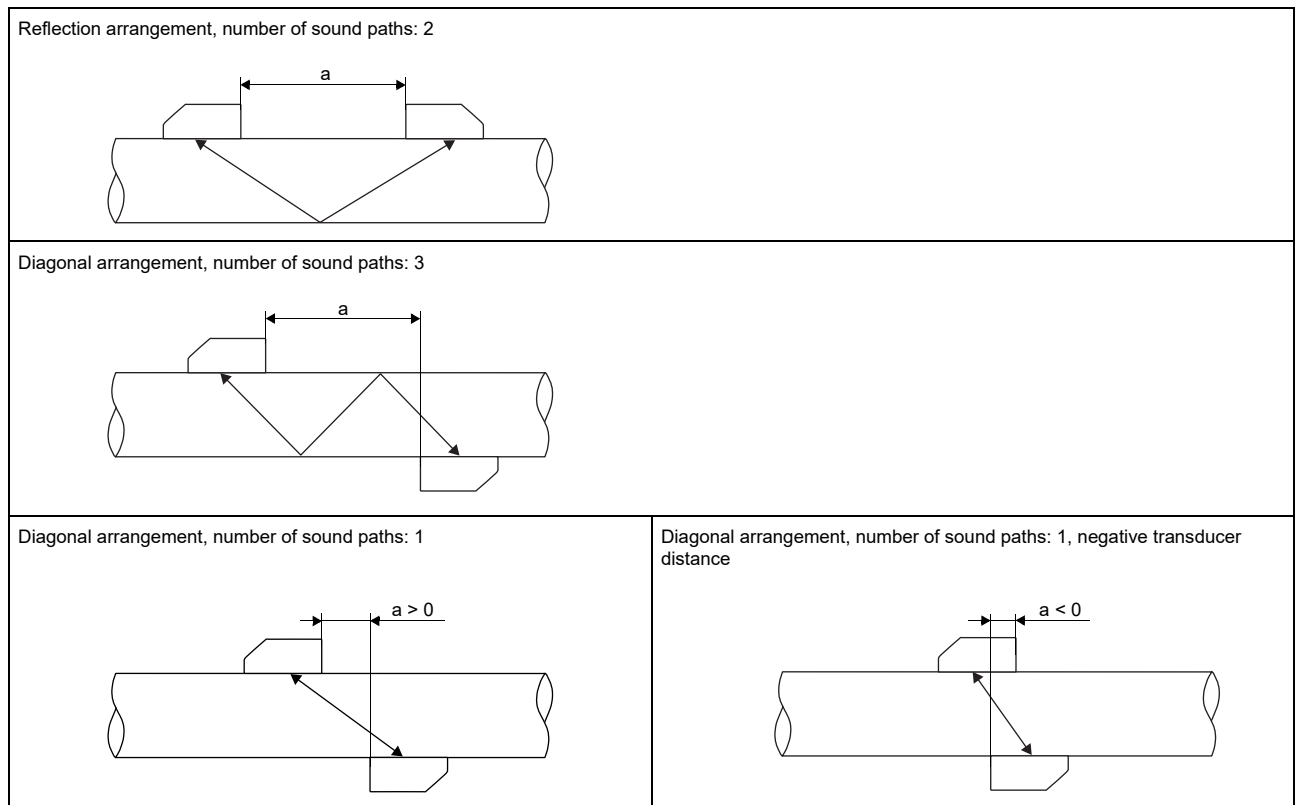
The number of sound paths is even. The transducers are mounted on the same side of the pipe. Correct positioning of the transducers is easy.

- **diagonal arrangement**

The number of sound paths is odd. The transducers are mounted on opposite sides of the pipe. In the case of a high signal attenuation by the fluid, pipe and coatings, diagonal arrangement with 1 sound path will be used.

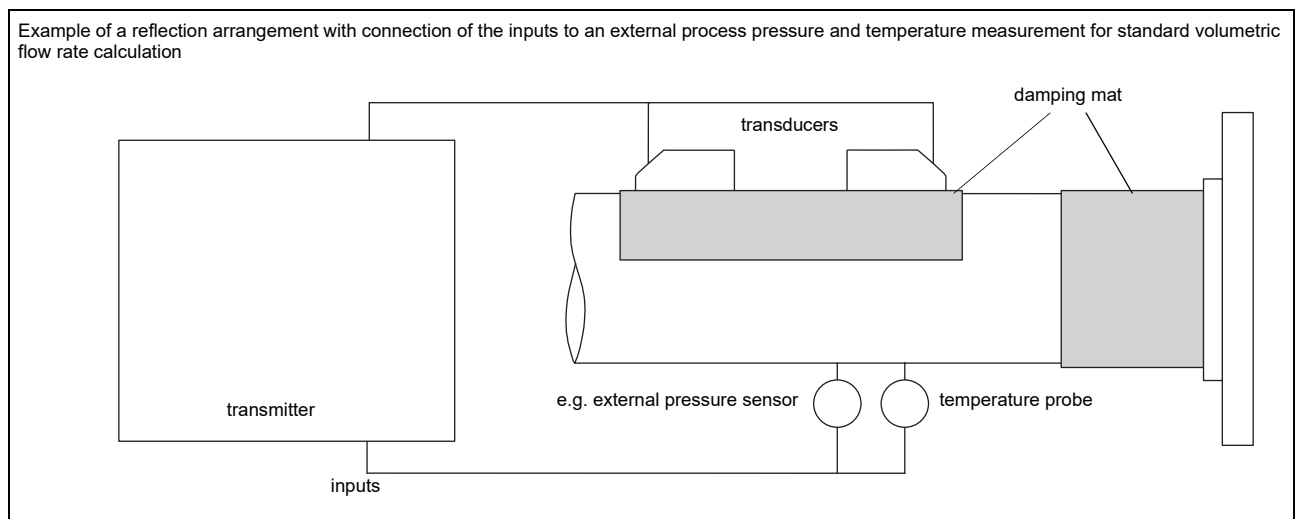
The preferred method of installation depends on the application. While increasing the number of sound paths increases the accuracy of the measurement, signal attenuation increases as well. The optimum number of sound paths for the parameters of the application will be determined automatically by the transmitter.

As the transducers can be mounted with the transducer mounting fixture in reflection arrangement or diagonal arrangement, the number of sound paths can be adjusted optimally for the application.



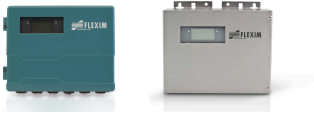


a - transducer distance

Typical measurement setup



Transmitter

Technical data

	FLUXUS G721CA-NNN**A G721CA-NNN**S	FLUXUS G721CA-A2N**A G721CA-A2N**S	FLUXUS G721CA-F2N**A G721CA-F2N**S
			
design	standard field device	standard field device zone 2	standard field device FM Class I Div. 2
application	flow measurement of compressed air and industrial gases		
measurement			
measurement principle	transit time difference correlation principle		
Flussrichtung	bidirektional		
flow velocity	m/s 0.01...35, depending on pipe diameter		
repeatability	0.15 % MV ±0.005 m/s		
fluid	compressed air, oxygen, nitrogen, argon, helium		
temperature compensation	corresponding to the recommendations in ANSI/ASME MFC-5.1-2011		
measurement uncertainty (volumetric flow rate)			
measurement uncertainty at the measuring point	±1...2 % MV ±0.005 m/s, depending on the application		
transmitter			
power supply	<ul style="list-style-type: none"> • 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, optional: 2	
damping	s	0...100 (adjustable)	
measuring cycle	Hz	100...1000 (1 channel)	
response time	s	1 (1 channel), option: 0.02	
housing material		aluminum, powder coated or stainless steel 316L (1.4404)	
degree of protection		IP66	aluminum housing: IP66/NEMA 4X stainless steel housing: IP65
dimensions	mm	see dimensional drawing	
weight	kg	aluminum housing: 5.4 stainless steel housing: 5.1	
fixation		wall mounting, optional: 2" pipe mounting	
ambient temperature	°C	-40...+60 (< -20 without operation of the display)	aluminum housing: -40...+55/60 (< -20 without operation of the display) stainless steel housing: -20...+55/60
display		128 x 64 pixels, backlight	
menu language		English, German, French, Spanish, Dutch, Russian, Polish, Turkish, Italian	
explosion protection			
• ATEX/IECEX			
marking	-	G721**-A20*A, G721**-A20*S: CE 0637 Ex II 3G II 2D Ex nA nC ic IIC T4 Gc Ex tb IIIC T120 °C Db T _a -40...+60 °C	-
certification	-	IBExU11ATEX1015, IECEx IBE 11.0008	-
• FM			
marking	-	-	G721**-F20*S2, G721**-F20*S3:  NI/CI. I,II,III/Div. 2/ GP: A,B,C,D,E,F,G/ T5 G721**-F20*S1:  NI/CI. I,II,III/Div. 2/ GP: A,B,C,D,E,F,G/ T4A
measuring functions			
physical quantities	operating volumetric flow rate, standard volumetric flow rate, mass flow rate, flow velocity		
totaliser	volume, mass		
calculation functions	average, difference, sum (2 measuring channels necessary)		
diagnostic functions	sound speed, signal amplitude, SNR, SCNR, standard deviation of amplitudes and transit times		

¹ with aperture calibration of the transducers

² outside the explosive atmosphere (housing cover open)

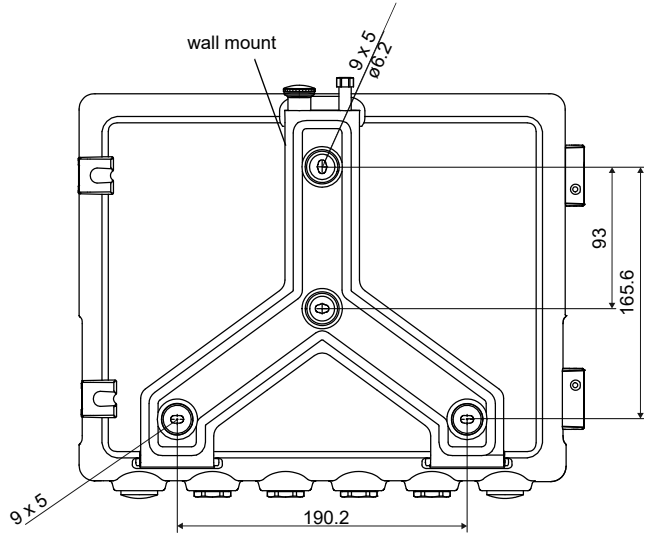
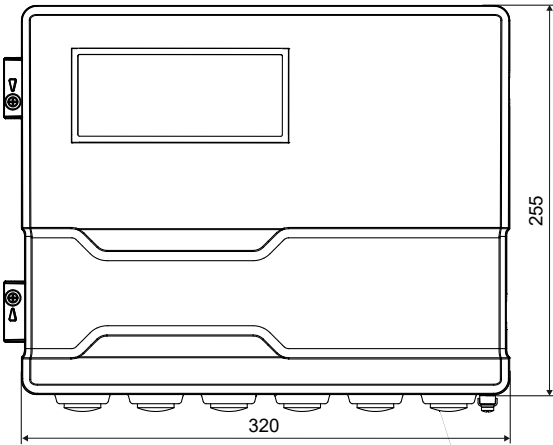
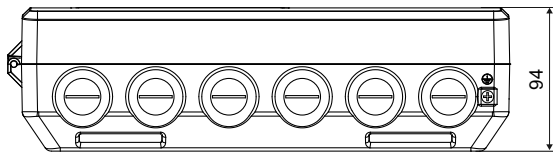
	FLUXUS G721CA-NNN**-*A G721CA-NNN**-*S	FLUXUS G721CA-A2N**-*A G721CA-A2N**-*S	FLUXUS G721CA-F2N**-*A G721CA-F2N**-*S
communication interfaces			
service interfaces	measured value transmission, parametrisation of the transmitter: • USB ² • LAN ²		
process interfaces	max. 1 option: • RS485 (ASCII sender) • Modbus RTU • BACnet MS/TP • M-Bus • Profibus PA • FF H1 • Modbus TCP • BACnet IP	max. 1 option: • RS485 (ASCII sender) • Modbus RTU • BACnet MS/TP • Profibus PA • FF H1 • Modbus TCP • BACnet IP	max. 1 option: • RS485 (ASCII sender) • Modbus RTU • BACnet MS/TP • Profibus PA • FF H1 • Modbus TCP • 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.		
• switchable current output			
	All switchable current outputs are jointly switched to active or passive.		
number	2 or 4		
range	mA	4...20 (3.2...22)	
accuracy	0.04 % MV ±3 µA		
active output	R _{ext} < 250 Ω		
passive output	U _{ext} = 8...30 V, depending on R _{ext} (R _{ext} < 1 kΩ at 30 V)		
• digital output			
functions	• 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	mainly for totalising		
• pulse value	units	0.01...1000	
• pulse width	ms	0.05...1000	
inputs			
	The inputs are galvanically isolated from the transmitter.		
• temperature input			
number	1 (1 measuring channel), 2 (2 measuring channels)		
type	Pt100/Pt1000		
connection	4-wire		
range	°C	-150...+560	
resolution	K	0.01	
accuracy	±0.01 % MV ±0.03 K		
• current input			
number	1 (1 measuring channel), 2 (2 measuring channels)		
accuracy	0.1 % MV ±10 µA		
active input	U _{int} = 24 V, R _{int} = 50 Ω, P _{int} < 0.5 W, not short-circuit proof		
• range	mA	0...20	
passive input	R _{int} = 50 Ω, P _{int} < 0.3 W		
• range	mA	-20...+20	

¹ with aperture calibration of the transducers

² outside the explosive atmosphere (housing cover open)

Dimensions

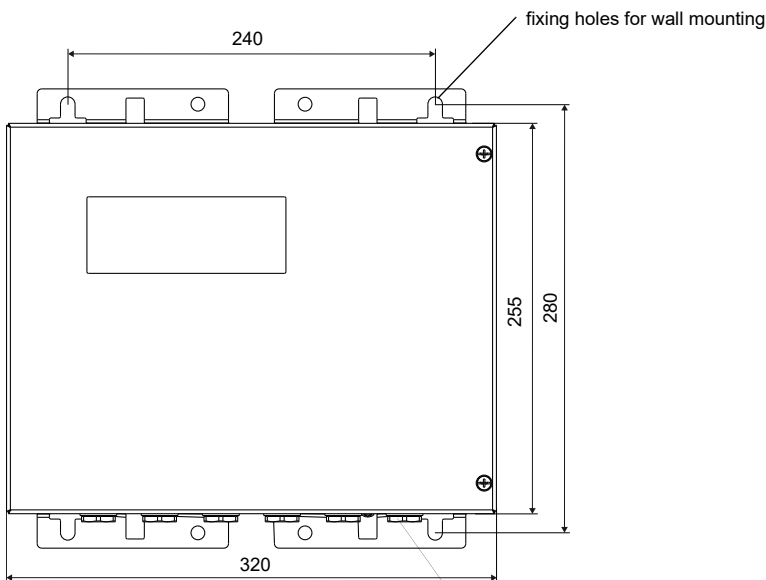
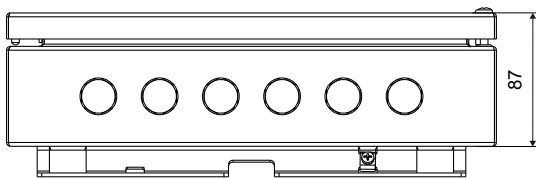
*72***_*****_A



thread: 6x M20 x 1.5
cable gland: max. 6x M20

in mm

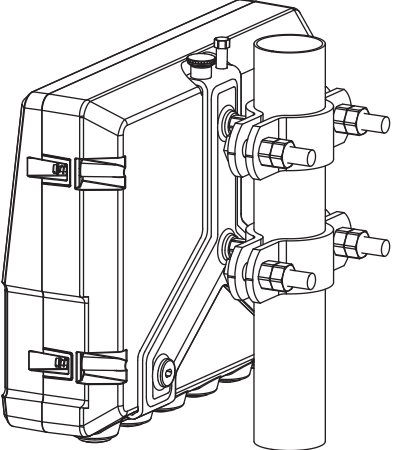
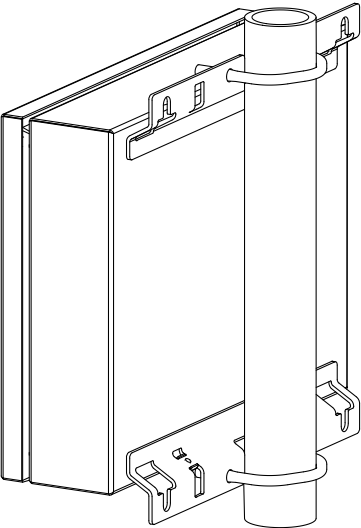
*72***_*****_S



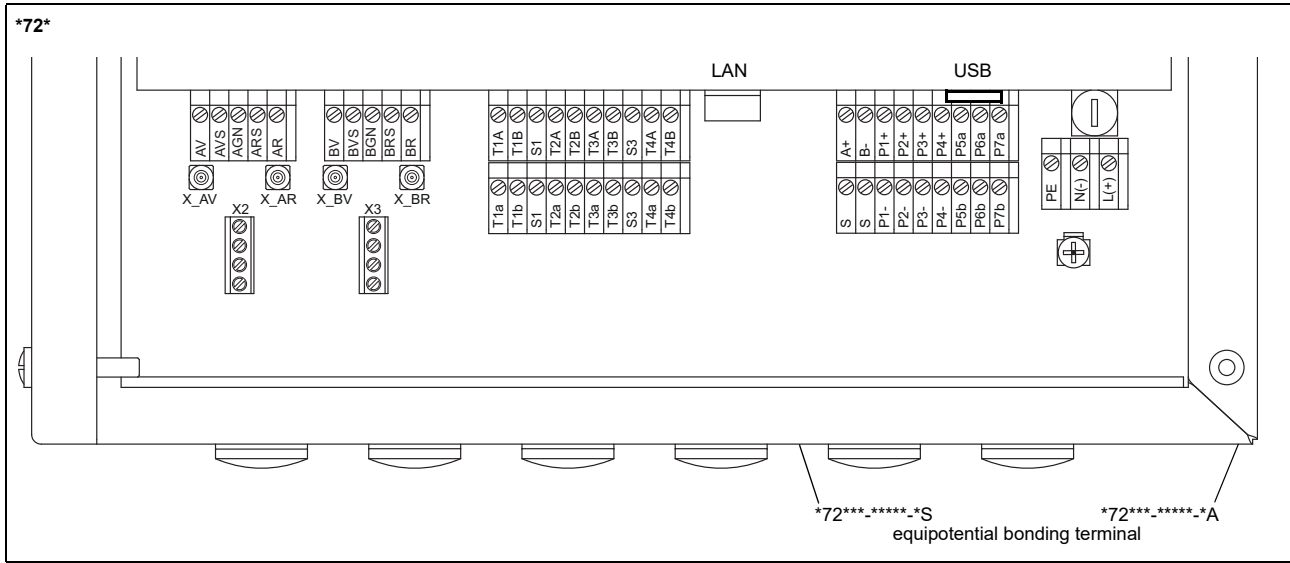
cable gland: max. 6x M20 with flat gasket and counter nut

in mm

2" pipe mounting kit

<p>*72***.*****-A</p> 	<p>item number: 721037-4</p>
<p>*72***.*****-S</p> 	<p>item number: 721110-4</p>

Terminal assignment



power supply¹

terminal	connection (AC)	connection (DC)
PE	protective earth	protective earth
N(-)	xxx	-
L(+)	outer conductor	+

transducers

extension cable				transducer cable			
measuring channel A		measuring channel B			measuring channel A	measuring channel B	
terminal	connection	terminal	connection	transducer	terminal	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				

outputs¹

terminal	connection	terminal	connection	communication interface
P1+...P4+ P1-...P4-	current output	A+	signal +	<ul style="list-style-type: none"> • RS485¹ • Modbus RTU¹ • BACnet MS/TP¹ • M-Bus¹ • Profibus PA¹ • FF H1¹
		B-	signal -	
P5a...P7a P5b...P7b	digital output	S	shield	
		USB	type B Hi-Speed USB 2.0 Device	<ul style="list-style-type: none"> • service (FluxDiag/FluxDiagReader)
		LAN	RJ45 10/100 Mbps Ethernet	<ul style="list-style-type: none"> • service (FluxDiag/FluxDiagReader) • Modbus TCP • BACnet IP

analog inputs^{1, 2}

terminal	temperature probe		passive sensor	active sensor
	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

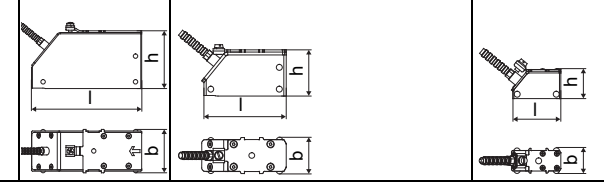

¹ cable (by customer):
 - e.g. flexible wires, with insulated wire ferrules, wire cross-section: 0.25...2.5 mm²
 - outer diameter of the cable (*72***.*****S with ferrite nut): max. 7.6 mm

² The number, type and terminal assignment are customised.

Transducers

Technical data

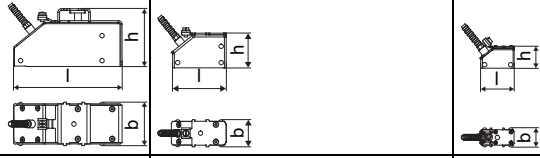
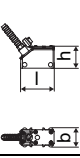

Lamb wave transducers

order code		GLK-N***-**TS	GLM-N***-**TS	GLP-N***-**TS	GLQ-N***-**TS
technical type		G(RT)K1N52	G(RT)M1N52	G(RT)P1N52	G(RT)Q1N52
transducer frequency	MHz	0.5	1	2	4
fluid pressure¹					
min. extended	bar	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 (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					
min. extended	mm	60	30	15	7
min. recommended	mm	80	40	20	10
max. recommended	mm	250	150	50	22
max. extended	mm	250	180	60	30
pipe wall thickness²					
min.	mm	5	2.5	1.2	0.6
max.	mm	10	5	3	1.2
material					
housing		PPSU with stainless steel cover 316L (1.4404)			
contact surface		PPSU			
degree of protection		IP66			
transducer cable					
type		1699			
length	m	5	4		3
dimensions					
length l	mm	128.5	74		42
width b	mm	51	32		22
height h	mm	67.5	40.5		25.5
dimensional drawing					
weight (without cable)	kg	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		GLK-NA2N-**TS	GLM-NA2N-**TS	GLP-NA2N-**TS	GLQ-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 IIIC T80 °C...T160 °C Db			
certification		IBExU10ATEX1163 X, IECEx IBE 12.0005X			
• FM					
order code		GLK-NF2N-**TS	GLM-NF2N-**TS	GLP-NF2N-**TS	GLQ-NF2N-**TS
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			

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

² typical values for steel, aluminum and titanium pipes, for other pipe materials please contact FLEXIM

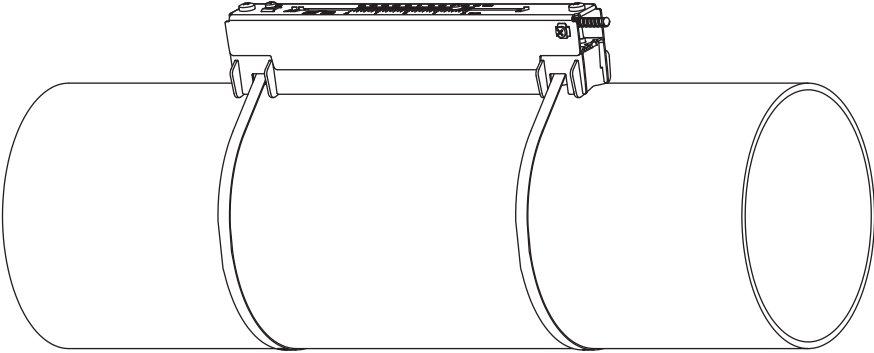
Shear wave transducers (optional)

order code		GSK-N***-**TS	GSM-N***-**TS	GSP-N***-**TS	GSQ-N***-**TS
technical type		G(DL)K1N52	G(DL)M2N52	G(DL)P2N52	G(DL)Q2N52
transducer frequency	MHz	0.5	1	2	4
fluid pressure¹					
min. extended	bar	metal pipe: 20			
min.	bar	metal pipe: 30, plastic pipe: 1			
inner pipe diameter d					
min. extended	mm	60	30	15	7
min. recommended	mm	80	40	20	10
max. recommended	mm	250	150	50	22
max. extended	mm	250	180	60	30
pipe wall thickness²					
min.	mm	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	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...+130			
ambient temperature	°C	-40...+130			
temperature compensation		x			
explosion protection					
• ATEX/IECEX					
order code		GSK-NA2N-**TS	GSM-NA2N-**TS	GSP-NA2N-**TS	GSQ-NA2N-**TS
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			
• FM					
order code		GSK-NF2N-**TS	GSM-NF2N-**TS	GSP-NF2N-**TS	GSQ-NF2N-**TS
pipe surface temperature (Ex)	°C	-40...+125	-40...+190		
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 depending on the application, typical absolute value for compressed air, nitrogen, argon

² typical values for steel, aluminum and titanium pipes, for other pipe materials please contact FLEXIM

Transducer mounting fixture

<p>Variofix L (VLK, VLM, VLQ)</p> 	<p>material: stainless steel 316Ti (1.4571), 316L (1.4404), 17-7PH (1.4568) inner length: VLK: 348 mm VLM: 234 mm VLQ: 176 mm dimensions: VLK: 423 x 90 x 93 mm VLM: 309 x 57 x 63 mm VLQ: 247 x 43 x 47 mm</p>
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Coupling materials for transducers

type	ambient temperature °C
coupling compound type N	-30...+130
coupling foil type VT	-10...+200

Damping mats (optional)

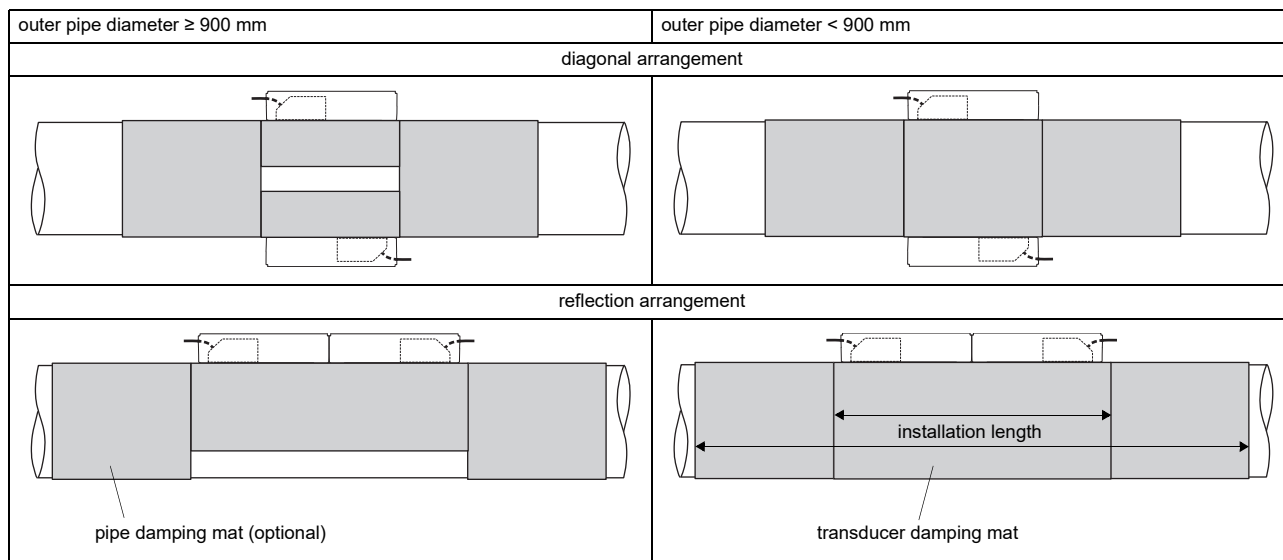
Damping mats will be used for the gas measurement to reduce acoustic noise influences on the measurement.

transducer damping mat

Transducer damping mats will be installed below the transducers.

pipe damping mat

Pipe damping mats will be installed if the sound propagation is disturbed at reflection points (e.g. flange, weld). Depending on the noise, the pipe damping mats will be installed at one or both sides of the transducer damping mat. If the local conditions are unknown, pipe damping mats should be installed.



Technical data

type		E30R4	E30R3
item number		992080-11	992080-10
width	mm	225	50
thickness	mm	0.7	
length (per roll)	m	10	
weight	kg/m ²	1.015	
ambient temperature	°C	-30...+80	
properties		self-adhesive	

Dimensioning

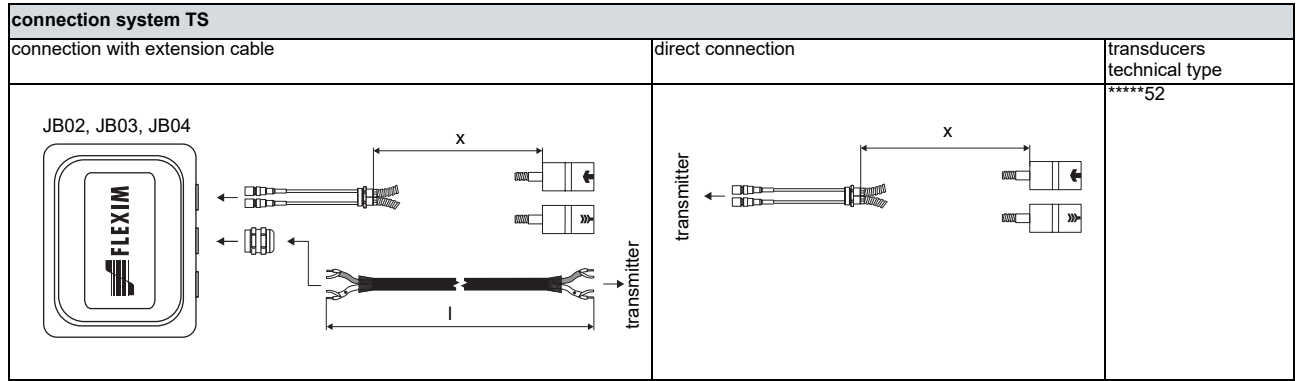
transducer		damping mat							
transducer mounting fixture	order code	type	number of layers	transducer damping mat			transducer damping mat + 2x pipe damping mat		
				max. installation length [mm]	number of rolls ¹		max. installation length [mm]	number of rolls ¹	
					standard ²	extended ²		standard	extended
VarioFix L									
VLK	GLK	E30R4	1	890	1	1	1830	2	2
	GSK		1		1	1		2	2
VLM	GLM	E30R3	1	660	1	1	1360	2	2
	GSM		1		1	1		2	2
	GLP		1		1	1		1	1
	GSP		1		1	1		1	1

¹ calculation on the base of:

max. installation length (installation of one transducer mounting fixture per transducer in reflection arrangement) and max. recommended pipe diameter (standard) or max. extended pipe diameter (extended)

² calculation of the number of rolls when both transducers are mounted in one transducer mounting fixture (reflection arrangement) or in diagonal arrangement: number of rolls/2 and round up to the nearest integer

Connection systems



Cable

transducer cable	
type	1699
weight	kg/m 0.094
ambient temperature	°C -55...+200
cable jacket	
material	PTFE
outer diameter	mm 2.9
thickness	mm 0.3
colour	brown
shield	x
sheath	
material	stainless steel 304 (1.4301)
outer diameter	mm 8

extension cable			
type		2615	5245
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

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)***5*	m	5	≤ 300	4	≤ 300	3	≤ 90	2	≤ 40
*(LT)***5*	m	9	≤ 300	9	≤ 300	9	≤ 90	-	≤ 40

x - transducer cable length

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

Junction box

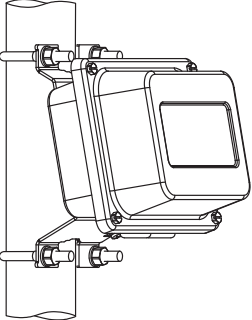
Technical data

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 marking	JB02 CE (Ex) II3G Ex nA IIC (T6)...T4 Gc II3D Ex tc III C T 100 °C Dc Ta -40...+(70)80 °C												
• FM													
junction box marking	JB04 NI/CI, I,II,III/Div. 2 / GP A,B,C,D,E,F,G/ T6 Ta = -40...+60 °C												
Connection													
Transducers													
	<table border="1"> <thead> <tr> <th>terminal</th> <th>connection</th> <th>transducer</th> </tr> </thead> <tbody> <tr> <td>XV</td> <td>SMB connector</td> <td>↑</td> </tr> <tr> <td>XR</td> <td>SMB connector</td> <td>↕</td> </tr> </tbody> </table>	terminal	connection	transducer	XV	SMB connector	↑	XR	SMB connector	↕			
terminal	connection	transducer											
XV	SMB connector	↑											
XR	SMB connector	↕											
Extension cable													
	<table border="1"> <thead> <tr> <th>terminal strip</th> <th>terminal</th> <th>connection</th> </tr> </thead> <tbody> <tr> <td rowspan="4">KL2</td> <td>TV</td> <td>signal</td> </tr> <tr> <td>TVS</td> <td>internal shield</td> </tr> <tr> <td>TRS</td> <td>internal shield</td> </tr> <tr> <td>TR</td> <td>signal</td> </tr> </tbody> </table>	terminal strip	terminal	connection	KL2	TV	signal	TVS	internal shield	TRS	internal shield	TR	signal
terminal strip	terminal	connection											
KL2	TV	signal											
	TVS	internal shield											
	TRS	internal shield											
	TR	signal											

Dimensions

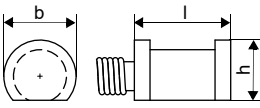
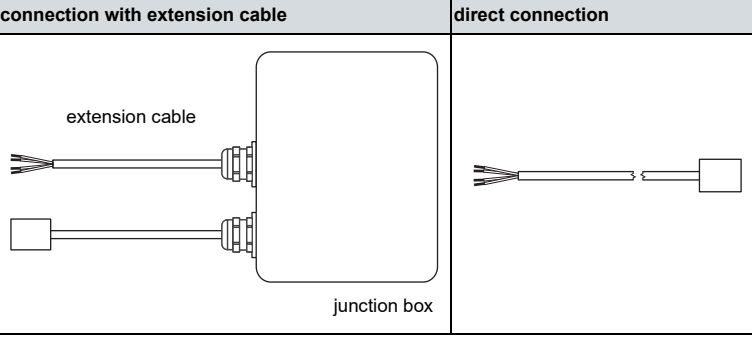
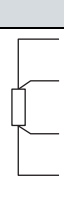
JB0*, JBP*	
<p>thread: 3x M20 x 1.5 cable gland: max. 2x M20</p>	
in mm	

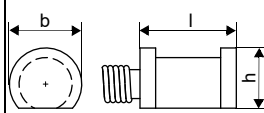

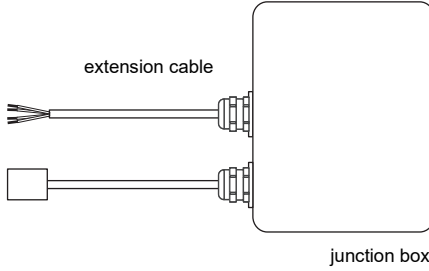
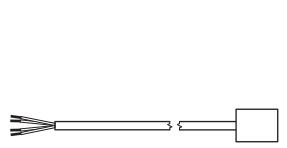
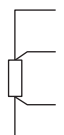
2" pipe mounting kit

<p>JB**</p> 	<p>item number: 751035-2</p>
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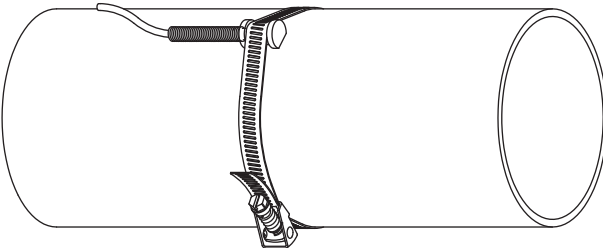
Clamp-on temperature probe (optional)

Technical data

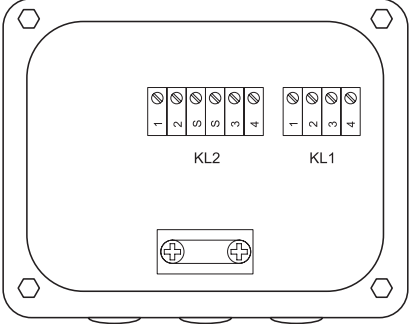
PT12N, PT12N-LC			
item number	PT12N: • 770415-1 • 770414-1 (matched) PT12N-LC: • 770415-4 • 770414-4 (matched)		
design	clamp-on option: with long cable		
type	Pt100		
connection	4-wire		
measuring range	°C -30...+250		
accuracy T	$\pm(0.15 \text{ °C} + 2 \cdot 10^{-3} \cdot T \text{ [°C]})$ class A		
accuracy ΔT (2x Pt matched according to EN 1434-1)	$\leq 0.1 \text{ K}$ ($3 \text{ K} < \Delta T < 6 \text{ K}$), more corresponding to EN 1434-1		
response time	s 50		
housing material	aluminum		
degree of protection	IP54		
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		
Connection system			
connection with extension cable	direct connection		
			
Connection			
	temperature probe		
	red		
	red/blue		
	white/blue		
	white		
Cable			
	PT12N	PT12N-LC	extension cable
type	4 x 0.22 mm ²		LIYCY 8 x 0.14 mm ² grey
standard length	m 3	15	5/10/25
max. length	m -		200
ambient temperature	°C -30...+250		-25...+80
min. bend radius	mm 27		68
cable jacket			
material	PFA		PVC
outer diameter	mm 3.8 ±0.15		4.8 ±2
colour	black		grey

PT12N		
item number		<ul style="list-style-type: none"> • 770415-1A2 • 770414-1A2 (matched)
design		clamp-on ATEX
type		Pt100
connection		4-wire
measuring range	°C	-30...+250
accuracy T		$\pm(0.15 \text{ °C} + 2 \cdot 10^{-3} \cdot T \text{ [°C]})$ class A
accuracy ΔT (2x Pt matched according to EN 1434-1)		$\leq 0.1 \text{ K}$ ($3 \text{ K} < \Delta T < 6 \text{ K}$), more corresponding to EN 1434-1
response time	s	50
housing material		aluminum
degree of protection		IP67
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		
• ATEX		
marking		 IIIG 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	
	white/blue	
Cable		
	temperature probe	extension cable
type	4 x 0.25 mm ²	LIYCY 8 x 0.14 mm ²
standard length	m	3
max. length	m	-
ambient temperature	°C	-30...+250
min. bend radius	mm	19
cable jacket		
material	PTFE	PVC
outer diameter	mm	3.8
colour	black	grey

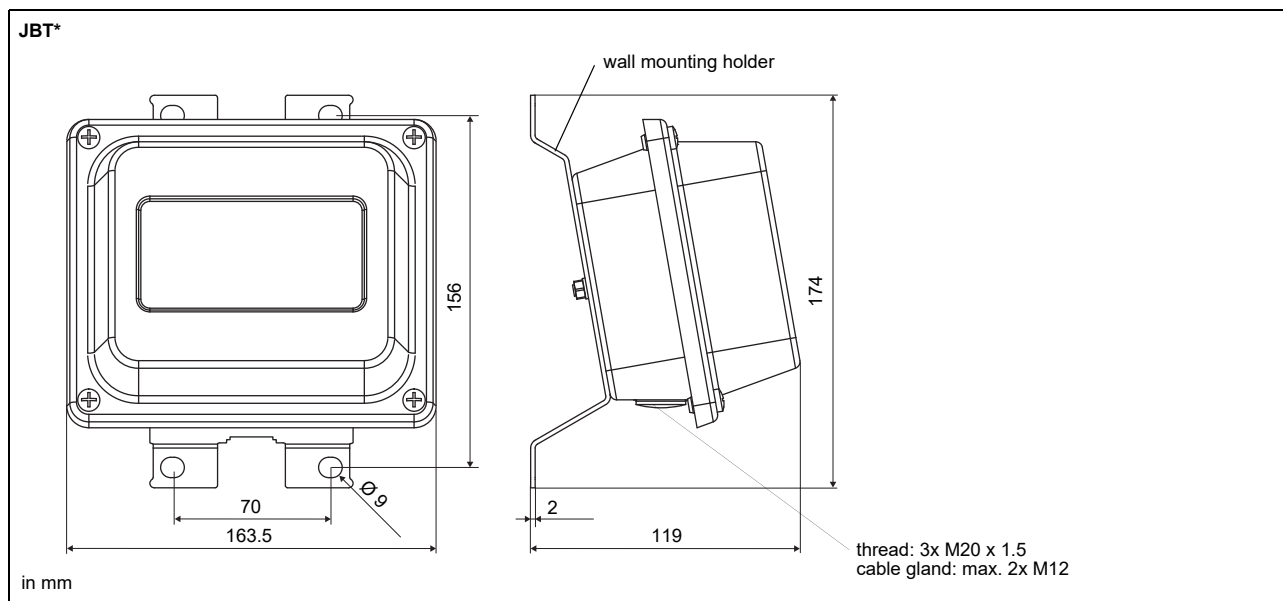
Fixation

tension strap PT12N	
	material: stainless steel 301 (1.4310), 410 (1.4006) thermal insulation necessary

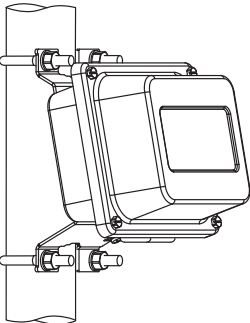
Junction box

JBT2, JBT3																									
item number	<ul style="list-style-type: none"> JBT2: 770428-5A2 JBT3: 751040-36 																								
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 marking	JBT2																								
marking	CE (Ex) II3G Ex nA IIC T6...T4 Gc II3D Ex tc IIIC T 100 °C Dc Ta -40...+70/80 °C																								
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Connection</p>  </div> <div style="width: 45%;"> <p>Temperature probe</p> <table border="1"> <thead> <tr> <th>terminal strip</th> <th>terminal</th> <th>connection</th> </tr> </thead> <tbody> <tr> <td rowspan="4">KL1</td> <td>1</td> <td>red</td> </tr> <tr> <td>2</td> <td>red/blue</td> </tr> <tr> <td>3</td> <td>white</td> </tr> <tr> <td>4</td> <td>white/blue</td> </tr> </tbody> </table> <p>Extension cable</p> <table border="1"> <thead> <tr> <th>terminal strip</th> <th>terminal</th> <th>connection</th> </tr> </thead> <tbody> <tr> <td rowspan="4">KL2</td> <td>1</td> <td>red</td> </tr> <tr> <td>2</td> <td>grey</td> </tr> <tr> <td>3</td> <td>white</td> </tr> <tr> <td>4</td> <td>blue</td> </tr> </tbody> </table> </div> </div>		terminal strip	terminal	connection	KL1	1	red	2	red/blue	3	white	4	white/blue	terminal strip	terminal	connection	KL2	1	red	2	grey	3	white	4	blue
terminal strip	terminal	connection																							
KL1	1	red																							
	2	red/blue																							
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terminal strip	terminal	connection																							
KL2	1	red																							
	2	grey																							
	3	white																							
	4	blue																							

Dimensions



2" pipe mounting kit

<p>JB**</p> 	<p>item number: 751035-2</p>
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Pressure transmitter (optional)

Technical data

Nöding P 121	
connection	2-wire
measuring range	bar (a) 0...16
fluid pressure	bar (a) -1...40
accuracy	≤ ±0.2 % FS ≥ 0.1 bar at 25 °C
temperature coefficient	≤ ±0.015 % FS/K (zero) ≤ ±0.01 % FS/K (span)
long term stability	≤ ±0.15 % per year
response time	ms 200 (T ₉₀)
power supply	V DC 9...30
ambient temperature	°C -25...+80
fluid temperature	°C -40...+100 max. 125 (< 0.5 h)
material	
housing	stainless steel 316L (1.4404)
measuring cell	Al ₂ O ₃
process connection	stainless steel 316L (1.4404)
process gasket	FPM
degree of protection	IP65
weight (without connector)	kg 0.236
current output	mA 4...20
Dimensions	
<p>in mm</p>	
Connection	
connector	
pin	
1(+)	
2(-)	
Cable	
8038	
type	2 x 0.5 mm ²
standard length	m 5 15
weight	kg/m 0.045
ambient temperature	°C -40...+80
bend radius	mm min. 29
properties	self-extinguishing, flame retardant according to IEC 60332-1
cable jacket	
material	PVC
outer diameter	mm 5.7
colour	grey
shield	x

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