

Ultrasonic Measurement of Water Flow

Permanently installed ultrasonic clamp-on system for flow measurement of water

Features

- Non-intrusive flow measurement with high measuring accuracy for stationary use
- Precise bi-directional, highly dynamic flow measurement
- Water-tight transducers (IP67) are characterised by their high robustness
- Simple retrofitting of measurements in existing networks and systems without interrupting the supply or the need for pipe work
- For inner pipe diameters of 10...3100 mm
- High measuring accuracy, even at low flow velocities
- Cost-efficient for large rated diameters
- Installation and commissioning can be carried out during operation
- Digital signal processor (DSP) and signal processing ensure stable and reliable results even under difficult measurement conditions
- User-friendly menu navigation - the firmware is specifically adapted to the needs of the water industry

Applications

- Water and wastewater industry
- Clean measurement process for drinking water systems
- Leakage detection
- Hydroelectric power plants (reservoirs)
- Reservoirs



FLUXUS F501



Flow transducers in transducer shoe, mounted with tension strap

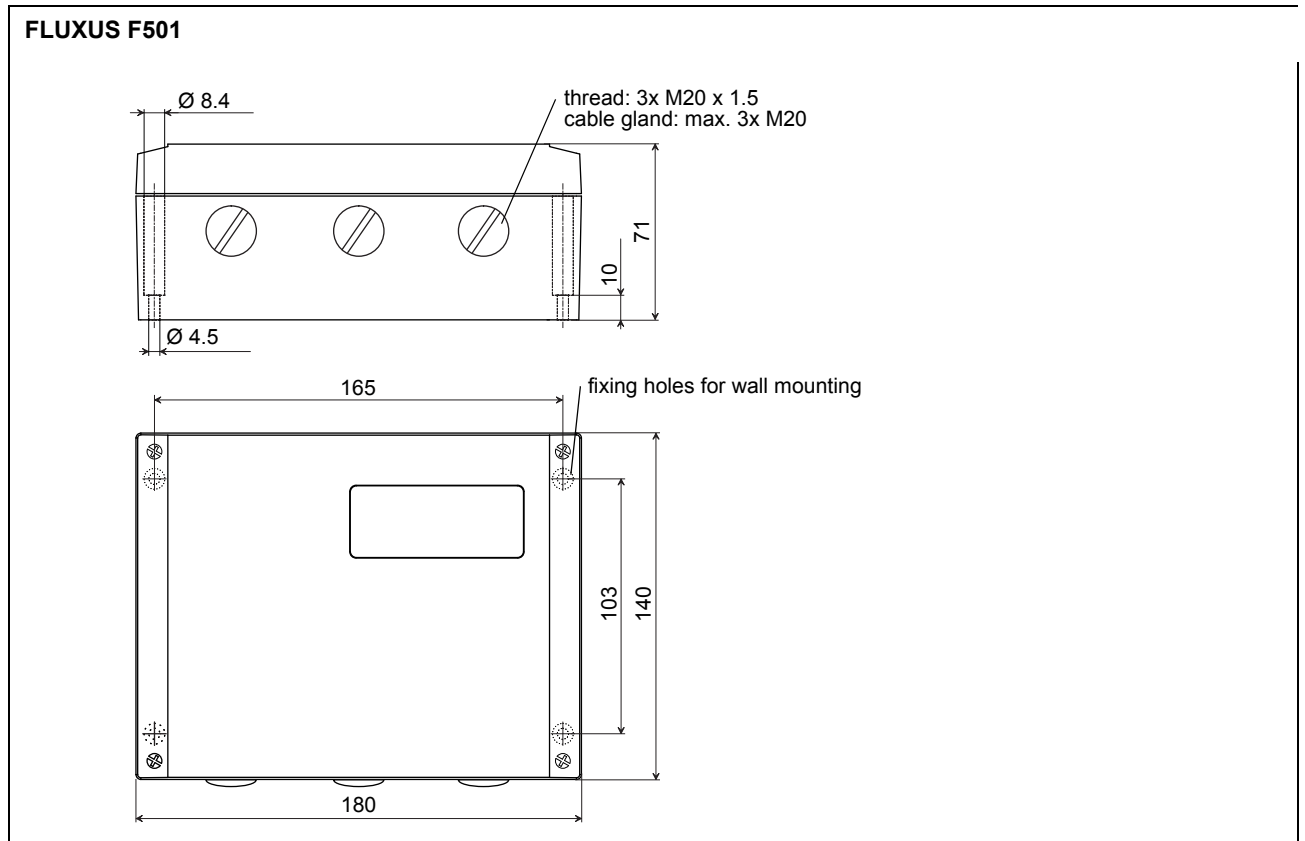
Flow Transmitter

Technical Data

FLUXUS	F501MQ F501PK
design	field device with 1 measuring channel
transducers	F501MQ: M5L7, P5L7, Q5L7 F501PK: K5L7, M5L7, P5L7
measurement	
measurement principle	transit time difference correlation principle
flow velocity	0.01...25 m/s
repeatability	0.25 % of reading ± 0.01 m/s
medium	water and acoustically similar liquids with < 6 % gaseous or solid content by volume
accuracy ¹ - volumetric flow rate	± 2 % of reading ± 0.01 m/s
flow transmitter	
power supply	100...240 V/50...60 Hz or 20...32 V DC 11...16 V DC
power consumption	< 10 W
number of flow measuring channels	1
damping	0...100 s, adjustable
measuring cycle (1 channel)	10 Hz
response time	1 s
housing material	aluminum, powder coated
degree of protection according to IEC/EN 60529	IP66
dimensions	see dimensional drawing
weight	1.5 kg
fixation	wall mounting, optional: 2 " pipe mounting
ambient temperature	-10...+60 °C
display	2 x 16 characters, dot matrix, backlight
menu language	English, German, French, Dutch, Spanish
measuring functions	
physical quantities	volumetric flow rate, mass flow rate, flow velocity
totalizer	volume, mass
communication	
interface	optional: RS485 (emitter) or Modbus RTU or BACnet MS/TP
outputs (optional)	
	The outputs are galvanically isolated from the transmitter.
current output	
number	1
range	0/4...20 mA
accuracy	0.1 % of reading ± 15 μ A
active output	$R_{ext} < 500 \Omega$
binary output	
number	2
optorelay	28 V/100 mA
binary output as alarm output - functions	limit, change of flow direction or error
binary output as pulse output - pulse value - pulse width	0.01...1000 units 80...1000 ms

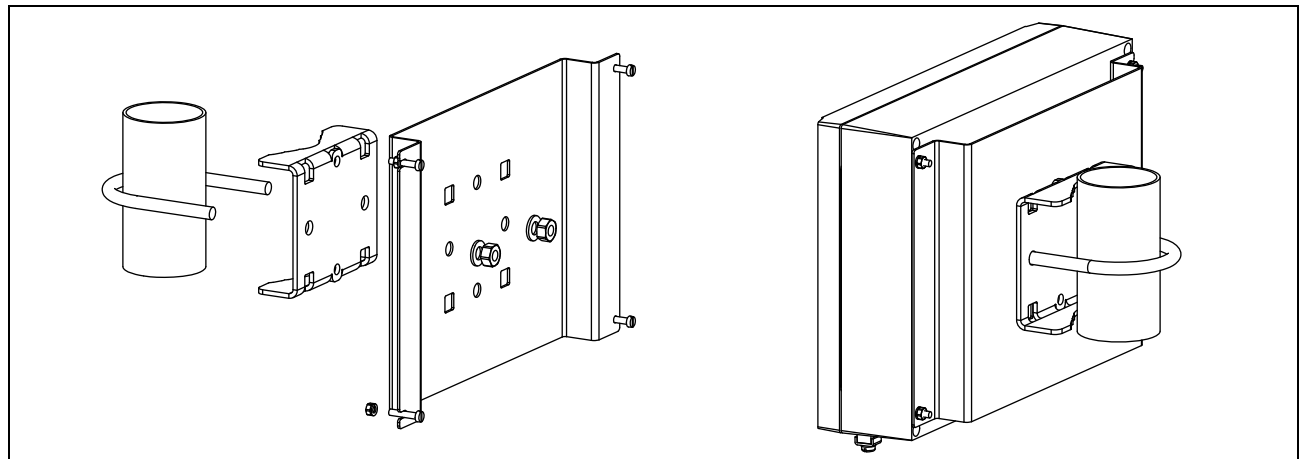
¹ for reference conditions and $v > 0.25$ m/s

Dimensions



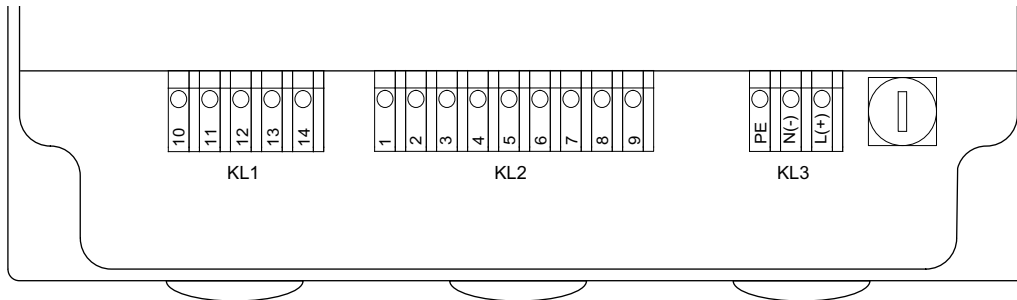
in mm

2 " Pipe Mounting Kit (optional)



Terminal Assignment

FLUXUS F501



power supply

terminal strip KL3

terminal	connection (AC)	connection (DC)
PE	earth	earth
N(-)	neutral	-
L(+)	phase	+

transducers

terminal strip KL1

extension cable, transducer cable	
measuring channel A	
terminal	connection
10	transducer ↗, signal
11	transducer ↗, internal shield
13	transducer ↘, internal shield
14	transducer ↘, signal
cable gland	external shield

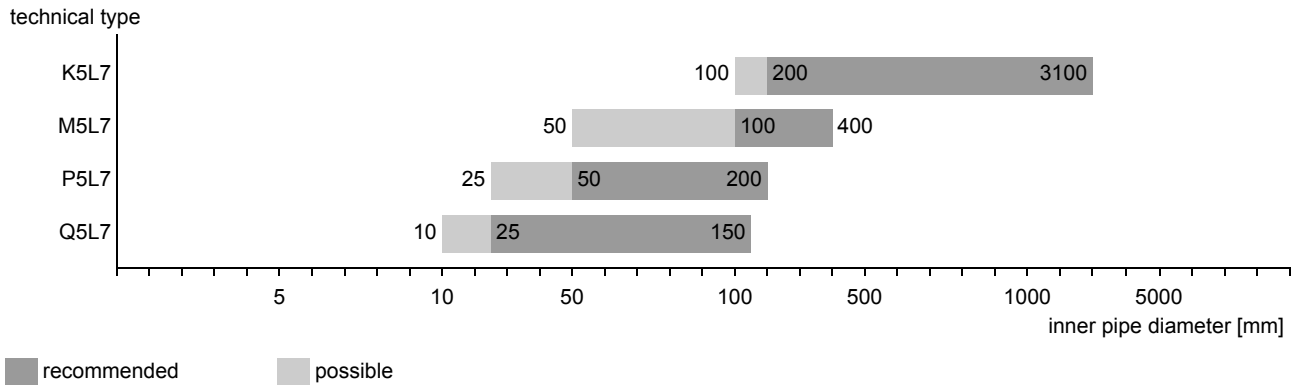
outputs

terminal strip KL2

terminal	connection
1(-), 2(+)	binary output B1
3(-), 4(+)	binary output B2
5(-), 6(+)	current output I1
7(-), 8(+), 9 (shield)	RS485 (optional)

Transducers

Transducer Selection

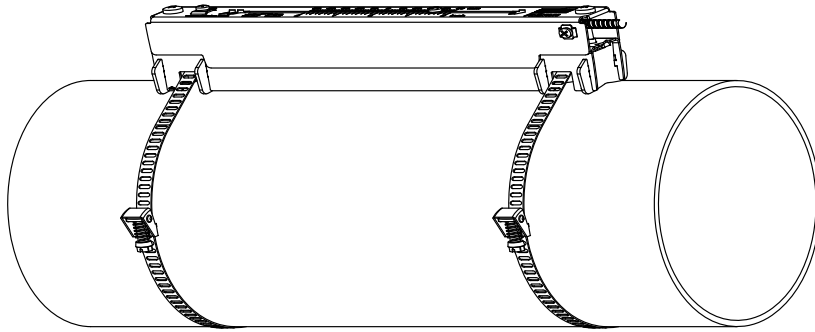


Technical Data

technical type		K5L7	M5L7	P5L7	Q5L7
transducer frequency	MHz	0.5	1	2	4
inner pipe diameter d					
min. extended	mm	100	50	25	10
min. recommended	mm	200	100	50	25
max.	mm	3100	400	200	150
material					
housing		PEEK with stainless steel cap 316Ti (1.4571)	PEEK with stainless steel cap 316Ti (1.4571)	PEEK with stainless steel cap 316Ti (1.4571)	PEEK with stainless steel cap 316Ti (1.4571)
contact surface		PEEK	PEEK	PEEK	PEEK
degree of protection according to IEC/EN 60529		IP67	IP67	IP67	IP67
transducer cable					
type	m	2606	2606	2606	2606
length	m	10	10	10	10
dimensions					
length l	mm	126.5	59	59	36
width b	mm	51	28	28	18
height h	mm	67.5	31	31	21
dimensional drawing					
ambient temperature					
min.	°C	-40	-40	-40	-40
max.	°C	+100	+100	+100	+100

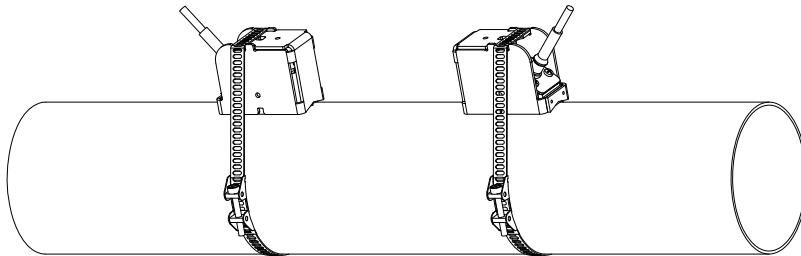
Transducer Mounting Fixture

Variofix L (VLK)



material: 316 (1.4571), 316L (1.4404), 17-7PH (1.4568)
 inner length:
VLK: 348 mm
 dimensions:
VLK: 423 x 90 x 93 mm

tension straps, clasps and transducer shoes



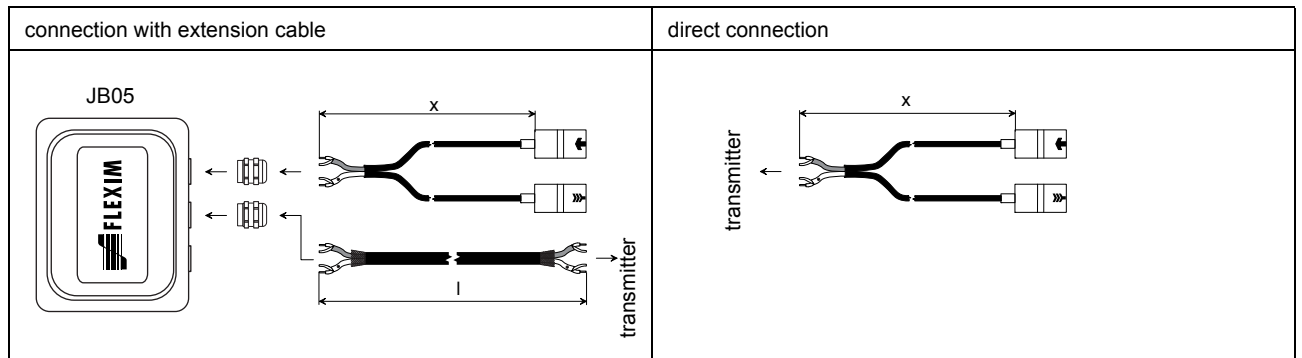
material: stainless steel 304 (1.4301), 303 (1.4305)
 tension strap length: 10 m

Coupling Materials for Transducers

Technical Data

type	order code	ambient temperature °C	material	transducer
coupling compound type N	990739-1	-30...+130	mineral grease paste	K5L7, M5L7, P5L7, Q5L7
coupling foil type VT	990739-0	-10...+200	fluoroelastomer	K5L7
	990739-6			M5L7, P5L7
	990739-5			Q5L7

Connection Systems



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

Transducer Cable

Technical Data

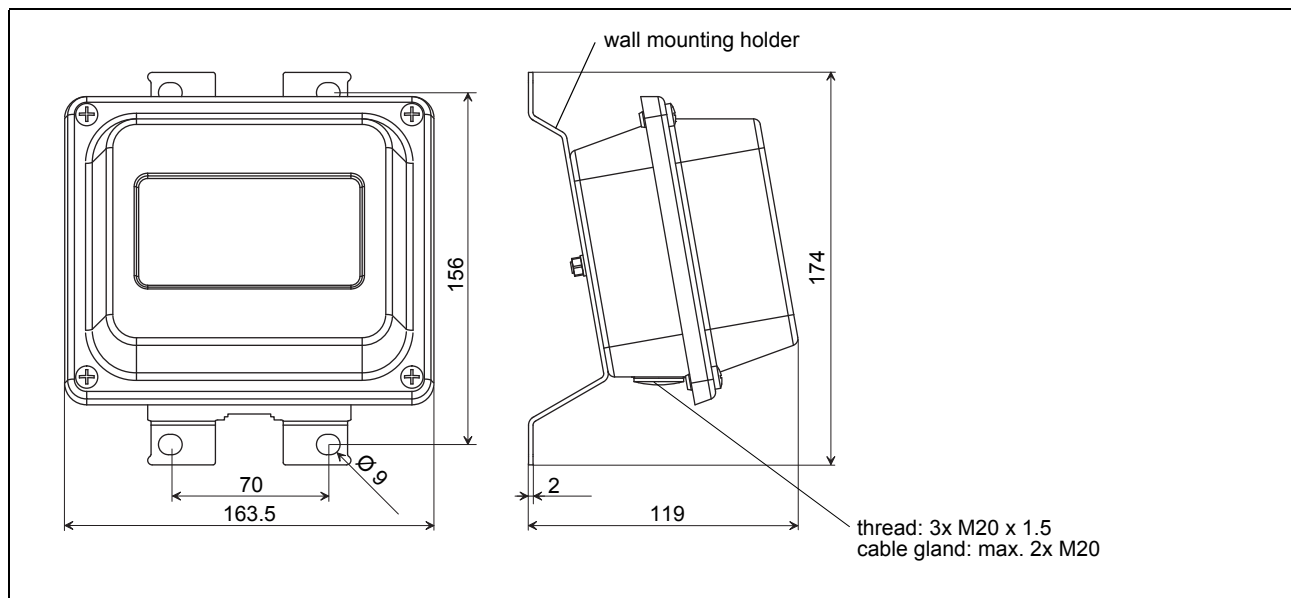
		transducer cable		extension cable	
type		2606	2552	2615	
standard length x	m	10	-	-	
max. length l	m	-	K5L7, M5L7, P5L7: 300 Q5L7: 90		
ambient temperature	°C	-40...+100	-25...+80	-40...+70	
properties				halogen free fire propagation test according to IEC 60332-1 combustion test according to IEC 60754-2	
cable jacket					
material		PUR	TPV	PUR	
outer diameter	mm	5	12	12	
thickness	mm			2	
colour		grey	black	black	
shield		x	x	x	

Junction Box

Technical Data

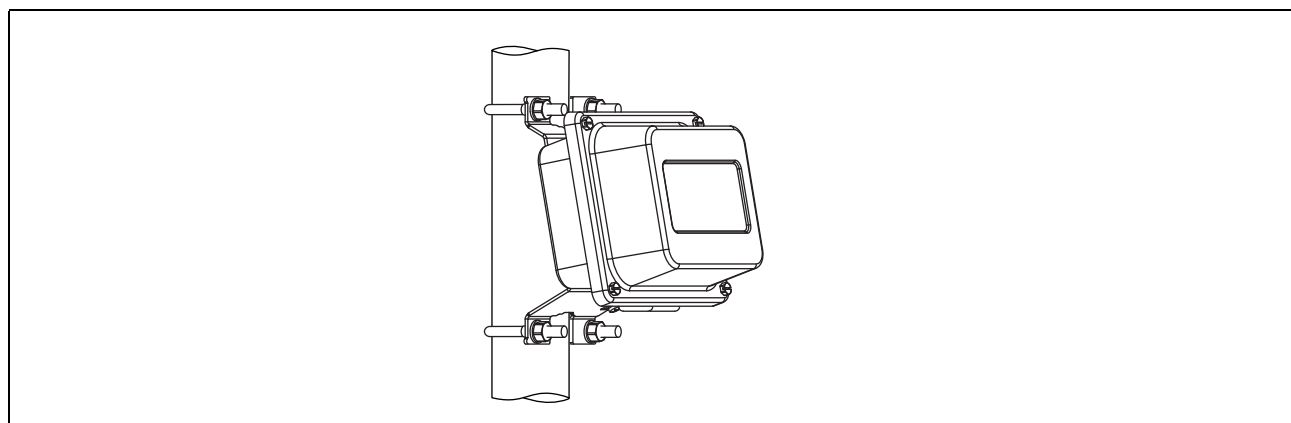
technical type	JB05	
dimensions	see dimensional drawing	
fixation	wall mounting, optional: 2 " pipe mounting	
material		
housing	stainless steel 304 (1.4301)	
gasket	silicone	
degree of protection according to IEC/ EN 60529	IP67	
ambient temperature		
min.	°C	-40
max.	°C	+80

Dimensions



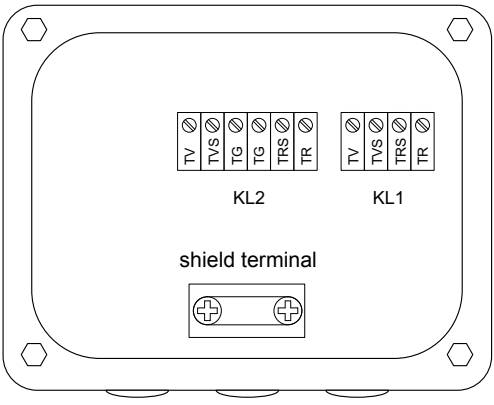
in mm

2 " Pipe Mounting Kit (optional)



Terminal Assignment

JB05



transducers

terminal strip KL1

terminal	connection
TV	transducer ↗, signal
TVS	transducer ↗, internal shield
TRS	transducer ↘, internal shield
TR	transducer ↘, signal
cable gland	external shield

extension cable

terminal strip KL2

terminal	connection
TV	signal
TVS	internal shield
TRS	internal shield
TR	signal
shield terminal	external shield



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