

# Differential pressure sensor For ventilation and air-conditioning Model A2G-500

WIKA data sheet PE 88.05



## Applications

- Measurement of differential pressure, gauge pressure and vacuum
- Monitoring of filters, ventilators and heat exchangers
- Pressure monitoring in ventilation ducts, laboratories, production areas and clean rooms

## Special features

- 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
- No cabling effort for retrofit projects thanks to battery operation and LoRaWAN®
- Decentralised data node – up to four input signals – reduces cabling effort and installation costs
- Reduction of installation costs due to simple wall or DIN rail mounting in a control cabinet



Differential pressure sensor, model A2G-500

## Description

The model A2G-500 is used to measure differential pressure, gauge pressure and vacuum in air and also in non-aggressive and non-flammable gases in ventilation and air-conditioning systems.

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

With relay outputs, the instrument becomes a cost-saving differential pressure switch or 2-point controller.

The A2G-500 has freely adjustable measuring ranges. The instrument can be set using the WIKA app and NFC and, depending on the version, using buttons and LEDs or 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-500 is robust and weather-proof (IP65). The case can be opened without tools thanks to the snap-on cover. The graphics of the cover sheet insert can be customised. The instruments can thus be optimally integrated into any system design.

## Version

| Instrument versions          |   |   |                              |                                 |
|------------------------------|---|---|------------------------------|---------------------------------|
| Specifications               | 1 x analogue output<br>2-wire or 3-wire<br>(single range) <sup>1)</sup> | 1 x analogue out-<br>put<br>3-wire<br>(multi range) | Modbus® RTU<br>(multi range) | 1 x wireless<br>(battery power) |
| Display                      | x   | O   | O                            | x                               |
| Additional analogue output   | x   | O   | O                            | x                               |
| Signal inputs                | x   | O   | O                            | x                               |
| Relay                        | x   | O   | O                            | x                               |
| Automatic zero point setting | x   | O   | O                            | x                               |
| Wireless signal (LoRaWAN®)   | x   | O   | O                            | ✓                               |
| <b>NFC</b>                   |   |   |                              |                                 |
| Configure                    | ✓   | ✓   | ✓                            | ✓                               |
| Read                         | ✓   | ✓   | ✓                            | ✓                               |

1) Measuring range preset

✓: included  
x: not included  
O: selectable

## Specifications

| Basic information       |  |
|-------------------------|--|
| Case dimensions         | → See dimensions on page 6   |
| Process connection      | 2 x connecting nozzle Ø 4.5 mm [0.17 in] / Ø 7.5 mm [0.29 in]<br>For hoses with inner diameter 4 ... 6 mm [0.157 ... 0.236 in] |
| Case                    | PC GF20  |
| Cover with insert sheet | PC, transparent; ABS, RAL 9010   |
| Mounting plate          | PC, RAL 7035   |
| Weight                  | 260 ... 320 g [0,57 ... 0,70 lb] (depending on version)  |

### Measuring ranges <sup>1)</sup> in Pa [inWC]

| Operating range <sup>2)</sup> |               | Operating range <sup>2)</sup> |           | Operating range <sup>2)</sup> |          | Operating range <sup>2)</sup> |          |
|-------------------------------|---------------|-------------------------------|-----------|-------------------------------|----------|-------------------------------|----------|
| ±250 Pa                       | ±1 inWC       | ±2,500 Pa                     | ±10 inWC  | ±7,000 Pa                     | ±28 inWC | ±12,000 Pa                    | ±48 inWC |
| -25 ... +25                   | -0.1 ... +0.1 | -500 ... +500                 | -2 ... +2 | 0 ... 1,000                   | 0 ... 4  | 0 ... 5,000                   | 0 ... 20 |
| -50 ... +50                   | -0.2 ... +0.2 | -1,000 ... +1,000             | -4 ... +4 | 0 ... 1,500                   | 0 ... 6  | 0 ... 6,000                   | 0 ... 24 |
| -100 ... +100                 | -0.4 ... +0.4 | 0 ... 250                     | 0 ... 1   | 0 ... 2,000                   | 0 ... 8  | 0 ... 7,000                   | 0 ... 28 |
| -150 ... +150                 | -0.6 ... +0.6 | 0 ... 500                     | 0 ... 2   | 0 ... 2,500                   | 0 ... 10 | 0 ... 7,500                   | 0 ... 30 |
| 0 ... 25                      | 0 ... 0.1     | 0 ... 1,000                   | 0 ... 4   | 0 ... 3,000                   | 0 ... 12 | 0 ... 8,000                   | 0 ... 32 |
| 0 ... 50                      | 0 ... 0.2     | 0 ... 1,500                   | 0 ... 6   | 0 ... 4,000                   | 0 ... 16 | 0 ... 9,000                   | 0 ... 36 |
| 0 ... 100                     | 0 ... 0.4     | 0 ... 2,000                   | 0 ... 8   | 0 ... 5,000                   | 0 ... 20 | 0 ... 10,000                  | 0 ... 40 |
| 0 ... 250                     | 0 ... 1       | 0 ... 2,500                   | 0 ... 10  | 0 ... 7,000                   | 0 ... 28 | 0 ... 12,000                  | 0 ... 48 |

1) Settable via instrument menu (display), HMI (buttons, LEDs) or WIKA app (NFC) or preset with single-range instruments  
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 |  |
|---|--|
| <b>Pressure type</b>                                | Differential pressure  |
| <b>Unit</b>   | <ul style="list-style-type: none"> <li>■ Pa</li> <li>■ kPa</li> <li>■ mbar</li> <li>■ mmWC</li> <li>■ inWC</li> </ul>  |
| <b>Max. operating pressure</b>                      | <ul style="list-style-type: none"> <li>■ ±250 ... ±2.500 Pa [±1 ... ±10 inWC]: 10 kPa [40 inWC]</li> <li>■ ±7.000 ... ±12.000 Pa [±28 ... ±48 inWC]: 100 kPa [400 inWC]</li> </ul>                               |
| <b>Measuring element</b>                            | Piezo measuring cell   |
| <b>Digital display</b>                              |  |
| 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                   |   |                         |                         |                          |
|---|---|-------------------------|-------------------------|--------------------------|
| <b>Accuracy 1)</b>                        | 0.50 % FS 2)  |                         |                         |                          |
| Operating range                           | ±250 Pa<br>[±1 inWC]  | ±2,500 Pa<br>[±10 inWC] | ±7,000 Pa<br>[±28 inWC] | ±12,000 Pa<br>[±48 inWC] |
| Temperature range                         |   |                         |                         |                          |
| Compensated 3)<br>TC 4) offset (% FS/K)   | 0.015 %   | 0.01 %                  | 0.008 %                 | 0.005 %                  |
| Uncompensated 5)<br>TC 4) offset (% FS/K) | 0.025 %   | 0.02 %                  | 0.02 %                  | 0.01 %                   |
| Compensated 3)<br>TC 4) span (% FS/K)     | 0.02 %  | 0.02 %                  | 0.01 %                  | 0.01 %                   |
| Uncompensated 5)<br>TC 4) span (% FS/K)   | 0.03 %  | 0.02 %                  | 0.02 %                  | 0.02 %                   |
| <b>Zero point setting</b>                 | <ul style="list-style-type: none"> <li>■ Manually via push button on the PCB</li> <li>■ "myWIKa wireless device" app</li> <li>■ Automatic 6)</li> </ul> |                         |                         |                          |

- 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           |  |                       |
|-----------------------------------|--|-----------------------|
| <b>Output signals</b>             | <ul style="list-style-type: none"> <li>■ 0 ... 10 V, 0 ... 5 V or 2 ... 10 V, 3-wire</li> <li>■ 4 ... 20 mA, 2- or 3-wire</li> <li>■ Relay</li> <li>■ Modbus®</li> <li>■ LoRaWAN®</li> </ul> |                       |
| <b>Number of analogue outputs</b> | <ul style="list-style-type: none"> <li>■ 1 x</li> <li>■ 2 x</li> </ul>   |                       |
| <b>Load</b>                       | Current output   | Max. 500 Ω            |
|                                   | Voltage output   | Typ. 1 kΩ, min. 500 Ω |

| Output and input signal               |  |
|---------------------------------------|--|
| Number of relays                      | <ul style="list-style-type: none"> <li>■ Without</li> <li>■ 1 x (DC 24 V / 0.5 A)</li> <li>■ 2 x (DC 24 V / 0.5 A)</li> </ul>  |
| Switching function                    | <ul style="list-style-type: none"> <li>■ NO (normally open)</li> <li>■ NC (normally closed)</li> <li>■ Force open, force closed</li> </ul>   |
| <b>Input signal</b>                   |  |
| 2 x voltage input                     | <ul style="list-style-type: none"> <li>■ DC 0 ... 10 V</li> <li>■ DC 0 ... 5 V</li> <li>■ DC 2 ... 10 V</li> </ul>   |
| 2 x resistance input                  | <ul style="list-style-type: none"> <li>■ Pt1000</li> <li>■ Ni1000</li> <li>■ Ni1000-LG</li> <li>■ NTC 10 k<math>\Omega</math> (<math>\beta = 3,977</math>)</li> <li>■ Binary (on/off)</li> </ul> |
| Temperature range (resistance inputs) | -40 ... +120 °C [-40 ... +248 °F]  |

| Electrical connection       |   |
|-----------------------------|---|
| Connection type             | Spring-clip terminals   |
| Wire cross-section          | Max. 1.5 mm <sup>2</sup>  |
| Cable specification         | Use shielded cables <sup>1)</sup>   |
| Cable connection            | <ul style="list-style-type: none"> <li>■ Cable gland M20 x 1.5 with strain relief</li> <li>■ Standard version with clamping area 4 ... 13 mm [0.15 ... 0.51 in]</li> <li>■ Further sealing inserts available (see Accessories)</li> </ul> |
| Reverse polarity protection | Integrated protection against reverse polarity and overvoltage resulting from wiring errors   |
| <b>Auxiliary power</b>      |   |
| Supply voltage              | <ul style="list-style-type: none"> <li>■ AC <sup>2)</sup> 24 V <math>\pm</math>10 % / 50 Hz / 60 Hz</li> <li>■ DC 24 V <math>\pm</math>10 %</li> </ul>  |
| Power consumption           | <ul style="list-style-type: none"> <li>■ 1.7 W at DC 24 V</li> <li>■ 2.5 VA at AC 24 V</li> </ul>   |
| 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          | <ul style="list-style-type: none"> <li>■ -40 ... +60 °C [-40 ... +140 °F]</li> <li>■ -10 ... +50 °C [14 ... 122 °F], with automatic zero point setting</li> <li>■ -20 ... +60 °C [-4 ... +140 °F], with display</li> </ul> |
| Storage temperature range                     | -40 ... +60 °C [-40 ... +140 °F]   |
| Relative humidity, condensation               | 0 ... 95 % relative humidity (non-condensing)  |
| Permissible media                             | <ul style="list-style-type: none"> <li>■ Air</li> <li>■ Non-aggressive gases</li> <li>■ Non-flammable gases</li> </ul>   |
| <b>Mounting position</b>                      |  |
| Process connections                           | Lower mount <sup>1)</sup><br>Side mount <sup>2)</sup>  |
| 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          | <ul style="list-style-type: none"> <li>■ ± 10 V without terminating resistor</li> <li>■ ± 6 V with terminating resistor</li> </ul> |

## 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         |
|---|-------------------------------------|----------------|
|  | <b>EU declaration of conformity</b> | European Union |
|   | EMC directive                       |                |
|   | RED - Radio Equipment Directive     |                |
|   | RoHS directive                      |                |
|   | WEEE directive                      |                |

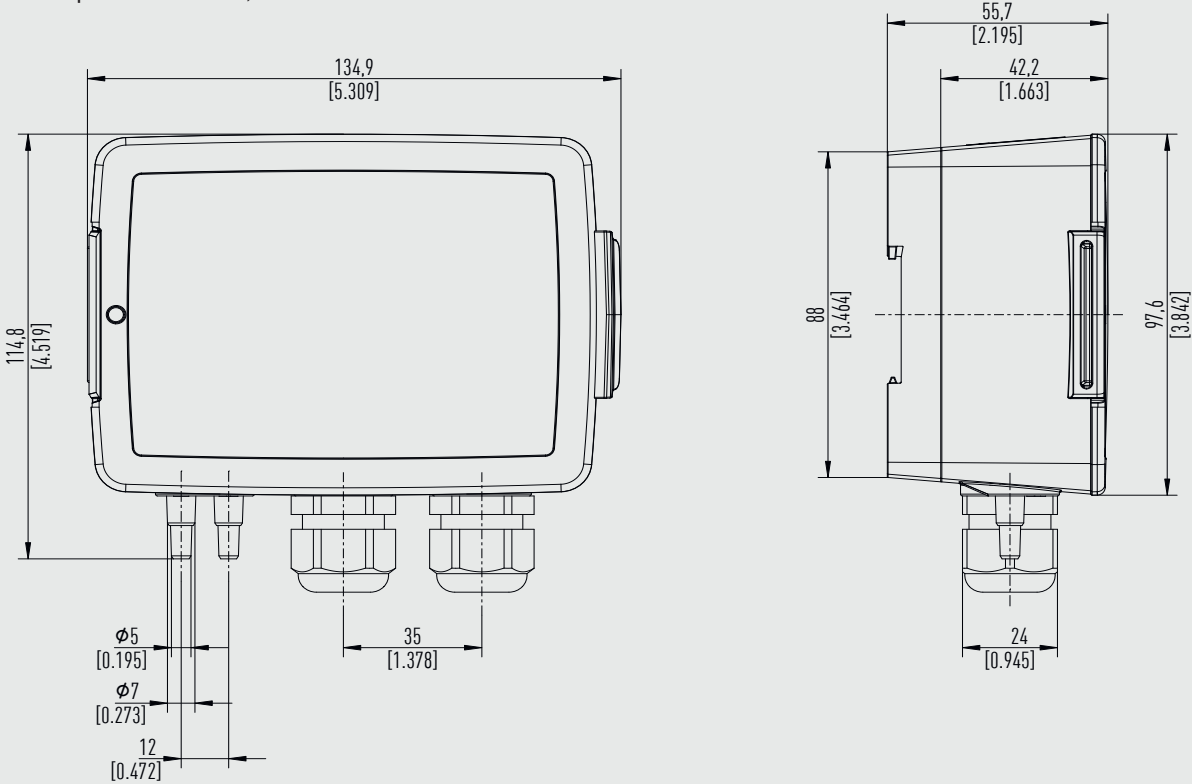
## Certificates

| Certificates |   |
|--------------|---|
| Certificates | <ul style="list-style-type: none"> <li>■ Without</li> <li>■ Measurement report per EN 837</li> <li>■ 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, material proof, indication accuracy)</li> <li>■ 3.1 inspection certificate per EN 10204 (e.g. material proof for wetted metal parts, indication accuracy, calibration certificate)</li> </ul> |

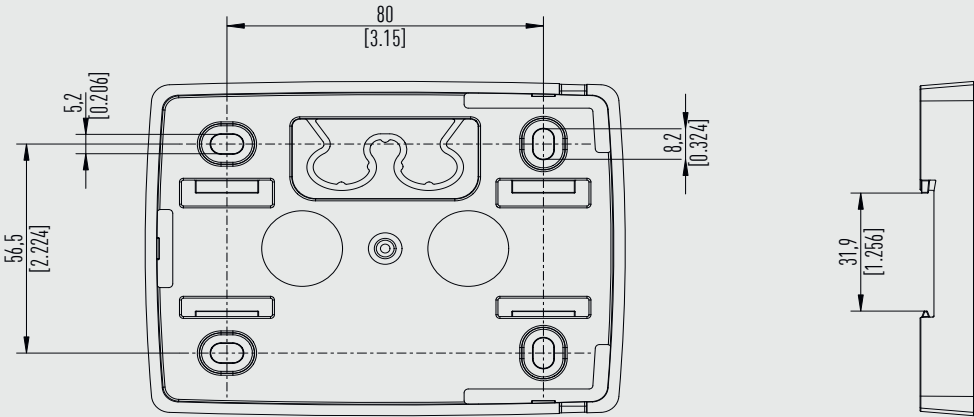
→ For approvals and certificates, see website

**Dimensions in mm [in]**

Differential pressure sensor, model A2G-500

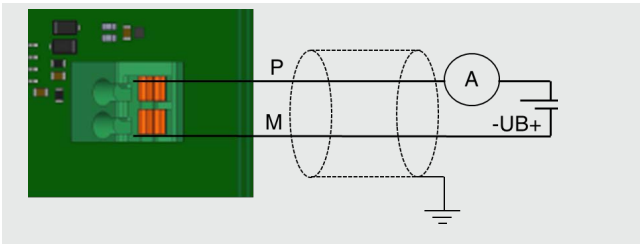


Mounting plate

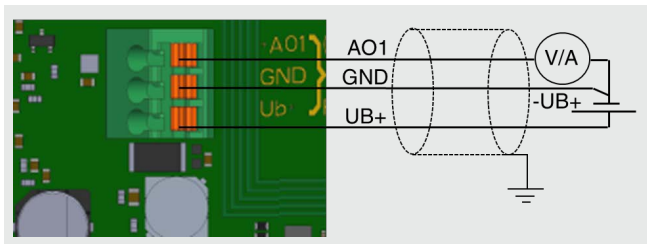


## Electrical connection

Output signal 4 ... 20 mA, 2-wire

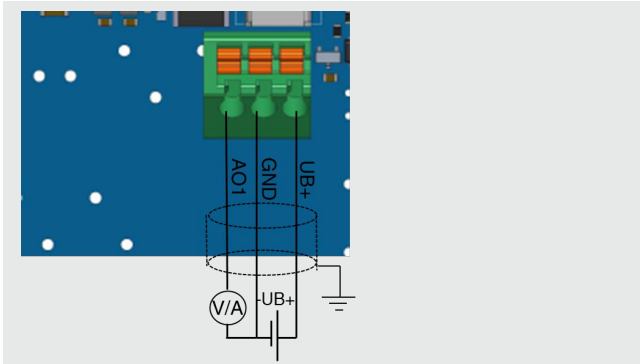


Output signal 0 ... 10 V or 0 ... 5 V or 2 ... 10 V or 4 ... 20 mA, 3-wire

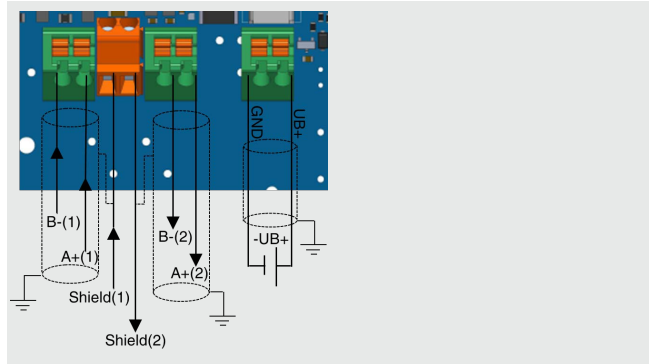


Output signal 0 ... 10 V or 0 ... 5 V or 2 ... 10 V or 4 ... 20 mA, 3-wire

With display and/or relay and/or signal input

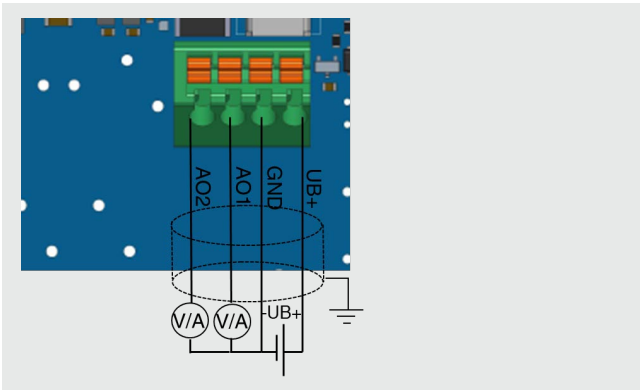


Modbus® RTU

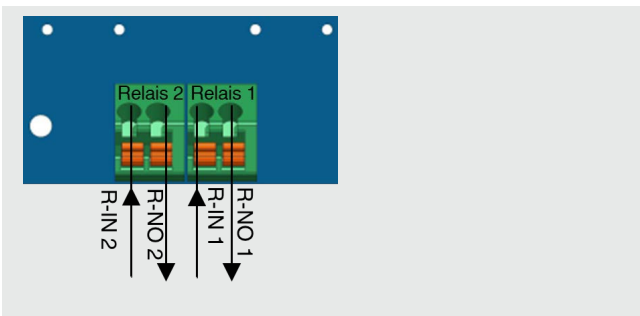


## Additional electronic connection

Additional signal output



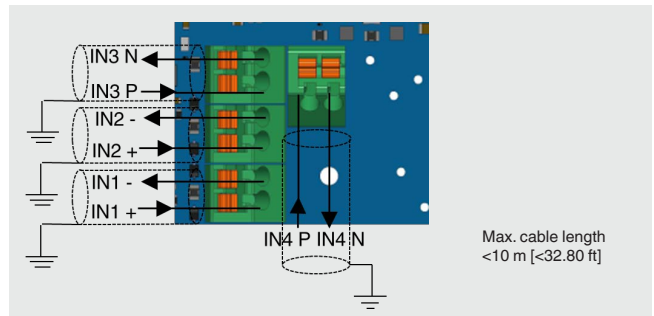
One or two relay outputs









Up to four signal inputs

IN1, IN2 = active input signal

IN3, IN4 = passive input signal



## Accessories 1)

| Model   | Description  | Order number |
|---|--|--------------|
|  | <b>Measuring hoses</b>   |              |
|   | 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     |
|  | <b>2 x of duct connector for measuring hoses Ø 4 ... 6 mm [0.16 ... 0.24 in] and 4 x of mounting screw</b> | 40217507     |
|  | <b>Multiple sealing inserts (for M20 cable gland)</b>  |              |
|   | 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     |
|  | <b>Battery AA 3.6 V, 2.6 Ah (only with battery version); PU 2 x</b>  | 40443947     |
|   | <b>LoRaWAN® gateway, preconfigured for WIKA network server</b>   | 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-500
- Mounting plate
- 4 x pan-head, self-tapping screws ST4.2x9.5 (cross head Philipps Form H2)
- 2 x batteries AA 3.6 V, 2.6 Ah (only with battery version)

### 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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