Operating instructions

Differential pressure sensor / Differential pressure air flow sensor / Differential pressure air flow controller, models A2G-500, A2G-520 and A2G-540

EN

**Differential pressure sensor, model A2G-500 /
Differential pressure air flow sensor, model A2G-520 /
Differential pressure air flow controller, model A2G-540**

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Operating instructions
Models A2G-500, A2G-520 and A2G-540

Prior to starting any work, read the operating instructions.
Keep for later use.

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1. General information

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- The instrument described in the operating instructions has been designed and manufactured using state-of-the-art technology. All components are subject to stringent quality and environmental criteria during production. Our management systems are certified in accordance with ISO 9001 and ISO 14001.
- These operating instructions contain important information on handling the instrument. Working safely requires that all safety instructions and work instructions are observed.
- Observe the relevant local accident prevention regulations and general safety regulations for the instrument's range of use.
- The operating instructions are part of the product and must be kept in the immediate vicinity of the instrument and readily accessible to skilled personnel at any time. Pass the operating instructions on to the next operator or owner of the instrument.
- Skilled personnel must have carefully read and understood the operating instructions prior to beginning any work.
- In case of a different interpretation of the translated and the English operating instructions, the English wording shall prevail.
- If available, the provided supplier documentation is also considered to be part of the product in addition to these operating instructions.
- The general terms and conditions contained in the sales documentation shall apply.
- Subject to technical modifications.

- Further information:
  - Internet address: www.wika.de / www.wika.com
  - Relevant data sheets: PE 88.05, PE 88.06, PE 88.07
  - Special documentation: Special documentation for LoRaWAN®
  - Contact info@wika.ch

1.1 Abbreviations, definitions

■	Bullet
►	Instruction
1. ... x.	Follow the instruction step by step
⇒	Result of an instruction
→	See ... cross-references

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1.2 Explanation of symbols

DANGER!
... indicates a directly dangerous situation resulting in serious injury or death, if not avoided.

WARNING!
... indicates a potentially dangerous situation that can result in serious injury or death, if not avoided.

CAUTION!
... indicates a potentially dangerous situation that can result in light injuries or damage to property or the environment, if not avoided.

Information
... points out useful tips, recommendations and information for efficient and trouble-free operation.

2. Safety

2.1 Intended use

This differential pressure sensor is used for measuring differential pressure, overpressure and vacuum of air and other non-inflammable and non-aggressive gases in ventilation and air-conditioning applications and is used in industrial electromagnetic environments.

This instrument is not permitted to be used in hazardous areas.

The instrument has been designed and engineered solely for the intended use described here, and may only be used accordingly.

The technical specifications contained in these operating instructions, see chapter 9 “Specifications”, must be observed. It is assumed that the instrument is handled properly and within its technical specifications.

The manufacturer shall not be liable for claims of any type based on operation contrary to the intended use.

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2.2 Improper use

- Any use beyond or different to the intended use is considered as improper use.
- Unauthorised modifications to the instrument are not permissible.

2.3 Personnel qualification

The activities described in these operating instructions may only be carried out by skilled personnel who have the qualifications described below.

Skilled electrical personnel
Skilled electrical personnel are understood to be personnel who, based on their technical training, know-how and experience as well as their knowledge of country-specific regulations, current standards and directives, are capable of carrying out work on electrical systems and independently recognising and avoiding potential hazards. The skilled electrical personnel have been specifically trained for the work environment they are working in and know the relevant standards and regulations. The skilled electrical personnel must comply with current legal accident prevention regulations.

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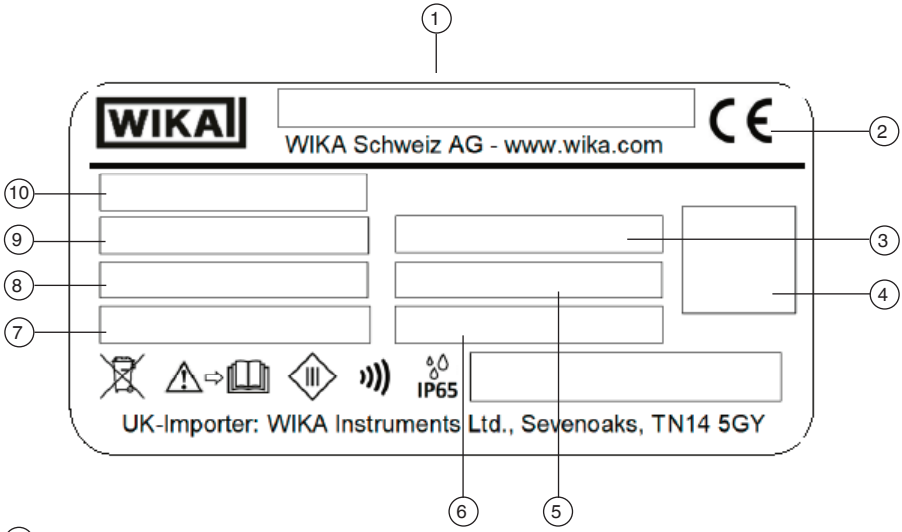
2.4 Labelling, safety markings

The labelling, safety markings must be maintained in a legible condition.

Product label (example)



1. Model
2. Approval marking
3. Serial number
4. QR code per LoRa Alliance® specification
5. Item number
6. Radio standard
7. Date of manufacture (YYYY/MM)
8. Output signal / Bus protocol (optional)
9. Auxiliary power
10. Operating range

Do not dispose of with household waste. Ensure a proper disposal in accordance with national regulations.

Before mounting and commissioning the instrument, ensure you read the operating instructions.

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In electrical engineering, the protection class is used to categorise and label electrical equipment with regard to the protective and safety measures in place to prevent electric shock.

NFC means “Near Field Communication”. This refers to contactless data transmission that utilises radio frequency identification (RFID) technology.

IP ingress protection ratings indicate the degree to which an object is protected against the ingress of water and dust or other possible external influences.

2.5 Contents of the QR code

Example:
LW (LoRaWAN®):
D0:70B3D597B0000008:70B3D597B0004D71:02A30008:S2Y01FZFCOJ6:CC9B3

Contents	Identifier	Example	Comment
SchemaID	-	D0	-
JoinEUI (64 bit)	-	70B3D597B0000008	JoinEUI = AppEUI
DevEUI (64 bit)	-	70B3D597B0004D71	-
ProfileID	-	02A30008	02A3 = VendorID WIKA 0008 last 4 digits of the JoinEUI
SerNum	S	2Y01FZFCOJ6	Alphanumeric WIKA serial number (11-digit)
CheckSum	C	C9B3	-

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3. Transport, packaging and storage

3.1 Transport

WARNING!
Damage from batteries through improper transport
If loose or removed batteries are transported incorrectly, they can explode, burn or leak.

- ▶ Tape exposed contacts and pack the batteries so that they do not move in the packaging (prevent short-circuit).
- ▶ Be careful when transporting.

CAUTION!
Damage through improper transport
With improper transport, damage to property can occur.

- ▶ When unloading packed goods upon delivery as well as during internal transport, proceed carefully.
- ▶ With internal transport, observe the instructions in chapter 3.2 “Packaging and storage”.

Check the instrument for any damage that may have been caused.
In the event of any damage, do not commission the instrument and contact the manufacturer immediately.

If the instrument is transported from a cold into a warm environment, the formation of condensation may result in instrument malfunction. Prior to recommissioning, wait for the instrument temperature and the room temperature to equalise.

3.2 Packaging and storage

Do not remove packaging until just before mounting.
Keep the packaging as it will provide optimum protection during transport (e.g. change in place of use, sending for repair).

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4. Design and function

4.1 Overview

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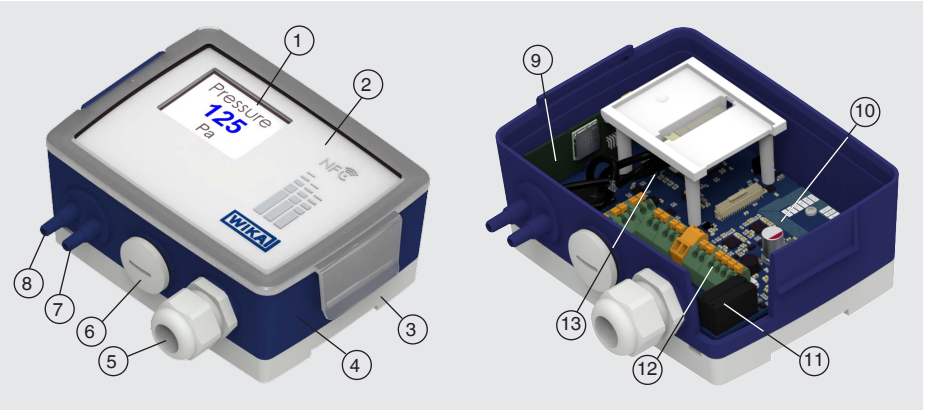

(1) Display (option)
(2) Cover with insert sheet
(3) Mounting plate
(4) Case
(5) M20 cable gland (depending on version)
(6) Blind plug (depending on version)
(7) Process connection ⊕
(8) Process connection ⊖
(9) LoRaWAN® (option)
(10) NFC antenna
(11) Relay (option)
(12) Connection terminals
(13) Valve for automatic zero point setting (option)

The illustrations are symbolic images and there may be differences depending on the version.

4.2 Scope of delivery

- Differential pressure sensor
- Mounting plate
- 4 pan-head, self-tapping screws ST4.2x9.5 (cross head Philipps Form H2)
- LoRaWAN® login credentials for commissioning (only with LoRaWAN® devices)
- 2 batteries AA 3.6 V, 2.6 Ah (only with battery version)
- Quick start instructions

Cross-check scope of delivery with delivery note.

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4.3 Description

The A2G-500 differential pressure sensor is used to measure differential pressure, gauge pressure and vacuum. The A2G-520 differential pressure air flow sensor measures the pressure difference on components such as ventilators and pitot tubes or similar, e.g. model A2G-FM, and calculates the air flow using the calibration factor (K value). The A2G-540 differential pressure air flow sensor is further used to control differential pressure and air flow.
All instrument versions are used in air and also in non-aggressive and non-inflammable gases in ventilation and air-conditioning systems.

The measured values are available as analogue voltage and current signals, digitally via the RS-485 interface using Modbus® RTU or via wireless transmission via LoRaWAN®. LoRaWAN® is based on LPWAN technology (“Low Power Wide Area Network”) to enable high transmission ranges. The IIoT-capable instrument fulfils safety-related requirements of the relevant standards and regulations for on-site display, as well as the requirements of the Radio Equipment Directive for data communication. Integration into any control system or directly into cloud solutions is therefore easily possible.

The settings, measured values and the instrument status can be set and queried on site using a mobile device, such as a smartphone, via the WIKA app “myWIKA wireless device” (NFC) and, depending on the version, by means of buttons or LED operation.

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4.4 Overview of versions

Model	A2G-500	A2G-500 /-520 / -540		A2G-500
Specification	**Single-range**	**Multi-range**	**Modbus RTU**	**Wireless (battery power)**
Differential pressure	✓	✓	✓	✓
Air flow [1]	×	O	O	×
Controller [2]	×	O	O	×
Operating range				
±250 Pa	✓	✓	✓	✓
±2,500 Pa	✓	✓	✓	✓
±7,000 Pa	✓	✓	✓	✓
±12,000 Pa [3]	✓	✓	✓	✓
Measuring range				
Preset	1	8	8	8
Customer-specific	×	✓	✓	✓
1. Analogue output (only one selection possible)				
2-wire 4 … 20 mA	O	×	×	×
3-wire 4 … 20 mA, 0 … 10 V, 0 ... 5 V or 2 ... 10 V	O	O	O	×
2. Analogue output				
3-wire 4 … 20 mA, 0 … 10 V, 0 ... 5 V or 2 ... 10 V	×	O	O	×
Signal inputs	×	O	O	×
Relay	×	O	O	×
Manual zero point setting	✓	✓	✓	✓
Automatic zero point setting	×	O	O	×
Wireless signal (LoRaWAN®)	×	O	O	✓
Display	×	O	O	×

✓: included ×: not included O: optional

1) A2G-520 or A2G-540
2) A2G-540
3) This operating range is only available for A2G-500 and A2G-540 (differential pressure sensor).

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5. Commissioning and operation

Personnel: skilled electrical personnel
Tools: voltage tester, screwdriver

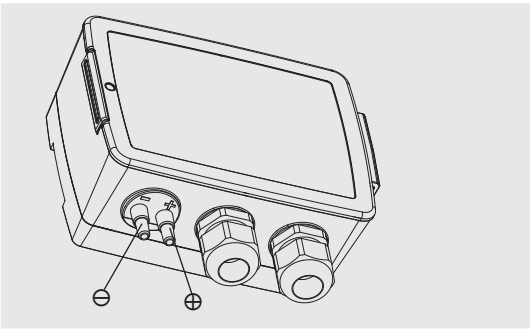
Only use original parts, see chapter 10 “Accessories and spare parts”.
Check the instrument for any damage that may have been caused.
In the event of any damage, do not commission the instrument and contact the manufacturer immediately.

CAUTION!
Damage to property due to electrostatic discharge (ESD)
When working on open circuits (PCBs) there is a danger of damaging sensitive electronic components through electrostatic discharge.

- ► When the battery compartment is open, e.g. when changing the battery, sufficient ESD protection must be ensured.
- ► Do not touch PCBs and electrical components.
- ► Before removing the plastic cover, touch any part of an adjacent grounded metal object (e.g. radiator, pipelines) (static charges are dissipated from the body).
- ► Avoid contact between the electronics and clothing.

5.1 Commissioning procedure

1. Fasten the instrument at the desired mounting location, see chapter 5.2 “Instrument mounting”
2. Connect the power supply and the input and output signals, see chapter 5.3 “Electrical connection” and chapter 5.3.2 “Battery power (A2G-500)”
3. Carry out a zero point setting (depending on instrument variant, see chapter 5.4.4 “Zero point setting”).
4. Connect measuring hoses, see following graphic



5. The instrument is ready for configuration, see chapter 5.4 “Operation / Instrument setting”

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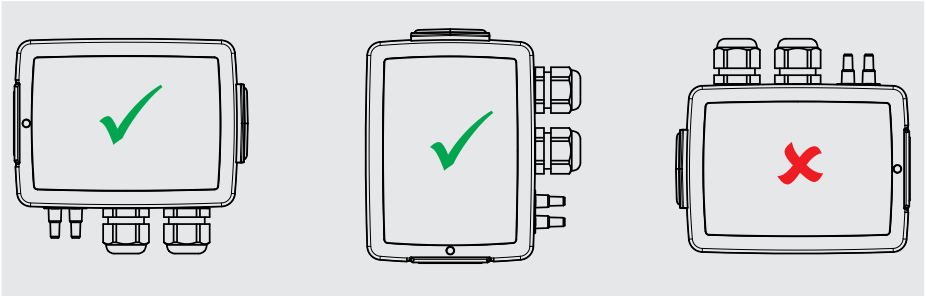
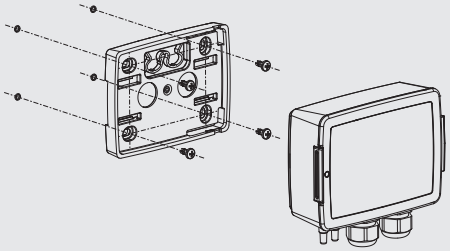
5.2 Instrument mounting

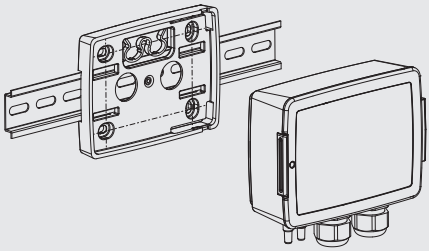
The instrument can be mounted both vertically and horizontally. Measurement accuracy and IP ingress protection may deviate with cable entry from side. The specifications are based on vertical mounting with cable entries at the bottom.



1. Select a vibration-free mounting location



a. Fastening to a duct, wall or panel.



b. Fastening to a DIN rail (standard rail TS35 (35 x 7.5 mm) in accordance with DIN EN 60715)

2a. Separate the mounting plate from the case and use the screw holes as drilling templates.
(bore diameter 3.8 mm)

3a. Mount using the fastening screws supplied.

2b. Snap the instrument onto the DIN rail.

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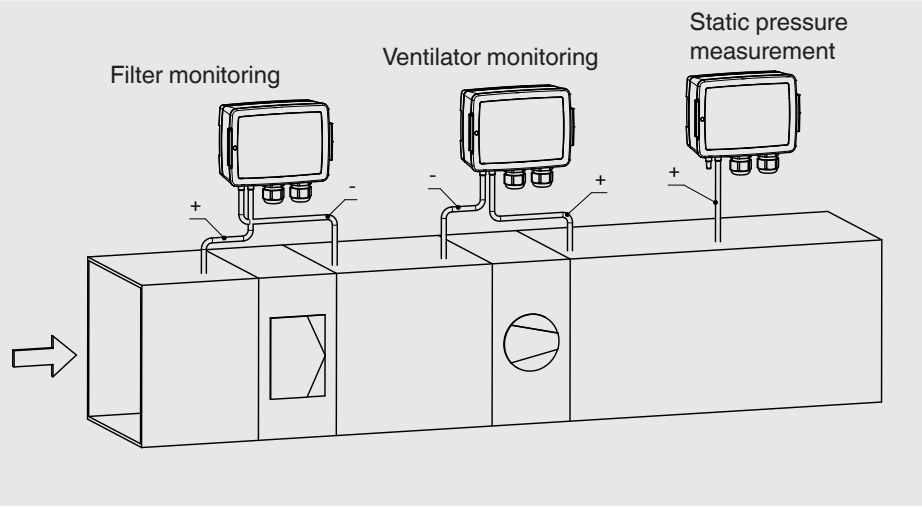
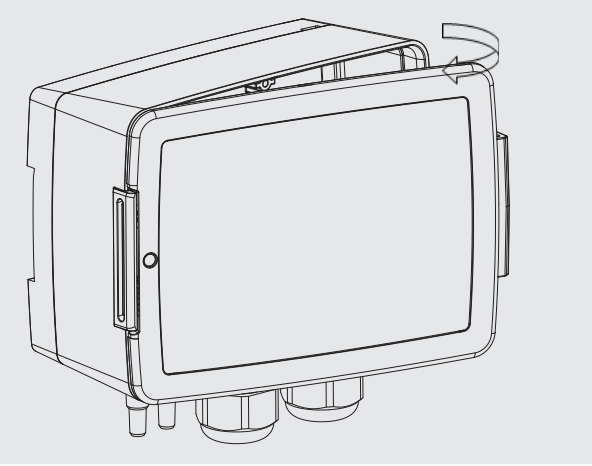
Application-related connections



5.3 Electrical connection

The instrument is designed to operate with safety extra-low voltages (SELV).

1. Remove the case cover



In the instrument version with battery supply, the batteries can be inserted directly after opening the case cover, see chapter 5.3.2 “Battery power (A2G-500)”.

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2. Loosen the cable gland and feed through the cable or cables.
3. Tighten the cable gland.
4. Connect the wires, see chapter 5.3.1 “Connection diagram”.

Load: Current output = max. 500 Ω
Voltage output = Typ. 1 kΩ

CE conformity requires shielded cables. These must be grounded at the opposite end (PLC or DDC). With Modbus cabling, the shield must be connected on both sides to the specially designated connection terminals (labelled Shield).

5.3.1 Connection diagram

Explanation of abbreviations in the diagram.

Abbreviation	Meaning
UB +	Operating voltage
GND	Ground
AO x	Output signal
P	Plus (2-wire)
M	Minus (2-wire)
A	Current output
V	Voltage output
A +(x)	Output signal A +
B -(x)	Output signal B -
Shield	Shield
INx +/-	Active input signal (positive/negative)
INx P/N	Passive input signal (positive/negative)
R-IN x	Relay input
R-NO x	Relay normally open

x = Numbering

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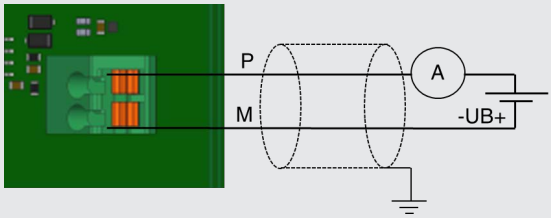
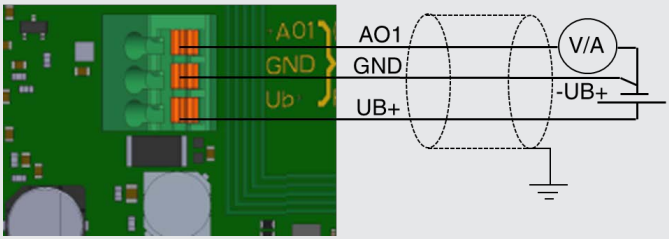
A2G-500 (single-range)

■ Output signal 4 ... 20 mA, 2-wire

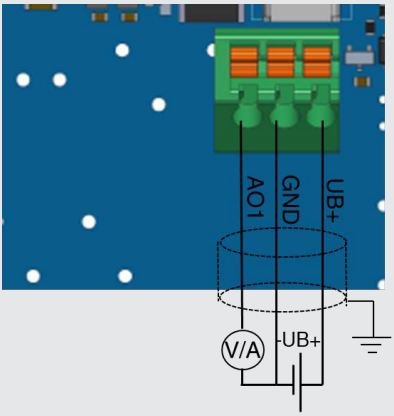


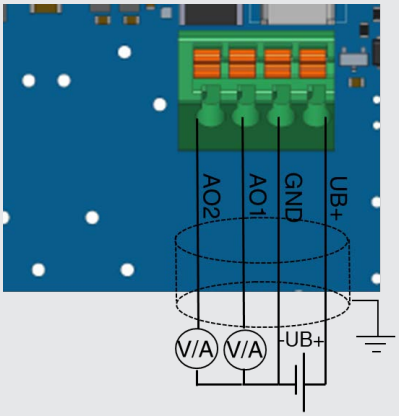
■ Output signal 0 ... 10 V, 4 ... 20 mA, 0 ... 5 V or 2 ... 10 V, 3-wire



A2G-500 / -520 / -540 (multi-range)

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





Second output signal included

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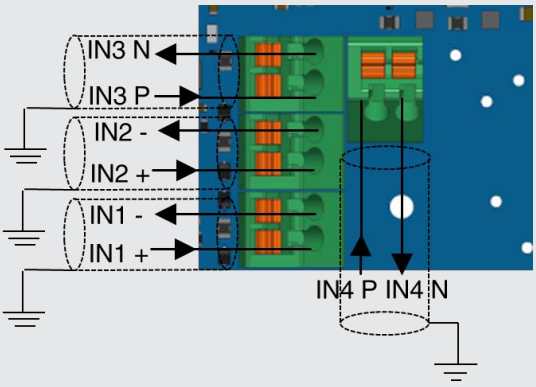
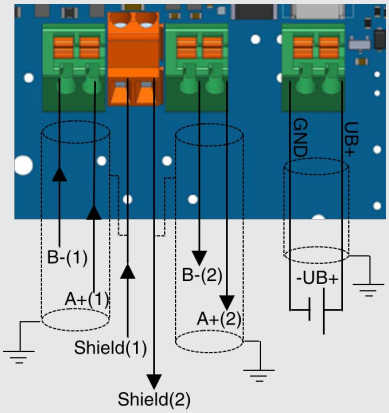
■ 4 x input signal (2x voltage input, 2x resistance input)

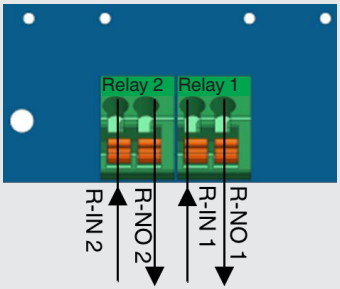


Maximum cable length <10 m [<32,80 ft]

■ Modbus connection



■ 2 x relay switching output



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5.3.2 Battery power (A2G-500)

DANGER!
Physical injuries and damage to property and the environment through lithium thionyl chloride batteries
Improper handling of lithium thionyl chloride batteries can lead to leakage or escape of vapourised electrolyte vapours and cause a fire or explosion.

- ▶ Do not open the batteries.
- ▶ Do not damage the batteries.
- ▶ The positive and negative connections must not be short-circuited with conductors.
- ▶ Do not reverse the polarity.
- ▶ Do not expose the batteries to excessive mechanical loads.
- ▶ Do not expose the batteries to water or condensation.
- ▶ Do not heat, solder or expose the batteries to fire.
- ▶ Do not use any rechargeable batteries.
- ▶ Do not continue to use batteries that have been dropped on the ground / damaged.

To ensure proper operation and the best possible performance, use only the batteries listed below:
Lithium thionyl chloride battery, model Saft LS 14500

The battery life is transmitted as a percentage value via LoRaWAN®. Since the battery life is influenced by many factors, such as the measurement and sending rate, the spreading factor, and the ambient and process temperatures, this value is only an approximation.

At values below 20 % of the expected remaining service life a battery change is recommended.

The battery charge/life can be read out as a percentage value via the “myWIKA wireless device” app and the NFC interface.

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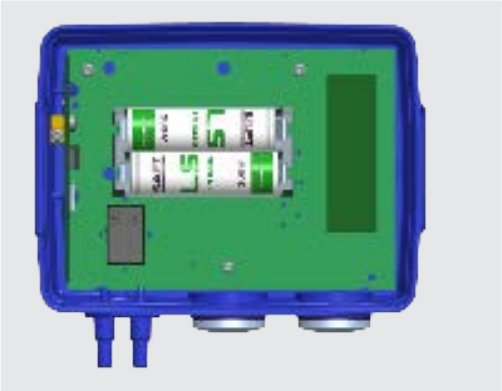

Polarity of the batteries	
Battery (top)	Left = - Right = +
Battery (bottom)	Left = + Right = -

5.4 Operation / Instrument setting

The instrument can be operated in different ways, depending on the specification.

Model	A2G-500	A2G-500 /-520 / -540		A2G-500
Specification	**Sigle-Range**	**Multi-Range**	**Modbus RTU**	**Wireless (battery power)**
WIKA app (NFC)				
Configure	✓	✓	✓	✓
Read	✓	✓	✓	✓
Button/Display	×	O	O	×
Button/LED	O [1]	O [2]	×	×

1) Only 3-wire
2) Only A2G-500

✓: included
×: not included
O: optional

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All setting options are available via the WIKA app (NFC) and the buttons/display.
The setting options are limited if using the buttons/LED.
In the A2G-520 and A2G-540 versions without display, the buttons have no function.

5.4.1 Operation via the WIKA app (NFC)

Via the “myWIKA wireless device” app and an NFC connection, the data transmission can be activated and deactivated through the mobile device. Furthermore, the instrument data and the current measured value can be read and the parameters set via the app.

“myWIKA wireless device” app		
	Download on the App Store For iOS-based mobile phones (from iOS version 13), the app is available in the Apple Store under the link below:	GET IT ON Google Play For mobile phones with an Android operating system, the app is available in the Play Store via the link below:

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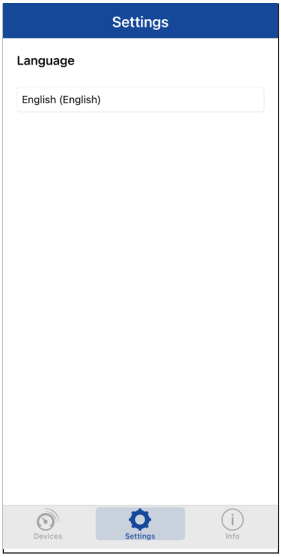
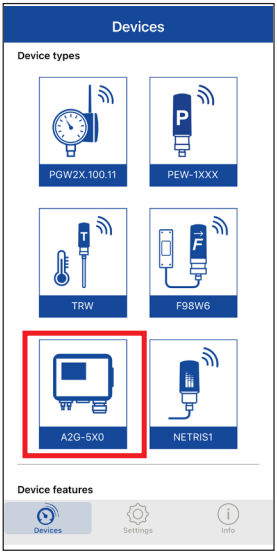
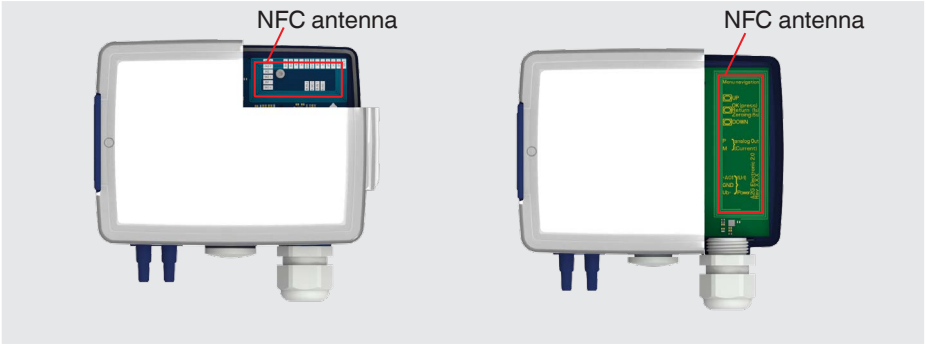
The structure of the WIKA app is explained below:
Select language: The language can be selected under “Settings” in the lower menu ribbon. The model A2G-5x0 instrument can then be selected on the start screen.





Smartphone positioning for NFC data exchange:
The NFC antenna on the A2G-5x0 is installed on the printed circuit board (see figure below).The NFC antenna on the smartphone is installed differently by each manufacturer. It is always located on the back of the smartphone. It can be at the top, in the centre or at the bottom. It is therefore important to find the right position.
In addition, the NFC communication must be activated in the smartphone settings.



iPhone models from version 7 are NFC-capable.
With some Android devices, NFC is deactivated as standard.

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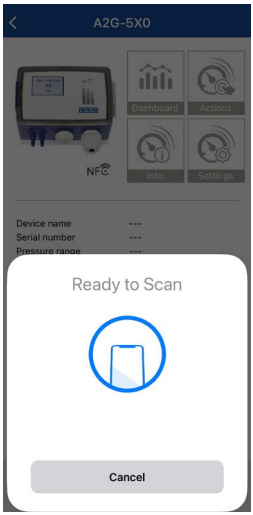
Hold the smartphone **right up against** the A2G-5x0. If the smartphone position is correct, “Communication active ...” appears on the A2G-5x0 display.



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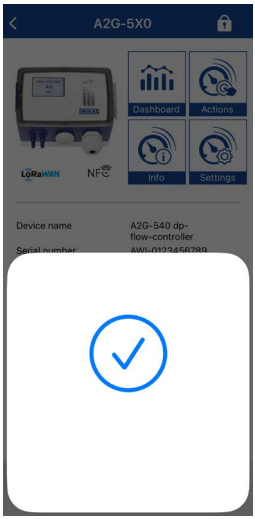
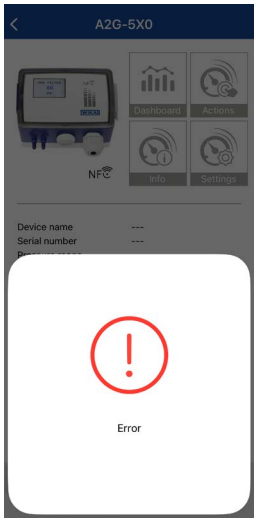
Data exchange successful



Data exchange failed, try again

Change smartphone position and hold it right up against the A2G-5x0



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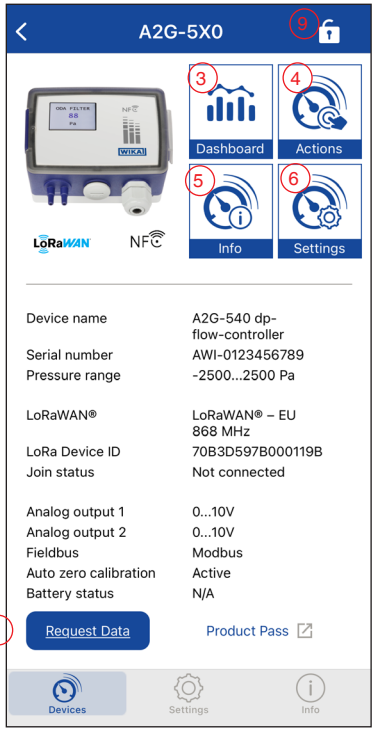
Menu structure

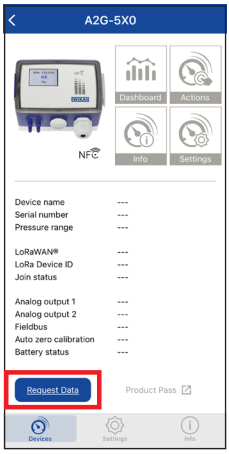
The menu structure, menu items and settings are explained below.
Some settings are self-explanatory, such as the pressure ranges, and are not explained further.
Depending on the instrument version and options, only the menu items that are available on the hardware side can be set in the instrument. The options that have not been ordered are greyed out and cannot be selected.

Device home



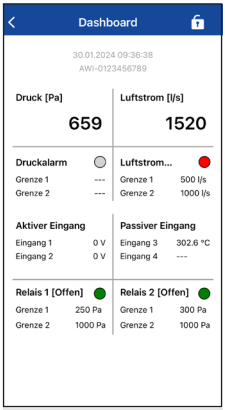
Settings

① **Request data:**
Read data, specifications and settings of the instrument



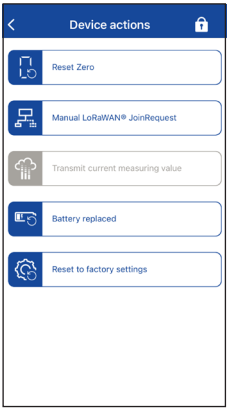
② **Load settings:**
Upload saved parameter files (settings) from the smartphone to the instrument

③ **Dashboard:**
Display of current measured values



④ **Device Actions:**

- Zero point adjustment (manual and automatic, depending on hardware)
- Manual connection of the instrument and the LoRaWAN® gateway
- Transmission of current measured value via LoRaWAN®
- Changing the battery (for battery-powered instruments)
- Resetting the instrument to factory settings
  Factory setting password: 1234



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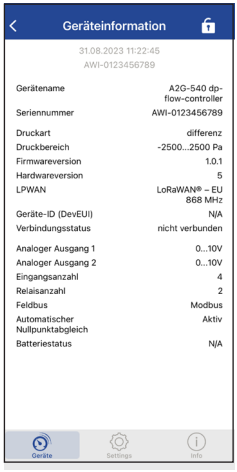
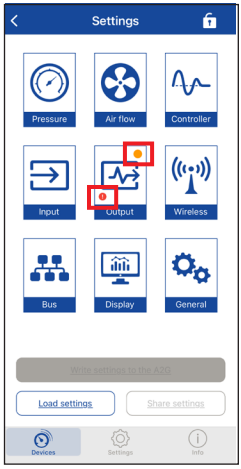
⑤ **Device information:**
Instrument information

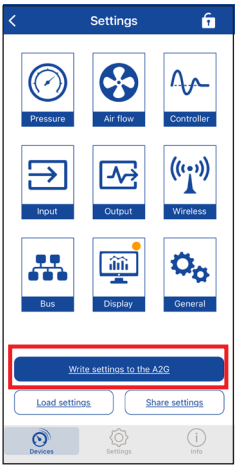


⑥ **Settings:**
Parameter settings

- The orange dot indicates that change(s) have been made.
- A red, circled exclamation mark indicates that the entered value is not possible.



⑦ **Write settings to the A2G:**
Sending changed specifications to the instrument



⑧ **Share settings:**
Save changed, customised and current settings as a file on your smartphone or send them via e-mail, for example

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⑨ **Lock function:**
The password can be activated or deactivated and the password can be changed in the “General” settings, see chapter 5.4.1.8 “General”.
Factory setting password: 1234

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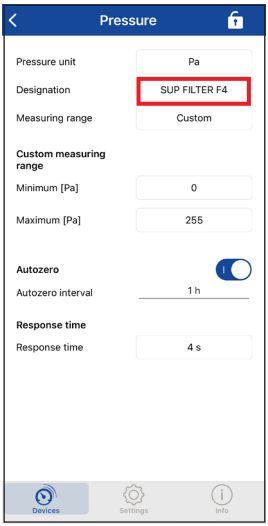
Alphanumeric designation
In the respective menu items, in this example “Pressure”, the measured value can be described alphanumerically, e.g. “SUP FAN F4” (max. 13 characters).

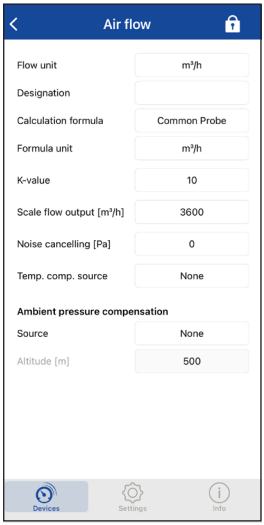
In the “Measuring range” setting, individual measuring ranges can be selected in addition to the predefined measuring ranges, i.e. a customised measuring range can be defined.



5.4.1.1 Air flow (A2G-520 and A2G-540)

1. **Select “Air flow”**
   Select unit for display and output signal
   Flow unit: m^3/s, m^3/h, cfm, l/s
   Formula unit: m/s, ft/min

2. **Calculation formula (manufacturer’s formula):**
   Measurement of the air volume flow using the K-value of the ventilator
   a) Select ventilator manufacturer
   b) “Common probe” (measuring probe):
   Use together with the model A2G-FM measuring probe



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Manufacturers' calculation formulas

Calculation formula	Formula unit	Formula	K-value	Flow unit
Common Probe	m^3/h; m^3/s; l/s; cfm	$q = k * \sqrt{\Delta p}$	0.001 – 9999.99	m^3/h; m^3/s; l/s; cfm
	m/s; ft/min	$v = k * \sqrt{\Delta p}$	0.001 – 9999.99	m/s; ft/min
Rosenberg	m^3/h	$q = k * \sqrt{\frac{2}{\rho}\Delta p}$	37.0 - 800.0	m^3/h; m^3/s; l/s; cfm
Comefri	m^3/h	$q = k * \sqrt{\frac{2}{\rho}\Delta p}$	10.0 – 2000.0	m^3/h; m^3/s; l/s; cfm
Nicotra Gebhardt	m^3/h	$q = k * \sqrt{\frac{2}{\rho}\Delta p}$	10.0 – 4700.0	m^3/h; m^3/s; l/s; cfm
Ziehl-Abegg	m^3/h	$q = k * \sqrt{\Delta p}$	10.0 – 1500.0	m^3/h; m^3/s; l/s; cfm
ebm-papst	m^3/h	$q = k * \sqrt{\Delta p}$	10.0 – 1500.0	m^3/h; m^3/s; l/s; cfm
Fläkt Woods	m^3/s	$q = \frac{1}{k} * \sqrt{\Delta p}$	0.3 – 99.0	m^3/h; m^3/s; l/s; cfm

Legend:
q = Air flow
k = K-value
ρ = Air density at standard conditions
Δp = Differential pressure
v = Velocity

3. **Only for "Common Probe"**
   The unit for the formula and the flow must be selected identically. Subsequently, the K-value is entered.

4. **Select K value: between 0.001 ... 9999.99**
   The ventilator- or probe-specific K value must be entered. The K value can be found on the data sheet / product label of the respective ventilator or installation part.

5. **Select the maximum air flow (upper measuring range limit) for scaling the output signal**
   In the "Scale air flow output" menu item, enter the maximum air flow depending on the selected measuring instrument variant.

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6. Noise cancelling
The noise cancelling function can be used to suppress the smallest air movements when the ventilator is switched off.

7. Temperature and/or pressure compensation
Optionally, a temperature and/or pressure compensation can be carried out.

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Temperature compensation:
If a temperature signal T(x) is connected to the inputs of the instrument, see chapter 5.4.1.3 “Input“), temperature compensation can be activated in the air flow. The pressure difference for the air flow is adjusted according to the temperature applied in relation to the standard environment.

$$q_{T-komp.} = q * \sqrt{\frac{T(x)}{T_{ref}}} \qquad T_{ref} = 20\,°C$$

q_T = Air flow, temperature compensated
T_{ref} = Temperature reference = 20 °C [68 °F]

Pressure compensation:
There are two options for pressure compensation in the air flow menu: altitude correction and an external pressure signal. With altitude correction, the altitude of the measuring location above sea level can be entered and the pressure difference for the air flow is compensated according to the isothermal barometric altitude formula. If an external pressure signal, e.g. for the external pressure, is connected to an analogue input, see chapter 5.4.1.3 “Input” of the instrument, pressure compensation is performed in relation to the standard environment.

$$q_{p-komp.} = q * \sqrt{\frac{p_{ref}}{p(h)}}$$

With altitude compensation:

$$p(h) = p_{0\ *\ e\ -\ \frac{g*pref}{p_0}\ *\ altitude\ (h)}$$

$\rho_0 \quad = 1.2041\ [\frac{kg}{m^3}]$
$g \quad = 9.80665\ [\frac{m}{s^2}]$

$p_{ref} = 1013.25\ hPa$

The values with the index 0 refer to the reference values of the ICAO standard atmosphere and not to the laboratory conditions.

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Or ambient pressure sensor: p(h) = value from external ambient pressure sensor

q_p = Pressure compensated
p_{ref} = Pressure reference

5.4.1.2 PID controller (A2G-540)

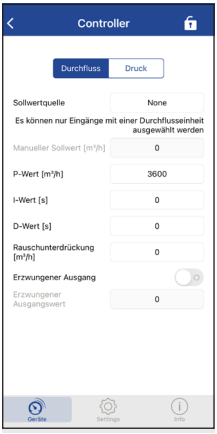
The controller output is calculated by the instrument using:

$$u = 0.5 + K_P \cdot e + K_I \cdot \int e(t)dt + K_D \cdot \frac{d\,e(t)}{dt}$$

u	= Manipulated variable (controller output)	
e	= Deviation from the set point	
$K_P \cdot e$	= P	= Proportional action
$K_I \cdot \int e(t)dt$	= I	= Integral action
$K_D \cdot \frac{de(t)}{dt}$	= D	= Derivative component

Possible controllers are P; PI; PD and PID controllers, controlled via the de-/activation of the P, I and D values.

1. **Select “Flow” or “Pressure” under Controller**
   Set the setpoint:
   a) The source can be selected in the “Setpoint source” menu, e.g. external potentiometer.
   b) If the setpoint source “Manual setpoint” is selected, the value can be entered numerically in this menu.



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2. Select proportional band depending on the specification
Enter it in the “P-Value”
P in the respective pressure/flow unit for K_P value, reciprocal of P value (K_P=1/P)

3. Select reset time
Enter it in “I-Value”
Tn in seconds for I-Value

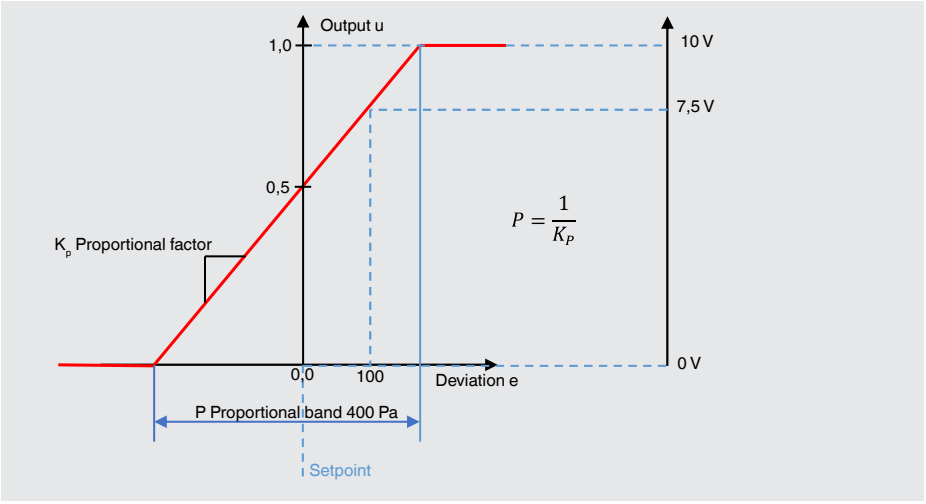
4. Select derivative time
Enter in “D-Value”
Tv in seconds for D-Value

5. Noise cancelling
Enter the desired value for activation

6. Select forced output value

1. Deactivate or activate in the “Output forcing” menu
2. Manually enter the value between 0 and 1 (up to 5 decimal places possible) in the “Forced output value” menu

Example: P controller



Explanations of P controller figure:

- The user input for the P value as a proportional band in the range 0 ... 999999 (flow/pressure)
- The proportional band is defined as the reciprocal of K_P

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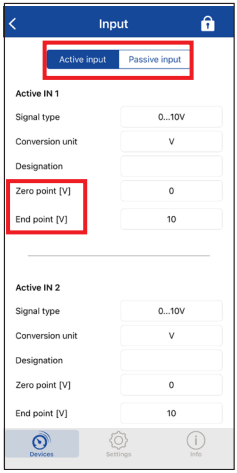
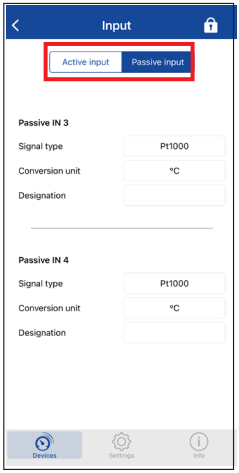
- The controller output is calculated using
  $u = 0.5+K_P \cdot e$
- Example: $P = 400\ Pa \Rightarrow K_P = 1/400Pa$
  With a deviation of 100 Pa from the set point, the result is
  $u = 0.5+1/400\ Pa \cdot 100\ Pa = 0.75$
  Scaled to the 0 ... 10 V output, the controller outputs 7.5 V for this deviation

5.4.1.3 Input

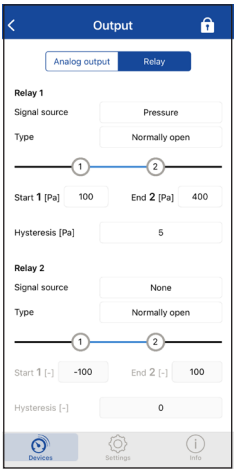
The active and passive inputs can be set in the “Input” setting.
The numerical value for the scaling must be entered in the “End point” and “Zero point” menu items.

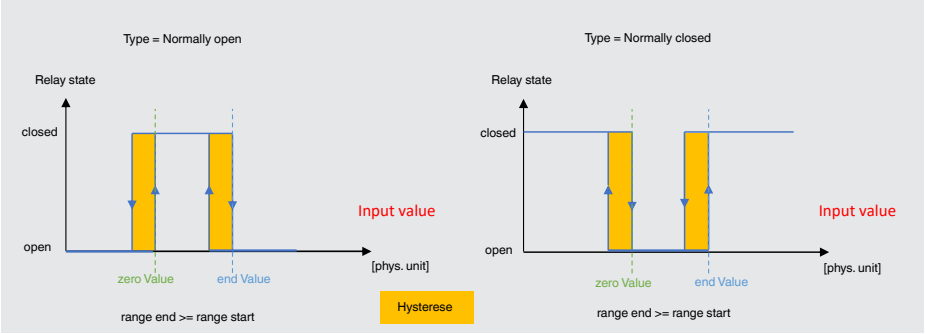




5.4.1.4 Output (relay)

Select Relay in “Output” menu
a. Select signal source
b. Select relay type
Select the desired type in the “Type” setting
- Normally open
- Normally closed
- Force open
- Force closed





c. Select switch points

Enter the start and end value (“Zero value” and “End value”) in the “Start 1” and “End 2” settings.

d. Enter the desired value in the “Hysteresis” setting

5.4.1.5 Wireless (LPWAN)

Integration of the radio network

The energy mode of the A2G-5x0 defines the communication class for LoRaWAN®.
A2G-5x0: LoRaWAN® class A
The A2G-5x0 is configured for “over-the-air” activation. To go through the activation procedure, the instrument is already preconfigured with specific LoRaWAN® parameters. In accordance with the LoRaWAN® specifications 1.1.0, the instrument is equipped with the following parameters:

- A device identifier (DevEUI)
- An application identifier (AppEUI)
- An application key (AppKey)

This information can be found on the enclosed label and must be communicated to the network server so that it can activate the instrument and communicate with the instrument. Commissioning the instrument is a specific process that must be carried out with a LoRaWAN® network service provider. Further information can be obtained from the network service provider.

Connection procedure

When switched on, the sensor starts a LoRaWAN® connection sequence (1 attempt and 1 retry 3 minutes later if the first attempt was unsuccessful).

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In the event of a failure, the sensor goes into sleep mode for a random period of time and then starts a new connection sequence.

The sleep mode between 2 connection sequences is defined as follows:
- 10 ... 15 min, first time
- 55 ... 60 min, second time
- 3 h 55 min ... 4 h, the subsequent times

The last time period is retained indefinitely until the connection is successful or is restarted.

LoRaWAN® LED

The LED is located on the LoRaWAN® board. The meanings are explained in the table below.

LED colour	Mode	Meaning
Cyan	Blinks once	LoRaWAN® join procedure successful
Red	Blinks twice	LoRaWAN® data transmission not successful (confirmed message)
Green	Blinks twice	LoRaWAN® data transmission successful (confirmed message)

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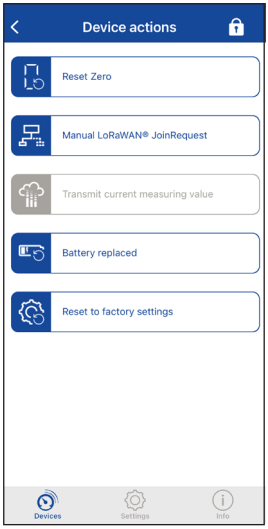
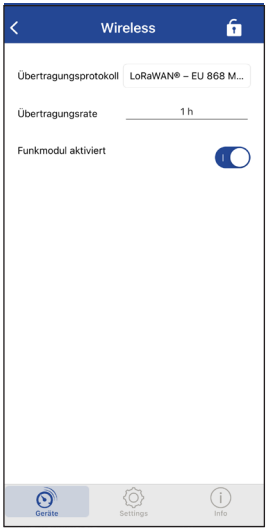
WIKA app settings

- The “Manual LoRaWAN® JoinRequest” command can be started under “Device Actions”. The LED flashes once in cyan = the device is connected to the LoRaWAN® gateway.
- In the WIKA app under “Settings” - “Wireless”:
  - Select the transmission protocol.
  - Set the desired transmission rate (from 15 min ... 24 h).
  - Activate the radio module. When the radio module is switched off, the instrument does not send any data.





With a customer-specific integration, the payload integration must be carried out by the customer in accordance with the special documentation “Special documentation for LoRaWAN® communication specifications, model A2G-500 / A2G-520 / A2G-540”. The special documentation can be found on the WIKA website.

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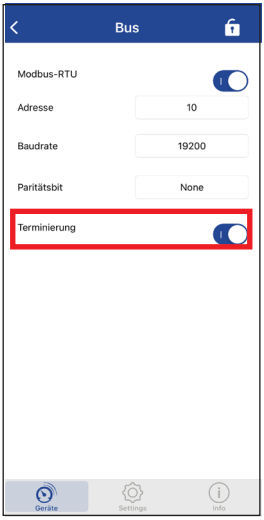
5.4.1.6 Bus (Modbus®)

In the “Bus” menu, the Modbus® settings can be made.



When the termination is switched on, the terminating resistor is activated. The instrument with the termination must be permanently energised.

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Modbus register
(only with read function)

Access	Data addresses	Function Code	Description Comment	Data type	Range enumeration	Display	Unit
Inputs register							
R	3x0001	04	FW version	Bitmask	■ Bit 0 ... 7 = patch ■ Bit 8 ... 11 = minor ■ Bit 12 ... 15 = major	major/minor/patch	
R	3x0002	04	HW version	Unsigned 16 Bit	0 ... 15	0 ... 15	
R	3x0003	04	Model	Unsigned 16 Bit	1 ... 3	■ 1: A2G-500 Diff. Pressure ■ 2: A2G-520 Flow ■ 3: A2G-540 Control	
R	3x0004	04	Operating range	Unsigned 16 Bit	0 ... 4	■ 0: Single-range ■ 1: -250 ... +250 Pa ■ 2: -2,500 ... +2,500 Pa ■ 3: -7,000 ... +7,000 Pa ■ 4: -12,000 ... +12,000 Pa	
R	3x0005	04	Prod. date	Bitmask	■ Bit 0 ... 6 = yyyy ■ Bit 7 ... 10 = mm ■ Bit 11 ... 15 = dd	dd/mm/yyyy	

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Access	Data addresses	Function Code	Description Comment	Data type	Range enumeration	Display	Unit
Inputs register							
R	3x0006	04	Measuring range_Min	Signed 16 Bit	-12,000 ... +12,000	-12,000 ... +12,000	Pa
R	3x0007	04	Measuring range_Max	Signed 16 Bit	-12,000 ... +12,000	-12,000 ... +12,000	Pa
R	3x0008 1)	04	Pressure	Signed 16 Bit	-12,600 ... +12,600	-12,600 ... +12,600	Pa
R	3x0009 1)	04	Pressure HR	Signed 16 Bit	-9,999 ... +9,999	-999.9 ... +999.9	Pa
R	3x00010 1)	04	AIN 1 Voltage	Signed 16 Bit	-500 ... +10,500	-500 ... +10,500	mV
R	3x00011 1)	04	AIN 2 Voltage	Signed 16 Bit	-500 ... +10,500	-500 ... +10,500	mV
R	3x00012 1)	04	AIN 3 Temperature	Signed 16 Bit	-480 ... +1,280	-48... +128	°C
R	3x00013 1)	04	AIN 4 Temperature	Signed 16 Bit	-480 ... +1,280	-48... +128	°C
R	3x00014 1)	04	Flow	Unsigned 16 Bit	0 ... 65,535	0 ... 655,350	m^3/h
R	3x00015	04	Measuring range_Min	Signed 16 Bit	-4,818 ... +4,818	-48.18 ... +48.18	inWC
R	3x00016	04	Measuring range_Max	Signed 16 Bit	-4,818 ... +4,818	-48.18 ... +48.18	inWC
R	3x00017 1)	04	Pressure	Signed 16 Bit	-5,058 ... +5,058	-50.58 ... +50.58	inWC
R	3x00018 1)	04	AIN 3 Temperature	Signed 16 Bit	-544 ... 2,624	-54.4 ... 262.4	°F
R	3x00019 1)	04	AIN 4 Temperature	Signed 16 Bit	-544 ... 2,624	-54.4 ... 262.4	°F
Coils register							
R	0x0001 1)	01	R1 status	Bit	0 ... 1	0:OFF, 1:ON	Bit
R	0x0002 1)	01	R2 status	Bit	0 ... 1	0:OFF, 1:ON	Bit

1) Values are only output if the corresponding option is enabled.

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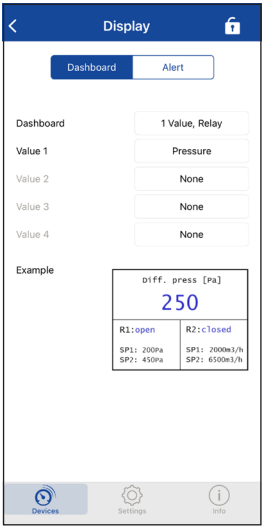
5.4.1.7 Display

In the “Display” menu item under “Dashboard”, you can select how many and which measured values (Value 1-4) are visible and whether the relays should be shown on the instrument display.

Start display example:
1 x value, relay

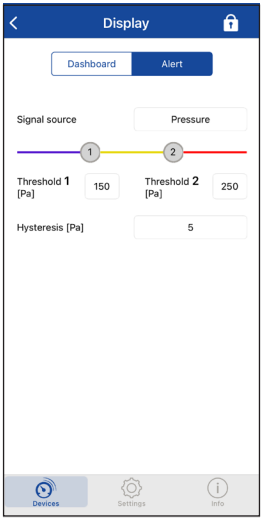
SUP FILTER F4 [Pa]	
250	
R1:open SP1: 200Pa SP2: 450Pa	R2:closed SP1: 2000m3/h SP2: 6500m3/h



The colour change of the set limit values can be defined under “Alarm”. The displayed value can take on up to three different colours. E.g., in the case of a supply air filter, the normal value can be displayed in WIKA blue, the pre-alarm in yellow and the alarm in red. The colours can be freely-selected using RGB.

e.g. RGB: 031, 000, 000 = red

SUP FILTER F4 [Pa]	
459	
R1:open SP1: 200Pa SP2: 450Pa	R2:closed SP1: 2000m3/h SP2: 6500m3/h



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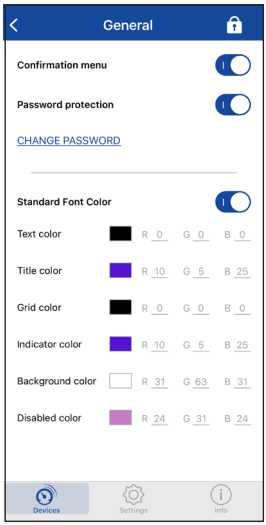
5.4.1.8 General

In the “General” menu:

- The confirmation menu for operation with button/display can be activated or deactivated.
- The password function can be enabled or disabled and a password set.
- The background, foreground and title colour of the display can be defined on a customer-specific basis.

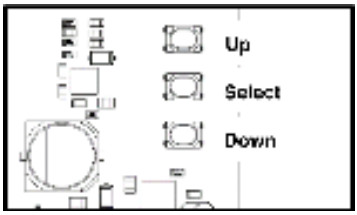


5.4.2 Operation via buttons/display

Control element

The following buttons are used to control the operating menu on the display:

- Select
  - Select or call up menu = press briefly
  - Confirm or exit = press and hold for 1 s
- Up/Down
  - Navigate through menu (upwards/downwards)



The “Select” function may vary depending on the menu level.
Note the legend on the respective display.

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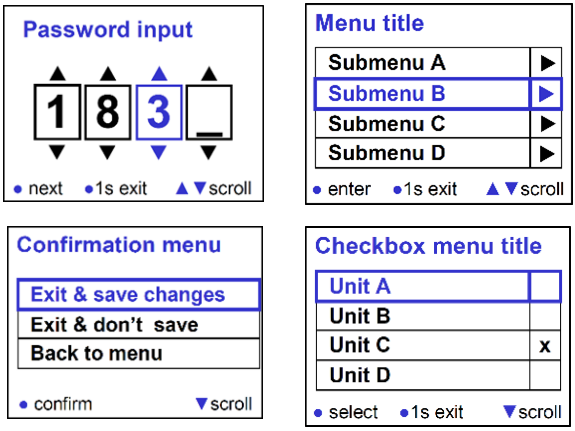
Display examples



5.4.3 Operation via buttons/LED

Default settings can be configured as follows using 3 buttons and 7 LEDs:

- The "Up" and "Down" buttons are used to navigate between the LEDs.
- The LED is switched on or off with the "ON/OFF" button.
  To show which LED is selected, this LED flashes at a defined regularity.
  Switched on = Slow flashing (0.5 Hz = 1 second on and 1 second off)
  Switched off = Normal flashing (1.67 Hz = 300 milliseconds on and 300 milliseconds off)
  No default setting = Fast flashing (10 Hz = 50 milliseconds on and 50 milliseconds off)

The WIKA app can be used to configure other settings that cannot be selected as default settings. When no default settings are set, LED 7 is lit permanently.

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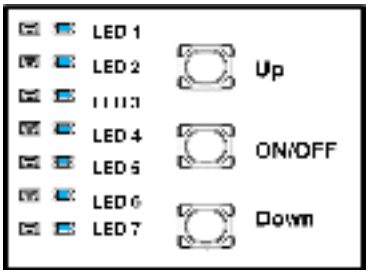
Description of the LEDs (default settings)

- LED 1: Pressure unit
  - ON = Pa
  - OFF = inWC
- LED 2, 3 and 4: Measuring range (displayed in binary)
  (only with multi-range instruments)
- LED 5: Output signal
  - ON = 0 ... 10 V
  - OFF = 4 ... 20 mA
- LED 6: Response time
  - ON = 4 s
  - OFF = 0.8 s
- LED 7: Zero point calibration
  - OFF = Not active
  - Blinks = Active



If LED 7 is lit continuously, one or more non-default setting(s) have been configured with the WIKA app.

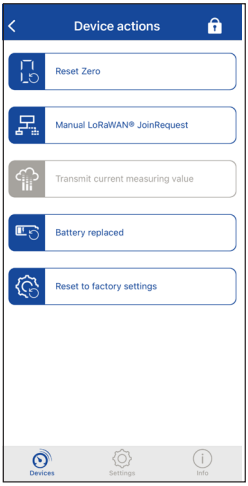
Binary code			Operating range ±250 Pa	Operating range ±2,500 Pa	Operating range ±7,000 Pa	Operating range ±12,000 Pa
LED 4	LED 3	LED 2				
Off	Off	Off	0 … 25	0 … 250	0 … 1,000	0 … 5,000
Off	Off	On	0 … 50	0 … 500	0 … 1,500	0 … 6,000
Off	On	Off	0 … 100	0 … 1,000	0 … 2,000	0 … 7,000
Off	On	On	0… 250	0 … 1,500	0 … 2,500	0 … 7,500
On	Off	Off	-25 … +25	0 … 2,000	0 … 3,000	0 … 8,000
On	Off	On	-50 … +50	0 … 2,500	0 … 4,000	0 … 9,000
On	On	Off	-100 … +100	-500 … +500	0 … 5,000	0 … 10,000
On	On	On	-150 …+150	-1,000 … +1,000	0 … 7,000	0 … 12,000

5.4.4 Zero point setting

Manual zero point setting

1. Remove both hoses from the pressure connections ⊕ and ⊖.
2. The zero setting can be started via the WIKA app under “Device Actions” for all instrument versions. For multi-range instruments, the zero point setting can also be activated via the Select button or ON/OFF button (press for 5 seconds). Depending on the version, “Auto zero active ...” appears on the display or LED 7 starts to flash.
3. Wait until the information on the screen is no longer visible, LED 7 switches off or follow the instructions on the WIKA app.

4. Reconnect the hoses to the pressure connections.
5. Do not change the location of the sensor.

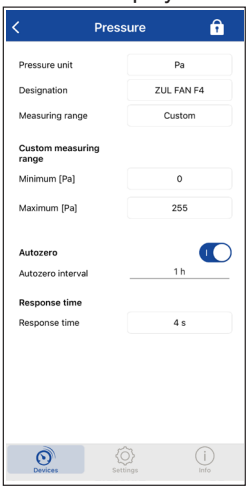


In normal operation, we recommend that a zero point calibration is carried out every 12 months.

Automatic zero point setting

The automatic zero point setting makes the instrument maintenance-free.
The A2G-5x0 corrects the zero point at a defined interval and thus prevents any zero-point drift in the piezoresistive sensor element.

During the zero point setting the display and output value remains at the last measured value. Automatic zero point setting takes 5 seconds.
The interval can be set either in the WIKA app, in the “Pressure” menu under “Autozero”, or on the display in the “Auto zero” menu.



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6. Faults

Personnel: skilled electrical personnel
Tools: voltage tester, screwdriver

If faults cannot be eliminated by means of the listed measures, the instrument must be taken out of operation immediately.

- ▶ Contact the manufacturer.
- ▶ If a return is needed, please follow the instructions given in chapter 8.2 “Return”.

For contact details, see chapter 1 “General information” or the back page of the operating instructions.

Faults	Causes	Measures
Connection to the IIoT platform is not successful	Login credentials lost	Contact customer service
	Incorrect login credentials	Check using the supplied login credentials
	Customer firewall blocks interfaces	Contact the person responsible for infrastructure
	Instrument is outside the range of the gateway	Observe instructions in accordance with the operating instructions
	Faulty commissioning or improper, unsuitable installation location	Observe instructions in accordance with the operating instructions
Individual measured value not transmitted (LPWAN)	Collision in the data transmission	Unavoidable! Adaptation of infrastructure possible
NFC transmission does not work	NFC is switched off on the smartphone	Switch on NFC on the smartphone
	Smartphone is not held against the instrument in the right place	Hold the smartphone against the NFC sensor
		Hold the smartphone at the top or at the side of the instrument
Constant output signal upon change in pressure	Incorrect measuring range	Set the correct measuring range
	Incorrect signal source for the output	Set the correct output signal source

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6. Faults

Faults	Causes	Measures
Erroneous analogue input/ output signal	Cable not properly connected	Check the cable connections
	Instrument set incorrectly	Check the settings
Instrument leaking	Cover not mounted correctly	Mount the case cover correctly
	Seal is missing/defective	Replace/mount the seal
	Cable gland / blind plug not mounted correctly	Mount the cable gland /blind plug correctly

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Display error messages

Code	Name	Cause	Measure
0	ERROR_NONE	No error	No error
1	ERROR_EEPROM_NO_ RESPONSE	■ ST25: Writing to RAM failed ■ ST25: Reading RAM failed	■ Follow the instructions on the screen ■ Restart the instrument if this occurs repeat-edly
2	ERROR_EEPROM_ INVALID_MAGICNR	Invalid user settings identified in the memory.	Default user settings are loaded automatically.
3	ERROR_FACTORY_ INVALID_MAGICNR	Invalid factory options identified in the memory.	Default factory options are loaded automatically.
4	ERROR_FACTORY_ ERASE_FAILED	Failed to delete the factory options from the flash memory.	Contact the manufacturer
5	ERROR_ FACTORY_ WRITE_FAILED	Failed to write the factory options from the flash memory.	Contact the manufacturer
6	ERROR_PRESSENS_ TIMEOUT	This error appears if the pressure sensor does not display any new measurement data within a timeout.	■ Follow the instructions on the screen ■ Restart the instrument if this occurs several times
7	ERROR_PRESSENS_NO_ RESPONSE	No response received from the pressure sensor.	Follow the instructions on the screen
8	ERROR_ADC_CONVER-SION_FAILED	This error appears if the analogue digital conversion takes too long. (>10 ms).	■ Follow the instructions on the screen ■ Restart the instrument if this occurs several times

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Code	Name	Cause	Measure
9	ERROR_AOUT1_ COMMON_MODE_OVER_ RANGE_FAULT	This error appears if the analogue output AOUT1 displays the common-mode over-range error.	Check or connect signal at AOUT1
10	ERROR_AOUT1_LOAD_ FAULT	This error appears if the analogue output AOUT1 displays the load fault error.	Check or connect signal at AOUT1
11	ERROR_AOUT1_OVER_ TEMPERATURE_WARNING	This error appears if the analogue output AOUT1 displays the over-temperature error.	Instrument is too warm, leave it to cool
12	ERROR_AOUT2_ COMMON_MODE_OVER_ RANGE_FAULT	This error appears if the analogue output AOUT2 displays the common-mode over-range error.	Check or connect signal at AOUT2
13	ERROR_AOUT2_LOAD_ FAULT	This error appears if the analogue output AOUT2 displays the load fault error.	Check or connect signal at AOUT2
14	ERROR_AOUT2_OVER_ TEMPERATURE_WARNING	This error appears if the analogue output AOUT2 displays the over-temperature error.	Instrument is too warm, leave it to cool
15	ERROR_CONFIG_INVALID	Invalid signal source specified.	Restart the instrument if this occurs repeatedly

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7. Maintenance, cleaning and calibration

Personnel: skilled electrical personnel
Tools: voltage tester, screwdriver

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For contact details, see chapter 1 “General information” or the back page of the operating instructions.

7.1 Maintenance

The instrument version with automatic zero point adjustment is maintenance-free.
For the instrument version with manual zero point adjustment, this must be carried out regularly as described in chapter 5.4.4 “Zero point setting”.

Repairs must only be carried out by the manufacturer.
This does not apply to the battery replacement.
Only use original parts, see chapter 10 “Accessories and spare parts”.

7.2 Changing the batteries (only with instruments with battery operation)

For battery replacement observe the following:
- Only change the batteries in a dry environment.
- Do not use any rechargeable batteries.
- Only use approved batteries, see chapter 5.3.2 “Battery power (A2G-500)”.

During longer times of inactivity, remove the batteries from the instrument.

7.3 Cleaning

CAUTION!
Damage to property due to improper cleaning
Improper cleaning may lead to damage to the instrument.
- ▶ Do not use any aggressive cleaning agents.
- ▶ Do not use any hard or pointed objects for cleaning.
- ▶ Do not use any abrasive cloths or sponges.

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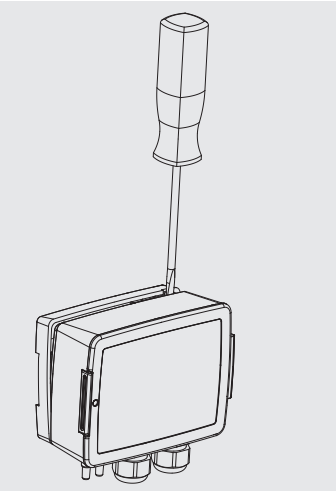
1. Before cleaning, correctly disconnect the instrument from the pressure supply, switch it off and disconnect it from the mains.
2. Clean the instrument with a moist cloth.
   Electrical connections must not come into contact with moisture.
3. Clean the dismounted instrument, in order to protect persons and the environment from exposure to residual media.

8. Dismounting, return and disposal

Personnel: skilled electrical personnel
Tools: voltage tester, screwdriver

8.1 Dismounting

Use a slotted screwdriver to separate the instrument from the mounting plate at the markings as shown in the following image.



8.2 Return

Strictly observe the following when shipping the instrument:

- All instruments delivered to WIKA must be free from any kind of hazardous substances (acids, bases, solutions, etc.) and must therefore be cleaned before being returned, see chapter 7.3 “Cleaning”.
- When returning the instrument, use the original packaging or a suitable transport packaging.

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With hazardous substances, include the material safety data sheet for the corresponding medium.

Instruments with lithium-ion rechargeable batteries or lithium-metal batteries
The lithium-ion rechargeable batteries or lithium-metal batteries included are subject to the requirements of the dangerous goods law. Special requirements for packaging and marking must be observed when shipping. A dangerous goods expert must be consulted when preparing the package. Do not send any damaged or defective rechargeable batteries. Mask open contacts and pack the rechargeable battery so that it does not move in the packaging and also prevents short-circuits. Observe the different dangerous goods requirements relative to the respective modes of transport and any other national regulations.

To avoid damage:
1. Wrap the instrument in an anti-static plastic film.
2. Place the instrument, along with the shock-absorbent material, in the packaging.
3. If possible, place a bag, containing a desiccant, inside the packaging.
4. Label the shipment as carriage of a highly sensitive measuring instrument.

Information on returns can be found under the heading “Service” on our local website (product return form).

8.3 Disposal

Incorrect disposal can put the environment at risk.
Dispose of instrument components and packaging materials in an environmentally compatible way and in accordance with the country-specific waste disposal regulations.

Disposal of electrical appliances with non-permanently installed batteries

This instrument is labelled in accordance with the EU Waste Electrical and Electronic Equipment (WEEE) directive. This instrument must not be disposed of with household waste.

- Hand in old instruments for environmentally friendly disposal at a designated collection point for the disposal of electrical and electronic devices.
- Ensure a proper disposal in accordance with national regulations.
- Observe the currently applicable regulations.
- Remove non-permanently installed batteries from the instrument and dispose of them separately.

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Disposal of batteries

WARNING!

Damage to the environment and health due to incorrect disposal of batteries

Batteries contain pollutants such as heavy metals, which are harmful to the environment and health if not disposed of properly.

- ► Do not dispose of batteries with household waste.
- ► Ensure a proper disposal in accordance with national regulations.
- ► Observe the currently applicable regulations.
- ► Hand in used batteries for environmentally friendly disposal at retail outlets or appropriate collection points in accordance with national or local regulations.

If possible, completely discharge the batteries before disposal and isolate contacts to prevent short-circuits.

9. Specifications

9.1 Specifications A2G-5x0

EN

Basic information	
Process connection	2 x connecting nozzle Ø 4.5 mm [0.177 in] / Ø 7.5 mm [0.295 in] 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 [1] in Pa

Operating range [2] ±250 Pa	Operating range [2] ±2,500 Pa	Operating range [2] ±7,000 Pa	Operating range [2] ±12,000 Pa
-25 … +25	-500 … +500	0 … 1,000	0 … 5,000
-50 … +50	-1,000 … +1,000	0 … 1,500	0 … 6,000
-100 … +100	0 … 250	0 … 2,000	0 … 7,000
-150 … +150	0 … 500	0 … 2,500	0 … 7,500
0 … 25	0 … 1,000	0 … 3,000	0 … 8,000
0 … 50	0 … 1,500	0 … 4,000	0 … 9,000
0 … 100	0 … 2,000	0 … 5,000	0 … 10,000
0 … 250	0 … 2,500	0 … 7,000	0 … 12,000

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

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9. Specifications

Measuring ranges [1] in inWC

Operating range [2] ±1 inWC	Operating range [2] ±10 inWC	Operating range [2] ±28 inWC	Operating range [2] ±48 inWC
-0.1 ... +0.1	-2 ... +2	0 ... 4	0 ... 20
-0.2 ... +0.2	-4 ... +4	0 ... 6	0 ... 24
-0.4 ... +0.4	0 ... 1	0 ... 8	0 ... 28
-0.6 ... +0.6	0 ... 2	0 ... 10	0 ... 30
0 ... 0.1	0 ... 4	0 ... 12	0 ... 32
0 ... 0.2	0 ... 6	0 ... 16	0 ... 36
0 ... 0.4	0 ... 8	0 ... 20	0 ... 40
0 ... 1	0 ... 10	0 ... 28	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	
Pressure type	Differential pressure
Unit	
Differential pressure	■ Pa ■ kPa ■ mbar ■ mmWC ■ inWC
Air flow [1]	■ l/s ■ m^3/s ■ m^3/h ■ cfm
Air velocity [1]	■ m/s ■ fpm
Operating pressure	■ ±250 ... ±2,500 Pa [±1 ... ±10 inWC]: 10 kPa [40 inWC] ■ ±7,000 ... ±12,000 Pa [±28 ... ±48 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

1) The units of air flow and air velocity are only available on the A2G-520 and A2G-540.

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9. Specifications

EN

Pressure type / Measuring element / Digital 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; when these limit values are reached, 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]	±12,000 Pa [±48 inWC]
Temperature range				
Compensated [3] TC [4] offset (% FS/K)	0.015 %	0.01 %	0.008 %	0.005 %
Uncompensated [5] TC [4] offset (% FS/K)	0.025 %	0.02 %	0.02 %	0.01 %
Compensated [3] TC [4] span (% FS/K)	0.02 %	0.02 %	0.01 %	0.01 %
Uncompensated [5] TC [4] span (% FS/K)	0.03 %	0.02 %	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®

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9. Specifications

Output and input signal		
Number of analogue outputs	■ 1 x ■ 2 x	
Number of relays	■ Without ■ 1 x (DC 24 V / 5 A) ■ 2 x (DC 24 V / 5 A)	
Switching function	■ NO (normally open) ■ NC (normally closed) ■ Force open, force closed	
Load	Current output	Max. 500 Ω
	Voltage output	Typ. 1 kΩ
Switching voltage, relay	DC 24 V	
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 = 3977 ■ Binary (on/off)	

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 4 ... 13 mm [0.15 ... 0.51 in] ■ Optional 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	■ 1.7 W at DC 24 V ■ 2.5 VA at AC 24 V
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

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9. Specifications

EN

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]
Relative humidity, condensation	0 ... 95 % r. h., non-condensing
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) Instrument specifications are based on tests with lower mount (reference position)
2) Deviation when side mount: +2 Pa; can be corrected via zero point function

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

Modbus® communication	
Protocol	Modbus® via serial interface
Transfer mode	RTU
Interface	RS-485

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 [≤ 6.2 mi]
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.

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9. Specifications

9.2 Approvals

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

EN

9.3 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
→ Depending on the selected instrument version, the specification may deviate from the specifications listed here.
→ The specifications in the order documentation are definitive.

For further specifications, see WIKA data sheets PE 88.05, PE 88.06 and PE 88.07 and order documentation.

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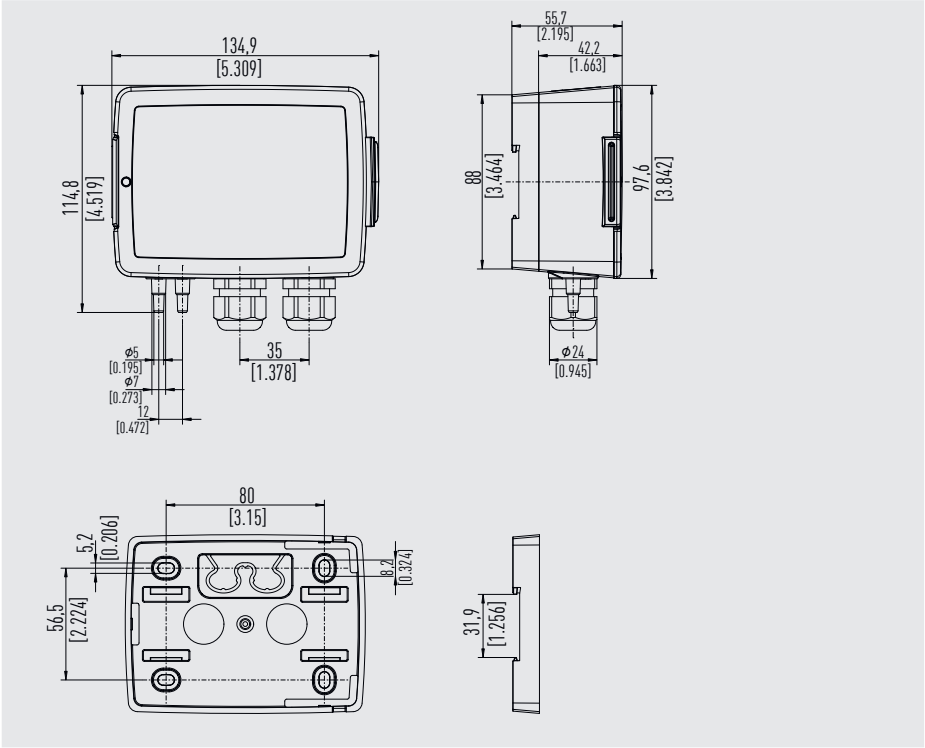
9.4 Dimensions in mm [in]



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10. Accessories and spare parts

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
	2 pcs. of duct connector for measuring hoses Ø 4 … 6 mm [0.16 … 0.24 in] and 4 pcs. of mounting screw	40217507
	**Multiple sealing inserts (for M20 cable gland)**	
	Sealing insert with 2 bores at Ø 4 mm [0.16 in]; PU 10 pcs.	40444284
	Sealing insert with 2 bores at Ø 6 mm [0.24 in]; PU 10 pcs.	40444285
	Sealing insert with 4 bores at Ø 5 mm [0.20 in]; PU 10 pcs.	40444286
	Battery AA 3.6 V, 2.6 Ah (only with battery version); PU 2 pcs.	40443947

WIKA accessories can be found online at www.wika.com.

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EU-Konformitätserklärung
EU Declaration of Conformity

Dokument Nr.: **40445841.01**
Document No.:

Wir erklären in alleiniger Verantwortung, dass die mit CE gekennzeichneten Produkte
We declare under our sole responsibility that the CE marked products

Typenbezeichnung: **A2G-500**
Type Designation:

Beschreibung: **Differenzdrucksensor für die Lüftungs- und Klimatechnik**
Description: ***Differential pressure sensor for ventilation and air-conditioning***

gemäß gültigem Datenblatt: PE 88.05
according to the valid data sheet:

mit den nachfolgenden relevanten Harmonisierungsvorschriften der Union übereinstimmen:
are in conformity with the following relevant Union harmonisation legislation:

Angewandte harmonisierte Normen:
Applied harmonized standards:

2011/65/EU	gefährliche Stoffe (RoHS) *Hazardous Substances (RoHS)*	EN IEC 63000:2018
2014/53/EU	Funkanlagen (RED) *Radio Equipment (RED)*	Gesundheit und Sicherheit (Artikel 3 (1) a)) *Protection of health and safety (Article 3 (1) (a))* EN 60730-1:2011 EN 60730-2-6:2016 EN 60730-2-15:2010 EN 62479:2010 Elektromagnetische Verträglichkeit (Artikel 3 (1) b)) *Electromagnetic compatibility (Article 3 (1) b))* EN 301 489-1 V2.2.3 EN 301 489-3 V2.3.2 stimmt auch überein mit/*also complies with* EN 61326-1:2013 Effiziente Nutzung Frequenzspektrum (Artikel 3 (2)) *Effective use of spectrum (Article 3 (2))* EN 300 220-1 V3.1.1 EN 300 220-2 V3.1.1 EN 300 330 V2.1.1

Unterzeichnet für und im Namen von / *Signed for and on behalf of*

WIKA Schweiz AG

Hitzkirch, 2023-07-28

Peter Barmettler, Technical Director
WIKA Schweiz AG

Peter Küng, Approval Representative
WIKA Schweiz AG

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Industriestrasse 11
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40452360.01 07/2024 EN

EU-Konformitätserklärung
EU Declaration of Conformity

Dokument Nr.: **40445842.01**
Document No.:

Wir erklären in alleiniger Verantwortung, dass die mit CE gekennzeichneten Produkte
We declare under our sole responsibility that the CE marked products

Typenbezeichnung: **A2G-520**
Type Designation:

Beschreibung: **Differenzdruck-Volumenstromsensor für die Lüftungs- und Klimatechnik**
Description: ***Differential pressure air flow sensor for ventilation and air-conditioning***

gemäß gültigem Datenblatt: PE 88.06
according to the valid data sheet:

mit den nachfolgenden relevanten Harmonisierungsvorschriften der Union übereinstimmen:
are in conformity with the following relevant Union harmonisation legislation:

Angewandte harmonisierte Normen:
Applied harmonized standards:

2011/65/EU	gefährliche Stoffe (RoHS) *Hazardous Substances (RoHS)*	EN IEC 63000:2018
2014/53/EU	Funkanlagen (RED) *Radio Equipment (RED)*	Gesundheit und Sicherheit (Artikel 3 (1) a)) *Protection of health and safety (Article 3 (1) (a))* EN 60730-1:2011 EN 60730-2-6:2016 EN 60730-2-15:2010 EN 62479:2010 Elektromagnetische Verträglichkeit (Artikel 3 (1) b)) *Electromagnetic compatibility (Article 3 (1) b))* EN 301 489-1 V2.2.3 EN 301 489-3 V2.3.2 stimmt auch überein mit/*also complies with* EN 61326-1:2013 Effiziente Nutzung Frequenzspektrum (Artikel 3 (2)) *Effective use of spectrum (Article 3 (2))* EN 300 220-1 V3.1.1 EN 300 220-2 V3.1.1 EN 300 330 V2.1.1

Unterzeichnet für und im Namen von / *Signed for and on behalf of*

WIKA Schweiz AG

Hitzkirch, 2023-07-28

Peter Barmettler, Technical Director
WIKA Schweiz AG

Peter Küng, Approval Representative
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EN

EU-Konformitätserklärung
EU Declaration of Conformity

Dokument Nr.: **40445843.01**
Document No.:

Wir erklären in alleiniger Verantwortung, dass die mit CE gekennzeichneten Produkte
We declare under our sole responsibility that the CE marked products

Typenbezeichnung: **A2G-540**
Type Designation:

Beschreibung: **Differenzdruck- und Volumenstromregler für die Lüftungs- und Klimatechnik**
Description: ***Differential pressure and air flow controller for ventilation and air-conditioning***

gemäß gültigem Datenblatt: PE 88.07
according to the valid data sheet:

mit den nachfolgenden relevanten Harmonisierungsvorschriften der Union übereinstimmen:
are in conformity with the following relevant Union harmonisation legislation:

Angewandte harmonisierte Normen:
Applied harmonized standards:

2011/65/EU	gefährliche Stoffe (RoHS) *Hazardous Substances (RoHS)*	EN IEC 63000:2018
2014/53/EU	Funkanlagen (RED) *Radio Equipment (RED)*	Gesundheit und Sicherheit (Artikel 3 (1) a)) *Protection of health and safety (Article 3 (1) (a))* EN 60730-1:2011 EN 60730-2-6:2016 EN 60730-2-15:2010 EN 62479:2010 Elektromagnetische Verträglichkeit (Artikel 3 (1) b)) *Electromagnetic compatibility (Article 3 (1) b))* EN 301 489-1 V2.2.3 EN 301 489-3 V2.3.2 stimmt auch überein mit/*also complies with* EN 61326-1:2013 Effiziente Nutzung Frequenzspektrum (Artikel 3 (2)) *Effective use of spectrum (Article 3 (2))* EN 300 220-1 V3.1.1 EN 300 220-2 V3.1.1 EN 300 330 V2.1.1

Unterzeichnet für und im Namen von / *Signed for and on behalf of*

WIKA Schweiz AG

Hitzkirch, 2023-07-28

Peter Barmettler, Technical Director
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