Technical Data Sheet

SONOFLOW CO.55
V3.0

Ultrasonic Flow Sensor for Non-Invasive Flow
Measurement

SONOFLOW CO.55 V3.0 clamp-on flow meters measure the flow rate of liquids in flexible
tubes of different diameters. With high accuracy, reproducibility and repeatability – even in
the lowest flow range – the sensors are suited for a variety of applications. Various
accessories allow for easy integration into bench top setups and industrial process
environments.

Accuracy

SONOFLOW type	Accuracy (of reading) on specified tubing [1]		Typical flow range [2]
	Low flow range	High flow range	
CO.55/0250 V3.0	0 ... 150 ml/min: ± 1.5 ml/min	> 150 ml/min: ± 1 %	0 ... 1 000 ml/min
CO.55/0375 V3.0	0 ... 300 ml/min: ± 3 ml/min	> 300 ml/min: ± 1 %	0 ... 4 000 ml/min
CO.55/0500 V3.0	0 ... 500 ml/min: ± 5 ml/min	> 500 ml/min: ± 1 %	0 ... 5 000 ml/min
CO.55/0625 V3.0	0 ... 700 ml/min: ± 7 ml/min	> 700 ml/min: ± 1 %	0 ... 10 000 ml/min
CO.55/0750 V3.0	0 ... 1 000 ml/min: ± 10 ml/min	> 1 000 ml/min: ± 1 %	0 ... 15 000 ml/min
CO.55/1375H V3.0	0 ... 6 000 ml/min: ± 60 ml/min	> 6 000 ml/min: ± 1 %	0 ... 80 000 ml/min

1) Accuracy based on standard calibration conditions as listed. Accuracy depends on tubing, tubing variations,
temperature, fluid properties, clamping and other conditions (design of inlet and outlet section).

2) Maximum flow: limited by tubing and pump capacity only.

Calibration conditions

Sensors are factory calibrated under the following standard conditions:

- Tubing as listed in table 'Tubing properties'
- Water at 23 °C ± 2 K
- Warm up: at least 30 min
- Zero calibration after clamp-on
- Open tubing outlet (pressure close to zero)

Besides recalibrations of our flow sensors we offer safety inspections and repair service for all our products. Contact us!

Tubing properties

Typical types of tubes are listed below. The sensors are also suitable for comparable flexible tubes (different tube manufacturers, diameters, materials such as PVC, TPE, etc.). If possible, provide a tubing sample (minimum length 75 cm) along with your order.

Sensor variant with cover clasp

Tube type: Masterflex® precision pump tubing, platinum-cured silicone

SONOFLOW type	Tubing ID	Tubing OD	Tubing details from the manufacturer	
CO.55/0250 V3.0	1/8" [0.125"]	1/4" [0.250"]	L/S® 16	Item No. 96410-16
CO.55/0375 V3.0	1/4" [0.250"]	3/8" [0.375"]	L/S® 17	Item No. 96410-17
CO.55/0500 V3.0	5/16" [0.313"]	1/2" [0.5"]	L/S® 35	Item No. 96410-35
CO.55/0625 V3.0	3/8" [0.375"]	5/8" [0.625"]	I/P® 73	Item No. 96410-73
CO.55/0750 V3.0	1/2" [0.5"]	3/4" [0.75"]	I/P® 82	Item No. 96410-82

Sensor variant with handle (H)

Tube type: Saint-Gobain® C-Flex® tubing, thermoplastic elastomer (TPE)

SONOFLOW type	Tubing ID	Tubing OD	Tubing details from the manufacturer	
CO.55/1375H V3.0	1"	1 3/8" [1.375"]	374	Item No. 374-1000-6

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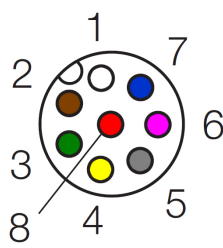
Sensor interfaces

Interface	Specifications
Current output	0 (4) … 20 mA │ Resolution: < 1 µA │ Update rate: up to 1 kHz │ Configurable for flow range
	Load to GND. The max. load depends on the operating voltage: 12 V → 250 Ω │ 15 V → 500 Ω │ 24 V → 1 kΩ │ 30 V → 1.2 kΩ
RS-485 interface	RS-485 bus operation: max. 12 subscribers │ Default address: #01
	Available protocols:
	• SONOTEC protocol: Half-duplex operation │ 115 200 baud │ No parity │ 1 stop bit │ no handshaking
	• Modbus® protocol: configurable settings via software
Switching output	Switching characteristics: PNP / NPN / Push-pull │ 0 … 30 V │ max. 100 mA │ PWM output period: 0.1 ms … 1 000 ms │ Output range 0 … 100 % or 5 … 95 % │ Smallest pulse length: 5 µs
	Configurable as:
	• Volume switch (adapting batch process / dosing)
	• Threshold switch of flow
	• Pulses of volume (flexible pulse length, max. 20 kHz)
	• Flow rate (via frequency or duty cycle)
	• Status information via switch
Digital input	Internal pull-up to operating voltage (100 kΩ) │ Voltage resistant up to 30 V
	Configurable for:
	• Zero point calibration of flow
	• Start dosing processes (reset volume)
	(Either separate or simultaneous execution possible)

Electrical specifications and connections

Parameter	Specifications
Operating voltage	12 ... 30 VDC │ Maximum ripple: 10 % │ Protection against reverse-polarity (external fuse, if required: min. 200 mA)
Current consumption	Maximum 60 mA (with open current, frequency and switching output, depending on supply voltage) │ Inrush current (during start-up < 10 ms): < 350 mA at 12 V, < 150 mA at 24 V
Electrical connection	8-pin M12 connector │ DIN EN 61076-2-101:2012

8 pin connector to 8 pole cable

Connection	Pin	Assignment	Color
	1	Ground	White
	2	Operating voltage	Brown
	3	Current output	Green
	4	RS-485 B	Yellow
	5	RS-485 A	Grey
	6	(not assigned)	Pink
	7	Switching output / frequency output	Blue
	8	Digital input	Red
Shielding	Cable shield must be connected to housing		

Male connector (at the sensor)

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General data

Parameter	Specifications
Measuring method	Ultrasonic time of flight measurement
Sensor materials	Measuring channel: ABS │ Housing: anodized aluminum, polyamide │ Connector: stainless steel
Mounting	4 threaded mounting holes (see 'Technical drawings')
Maintenance	Maintenance-free
Directives and standards	• EMC Directive 2014/30/EU • RoHS Directive 2011/65/EU, exception: III 7cI/ IV 15; RoHS 2015/863 • Acoustic emission: IEC 61157:2007 + A1:2013

Conditions of use

| Parameter	Specifications
Customized calibration	Standard calibration according to factory specification. Calibration to deviating, flexible customer tubing, fluid, flow range, temperature, etc. on request.
Operating conditions	Adaptation to different tubes or operating conditions by parameter settings (with the help of optionally available software).
Media	Water or similar liquids
Ambient- / Media temperature	0 ... 60 °C (other temperatures available on request)
Storage temperature	-20 ... +70 °C
Degree of protection	IP65

Scope of supply and accessories

Parameter	Specifications
Scope of supply	• SONOFLOW CO.55 V3.0 sensor according to specification • User documentation • Calibration report
Optional accessories	Sensor cable │ Length: 2 m / 5 m / 10 m │ 8-pole M12 connector
	SONOFLOW Monitor software for setting parameters, recording measurements and update of sensor software consisting of • USB Data Converter Type 013 for the connection to a computer • USB cable, type A-B, length 2 m • Cable 2 m, 8-pole M12 connector • Switching power supply 12 V • Flow Monitor Software Package • User documentation
	SONOFLOW RD.10 Remote Display including connecting cable for • Monitoring sensor performance (display e.g. current flow rate, volume or measuring state) • Zero calibration • Manual volume reset
	EtherNet/IP Gateway programmed for SONOTEC • Serial communication with an EtherNet/IP-based system (e.g. PLC) • Support of up to 12 sensors • Pre-configured parameters and commands (library with Modbus registers for time-saving installation)
	Portable USB Data Converter Type 023 for • Mobile operation of sensors via a standard USB power socket or power bank • Triggering of functions stored for the digital sensor input ('push button switch')

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Sensor dimensions and technical drawings

Design data (STEP files) for integration will be provided upon request. Please feel free to contact us.

Sensor variant with cover clasp

SONOFLOW type	Product No	Dimensions (L × W × H)	Mounting holes	Mounting hole spacing	Weight (approx.)
CO.55/0250 V3.0	200 08 0117	44 × 44 × 34 mm	M4 × 8 mm	36 mm	140 g
CO.55/0375 V3.0	200 08 0118	44 × 44 × 34 mm	M4 × 8 mm	36 mm	140 g
CO.55/0500 V3.0	200 08 0139	44 × 44 × 34 mm	M4 × 8 mm	36 mm	140 g
CO.55/0625 V3.0	200 08 0133	66 × 66 × 45 mm	M6 × 10 mm	55 mm	400 g
CO.55/0750 V3.0	200 08 0120	66 × 66 × 45 mm	M6 × 10 mm	55 mm	400 g
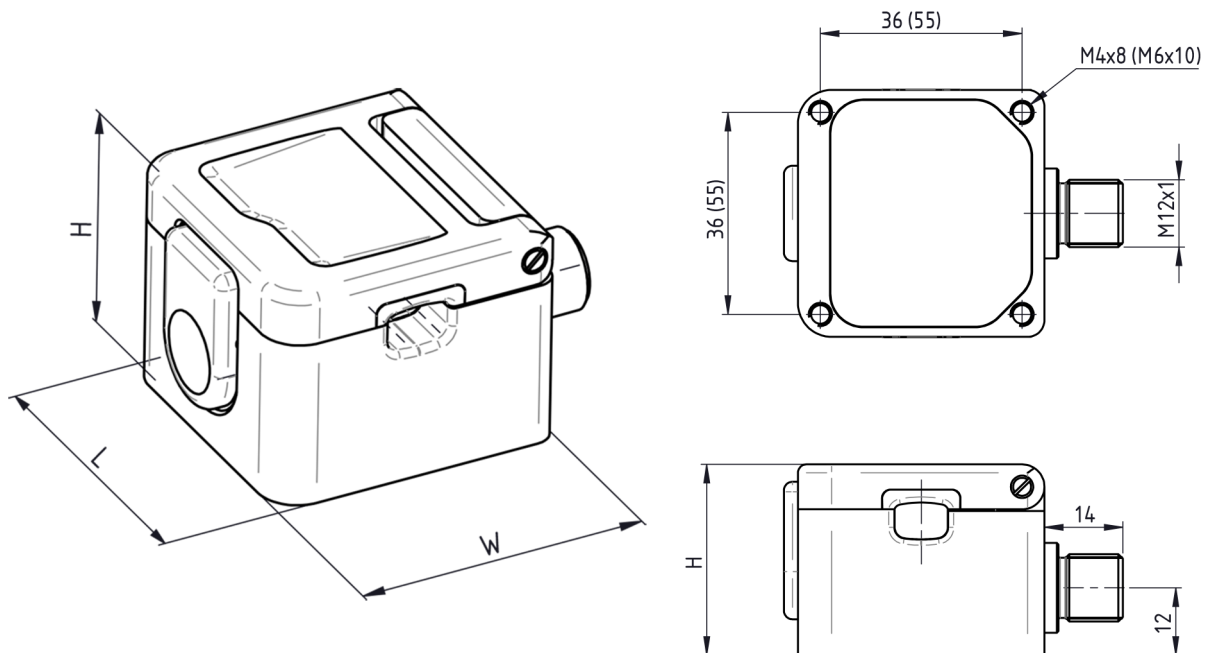
Sensor variant with handle (H)

For applications on tubes with large outer diameters, the corresponding sensors are equipped with a locking screw (handle) to assist handling when inserting the tube.

SONOFLOW type	Product No	Dimensions (L × W × H) [Height with handle]	Mounting holes	Mounting hole spacing	Weight (approx.)
CO.55/1375H V3.0	200 08 0140	66 × 66 × 62 [80] mm	M6 × 10 mm	55 mm	450 g
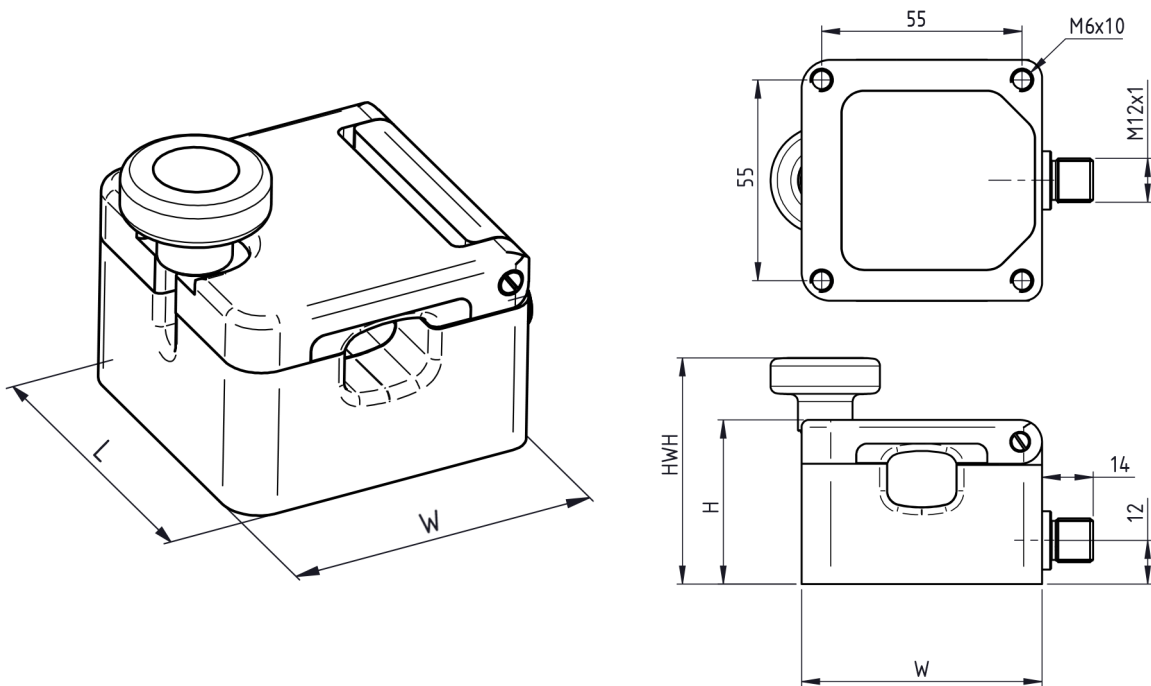
Drawings are not to scale. Dimensions in mm, unless otherwise specified. Information is subject to change without notice. SONOTEC is a registered trademark.

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