KATflow 200

Hand-Held Clamp-On Ultrasonic Flowmeter

- **Lightweight and robust hand-held flow meter with one measurement channel and graphic LCD display**
- **For commonly used pipe materials and diameters from 10 mm to over 3.0 m**
- **Intuitive menu, Setup Wizard and *Audible Sensor Positioning Assistant* ™ for easy and quick setup and installation**
- **Transit-time correlation measurement using dual DSP-technology for better measurement accuracy**
- **Data logger for up to 100,000 measurements and PC download software**
- **Optional wall thickness gauge**

Features

- Lightweight (< 700 g), compact and robust enclosure with added rubber shock protector
- Powered up to 24 hours by internal batteries or by mains power for unlimited period of time
- Auto-detected ultrasonic clamp-on sensors and optional dedicated wall thickness gauge
- Graphic LCD display, meter diagnostic functions and site parameter storage capability
- Available with crush-proof IP 67 case or lightweight soft case holding all necessary accessories including clamp-on chains, clips and acoustic coupling paste
- KATdata+ software for online/offline data transfer to PC via RS 232 or USB cable
- Mains and internal battery power supply, optional external battery pack available for long-term measurements (up to 21 days)
- Bi-directional measurement with totalizer function

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.

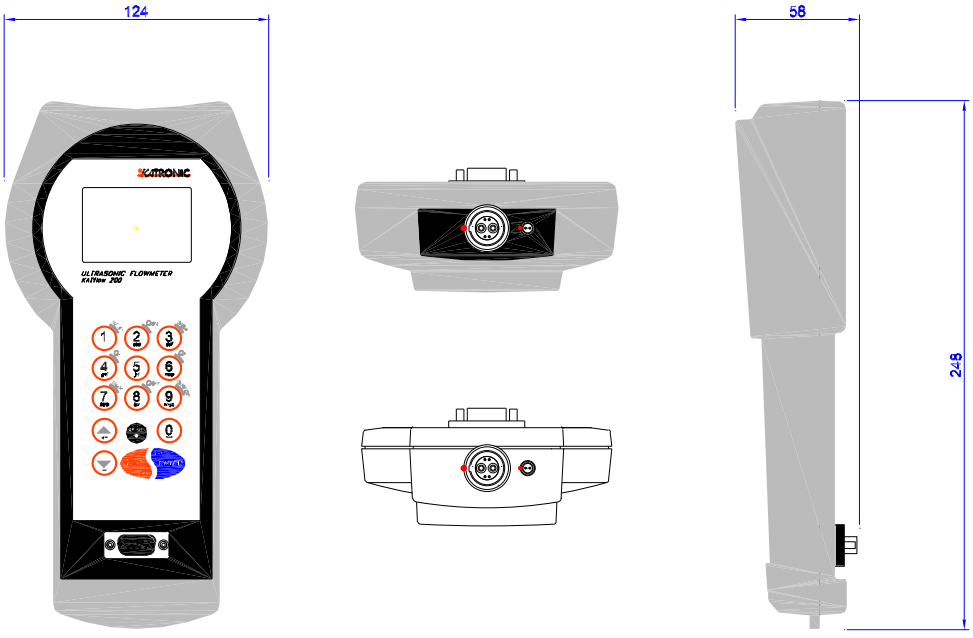
The KATflow 200 is a hand-held ultrasonic flow meter for non-invasive and non-intrusive flow measurement of liquids and liquefied gases in fully filled pipes. The flow meter is equipped with one measurement channel to monitor the flow in one single pipe at a time. The instrument is supplied with an internal datalogger and software for the recording and download of measured values. Additionally, the KATflow 200 can be equipped with a dedicated wall thickness gauge to provide further information about the application parameters. Thanks to its intuitive instrument menu, Setup Wizard, and *Audible Sensor Positioning Assistant* ™ the flow meter can be set up and its transducers correctly installed in a matter of minutes.

Specification: Transmitter

Performance	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, ±0.015 m/s
	Accuracy	:	*Volume flow* ±1 ... 3 % of measured value depending on application ±0.5 % of measured value with process calibration *Flow velocity (mean)* ±0.5 % of measured value
	Turn down ratio	:	1/100
	Measurement rate:	:	1 Hz as standard, higher rates on application
	Response time	:	1 s
	Damping of displayed value	:	0 ... 99 s (selectable by user)
	Gaseous and solid content of liquid media	:	< 10 % of volume

General	Enclosure type	:	Hand-held
	Degree of protection	:	IP 65 according to EN 60529
	Operating temperature	:	-10 ... 60 °C (14 ... 140 °F)
	Housing material	:	ABS (UL 94 HB)
	Measurement channels	:	1
	Power supply	:	Internal rechargeable batteries, 4 x NiMH AA 2850 mAh Power adapter, 100 ... 240 V AC input, 9 V DC output External battery pack, 12 V 105 Ah, 25 kg (optional)
	Operating time	:	Up to 24 h with fully charged internal batteries
	Display	:	LCD graphic display, 128 x 64 dots, backlit
	Dimensions	:	228 (h) x 72/124 (w) x 47 (d) mm
	Weight	:	Approx. 650 g
	Power consumption	:	< 1 W
	Operating languages	:	English, German, French, Spanish, Russian

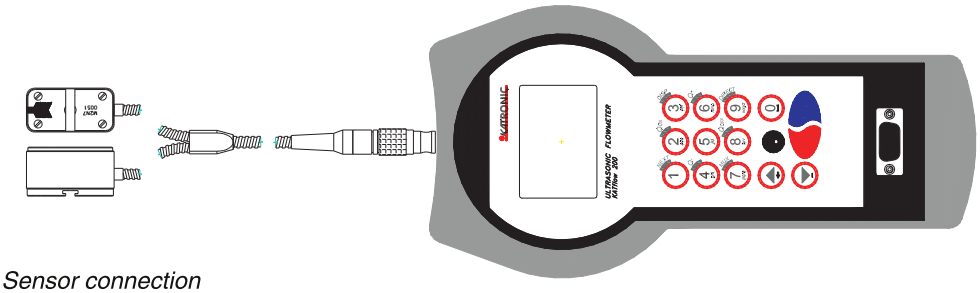
Drawings



Dimensions in mm

Specification: Transmitter (continued)

Drawings and images



Sensor connection

KATflow 200 in crush-proof transport case

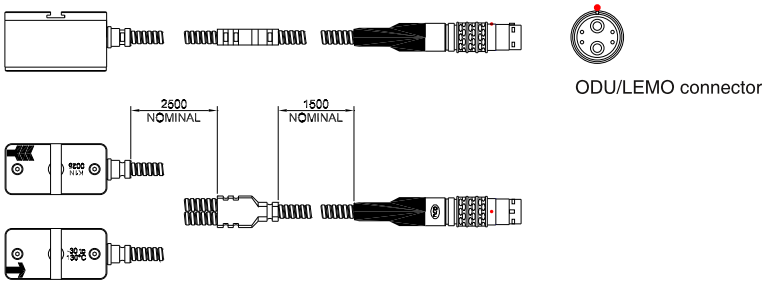
KATflow 200 in operation

Communication	Type	:	RS 232, USB converter cable (optional)
	Transmitted data	:	Measured and totalized value, parameter set and configuration, logged data
Internal data logger	Storage capacity	:	Approx. 30,000 measurements (each comprising up to 10 selectable measurement units), logger size 5 MB Approx. 100,000 measurements (each comprising up to 10 selectable measurement units), logger size 16 MB
	Logged data	:	All measured and totalized values, parameter sets
KATdata+ software	Functionality	:	Download of measured values/parameter sets, graphical presentation, list format, export to third party software, online transfer of measured data
	Operating systems	:	Windows 7, Vista, XP, NT, 2000 Linux Mac (optional)
Quantity & units of measurement	Volumetric flow rate	:	m^3/h, m^3/min, m^3/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^3, l, gal (US gallons), bbl
	Mass	:	g, kg, t

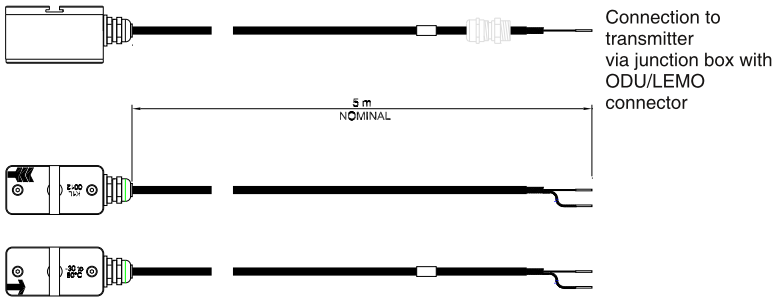
Specification: Transducers

K1L, K1N, K1E	Pipe diameter range	:	50 ... 3000 mm for type K1N/E 50 ... 6500 mm for type K1L
	Dimensions of sensor heads	:	60 (h) x 30 (w) x 34 (d) mm
	Material of sensor heads	:	Stainless steel
	Material of cable conduits	:	*Type K1L:* PVC *Type K1N/E:* Stainless steel
	Temperature range	:	*Type K1L:* -30 ... 80 °C (-22 ... 176 °F) *Type K1N:* -30 ... 130 °C (-22 ... 266 °F) *Type K1E:* -30 ... 200 °C (-22 ... 392 °F) for short periods up to 300 °C (572 °F)
	Degree of protection	:	IP 66 acc. EN 60529, (IP 67 and IP 68 upon request)
	Standard cable lengths	:	*Type K1L:* 5.0 m *Type K1N/E:* 4.0 m

Drawings and images



K1N/E transducers



K1L transducers

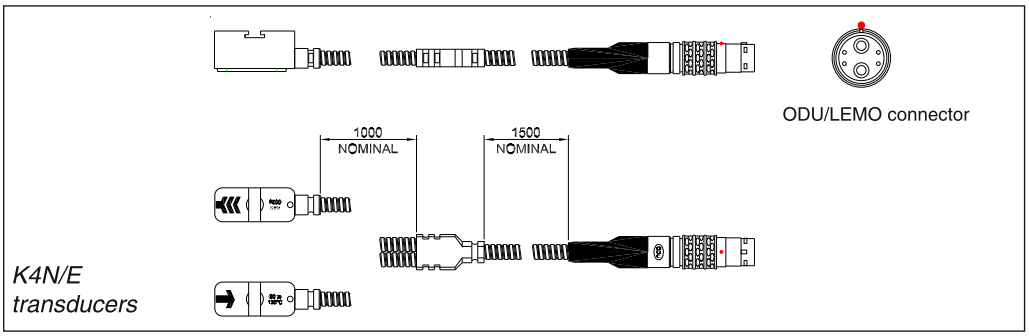
K1N/E transducers

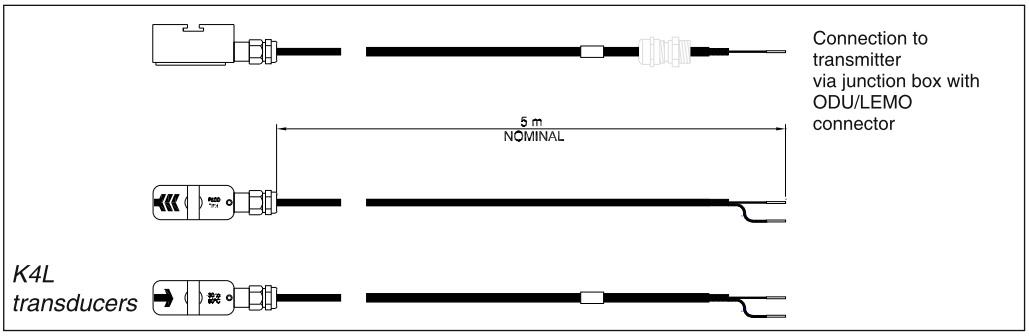
K1L transducers

Specification: Transducers (continued)

K4L, K4N, K4E	Pipe diameter range	:	10 ... 250 mm for type K4N/E 10 ... 250 mm for type K4L
	Dimensions of sensor heads	:	43 (h) x 18 (w) x 22 (d) mm
	Material of sensor heads	:	Stainless steel
	Material of cable conduits	:	*Type K4L:* PVC *Type K4N/E:* Stainless steel
	Temperature range	:	*Type K4L:* -30 ... 80 °C (-22 ... 176 °F) *Type K4N:* -30 ... 130 °C (-22 ... 266 °F) *Type K4E:* -30 ... 200 °C (-22 ... 392 °F) for short periods up to 300 °C (572 °F)
	Degree of protection	:	IP 66 acc. EN 60529, (IP 67 and IP 68 upon request)
	Standard cable lengths	:	*Type K4L:* 5.0 m *Type K4N/E:* 2.5 m

Drawings and images





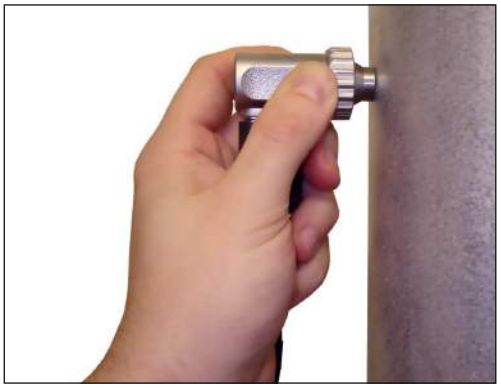
K4N/E transducers

K4L transducers

Specification: Wall thickness gauges, optional

Wall thickness gauge LT	Temperature range	:	-20 … 40 °C (-4 … 104 °F)
	Measuring range	:	1.0 … 100 mm
	Resolution	:	0.01 mm
	Linearity	:	0.2 mm
	Cable length	:	1.5 m
Wall thickness gauge NT	Temperature range	:	-20 … 60 °C (-4 … 140 °F)
	Measuring range	:	1.0 … 200 mm
	Resolution	:	0.01 mm
	Linearity	:	0.1 mm
	Cable length	:	1.5 m
Wall thickness gauge HT	Temperature range	:	0 … 500 °C (32 … 932 °F)
	Measuring range	:	1.0 … 200 mm
	Resolution	:	0.01 mm
	Linearity	:	0.1 mm
	Cable length	:	1.5 m

Images



Wall thickness gauge NT in use

Wall thickness gauge used with KATflow 200

Specification: Transport accessories

Crush-proof transport case	Dimensions (external)	:	190 (h) x 480 (w) x 385 (d) mm
	Weight (empty)	:	3.71 kg
	Degree of protection	:	IP 67 acc. EN 60529
	Outside material	:	Polypropylene/resin compound
	Inside material	:	High-density polyurethane foam

Soft transport case	Dimensions (external)	:	240 (h) x 350 (w) x 180 (d) mm
	Weight (empty)	:	0.50 kg
	Degree of protection	:	No IP rating
	Outside material	:	Nylon
	Inside material	:	Nylon

Images

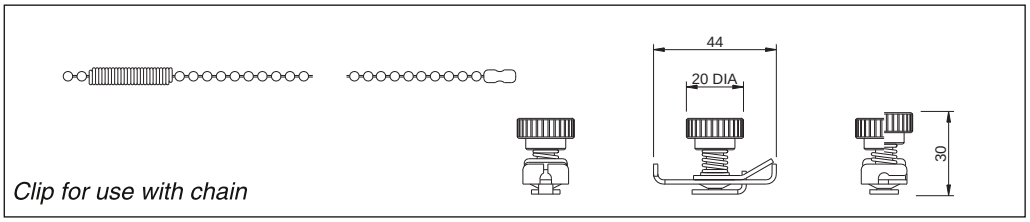
Crush-proof IP 67 case

Soft case

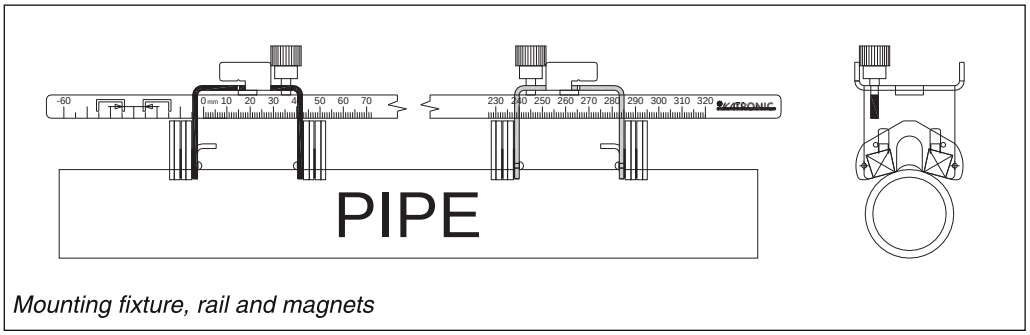
Specification: Transducer mounting accessories

General	Diameter range and mounting types	:	*Clamping set (metal collar with screw), stainless steel* DN 10 ... DN 40 *Clips and chains, chain length 1 m, stainless steel* DN 15 ... DN 310 *Clips and chains, chain length 2 m, stainless steel* DN 25 ... DN 600 *Clips and chains, chain length 4 m, stainless steel* DN 25 ... DN 1200 *Textile tension straps, up to 15 m in length* DN 1000 ... DN 3000 (6500) *Mounting fixture, rail and magnets (for K4 type sensors)* DN 10 ... DN 250 *Mounting fixture, rail and magnets (for K1 type sensors)* DN 50 ... DN 3000
	Mounting fixure for flexible hoses	:	Custom made mounting bracket, stainless steel (available upon request)

Drawings and images

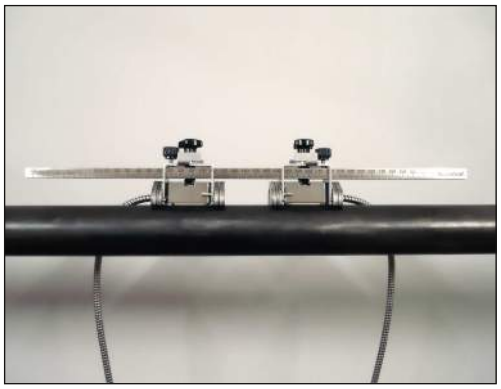


Clip for use with chain



Mounting fixture, rail and magnets

Transducers mounted using clips and chains



Mounting fixture, rail and magnets

Configuration code: Transmitter and accessories

KF200	Hand-held KATflow 200, one measurement channel, serial interface RS 232, operating instructions								
	Configuration								
	0	Basic unit without accessories							
	1	With crush-proof transport case IP 67, power adapter/battery charging unit, measuring tape							
	2	With soft case, power adapter/battery charging unit, measuring tape							
		Internal code							
		03	Internal code						
			Power adapter						
			0	Without					
			1	UK					
			2	US					
			3	Europe					
			4	Australia					
			Z	Special (please specify)					
				Degree of protection					
				1	IP 65 (standard)				
				2	IP 67 (transport case with external sensor connections)				
				Z	Special (please specify)				
					Internal data logger				
					0	Without			
					1	30,000 measurements, KATdata+ download software, RS 232 cable			
					2	30,000 measurements, KATdata+ download software, USB cable			
					3	100,000 measurements, KATdata+ download software, RS 232 cable			
					4	100,000 measurements, KATdata+ download software, USB cable			
						Wall thickness measurement			
						0	Without		
						1	Wall thickness gauge LT		
						2	Wall thickness gauge NT		
						3	Wall thickness gauge HT		
							Optional items		
								Without (leave space blank)	
							BA	Spare battery set and external battery charging unit	
							BP	External battery pack for long-term power supply	
							Z	Special (please specify)	
KF200 – 1 – 01 – 1 – 1 – 1 – 0 /									(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.

Configuration code: Transducers and accessories

K1	Transducer pair, pipe diameter range 50 ... 3000 mm							
K4	Transducer pair, pipe diameter range 10 ... 250 mm							
Z	Special (please consult factory)							
	Temperature range							
	L	Process temperature -30 ... 80 °C, including acoustic coupling paste						
	N	Process temperature -30 ... 130 °C, including acoustic coupling paste						
	E	Process temperature -30 ... 200 °C, including acoustic coupling paste						
	Z	Special (please consult factory)						
		Internal code						
		1	Internal code					
			Degree of protection					
			1	IP 66 (standard)				
			2	IP 67 (please consult factory)				
			3	IP 68 (please consult factory)				
			Z	Special (please consult factory)				
				Transducer mounting accessories				
				00	Without			
				30	Clamping set DN 10 ... 40			
				40	Clips and chains DN 15 ... 310			
				50	Clips and chains DN 25 ... 600			
				60	Clips and chains DN 25 ... 1200			
				70	Textile tension straps DN 1000 ... 6500			
				80	Mounting fixture, rail and magnets DN 10 ... 250 (optional for K4-type transducer)			
				90	Mounting fixture, rail and magnets DN 50 ... 3000 (optional for K1-type transducer)			
				Z	Special (please consult factory)			
					Transducer connection and extension cables			
					P		ODU/LEMO transducer plug	
					PJ		ODU/LEMO transducer plug with junction box (for L transducers)	
						E000	Without	
						E005	With extension cable, 5 m length	
						E010	With extension cable, 10 m length	
						E___	With extension cable, (specify length in m)	
					Z		Special (please specify)	
							Optional items	
							Without (leave space blank)	
							CA	5-point calibration with certificate

K1 N – 1 – 1 – 50 – P E000 / (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.

Katronic Technologies Limited I Earls Court
Warwick Street I Coventry I CV5 6ET
United Kingdom

Phone: +44 (0)2476 714 111
Fax: +44 (0)2476 715 446

Email: info@katronic.co.uk
Web: www.katronic.co.uk