ALSONIC Plastic

Allengra's Versatile Ultrasonic Flow Meter Product Family

Overview

- Available in **DN15 – DN50**
- For Water, Water+Glycol, DI Water *and many others*
- Accuracy **± 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, DI water *other media on request*
Medium temperature	-20 – 90 °C *fluid in liquid phase*
Medium over temperature	110 °C < 5 min
Operating pressure	0 – 10 bar
Burst pressure	20 bar
Ambient temperature	-20 - +80 °C
Relative humidity	< 95 % rH
IP code	acc. to IP 44 *on request IP66*
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	
Sensor Body	PPS 40% GF
Other wetted parts	EPDM[1,2], 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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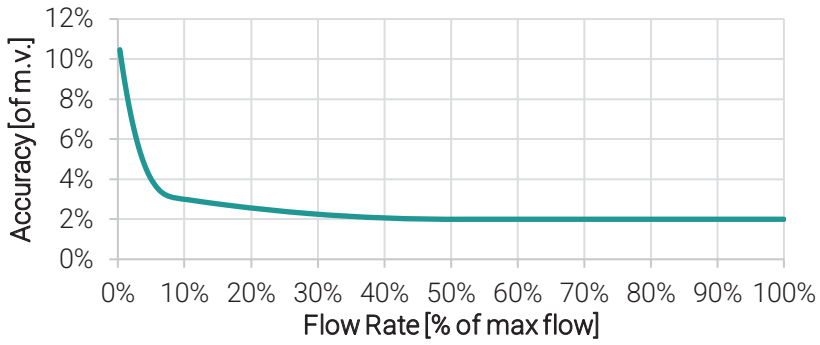
Flow Measurement

Measurement technology	Ultrasonic					
Dimension:	**DN15**	**DN20**	DN25 [3]	DN32 [3]	DN40 [3]	DN50 [3]
Measurement range [L/min]	0.15-50	0.3-100	0.6-200	1-360	1.5-540	2-1000
Measurement range [L/h]	9-3.000	18-6.000	36-12.000	60-21.600	90-32.400	120-60.000
Overflow Measurement [L/h] *up to*	6.000	10.000	15.000	25.000	40.000	60.000
Accuracy	±2 % *of measured value* [4]					
Repeatability	±1 % *of measured value*					
Response time	<0.5 s					

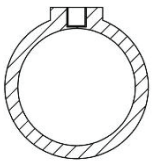
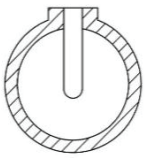
Accuracy funnel



[3] Not yet in series production. Prototypes available.

[4] Accuracy specification per 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 *Internal and external sensor paired*					
Accuracy Heat Measurement	**Temp. Difference ΔT**	**3 K**	**4 K**	**5 K**	**10 K**	**20 K**
	Accuracy	± 12%	± 9.5%	± 8%	± 5%	± 3.5%
Response time T_{90}	< 2 s					
Wetted materials	Stainless steel, EPDM					

Electrical data

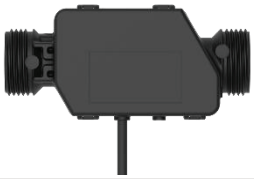
Power Supply	4.5-28 VDC
Current consumption	< 10 mA *(< 40 mA during power up for 100 ms)*
Protection class	III

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

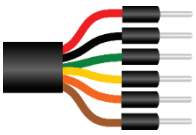
Cable length options	0.3 m	0.5 m / 1.0 m / 1.5 m
Max. perm. wire extension	Modbus < 50 m, Pulse | 0-5 V < 10 m	
Cable Type	Integrated	Detachable RAST 2.5 [5]

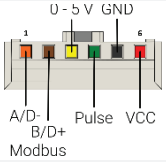


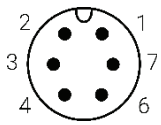
[5] Just available for DN15

Electrical Connections
for integrated data cable option

Open Wires	JST PHR-6 or PAP-06V-S	M12 6-Pin Male



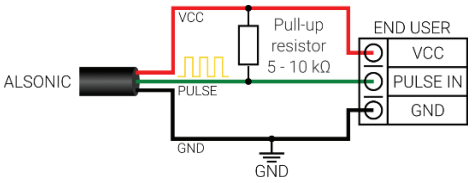




Pinout

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 [3]	DN32 [3]	DN40 [3]	DN50 [3]
Pulses/Liter	1000	1000	500	250	100	100

Conversion

$$\text{Volume Flow [L/h]} = \text{Frequency [Hz]} \cdot \frac{3600}{\text{Pulse Rate [Pulses/L]}}$$

$$\text{Frequency [Hz]} = \frac{\text{Pulse Rate [Pulses/L]} \cdot \text{Volume Flow [L/h]}}{3600}$$

[3] Not yet in series production. Prototypes available.

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

Channel assignment options	Flow	Temperature	Pressure
Measuring range *others on request*	0 – max flow	0 – 90 °C	0 – 10 bar
Voltage range	0.5-4.5 V		

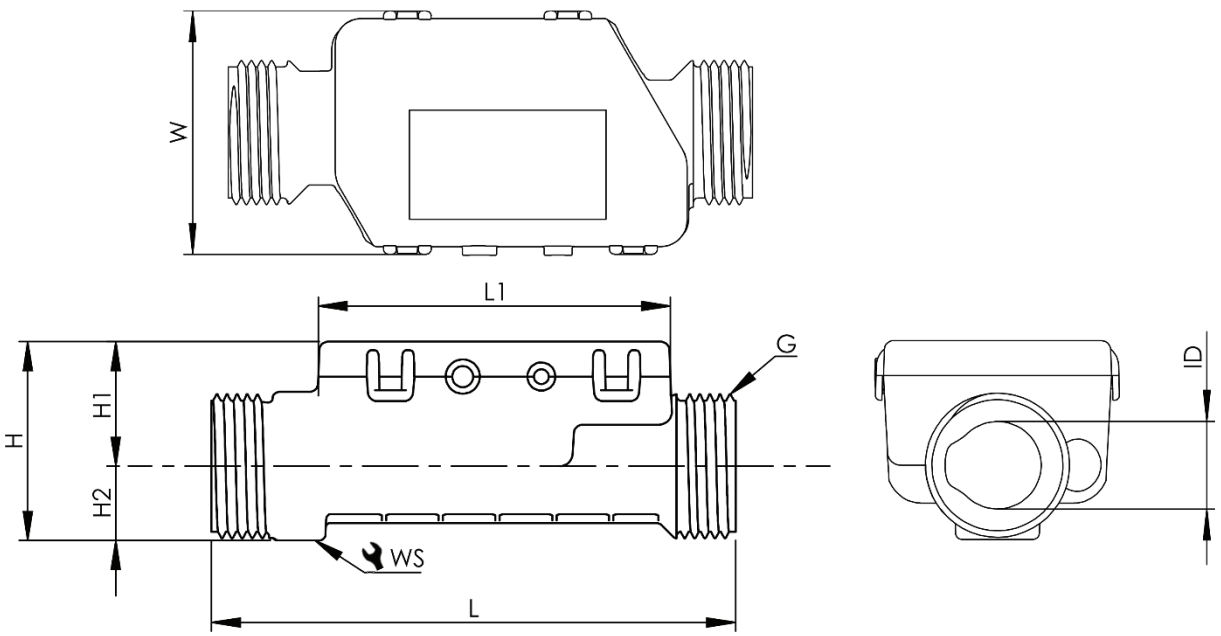
Conversion

$$\text{meas.value} = \frac{(\text{max} - \text{min})}{4\ \text{V}} \cdot (\text{meas.voltage} - 0.5\ \text{V})$$

Modbus channel

Communication Protocol	Modbus RTU
Medium	RS-485
Speed	Up to 115.2 kbps
Channel assignment [6]	▪ 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 *based on temperature-viscosity data input* ▪ Diagnostics

[6] *See Modbus specification for detailed channel assignment*

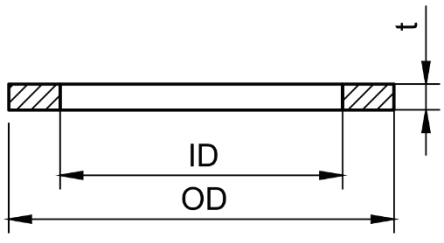


Dimensions

Dimension	DN15	DN20	DN25 [3]	DN32 [3]	DN40 [3]	DN50 [3]
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	24	34	44	42	50	70
Length L	110	120	130	140	150	170
Length L1	79.4	80.6	78.9	82.9	98.1	112.4
Width W	55.3	56.0	59.2	68.8	80.1	90.1
Height H	48.6	45.5	53.0	60.0	69.0	82.9
Height H1	35.5	28.5	31.0	35.0	39.0	45.5
Height H2	13.1	17.0	22.0	25.0	30.0	37.4

[3] Not yet in series production. Prototypes available.

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*

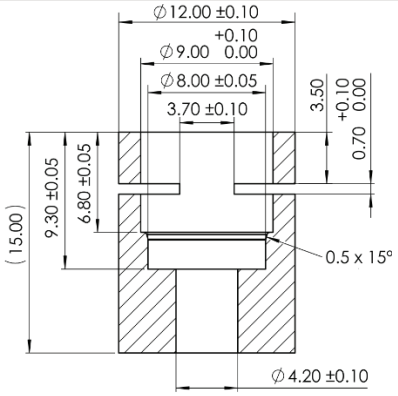
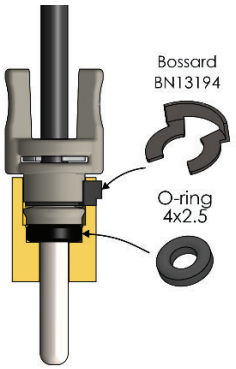
Dimension	DN15	DN20	DN25 [3]	DN32 [3]	DN40 [3]	DN50 [3]
Recommended Flat Seal dimensions [7]	24x17x2	30x22x2	39x28x2	44x35x2	55x43x2	70x59x2

[3] Not yet in series production. Prototypes available; [7] Flat seal's inner diameter must not intrude into the flow path.

Permissible Tightening Torque for Hydraulic Thread Connection

Dimension:	DN15	DN20	DN25 [3]	DN32 [3]	DN40 [3]	DN50 [3]
M_{max} [Nm]	12	12	12	12	12	12

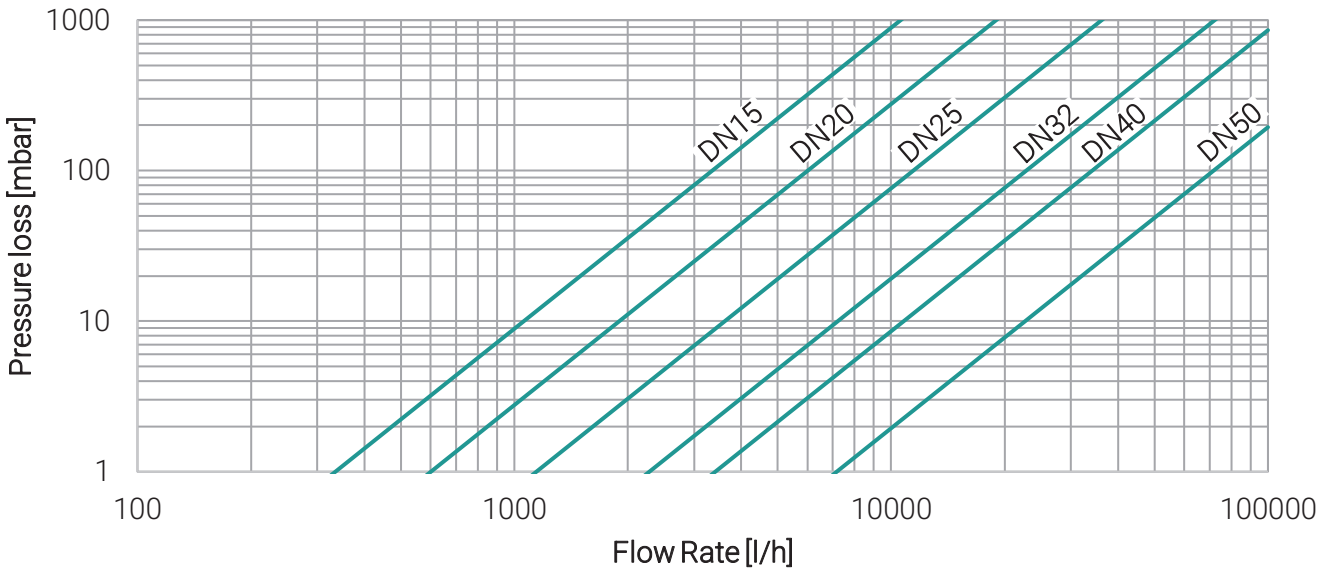
External Temperature Sensor

	Probe	Counterpart dimensions [8]	Assembly	Cable length
Wet Probe				700 mm 1100 mm
Dry Probe		-	-	300 mm 500 mm 1000 mm

[8] Integration on the customer side, no provision by Allengra

Pressure Loss

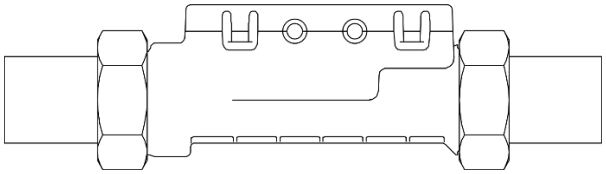
Dimension	DN15	DN20	DN25 [3]	DN32 [3]	DN40 [3]	DN50 [3]
Pressure Loss[9] @ max flow [mbar]:	80	100	110	90	90	70
Kvs [m³/h]:	10.6	19.0	36.2	72.2	108.0	226.8

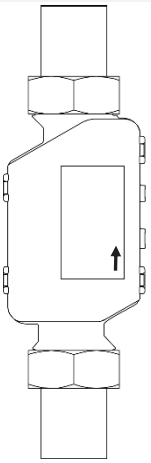


[3] Not yet in series production. Prototypes available.
[9] Pressure loss values refer to variant with integrated standard contact temperature sensor.

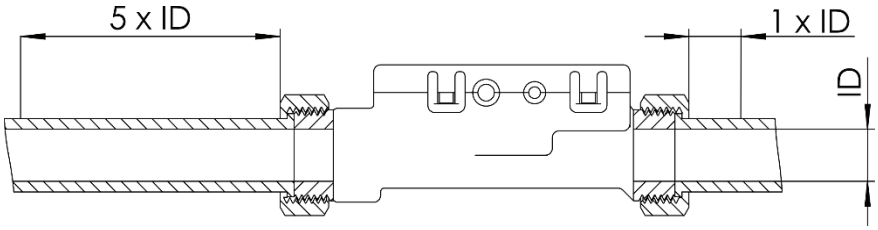
Installation notes

Orientation	Recommended installation positions *(others on request)*: Horizontal *(housing cover parallel to ground)* Vertical *(flow direction upwards recommended)*





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 *Standard DN40, DN50*								0100				
	250 Pulses/L *Standard DN32*								0250				
	500 Pulses/L *Standard DN25*								0500				
	1000 Pulses/L *Standard DN15, DN20*								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 Sensor Cable Length	no ext. temperature probe											00	
	0.3 m *available only for **dry** probe*											03	
	0.5 m *available only for **dry** probe*											05	
	0.7 m *available only for **wet** probe*											07	
	1.0 m *available for only **dry** probe*											10	
	1.1 m *available for only **wet** probe*											11	
Data Cable Type	integrated												0
	detachable RAST 2.5 *available for Plastic DN15 only*												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.