Differential pressure air flow sensor
For ventilation and air-conditioning
Model A2G-520

WIKA data sheet PE 88.06

LoRaWAN®

Applications

- Measurement and monitoring of ventilator air flow
- Measurement and monitoring of air flow in ventilation pipes and ventilation ducts in conjunction with A2G-FM
- Measurement of differential pressure, gauge pressure and vacuum

Special features

- Integrated air flow calculation based on all common formulas
- Optimisation of air flow measurement through additional pressure and/or temperature compensation
- IIoT-ready and future-proof thanks to analogue and digital signal transmission (Modbus®) as well as wireless (LoRaWAN®)
- Time-saving instrument configuration and display of current measured values on the smartphone via NFC or WIKA app
- Precise measuring results, even under extreme ambient conditions

Differential pressure air flow sensor, model A2G-520

Description

The model A2G-520 measures the pressure difference on components such as ventilators or pitot tubes, e.g. model A2G-FM, and calculates the air flow using the calibration factor (K factor). By selecting the respective component manufacturer in the menu, the correct calculation formula is automatically taken into account.
To further optimise the air flow measurement under extreme ambient conditions such as altitude and high medium temperature, suitable sensors can be directly integrated.

The piezoresistive measuring element is temperature-compensated and particularly stable over the long term. It records even the smallest pressure differences and thus ensures high reliability and the highest measurement accuracy. The measured values are available as analogue voltage and current signals, digitally via the RS-485 interface using Modbus® RTU or via LoRaWAN® (LPWAN).

Integration into any control system or directly into cloud solutions is therefore easily possible.

The A2G-520 has freely adjustable measuring ranges. The instrument can be set using the WIKA app and NFC and, depending on the version, using buttons and a display. Efficient project documentation is possible using instrument parameter file readout via NFC and smartphone. The indication of up to four measured values and two relay states can be read from all viewing angles thanks to 2" TFT colour display with traffic light function and individualised measurement parameter lettering.

The construction of the A2G-520 is robust and weather-proof (IP65). The case can be opened without tools thanks to the snap-on cover.

WIKA

Smart in sensing

Data sheets showing similar products:
Differential pressure sensor; model A2G-500, see data sheet PE 88.05
Differential pressure and air flow controller; model A2G-540, see data sheet PE 88.07

Specifications

Instrument versions		
Specifications	**1 x analogue output 3-wire (multi range)**	**Modbus® RTU (multi range)**
Display	O	O
Additional analogue output	O	O
Signal inputs	O	O
Relay	O	O
Automatic zero point setting	O	O
Wireless signal (LoRaWAN®)	O	O
NFC		
Configure	✓	✓
Read	✓	✓

✓: included
O: selectable

Basic information	
Case dimensions	→ See dimensions on page 6
Process connection [1]	
2 x connecting nozzle	Ø 5 mm [0.19 in] / Ø 7 mm [0.27 in]
For hoses	With inner diameter 4 ... 6 mm [0.15 ... 0.23 in]
Case [1]	PC GF20
Cover with insert sheet [1]	PC, transparent; ABS, RAL 9010
Mounting plate [1]	PC, RAL 7035
Weight (depending on version)	260 ... 320 g [0,573 ... 0,705 lb]

1) Flame retardant in accordance with UL94-V2

Measuring ranges [1] in Pa [inWC]

Operating range [2]		Operating range [2]		Operating range [2]	
±250 Pa	**±1 inWC**	**±2,500 Pa**	**±10 inWC**	**±7,000 Pa**	**±28 inWC**
-25 … +25	-0.1 ... +0.1	-500 … +500	-2 ... +2	0 … 1,000	0 ... 4
-50 … +50	-0.2 ... +0.2	-1,000 … +1,000	-4 ... +4	0 … 1,500	0 ... 6
-100 … +100	-0.4 ... +0.4	0 … 250	0 ... 1	0 … 2,000	0 ... 8
-150 … +150	-0.6 ... +0.6	0 … 500	0 ... 2	0 … 2,500	0 ... 10
0 … 25	0 ... 0.1	0 … 1,000	0 ... 4	0 … 3,000	0 ... 12
0 … 50	0 ... 0.2	0 … 1,500	0 ... 6	0 … 4,000	0 ... 16
0 … 100	0 ... 0.4	0 … 2,000	0 ... 8	0 … 5,000	0 ... 20
0 … 250	0 ... 1	0 … 2,500	0 ... 10	0 … 7,000	0 ... 28

1) Settable via instrument menu (display) or WIKA app (NFC)
2) Defined with model code: Selection of an operating range (with several measuring ranges) or an individual measuring range

Pressure type / Measuring element / Digital display	
Pressure type	Differential pressure
Unit	
Differential pressure	■ Pa ■ kPa ■ mbar ■ mmWC ■ inWC
Air flow	■ l/s ■ m^3/s ■ m^3/h ■ cfm
Air velocity	■ m/s ■ fpm
Air flow measuring range	0 ... 999,999 m^3/h
Operating pressure	■ ±250 ... ±2.500 Pa [±1 ... ±10 inWC]: 10 kPa [40 inWC] ■ ±7.000 [±28 inWC]: 100 kPa [400 inWC]
Measuring element	Piezo measuring cell
Digital display	
Display resolution	240 x 320 dpi
Type of display	2" TFT colour display
Dashboard function	Indication of up to four measured values and two relay states possible; automatic size scaling depending on the number of measured values displayed. Indicated values can be given any alphanumeric designation.
Colour configuration	Range of setting possibilities; colours definable via RGB code.
Alarm function	Definition of two limit values possible; on reaching these limit values, a colour change can be defined for each (e.g. "Warning" and "Alarm")

Accuracy specifications			
Accuracy [1]	0.50 % FS [2]		
Operating range	±250 Pa [±1 inWC]	±2,500 Pa [±10 inWC]	±7,000 Pa [±28 inWC]
Temperature range			
Compensated [3] TC [4] offset (% FS/K)	0.015 %	0.01 %	0.008 %
Uncompensated [5] TC [4] offset (% FS/K)	0.025 %	0.02 %	0.02 %
Compensated [3] TC [4] span (% FS/K)	0.02 %	0.02 %	0.01 %
Uncompensated [5] TC [4] span (% FS/K)	0.03 %	0.02 %	0.02 %
Zero point setting	■ Manually via push button on the PCB ■ "myWIKA wireless device" app ■ Automatic [6]		

[1] At 23 °C [73.4 °F], relative to reference measuring instrument
Output wiring: 200 Ω in series for current output, 1000 Ω in parallel for voltage output
[2] E.g. 0.50 % of ±250 Pa = 1.25 Pa
[3] 0 ... 50 °C [32 ... 122 °F]
[4] Temperature coefficient
[5] -40 ... 0 °C [-40 ...+32 °F] / >50 °C [>122 °F]
[6] Recommended for measuring ranges ≤ 250 Pa [≤ 1 inWC]

Output and input signal

Output signals	■ 0 ... 10 V, 0 ... 5 V or 2 ... 10 V, 3-wire ■ 4 ... 20 mA, 2- or 3-wire ■ Relay ■ Modbus® ■ LoRaWAN®
Number of analogue outputs	■ 1 x ■ 2 x
Load	
Current output	Max. 500 Ω
Voltage output	Typ. 1 kΩ, min. 700 Ω
Number of relays	■ Without ■ 1 x (24 V / 0.5 A) ■ 2 x (24 V / 0.5 A)
Switching function	■ NO (normally open) ■ NC (normally closed) ■ Force open, force closed
Input signal	
2 x voltage input	■ DC 0 ... 10 V ■ DC 0 ... 5 V ■ DC 2 ... 10 V
2 x resistance input	■ Pt1000 ■ Ni1000 ■ Ni1000-LG ■ NTC 10 kΩ (β = 3977) ■ Binary (on/off)
Temperature range (resistance inputs)	-40 ... +120 °C [-40 ... +248 °F]

Electrical connection

Connection type	Spring-clip terminals
Wire cross-section	Max. 1.5 mm^2
Cable specification	Use shielded cables [1]
Cable connection	■ Cable gland M20 x 1.5 with strain relief ■ Standard version with clamping area 6 ... 13 mm [0.23 ... 0.51 in] ■ Further sealing inserts available (see Accessories)
Reverse polarity protection	Integrated protection against reverse polarity and overvoltage resulting from wiring errors
Auxiliary power	
Supply voltage	■ AC [2] 24 V ±10 % / 50 Hz / 60 Hz ■ DC 24 V ±10 %
Power consumption	3,6 W at 24 VDC or 24 VAC
Electrical safety	Protection class III, safety extra-low voltage (SELV)

1) Instrument specifications are based on tests with shielded cables
2) Not permissible for 2-wire 4 ... 20 mA

Operating conditions

Medium and ambient temperature range	■ -40 ... +60 °C [-40 ... +140 °F] ■ -10 … +50 °C [14 … 122 °F], with automatic zero point setting ■ -20 … +60 °C [-4 … +140 °F], with display
Storage temperature range	-40 ... +60 °C [-40 ... +140 °F]
Humidity	5 ... 95 % relative humidity
Condensation	Non-condensing

Operating conditions	
Permissible media	■ Air ■ Non-aggressive gases ■ Non-flammable gases
Mounting position	
Process connections	Lower mount [1]
	Side mount [2]
Ingress protection of the complete instrument	IP65

[1] Measurement accuracy and IP protection are based on tests with lower mount (reference position)
[2] Deviation when side mount: +2 Pa; can be corrected via zero point function

NFC interface

NFC specification	
On-site interface	NFC (near field communication)
Standard	ISO/IEC 15693
Modulation	13.56 MHz

Modbus® interface

Modbus® communication	
Protocol	Modbus® via serial interface
Transfer mode	RTU
Interface	RS-485
Max. voltage	■ ± 10 V without terminating resistor ■ ± 6 V with terminating resistor

LoRa® interface

LoRaWAN® specification	
LoRaWAN® specification	LoRa® 868 MHz EU
Version	1.0.3
Frequency range	863 ... 870 MHz
Transmission power	12 dBm
Range [1]	≤ 10 km [≤ 6.21 miles]
Max. output power	14 dBm

[1] The range depends on the topography. 10 km [6.2 mi] can be achieved in free field conditions and with a spreading factor of 12.

Approvals

Logo	Description		Region
CE	**EU declaration of conformity**		European Union
	EMC directive		
	RED - Radio Equipment Directive		
	RoHS directive		
	WEEE directive		

Certificates

| Certificates	
Certificates	■ Without ■ Measurement report per EN 837 ■ 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, material proof, indication accuracy) ■ 3.1 inspection certificate per EN 10204 (e.g. material proof for wetted metal parts, indication accuracy, calibration certificate)

→ For approvals and certificates, see website

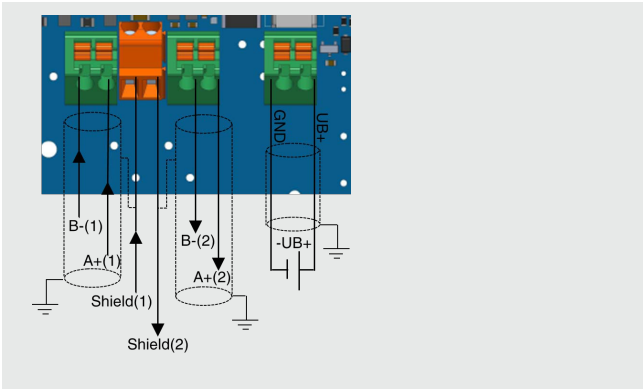## Dimensions in mm [in]

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Mounting plate
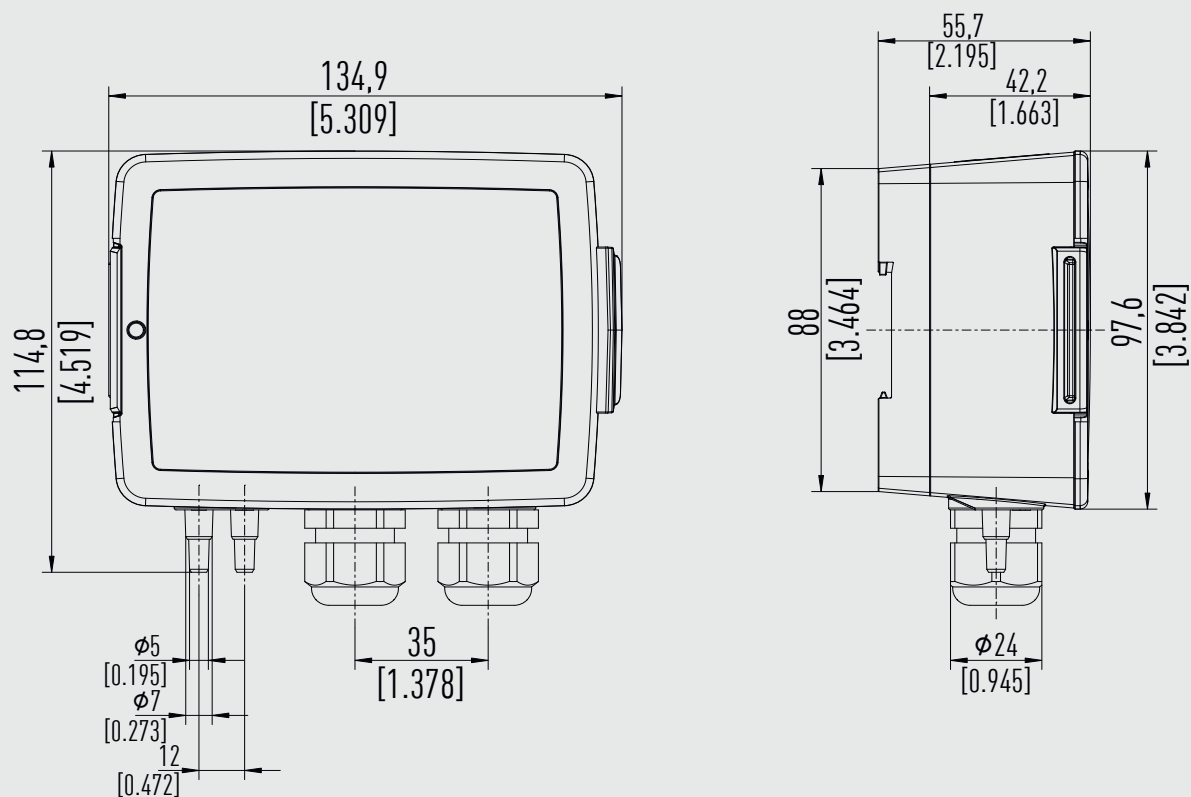
Electrical connection

Output signal 0 … 10 V or 0 ... 5 V or 2 ... 10 V or 4 … 20 mA, 3-wire
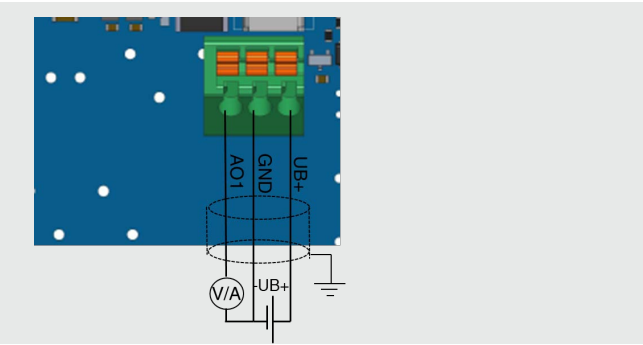
Modbus® RTU

Additional electronic connections
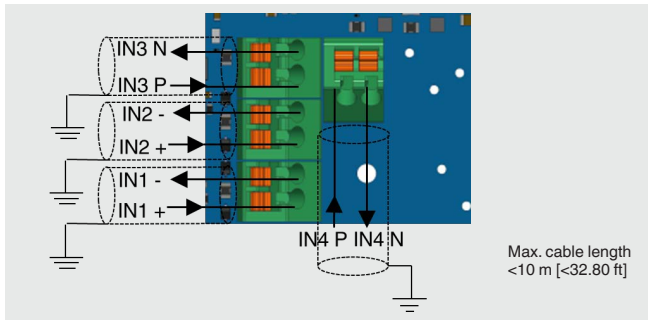
Additional signal output
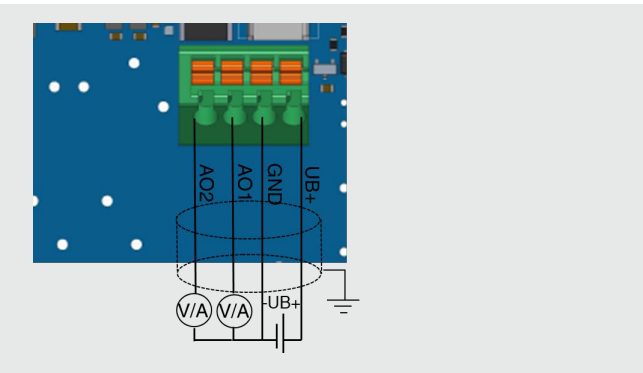
One or two relay outputs
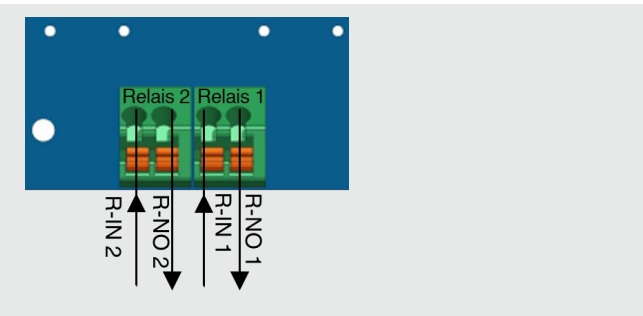
Up to four signal inputs
IN1, IN2 = active input signal
IN3, IN4 = passive input signal

Max. cable length
<10 m [<32.80 ft]

Accessories [1]

Model	Description	Order number
	Measuring hoses	
	PVC hose, inner diameter 4 mm [0.16 in], roll at 25 m [82.02 ft]	40217841
	PVC hose, inner diameter 6 mm [0.24 in], roll at 25 m [82.02 ft]	40217850
	Silicone hose, inner diameter 4 mm [0.16 in], roll at 25 m [82.02 ft]	40217906
	Silicone hose, inner diameter 6 mm [0.24 in], roll at 25 m [82.02 ft]	40217914
	Duct connector for measuring hoses Ø 4 … 6 mm [0.16 … 0.24 in]	40217507
	Multiple sealing inserts (for M20 cable gland)	
	Sealing insert with 2 bores at Ø 4 mm [0.16 in]; PU 10 x	40444284
	Sealing insert with 2 bores at Ø 6 mm [0.24 in]; PU 10 x	40444285
	Sealing insert with 4 bores at Ø 5 mm [0.20 in]; PU 10 x	40444286
	Sealing plug for sealing insert with 4 bores, each with Ø 5 mm [0.20 in]; PU 50 x	40454873
-	**LoRaWAN® gateway, preconfigured for WIKA network server**	On request
	Gateway for indoor use	
	Gateway for outdoor use	

1) The figures are an example and may change depending on the state of the art in design, material composition and representation.

Scope of delivery
- Differential pressure sensor model A2G-520
- Mounting plate
- 4 x pan-head, self-tapping screws ST4.2x9.5 (cross head Philipps Form H2)

Ordering information
Model / Unit / Operating range / Measuring range / Output signal / Display / Zero point setting / 2nd analogue output / Relay / Signal input / Accessories / Certificates / Approvals

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