

# AH4000 SERIES

## 180mm chart MULTI-POINT TYPE

### HYBRID MEMORY RECORDER



AH4000 series is a hybrid recorder which employs bright and clear, easy to view LCD display.

Measuring value display is prepared as 1 point display, multi-points simultaneous display and digital display + bar graph display.

Various measuring and recording settings can be easily done by front key switch and confirmed by LCD digital display.

Equipped with SD card (sold separately) and it can record data, read and write setting value.

Equipped with DC voltage 10 kinds, T/C 36 kinds, RTD 12 kinds, in total 58 kinds. Easily set the range per channels.

Provided with USB port and connect with PC directly. RS232C, RS422A, RS485 and Ethernet communication interface is optionally prepared. When Ethernet is selected, settings from the web and E-mail alarm notification are added.

By Data acquisition software, the use of application expands from recording/management to information processing.

\*Optional communication interface required.

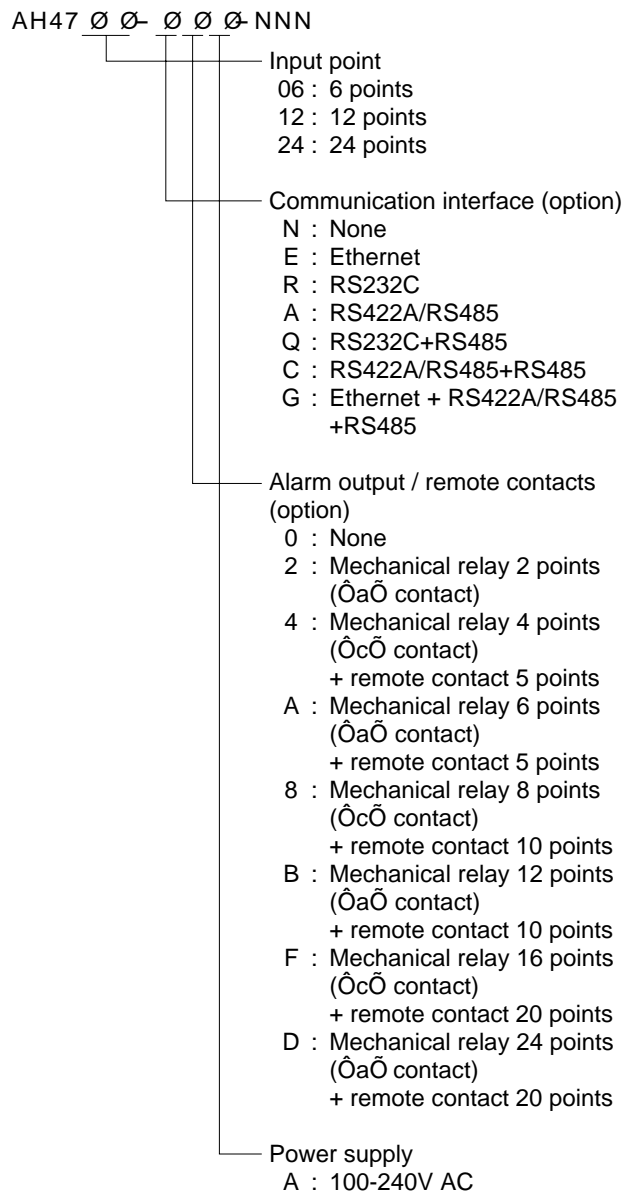
Data analysis software can replay display, wave process, editing and trend display.

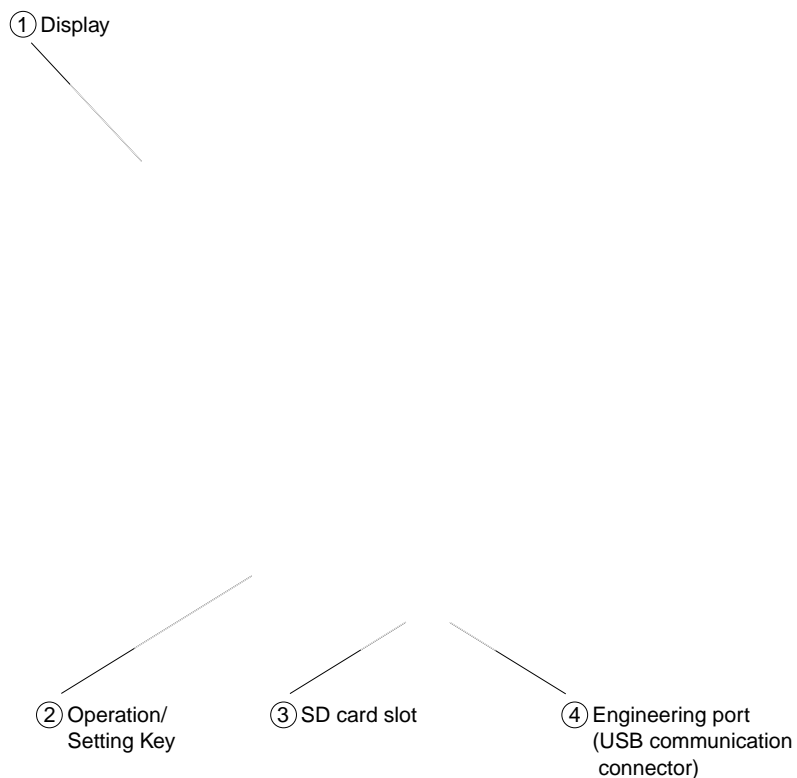
Parameter setting software can manage the setting information on PC.

Set 4 types of alarm per each input points. When alarm occurs, status display  $\text{ALM}$  flashes and measuring value flashes at LCD operation screen.

Can set the alarm operation when chart end is detected.

Process the measured data by programming setting and displayed/recorded data of each channels are shown as programmed result data.





Display measured data by digital display and analog indication by bar graph display.

Setting contents can be easily registered by front key switch.

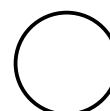
Press **Menu** key and menu screen (list of setting items) will be displayed to graphic LCD.

Save measured data to SD card by designated interval (Fastest 12 points: 2 sec). Also, register measuring / recording condition such as range, scale, chart speed and when required, setup the unit by registered conditions.

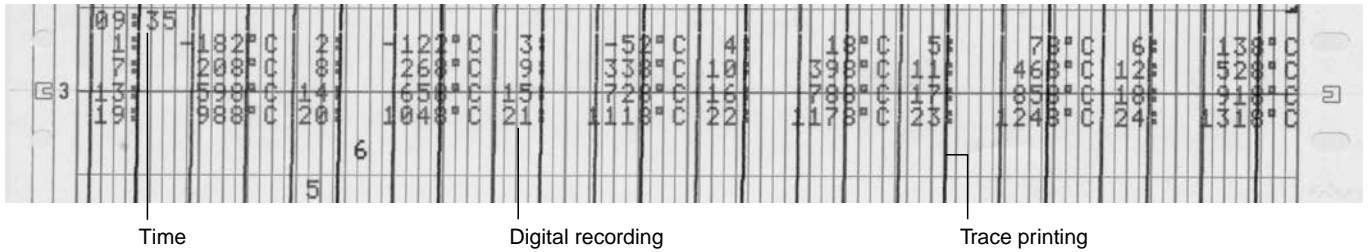
Connect with PC by mini-USB cable\*. By attached setting software, you can set or change the parameter by PC.

\*Purchase commercialized product separately.

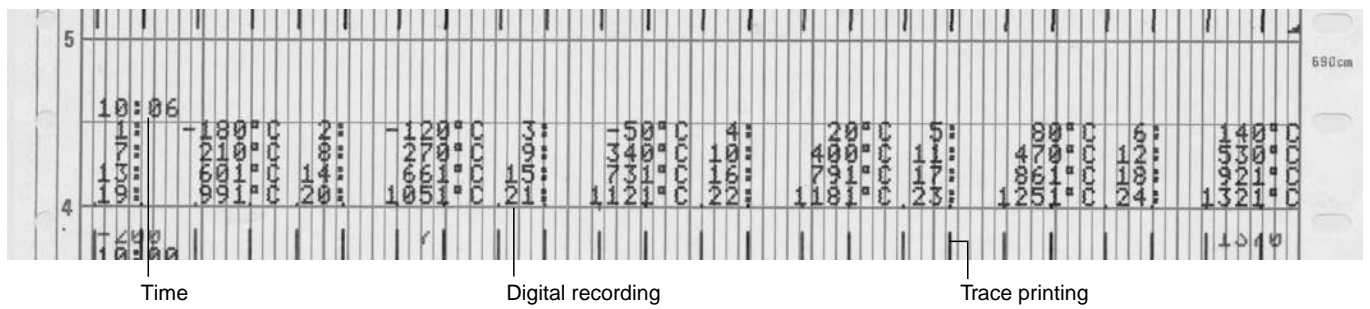
Set ON/OFF/AUTO (OFF after no operation for 3 minutes).



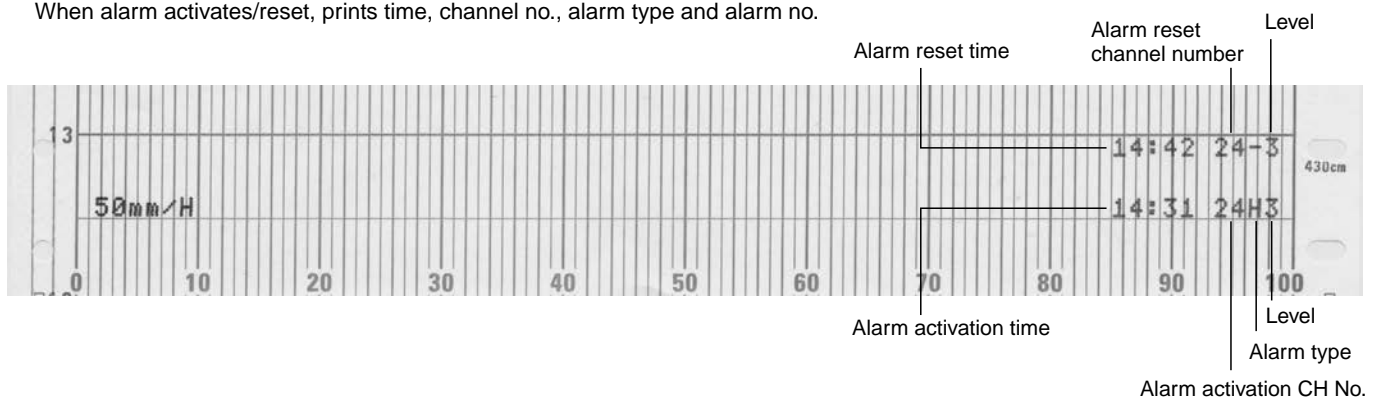
Record the data with time, scale, chart speed, setting change mark and time line over trace printing by arbitrary interval.



When the latest data is required, trace printing will stop and recorded.



When alarm activates/reset, prints time, channel no., alarm type and alarm no.



# AH4000 SERIES

Measuring points: 6, 12, 24  
 Input types: DC voltage ---  $\pm 13.8\text{mV}$ ,  $\pm 27.6\text{mV}$ ,  $\pm 69.0\text{mV}$ ,  
 $\pm 200\text{mV}$ ,  $\pm 500\text{mV}$ ,  $\pm 1\text{V}$   
 $\pm 5\text{V}$ ,  $\pm 10\text{V}$ ,  $\pm 20\text{V}$ ,  $\pm 50\text{V}$   
 DC current --- Max 50mA by external shunt resistor  
 (100 $\Omega$ , 250 $\Omega$ ) (sold separately)  
 Thermocouple ---  
 K, E, J, T, R, S, B, N, U, L,  
 W-WRe26, WRe5-WRe26,  
 PtRh40-PtRh20, NiMo-Ni,  
 CR-AuFe, Platinel II, Au/Pt  
 Resistance thermometer ---  
 Pt100, old Pt100, JPt100, Pt50,  
 Pt-Co  
 Accuracy ratings: Refer to the table of measuring range/accuracy ratings/display resolution  
 Measuring interval: 1 second/ 6 points, 2 seconds/ 12 points, 2 seconds/ 24 points  
 Input resolution: About 1/40,000 or better (converted to reference range)  
 Reference junction compensation accuracy:  
 At ambient temperature:  $23^{\circ}\text{C} \pm 10^{\circ}\text{C}$   
 K, E, J, T, N Platinel II ---  
 $\pm 0.5^{\circ}\text{C}$  or EMF 20 $\mu\text{V}$ , whichever greater  
 Other than above ---  
 $\pm 1.0^{\circ}\text{C}$  or EMF 40 $\mu\text{V}$ , whichever greater  
 Burnout: Burnout detection function for thermocouple input and RTD input. Upper burnout, lower burnout or burnout disabled is selectable for each input.  
 Maximum common mode voltage: 30V AC/60V DC  
 Common mode rejection ratio: 130dB or more (50/60Hz)  
 Normal mode rejection ratio: 50dB or more (50/60Hz)  
 Terminal board: Removable when wiring.  
 Analog display: LCD bar graph 180mm  
 Digital display: Monographic type LCD (Backlight AUTO / Always ON settable)  
 Dots : 264 x 48 dots  
 Display area : 184 x 22mm  
 Display item: All channels simultaneous display, year/month/day, hour/minute, alarm activate channel, chart speed display of measuring value.  
 Status display: REC, CARD, ALM  
 Alarm display: Status display "ALM" flash, measuring value flash at operation screen  
 Alarm types: Absolute alarm, differential alarm, rate-of-change alarm, FAIL, calendar timer, chart end.  
 Alarm settings: Individual settings, Max 4 levels/channel  
 Alarm output: Mechanical relay 2, 6, 12, 24 points ('a' contact)  
 Mechanical relay 4, 8, 16 points ('c' contact)  
 CE marking: EN61326-1  
 EN61010-1  
 \*Under EMC test condition, variation in indication value is  $\pm 20\%$  or  $\pm 2\text{mV}$  at maximum, whichever is larger.  
 UL: UL61010-1 2nd edition  
 CSA (C-UL): CAN/CSA C22.2 No.61010-1  
 Protection: IEC 60529 IP54

Dotting interval: 5 seconds/point, 2.5 seconds/point  
 Interlock to chart speed

Recording method: Wire-dot type 6-color ribbon

Record/Printed color:

Trace printing (default colors)

Channel no.	1, 7 13, 19	2, 8 14, 21	3, 9 15, 21
Color	Red	Black	Blue
Channel no.	4, 10 16, 22	5, 11 17, 23	6, 12 18, 24
Color	Green	Brown	Purple

Digital recording

	Repetition of red, black, blue, green, brown and purple
	Activate: Red, Reset: Green
	Black (channel each items color are same as trace printing color)

Chart paper: Fan-fold type  
 Total width 200mm, total length 20m, effective chart width 180mm

Chart speed: 1 to 1500mm / h, in 1mm/h increments  
 (12.5mm / h can be set exceptionally)

Periodic data printing: Digital printing is added to trace printing at month / day, time, channel no., data, unit Interval (hour/time) arbitrary setting.

Data printing: When required, interrupt trace printing and digital print time and measuring value.

Alarm printing: Alarm activated --- Time, channel no., alarm type and level  
 Alarm reset --- Time, channel no., alarm level  
 Memory capacity --- Max. 48 data

List printing: When required, interrupt trace printing and print date, chart speed and setting information of each channel.

Message printing: Print when required  
 Up to 15 characters/message, register up to 20 characters.

ON/OFF of display and recording: Select ON / OFF of display per each channel, trace recording to chart, digital recording to chart, recording to SD card

Subtract printing: Record difference between reference channel and measuring value or between reference value (set value) and measuring value.

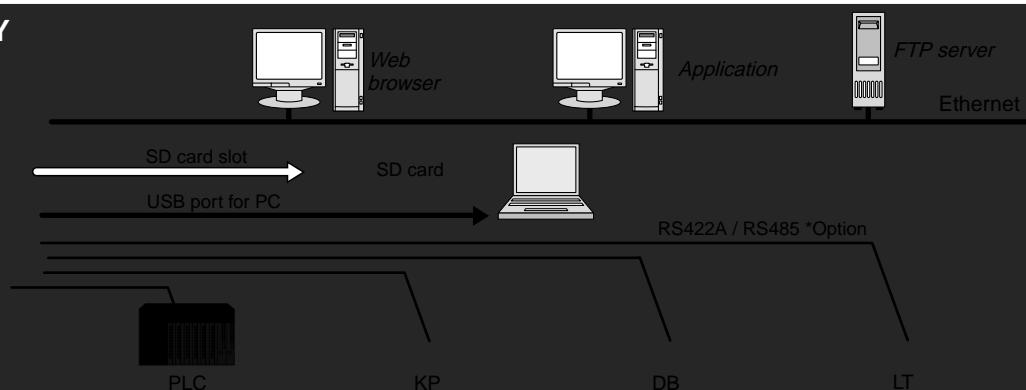
Zone printing: 2 / 3 / 4 divisions

Compressed/Expanded printing: Range limit is made non-linear and specific chart recording lower/upper limit is shrunk or expanded.

Automatic range shift printing: Recording range is shifted automatically to another set range when measured value exceeds the current range. Overlap function available.

Skip function: No display or printing of channels of which ranges are not set.

## CONNECTIVITY



Rated power voltage:  
100 to 240VAC, 50/60Hz

Maximum power consumption:  
Max 65VA  
100V AC balanced: 22VA,  
240V AC balanced: 31VA

Normal operation condition:  
Ambient temperature range:  
0 to 50°C (20 to 65%)  
Ambient humidity range:  
20 to 80%RH (5 to 40°C)  
Power voltage:90 to 264V AC  
Power frequency:50/60Hz ±2%  
Attitude: forward tilting 0°,  
backward tilting 0 to 30°, left/right 0 to 10°

Case material: Door --- Aluminum die-casting  
Front panel --- Glass  
Case --- Cold-rolled steel plate

Case color: Door--- Black (equivalent of Munsell N3.0)  
Glass--- Clear and colorless  
Case --- Gray (equivalent of Munsell N7.0)

Mounting: Panel mounting  
Weight: About 7.6kg  
Terminal screw: Power terminal,  
Protective conductor terminal --- M4.0  
Measuring input terminal, alarm output terminal  
Remote contact terminal --- M3.5  
Communication terminal --- M3.0

Remote contact: By external relay contact signal  
(digital contact: short or open), you can select  
chart speed or data printing  
Input points: 5 points, 10 points, 20 points  
Input signal: Digital contact signal or open  
collector signal  
Exterior output: 5V DC/2mA  
Function: 1. Record start/stop  
2. Chart speed 3-speed switch  
3. Data printing  
4. List printing  
5. Message printing  
6. Operation record  
(Record ON/OFF condition to the  
designate location by bar line)  
7. Integration/F value reset  
8. Memory card (record start/stop)  
9. Alarm output rest  
10. Time correction

Alarm output: Mechanical relay ('a' contact) 2 points, 6 points,  
12 points, 24 points  
Max. load 100 to 240VAC 0.2A  
30V DC 0.2A  
Min. load 5V DC 10mA  
Mechanical relay ('c' contact) 4 points, 8 points,  
16 points  
Max. load 100 to 240VAC 0.2A  
30V DC 0.2A  
Min. load 5V DC 10mA

Communication interface: RS232C, RS422A, RS485, Ethernet

	512MB	
	1GB	
	2GB	

	Input type	Measuring range	Reference range	Accuracy ratings	Display resolution
DC voltage	mV	-13.8 to 13.8mV	±13.8mV	±0.1% ±1 digit	10μV
		-27.6 to 27.6mV	±27.6mV		10μV
		-69.0 to 69.0mV	±69.0mV		10μV
		-200 to 200mV	±200mV		100μV
		-500 to 500mV	±500mV		100μV
	V	-1 to 1V	± 1V		10mV
		-5 to 5V	± 5V		10mV
		-10 to 10V	± 10V		10mV
		-20 to 20V	± 20V		10mV
		-50 to 50V	± 50V		10mV
Thermocouple	K	-200 to 300°C	±13.8mV	±0.1% ±1 digit	0.1°C
		-200 to 600°C	±27.6mV		0.1°C
		-200 to 1370°C	±69.0mV		1 °C
	E	-200 to 200°C	±13.8mV		0.1°C
		-200 to 350°C	±27.6mV		0.1°C
	J	-200 to 900°C	±69.0mV		1 °C
		-200 to 250°C	±13.8mV		0.1°C
	T	-200 to 500°C	±27.6mV		0.1°C
		-200 to 1200°C	±69.0mV		1 °C
	R	-200 to 250°C	±13.8mV		0.1°C
		-200 to 400°C	±27.6mV		0.1°C
	S	0 to 1200°C	±13.8mV		1 °C
		0 to 1760°C	±27.6mV		1 °C
	B	0 to 1300°C	±13.8mV		1 °C
		0 to 1760°C	±27.6mV		1 °C
	N	0 to 1820°C	±13.8mV		1 °C
		-200 to 400°C	±13.8mV		0.1°C
	U	-200 to 750°C	±27.6mV		0.1°C
		-200 to 1300°C	±69.0mV		1 °C
	L	-200 to 250°C	±13.8mV		0.1°C
		-200 to 500°C	±27.6mV		0.1°C
	W-WRe26	-200 to 900°C	±69.0mV		1 °C
		-200 to 250°C	±13.8mV		0.1°C
	WRe5-WRe26	-200 to 500°C	±27.6mV		0.1°C
		-200 to 900°C	±69.0mV		1 °C
	NiMo-Ni	0 to 2315°C	±69.0mV		1 °C
0 to 290°C		±13.8mV	0.1°C		
Platinel II	0 to 600°C	±27.6mV	0.1°C		
	0 to 1310°C	±69.0mV	1 °C		
PtRh40-PtRh20	0 to 350°C	±13.8mV	0.1°C		
	0 to 650°C	±27.6mV	0.1°C		
CR-AuFe	0 to 1390°C	±69.0mV	1 °C		
	0 to 1880°C	±13.8mV	1 °C		
Au/Pt	0 to 280 K	±6.9mV	±0.2% ±1 digit	0.1 K	
	0 to 1000°C	±27.6mV	0.1°C		
RTD	Pt100	-140 to 150°C	160Ω	±0.1% ±1 digit	0.1°C
		-200 to 300°C	220Ω		0.1°C
		-200 to 649°C	340Ω		0.1°C
		-200 to 850°C	400Ω		0.1°C
	Old Pt100	-140 to 150°C	160Ω		0.1°C
		-200 to 300°C	220Ω		0.1°C
	JPt100	-200 to 649°C	340Ω		0.1°C
		-140 to 150°C	160Ω		0.1°C
	Pt50	-200 to 300°C	220Ω		0.1°C
		-200 to 649°C	340Ω		0.1°C
Pt-Co	-200 to 649°C	220Ω	±0.15% ±1 digit	0.1 K	
	4 to 374K	220Ω			

Note: The accuracy ratings are converted into the measuring range under reference condition. Thermocouple input does not contain reference junction compensation accuracy.

K, E, J, T, R, S, B, N : IEC584(1977, 1982), JIS C 1602-1995, JIS C 1605-1995

W-WRe26, NiMo-Ni, Platinel II, PtRh40-PtRh20, CR-AuFe, Au/Pt : ASTM E1751

WRe5-WRe26 : ASTM E988 U, L : DIN43710-1985

Pt100 : IEC751(1995), JIS C 1604-1997

Old Pt100 : IEC751(1983), JIS C 1604-1989, JIS C 1606-1989

JPt100 : JIS C 1604-1981, JIS C 1606-1986, Pt50 : JIS C 1604-1981 Pt-Co : CHINO

# APPLICATION SOFTWARE (standard attached)

Data Acquisition Software

Parameter Setting Software

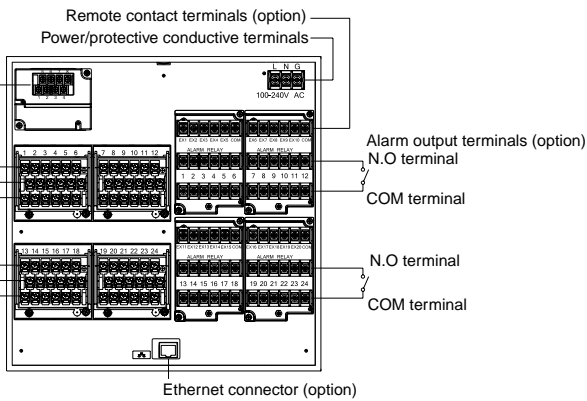
Data Analysis Software

Communication terminal \* RS232C and RS422A/485 are specified on purchase.

	3	4	\$			4	(	4	%		3	%	
\$ 0.	3	4	*			4	(	4	%	4	%	3	%
\$ 0.	3	4				4	(	4	%	4	%	4	%
\$ 0.	3	4	4	4	4	4	(	4	%	4	%	4	%

Measurement input terminals  
 TC-mV(+), RTD(A) terminals  
 TC-mV(-), RTD(B) terminals  
 RTD(B) terminals

TC-mV(+), RTD(A) terminals  
 TC-mV(-), RTD(B) terminals  
 RTD(B) terminals

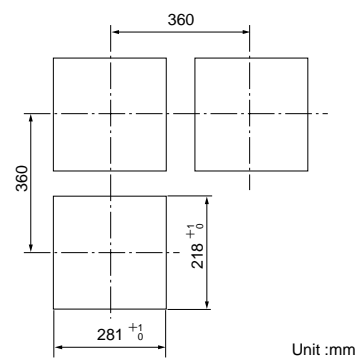
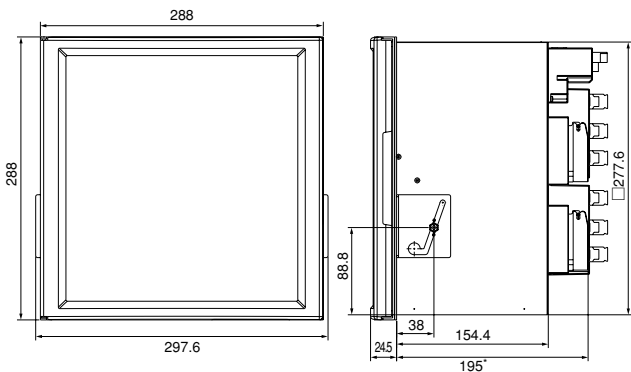
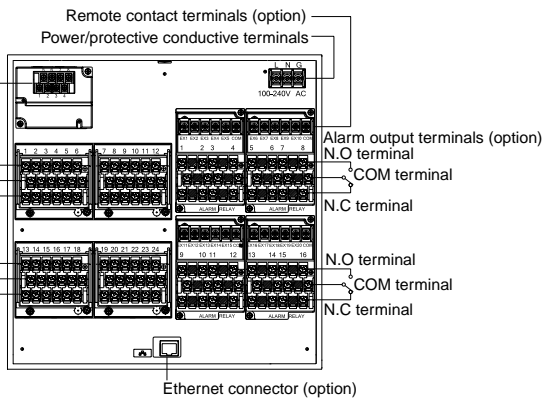


Communication terminal \* RS232C and RS422A/485 are specified on purchase.

	3	4	\$			4	(	4	%		3	%	
\$ 0.	3	4	*			4	(	4	%	4	%	3	%
\$ 0.	3	4				4	(	4	%	4	%	4	%
\$ 0.	3	4	4	4	4	4	(	4	%	4	%	4	%

Measurement input terminals  
 TC-mV(+), RTD(A) terminals  
 TC-mV(-), RTD(B) terminals  
 RTD(B) terminals

TC-mV(+), RTD(A) terminals  
 TC-mV(-), RTD(B) terminals  
 RTD(B) terminals



Unit : mm

\*Max216, When alarm output/remote contacts unit and communication unit are added

Specifications subject to change without notice. Printed in Japan (I) 2012. 6

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