Air Intake Flow Meter

Prototype Phase

Overview

- For **Air** Intake Measurement
- **Humid** Air Measurement
- Accuracy **± 3 %** *of measured value*
- **Mass Flow** Determination
- **CAN** & **Modbus** Communication
- Integrated **Temperature** and **Pressure** Sensor
- Integrated **Humidity Sensor** *optional*
- **Robust** against impurities and dirt

Operating conditions	
Medium	Air
Medium temperature	-20 – 80 °C
Medium pressure	0.8 – 10 bar(a)
Medium humidity	0 – 100 % RH *non-condensing*
Burst pressure	20 bar(g)
Ambient temperature	-20 – 80 °C
Ambient humidity	0 – 95 % RH
IP code	acc. to IP 44
Materials	
Wetted parts	PPS 40% GF, Silica, EPDM
Non-wetted parts	ABS

Features	
Mass Flow Determination	Mass flow determination using **ideal gas law** based on measurements of volume flow, temperature, and pressure.
Humidity Compensation *optional*	Automatic compensation for humidity's influence on air density ensures accurate mass flow determination.

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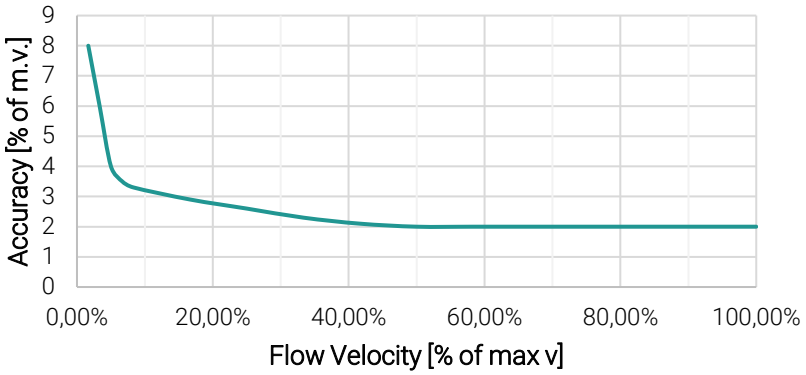
Flow Measurement	
Measurement technology	Ultrasonic
Volume Flow Range	0.3 – 270 m³/h
Volume Flow Accuracy	±3 % of measured value *
Repeatability	±1 % of measured value
Response time	< 0.5 s
Accuracy funnel	

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

Temperature Measurement	
Measurement element	PT1000 class B
Measurement range	0 - 110 °C
Accuracy	±1 K
Repeatability	±0.5 K
Response time T09	< 5 s

Pressure Measurement	
Measurement element	Ceramic pressure sensor
Measurement range	0 - 20 bar(a)
Accuracy	2 % of measured value
Repeatability	1 % of measured value
Response time	< 0.5 s

Humidity Sensor *optional*	
Measurement technology	Capacitive, polymer-based
Humidity range	0 – 100 % RH
Humidity Accuracy	±3 %
Repeatability	±0.5 %
Response time	< 10 s

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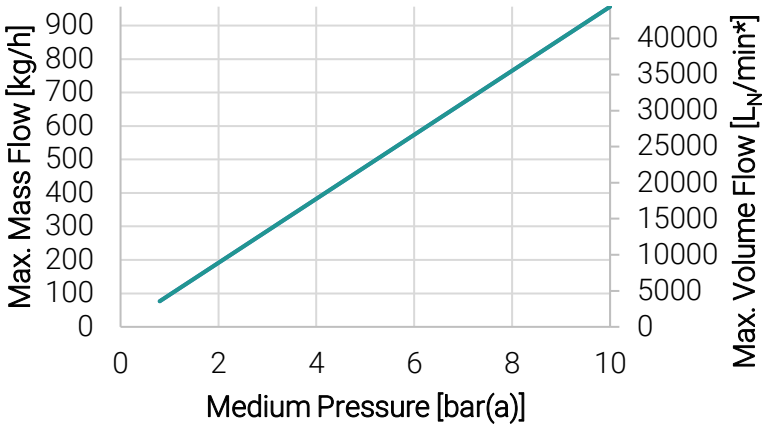
Mass Flow Determination

Method	Based on ideal gas law
Flow Range *vs. medium pressure* Max. measurable mass / nominal volume flow increases with higher medium pressure	 ** Reference conditions 1 atm, 0 °C*
Mass Flow Accuracy	±4 % *of measured value*
Repeatability	±1 % *of measured value*

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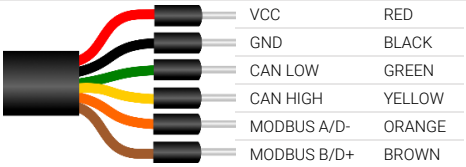
Electrical data	
Power Supply	12 - 24 V
Current consumption	< 100 mA
Electrical interface	
Cable length	1.0 m
Electrical connection	Open cable ends
Interfaces	CAN, Modbus *others on request*
Cable color-coding Pinout	
CAN Bus interface	
Standard	ISO 11898-2 (High-Speed Applications)
Message Format	2.0A (11 bit identifier)
Baud rate	1.000.000 kbps
Termination Resistor	Open
Base ID	0x190
Modbus interface	
Baud rate	115200 Baud Parity: Even Stopbits: 1
Parity	Even
Stopbits	1
Device ID	0x01

Data Points

Standard	Optional
▪ Velocity [m/s] ▪ Volume Flow [l/min] ▪ Volume Flow in Normal Conditions [L_n/min] ▪ Temperature [°C] ▪ Pressure [bar] ▪ Mass flow [g/s]	▪ Humidity [% RH] ▪ *More on request*

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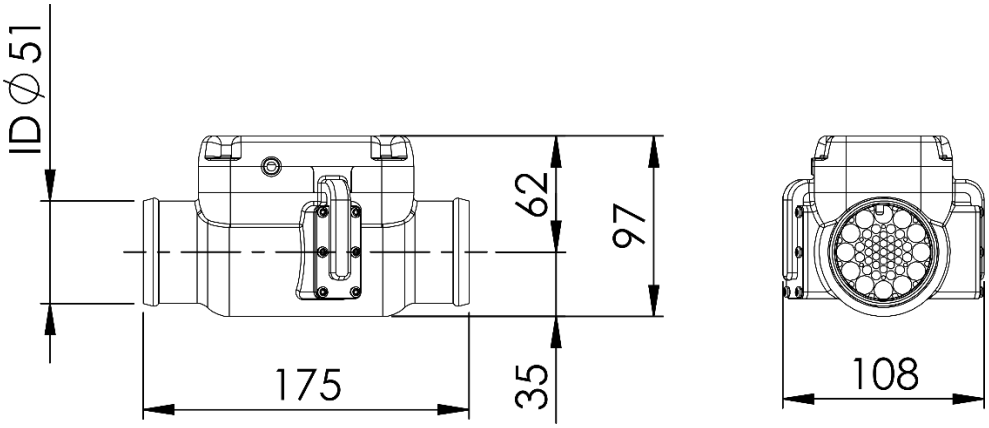
Dimensions



Length	175 mm
Height	97 mm
Width	108 mm
Connection	Hose connection 55 mm

Installation notes

Orientation	Installable in any orientation
Calming section	Ensure accurate readings with a calming section 5 x ID upstream and 5 x ID downstream of the sensor. Select the pipe/hose ID according to the sensor dimensions.

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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.

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.