

AG500 Installation Manual

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IMR02F06-E3

Thank you for purchasing this RKC product. In order to achieve maximum performance and ensure proper operation of your new instrument, carefully read all the instructions in this manual. Please place the manual in a convenient location for easy reference.

This manual describes the mounting, wiring and specifications.

For the operations, refer to **AG500 Operation Manual (IMR02F07-E□)**.
For the communication (Optional), refer to the **AG500 Communication Quick Instruction Manual (IMR02F08-E□)** or the separate **AG500 Communication Instruction Manual (IMR02F09-E□)**.
The manuals can be downloaded from the official RKC website:
http://www.rkcinst.com/english/manual_load.htm.

Accessories check

AG500 Installation Manual (IMR02F06-E3).....	1
AG500 Operation Manual (IMR02F07-E□).....	1
AG500 Communication Quick Instruction Manual (IMR02F08-E□) *.....	1
Mounting brackets (with screw).....	2
Unit seal (SAP-306).....	1

* Only AG500 provided with the communication function

Safety precautions



WARNING

- An external protection device must be installed if failure of this instrument could result in damage to the instrument, equipment or injury to personnel.
- All wiring must be completed before power is turned on to prevent electric shock, fire or damage to instrument and equipment.
- This instrument must be used in accordance with the specifications to prevent fire or damage to instrument and equipment.
- This instrument is not intended for use in locations subject to flammable or explosive gases.
- Do not touch high-voltage connections such as power supply terminals, etc. to avoid electric shock.
- RKC is not responsible if this instrument is repaired, modified or disassembled by other than factory-approved personnel. Malfunction can occur and warranty is void under these conditions.

CAUTION

- This product is intended for use with industrial machines, test and measuring equipment. (It is not designed for use with medical equipment and nuclear energy.)
- This is a Class A instrument. In a domestic environment, this instrument may cause radio interference, in which case the user may be required to take adequate measures.
- This instrument is protected from electric shock by reinforced insulation. Provide reinforced insulation between the wire for the input signal and the wires for instrument power supply, source of power and loads.
- Be sure to provide an appropriate surge control circuit respectively for the following:
 - If input/output or signal lines within the building are longer than 30 meters.
 - If input/output or signal lines leave the building, regardless of the length.
- This instrument is designed for installation in an enclosed instrumentation panel. All high-voltage connections such as power supply terminals must be enclosed in the instrumentation panel to avoid electric shock by operating personnel.
- All precautions described in this manual should be taken to avoid damage to the instrument or equipment.
- All wiring must be in accordance with local codes and regulations.
- To prevent instrument damage or failure, protect the power line and the input/output lines from high currents with a protection device such as fuse, circuit breaker, etc.
- Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction.
- Tighten each terminal screw to the specified torque found in the manual to avoid electric shock, fire or malfunction.
- For proper operation of this instrument, provide adequate ventilation for heat dispensation.
- Do not connect wires to unused terminals as this will interfere with proper operation of the instrument.
- Turn off the power supply before cleaning the instrument.
- Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or discoloration will occur. Use a soft, dry cloth to remove stains from the instrument.
- To avoid damage to instrument display, do not rub with an abrasive material or push front panel with a hard object.

NOTICE

- This manual assumes that the reader has a fundamental knowledge of the principles of electricity, process control, computer technology and communications.
- The figures, diagrams and numeric values used in this manual are only for purpose of illustration.
- RKC is not responsible for any damage or injury that is caused as a result of using this instrument, instrument failure or indirect damage.
- RKC is not responsible for any damage and/or injury resulting from the use of instruments made by imitating this instrument.
- Periodic maintenance is required for safe and proper operation of this instrument. Some components have a limited service life, or characteristics that change over time.
- Every effort has been made to ensure accuracy of all information contained herein. RKC makes no warranty expressed or implied, with respect to the accuracy of the information. The information in this manual is subject to change without prior notice.
- No portion of this document may be reprinted, modified, copied, transmitted, digitized, stored, processed or retrieved through any mechanical, electronic, optical or other means without prior written approval from RKC.

1. MOUNTING



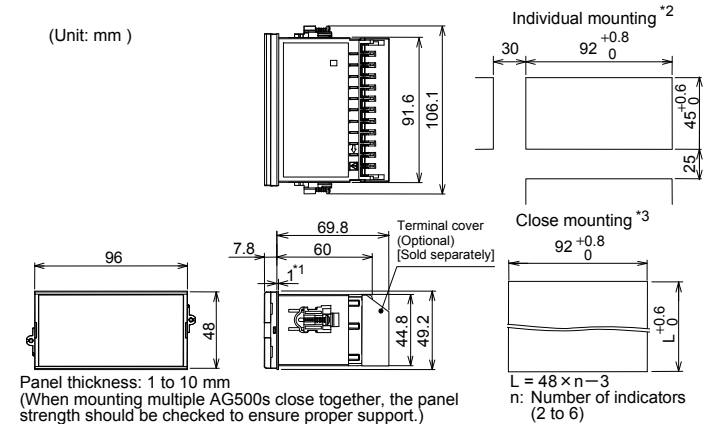
WARNING

To prevent electric shock or instrument failure, always turn off the power before mounting or removing the instrument.

1.1 Mounting Cautions

- (1) This instrument is intended to be used under the following environmental conditions. (IEC61010-1) [OVERVOLTAGE CATEGORY II, POLLUTION DEGREE 2]
- (2) Use this instrument within the following environment conditions.
 - Allowable ambient temperature: -10 to 50 °C
 - Allowable ambient humidity: 5 to 95 %RH (Absolute humidity: MAX. W. C 29.3 g/m³ dry air at 101.3 kPa)
 - Installation environment conditions: Indoor use, Altitude up to 2000 m
- (3) Avoid the following conditions when selecting the mounting location:
 - Rapid changes in ambient temperature which may cause condensation.
 - Corrosive or inflammable gases.
 - Direct vibration or shock to the mainframe.
 - Water, oil, chemicals, vapor or steam splashes.
 - Excessive dust, salt or iron particles.
 - Excessive induction noise, static electricity, magnetic fields or noise.
 - Direct air flow from an air conditioner.
 - Exposure to direct sunlight.
 - Excessive heat accumulation.
- (4) Mount this instrument in the panel considering the following conditions:
 - Ensure at least 50 mm space on top and bottom of the instrument for maintenance and environmental reasons.
 - Do not mount this instrument directly above equipment that generates large amount of heat (heaters, transformers, semi-conductor functional devices, large-wattage resistors.)
 - If the ambient temperature rises above 50 °C, cool this instrument with a forced air fan, cooler, or the like. Cooled air should not blow directly on this instrument.
 - In order to improve safety and the immunity to withstand noise, mount this instrument as far away as possible from high voltage equipment, power lines, and rotating machinery.
 - High voltage equipment: Do not mount within the same panel.
 - Power lines: Separate at least 200 mm.
 - Rotating machinery: Separate as far as possible.
 - Mount this instrument in the horizontal direction for panel. If you did installation except a horizontal direction, this causes malfunction.
 - If this instrument is permanently connected to equipment, it is important to include a switch or circuit-breaker into the installation. This should be in close proximity to the equipment and within easy reach of the operator. It should be marked as the disconnecting device for the equipment.

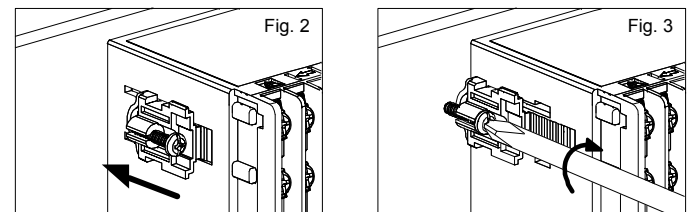
1.2 Dimensions



1.3 Procedures of Mounting and Removing

Mounting procedures

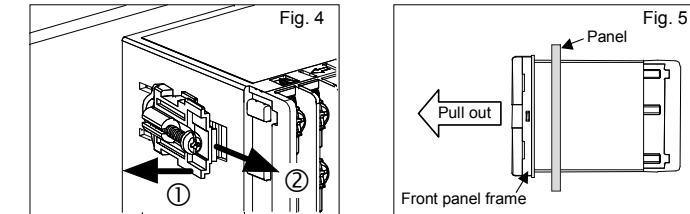
1. Prepare the panel cutout as specified in 1.2 Dimensions.
2. Insert the instrument through the panel cutout.
3. Insert the mounting bracket into the mounting groove of the instrument. (Fig. 1)
4. Push the mounting bracket forward until the bracket is firmly secured to the panel. (Fig. 2)
5. Only turn one full revolution after the screw touches the panel. (Fig. 3)
6. The other mounting bracket should be installed the same way described in 3. to 5.



The front of the instrument conforms to IP66 (NEMA4X) when mounted on the panel. For effective waterproof/dustproof, the rubber packing must be securely placed between instrument and panel without any gap. If rubber packing is damaged, please contact RKC sales office or the agent.

Removing procedures

1. Turn the power OFF.
2. Remove the wiring.
3. Loosen the screw of the mounting bracket.
4. Lift the latch of the mounting bracket (①), then pull the mounting bracket (②) to remove it from the case. (Fig. 4)
5. Use long-nose pliers to remove mounting brackets from the instrument that is installed in a narrow place or installed tightly in a vertical position.
6. The other mounting bracket should be removed in the same way as described in 3. and 4.
7. Pull out the instrument from the mounting cutout while holding the front panel frame of this instrument. (Fig. 5)



2. WIRING

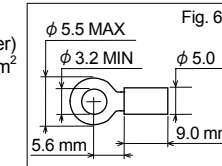


WARNING

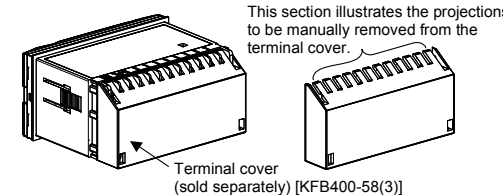
To prevent electric shock or instrument failure, do not turn on the power until all the wiring is completed. Make sure that the wiring has been properly made before applying power to the instrument.

2.1 Wiring Cautions

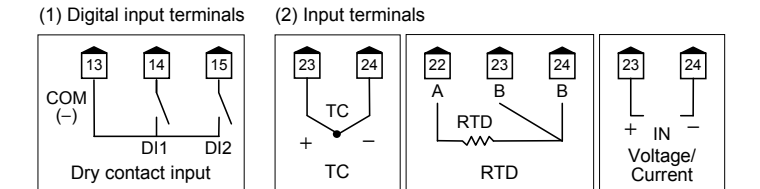
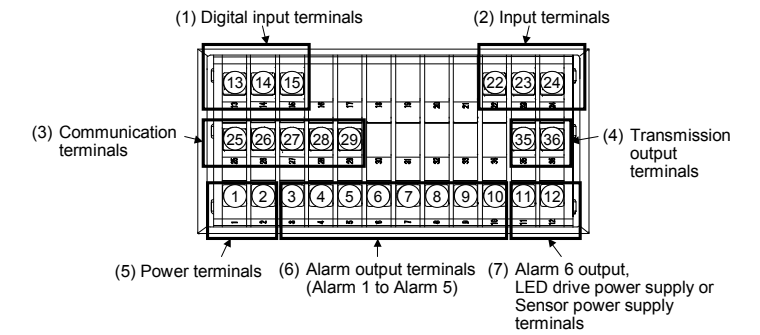
- For thermocouple input, use the appropriate compensation wire.
- For RTD input, use low resistance lead wire with no difference in resistance between the three lead wires.
- To avoid noise induction, keep communication signal wire away from instrument power line, load lines and power lines of other electric equipment.
- If there is electrical noise in the vicinity of the instrument that could affect operation, use a noise filter.
 - Shorten the distance between the twisted power supply wire pitches to achieve the most effective noise reduction.
 - Always install the noise filter on a grounded panel. Minimize the wiring distance between the noise filter output and the instrument power supply terminals to achieve the most effective noise reduction.
 - Do not connect fuses or switches to the noise filter output wiring as this will reduce the effectiveness of the noise filter.
- About five seconds are required as preparation time for contact output every time the instrument is turned on. Use a delay relay when the output line is used for an external interlock circuit.
- Power supply wiring must be twisted and have a low voltage drop.
- For an instrument with 24 V power supply, supply power from a SELV circuit.
- A suitable power supply should be considered in the end-use equipment. The power supply must be in compliance with a limited-energy circuits (maximum available current of 8 A).
- This instrument is not furnished with a power supply switch or fuse. Therefore, if a fuse or power supply switch is required, install close to the instrument. Recommended fuse rating: Rated voltage 250 V, Rated current 1 A Fuse type: Time-lag fuse
- Use the solderless terminal appropriate to the screw size.
 - Screw size: M3 × 7 (with 5.8 × 5.8 square washer)
 - Applicable wire: Solid/twisted wire of 0.25 to 1.65 mm²
 - Specified dimension: Refer to Fig. 6
 - Recommended tightening torque: 0.4 N·m (4 kgf·cm)
 - Specified solderless terminals:
 - Manufactured by J.S.T MFG CO., LTD.
 - Circular terminal with isolation V1.25-MS3
- Make sure that the any wiring such as solderless terminal is not in contact with the adjoining terminals.



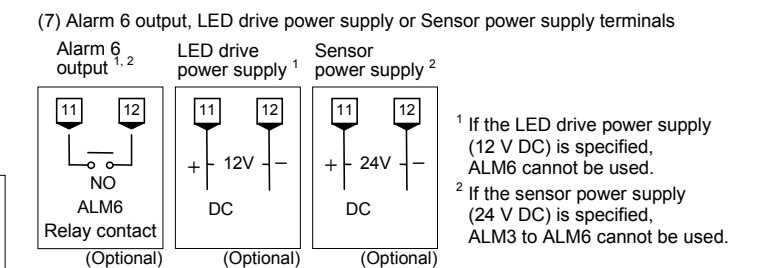
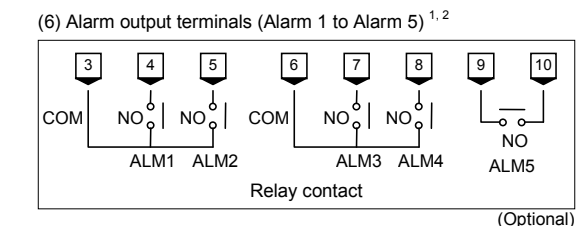
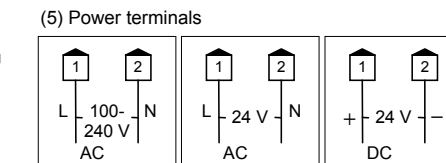
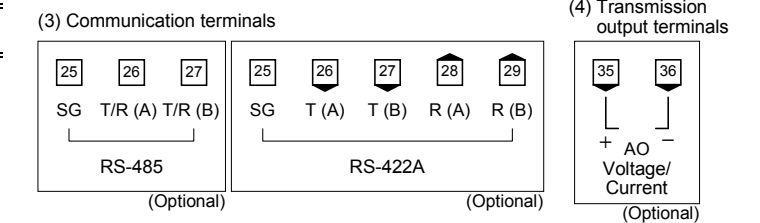
- If solderless terminal lugs other than those in not specified dimensions are used, terminal screws may not be tightened. In such a case, bend each solderless terminal lug in advance and then conduct wiring. If the terminal screw is forcibly tightened, it may be damaged.
- Up to two solderless terminal lugs can be connected to one terminal screw. However, in this case, reinforced insulation cannot be used.
- Caution for the terminal cover usage: If each solderless terminal lug touches the terminal cover, remove each projection from the terminal cover by manually bending it in front and in rear until broken.



2.2 Terminal Configuration



D11: Hold reset (Optional)
D12: Interlock release



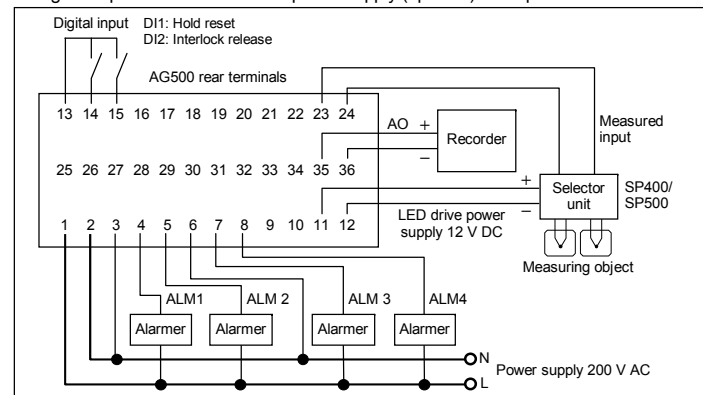
¹ If the LED drive power supply (12 V DC) is specified, ALM6 cannot be used.
² If the sensor power supply (24 V DC) is specified, ALM3 to ALM6 cannot be used.

Input/Output Isolation:
—: Isolated from each other circuit blocks.
—: Not isolated between inputs (or outputs).

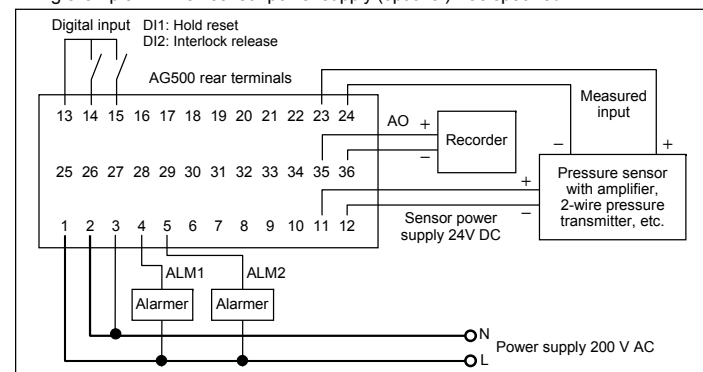
Power supply	Transmission output (AO)
Measured input	Alarm 6 output (ALM6) LED drive power supply Sensor power supply
	Alarm 5 output (ALM5)
Digital input 1 (D11)	Alarm 1 output (ALM1)
Digital input 2 (D12)	Alarm 2 output (ALM2)
Communication	Alarm 3 output (ALM3)
	Alarm 4 output (ALM4)

Wiring example

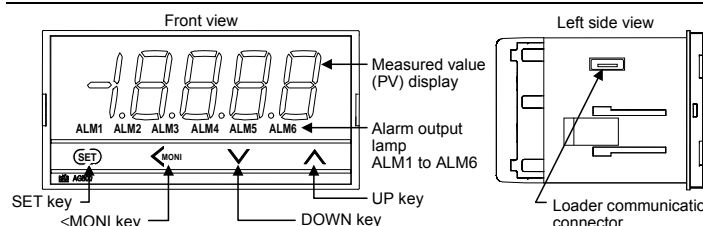
Wiring example 1: When LED drive power supply (optional) was specified



Wiring example 2: When sensor power supply (optional) was specified



3. PARTS DESCRIPTION



Measured value (PV) display [Red]	Displays Measured value (PV) or various parameters' symbols and set values.
Alarm output lamp [Red]	Lights when alarm output is turned on. ALM1 to ALM6: Alarm 1 output to Alarm 6 output
UP key	Use to increase a numerical value.
DOWN key	Use to decrease a numerical value.
<MONI key (Shift/Monitor key)	Use to change to Measured value (PV). Use to start changing settings. Use to move to a different digit when changing a setting.
SET key	Used for parameter calling up and set value registration.
Loader communication connector	Cannot be used in this specification. (For RKC maintenance)

4. SPECIFICATIONS

Input

Measured Input (PV)

Number of input: 1 point
 Input type and range: Refer to **Range code table**.
 Communication data 7 digits (Factory set value):
 Display range limit: -19999 to +19999 (No decimal place) [The input decimal point position is selectable to decimal four places].
 Communication data 6 digits:
 -9999 to +19999 (No decimal place) [The input decimal point position is selectable to decimal three places]

Sampling cycle: 250 ms ± 0.3 %
 Influence of external resistance: Approx. 0.2 μV/Ω (Converted depending on TC types)
 Influence of input lead: Approx. 0.01 %/Ω of Reading (RTD input) 10 Ω or less per wire
 Input impedance: Voltage (high) input: Approx. 1 MΩ
 Voltage (low) input: 1 MΩ or more
 Current input: Approx. 50 Ω
 Sensor current: Approx. 250 μA (RTD input)
 Action at input break: TC input, Voltage (low) input: Upscale or downscale
 RTD input: Upscale
 Voltage (high) input, Current input: Downscale (display of about zero value)

Action at input short circuit:

Downscale (RTD input)
 Action at input error: Setting range of input error determination point (high/low):
 Input scale low - (5 % of input span) to
 Input scale high + (5 % of input span)

Input correction: PV bias: -Input span to +Input span
 PV ratio: 0.500 to 1.500
 First order lag digital filter: 0.0 to 100.0 seconds (0.0: OFF)
 Square root extraction function (Voltage input, Current input):
 Calculation method:
 Measured value = √ (Input value × PV ratio + PV bias)
 Low level cutoff: 0.00 to 25.00 % of input span

Digital input (DI1, DI2) [Optional]

Number of input: 2 points
 Dry contact input
 Input method: Open state: 500 kΩ or more
 Close state: 500 Ω or less
 Contact current: 5 mA or less
 Voltage at open: Approx. 5 V DC
 Capture judgment time: 50 ms
 Function: Hold reset (DI1), Interlock release (DI2)

Output

Alarm output (ALM1 to ALM6) [Optional]

Number of output: 6 points
 When LED drive power supply (12 V DC) was specified, the number of alarm output points becomes 5 maximum.
 When sensor power supply (24 V DC) was specified, the number of alarm output points becomes 2 maximum.

Contact type: 1a contact
 Contact rating (Resistive load): 250 V AC 1 A, 30 V DC 1 A
 Electrical life: 300,000 times or more (Rated load)
 Mechanical life: 20 million times or more (Switching: 300 times/min)

Transmission output (AO) [Optional]

Number of outputs: 1 point, Outputs the measured value
 Output type:

	Rating	Output range	Allowable load resistance	Out put impedance
Voltage output	0 to 1 V DC	-0.05 to +1.05 V DC	1 kΩ or more	0.1 Ω or less
	0 to 5 V DC	-0.25 to +5.25 V DC		
	1 to 5 V DC	0.8 to 5.2 V DC		
	0 to 10 V DC	-0.5 to +10.5 V DC		
	0 to 10 mV DC	-0.5 to +10.5 mV DC	20 kΩ or more	
0 to 100 mV DC	-5 to +105 mV DC	600 Ω or less	1 MΩ or more	
Current output	4 to 20 mA DC	1 to 21 mA DC		
	0 to 20 mA DC	0 to 21 mA DC		

LED drive power supply (Sensor power supply 12 V) [Optional]

Output voltage: 12 V ± 1 V DC
 Output current: 20 mA or less
 Allowable load resistance: 600 Ω or more

Sensor power supply 24 V [Optional]

Output voltage: 24 V ± 1.2 V DC
 Output current: 24 mA or less
 Allowable load resistance: 1 kΩ or more

Performance (at the ambient temperature 23 ± 2 °C)

Measured input

Accuracy:

Input type	Input range	Accuracy
K, J, T, PLII, E, U, L	Less than -100 °C	±1.0 °C
	-100 °C or more, less than +500 °C	±0.5 °C
	500 °C or more	±(0.1 % of Reading + 1 digit)
S, R, N, W5Re/W26Re	Less than 0 °C	±2.0 °C
	0 °C or more, less than 1000 °C	±1.0 °C
	1000 °C or more	±(0.1 % of Reading + 1 digit)
B	Less than 400 °C	±70.0 °C
	400 °C or more, less than 1000 °C	±(1.4 °C + 1 digit)
	1000 °C or more	±(0.1 % of Reading + 1 digit)
Pt100, JPt100	Less than 200 °C	±0.2 °C
	200 °C or more	±(0.1 % of Reading + 1 digit)
Voltage input		±0.1 % of input span
Current input		

Noise rejection: Normal mode: 60 dB or more (50/60Hz)
 Common mode: 120 dB or more (50/60Hz)
 A/D conversion: 1/80000
 Cold-junction temperature compensation error (TC input):
 Within ±1.0 °C (23 ± 2 °C)
 Within ±1.5 °C (range of 0 to 50 °C)

Transmission output

Accuracy: 0.1 % of span
 Output resolution: Approx. 1/4000

Influence

Influence of ambient temperature (-5 to +50 °C):
 Input: ±0.006 % /°C of input span
 Influence of physical orientation (± 90°):
 Input:
 TC input: ±0.3 % of input span or ±3.0 °C or less
 RTD input: ±0.5 °C or less
 Voltage/Current input: Less than ±0.1 % of input span
 Output: Less than ±0.3 % of output span

Functions

Peak/bottom hold function

Peak/bottom hold: The peak hold/bottom hold function is used to store (hold) the maximum (peak) and minimum (bottom) Measured values (PV).

Alarm Function [Optional]

Number of alarms: Up to 6 points
 Alarm type: Process high, Process low
 Alarm setting range: Same as input range
 Additional function: Hold action, Alarm action at input error, Interlock, Energized/de-energized
 Delay timer: 0.0 to 600.0 seconds
 Differential gap: 0 to Input span
 Assignable to alarm output (ALM1 to ALM6)

Host Communication [Optional]

Interface: Based on RS-485 or RS-422A, EIA standard
 Protocol: RKC communication
 (ANSI X3.28-1976 subcategories 2.5 and A4)
 Modbus-RTU
 Communication speed: 1200 bps, 2400 bps, 4800 bps, 9600 bps, 19200 bps, 38400 bps
 Maximum connections: Up to 31 instruments
 Number of communication data digits: 7 or 6 digits

General specifications

Power supply voltage: 90 to 264 V AC [Including power supply voltage variation], 50/60 Hz (Rating 100 to 240 V AC)
 Frequency variation: 50 Hz±10 %, 60 Hz±10 %
 21.6 to 26.4 V AC [Including power supply voltage variation], 50/60 Hz (Rating 24 V AC)
 Frequency variation: 50 Hz±10 %, 60 Hz±10 %
 21.6 to 26.4 V DC [Including power supply voltage variation] (Rating 24 V DC)
 Power consumption: 100 V AC: 7.0 VA or less 240 V AC: 10.8 VA or less
 24 V AC: 7.6 VA or less 24 V DC: 230 mA or less
 12 A or less
 Rush current:
 Allowable ambient temperature: -10 to +50 °C
 Allowable ambient humidity: 5 to 95 %RH (Absolute humidity: MAX.W.C 29.3 g/m³ dry air at 101.3 kPa)
 Installation environment conditions:
 Indoor use, Altitude up to 2000 m
 Insulation resistance: Between measuring terminal and grounding: 20 MΩ or more at 500 V DC
 Between power supply terminal and grounding: 20 MΩ or more at 500 V DC
 Between power supply and measuring terminals: 20 MΩ or more at 500 V DC
 When grounding is not provided: Between panels

Withstand voltage:

Time: 1 min	①	②	③	④	⑤
① Grounding terminal					
② Power terminal	1500 V AC				
③ Measured input terminal	1500 V AC	2300 V AC			
④ Alarm output terminal	1500 V AC	2300 V AC	2300 V AC		
⑤ Transmission output terminal	1500 V AC	2300 V AC	1500 V AC		
⑥ Communication and digital input terminals	1500 V AC	2300 V AC	510 V AC	2300 V AC	1000 V AC

Power failure: A power failure of 20 ms or less will not affect the control action.
 Memory backup: Backed up by non-volatile memory

Number of writing:
 User setting data: Ten quadrillion (10¹⁶) times (FRAM)
 Adjustment and factory setting data: Approx. 100,000 times (EEPROM)
 Depending on storage and operating conditions.

Data storage period: Approx. 10 years
 Mounting and structure: Mounting method: Panel-mounted
 Case color: Black
 Front panel material: PC [Flame retardancy: UL94 V-1]
 Case material: PPE [Flame retardancy: UL94 V-1]
 Panel sheet material: PET [Flame retardancy: V-1]
 Approx. 190 g

Weight:

Standard

Safety standards: UL: UL61010-1
 cUL: CAN/CSA-C22.2 No.61010-1
 LVD: EN61010-1
 CE marking: OVERVOLTAGE CATEGORYII, POLLUTION DEGREE 2, Class II (Reinforced insulation)
 EMC: EN61326-1
 EN55011
 Panel sealing: NEMA 4X (NEMA250), IP66 (IEC60529) [Front panel]

5. MODEL CODE

Suffix code

AG500 - □ * □ - □ - □ - □ - □ □ - □ □ □ / □
 (1) (2) (3) (4) (5) (6) (7) (8) (9)

(8), (9): Indicates a specification code to be optional specified. If this section is blank, this means that no code is described on the nameplate.

(1) Power supply voltage
 3: 24 V AC/DC 4: 100 to 240 V AC

(2) Alarm output (ALM1 to ALM6)
 N: None 3: 3 points (ALM1 to ALM3) 6: 6 points (ALM1 to ALM6)
 1: 1 point (ALM1) 4: 4 points (ALM1 to ALM4)
 2: 2 points (ALM1, ALM2) 5: 5 points (ALM1 to ALM5)
 (3) Digital input (DI1, DI2)
 N: None 2: 2 points (DI1, DI2)
 (4) Sensor power supply
 N: None
 P: 12 V DC (LED drive power supply for SP400/SP500)¹
 Q: 24 V DC²

¹ When 12 V DC was specified, the number of alarm output points becomes 5 maximum.
² When 24 V DC was specified, the number of alarm output points becomes 2 maximum.

(5) Transmission output (AO)
 N: None 5: Voltage output (0 to 10 V DC)
 1: Voltage output (0 to 10 mV DC) 6: Voltage output (1 to 5 V DC)
 2: Voltage output (0 to 100 mV DC) 7: Current output (0 to 20 mA DC)
 3: Voltage output (0 to 1 V DC) 8: Current output (4 to 20 mA DC)
 4: Voltage output (0 to 5 V DC)
 (6) Communication function
 N: None 4: RS-422A 5: RS-485

(7) Quick start code

N: No quick start code (Configured at factory set value) *

1: Specify Measured input/range code

2: Specify Measured input/range code and Initial setting code

* Factory set value: K41 (K -200 to +1372 °C), No alarm 1 to 6

(8) Measured input and Range [Quick start code]

No code: No specify quick start code

□ □ □ □ Refer to **Range code table**.

(9) Instrument specification

Y: Version symbol

Initial setting code

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

□ □ □ □ □ □
 (1) (2) (3) (4) (5) (6)

(1) Alarm 1 function (AL1), (2) Alarm 2 function (AL2), (3) Alarm 3 function (AL3),
 (4) Alarm 4 function (AL4), (5) Alarm 5 function (AL5), (6) Alarm 6 function (AL6)

N: None J: Process low L: Process low with hold action

H: Process high K: Process high with hold action

Range code table

Thermocouple (TC) input, RTD input

Type	Code	Range	Code	Range	Code	Range
K	K35	-200.0 to +400.0 °C	K02	0 to 400 °C	KA4	0.0 to 800.0 °F
	K40	-200.0 to +800.0 °C	K04	0 to 800 °C	KA1	0 to 800 °F
	K41	-200 to +1372 °C	KC4	-328.0 to +400.0 °F	KA2	0 to 1600 °F
	K09	0.0 to 400.0 °C	KC6	-250.0 to +800.0 °F		
	K10	0.0 to 800.0 °C	KC5	-328 to +2502 °F		
J	J27	-200.0 to +400.0 °C	J02	0 to 400 °C	JB6	0.0 to 800.0 °F
	J32	-200.0 to +800.0 °C	J04	0 to 800 °C	JA1	0 to 800 °F
	J15	-200 to +1200 °C	JC6	-328.0 to +1200.0 °F	JA2	0 to 1600 °F
	J08	0.0 to 400.0 °C	JC7	-200.0 to +700.0 °F		
	J09	0.0 to 800.0 °C	JB9	-328 to +2192 °F		
T	T19	-200.0 to +400.0 °C	TC2	-328.0 to +752.0 °F		
E	E21	-200.0 to +700.0 °C	EA9	-328.0 to +1292.0 °F		
	E06	-200 to +1000 °C	EB1	-328 to +1832 °F		
	S	S06	-50 to +1768 °C	SA7	-58 to +3214 °F	
R	R07	-50 to +1768 °C	RA7	-58 to +3214 °F		
B	B03	0 to 1800 °C	BB2	0 to 3272 °F		
N	N02	0 to 1300 °C	NA7	0 to 2372 °F		
PLII	A02	0 to 1390 °C	AA2	0 to 2534 °F		
W5Re/W26Re	W03	0 to 2300 °C	WA2	0 to 4200 °F		
U	U04	0.0 to 600.0 °C	UB2	32.0 to 1112.0 °F		
L	L04	0.0 to 900.0 °C	LA9	32.0 to 1652.0 °F		
Pt100	D21	-200.0 to +200.0 °C	D35	-200.0 to +850.0 °C	DC8	-199.99 to +199.99 °F
	D34	-100.00 to +100.00 °C	DD1	-200.0 to +200.0 °F	DC9	-328.0 to +1562.0 °F
JPt100	P29	-100.00 to +100.00 °C	PC8	-199.99 to +199.99 °F	PD1	-200.0 to +200.0 °F
	P30	-200.00 to +640.0 °C	PC9	-328.0 to +1184.0 °F		

Voltage input, Current input

Range: Programmable range -19999 to +19999 (Factory set value: 0.0 to 100.0)

Type	Code	Type	Code
Voltage (high) input	-1 to +1 V DC	0 to 100 mV DC	201
	0 to 5 V DC	-100 to +100 mV DC	901
	1 to 5 V DC	0 to 1 V DC	301
	0 to 10 V DC	0 to 20 mA DC	701
Voltage (low) input	0 to 10 mV DC	4 to 20 mA DC	801
	-10 to +10 mV DC		

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