Special documentation

Modbus® register, 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

WIKA

EN	Special documentation, models A2G-500, A2G-520 and A2G-540	Page	3 - 9

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

40455191.01 04/2025 EN

Contents

Supplementary documentation:

▶ This special documentation for the Modbus register applies in conjunction with the operating instructions “Differential pressure sensor, models A2G-500, A2G-520 and A2G-540” (item number 40452360).

EN

1. Modbus® configurations

Modbus® communication	
Transmission mode	RTU
Interface	RS-485
Byte format	(11 bits) in RTU mode Coding system: 8 bits binary Bits per byte: ■ 1 start bit ■ 8 data bits (least significant bit is sent first) ■ 1 bit for parity (2nd stop bit if parity = None) ■ 1 stop bit Each character or byte is sent in this order (left to right): Least significant bit (LSB) ... most significant bit (MSB) With parity checking: Start, 1, 2, 3, 4, 5, 6, 7, 8, Par, Stop Instruments may accept by configuration either Even, Odd, or No Parity checking. If No Parity is implemented, an additional stop bit is transmitted to fill out the character frame to a full 11-bit asynchronous character: Without parity checking: Start, 1, 2, 3, 4, 5, 6, 7, 8, Stop, Stop
Parity	None, Even (default), Odd – adjustable in the configuration
Baud rate	9600, 19200 (default), 38400 – adjustable in the configuration
Modbus® addresses	1 ... 247 addresses – adjustable in the configuration 0 = Broadcast address

2. Modbus® registers

2.1 Coil registers

Access	Coil / Register reference	Bus addr. (decimal)	Function code	Description/ Comment	Data type	Range enumeration	Interpretation	Unit
R/W	00001 1) (0x0001)	0000	01/05/15	Auto zero enable	Bit	0 ... 1	0: Off, 1: On	Bit
W	00002 1) (0x0002)	0001	05/15	Auto zero trigger	Bit	0 ... 1	0: Idle, 1: Start	Bit
R/W	00003 1) (0x0003)	0002	01/05/15	LoRa® enable	Bit	0 ... 1	0: Off, 1: On	Bit
	00004 - 00009 (0x0004 - 0x0009)	0003 - 0008		Reserved				
R	00010 1) (0x0010)	0009	01	Relay 1 status	Bit	0 ... 1	0: Open, 1: Closed	Bit
R	00011 1) (0x0011)	0010	01	Relay 2 status	Bit	0 ... 1	0: Open, 1: Closed	Bit
	00012 - 00019 (0x0012 - 0x0019)	0011 - 0018		Reserved				
R/W	00020 2) (0x0020)	0019	01/05/15	Pressure controller Force output enable	Bit	0 ... 1	0: Disable, 1: Enable	Bit
R/W	00021 2) (0x0021)	0020	01/05/15	Flow controller Force output enable	Bit	0 ... 1	0: Disable, 1: Enable	Bit

1) Values can only be read and written if the corresponding option is enabled.
2) Values can only be read and written with A2G-540 (pressure/flow controller).

40455191.01 04/2025 EN

EN

2.2 Discrete input registers

Access	Coil / Register reference	Bus addr. (decimal)	Function code	Description/ Comment	Data type	Range enumeration	Interpretation	Unit
R	10001 [1)] (1x0001)	0000	02	Input 3: Binary input	Bit	0 ... 1	0: Open, 1: Closed	Bit
R	10002 [1)] (1x0002)	0001	02	Input 4: Binary input	Bit	0 ... 1	0: Open, 1: Closed	Bit

1) Values can only be read if the corresponding option is enabled and the input is set to binary input.

2.3 Input registers

Access	Coil / Register reference	Bus addr. (decimal)	Function code	Description/ Comment	Data type	Range enumeration	Interpretation	Unit
Instrument information								
R	30001 (3x0001)	0000	04	Firmware version	Bitmask	■ Bit 0 ... 7 = patch ■ Bit 8 ... 11 = minor ■ Bit 12 ... 15 = major	major/minor/patch	Binary
R	30002 (3x0002)	0001	04	Hardware version	Unsigned 16 bit	0 ... 15	0 ... 15	Binary
R	30003 (3x0003)	0002	04	Instrument type	Unsigned 16 bit	1 ... 3	■ 1: A2G-500 diff. pressure ■ 2: A2G-520 flow measurement ■ 3: A2G-540 press. / flow controller	Enum
R	30004 (3x0004)	0003	04	Operating range	Unsigned 16 bit	0 ... 4	■ 0: Single-range ■ 1: -250 ... +250 Pa ■ 2: -2500 ... +2500 Pa ■ 3: -7000 ... +7000 Pa ■ 4: -12000 ... +12000 Pa	Enum
R	30005 (3x0005)	0004	04	Date of manufacture	Bitmask	■ Bit 0 ... 6 = yyyy ■ Bit 7 ... 10 = mm ■ Bit 11 ... 15 = dd	dd/mm/yyyy dd: 0 ... 31 mm: 0 ... 12 yyy: 0... 127 (years since 2000)	Binary
R	30006 (3x0006)	0005	04	Hardware options	Bitmask	■ Bit 0: Reserved ■ Bit 1: Voltage input 1 ■ Bit 2: Voltage input 2 ■ Bit 3: Temper. input 3 ■ Bit 4: Temper. input 4 ■ Bit 5: Analogue output 1 ■ Bit 6: Analogue output 2 ■ Bit 7: Relay 1 ■ Bit 8: Relay 2 ■ Bit 9: Auto zero ■ Bit 10: Reserved ■ Bit 11: Reserved ■ Bit 12: LoRa® ■ Bit 13: Reserved ■ Bit 14: Reserved ■ Bit 15: Reserved	0 (false) = Option not enabled 1 (true) = Option enabled	Binary
	30007 - 30019 (3x0007 - 3x0019)	0006 - 0018	04	Reserved				

40455191.01 04/2025 EN

EN

Access	Coil / Register reference	Bus addr. (decimal)	Function code	Description/ Comment	Data type	Range enumeration	Interpretation	Unit
				Pressure measurement				
R	30020 (3x0020)	0019	04	Measuring range min. [Pa]	Signed 16 bit	-12000 ... +12000	-12000 ... +12000 [5)]	Pa
R	30021 (3x0021)	0020	04	Measuring range max. [Pa]	Signed 16 bit	-12000 ... +12000	-12000 ... +12000 [5)]	Pa
R	30022 (3x0022)	0021	04	Pressure [Pa]	Signed 16 bit	-12600 ... +12600	-12600 ... +12600 [5)]	Pa
R	30023 (3x0023)	0022	04	Pressure high resolution [Pa]	Signed 16 bit	-9999 ... +9999	-999.9 ... +999.9 [6)]	Pa
R	30024 (3x0024)	0023	04	Measuring range min. [Pa]	Signed 16 bit	-4818 … +4818	-48.18 … +48.18 [5)]	inWC
R	30025 (3x0025)	0024	04	Measuring range max. [Pa]	Signed 16 bit	-4818 … +4818	-48.18 … +48.18 [5)]	inWC
R	30026 (3x0026)	0025	04	Pressure [inWC]	Signed 16 bit	-5058 … +5058	-50.58 … +50.58 [5)]	inWC
R	30027 (3x0027)	0026	04	Pressure high resolution [Pa]	Signed 16 bit	-3999 … -3999	-3,999 … -3,999 [6)]	inWC
R	30028 - 30039 (3x0028 - 3x0039)	0027 - 0038	04	Reserved				
				Flow measurement				
R	30040 [2) 3)] (3x0040)	0039	04	Flow volumetric [m^3/s]	Unsigned 16 bit	0 ... 1000	0 ... 1000 [6)]	m^3/s
R	30041 [2) 3)] (3x0041)	0040	04	Flow volumetric [m^3/h]	Unsigned 16 bit	0 ... 65000	0 ... 65000 [6)]	m^3/h
R	30042 [2) 3)] (3x0042)	0041	04	Flow volumetric [l/s]	Unsigned 16 bit	0 ... 65000	0 ... 65000 [6)]	l/s
R	30043 [2) 3)] (3x0043)	0042	04	Flow volumetric [cfm]	Unsigned 16 bit	0 ... 65000	0 ... 65000 [6)]	cfm
R	30044 [2) 4)] (3x0044)	0043	04	Flow volumetric [m/s]	Unsigned 16 bit	0 ... 1000	0 ... 100.0 [6)]	m/s
R	30045 [2) 4)] (3x0045)	0044	04	Flow volumetric [ft/min]	Unsigned 16 bit	0 ... 20000	0 ... 20000 [6)]	ft/min
	30046 - 30059 (3x0046 - 3x0059)	0045 - 0058	04	Reserved				
				Voltage inputs				
R	30060 [1)] (3x0060)	0059	04	Analogue input 1 voltage	Signed 16 bit	-5 ... +105	-0.5 ... 10.5 [5)]	V
R	30061 [1)] (3x0061)	0060	04	Analogue input 2 voltage	Signed 16 bit	-5 ... +105	-0.5 ... 10.5 [5)]	V
	30062 - 30069 (3x0062 - 3x0069)	0061 - 0068	04	Reserved				
				Temperature inputs				
R	30070 [1) 8)] (3x0070)	0069	04	Analogue input 3 temperature	Signed 16 bit	-480 ... +1280	-48.0 ... +128.0 [5)]	°C
R	30071 [1) 8)] (3x0071)	0070	04	Analogue input 4 temperature	Signed 16 bit	-480 ... +1280	-48.0 ... +128.0 [5)]	°C
R	30072 [1) 8)] (3x0072)	0071	04	Analogue input 3 temperature	Signed 16 bit	-544 ... +2624	-54.4 ... +262.4 [5)]	°F
R	30073 [1) 8)] (3x0073)	0072	04	Analogue tnput 4 temperature	Signed 16 bit	-544 ... +2624	-54.4 ... +262.4 [5)]	°F
	30074 - 30079 (3x0074 - 3x0079)	0073 - 0078	04	Reserved				

EN

Access	Coil / Register reference	Bus addr. (decimal)	Function code	Description/ Comment	Data type	Range enumeration	Interpretation	Unit
				Analogue outputs				
R	30080 1) (3x0080)	0079	04	Analogue output 1 voltage	Unsigned 16 bit	0 ... 108	0.0 ... 10.8 5) 7)	V
R	30081 1) (3x0081)	0080	04	Analogue output 2 voltage	Unsigned 16 bit	0 ... 108	0.0 ... 10.8 5) 7)	V
R	30082 1) (3x0082)	0081	04	Analogue output 1 current	Unsigned 16 bit	27 ... 213	2.7 ... 21.3 5) 7)	mA
R	30083 1) (3x0083)	0082	04	Analogue output 2 current	Unsigned 16 bit	27 ... 213	2.7 ... 21.3 5) 7)	mA
	30084 - 30099 (3x0084 - 3x0099)	0083 - 0098	04	Reserved				
				Error				
R	30100 (3x0100)	0099	04	Technical alarm	Bitmask	■ Bit 0: Alarm 0 ■ Bit 1: Alarm 1 ■ Bit 2: Alarm 2 ■ Bit 3: Alarm 3 ■ Bit 4: Alarm 4 ■ Bit 5: Alarm 5 ■ Bit 6: Alarm 6 ■ Bit 7: Alarm 7	■ Bit 0: Pressure overload ■ Bit 1: Analogue out. 1 overload ■ Bit 2: Analogue out. 2 overload ■ Bit 3: Modbus® error ■ Bit 4: Voltage in. 1 overload ■ Bit 5: Voltage in. 2 overload ■ Bit 6: Temperature in. 3 overload ■ Bit 7: Temperature in. 4 overload	Binary
R	30101 (3x0101)	0100	04	Instrument alarm	Bitmask	■ Bit 0: Alarm 0 ■ Bit 1: Alarm 1 ■ Bit 2: Alarm 2 ■ Bit 3: Alarm 3 ■ Bit 4: Alarm 4 ■ Bit 5: Alarm 5 ■ Bit 6: Alarm 6 ■ Bit 7: Alarm 7 ■ Bit 8: Alarm 8 ■ Bit 9: Alarm 9 ■ Bit 10: Alarm 10 ■ Bit 11: Alarm 11 ■ Bit 12: Alarm 12 ■ Bit 13: Alarm 13 ■ Bit 14: Alarm 14 ■ Bit 15: Alarm 15	■ Bit 0: Error code 1 ■ Bit 1: Error code 2 ■ Bit 2: Error code 3 ■ Bit 3: Error code 4 ■ Bit 4: Error code 5 ■ Bit 5: Error code 6 ■ Bit 6: Error code 7 ■ Bit 7: Error code 8 ■ Bit 8: Error code 9 ■ Bit 9: Error code 10 ■ Bit 10: Error code 11 ■ Bit 11: Error code 12 ■ Bit 12: Error code 13 ■ Bit 13: Error code 14 ■ Bit 14: Error code 15 ■ Bit 15: Error code 16	Binary

1) Values can only be read if the corresponding option is enabled.
2) Values can only be read and written with A2G-520 (flow measurement).
3) Values can only be read if the flow measurement is set to a volume unit.
4) Values can only be read if the flow measurement is set to a velocity unit.
5) Values are limited as stated because the instrument cannot record or output smaller or larger measured values. (See overload messages under technical alarm register.)
6) Values are limited for the Modbus® interface in order to prevent overloads and/or too high, unrealistic values.
7) Values can only be read if the output signal type is set to voltage or current accordingly.
8) Values can only be read if the input is set to temperature measurement.

40455191.01 04/2025 EN

EN

2.4 Holding registers

Access	Coil / Register reference	Bus addr. (decimal)	Function code	Description/ Comment	Data type	Range enumeration	Interpretation	Unit
Pressure measurement								
R/W	40001 (4x0001)	0000	03/06/16	Response time	Unsigned 16 bit	0 ... 21	0: 0.5 s 1: 0.8 s 2: 1 s 3: 2 s ... 21: 20 s	Enum
R/W	40002 [1)] (4x0002)	0001	03/06/16	Auto zero interval	Unsigned 16 bit	1 ... 999	1 ... 999 [7)]	min
R/W	40003 [1)] (4x0003)	0002	03/06/16	LoRa® transmission interval	Unsigned 16 bit	15 ... 1440	15 ... 1440 [7)]	min
	40004 - 40019 (4x0004 - 4x0019)	0003 - 0018	03/06/16	Reserved				
Flow measurement								
R/W	40020 [2)] (4x0020)	0019	03/06/16	K-value	Unsigned 16 bit	1 ... 65000	0.1 ... 6500.0 [8)] [9)]	Formula unit
R/W	40021 [2)] (4x0021)	0020	03/06/16	Altitude compensation	Signed 16 bit	-1000 ... +8000	-1000 ... +8000 [7)]	m
	40022 - 40039 (4x0022 - 4x0039)	0021 - 0038	03/06/16	Reserved				
Pressure controller								
R/W	40040 [3)] (4x0040)	0039	03/06/16	Manual setpoint value [Pa]	Signed 16 bit	-12000 ... +12000	-12000 ... +12000 [8)]	Pa
R/W	40041 [3)] (4x0041)	0040	03/06/16	Manual setpoint value [inWC]	Signed 16 bit	-4800 ... +4800	-48.00 ... +48.00 [8)]	inWC
R/W	40042 [3)] (4x0042)	0041	03/06/16	P-value [Pa] (proportional band)	Signed 16 bit	-32500 ... +32500	-32500 ... +32500 [8)]	Pa
R/W	40043 [3)] (4x0043)	0042	03/06/16	P-value [inWC] (proportional band)	Signed 16 bit	-32500 ... +32500	-325.00 ... +325.00 [8)]	inWC
R/W	40044 [3)] (4x0044)	0043	03/06/16	I-value (reset time)	Unsigned 16 bit	0 ... 65000	0 ... 6500.0 [8)]	s
R/W	40045 [3)] (4x0045)	0044	03/06/16	D-value (derivative time)	Unsigned 16 bit	0 ... 65000	0 ... 650.00 [8)]	s
R/W	40046 [3)] [10)] (4x0046)	0045	03/06/16	Forced output value	Unsigned 16 bit	0 ... 1000	0 ... 100.0 [7)]	%
	40047 - 40059 (4x0047 - 4x0059)	0046 - 0058	03/06/16	Reserved				
Flow controller								
R/W	40060 [3)] [4)] (4x0060)	0059	03/06/16	Manual setpoint value [m^3/s]	Unsigned 16 bit	0 … 277	0 … 277 [7)]	m^3/s
R/W	40061 [3)] [4)] (4x0061)	0060	03/06/16	Manual setpoint value [m^3/h]	Unsigned 16 bit	0 … 65000	0 … 65000 [8)]	m^3/h
R/W	40062 [3)] [4)] (4x0062)	0061	03/06/16	Manual setpoint value [l/s]	Unsigned 16 bit	0 … 65000	0 … 65000 [8)]	l/s
R/W	40063 [3)] [4)] (4x0063)	0062	03/06/16	Manual setpoint value [cfm]	Unsigned 16 bit	0 … 65000	0 … 65000 [8)]	cfm
R/W	40064 [3)] [5)] (4x0064)	0063	03/06/16	Manual setpoint value [m/s]	Unsigned 16 bit	0 … 1000	0 … 100.0 [8)]	m/s

2. Modbus® registers

Access	Coil / Register reference	Bus addr. (decimal)	Function code	Description/ Comment	Data type	Range enumeration	Interpretation	Unit
R/W	40065 3) 5) (4x0065)	0064	03/06/16	Manual setpoint value [ft/min]	Unsigned 16 bit	0 … 20000	0 … 20000 8)	ft/min
R/W	40066 3) 4) (4x0066)	0065	03/06/16	P-value [m^3/s] (proportional band)	Signed 16 bit	-277 … +277	-277 … +277 7)	m^3/s
R/W	40067 3) 4) (4x0067)	0066	03/06/16	P-value [m^3/h] (proportional band)	Signed 16 bit	-32500 … +32500	-32500 … +32500 8)	m^3/h
R/W	40068 3) 4) (4x0068)	0067	03/06/16	P-value [l/s] (proportional band)	Signed 16 bit	-32500 … +32500	-32500 … +32500 8)	l/s
R/W	40069 3) 4) (4x0069)	0068	03/06/16	P-value [cfm] (proportional band)	Signed 16 bit	-32500 … +32500	-32500 … +32500 8)	cfm
R/W	40070 3) 5) (4x0070)	0069	03/06/16	P-value [m/s] (proportional band)	Signed 16 bit	-1000 … +1000	-100.0 … +100.0 8)	m/s
R/W	40071 3) 5) (4x0071)	0070	03/06/16	P-value [ft/min] (proportional band)	Signed 16 bit	-20000 … +20000	-20000 … +20000 8)	ft/min
R/W	40072 3) (4x0072)	0071	03/06/16	I-value (reset time)	Unsigned 16 bit	0 … 65000	0 … 6500.0 8)	s
R/W	40073 3) (4x0073)	0072	03/06/16	D-value (derivative time)	Unsigned 16 bit	0 … 65000	0 … 650.00 8)	s
R/W	40074 3) 10) (4x0074)	0073	03/06/16	Forced output value	Unsigned 16 bit	0 … 1000	0 … 100.0 7)	%

1) Values can only be read and written if the corresponding option is enabled.
2) Values can only be read and written with A2G-520 (flow measurement).
3) Values can only be read and written with A2G-540 (pressure/flow controller).
4) Values can only be read or written if the flow measurement is set to a volume unit.
5) Values can only be read or written if the flow measurement is set to a velocity unit.
6) Values only have an influence if the controller is configured to manual setpoint.
7) Values are limited as stated because the instrument does not allow smaller or larger set values.
8) Values are limited for the Modbus® interface in order to prevent overloads and/or too high, unrealistic values.
9) Limit values depend on the flow formula set. Limit values for the corresponding formulas are specified in the operating instructions.
10) Value only influences the output if the function is activated in the coil register and the controller is set to a signal source.

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