

**Clamp-On Ultrasonic Flow Transmitter**

- Flow transmitter with one measurement channel, backlit LCD display and 5-key keypad
- For commonly used pipe materials and diameters from 10 mm up to 3.0 m
- Ideal solution for large scale projects, configuration can be changed to suit requirements
- Transit-time correlation measurement using dual DSP-technology for better measurement accuracy
- Simple to install, operate and maintain
- AC, DC and solar panel power supply

**Features**

- Sturdy aluminium transmitter enclosure configurable with or without display and keypad
- Cost-effective solution for large-scale projects with wall or pipe mounted transmitter
- Blind transmitters supplied pre-configured or with external programming tool for convenient and quick setup
- Bi-directional measurement with totalizer function
- Available to with "P"-type transducers for more price sensitive applications
- Flowmeter has flexible input / output capabilities including analogue and digital outputs as well as serial communication options including Modbus RTU and HART\*
- AC, DC, battery and solar panel power supply options available

**Description**

The KATflow clamp-on ultrasonic flow meters work on the transit-time method. This is based on the principle that sound waves travelling with the flow will move faster than those travelling against it. The resulting difference in transit time is directly proportional to the flow velocity of the liquid and consequently to the volumetric flow rate.

The ultrasonic transducers (sensors) of the flow meter are mounted on the external surface of the pipe and are used to generate and receive pulses. The flowing liquid within causes time differences in the ultrasonic signals, which are evaluated by the flow meter to produce an accurate flow measurement. The advanced electronics of the flow meter compensate for and adapt to changes in the flow profile and medium temperature to deliver reliable measurements.

The KATflow 100 is a fixed-installation clamp-on ultrasonic flow transmitter for non-invasive and non-intrusive flow measurement of liquids and liquefied gases in fully filled pipes. It is supplied with a standard specification of a display, simple keypad and four input / output slots. Other configuration options such as a blind transmitter enclosure are available upon request for specific applications.

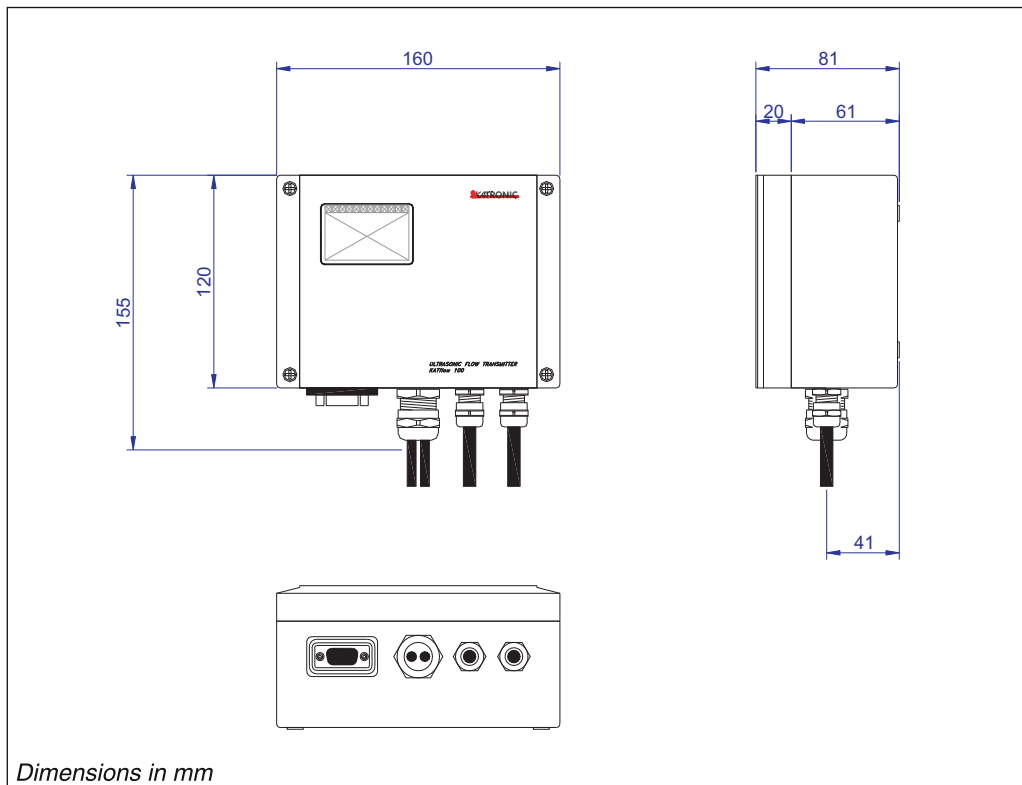
Thanks to the intuitive programming soft-ware, Setup Wizard, and *Audible Sensor Positioning Assistant*™ the flow transmitter can be set up and its sensors correctly installed in a matter of minutes.

## Specification: Transmitter

<b>Performance</b>	Measurement principle	:	Ultrasonic transit-time difference correlation
	Flow velocity range	:	0.01 ... 25 m/s
	Resolution	:	0.25 mm/s
	Repeatability	:	0.15 % of measured value, $\pm 0.015$ m/s
	Accuracy	:	<i>Volume flow</i> $\pm 1 \dots 3$ % of measured value depending on application $\pm 0.5$ % of measured value with process calibration <i>Flow velocity (mean)</i> $\pm 0.5$ % of measured value
	Turn down ratio	:	1/100
	Measurement rate:	:	1 Hz as standard, higher rates on application
	Response time	:	1 s, 70 ms (optional)
	Damping of displayed value	:	0 ... 99 s (selectable by user)
	Gaseous and solid content of liquid media	:	< 10 % of volume

<b>General</b>	Enclosure type	:	Wall mounted, optional pipe stands and brackets available
	Degree of protection	:	IP 66 according to EN 60529
	Operating temperature	:	-10 ... 60 °C (14 ... 140 °F)
	Housing material	:	Die-cast aluminium
	Measurement channels	:	1
	Calculation functions	:	None
	Power supply	:	100 ... 240 V AC 50/60 Hz 9 ... 36 V DC Special solutions (e.g. solar panel, battery) upon request
	Display	:	LCD graphic display, 128 x 64 dots, backlit (optional)
	Dimensions	:	120 (h) x 160 (w) x 81 (d) mm (without cable glands)
	Weight	:	Approx. 750 g
	Power consumption	:	< 5 W
Operating languages	:	English, German, French, Spanish, Russian	

## Drawings



## Specification: Transmitter (continued)

### Images



KATflow 100 with display



KATflow 100 without display and setup tool

<b>Communication</b>	Type	:	RS 232 (used for external programming and data transfer), USB cable (optional), RS 485 or Modbus RTU (optional)
	Transmitted data	:	Measured and totalized value, parameter set and configuration, logged data
<b>KATdata+ software</b>	Functionality	:	Online transfer of measured data
	Operating systems	:	Windows 7, Vista, XP, NT, 2000 Linux Mac (optional)
<b>Quantity &amp; units of measurement</b>	Volumetric flow rate	:	m <sup>3</sup> /h, m <sup>3</sup> /min, m <sup>3</sup> /s, l/h, l/min, l/s, USgal/h (US gallons per hour), USgal/min, USgal/s, bbl/d (barrels per day), bbl/h, bbl/min
	Flow velocity	:	m/s, ft/s, inch/s
	Mass flow rate	:	g/s, t/h, kg/h, kg/min
	Volume	:	m <sup>3</sup> , l, gal (US gallons), bbl
	Mass	:	g, kg, t
	Heat flow	:	W, kW, MW (only with heat quantity measurement option)
	Heat quantity	:	J, kJ, MJ (only with heat quantity measurement option)
	Temperature	:	°C (only with heat quantity measurement option)

## Specification: Transducers

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<b>K1P, K1L</b>	Pipe diameter range	:	50 ... 3000 mm for type K1P 50 ... 3000 mm for type K1L
	Dimensions of sensor heads	:	60 (h) x 30 (w) x 34 (d) mm
	Material of sensor heads	:	<i>Type K1P:</i> Plastic <i>Type K1L:</i> Stainless steel
	Material of cable conduits	:	<i>Type K1P/L:</i> PVC
	Temperature range	:	<i>Type K1P:</i> -20 ... 50 °C (-4 ... 122 °F) <i>Type K1L:</i> -30 ... 80 °C (-22 ... 176 °F)
	Degree of protection	:	IP 66 acc. EN 60529, (IP 67 and IP 68 upon request)
	Standard cable lengths	:	<i>Type K1P:</i> 5.0 m <i>Type K1L:</i> 5.0 m

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<b>K4P, K4L</b>	Pipe diameter range	:	10 ... 250 mm for type K4P 10 ... 250 mm for type K4L
	Dimensions of sensor heads	:	43 (h) x 18 (w) x 22 (d) mm
	Material of sensor heads	:	<i>Type K4P:</i> Plastic <i>Type K1L:</i> Stainless steel
	Material of cable conduits	:	<i>Type K4P/L:</i> PVC
	Temperature range	:	<i>Type K4P:</i> -20 ... 50 °C (-4 ... 122 °F) <i>Type K4N:</i> -30 ... 80 °C (-22 ... 176 °F)
	Degree of protection	:	IP 66 acc. EN 60529, (IP 67 and IP 68 upon request)
	Standard cable lengths	:	<i>Type K4P:</i> 5.0 m <i>Type K4L:</i> 5.0 m

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<b>Extension cable</b>	Available lengths	:	5.0 ... 100 m
	Cable type	:	Coaxial
	Material cable jacket	:	TPE
	Operating temperature	:	-40 ... 80 °C (-40 ... 176 °F)
	Min. bend radius	:	67 mm

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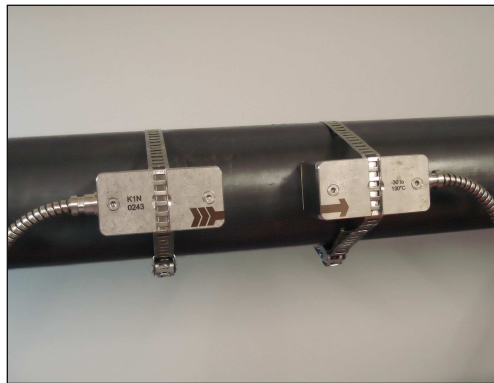
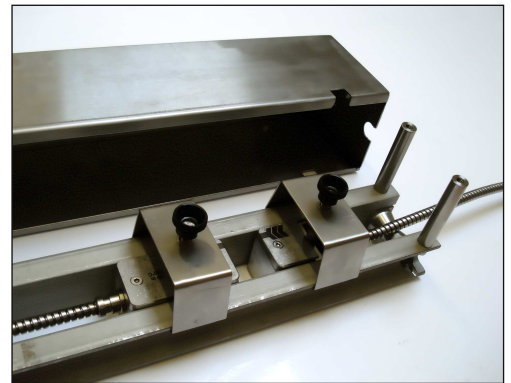
<b>Cable connection</b>	Connection types	:	Junction box
	Termination into transmitter	:	Direct cable connection (terminal block)

**Specification: Transducer mounting accessories**

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<b>General</b>	Diameter range and mounting types	:	<i>Clamping set (metal collar with screw), stainless steel DN 10 ... DN 40 Metallic straps and clamps DN 15 ... DN 310 Metallic straps and clamps DN 25 ... DN 3000 Metallic mounting rail and straps (available upon request) DN 50 ... DN 250 Metallic mounting rail and straps (available upon request) DN 50 ... DN 250 or DN 50 ... DN 3000</i>
	Mounting fixture for flexible hoses	:	<i>Custom made mounting bracket, stainless steel (available upon request)</i>

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**Images***Transducers mounted using strap and clamps**Metallic mounting rail with cover (example)*

## Configuration code: Transmitter and accessories

KF100	Ultrasonic flow transmitter KATflow 100, one measurement channel, serial interface RS 232, operating instructions
<b>Configuration</b>	
2	With LCD graphic display, 128 x 64 dots, backlit and 5-key keypad
Internal code	
03	Internal code
<b>Power supply</b>	
1	100 ... 240 V AC, 50/60 Hz
2	9 ... 36 V DC
Z	Special (please specify)
<b>Enclosure type</b>	
1	Die-cast aluminium, wall mounted, IP 66
Z	Special (please specify)
<b>Communication</b>	
0	Without
1	RS 485 serial interface
2	Modbus RTU protocol
Z	Special (please specify)
<b>Process inputs/outputs (select a maximum of 4 slots)</b>	
N	Without
C	Current output, 0/4 ... 20 mA, active (source)
P	Current output, 0/4 ... 20 mA, passive (sink)
D	Digital output, Open-Collector
R	Digital output, relay
H	HART* output, 0/4 ... 20 mA
V	Voltage output, 0 ... 10 V
F	Frequency output, 0 ... 10 kHz
<b>Optional items</b>	
Without (leave space blank)	
PS	2" pipe stand
PM	Pipe mounting bracket, diameter to be specified
HP	Hand-held programmer

KF100 - 2 - 03-1 - 1 - 0 - C /   (example configuration)

The configuration is customised by choosing from the above-listed options and is expressed by the resulting code at the bottom of the table.

## Configuration code: Transducers and accessories

### Pipe size and temperature range

- K4L Transducer pair, pipe diameter range 10 ... 250 mm, process temperature -30 ... 80 °C, including acoustic coupling past
- K1P Transducer pair, pipe diameter range 50 ... 500 mm, process temperature -20 ... 50 °C, including acoustic coupling paste
- K1L Transducer pair, pipe diameter range 10 ... 3,000 mm, process temperature -30 ... 80 °C, including acoustic coupling paste
- Z Special (please consult factory)

### Internal code

00 Internal code

### Degree of protection

- 1 IP 66 (standard)
- 2 IP 67 (please consult factory)
- 3 IP 68 (please consult factory)
- Z Special (please specify)

### Transducer mounting accessories

- 0 Without
- 3 Clamping set DN 10 ... 40
- 4 Metallic straps and clamps DN 15 ... 310
- 5 Metallic straps and clamps DN 25 ... 3000
- 7 Metallic mounting rail and straps DN 50 ... 250 (transducer type K4)
- 8 Metallic mounting rail and straps DN 50 ... 3000 (transducer type K1)
- Z Special (please consult factory)

### Stainless steel tag

- 0 Without
- 1 With stainless steel tag (please specify text to be engraved)

### Transducer connection type and extension cable length

- O Without connector or junction box (transducer type L or P)
  - C 000 Wired transducer connection to flowmeter
- J Extension via junction box (transducer type L or P)
  - C 005 With extension cable, 5 m length
  - C 010 With extension cable, 10 m length
  - C \_\_\_ With extension cable, (specify length in m)
- Z Special (please specify)

### Optional items

- Without (leave space blank)
- CA 5-point calibration with certificate

K1 L - 1 - 1 - 5 - 0 - J - C 010 /   (example configuration)

The configuration is customised by selecting the above-listed options and is expressed by the resulting code at the bottom of the table.