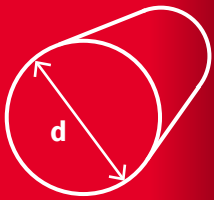# katronic

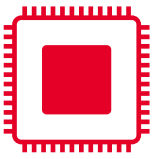# Clamp-On Ultrasonic Flow Measurement

10 – 6 500 mm
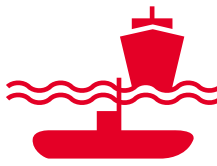
Power Generation

Aircraft and Aerospace

Measurement of Liquids and Gases

Portable and Fixed Installation

Semiconductor

Marine and Shipbuilding

Chemical and Petrochemical

+250°C and higher

Pharmaceutical

24ʰ

Oil and Gas

±25 m/s Flow Velocity

Food and Drink

−50°C and lower

Water and Wastewater

Building Services

ISO 9001 Certified Company

Manufacturing and Process

katronic

Reliable flow measurements for satisfied customers

Katronic's intuitive and precise non-intrusive ultrasonic flow and heat measurement instruments are backed up by market-leading customer service and technical support.

We build strong relationships with customers, partners and colleagues all over the world, and our commitment to responsiveness and flexibility helps us to meet our clients' unique needs.

Benefits of Katronic

Clamp-On Flowmeters

With no need to cut into the pipe, no process shutdown and no risk of leakage, Katronic flowmeters are cost-effective, hygienic, versatile and practical. Confident measurement across media as varied as purified water or toxic chemical effluent, natural gas or air, crude oil or glycol.
Easy to use, flexible, accurate and reliable.

Katronic
Meters
Made to Measure

## THE TECHNOLOGY BEHIND THE MEASUREMENT

KATflow non-invasive flowmeters work on the transit time principle, utilising ultrasonic pulses transmitted and received by a compact transducer pair externally mounted on the pipe. These pulses travel through both the pipe wall and the medium. With the ability to measure on liquids and gases in pipes ranging from 10 mm to 6500 mm in diameter, clamp-on meters determine flow velocity by precisely measuring the difference between transit times of sound waves travelling in the same direction as the flow and those moving against it. This allows them to calculate the volumetric flow. Additionally, the instruments compensate for variables such as flow profile, pipe material, and fluid changes to ensure reliable results. Advanced signal processing means that KATflow meters work with an exceptional variety of liquid and gas media, and offer the user many advantages over in-line measurement technologies. Katronic's reliable instruments have seen success in a vast array of applications from measurements on submarines, to installations on systems destined for use in space.

PERFECTLY PLACED: AUDIBLE SENSOR POSITIONING ASSISTANT

Katronic flowmeters include the *Audible Sensor Positioning Assistant*, a unique tool that ensures accurate sensor placement for quick and efficient measurements. By simply following the 'Quick Start' process and pressing 'Start Measurement', operators can easily fine-tune the installation to get the best possible results. The Assistant presents the recommended sensor spacing, number of pipe transits, and signal-to-noise ratio. Intuitive graphic bars displaying signal strength and signal confidence are augmented by a central cursor that makes it easy to precisely position the transducers. An audible signal means that the operator is not reliant on the display as the Assistant helps them place the sensors perfectly for optimal performance. This tool also serves as a first check for any setup errors, providing assurance for accurate measurements.
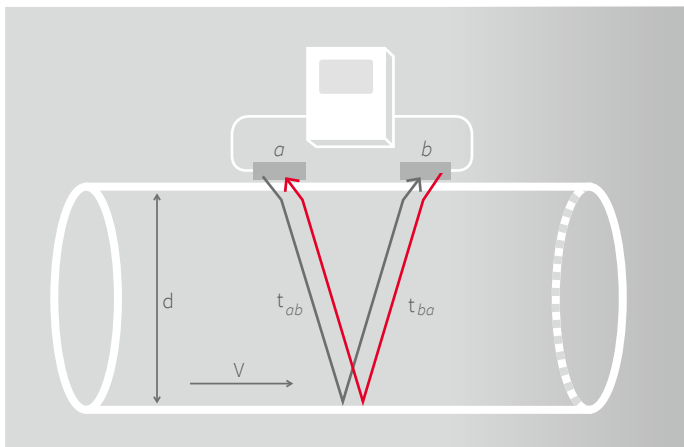
Sensors *a* and *b* work alternately to send and receive ultrasonic pulses. The sound waves *ab* travelling with the flow move faster than those travelling against it *ba*.
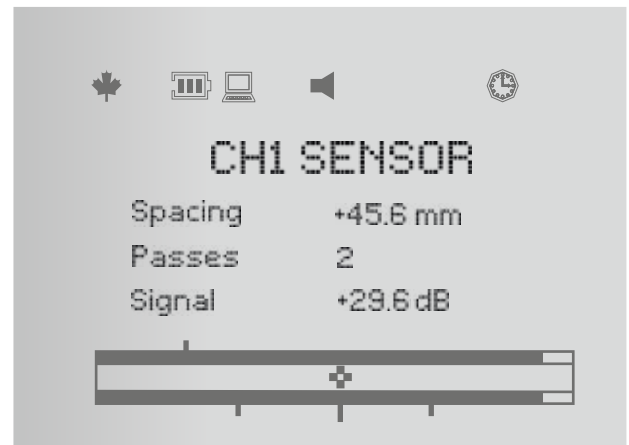
Katronic's unique *Audible Sensor Positioning Assistant* displays key information about the installation. The central cursor makes it easy to optimise sensor position.

KATflow 200
Hand-Held Clamp-On Ultrasonic Flowmeter

The hand-held KATflow 200 sets the standard for ease of installation and user-friendly operation. The high quality of Katronic flowmeters is exemplified by the robust and durable transducers, which can be used in a variety of different environments and applications.

INNOVATIVE. INTUITIVE. INTELLIGENT.

Cost-effective, lightweight and compact, the portable KATflow 200 is incredibly easy to set up and operate, with power and performance that belies its small size. It can be operated one-handed making it perfect for confined spaces or when working at height. Robust stainless steel transducers mean that you can rely on the KATflow 200 today, tomorrow and every day for critical measurement tasks.

SPECIFICATION

· Pipe diameter range 10 mm to 6 500 mm
· Temperature range for sensors
  -30 °C to +250 °C (-22 °F to +482 °F)
· Weight 650 g
· Robust IP65 enclosure with added
  rubber shock protector
· Selectable, energy-efficient LCD display
  and full keypad
· Battery life up to 24 hours with standard
  NiMH AA batteries for simple replacement

FEATURES

· Lightweight and tactile for easy
  one-handed use
· Stainless steel sensors, cable and connectors
  as standard
· Setup Wizard for fast and intuitive
  programming
· Full instrument diagnostics and
  scope function
· Large data logger and software for sampling
  and data transfer
· Optional pipe wall thickness gauge

APPLICATIONS

· Pump testing and verification
· In-line flowmeter performance evaluation
· Leakage and blockage detection
· Clean-In-Place (CIP) system testing
· Monitoring of hydraulic systems
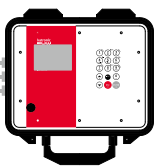· Clean room applications

KATflow 210
Durable Clamp-On Ultrasonic Flowmeter

The durable design of the KATflow 210 makes it ideal for use in outdoor, remote and exposed conditions. The very large battery capacity allows the KATflow 210 to make months of measurements without recharging.

ROUGH. ROBUST. REMOTE.

The KATflow 210 is a portable flowmeter designed to deliver reliable measurements in the toughest of conditions. With advanced battery technology for months of operation and durable waterproof (IP67) case, the KATflow 210 is ideal for long-term installation wherever access to power is limited and exposure to the worst of the elements is likely. This device features options of process outputs for display or control system interface and has an IP68 version of Katronic's K1N transducers to ensure the entire package provides a perfect balance of reliability, robustness and autonomy.

SPECIFICATION

· Pipe diameter range 50 mm to 2 500 mm
· Temperature range for sensors
  -30 °C to +130 °C (-22 °F to +266 °F)
· Rugged integrated IP67 portable design
· Selectable, energy-efficient LCD display and
  full keypad
· Weight 6 kg
· Standard operation up to 21 days without recharging,
  up to 100 days in power saving mode

FEATURES

· Three different measurement modes to maximise
  battery life
· IP68 stainless steel sensors, cable and connectors
  as standard
· Process output options including current,
  open-collector, relay and telemetry
· Large data logger and software for sampling and
  data transfer
· Integrated pipe wall thickness gauge available
· Optional wireless data transmission

APPLICATIONS

· Long-term leakage surveys
· Metering in pits, wells and areas where flooding is likely
· In-line flowmeter inspection verification and
  pump verification
· Metering of pipes in exposed locations
· Temporary replacement of conventional
  in-line flowmeters
· Monitoring of irrigation systems

KATflow 230
Dual-Channel Clamp-On Ultrasonic Flowmeter

Katronic's adaptable KATflow 230 provides the flexibility of one or two measurement channels, alongside the capability to incorporate a pair of clamp-on temperature sensors to establish a practical, portable energy meter.

POWERFUL. PRACTICAL. PORTABLE.

With an advanced specification for situations which require comprehensive measurement features coupled with easy operation, the KATflow 230 is the perfect choice. The instrument has two channels for measurement on large pipes, in two pipes simultaneously or in less-than-ideal conditions. Options include process outputs and temperature probe inputs, which turn the KATflow 230 into a sophisticated portable heat meter.

SPECIFICATION

· Pipe diameter range 10 mm to 6 500 mm
· Temperature range for sensors
  -30 °C to +250 °C (-22 °F to +482 °F)
· Robust IP65 aluminium enclosure
· Selectable three-line LCD display and full keypad
· Battery life up to 24 hours* with easily replaceable
  battery cartridge
· Measurement of two flows simultaneously

FEATURES

· Dual flow monitoring with *sum*, *average*,
  difference and *maximum* calculations
· Pt 100 input for heat quantity (thermal energy)
  measurement
· Process output options including current,
  open-collector, relay
· Large data logger and software for sampling
  and data transfer
· Stainless steel sensors, cable and connectors
  as standard
· Optional pipe wall thickness gauge

APPLICATIONS

· Heating, Ventilation and Air Conditioning
  (HVAC) measurements
· Large pipe measurement with two sensor
  pairs in 'X' configuration
· Temporary replacement of conventional
  in-line flowmeters
· Building surveys on large facilities
· Efficiency monitoring of the heat exchangers
· Clean-In-Place system (CIP) testing

* Inputs/outputs disabled

KATflow 100
Compact Clamp-On Ultrasonic Flowmeter

The KATflow 100 can be operated with either L-type or P-type transducers to suit both application and budget. There are no complicated installation requirements, making the meter ideal for rapid deployment at scale and integration into network supervisory systems.

SMALL. SIMPLE. STURDY.
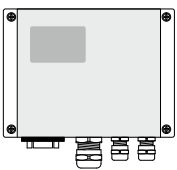
The KATflow 100 is made for project applications where its compact, single-channel design fits well across a process plant or network. Setup is simple and straightforward and offers the same accuracy as the rest of the range. Combined with either L-type or P-type transducers and providing up to four outputs, including telemetry, the KATflow 100 seamlessly integrates into your workflow.

SPECIFICATION

· Pipe diameter range 10 mm to 3 000 mm
· Temperature range for sensors
  -30 °C to +80 °C (-22 °F to +176 °F)
· Weight 750 g
· Robust IP66 aluminium enclosure
· Sturdy unit with LCD display and five-key keypad
· Wall or pipe mounted

FEATURES

· Low cost of ownership
· Process outputs including 4 … 20 mA, 0 … 10 V, pulse,
  M-Bus, BACnet, Modbus RTU and HART* compatible output
· Pt 100 inputs for heat quantity (thermal energy)
  measurement
· Bi-directional measurement with
  totaliser function
· Setup Wizard for quick and
  intuitive programming
· Configuration can be changed to suit
  customer requirements

APPLICATIONS

· Water and wastewater measurements
· Replacement of electromagnetic flowmeters
· Monitoring and controlling of HVAC systems
· Cost-effective solution for large scale projects
· Automated process control
· Ship applications

* HART® is a registered trademark of the
   HART Communication Foundation

KATflow 150
Advanced Clamp-On Ultrasonic Flowmeter

The wall mounted KATflow 150 offers practical and simple operation with its attractive housing, lockable polycarbonate cover and stainless steel transducers. It has ten Input/Output slot positions which can be configured with up to ten individual I/O modules.

FAST. FLEXIBLE. FUNCTIONAL.
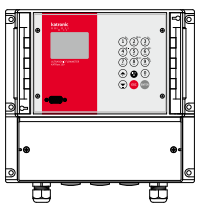
The KATflow 150 brings together versatility and top-notch performance, offering users a wide range of options for customisation. Its remarkable single- or dual-channel capabilities, coupled with a comprehensive specification, ensure optimal functionality. This user-friendly device boasts a practical modular design, allowing for perfect integration with a diverse selection of transducer types. Each KATflow 150 is tailored to meet the specific requirements of the application, whether it be a straightforward liquid flow measurement, energy monitoring, automated process control, or product recognition.
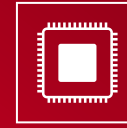
SPECIFICATION

· Pipe diameter range 10 mm to 6 500 mm
· Temperature range for sensors
  -30 °C to +250 °C (-22 °F to +482 °F),
  higher temperatures available on request
· Lockable and sturdy IP66 polycarbonate
  flowmeter enclosure
· Selectable three-line LCD display and full keypad
· Up to ten different input or output slots available
· Measurement of two flows simultaneously

FEATURES

· Dual flow monitoring with *sum*, *average*,
  difference and *maximum* calculations
· Process output options including current,
  open-collector, relay
· Communication options including RS 485, Modbus RTU,
  Profibus PA and HART* compatible output
· Current inputs for temperature, pressure
  and density compensation
· Large data logger and software for sampling
  and data transfer
· Optional heat quantity (thermal energy)
  measurement functionality

APPLICATIONS

· Heating, Ventilation and Air Conditioning
  (HVAC) measurements
· Large pipe measurement with two
  sensor pairs in 'X' configuration
· Product recognition and interface
  detection systems
· Measurements with Ex-certified
  transducers
· Effluent and wastewater measurements
· Automated process control

* HART® is a registered trademark of the
 *HART Communication Foundation*

KATflow 170
Explosion-Proof Clamp-On Ultrasonic Flowmeter

The KATflow 170 is available in both epoxy-coated aluminium and stainless steel versions, and is matched with IP68 transducers for maximum protection. The instruments are programmed using a magnetic pen to maintain security and integrity in both Zone 1 and 2 hazardous areas.

RUGGED. RESISTANT. RELIABLE.
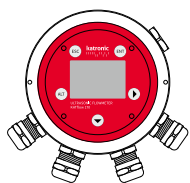
For applications where a harsh environment demands a rugged, corrosion-resistant instrument, and where Ex-certification is required, the KATflow 170 is the answer. Single- or dual-channel, with a range of process output options, the KATflow 170 provides Katronic's accuracy, reliability and ease of operation in a robust package designed for Zone 1 or 2 hazardous environments. The KATflow 170 demonstrates that even the most complex technical requirements can be met with straightforward solutions.

SPECIFICATION

· Pipe diameter range 10 mm to 3 000 mm
· Temperature range for sensors
  -50 °C to +115 °C (-58 °F to +293 °F),
  higher temperatures available on request
· Robust IP66 unit with LCD display and
  glass-fronted keypad
· Epoxy-coated aluminium or stainless steel
  enclosure
· Magnetic pen for safe and easy programming
· Simultaneous measurement of two flows

FEATURES

· Suitable for installation in hazardous areas,
  various Ex-certification approvals available
· Dual flow monitoring with *sum*, *average*,
  difference and *maximum* calculations
· IP68 stainless steel sensors as standard
· Process output options including current,
  open-collector, relay
· Communication options RS 485, Modbus RTU,
  Profibus PA and HART*
· Ex-certified Pt 100 probe for temperature
  compensation

APPLICATIONS

· Produced water measurements
· Methanol and water injection systems
· Product recognition and interface
  detection systems
· Measurement of refined products
· Tanker unloading systems
· Oil blending skids

* HART® is a registered trademark of the
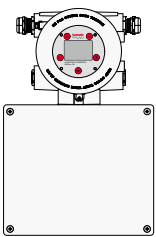 *HART Communication Foundation*

KATflow 180
Gas Clamp-On Ultrasonic Flowmeter

The new gas measurement instruments are available both as fixed and portable solutions for safe and hazardous area use and can measure on all commonly used pipe materials.

MEASUREMENT FROM AMMONIA TO XENON

Katronic flowmeters have a long-standing reputation in the liquid flow industry and have now extended their capabilities to include non-invasive measurement of gases. This groundbreaking approach not only enables accurate readings in high-pressure gas flow scenarios, but also in atmospheric conditions within steel pipes – a feat previously deemed unattainable. This exceptional advancement is made possible through cutting-edge sensor technology, state-of-the-art electronics, adaptive filtering techniques, and revolutionary signal processing algorithms, all harnessed by our advanced Digital Signal Processors (DSP's).

SPECIFICATION

· Pipe diameter range 50 mm to 1500 mm
· Temperature range for safe area sensors
  -20 °C to +60 °C (-4 °F to +140 °F)
· Robust IP66 unit with OLED display and
  glass-fronted keypad
· Pressure range 1 bar (absolute) to unlimited
  maximum
· Flow velocities 0.1 m/s to 75 m/s

FEATURES

· Shear and Lamb Wave IP68 stainless steel sensors
· Process output options including current,
  open-collector, relay
· Communication options Modbus RTU and others
· Inputs for temperature, pressure and gas
  compressibility factor available
· Web-based data evaluation, instrument setup via
  wired, wireless or GSM connection

APPLICATIONS

· Measurement of natural gas pipelines
· Natural gas storage installations
· Control of compressor stations
· Synthesised gas flow measurements
· Compressed air flow measurements

MEDIA TYPES

  Air, argon, carbon monoxide,
  ethane, ethylene, helium, hydrogen,
  natural gas, nitrogen, nitrous oxide,
  oxygen, process gas, propane,
  saturated steam, sour gas

Communication Types
Flowmeter Connectivity Explained

MEASUREMENT IS VALUABLE. DATA IS PRICELESS.

The KATflow range of products is designed to provide users not only with effective reliable flow measurement, but also with a variety of industry-specific digital serial interface options.

The table below illustrates an overview of the communication protocols that Katronic can offer and the instruments on which they are available.

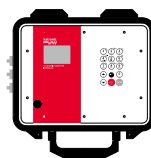| Protocol	Physical Layer	Devices	Industries
Modbus RTU	RS 485	KATflow 100 KATflow 150 KATflow 170 KATflow 210 KATflow 230	Aircraft and Aerospace Building Services Chemical and Petrochemical Food and Drink Manufacturing and Process Marine and Shipbuilding Oil and Gas Pharmaceutical Power Generation Semiconductor Water and Wastewater
Modbus TCP/IP	Ethernet	KATflow 100 KATflow 150 KATflow 210 KATflow 230	Building Services Manufacturing and Process
LonWorks	Twisted Pair (Free Topology)	KATflow 100 KATflow 150	Building Services
BACnet	Ethernet or RS 485	KATflow 100 KATflow 150	Building Services
M-Bus	Two-wire	KATflow 100 KATflow 150	Building Services
HART	Two wire, 4 ... 20 mA	KATflow 100 KATflow 150 KATflow 170	Process Automation
Profibus PA	Twisted Pair, IEC 61158 -2	KATflow 100 KATflow 150	Process Automation
Profibus DP	Twisted Pair, RS 485	KATflow 100 KATflow 150	Factory Automation
Profinet	Ethernet	KATflow 100 KATflow 150	Factory Automation
Foundation Fieldbus	Twisted Pair, IEC 61158 -2	KATflow 100 KATflow 150	Process Automation
Ethernet	Wired/Wireless Ethernet	KATflow 150	Building Services Factory Automation
Wireless	GSM/GPRS/3G	KATflow 150 KATflow 210	Oil and Gas Process Automation Water and Wastewater

Transducer Types
Sensor Connection and Extension Explained

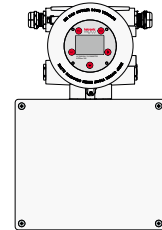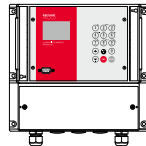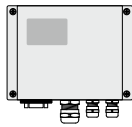| Sensor Type (Frequency)	Temperature Range	Pipe Diameter Range	Sensor Termination	Sensor Cable Length	Flowmeter Type	Extension Cable Length
K4 (4 MHz)	**L**ow temperature -30 ... +80 °C (-22 ... +176 °F)	10 ... 250 mm	Wires	10 m	Fixed	Max. 50 m
	Ex-rated -50 ... +115 °C (-58 ... +239 °F)	10 ... 250 mm	Wires	5 m	Fixed	Max. 50 m
	Normal temperature -30 ... +130 °C (-22 ... +266 °F)	10 ... 250 mm	ODU connectors	2.5 m	Portable	5 m, 10 m, 20 m
			SMB connectors	2.5 m	Fixed	Max. 50 m
	Extended temperature -30 ... +250 °C (-22 ... +482 °F)	10 ... 250 mm	ODU connectors	2.5 m	Portable	5 m, 10 m, 20 m
			SMB connectors	2.5 m	Fixed	Max. 50 m
K1 (1 MHz)	**P**lastic wedge -20 ... +60 °C (-4 ... +140 °F)	50 ... 600 mm	Wires	10 m	Fixed	Max. 100 m
	Low temperature -30 ... +80 °C (-22 ... +176 °F)	50 ... 3 000 (6 500) mm	Wires	10 m	Fixed	Max. 100 m
	Ex-rated -50 ... +115 °C (-58 ... +239 °F)	50 ... 3 000 (6 500) mm	Wires	5 m	Fixed	Max. 100 m
	Normal temperature -30 ... +130 °C (-22 ... +266 °F)	50 ... 3 000 (6 500) mm	ODU connectors	4 m	Portable	5 m, 10 m, 20 m
			SMB connectors	4 m	Fixed	Max. 100 m
	Extended temperature -30 ... +250 °C (-22 ... +482 °F)	50 ... 3 000 (6 500) mm	ODU connectors	4 m	Portable	5 m, 10 m, 20 m
			SMB connectors	4 m	Fixed	Max. 100 m
	Very **H**igh **T**emperature -200 ... +450 °C (-392 ... +842 °F)	40 ... 600 mm	Wires	10 m	Fixed	Max. 50 m
K0 (0.5 MHz)	**L**ow temperature -30 ... +80 °C (-22 ... +176 °F)	(100) 200 ... 6 500 mm	Wires	10 m	Fixed	Max. 200 m
	Normal temperature -30 ... +130 °C (-22 ... +266 °F)	(100) 200 ... 6 500 mm	ODU connectors	5 m, 10 m	Portable	5 m, 10 m, 20 m

Flowmeter Types
Portable and Fixed Installation Flowmeters Explained

Unit	KATflow 200	KATflow 210	KATflow 230
Model type	Portable	Portable	Portable
Pipe diameter range	10 … 6 500 mm	50 … 2 500 mm	10 … 6 500 mm
Temperature range	-30 … +250 °C (-22 … +482 °F)	-30 … +130 °C (-22 … +266 °F)	-30 … +250 °C (-22 … +482 °F)
Measurement channels	1	1	1 or 2[1]
Flow velocity range	0.01 … 25 m/s	0.01 … 25 m/s	0.01 … 25 m/s
Accuracy of volume flow	±1 … 3 % of measured value ±0.5 % process calibrated	±1 … 3 % of measured value ±0.5 % process calibrated	±1 … 3 % of measured value ±0.5 % process calibrated
Accuracy range	0.25 … 25 m/s	0.25 … 25 m/s	0.25 … 25 m/s
Weight	650 g	6.0 kg	2.0 kg
Battery life	Up to 24 h	Up to 100 days with 3 cells	Up to 24 h[2]
Power supply	4 x NiMH AA 2850 mAh 100 … 240 V AC (mains socket)[3]	1 to 3 LiFePo4 cells 12,8 Ah 100 … 240 V AC (mains socket)[3]	8 x NiMH AA 2850 mAh 100 … 240 V AC (mains socket)[3]
Display	LCD graphic display, 128 x 64 dots, backlit	LCD graphic display, 128 x 64 dots, backlit	LCD graphic display, 128 x 64 dots, backlit
Process inputs	No	0/4 … 20 mA	Pt 100 temperature[4], 0/4 … 20 mA
Process outputs	No	0/4 … 20 mA, pulse (OC), digital relay	0/4 … 20 mA, pulse (OC), digital relay
Communication[5]	RS 232, USB	USB, Modbus RTU	USB
Internal data logger	Yes	Yes	Yes
Wall thickness gauge	Yes	Yes	Yes
Energy metering	No	No	Yes[6]
Ex-approved version	No	No	No

KATflow 100	KATflow 150	KATflow 170	KATflow 180
Fixed installation	Fixed installation	Fixed installation	Fixed installation
10 … 3 000 mm	10 … 6 500 mm	10 … 3 000 mm	50 … 1 500 mm
-30 … +80 °C (-22 … +176 °F)	-30 … +250 °C (-22 … +482 °F)	-50 … +115 °C (-58 … +239 °F)	-20 … +60 °C (-4 … +140 °F)
1	1 or 2[1]	1 or 2[1]	1 (2 on request)
0.01 … 25 m/s	0.01 … 25 m/s	0.01 … 25 m/s	0.1 … 75 m/s
±1 … 3 % of measured value ±0.5 % process calibrated	±1 … 3 % of measured value ±0.5 % process calibrated	±1 … 3 % of measured value ±0.5 % process calibrated	±2 … 5 % of measured value
0.25 … 25 m/s	0.25 … 25 m/s	0.25 … 25 m/s	3.5 … 75 m/s
750 g	2.3 kg	4.0 kg	8.4 kg
n/a	n/a	n/a	n/a
100 … 240 V AC or 9 … 36 V DC	100 … 240 V AC or 9 … 36 V DC	100 … 240 V AC or 9 … 36 V DC	100 … 240 V AC or 9 … 36 V DC
LCD graphic display, 128 x 64 dots, backlit	LCD graphic display, 128 x 64 dots, backlit	LCD graphic display, 128 x 64 dots, backlit	OLED graphic display, 128 x 64 dots
Pt 100 temperature[4], 0/4 … 20 mA	Pt 100 temperature[4], 0/4 … 20 mA	Pt 100 temperature[4], 0/4 … 20 mA	Pt 100 temperature[4], 0/4 … 20 mA
0/4 … 20 mA, pulse (OC), digital relay, frequency, voltage, HART* compatible	0/4 … 20 mA, pulse (OC), digital relay, frequency, voltage, HART* compatible	0/4 … 20 mA, pulse (OC), digital relay, frequency, voltage, HART* compatible	0/4 … 20 mA, pulse (OC), digital relay, frequency, voltage, HART* compatible
RS 232, Modbus RTU	RS 232, RS 485, Modbus RTU, Profibus PA	RS 232, Modbus RTU, Profibus PA	RS 232, Modbus RTU
Yes	Yes	Yes	Yes
n/a	n/a	n/a	n/a
Yes[6]	Yes[6]	Yes[6]	No
No	No	Yes	Yes

1) For simultaneous measurement on two separate pipes or for measurement on one single pipe in a two-path sensor mounting configuration.
2) Inputs/Outputs disabled
3) For charging of internal batteries and supply of flowmeter with power when connected to mains electricity socket.
4) + 6) For contactless measurement of thermal energy consumption, displayable units: W, kW, MW, J, kJ, MJ, BTU (on request).
5) Please see communication connectivity page for complete list of options.

* HART® is a registered trademark of the *HART Communication Foundation*

katronic

A Trusted Partner at the Heart of Your Process

Katronic Technologies Ltd.
Earls Court
Warwick Street
Coventry CV5 6ET
United Kingdom

Tel. +44 (0)2476 714 111
Fax +44 (0)2476 715 446
E-mail info@katronic.co.uk
Web www.katronic.co.uk

Katronic GmbH & Co. KG
Gießerweg 5
38855 Wernigerode
Germany

Tel. +49 (0)3943 239 900
Fax +49 (0)3943 239 951
E-mail info@katronic.de
Web www.katronic.de

Katronic Instruments LLC.
1531 Stuyvesant Avenue
Union, NJ 07083
USA

Tel. +1 (0)908 688 6709
Fax +1 (0)908 688 9040
E-mail info@katronic.com
Web www.katronic.com

Katronic France S.a.r.l.
ZA La Charlotte
1389 Chemin des Préaux
26120 Montmeyran
France

Tel. +33 (0)475 856 430
E-mail info@katronic.fr
Web www.katronic.fr