INDICATOR

AG500

Digital Indicator

RKC INSTRUMENT INC.

Digital Indicator

AG500

High performance digital indicator with high visibility and advanced functions

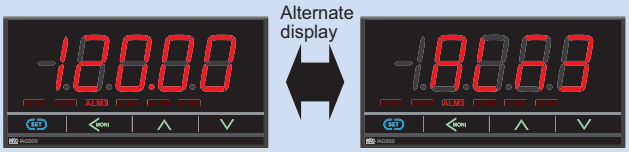
RoHS compliant

Resolution 1/100°C is available (RTD input)

Easy-to-Read Oversized LED Display

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.

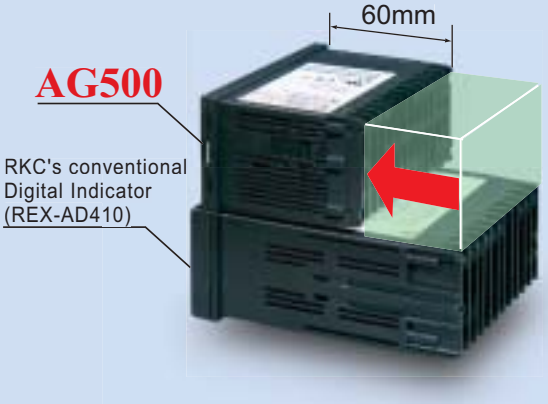


(when alarm 3 is in alarm state)

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

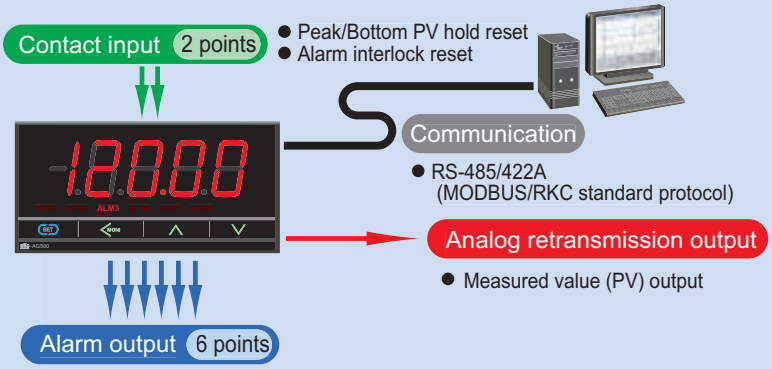
Panel space saving : 60mm

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



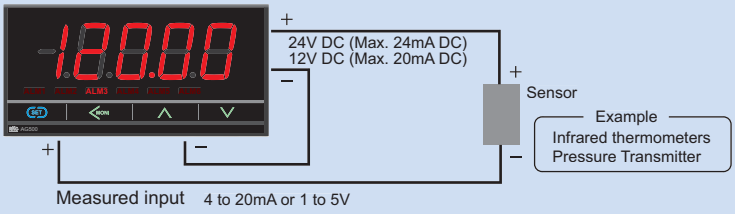
Numerous Input and Output Options

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



12/24V DC Sensor power supply (Optional)

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



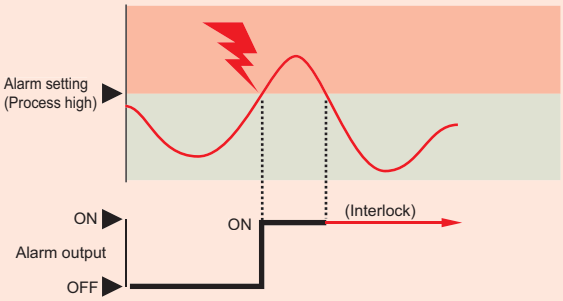
- If 24V DC is specified, the maximum number of alarm outputs will be 2.
- If 12V DC is specified, the maximum number of alarm outputs will be 5.

Standard Functions

Alarm function (Optional)

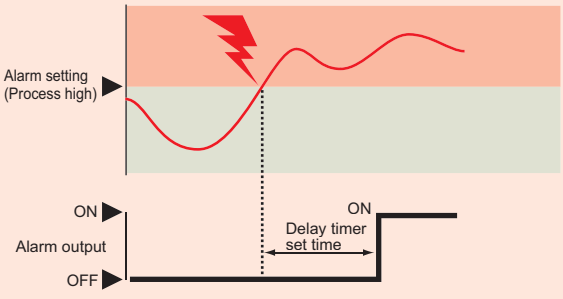
■ Interlock (Latch) Function

The alarm status is retained until the interlock is reset via front key operation, contact input or communication.



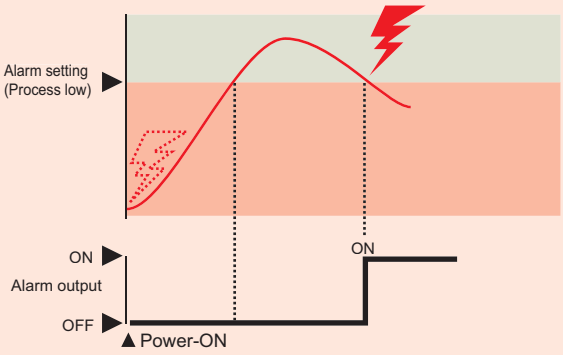
■ Alarm Delay Timer

This function will delay the alarm action by setting a delay time. If the alarm state exceeds the set time, the alarm becomes active.

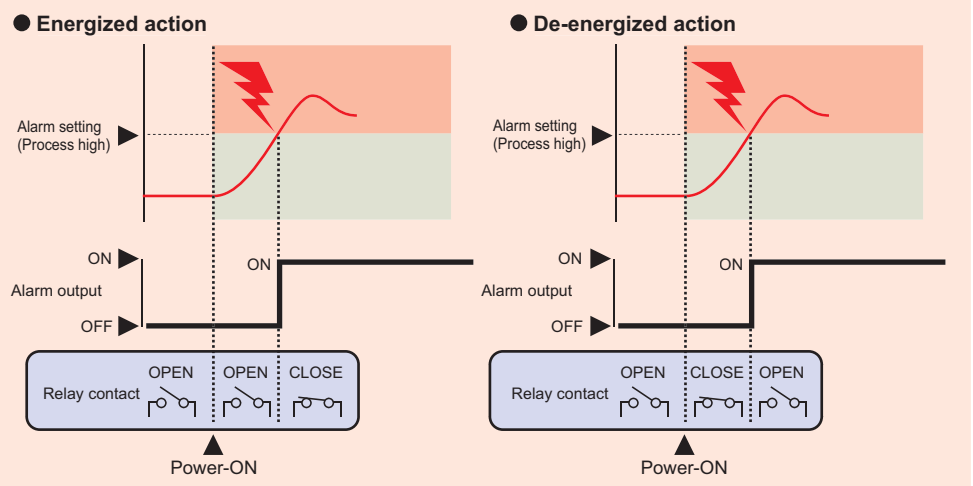


■ Hold Action

This function is active only after first entering a safe state on power-up.



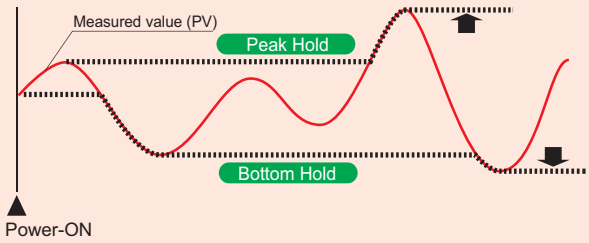
■ Alarm energized/de-energized action selection



Display function

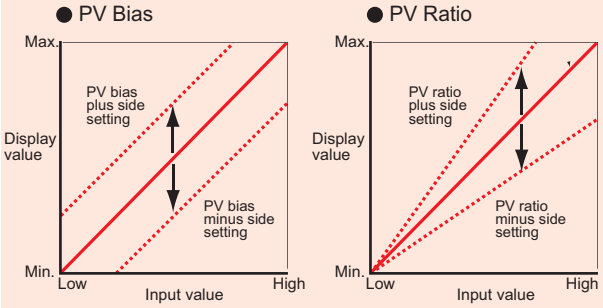
■ Peak and Bottom Hold Function

The AG500 memorizes the maximum and minimum measured value. This function allows reset via front key operation, digital input or communication.



■ PV Bias and PV Ratio

PV bias is a function to add or subtract bias to the measured value (PV).
PV ratio is a multiplier to be applied to the measured value (PV).
These functions are used to compensate the individual variations of the sensors or correct the difference between the measured values (PV) of other instruments.



PV bias and PV ratio can be used together.

Specifications

Input

Input	• Universal input (See Input range Code Table)
Measuring accuracy	a)Thermocouple Type : K, J, T, E, PLII, U, L Less than -100°C (-148°F) : ±1.0°C (±1.8°F) -100 to +500°C (-148 to 932°F) : ±0.5°C (±0.9°F) More than 500°C (932°F) : ±(0.1% of reading + 1 digit) Type : N, S, R, W5Re/W26Re Less than 0°C (32°F) : ±2.0°C (±3.6°F) 0 to 1000°C (32 to 1832°F) : ±1.0°C (±1.8°F) More than 1000°C (1832°F) : ±(0.1% of reading + 1 digit) Type B Less than 400°C (752°F) : ±70.0°C (±126°F) 400 to 1000°C (752 to 1832°F) : ±1.4°C (±2.5°F) More than 1000°C (1832°F) : ±(0.1% of reading + 1 digit) • Cold junction temperature compensation error ±1.0°C (1.8°F) [23±2°C(75.4±3.6°F)] ±1.5°C (2.7°F) [Between 0 and 50°C (32 and 104°F) b) RTD Less than 200°C (392°F) : ±0.2°C (±0.4°F) More than 200°C (392°F) : ±(0.1% of reading + 1 digit) c) DC voltage and DC current ±0.1% of span
Sampling time	0.25sec
Input impedance	a) Temperature, Low voltage input group : More than 1MΩ b) High voltage input group : Approx 1MΩ c) Current Input : Approx. 50Ω
Sensor current	Approx 250μA (RTD input):
Influence of external resistance	Approx 0.2μV/Ω (Thermocouple input)
Influence of lead resistance	0.01% of reading/Ω (RTD input) • Maximum 10Ω per wire
Input break action	Thermocouple input : Up-scale/Down-scale (Selectable) RTD input : Up-scale Low voltage input : Up-scale/Down-scale (Selectable) Current input : Value around 0mA High voltage input : Value around 0V
Input short action	Down-scale (RTD input)
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

Hold Function

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.

Display

Display digit	5-digits (The most significant digit : -1 or 1)
Flashing function	Flashing display at input error or event occurrence • Settable flashing function from each event 1 to 6.

Alarm Function (Optional)

Number of alarms	Up to 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, Process low • Hold action is available.
Alarm output	Relay contact output, Form a contact 250V AC 3A, 30V DC 1A (Resistive load) • Electric life : 300,000 cycles or more
Differential gap	0 to input span
Other functions	a) Energized/de-energized action is configurable. b) Delay timer : 0.0 to 600.0 sec c) Interlock (latch) function is configurable.

Digital Input (Optional)

Number of inputs	2 points (DI1 and DI2)
Input method	Non-voltage contact input (OPEN : 500kΩ or more, CLOSE : 500Ω or less)
Determination time	50ms
Function	DI1 : Hold reset, DI2 : Alarm interlock reset)

Analog Retransmission Output (AO) (Optional)

Output signal	0 to 1V DC, 0 to 5V DC, 1 to 5V DC, 0 to 10V DC Load resistance : More than 1kΩ Output impedance : Less than 0.1Ω 0 to 10mV DC, 0 to 100mV DC Load resistance : More than 20kΩ Output impedance : 10Ω 4 to 20mA DC, 0 to 20mA DC Load resistance : Less than 600Ω Output impedance : More than 1MΩ
Output type	Measured value (PV)
Output accuracy	±0.1% of span
Output resolution	More than 12 bits

Communication (Optional)

Communication method	RS-485 (2-wire), RS-422A (4-wire) a) ANSI X3.28 sub-category 2.5A4 (RKC standard) b) MODBUS-RTU • Selectable
Synchronous method	Half-duplex start-stop synchronous type
Communication speed	1200bps, 2400bps, 4800bps, 9600bps, 19200bps, 38400bps
Bit format	Start bit :1, Data bit : 7 or 8 (For MODBUS 8 bit only) Parity bit : 1 (odd or even) or none, Stop bit : 1 or 2
Maximum connection	31 units
Communication data digits	7 or 6 digits

Sensor Power Supply (Optional)

Output voltage	24V DC ±1.2V or 12V DC ±1V
Output current	24V DC type : Less than 24mA DC 12V DC type : Less than 20mA DC
Load resistance	24V DC type : More than 1kΩ 12V DC type : More than 600Ω

General Specifications

Waterproof/Dustproof	NEMA4X, IP66 • Waterproof/Dustproof protection only effective from the front in panel mounted installation.
Supply voltage	a) 90 to 264V AC (50/60Hz, Selectable) Rating : 100 to 240V AC b) 21.6 to 26.4V AC ±10% (50/60Hz, Selectable) Rating : 24V AC c) 21.6 to 26.4V DC Rating : 24V DC
Power consumption	a) At 100V AC : Less than 7.0VA At 240V AC : Less than 10.8VA b) 24V AC : Less than 7.6VA c) 24V DC : Less than 230mA
Memory backup	Backed up by non-volatile memory (FRAM) • Data retaining period : Approx. 10 years • Number of writing : Approx. 10,000,000,000 times. (Depending on storage and operating conditions.)
Insulation resistance	More than 20MΩ (500V DC) between measured terminals and ground More than 20MΩ (500V DC) between power terminals and ground
Dielectric voltage	1000V AC for one minute between measured terminals and ground 1500V AC for one minute between power terminals and ground
Power failure	A power failure of 20m sec or less will not affect the action. If power failure of more than 20m sec occurs, indicator will restart.
Weight	Approx. 190g
Ambient temperature	-10 to +50°C (14 to 122°F)
Ambient humidity	5 to 95% RH (Non condensing) • Absolute humidity : MAX.W.C 29g/m³ dry air at 101.3kPa
Compliance with Standards	CE Marking : LVD EN61010-1 OVERVOLTAGE CATEGORYII, POLLUTION DEGREE 2 Class II (Reinforced insulation) EMC EN61326 UL: UL 61010-1 C-UL: CAN/CSA-C22.2 No.61010-1 C-Tick mark : AS/NZS CISPR 11 (equivalent to EN55011)

Input Range Code Table

Temperature • DC Current • DC Low voltage Group • Use dip switch to change input group.

Thermocouple

Input	Code	Range
K	K 35	-200.0 to +400.0℃
	K 40	-200.0 to +800.0℃
	K 09	0.0 to 400.0℃
	K 10	0.0 to 800.0℃
	K 41	-200 to +1372℃
	K 02	0 to 400℃
	K 04	0 to 800℃
	K C6	-250.0 to +800.0℉
	K C4	-328.0 to +400.0℉
	K A4	0.0 to 800.0℉
	K C5	-328 to +2502℉
	K A1	0 to 800℉
	K A2	0 to 1600℉
J	J 27	-200.0 to +400.0℃
	J 32	-200.0 to +800.0℃
	J 08	0.0 to 400.0℃
	J 09	0.0 to 800.0℃
	J 15	-200 to +1200℃
	J 02	0 to 400℃
	J 04	0 to 800℃
	J C7	-200.0 to +700.0℉
	J C6	-328.0 to +1200.0℉
	J B6	0.0 to 800.0℉
	J B9	-328 to +2192℉

Input	Code	Range
J	J A1	0 to 800℉
	J A2	0 to 1600℉
T	T 19	-200.0 to +400.0℃
	T C2	-328.0 to +752.0℉
S	S 06	-50 to +1768℃
	S A7	-58 to +3214℉
R	R 07	-50 to +1768℃
	R A7	-58 to +3214℉
E	E 21	-200.0 to +700.0℃
	E 06	-200 to +1000℃
	E A9	-328.0 to +1292.0℉
	E B1	-328 to +1832℉
B	B 03	0 to 1800℃
	B B2	0 to 3272℉
N	N 02	0 to 1300℃
	N A7	0 to 2372℉
PLII (NBS)	A 02	0 to 1390℃
	A A2	0 to 2534℉
W5Re/W26Re (ASTM)	W 03	0 to 2300℃
	W A2	0 to 4200℉
U (DIN)	U 04	0.0 to 600.0℃
	U B2	32.0 to 1112.0℉
L (DIN)	L 04	0.0 to 900.0℃
	L A9	32.0 to 1652.0℉

RTD

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

DC Current • voltage

Input	Code	Range
0 to 10mV	1 01	Scale range and decimal point are programmable in the range of -19999 to +19999 • The decimal point position (digits below zero) is programmable between 0 and 3.
0 to 100mV	2 01	
0 to 1V	3 01	
-100 to +100mV	9 01	
-10 to +10mV	9 03	
0 to 20mA *2	7 01	
4 to 20mA *2	8 01	

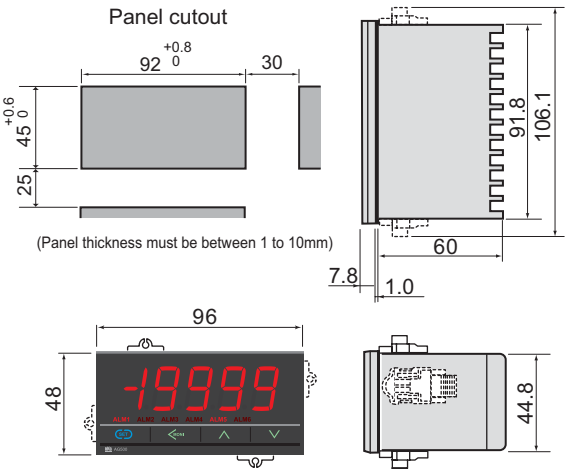
*1: In the event the communication data digit is 6, the decimal point is ignored and the scale range is -9999 to 19999.
*2: Shunt resistor is not required for current input.

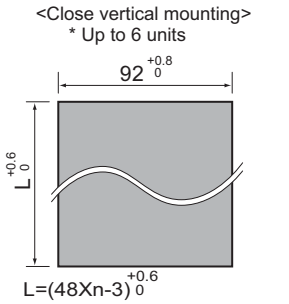
DC High voltage group

DC voltage

Input	Code	Range
0 to 5V	4 01	Scale range and decimal point are programmable in the range of -19999 to +19999
0 to 10V	5 01	
1 to 5V	6 01	
-1 to +1V	9 02	

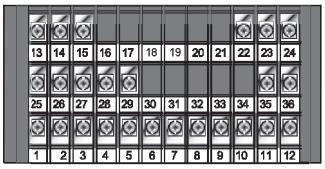
External Dimensions



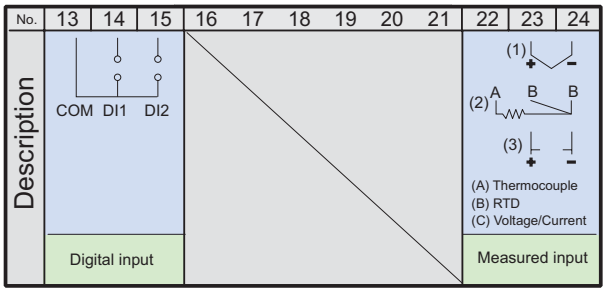


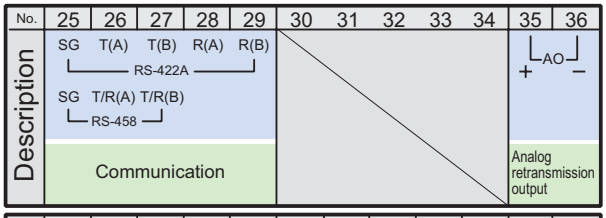
• Waterproof/dustproof is not available for close horizontal mounting.

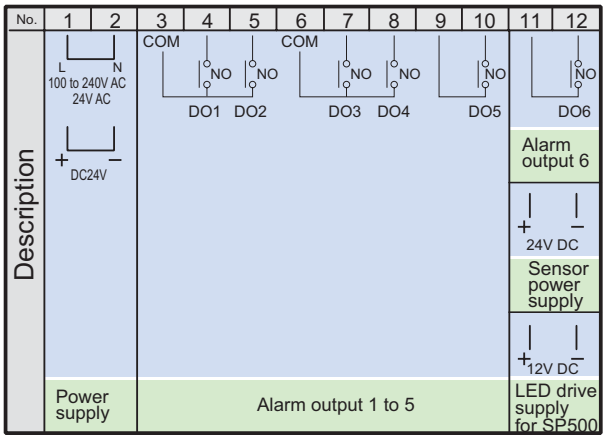
Rear Terminals



• Use a solderless terminal for screw size M3X6.





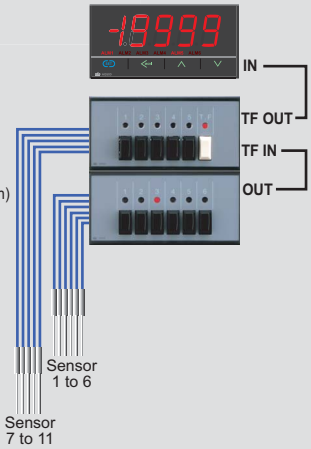


● Input Selector Unit (SP500)

The SP500 is an input selector unit with 6 inputs (standard) or 5 inputs (transfer type).
Maximum 3 units can be connected by using transfer type SP500 with 5 inputs.

Specifications

Input type	Thermocouple K,J,E,T,R,S,B,N,L,U RTD Pt100/JPt100 Voltage/Current inputs
Number of inputs	6 points (Transfer switch type : 5 points)
LED display	LED lights by the power supply from the indicator (12V DC)
Life of switch	30 thousand operation (at 70mm/sec.)
Contact resistance	15mΩ (initially), Less than 40mΩ (after 30 thousand operation)
Switching timing	Non-shooting
External dimension	96 x 48 x 100mm
Weight	Approx 250g



Model Code

SP500 − □ □/□

- Body color: N : White, A : Black
- Transfer switch (TF): N : Not supplied, T : With TF
- Input type:
  - K : Thermocouple K
  - J : Thermocouple J
  - E : Thermocouple E
  - T : Thermocouple T
  - R : Thermocouple R
  - S : Thermocouple S
  - B : Thermocouple B
  - N : Thermocouple N
  - L : Thermocouple L
  - U : Thermocouple U
  - D : RTD Pt100/JPt100
  - V : Voltage/Current

■ Model and Suffix Code

	Specification	Model and Suffix Code	Hardware coding only ① ② ③ ④ ⑤ ⑥ ⑦	Input and Range code ⑧
		AG500 −□*□−□−□−□−□−□ □ −		
①	Power Supply	100 to 240V AC 24V AC/DC	4 3	
②	Alarm output	Not supplied Specify output points (1 to 6)	N □	
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 *1 24V DC : Sensor power supply *2	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 Specify Input and range code Specify Input and range code and quick start code (See page 11)	N 1 2	
⑧	Input and range	See Input range Code Table		

Analog Output Code Table

1	0 to 10mV DC
2	0 to 100mV DC
3	0 to 1V DC
4	0 to 5V DC
5	0 to 10V DC
6	1 to 5V DC
7	0 to 20mA DC
8	4 to 20mA DC

*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.

Input range Code Table

Thermocouple

Input	Code	Range
K	K 35	-200.0 to +400.0℃
	K 40	-200.0 to +800.0℃
	K 09	0.0 to 400.0℃
	K 10	0.0 to 800.0℃
	K 41	-200 to +1372℃
	K 02	0 to 400℃
	K 04	0 to 800℃
	K C6	-250.0 to +800.0℉
	K C4	-328.0 to +400.0℉
	K A4	0.0 to 800.0℉
	K C5	-328 to +2502℉
	K A1	0 to 800℉
	K A2	0 to 1600℉
J	J 27	-200.0 to +400.0℃
	J 32	-200.0 to +800.0℃
	J 08	0.0 to 400.0℃
	J 09	0.0 to 800.0℃
	J 15	-200 to +1200℃
	J 02	0 to 400℃
	J 04	0 to 800℃

Input	Code	Range
J	J C7	-200.0 to +700.0℉
	J C6	-328.0 to +1200.0℉
	J B6	0.0 to 800.0℉
	J B9	-328 to +2192℉
	J A1	0 to 800℉
	J A2	0 to 1600℉
T	T 19	-200.0 to +400.0℃
	T C2	-328.0 to +752.0℉
S	S 06	-50 to +1768℃
	S A7	-58 to +3214℉
R	R 07	-50 to +1768℃
	R A7	-58 to +3214℉
E	E 21	-200.0 to +700.0℃
	E 06	-200 to +1000℃
	E A9	-328.0 to +1292.0℉
	E B1	-328 to +1832℉
B	B 03	0 to 1800℃
	B B2	0 to 3272℉
N	N 02	0 to 1300℃
	N A7	0 to 2372℉

Input	Code	Range
PLII (NBS)	A 02	0 to 1390℃
	A A2	0 to 2534℉
W5Re/W26Re (ASTM)	W 03	0 to 2300℃
	W A2	0 to 4200℉
U (DIN)	U 04	0.0 to 600.0℃
	U B2	32.0 to 1112.0℉
L (DIN)	L 04	0.0 to 900.0℃
	L A9	32.0 to 1652.0℉

RTD

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

DC Current • voltage

Input	Code	Range
0 to 10mV	1 01	0.0 to 100.0%
0 to 100mV	2 01	
0 to 1V	3 01	
0 to 5V	4 01	
0 to 10V	5 01	
1 to 5V	6 01	

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

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

■ 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

H	Process High	K	Process High with Alarm Hold
J	Process Low	L	Process Low with Alarm Hold

Terminal cover
(Sold separately)
KFB400-58

Conventional indicator : REX-AD410

<Comparison of function>

	REX-AD410	AG500
Display digits	4	5
Sampling time	0.5 sec	0.25 sec
Analog output resolution	10 bits	More than 12 bits
Sensor power supply	Mot available	Available
Alarm output	Max.6 points 2 points/1 common x 3	Max.6 points 2 points/1 common x 2 1 point independent output x 2
Depth	100mm	60mm
RoHS	Not available	Available

Safety Warning

- Before operating this product, read the instruction manual carefully to avoid incorrect operation.
- This product is intended for use with industrial machines, test and measuring equipment. It is not designed for use with medical equipment.
- If it is possible that an accident may occur as a result of the failure of the product or some other abnormality, an appropriate independent protection device must be installed.

Caution for the export trade

All transactions must comply with laws, regulations, and treaties.

Caution for imitated products

As products imitating our product now appear on the market, be careful that you don't purchase these imitated products. We will not warrant such products nor bear the responsibility for any damage and/or accident caused by their use.

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