

ALSONIC Brass

Allengra's Versatile Ultrasonic Flow Meter Product Family

ALLENGRA
Flow meters



Overview

- Available in DN15 – DN50
- For Water, Water+Glycol, DI Water *and many others*
- Accuracy $\pm 2\%$ of measured value
- Almost **no pressure loss**
- Analogue & Bus communication
- Integrated **Temperature Sensor**
- Integrated **Pressure Sensor** *Optional*
- External Temperature Probe for **heat metering** *Optional*
- **Gas Bubble Detection**
- **Glycol Concentration Detection**

Operating conditions

Media	Water, Water-glycol mixtures <i>other media on request</i>
Medium temperature	-20 – 100 °C <i>fluid in liquid phase</i>
Medium over temperature	110 °C < 5 min
Operating pressure	0 – 16 bar
Burst pressure	25 bar <i>reduced to 20 bar with pressure measurement option</i>
Ambient temperature	-20 - +80 °C
Relative humidity	< 95 % rh
IP code	acc. to IP 44 <i>on request IP66</i>
Storage temperature	-40 - +80 °C
Lifetime	> 12 years

Compliance

CE Marking	Compliant to all applicable EU Directives (EMC, RoHS, PED)
REACH Regulation	Compliant
Drinking Water	All materials compliant to the German FEA guidelines (UBA BWGL)
Electrical Safety	Acc. to EN 60335-1, EN 60335-2-40

Materials

Dimension	DN15	DN20	DN25	DN32	DN40	DN50
Sensor Body		CW724R		CW724R CW617N	CW724R	CW617N
Other wetted parts	PPS 40% GF, EPDM, Stainless Steel ¹ , Ceramic ²					
Non-wetted parts	ABS					
	¹ only for temperature immersion sensor option; ² only for pressure sensor option					

Features

Gas bubble detection	Identifies inefficiently vented heating systems and safety-relevant leaks in heat pumps using flammable refrigerants.
Glycol concentration	Measurement of glycol concentration , automatic volume flow compensation and freezing point estimation.
Consumption measurement	Measurement of water and heat consumption for efficient system operation, resource management and monitoring.
Custom Fluid Calibration	Custom calibration to almost any medium via user-defined temperature-viscosity table over Modbus.

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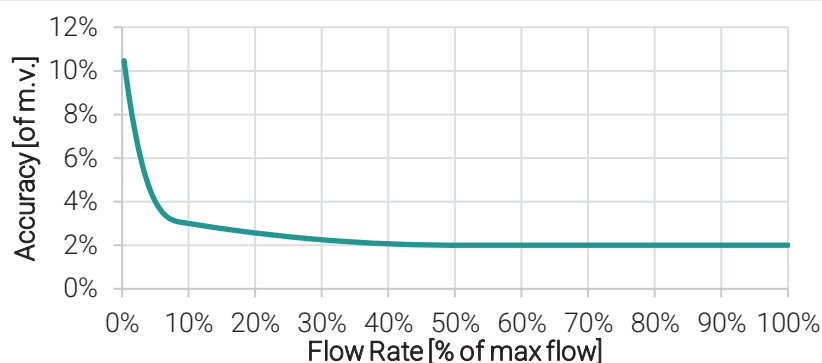
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Flow Measurement

Measurement technology	Ultrasonic					
Dimension	DN15	DN20	DN25	DN32	DN40	DN50
Measurement range [L/min] <i>nominal</i>	0.15-50	0.3-100	0.6-200	1-360	1.5-540	2-1000
Measurement range [L/h] <i>nominal</i>	9-3.000	18-6.000	36-12.000	60-21.600	90-32.400	120-60.000
Overflow Measurement [L/h] <i>up to</i>	6.000	10.000	15.000	25.000	40.000	60.000
Accuracy	± 2 % of measured value ³					
Repeatability	± 1 % of measured value					
Response time	<0.5 s					

Accuracy funnel



³Accuracy specification for water acc. to accuracy funnel, assuming turbulence-free flow conditions (refer to [installation notes](#)).

Internal Temperature Measurement

	Standard Contact Sensor		Immersion Sensor (Metal Sleeve)	
Measurement element	NTC		PT1000 class B	
Measurement range	-20 – 110 °C		-20 – 110 °C	
Accuracy	± 3 K		± 0.5 K	
Repeatability	± 0.3 K		± 0.3 K	
Response time T ₉₀	< 30 s		< 2 s	

Pressure Measurement *Optional*

Measurement element	Ceramic pressure sensor
Measurement range	0-10 bar
Accuracy	0.1 % of full scale
Response time	<0.5 s

External temperature sensor for heat metering *Optional*

Configuration	Internal immersion sensor option mandatory					
Measurement element	PT1000 class B					
Measurement range	-20 – 110 °C					
Accuracy Ext. Temp.	± 0.5 K					
Accuracy Temp. Diff.	± 0.3 K <i>Internal and external sensor paired</i>					
Accuracy Heat Measurement	Temp. Difference ΔT	3 K	4 K	5 K	10 K	20 K
	Accuracy	$\pm 12\%$	$\pm 9.5\%$	$\pm 8\%$	$\pm 5\%$	$\pm 3.5\%$
Response time T ₉₀	< 2 s					
Wetted materials	Stainless steel, EPDM					

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Electrical data

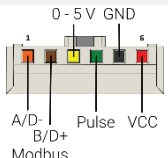
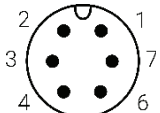
Power Supply	4.5-28 VDC
Current consumption	< 10 mA (< 40 mA during power up for 100 ms)
Protection class	III

Electrical reliability

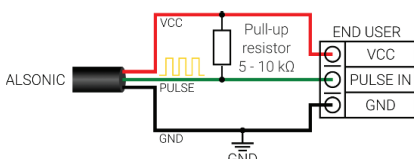
	Power Supply	0 – 5 V	Pulse	Modbus
Reverse voltage	Yes	N/A	N/A	N/A
ESD Protection	Yes	Yes	Yes	Yes
Overvoltage protection	Up to 30 V	N/A	N/A	N/A
EMI Protection	Yes	Yes	Yes	Yes
Short Circuit of VCC over output interfaces	N/A	up to 13 V	up to 28 V	up to 15 V

Electrical interface

Cable length options	0.3 m	0.5 m	1.0 m	1.5 m
Max. perm. wire extension	Modbus < 50 m, Pulse 0-5 V < 10 m			

Electrical Connections for integrated data cable option	Open Wires			JST PHR-6 or PAP-06V-S	M12 6-Pin Male
					
Pinout	VCC	RED	2		
	GND	BLACK	7		
	PULSE	GREEN	3		
	0.5 – 4.5 V	YELLOW	4		
	MODBUS A/D-	ORANGE	1		
	MODBUS B/D+	BROWN	6		

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)

Dimension	DN15	DN20	DN25	DN32	DN40	DN50
Pulses/Liter <i>other on request</i>	1000	1000	500	250	100	100
Conversion	$\text{Volume Flow [L/h]} = \text{Frequency [Hz]} \cdot \frac{3600}{\text{Pulse Rate [Pulses/L]}}$ $\text{Frequency [Hz]} = \frac{\text{Pulse Rate [Pulses/L]} \cdot \text{Volume Flow [L/h]}}{3600}$					

0 – 5 V channel *Supply Voltage > 5.5 V mandatory*

Channel assignment options	Flow	Temperature	Pressure
Measuring range <i>others on request</i>	0 – max flow	0 – 90 °C	0 – 10 bar
Voltage range	0.5-4.5 V		
Conversion	$\text{meas. value} = \frac{(\text{max} - \text{min})}{4 \text{ V}} \cdot (\text{meas. voltage} - 0.5 \text{ V})$		

Modbus channel

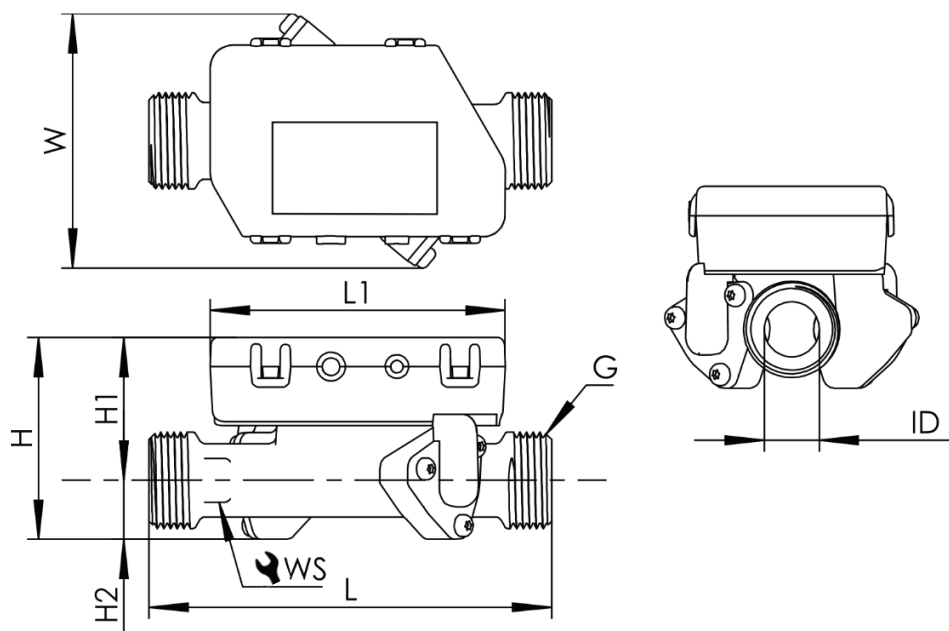
Communication Protocol	Modbus RTU
Medium	RS-485
Speed	Up to 115.2 kbps
Channel assignment ⁴	- Flow - Temperature - Pressure
Additional features	- Bubble detection - Heat metering - Glycol Detection - Freezing point estimation for water-glycol mixtures - Consumption measurement - High-speed temperature measurement - Custom Fluid Calibration <i>based on temperature-viscosity data input</i> - Diagnostics

⁴ See Modbus specification for detailed channel assignment

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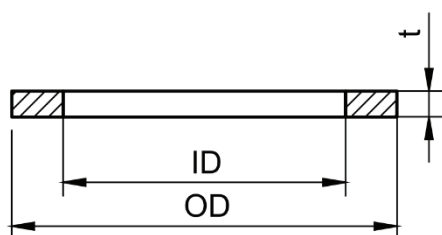
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Dimensions

Dimension	DN15	DN20	DN25	DN32	DN40	DN50
Inner Diameter ID	15	20	25	32	40	50
Thread G for flat seal	G3/4"	G1"	G1 1/4"	G 1 1/2"	G 2"	G 2 1/2"
Wrench Size WS	21	26	31	38	46	56
Length L	110	120	130	140	150	170
Length L1	80.6	80.6	80.6	80.6	80.6	80.6
Width W	69.4	74.1	79.1	86.2	97.4	107.5
Height H	55.1	57.5	64.3	71.3	81.2	93.9
Height H1	39.0	41.5	44.0	47.5	51.5	56.5
Height H2	16.1	16.1	20.3	23.8	29.7	37.4

Seals



Hydraulic connection with flat seals *not included*
Choose ID of seal larger than sensor *see recommendation*
Align flat seal concentrically *no interference with free cross-section*

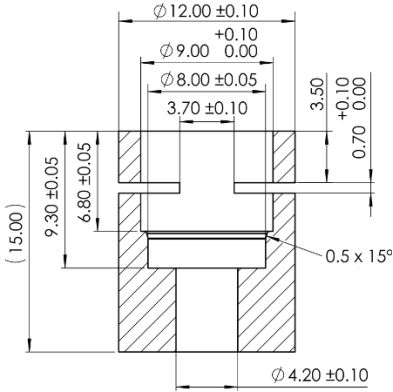
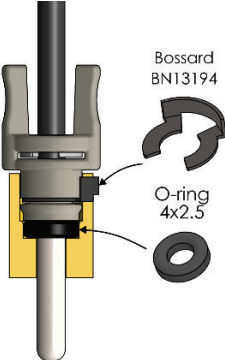
Dimension	DN15	DN20	DN25	DN32	DN40	DN50
Recommended Flat Seal dimensions ⁵	24x17x2	30x22x2	39x28x2	44x35x2	55x43x2	70x59x2

⁵ Flat seal's inner diameter must not intrude into the flow path.

Permissible Tightening Torque for Hydraulic Thread Connection

Dimension:	DN15	DN20	DN25	DN32	DN40	DN50
M _{max} [Nm]	12	12	12	12	12	12

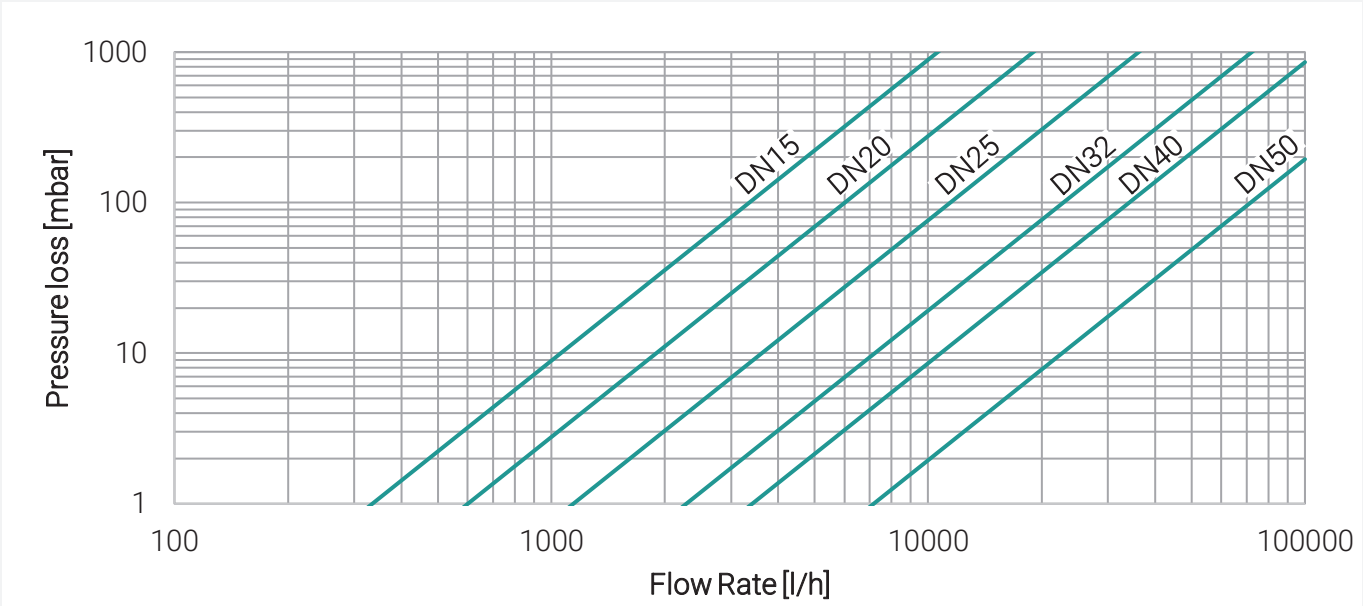
External Temperature Sensor

Probe	Counterpart dimensions ⁶	Assembly	Cable length
Wet Probe			700 mm
			1100 mm
Dry Probe	-	-	300 mm
			500 mm
			1000 mm

⁶ Integration on the customer side, no provision by Allengra

Pressure Loss

Dimension	DN15	DN20	DN25	DN32	DN40	DN50
Pressure Loss ⁷ @ max flow [mbar]	80	100	110	90	90	70
Kvs [m³/h]	10.6	19.0	36.2	72.2	108.0	226.8



⁷ Pressure loss values refer to variant with integrated standard contact temperature sensor

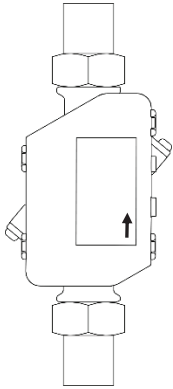
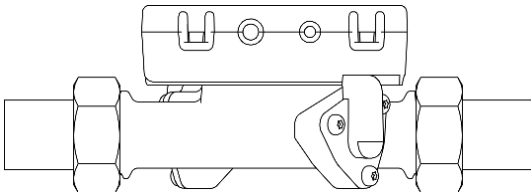
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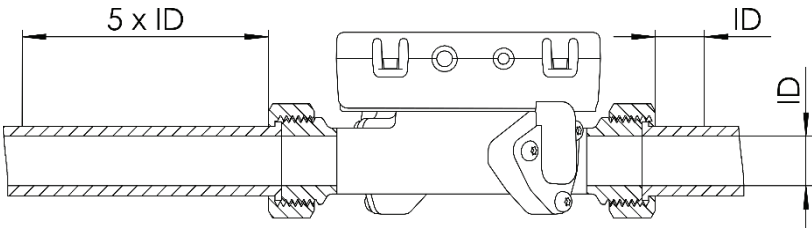


Installation notes

Orientation	Recommended installation positions (<i>others on request</i>): Horizontal (<i>housing cover parallel to ground</i>) Vertical (<i>flow direction upwards recommended</i>)
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Calming section	Ensure accurate readings with a calming section upstream and downstream of the sensor. Select the pipe ID according to the sensor dimensions. Other installation conditions on request with special calibration.
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Note: Not all variants and dimensions are yet in series production. Prototypes available.

Order Code													
		-	--	-	--	-	--	-	----	-	--	--	-
Material Body	Plastic	P											
	Brass	B											
	Stainless Steel	S											
Size	DN15 (G3/4")	15											
	DN20 (G1")	20											
	DN25 (G1 1/4")	25											
	DN32 (G1 1/2")	32											
	DN40 (G2")	40											
	DN50(G2 1/2")	50											
Int. Temperature Sensor	Standard Contact Sensor	1											
	Immersion Sensor (Metal Sleeve)	3											
Pressure Sensor	no pressure sensor	00											
	0 - 10 bar	10											
External Temperature Sensor (Heat Metering)	no ext. temperature sensor	0											
	Wet Probe	1											
	Dry Probe	2											
Data Cable Length	no integrated data cable	00											
	0.3 m	03											
	0.5 m	05											
	1.0 m	10											
	1.5 m	15											
Connector	Open wires	0											
	JST PHR-6	1											
	JST PAP-06V-S	4											
	M12 6-Pin Male	7											
Pulse Rate	no pulse output	0000											
	100 Pulses/L <i>Standard DN40, DN50</i>	0100											
	250 Pulses/L <i>Standard DN32</i>	0250											
	500 Pulses/L <i>Standard DN25</i>	0500											
	1000 Pulses/L <i>Standard DN15, DN20</i>	1000											
Source 0 – 5 V Output	no 0 – 5 V output	0											
	Temperature 0 – 90 °C	1											
	Pressure 0 – 10 bar	2											
	Flow 0 – max flow	3											
Modbus Configuration	Device ID: 0x01 Baud: 115200 Parity: Even Stopbits: 1	01											
	Device ID: 0x1E Baud: 19200, Parity: Even, Stopbits: 1	02											
	Device ID: 0x03 Baud: 19200, Parity: None, Stopbits: 2	03											
	Device ID: 0x3C Baud: 19200, Parity: Even, Stopbits: 1	04											
	Custom	XX											
External Temperature	no ext. temperature probe	00											
	0.3 m <i>available only for dry probe</i>	03											
Sensor Cable Length	0.5 m <i>available only for dry probe</i>	05											
	0.7 m <i>available only for wet probe</i>	07											
	1.0 m <i>available for only dry probe</i>	10											
	1.1 m <i>available for only wet probe</i>	11											
Data Cable Type	integrated	0											
	detachable RAST 2.5 <i>available for Plastic DN15 only</i>	1											



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.

Allengras 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.