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

The sensors have no contact to the medium or product. With stainless steel housing they are suitable for applications in fields with strict hygienic standards e.g. the medical technology, biotechnology and pharmaceutical industry as well as chemical and semiconductor industry. 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/xxxSD V2.0** sensors with complete built-in electronics can be installed in machines or apparatuses. The display shows the current flow rate and the measuring state.

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.55/035SD V2.0	200 08 0036	3.5 mm	44 x 64 x 29 mm	380 g
CO.55/060SD V2.0	200 08 0032	6.0 mm	44 x 64 x 31 mm	420 g
CO.55/100SD V2.0	200 08 0030	10.0 mm	44 x 64 x 36 mm	480 g
CO.55/160SD V2.0	200 08 0031	16.0 mm	44 x 64 x 43 mm	540 g

Tubing properties

Material: PVC, Silicone, PTFE, PFA, FEP, TPE, Tygon, PE, etc.
Outer diameter: 4 mm … 22 mm

The selection of the right sensor depends on tubing dimensions as well as on tubing properties. If possible, please provide us with a tubing sample. The sensors are also applicable for further tubing diameters, up to 2". Please note that the given OD and ID are guide values.

Sensor	Tubing OD	Tubing ID	Tubing material	Product ID of tube manufacturer
CO.55/035SD V2.0	5/32"	1/32"	Silicone	PHI-031x156 *
	4.0 mm	3.0 mm	PVC [1]	3500304 ***
CO.55/060SD V2.0	6.4 mm	3.2 mm	Silicone, PVC	PHI-1.6MMx6.4MM *
	1/4"	1/8"	Silicone, PVC	PHI-125x250 *
	7.0 mm	5.0 mm	PVC [1]	702101051099 **
CO.55/100SD V2.0	7/16"	1/4"	Silicone, PVC, TPE	PHI-250x437 *
	12.0 mm	9.0 mm	PVC [1]	702101091550 **
CO.55/160SD V2.0	18.8 mm	12.8 mm	Silicone, PVC, TPE	PHI-12.4MMx18.8MM *
	3/4"	1/2"	Silicone, PVC, TPE	PHI-500x750 *
	19.0 mm	14.0 mm	PVC [1]	702101142550 **

[1] Sensors are factory calibrated with the highlighted tubing.
Calibration to all the listed tubing upon request, please inform our sales team.

Special calibration to customer specific tubing is available.

Manufacturer:

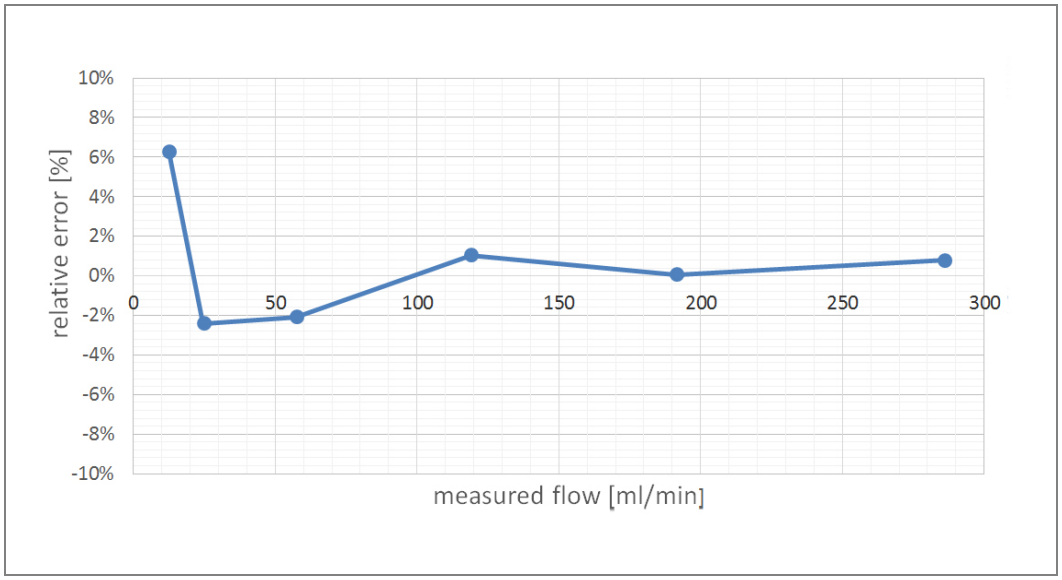
* TBL Performance Plastics, New Jersey 07871 (USA); ** ESSKA.de GmbH, 20537 Hamburg (Germany);
*** Deutsch & Neumann GmbH, 10585 Berlin (Germany)

Accuracy

Specification SONOFLOW	Upper range value	Accuracy for water: adjusted at 23 °C ± 2 K and 1 bar on specified tube	
CO.55/035SD V2.0	3 000 ml/min	0 … 300 ml/min: ± 6 ml/min	300 … 3 000 ml/min: ± 2 %
CO.55/060SD V2.0	6 000 ml/min	0 … 600 ml/min: ± 12 ml/min	600 … 6 000 ml/min: ± 2 %
CO.55/100SD V2.0	10 000 ml/min	0 … 1 000 ml/min: ± 20 ml/min	1 000 … 10 000 ml/min: ± 2 %
CO.55/160SD V2.0	16 000 ml/min	0 … 1 600 ml/min: ± 32 ml/min	1 600 … 16 000 ml/min: ± 2 %

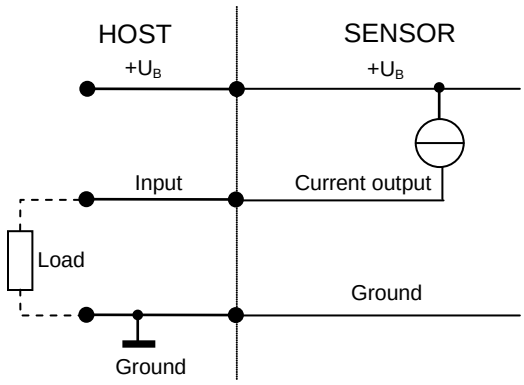
Accuracy and calibration

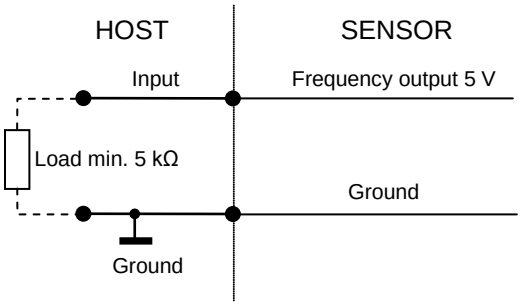
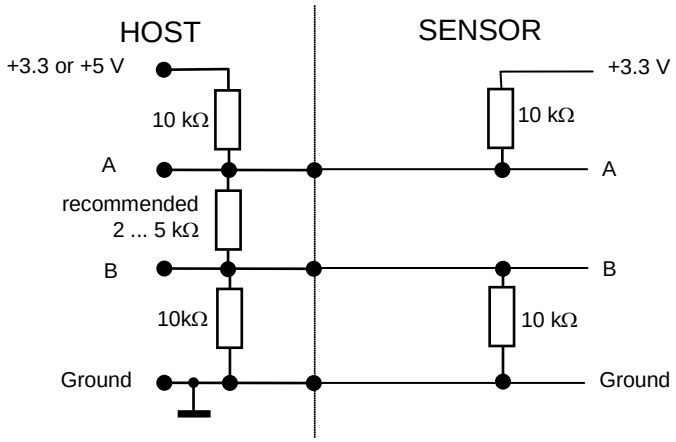
Example for accuracy of **SONOFLOW CO.55/035SD** in the lower flow range, achieved by calibration to customer specific conditions:

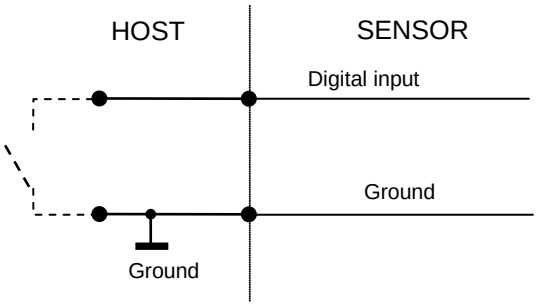


Accuracy depends on tubing, temperature, fluid properties and other conditions. Calibration to customer tubing, fluid, flow range, temperature, etc. on request.

Technical data

SONOFLOW CO.55/xxxSD V2.0 **Flow Sensor for liquids**	
Measuring method	Ultrasound, two sections of measurements, dry coupling, no couplant required
Calibration	Sensors are factory calibrated for water at 23 °C ± 2 K, tube end depressurized (0 bar); other calibration on request
Mounting	Fixed installation: 4 fixing holes M4, 8 mm deep, tube fixed with sensor lid
Media	Water, human blood or other acoustically transparent liquids
Sensor materials	Measuring channel: PMMA black, Display protection: PMMA transparent, Housing: stainless steel 1.4305
Operating voltage	12 ... 30 VDC, maximum ripple 10 %, protection against reverse-polarity
Current consumption	Maximum 30 mA (with open current, frequency and switching output)
Electrical connection	8-pin M12 Connector, DIN EN 61076-2-101:2012
Shielding	Required: via cable / housing (mounting screws)
Interfaces	• Current output for flow rate: 0/4 … 20 mA • Frequency output for flow rate: 0 … 20 kHz, 5 V digital • RS485 interface: bus-capable • Switching output: configurable as PNP / NPN / Push-Pull, 0 … 30 V • Digital input
Current output for flow rate	⚠ **NOTE:** 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 

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

Digital input	Freely configurable: for example for zero point calibration of flow or start dosing processes Voltage resistant up to 30 V
	
Ambient- / Media temperature	0 ... 60 °C, other temperatures available on request
Storage temperature	-20 ... +70 °C
Protection class	IP65
Directives and standards	• EMC directive 2004/108/EG • RoHS: 011/65/EU, exception: III 7cI/ IV 15 • Acoustic emission: IEC 61157
Maintenance	Maintenance-free
Scope of delivery	• SONOFLOW CO.55/xxxSD V2.0 according to specification • User documentation
Optional accessories	• 8-pin M12 sensor cable, length 2 m / 5 m • Calibration protocol
	SONOFLOW Monitor for setting parameters and recording measurements consisting of • USB Data Converter, type 013 for the connection to a computer • Power supply unit (24 VDC) • 8-pin M12 connecting cable, length 2 m • USB cable, type A-B, length 2 m • CD with Software SONOFLOW Monitor and driver for Windows

Display

Start screen:

- displayed for 5 seconds
- shows all information about the identity of sensor

Measuring screen:
(Indication of units adaptable with SONOFLOW Monitor)

- shows the current flow rate and the measuring state
- in intervals of 30 seconds the internal temperature of sensor is displayed

Note: The internal temperature differs from the medium temperature

The displayed information can be customized via software settings. Possible: various units, volume or running time

Error screen:

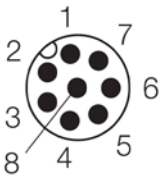
- shows error codes

In case of displayed error codes contact the manufacturer.

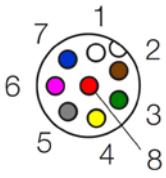
Technical data display

Format	128 x 64 Dots
Colour	White
Viewing area (W x H)	23.7 x 12.8 mm

Electrical connection



Male connector
(at the sensor)



Female connector
(at the cable)

M12 connecting cable	Pin	Colour	Connection
Assignment	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

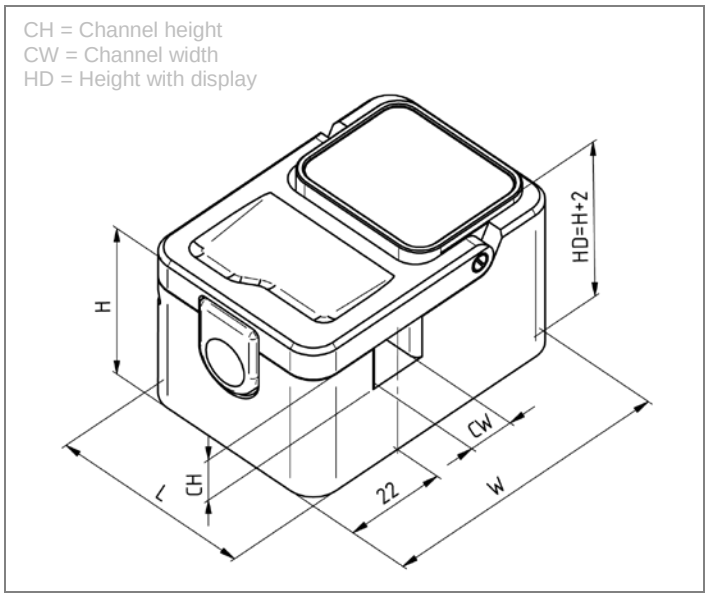


Figure 1: Dimensions SONOFLOW CO.55/xxxSD V2.0
(The drawings are not to scale)

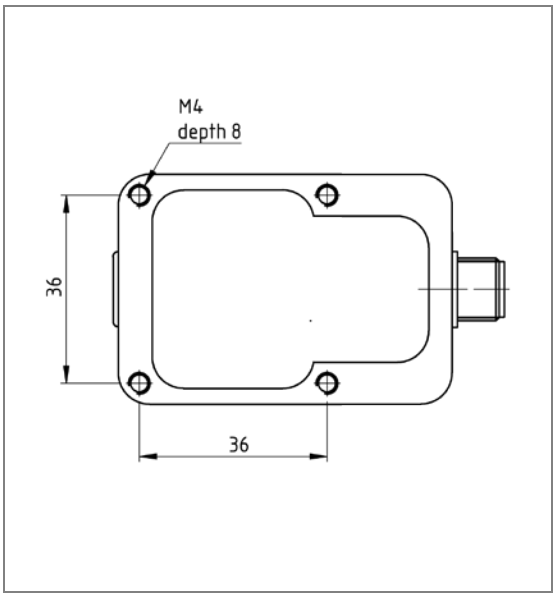


Figure 2: Rear side with drill holes for mounting

Information is subject to change without notice!

HEADQUARTERS GERMANY

SONOTEC
Ultraschallsensorik Halle GmbH
Nauendorfer Str. 2
06112 Halle (Saale), Germany

Tel.: +49 (0)345 / 133 17- 0
sales_eu@sonotec.de
www.sonotec.eu

AMERICAS

SONOTEC US Inc.
190 Blydenburgh rd
Suite 8 2nd floor
Islandia, New York 11749, USA

Phone: +1 631 / 415 4758
sales@sonotecusa.com
www.sonotecusa.com