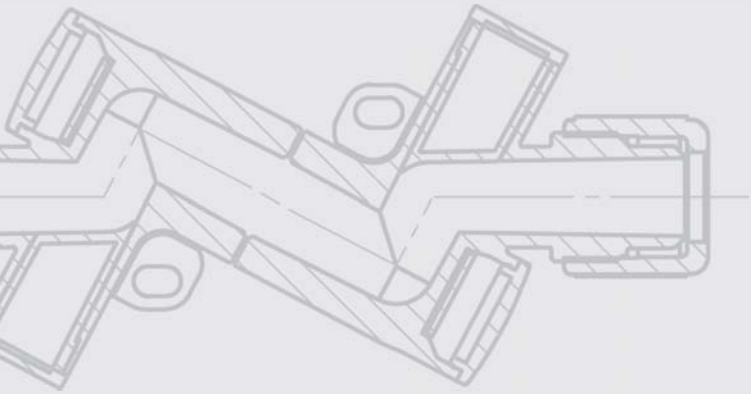
CleanStar® SonicLine®

High Purity PFA Ultra-Sonic Flow Measurement Devices

Product overview and technical data



New!

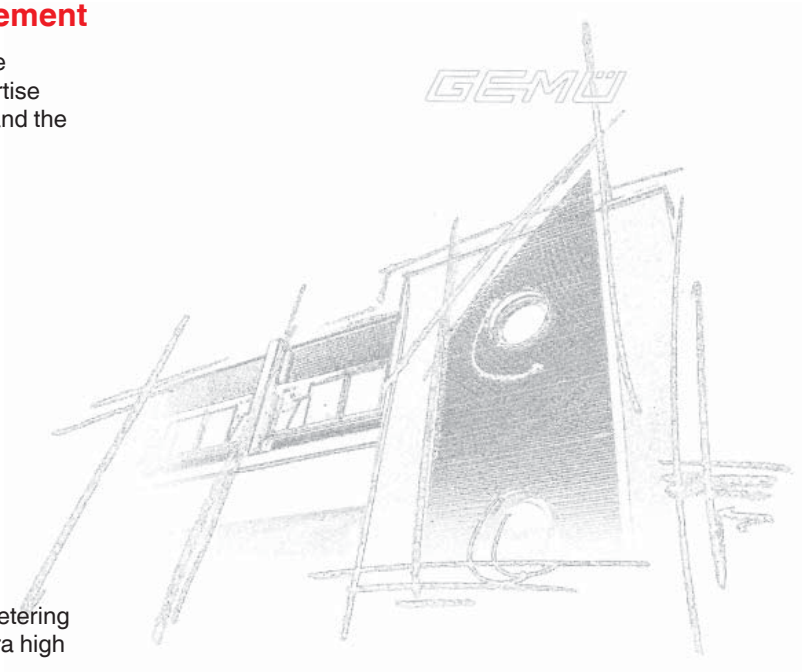
Extended low flow measuring range
⅜" unit:
0.03 - 6 l/min.

GEMÜ® VALVES, MEASUREMENT AND CONTROL SYSTEMS

Synergy effects used and translated into practice - *SonicLine*®

Contactless ultra-sonic flow measurement

GEMÜ has combined many years of experience in the manufacture of High Purity PFA Valves, with the expertise of a leading producer of flow measurement systems and the result is ***SonicLine***®.

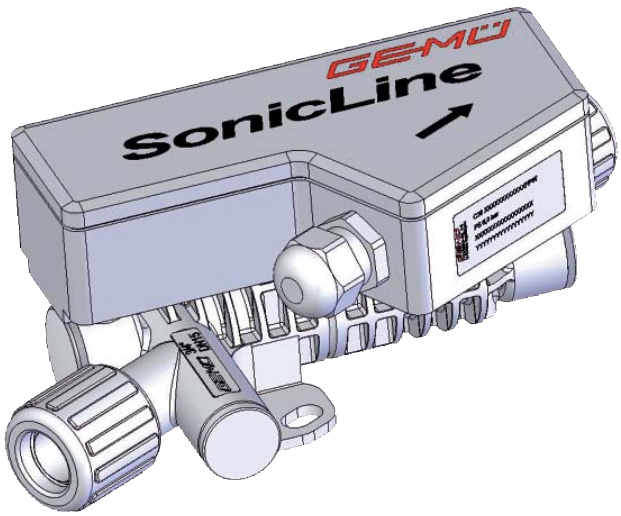


Your applications

- Continuous flow measurement
- Dosing and batching
- Flow control
- Wet benches
- Cleaning and etching installations

Our solution

A product range of ultra-sonic flowmeters with PFA metering tube, particularly suitable for flow measurement of ultra high purity chemicals and DI water - ***SonicLine***®.



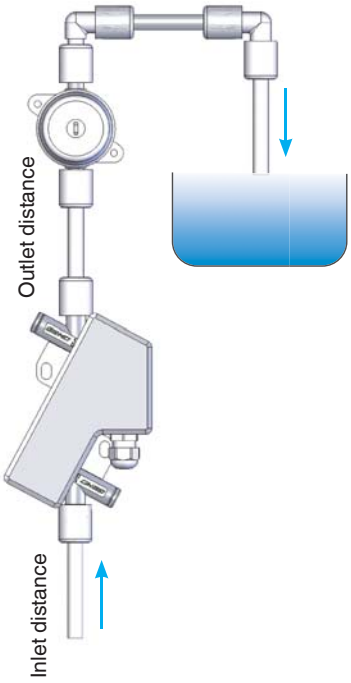
SonicLine® advantages at one glance

- Large dynamic range, typical value 1:100
- Reproducibility of measured values 0.5 %
- Accuracy of measured values ± 1 %
- Extremely fast detection of measured values (250 measured values/sec.)
- Free tube cross section – no moving parts
- Low pressure loss
- All medium wetted parts made of High Purity PFA
- Empty pipe monitoring with alarm connection
- Digital inputs and outputs
- Pulse and analog output
- EDP connection and data processing possible
- Process parameters freely programmable
- Compact measurement system
- Space-saving installation
- Proven design (beverage industry)
- Subject to low wear and low maintenance

Typical applications

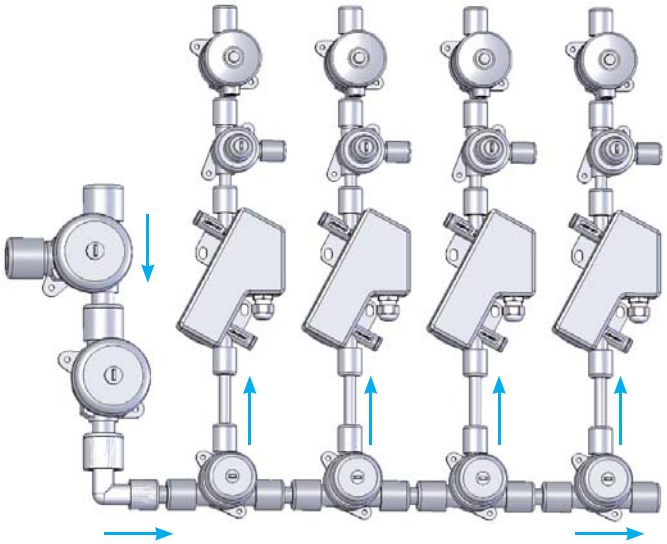
Dosing with *SonicLine*®

- On-Site-Mixing
- Batching
- Spiking
- Overflow control
- Process basin / recipe preparation in the chemical industry
- Automated / repeatable
- Complete, integrated dosing process control system
  - Preselection quantity is freely programmable
  - External pulse starts the dosing process
  - ***SonicLine***® gives a signal to the valve control system to open the valve
  - When the preselected volume is reached the valve is closed
  - ***SonicLine***® standby for next filling process



Continuous flow measurement, e.g. facility sector:

- Process monitoring also in very dynamic flow situations
- Controlling of specified plant consumption values
- Measurement of consumption values as a basis for the logistics of inventories
- Leakage monitoring
- Empty tube monitoring
- Monitoring of 2 flow limiting values



Measurement principle and functionality

- Two sensors in opposite position reciprocally send and receive ultra-sonic signals.
- With a standing medium, both sensors receive the sent ultra-sonic signals within the same phase, i.e. no difference in phase occurs
- With a flowing medium a phase shifting takes place
- This phase difference is directly proportional to the flow velocity (v)
- The flow volume is determined from the flow velocity and the pipe diameter (D)

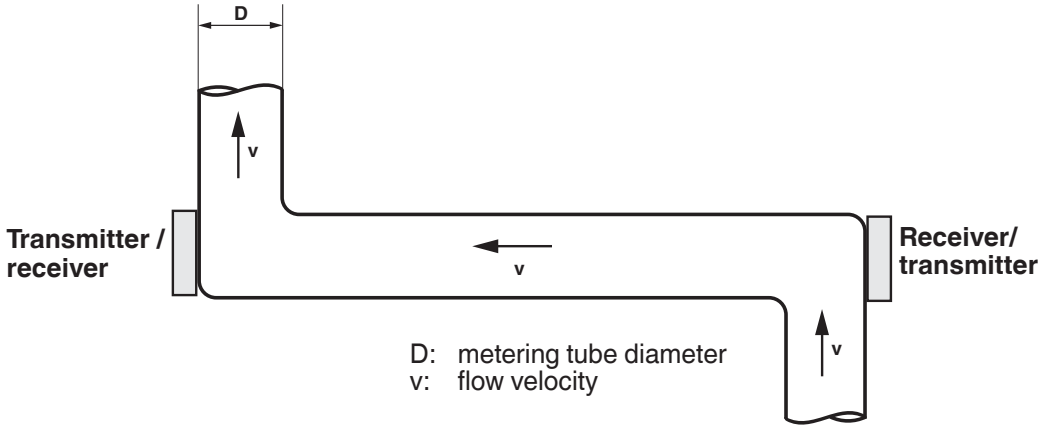
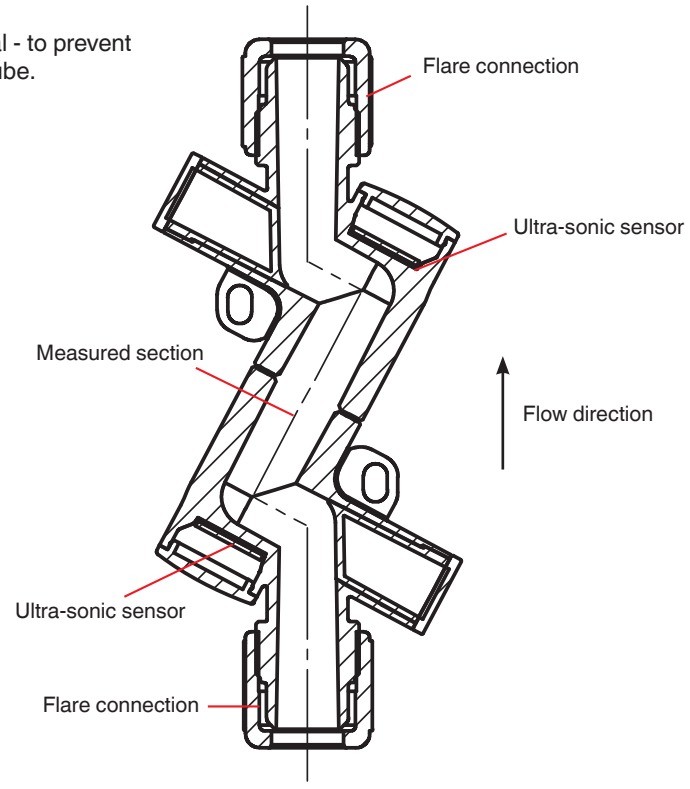


Fig: Presentation of the ultra-sonic flow measurement principle

Metering tube design

Preferred mounting position: vertical - to prevent gas accumulation in the metering tube.



Sectional drawing of the ***SonicLine***® metering tube

Technical data

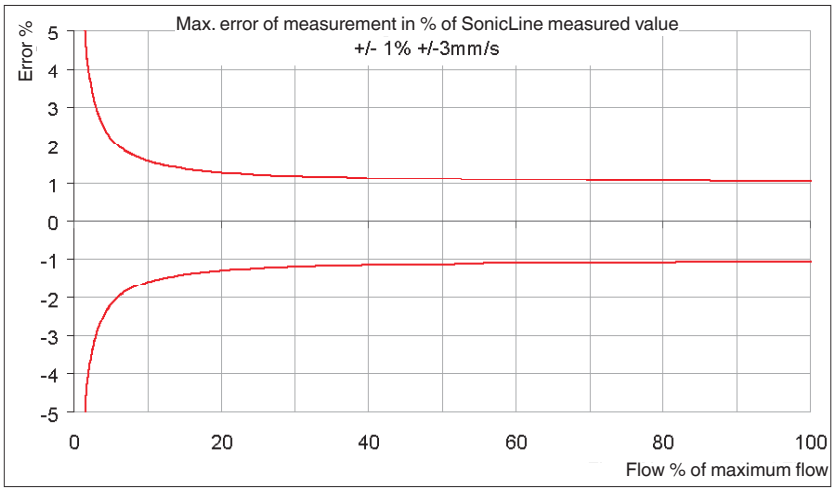
Overview - *SonicLine*® C38						
Connection	Nominal size Inch	DN	Measuring range ml/s	Measuring range l/min	Kv value [m^3/h]	Cv value [gal/min]
Flare connection	⅜	6	1.5 - 100	0.09 - 6	0.70	0.82
	½	10	5 - 400	0.3 - 24	1.65	1.93
	¾	15	15 - 1000	0.9 - 60	4.34	5.07
	1	20	20 - 2000	1.2 - 120	8.80	10.30

New: Extended low flow measuring range:

Nominal size Inch	DN	Measuring range ml/s	Measuring range l/min	Kv value [m^3/h]	Cv value [gal/min]
⅜	6	0,5 - 100	**0,03 - 6**	0,70	0,82

The ***SonicLine***® flowmeter meets the EMC requirements EN 50081 part ½ and EN 50082 part ½.
It complies with the requirements of the EC directives and carries the CE mark.

Error of measurement, water 20°C



Calibration via configuration software (***Flow Soft***®) may be necessary for other media and operating temperatures.
The GEMÜ USB converter C38000ZC23C10 is required for this.

Technical data

Working medium

Corrosive, inert, liquid media - particularly high purity media- which have no negative impact on the physical and chemical properties of the metering tube material

Operating pressure

Max. 6 bar

Operating temperature

Ambient temperature	0° to +60° C
Medium temperature	0° to +60° C
Storage temperature	-20° to +60° C

Materials

Electronics housing material	PP
Metering tube material	PFA

Flow direction

Flow direction acc. to arrow on housing

General information

Protection class to EN 60259	IP 65	
Mounting position* - vertical riser pipe recommended - with horizontal mounting position the flowmeter must be mounted rising in flow direction		
Inlet distance	⅜"	5 cm
	½"	5 cm
	¾"	40 cm
	1"	100 cm
Outlet distance	⅜"	0 cm
	½"	0 cm
	¾"	20 cm
	1"	20 cm
min. backpressure at outlet		0.3 bar
Special feature	filled pipelines required	

*Note: Select the mounting position so that gas bubbles can escape from the flowmeter independently.

Electrical data

Power supply

Power supply	Uv = 24V DC
Power consumption	3.6 W

Output signals

Analog output

Analog output	0/4-20 mA / active (Version U41) 0-10 V / active (Version U11)

Digital outputs

Output 1	Open Collector (NPN)
Output 2	Open Collector (NPN)
Switching voltage	max. 30V DC
Switching current	max. 80 mA (optocoupler)
Pulse rate	max. 2 kHz

Function

The function of the 2 outputs can be set using the **FlowSoft®** configuration software.
- alarm output, - pulse output, - dosing output
For inductive load a free-wheeling diode must be built in parallel to the coil. A pull up resistor may be necessary for connection to a PLC.

Input signals

Digital inputs

Input 1	24V DC

Electrical connection

Input/output signals	10-core cable with total shield
Cable length	5 m (PTFE coated)

Measurement data

Measuring range for pos. flow direction (in arrow direction)

⅜"	0.5...100 ml/s	0.03...6 l/min
⅜"	1.5...100 ml/s	0.09...6 l/min
½"	5...400 ml/s	0.3...24 l/min
¾"	15...1000 ml/s	0.9...60 l/min
1"	20...2000 ml/s	1.2...120 l/min

Accuracy/Reproducibility

Reference condition	Factory calibration with water at 20° C
Accuracy	± 1% v.M ± 3 mm/s
Reproducibility	0.5%
Parameterisation	By **converter** and **FlowSoft®** configuration software (not included in the scope of delivery

Interfaces

PC Interface	RS 485 (Parameterisation by RS 485 / USB converter and **FlowSoft®** configuration software)

Electrical connection

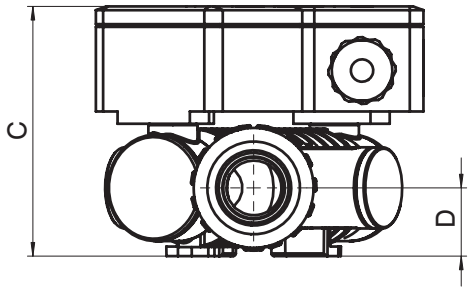
Color	Function	Color	Function
Red	Uv, 24V DC supply voltage	Violet	I+/U+ analog output
Black	Uv, GND supply voltage, input 1	Blue	I-/U- analog output
Brown	U+, output 1 (pulse output*/dosing output)	Yellow	RS 485 A
Orange	U+, output 2 (alarm output)	Green	RS 485 B
Grey	U-, GND output 1, output 2	White	Input 1 (dosing start)

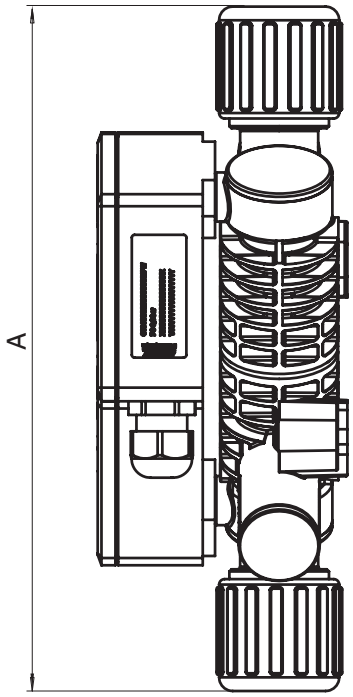
Shield must be connected to earth ground in the control cabinet.

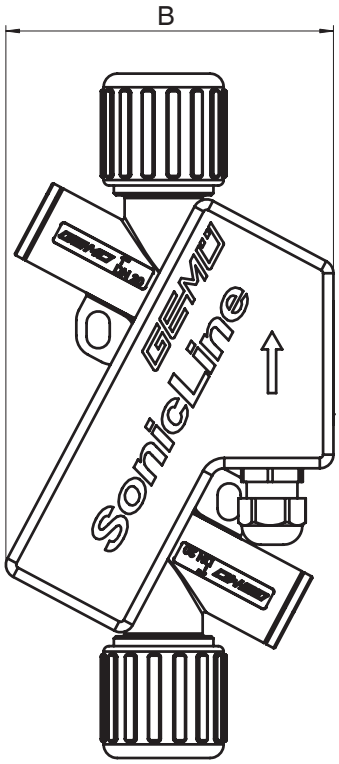
* Factory setting

Dimensions and weight

Nominal size	A [mm]	B [mm]	C [mm]	D [mm]	Weight [kg]
⅜“	218.0	120.0	79.0	16	1.3
½“	219.5	120.0	79.0	16	1.3
¾“	227.0	120.0	82.0	19	1.3
1“	251.0	120.0	91.5	25	1.6







Order data

Nominal size		Code
3/8"	(DN 6)	6
1/2"	(DN 10)	8
3/4"	(DN 15)	12
1"	(DN 20)	16

Body configuration	Code
Straight through	D

Connection	Code
Flare connection with C-PFA union nut	73
Flare connection with PVDF union nut	75
Flare connection with PFA union nut	77

Body material	Code
PFA, Perfluoralkoxy	30

Device version	Code
Measuring transducer 0 - 10V 1 pulse output, 1 switching output, 1 switching input	U11
Measuring transducer 0/4 - 20 mA 1 pulse output, 1 switching output, 1 switching input	U41

Option	Code
None	00

Voltage/Frequency	Code
24V DC	C1

Measuring range	Code
3/8" (DN 6) 0.03...6 l/min	AL

Version	Code
High Purity White	HPW

Order example	C38	6	D	75	30	U41	00	C1	AL	HPW
Type	C38									
Nominal size (code)		6								
Body configuration (code)			D							
Connection (code)				75						
Body material (code)					30					
Device version (code)						U41				
Option (code)							00			
Voltage/Frequency (code)								C1		
Measuring range (optional) (code)									AL	
High Purity White (code)										HPW

GEMÜ C38000ZC23C10
converter for C38 ***SonicLine***®
(incl. ***FlowSoft***®, USB cable and power supply unit)

For further flowmeters, High Purity products, accessories and other products, please see our Product Range catalog and Price List. Contact GEMÜ.

GEMÜ® VALVES, MEASUREMENT AND CONTROL SYSTEMS

TÜV CERT DIN EN ISO 9001 Zertifikat: 09 100 4136

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Subject to alteration · 10/2008 · 88303254