



The sensor series **SONOFLOW CO.55/xxx V2.0** – designed as clamp-on-sensors – detect the flow rate of liquids in plastic tubes of different diameters or materials within a few milliseconds.



For applications on tubes with higher outer diameters the sensors **SONOFLOW CO.55/xxxH V2.0** are equipped with a handle for an optimized handling for tube insertion.

The sensors have no contact to the medium or product and are suitable for applications in fields with strict hygienic standards. Due to the current, frequency and switching outputs industrial dosing applications can be supported. The RS485 interface allows bus operation of up to 12 sensors in rough industrial environments.

The **SONOFLOW CO.55/xxx(H) V2.0** sensors with complete built-in electronics can be installed in machines or apparatuses.

In addition to our standard sensors, we also manufacture customer-specific solutions regarding housing materials, colors, mechanical dimensions, customized output specifications and parameter settings.


## Overview sensors

Specification SONOFLOW	Order-No.	Measuring channel (CH = CW)	Dimensions (L x W x H)	Weight
CO.55/035 V2.0	200 01 0292	□ 3.5 mm	44 x 44 x 28 mm	120 g
CO.55/044 V2.0	200 08 0026	□ 4.4 mm	44 x 44 x 30 mm	125 g
CO.55/060 V2.0	200 01 0293	□ 6.0 mm	44 x 44 x 32 mm	130 g
CO.55/080 V2.0	200 01 0297	□ 8.0 mm	44 x 44 x 34 mm	135 g
CO.55/100 V2.0	200 08 0006	□ 10.0 mm	44 x 44 x 35 mm	138 g
CO.55/120 V2.0	200 08 0027	□ 12.0 mm	44 x 44 x 36 mm	140 g
CO.55/140 V2.0	200 08 0004	□ 14.0 mm	44 x 44 x 38 mm	145 g
CO.55/160 V2.0	200 08 0008	□ 16.0 mm	44 x 44 x 40 mm	150 g
CO.55/190 V2.0	200 08 0007	□ 19.0 mm	66 x 66 x 48 mm	380 g

Specification SONOFLOW (with Handle)	Order-No.	Measuring channel (CH x CW)	Dimensions L x W x H [Height without handle]	Weight
CO.55/230H V2.0	200 08 0047	□ 23.0 mm	66 x 75 x 72 [51] mm	510 g
CO.55/260H V2.0	200 08 0049	□ 26.0 mm	66 x 75 x 75 [54] mm	520 g
CO.55/300H V2.0	200 08 0076	□ 30.0 mm	66 x 75 x 79 [58] mm	510 g
CO.55/340H V2.0	200 08 0050	30.0 x 34.0 mm	66 x 75 x 79 [58] mm	510 g

## Tubing properties

**Material:** PVC, Silicone, PTFE, PFA, FEP, TPE, Tygon, PE, etc.  
**Outer diameter:** ≈ 4 mm ... 35 mm

	<p><b>Note</b></p> <p>The listed tubes are examples for frequently used tubes and the given OD and ID are guiding values. The sensors are also applicable for further tubing diameters, up to 2". The selection of the right sensor depends on tubing dimensions as well as on tubing properties. If possible, provide us with a tubing sample.</p>
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**Sensors are factory calibrated with the highlighted tubing in the following list.**  
**Calibration to customer specific tubing upon request, please contact our sales team.**

Specification SONOFLOW	Tubing OD		Tubing ID		Wall thickness		Tubing
	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	
CO.55/035 V2.0	4.0 mm		3.0 mm		0.5 mm		PVC, Deutsch & Neumann™ 3500304
	3.96 mm	5/32" 0.1563"	0.79 mm	1/32" 0.031"	1.6 mm	1/16" 0.0625"	Platinum-Cured Silicone, Cole-Parmer® L/S 13, Masterflex®
CO.55/044 V2.0	5.0 mm		3.0 mm		1.0 mm		PVC, ESSKA, 702101031099
	4.76 mm	3/16" 0.1875"	1.6 mm	1/16" 0.0625"	1.6 mm	1/16" 0.0625"	Platinum-Cured Silicone, Cole-Parmer® L/S 14, Masterflex®
CO.55/060 V2.0	7.0 mm		5.0 mm		1.0 mm		PVC, ESSKA, 702101051099
	6.35 mm	1/4" 0.25"	3.18 mm	1/8" 0.125"	1.6 mm	1/16" 0.0625"	Platinum-Cured Silicone, Cole-Parmer® L/S 16, Masterflex®
CO.55/080 V2.0	9.0 mm		6.0 mm		1.5 mm		PVC, ESSKA, 702101061599
	9.53 mm	3/8" 0.375"	6.35 mm	1/4" 0.25"	1.6 mm	1/16" 0.0625"	Platinum-Cured Silicone, Cole-Parmer® L/S 17, Masterflex®
CO.55/100 V2.0	12.0 mm		9.0 mm		1.5 mm		PVC, ESSKA, 702101091550
	11.13 mm	7/16" 0.438"	6.35 mm	1/4" 0.25"	2.39 mm	3/32" 0.0938"	Platinum-Cured Silicone, Cole-Parmer® L/S 24, Masterflex®
CO.55/120 V2.0	14.0 mm		10.0 mm		2 mm		PVC, ESSKA, 702101102050
	14.29 mm	9/16" 0.563"	9.53 mm	3/8" 0.375"	2.39 mm	3/32" 0.0938"	Platinum-Cured Silicone, Cole-Parmer® L/S 36, Masterflex®
CO.55/140 V2.0	16.0 mm		12.0 mm		2 mm		PVC, ESSKA, 702101122050
	15.88 mm	5/8" 0.625"	9.53 mm	3/8" 0.375"	3.18 mm	1/8" 0.125"	Platinum-Cured Silicone, Cole-Parmer® I/P 73, Masterflex®
CO.55/160 V2.0	19.0 mm		14.0 mm		2.5 mm		PVC, ESSKA, 702101142550
	19.05 mm	3/4" 0.75"	12.7 mm	1/2" 0.5"	3.18 mm	1/8" 0.125"	Platinum-Cured Silicone, Cole-Parmer® I/P 82, Masterflex®
CO.55/190 V2.0	22.0 mm		16.0 mm		3 mm		PVC, ESSKA, 702101163050
	22.23 mm	7/8" 0.875"	15.88 mm	5/8" 0.625"	3.18 mm	1/8" 0.125"	Platinum-Cured Silicone, Saint Gobain, Sani-Tech® STHT®-C-625-4
CO.55/230H V2.0	25.4 mm	1"	15.88 mm	5/8" 0.625"	4.76 mm	3/16" 0.1875"	Platinum-Cured Silicone, Saint Gobain, Sani-Tech® STHT®-C-625-5
CO.55/260H V2.0	28.56 mm	1 1/8" 1.125"	19.05 mm	3/4" 0.75"	4.76 mm	3/16" 0.1875"	Platinum-Cured Silicone, Saint Gobain, Sani-Tech® STHT®-C-750-5
CO.55/300H V2.0	31.75 mm	1 1/4" 1.25"	19.05 mm	3/4" 0.75"	6.35 mm	1/4" 0.25"	Platinum-Cured Silicone, Cole-Parmer® I/P 91, Masterflex®
CO.55/340H V2.0	34.93 mm	1 3/8" 1.375"	25.4 mm	1"	4.76 mm	3/16" 0.1875"	Platinum-Cured Silicone, Saint Gobain, Sani-Tech® STHT®-C-1000-5

**Manufacturers:**

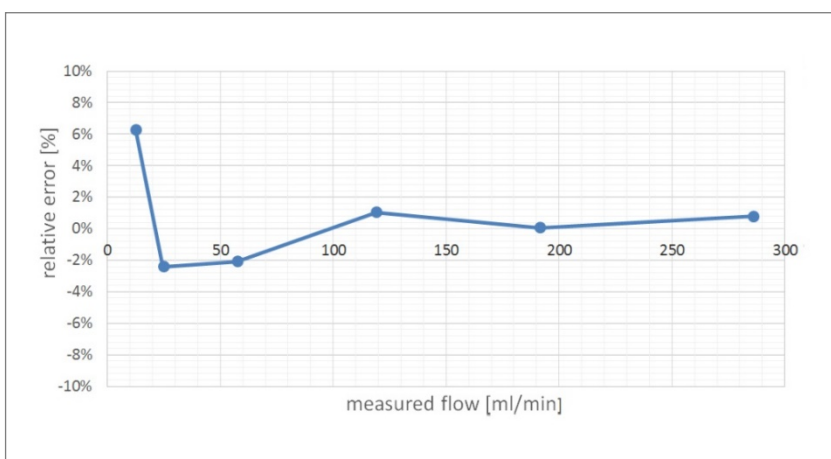
PVC Tubing: Deutsch & Neumann GmbH, 10585 Berlin (Germany); ESSKA.de GmbH, 20537 Hamburg (Germany)  
 Silicone Tubing: Cole-Parmer®, Vernon Hills, IL 60061 United States; Saint Gobain Performance Plastics, Solon, OH 44139

## Accuracy

Specification SONOFLOW	Upper range value	Accuracy for water: adjusted at 23 °C ± 2 K and 1 bar on specified tube (listed)	
CO.55/035 V2.0	3 000 ml/min	0 ... 300 ml/min: ± 6 ml/min	300 ... 3 000 ml/min: ± 2 %
CO.55/044 V2.0	5 000 ml/min	0 ... 500 ml/min: ± 10 ml/min	500 ... 5 000 ml/min: ± 2 %
CO.55/060 V2.0	6 000 ml/min	0 ... 600 ml/min: ± 12 ml/min	600 ... 6 000 ml/min: ± 2 %
CO.55/080 V2.0	8 000 ml/min	0 ... 800 ml/min: ± 16 ml/min	800 ... 8 000 ml/min: ± 2 %
CO.55/100 V2.0	10 000 ml/min	0 ... 1 000 ml/min: ± 20 ml/min	1 000 ... 10 000 ml/min: ± 2 %
CO.55/120 V2.0	12 000 ml/min	0 ... 1 200 ml/min: ± 24 ml/min	1 200 ... 12 000 ml/min: ± 2 %
CO.55/140 V2.0	14 000 ml/min	0 ... 1 400 ml/min: ± 28 ml/min	1 400 ... 14 000 ml/min: ± 2 %
CO.55/160 V2.0	18 000 ml/min	0 ... 1 800 ml/min: ± 36 ml/min	1 800 ... 18 000 ml/min: ± 2 %
CO.55/190 V2.0	40 000 ml/min	0 ... 4 000 ml/min: ± 80 ml/min	4 000 ... 40 000 ml/min: ± 2 %
CO.55/230H V2.0	50 000 ml/min	0 ... 5 000 ml/min: ± 100 ml/min	5 000 ... 50 000 ml/min: ± 2 %
CO.55/260H V2.0	70 000 ml/min	0 ... 7 000 ml/min: ± 140 ml/min	7 000 ... 70 000 ml/min: ± 2 %
CO.55/300H V2.0	100 000 ml/min	0 ... 10 000 ml/min: ± 200 ml/min	10 000 ... 100 000 ml/min: ± 2 %
CO.55/340H V2.0	140 000 ml/min	0 ... 14 000 ml/min: ± 280 ml/min	14 000 ... 140 000 ml/min: ± 2 %

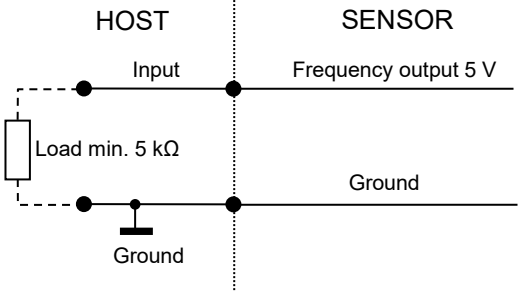
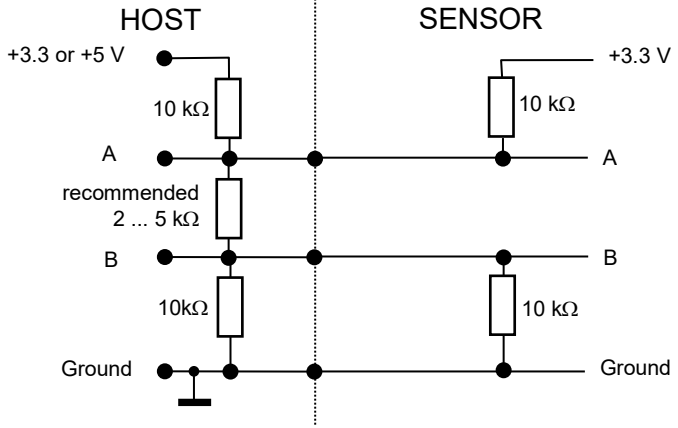
## Accuracy and calibration

Example for accuracy of **SONOFLOW CO.55/035** in the lower flow range, achieved by calibration to customer specific conditions:



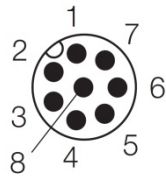
**Technical data**

SONOFLOW CO.55/xxx(H) V2.0 Flow Sensor for liquids	
<b>Measuring method</b>	Ultrasound, two sections of measurements, dry coupling, no couplant required
<b>Calibration</b>	Sensors are factory calibrated for water at 23 °C ± 2 K, tube end depressurized (0 bar); other calibration (to customer tubing, fluid, flow range, temperature) on request
<b>Mounting</b>	Fixed installation: CO.55/xxx V2.0 M4, 8 mm deep 4 fixing holes CO.55/xxxH V2.0 M5, 10 mm deep
<b>Media</b>	Water, human blood or other acoustically transparent liquids
<b>Sensor materials</b>	Measuring channel: PMMA black Housing: aluminium, anodized grey/red (optional: stainless steel, plastics)
<b>Operating voltage</b>	12 ... 30 VDC, maximum ripple 10 %, protection against reverse-polarity
<b>Current consumption</b>	Maximum 30 mA (with open current, frequency and switching output)
<b>Electrical connection</b>	8-pin M12 Connector, DIN EN 61076-2-101:2012
<b>Shielding</b>	Required: via cable / housing (mounting screws)
<b>Interfaces</b>	<ul style="list-style-type: none"> <li>• Current output for flow rate: 0/4 ... 20 mA</li> <li>• Frequency output for flow rate: 0 ... 20 kHz, 5 V digital</li> <li>• RS485 interface: bus-capable</li> <li>• Switching output: configurable as PNP / NPN / Push-Pull, 0 ... 30 V</li> <li>• Digital input</li> </ul>
<b>Current output for flow rate</b>	<p>⚠ <b>NOTE:</b> 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</p>

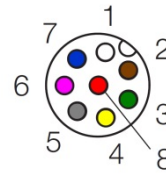
<b>Frequency output for flow rate</b>	
<b>RS485 interface</b>	<p>Half-duplex operation / 115.200 baud / no parity / 1 stop bit / no handshaking</p> <p>⚠ <b>NOTE:</b> Please find the description of the serial protocol for details (upon request).</p>  <p>Recommended electrical connection of the RS 485 interface</p> <p>⚠ <b>CAUTION!</b> If the interface is not used, it does not necessarily has to be connected; the two pins A and B can remain open.</p>
<b>RS485 Bus operation</b>	<p>The sensor supports bus operation with max. 12 subscribers. The default address is #1.</p> <p>⚠ <b>NOTE:</b> The address can be changed with the help of the SONOFLOW Monitor. Permitted are addresses from #01 ... #12. → Menu: Identification   RS485 address</p>
<b>Switching output</b>	<p>Freely configurable: e.g. adapting batch process or threshold switch of flow, Maximum 100 mA</p>

<p><b>Digital input</b></p>	<p>Freely configurable: for example for zero point calibration of flow or start dosing processes</p> <p>Voltage resistant up to 30 V</p> <div data-bbox="507 412 1043 712" data-label="Diagram"> </div>
<p><b>Ambient- / Media temperature</b></p>	<p>0 ... 60 °C, other temperatures available on request</p>
<p><b>Storage temperature</b></p>	<p>-20 ... +70 °C</p>
<p><b>Protection class</b></p>	<p>IP65</p>
<p><b>Directives and standards</b></p>	<ul style="list-style-type: none"> <li>• EMC directive 2004/108/EG</li> <li>• RoHS: 011/65/EU, exception: III 7cI/ IV 15</li> <li>• Acoustic emission: IEC 61157</li> </ul>
<p><b>Maintenance</b></p>	<p>Maintenance-free</p>
<p><b>Scope of delivery</b></p>	<ul style="list-style-type: none"> <li>• SONOFLOW CO.55/xxx V2.0 according to specification</li> <li>• User documentation</li> </ul>
<p><b>Optional accessories</b></p>	<ul style="list-style-type: none"> <li>• 8-pin M12 sensor cable, length 2 m / 5 m</li> <li>• Calibration protocol</li> </ul> <p>SONOFLOW Monitor for setting parameters and recording measurements consisting of</p> <ul style="list-style-type: none"> <li>• USB Data Converter, type 013 for the connection to a computer</li> <li>• Power supply unit (24 VDC)</li> <li>• 8-pin M12 connecting cable, length 2 m</li> <li>• USB cable, type A-B, length 2 m</li> <li>• CD with Software SONOFLOW Monitor and driver for Windows</li> </ul>

## Electrical Connection



Male connector  
(at the sensor)



Female connector  
(at the cable)

M12 connecting cable	Pin	Colour	Connection
<b>Assignment</b>	1	White	Ground
	2	Brown	Operating voltage +12 ... 30 VDC
	3	Green	Current output (0/4 ... 20 mA)
	4	Yellow	RS485 B
	5	Grey	RS485 A
	6	Pink	Frequency output 0 ... 20 kHz
	7	Blue	Switching output: PNP / NPN / Push-Pull
	8	Red	Digital input



Technical drawings

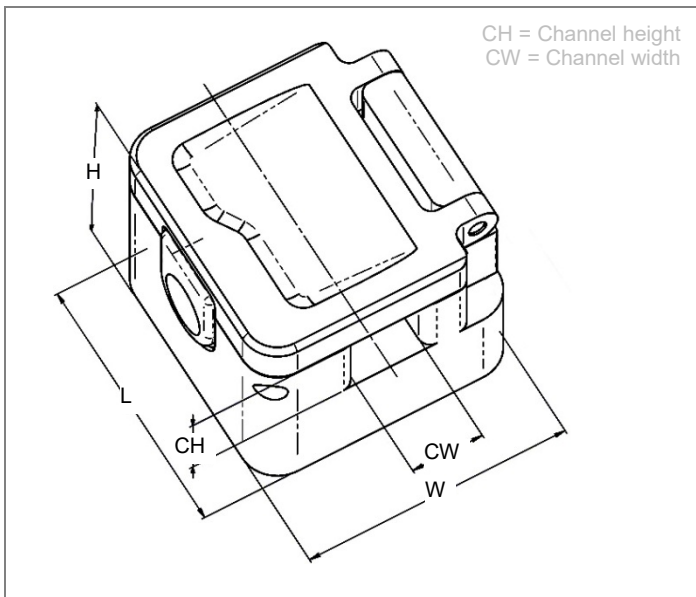


Figure 1: Dimensions SONOFLOW CO.55/xxx V2.0

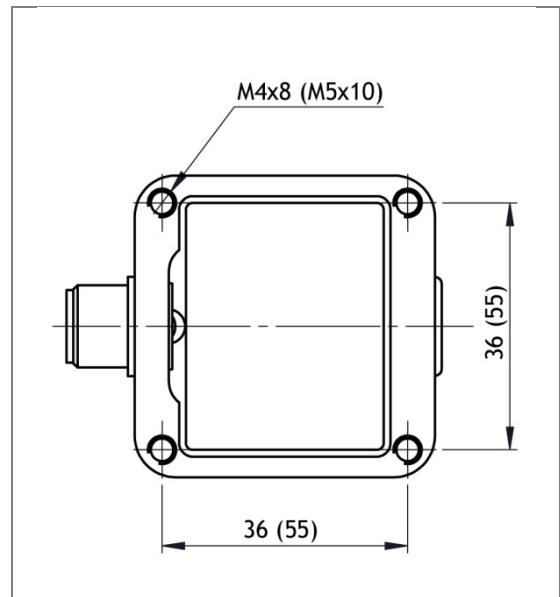


Figure 2: Rear side with drill holes for mounting (dimensional deviation SONOFLOW CO.55/190 V2.0)

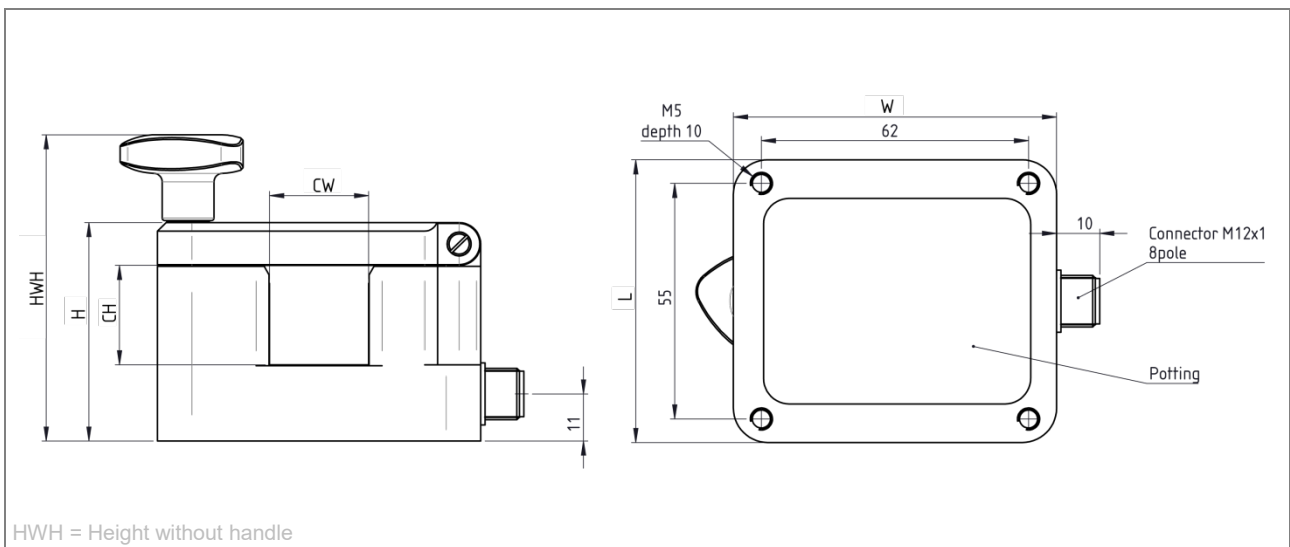


Figure 3: Dimensions SONOFLOW CO.55/xxx V2.0/xxxH V2.0

Drawings are not to scale. Information is subject to change without notice!

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