

Micro Flow Meter

Mastering smallest volume flows with precision



Overview

- For Water, Milk, Coffee, Soft Drinks *and many others*
- Accuracy $\pm 2\%$ of measured value
- **Push-In Fitting** Connection U & Z shaped
- **Food Approved** Design & Materials
- **Analogue & Bus** Communication
- Integrated **Temperature Sensor**
- Ultrasonic **High-Speed Temperature** Measurement
- **Gas Bubble** Detection

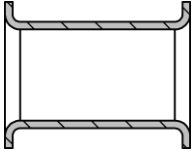
Operating conditions

Media	Water, Sparkling Water, Milk, Coffee, Soft Drinks <i>and many others</i>
Operating temperature	0 – 105 °C
Operating pressure	0 – 16 bar
Over temperature	120 °C < 5 min
Over pressure	25 bar
Burst pressure	40 bar
IP code	acc. to IP 44
Relative humidity	$\leq 95\%$ rh
Lifetime	> 12 years

Compliance

CE Marking	Compliant to all applicable EU Directives (EMC, RoHS, PED)
REACH Regulation	Compliant
Food	All materials compliant with EU regulations 1935/2004, 10/2011, NSF51 and FDA
Drinking Water	All materials compliant with German FEA guidelines (UBA BWGL)

Materials

Wetted parts	PPS, Silicone Rubber (VMQ)		
Non-wetted parts	POM		
Tube Insert		Stainless Steel	Plastic
Wetted tube material		Stainless Steel 1.4301	PPS

Features

Gas Bubble Detection	Detect and quantify gas bubbles in liquid flow for timely intervention to prevent issues such as empty tanks or reservoirs.
High-Speed Temperature Measurement	Monitor highly dynamic temperature changes due to the fast response time of ultrasonic temperature measurement.
Liquid Identification	Identify liquids or detect changes, such as contamination, by analyzing their speed of sound characteristics.

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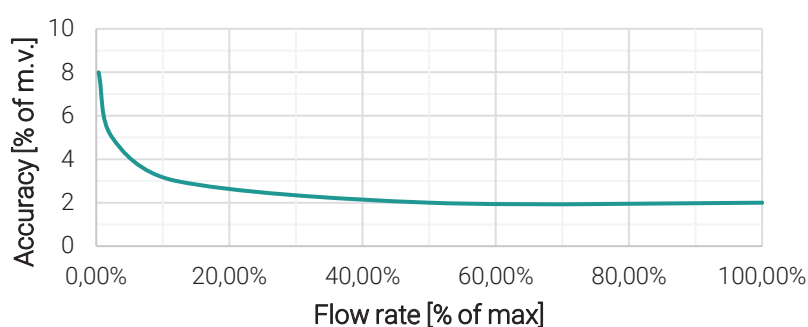
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ALLENGRA
Flow meters

Flow Measurement

Measurement technology	Ultrasonic	
Dimension	OD 6	OD 8
Measurement range	1 - 300 l/h	1 – 600 l/h
	0.02 - 5 l/min	0.02 – 10 l/min
	0.28 - 83.3 ml/s	0.28 – 166.7 ml/s
Accuracy	± 2 % of measured value *	
Repeatability	± 1 % of measured value	
Response time	< 0.1 s	

Accuracy funnel



* Accuracy specification per accuracy funnel, assuming turbulence-free flow conditions (refer to [installation notes](#)).

Temperature Measurement

Measurement element	PT1000 class B	
Measurement range	0 - 120 °C	
Variant	Stainless Steel Tube Insert	Plastic Tube Insert
Accuracy	± 1 K	± 3 K
Repeatability	± 0.15 K	± 0.3 K
Response time T_{90}	< 2 s	< 30 s

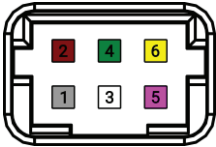
High-Speed Temperature Measurement

Measurement technology	Ultrasonic Transit Time
Measurement range	0 - 60 °C
Accuracy	± 3 K
Repeatability	± 1.5 K
Response time T_{70}	< 0.1 s
Response time T_{90}	< 0.25 s

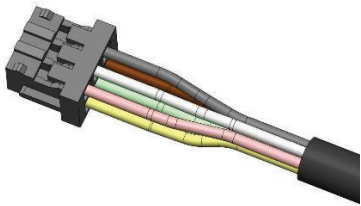
Electrical data

Power Supply	4.5 - 28 V
Current consumption	< 10 mA (< 40 mA during power up for 100 ms)

Electrical interface

Electrical connection	Female Hirose DF11-6DS-2C Socket																			
Pinout / Color-coding		<table><tr><td>1</td><td>GND</td><td>GRAY</td></tr><tr><td>2</td><td>VCC</td><td>BROWN</td></tr><tr><td>3</td><td>0 – 3.3V</td><td>WHITE</td></tr><tr><td>4</td><td>SDA Modbus A/D-</td><td>GREEN</td></tr><tr><td>5</td><td>Pulse</td><td>PINK</td></tr><tr><td>6</td><td>SCL Modbus B/D+</td><td>YELLOW</td></tr></table>	1	GND	GRAY	2	VCC	BROWN	3	0 – 3.3V	WHITE	4	SDA Modbus A/D-	GREEN	5	Pulse	PINK	6	SCL Modbus B/D+	YELLOW
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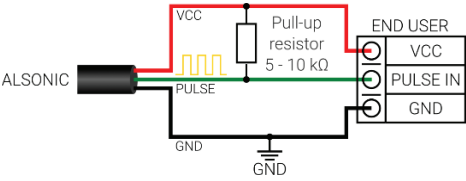
Cable with Hirose DF11-6DS-2C plug and open wires
available as optional accessory



Cable length options

1.0 m	1.5 m
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PULSE / PWM channel

Channel assignment	Flow	
Type	Open collector	
PLC connection		external 5 – 10 kΩ pull-up resistor required Voltage level equal to VCC (voltage pull-up resistor)
Pulses/Liter	5000 configurable from 100 - 75000	

0 – 3.3 V channel

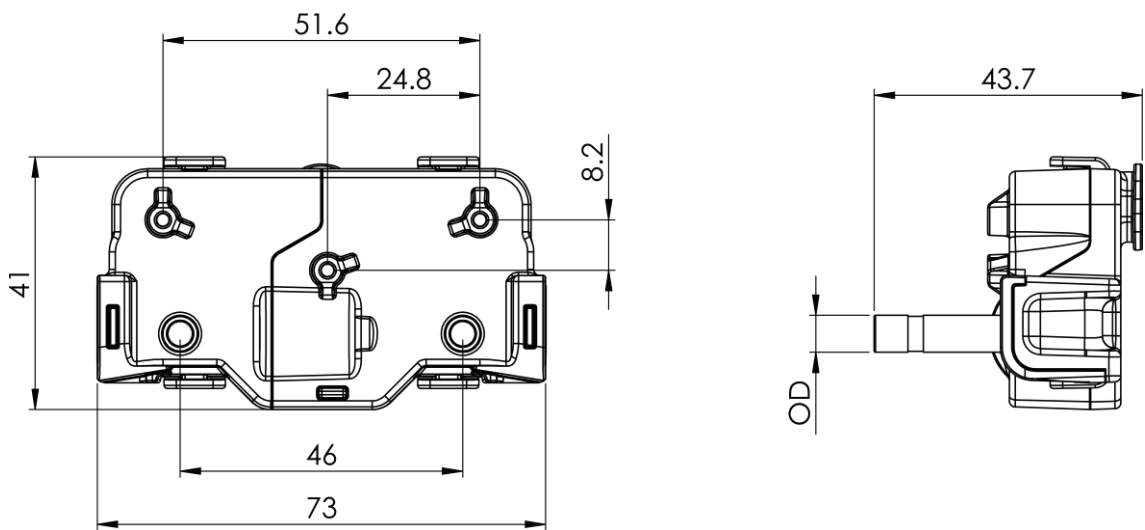
Channel assignment options	Flow	Temperature (PT1000)
Measuring range	0 – max flow	0 – 120 °C
Voltage range	0.3 - 3 V	
Conversion	$\text{meas.value} = \frac{(\text{max} - \text{min})}{2.7 \text{ V}} \cdot (\text{meas.voltage} - 0.3 \text{ V})$	

RS485 ModBus / I²C channel

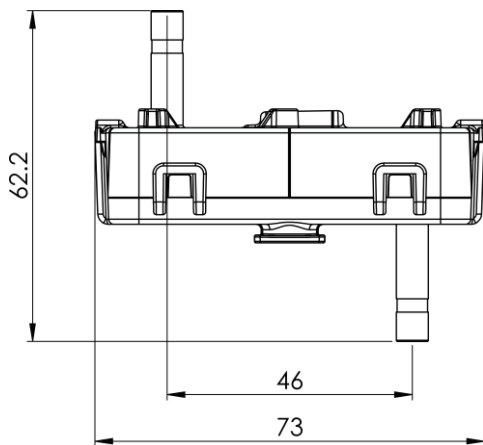
Channel assignment	Flow, Temperature, and Diagnostics	
Additional features	Bubble detection, High-speed temperature measurement <i>see separate Modbus/I²C interface description for details</i>	

Dimensions

U-Shape



Z-Shape



Configuration	U-Shape	Z-Shape
Length	73 mm	73 mm
Height	41 mm	41 mm
Width	43.7 mm	62.2 mm
Connection	Male Hose Push-Fit Connection	
Dimension	OD 6	OD 8
Outer Diameter OD	6 mm	8 mm
Inner Diameter ID	4 mm	6 mm

Installation notes

Orientation	Install in any orientation; avoid air accumulation inside the sensor.
Calming section	Ensure accurate readings with a calming section upstream and downstream of the sensor.

Ordering Code								
		MF	-	-	-	-	-----	-
Hydraulic Configuration	U-Shape		U					
	Z-Shape		Z					
Dimension	DN6			6				
	DN8			8				
Tube Insert	Stainless Steel				S			
	Plastic				P			
Bus Interface	Modbus					M		
	I²C					I		
Pulse Rate	100 Pulses/L						00100	
	1000 Pulses/L						01000	
	5000 Pulses/L <i>Standard</i>						05000	
	10000 Pulses/L						10000	
	Other						99999	
Source 0 – 3.3 V	Temperature							T
	Flow							F

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About Us

Allengra GmbH, with headquarters in Germany and Romania, was established in 2005 and specializes in the design and production of standard or OEM ultrasonic flow sensors and control valves for liquids and gases, tailored to meet the specific needs of each end client application. Our company manages the entire development process, from concept to serial production, with various engineering departments and prototyping skills at our disposal.

Allengra's core technology, ultrasonic metering, has been refined over the years to a level where both high-end device integration and cost-effective applications are achievable. Allengra provides metering and regulating solutions for various industries, including gas heating boilers, automatic coffee machines, robotic scrubbers, and industrial automation, among others.

Über Uns

Die 2005 gegründete Allengra GmbH mit Sitz in Deutschland und Rumänien entwickelt und produziert sowohl Standard- als auch maßgeschneiderte Ultraschall-Durchflusssensoren und Regelventile für Flüssigkeiten und Gase. Allengra vereint alle notwendigen Engineering und Prototyping Fähigkeiten, um die Produkte interdisziplinär und ganzheitlich zu entwickeln. So können auch neue und innovative Ideen schnell und flexibel in robuste Serienprodukte überführt werden.

Allengras Kernkompetenz, die Ultraschall-Durchflussmessung, kann durch die umfangreiche und langjährige Erfahrung mit der Technologie problemlos sowohl in High-End-Produkte als auch in robuste und kostengünstige Serienlösungen integriert werden. Allengra bietet Mess- und Regelungslösungen für Anwendungen in Gasheizkesseln, Kaffeevollautomaten, Bodenreinigungsmaschinen, dem Motorsport, der industriellen Automatisierung und vieles mehr.