



AG500



General Description

The AG500 is a digital indicator in a panel saving 60mm depth 1/8 DIN case. The 21mm high LED readout has a luminance double that of conventional indicators and the easy-to-read five digit display. The options available for the AG500 include universal input types, up to six programmable alarms, analog retransmission, digital input, 12 or 24 V DC sensor power supply and RS-485 or MODBUS-RTU communications.

Features

- ☆ Bright, easy-to-read LED displays (21mm high)
- ☆ Digital communications
- ☆ Up to 6 alarms
- ☆ Analog retransmission output
- ☆ 12V or 24V DC sensor power supply
- ☆ Resolution 1/100°C is available (RTD input)

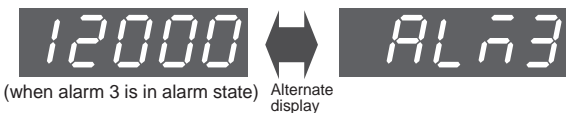
Easy-To-Read Oversized LED Displays

The easy-to-read 21mm height five-digit display can show a range up to 19999. Luminance is double that of conventional indicators.

Alarm status can be checked easily with alternate displays of PV and alarm number.



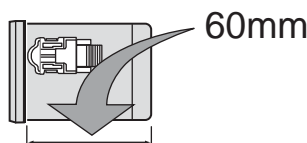
- PV and alarm number will be displayed alternately when the alarm is ON.



- Alternate display function can be set ON/OFF for each alarm (1 to 6).

Panel space saving : 60mm

Depth of AG500 is only 60mm, requiring less panel space.

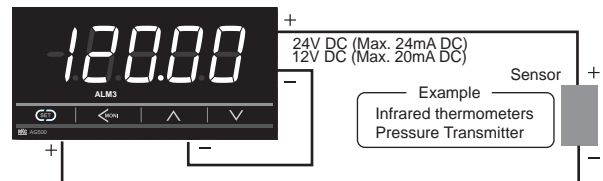


Display function

- Peak and Bottom Hold Function
- PV Bias and PV Ratio

12/24V DC Sensor power supply (Optional)

Sensor power supply function is available. Supply voltage can be specified from 12V DC or 24V DC.

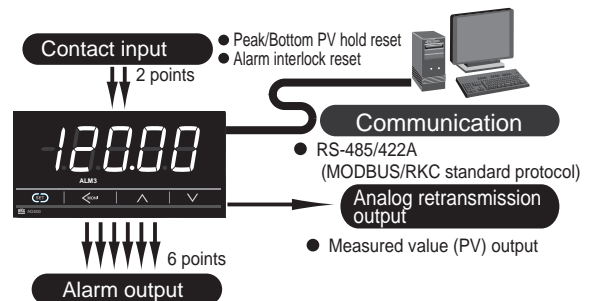


Measured input 4 to 20mA or 1 to 5V

- If 24V DC is specified, the maximum number of alarm outputs will be 2.
- If 12V DC is specified, the maximum number of alarm outputs will be 5.

Numerous Input and Output Options

- Contact input (max. 2 points)
- Alarm output (max. 6 points)
- Analog retransmission output
- Communication



Alarm function

- Interlock (Latch) Function
- Alarm Delay Timer
- Hold Action
- Alarm energized/de-energized action selection

Panel Mounting Type Indicator AG500



Specifications

Input

Input

- Universal input
a) Temperature, Current, Low voltage input group
Thermocouple : K, J, R, S, B, E, T, N (JIS/IEC), PLII (NBS), W5Re/W26Re (ASTM), U, L (DIN)
• Influence of external resistance : Approx. $0.2\mu\text{V}/\Omega$
• Input break action : Up-scale / Down-scale (Selectable)
RTD : Pt100 (JIS/IEC), JPt100 (JIS)
• Influence of input lead resistance : Approx. $0.01[\%/\Omega]$ of reading
• Maximum 10Ω per wire
• Input break action : Up-scale
Low voltage : 0 to 1V DC, 0 to 100mV DC, 0 to 10mV DC, -100 to +100mV DC, -10 to +10mV DC
• Input break action : Up-scale / Down-scale (Selectable)
Current : 4 to 20mA DC, 0 to 20mA DC
• Input break action : Uncertain (indicates a value around 0mA)
b) High voltage input group
High voltage : 0 to 5V DC, 1 to 5V DC, 0 to 10V DC, -1 to +1V DC
• Input break action : Uncertain (indicates a value around 0V)

Sampling Time

0.25 sec

Input Digital Filter

0.1 to 100.0 sec (OFF when 0 is set.)

PV Bias

-span to +span

PV Ratio

0.500 to 1.500

Performance

Measuring Accuracy

- a) Thermocouple
Type : K, J, T, E, N, PLII, U, L
Less than -100°C (-148°F) : $\pm 1.0^{\circ}\text{C}$ ($\pm 1.8^{\circ}\text{F}$)
 -100 to 500°C (-148 to 932°F) : $\pm 0.5^{\circ}\text{C}$ ($\pm 0.9^{\circ}\text{F}$)
More than 500°C (932°F) : $\pm(0.1\%$ of Reading + 1 digit)
Type : N, S, R, W5Re/W26Re
Less than 0°C (32°F) : $\pm 2.0^{\circ}\text{C}$ ($\pm 3.6^{\circ}\text{F}$)
 0 to 1000°C (-148 to 1832°F) : $\pm 1.0^{\circ}\text{C}$ ($\pm 1.8^{\circ}\text{F}$)
More than 1000°C (1832°F) : $\pm(0.1\%$ of Reading + 1 digit)
Type : B
Less than 400°C (752°F) : $\pm 70.0^{\circ}\text{C}$ ($\pm 126^{\circ}\text{F}$)
 400 to 1000°C (752 to 1832°F) : $\pm 1.4^{\circ}\text{C}$ ($\pm 2.5^{\circ}\text{F}$)
More than 1000°C (1832°F) : $\pm(0.1\%$ of Reading + 1 digit)
Cold junction temperature compensation error
 $\pm 1.0^{\circ}\text{C}$ (1.8°F) [$23\pm 2^{\circ}\text{C}$ ($75.4\pm 3.6^{\circ}\text{F}$)]
Within $\pm 1.5^{\circ}\text{C}$ ($\pm 2.7^{\circ}\text{F}$) [Between 0 and 50°C (32 to 104°F)]
b) RTD
Less than 200°C (392°F) : $\pm 0.2^{\circ}\text{C}$ ($\pm 0.4^{\circ}\text{F}$)
More than 200°C (392°F) : $\pm(0.1\%$ of Reading + 1 digit)
c) DC voltage and DC current
 $\pm(0.1\%$ of span)

Insulation Resistance

More than $20\text{M}\Omega$ (500V DC) between measured terminals and ground
More than $20\text{M}\Omega$ (500V DC) between power terminals and ground

Dielectric Strength

1000V AC for one minute between measured terminals and ground
 1500V AC for one minute between power terminals and ground

Hold

Maximum and minimum measured values are memorized.

- Memorized value can be reset via front key operation, digital input or communication.
- Data is not backed up when the instrument power supply is off.

Alarms

(Optional)

Alarms

Number of outputs : 6 points
• With 12V DC sensor power supply : Up to 5 points
• With 24V DC sensor power supply : Up to 2 points

Alarm type : Process High, Low
• Hold action can be programmed.

Differential gap : 0 to input span

Alarm Output

Relay output, Form A contact 250V AC 3A, 30V DC 1A (resistive load)

Other Function

- a) Energized/de-energized action is configurable.
b) Interlock (latch) function is configurable.

Digital Input

(Optional)

Number of Inputs

2 points (DI 1 and DI 2)

Input Rating

Non-voltage contact input
(OPEN : $500\text{k}\Omega$ or more, CLOSE : 500Ω or less)

Determination time

50ms

Functions

DI1 : Hold reset, DI2 : Alarm interlock reset

Communications

(Optional)

- a) Communication method : RS-485 (2-wire), RS-422A (4-wire)
b) Communication protocol : ANSI X3.28 sub-category 2.5A4 (RKC standard) MODBUS-RTU
• Selectable
c) Communication speed : 1200, 2400, 4800, 9600, 19200, 38400 bps
d) Bit format
Start bit : 1
Data bit : 7 or 8 • For MODBUS 8 bit only
Parity bit : Even, odd or without parity
Stop bit : 1 or 2
e) Maximum connection : 31 units

Analog outputs

(Optional)

- a) Number of outputs : 1 point
b) Output signal : 0 to 1V DC, 0 to 5V DC, 1 to 5V DC, 0 to 10V DC
Load resistance : More than $1\text{k}\Omega$
Output impedance : Less than 0.1Ω
0 to 10mV DC, 0 to 100mV DC
Load resistance : More than $20\text{k}\Omega$
Output impedance : 10Ω
4 to 20mA DC, 0 to 20mA DC
Load resistance : Less than 600Ω
Output impedance : More than $1\text{M}\Omega$
c) Output type : Measured value (PV)
d) Output accuracy : $\pm 0.1\%$ of span
e) Output resolution : More than 12 bits

Sensor Power Supply

(Optional)

- a) Output voltage : 24V DC $\pm 1.2\text{V}$ or 12V DC $\pm 1\text{V}$
b) Output current : 24V DC type : Less than 24mA DC
12V DC type : Less than 20mA DC
c) Load resistance : 24V DC type : More than $1\text{k}\Omega$
12V DC type : More than 600Ω

General specifications

Waterproof/dustproof protection

- NEMA4X, IP66
• Waterproof/dustproof protection only effective from the front in panel mounted installations.

Supply voltage

- a) 90 to 264V AC (Including supply voltage variation)
[Rating : 100 to 240V AC] (50/60Hz common)
b) 21.6 to 26.4V AC (Including supply voltage variation)
[Rating : 24V AC] (50/60Hz common)
c) 21.6 to 26.4V DC (Ripple rate 10% p-p or less) [Rating : 24V DC]

Power consumption

Less than 10.8VA (at 240V AC) for standard AC type
Less than 7.6VA for 24V AC type
Less than 230mA for 24V DC type

Power Failure Effect

Not affected by power failure shorter than 20msec, otherwise reset to the initial state.

Operating environments

-10 to 50°C [14 to 122°F], 5 to 95% RH.
Absolute humidity : MAX. W.C 29.3g/m³ dry air at 101.3kPa.

Memory backup

- Backed up by non-volatile memory (FRAM)
- Data retaining period : Approx. 10 years
- Number of writing : Approx. 10,000,000 times.
(Depending on storage and operating conditions.)

Net weight

Approx. 190g

External dimensions (W x H x D)

96 x 48 x 60mm

Compliance with standards

- CE Mark
- UL/c-UL Recognized
- RCM Mark





Model and Suffix Code

Specifications	Model and Suffix Code	Hardware coding only								Input and Range code
		①	②	③	④	⑤	⑥	⑦	⑧	
	AG500 (96 X 48mm) (W X H)	- □ * □ - □ - □ - □ - □ - □ □ □ / Y								
① Power Supply	24V AC/DC 100 to 240V AC	3 4								
② Alarm output	Not supplied Specify output points (1 to 6)		N 1 to 6							
③ Contact input (DI)	Not supplied Contact inputs : 2 points			N 2						
④ Sensor power supply/ LED drive supply (For SP500)	Not supplied 12V DC : Sensor power supply or LED drive supply 24V DC : Sensor power supply				N P Q					
⑤ Analog retransmission output (AO)	Not supplied See Analog Output Code Table					N □				
⑥ Communication	Not supplied RS-422A RS-485						N 4 5			
⑦ Quick Start Code	No quick start code							N		
	Specify Input and range code							1		
	Specify Input and range code and quick start code							2		
⑧ Input and range	See Input range Code Table								□ □ □	
⑨ Instrument version	Version symbol									Y

*1 : When 12V DC (For sensor power supply/LED drive supply) is used, alarm output is max. 5 points.

*2 : When 24V DC (Sensor power supply) is used, alarm output is max. 2 points.

Range and Input Code Table

Thermocouple

Input	Code	Range	Input	Code	Range
K	K : 35	-200.0 to +400.0°C	J	J : C7	-200.0 to +700.0°F
	K : 40	-200.0 to +800.0°C		J : C6	-328.0 to +1200.0°F
	K : 09	0.0 to 400.0°C		J : B6	0.0 to 800.0°F
	K : 10	0.0 to 800.0°C		J : B9	-328 to +2192°F
	K : 41	-200 to +1372°C		J : A1	0 to 800°F
	K : 02	0 to 400°C		J : A2	0 to 1600°F
	K : 04	0 to 800°C	T	T : 19	-200.0 to +400.0°C
	K : C6	-250.0 to +800.0°F		T : C2	-328.0 to +752.0°F
	K : C4	-328.0 to +400.0°F	S	S : 06	-50 to +1768°C
	K : A4	0.0 to 800.0°F		S : A7	-58 to +3214°F
	K : C5	-328 to +2502°F	R	R : 07	-50 to +1768°C
	K : A1	0 to 800°F		R : A7	-58 to +3214°F
	K : A2	0 to 1600°F	E	E : 21	-200.0 to +700.0°C
	J	J : 27		-200.0 to +400.0°C	E : 06
J : 32		-200.0 to +800.0°C		E : A9	-328.0 to +1292.0°F
J : 08		0.0 to 400.0°C		E : B1	-328 to +1832°F
J : 09		0.0 to 800.0°C	B	B : 03	0 to 1800°C
J : 15		-200 to +1200°C		B : B2	0 to 3272°F
J : 02		0 to 400°C	N	N : 02	0 to 1300°C
J : 04	0 to 800°C	N : A7		0 to 2372°F	

RTD

Input	Code	Range
Pt100	D : 34	-100.00 to +100.00°C
	D : 35	-200.0 to +850.0°C
	D : 21	-200.0 to +200.0°C
	D : C8	-199.99 to +199.99°F
	D : C9	-328.0 to +1562.0°F
JPt100	P : 29	-100.00 to +100.00°C
	P : 30	-200.0 to +640.0°C
	P : C8	-199.99 to +199.99°F
	P : C9	-328.0 to +1184.0°F
	P : D1	-200.0 to +200.0°F

DC Current • voltage *1

Input	Code	Range	Input	Code	Range
0 to 10mV	1 : 01	0.0 to 100.0%	0 to 20mA ²	7 : 01	0.0 to 100.0%
0 to 100mV	2 : 01		4 to 20mA ²	8 : 01	
0 to 1V	3 : 01		-100 to +100mV	9 : 01	
0 to 5V	4 : 01		-1 to +1V	9 : 02	
0 to 10V	5 : 01		-10 to 10mV	9 : 03	
1 to 5V	6 : 01				

*1: Low limit scale > High limit scale setting is possible.

*2: Shunt resistor is not required for current input.

Analog Output Code Table

1	0-10mV DC	2	0-100mV DC	3	0-1V DC	4	0-5V DC	5	0-10V DC	6	1-5V DC	7	0-20mA DC	8	4-20mA DC
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Quick Start Code

- Quick start code tells the factory to ship with each parameter preset to the values detailed as specified by the customer. Quick start code is not necessarily specified when ordering, unless the preset is requested. These parameters are software selectable and can be re-programmed in the field.

Specification	Quick start code	□ □ □ □ □ □
Alarm function 1	No alarm See Alarm Code Table	N : □ □ □ □ □ □
Alarm function 2	No alarm See Alarm Code Table	□ : N □ □ □ □ □
Alarm function 3	No alarm See Alarm Code Table	□ □ : N □ □ □ □ □
Alarm function 4	No alarm See Alarm Code Table	□ □ □ : N □ □ □ □ □
Alarm function 5	No alarm See Alarm Code Table	□ □ □ □ : N □ □ □ □ □
Alarm function 6	No alarm See Alarm Code Table	□ □ □ □ □ : N □ □ □ □ □

Alarm Code Table

Code	Type
H	Process High
J	Process Low
K	Process High with hold
L	Process Low with hold

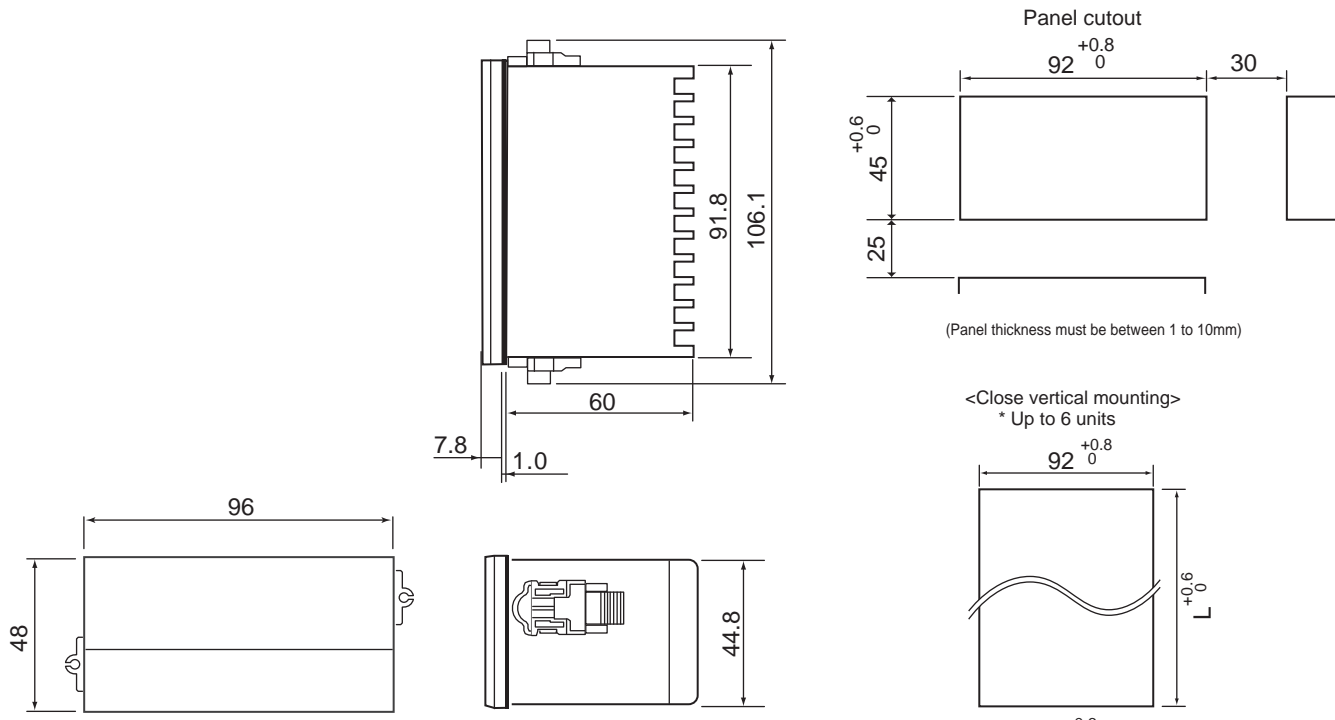
Accessory

Terminal cover
KFB400-58

Panel Mounting Type Indicator AG500

External Dimensions and Rear Terminals

(Unit:mm)



<Close vertical mounting>
* Up to 6 units

$$L = (48 \times n - 3) \begin{matrix} +0.6 \\ 0 \end{matrix}$$

n : Number of controllers (2 ≤ n ≤ 6)

• Waterproof/dustproof is not available for close horizontal mounting.

13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36
1	2	3	4	5	6	7	8	9	10	11	12

• Use a solderless terminal for screw size M3X6.

