

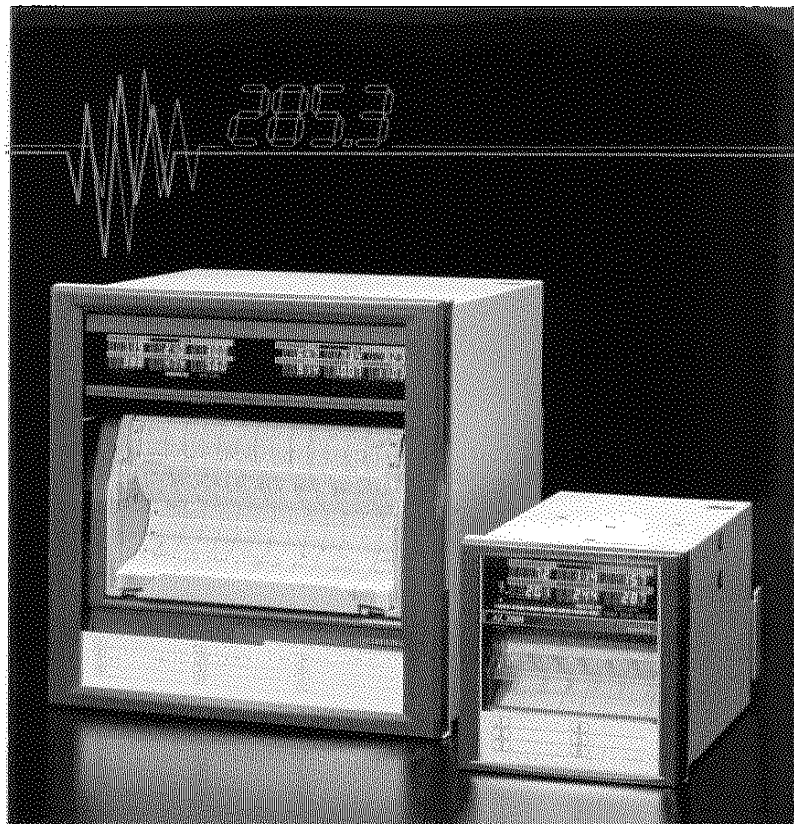
# AL3000 • AH3000 SERIES

100mm Chart      180mm Chart

## MULTI-POINT TYPE HYBRID RECORDERS

NEW

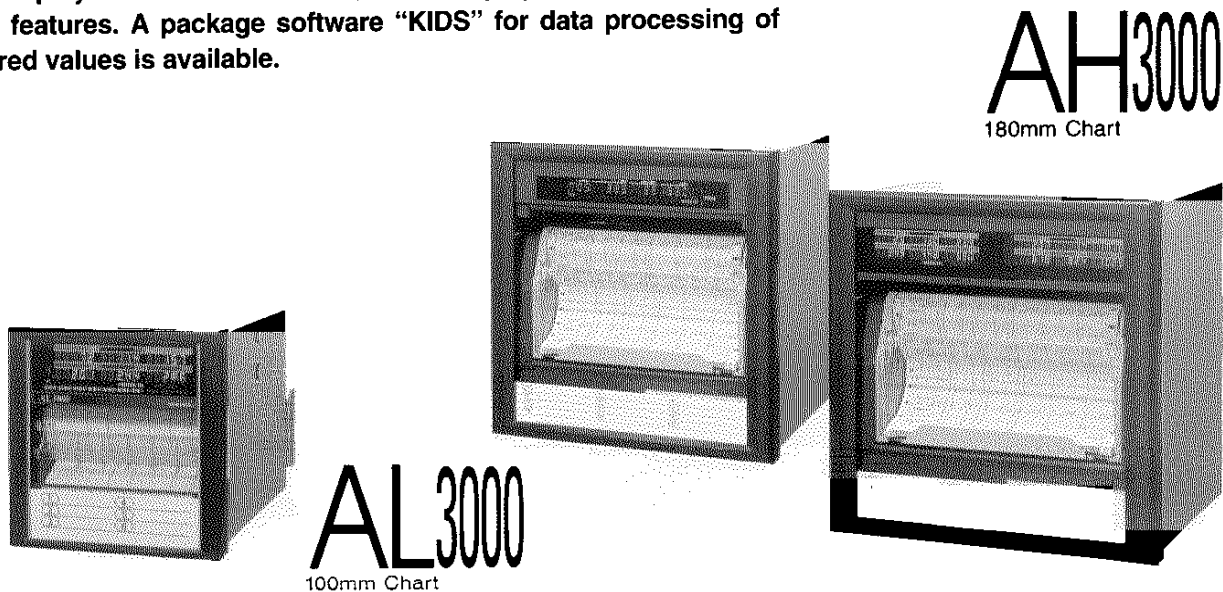
- ***Easy-to-read digital display, simple operation, abundant functions and much more!!!***



**CHINO**

# SIMULTANEOUS DISPLAY OF 12-POINT DATA (AH3000 SERIES)

AL3000/AH3000 series conforming to CE-marking, UL and CSA are 100mm and 180mm multi-point type hybrid recorders with a simultaneous display of multi-channel data, alarm display/printings and other unique features. A package software "KIDS" for data processing of measured values is available.



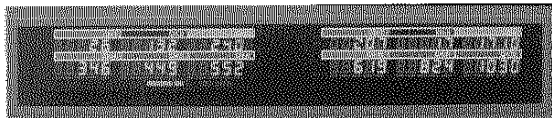
## FEATURES

### Simultaneous digital displays of multi-point data

Simultaneous digital display of 6 points or 12 points allows measured data to be viewed at a glance.



AL3000 series  
6-channel simultaneous display



AH3000 series, 12-channel simultaneous display

### Universal input

The recorders accept total 54 ranges of 7 DC voltage ranges, 36 thermocouple ranges and 11 resistance thermometer ranges and these ranges can be programmed for each channel.

### Package software "KIDS" for data acquisition

The data acquisition software "KIDS" is available for data acquisition with real-time data/trend displays and historical data/trend displays.

### Alarm display/printings

Alarm display (status and channels) and printings (channels, alarm types and alarm numbers) are executed. Up to 4 levels of alarm are programmable for each channel. Optional alarm outputs are available.

### CE-making, UL and CSA standards

The recorders manufactured in our ISO9001 certified facilities conform to the rules of safety standards of CE-marking, UL (approval pending) and CSA (approval pending).

### Other features:

Universal power supply – 100V to 240V AC, 50/60Hz  
Communications interface – RS232C, RS422A or RS485 (options)

Clear printing – Cassette type wire-dotting system 6-color ink ribbon for clear trending and digital prints

# SPECIFICATIONS

## INPUT SPECIFICATIONS

Number of points: AL3000 .....6 points  
 AH3000 .....6 points, 12 points, 24 points

Input signals: Universal input  
 DC voltage—7 ranges, Thermocouple—36 ranges,  
 Resistance thermometer—11 ranges  
 Note: DC current inputs—By shunt resistors to be mounted externally

Range setup: Program input signals and measuring ranges using keys  
 Scale setup: Program maximum values, minimum values and engineering units using keys

Accuracy rating: Refer to the table of inputs  
 Measuring cycle: About 5 seconds/6-point, about 10 seconds/12-point, about 20 seconds/24-point

Reference junction compensation accuracy:  
 K, E, J, T, N, Platinel .....Maximum  $\pm 0.5^{\circ}\text{C}$   
 R, S, Ni-NiMo, AuFe-Cr, WWRRe5-26, WWRRe0-26, U, L  
 .....Maximum  $\pm 1.0^{\circ}\text{C}$   
 (The above errors are added to the accuracy ratings for an internal reference junction compensation.)

Burnout: With a function to detect input signal disconnection for thermocouple inputs and resistance thermometer inputs  
 Up-scale burnout, down-scale burnout or burnout disabled.

Terminal board: Detachable type, removable on wiring

## PRINTING SPECIFICATIONS

Printing interval: About 5 seconds/channel  
 Printing system: Wire-dotting system 6-color ribbon  
 Printings/colors:

Trace printing:	Channel No.	1,7, 13,19	2,8, 14,20	3,9, 15,21	4,10, 16,22	5,11, 17,23	6,12, 18,24
	Colors	Red	Black	Blue	Green	Brown	Purple

Chart: Fan-fold type

	Effective width	Total width	Total length
AL	100mm	114mm	10m
AH	180mm	200mm	20m

Chart speed: 1 to 1500mm/h (Default chart speed....AL3000: 20mm/h, AH3000: 25mm/h)

Periodic data printing: Digital printing of time, channel numbers and measured values on trace printing  
 Programming range of interval (hour, minute) depends on chart speed.

Digital data printing: Digital printing of time and measured values by interrupting trace printing on demand.

Alarm printing: Alarm-on .....Time, channel number, alarm type and alarm number in right side of chart  
 Alarm-reset .....Time, channel number and alarm number in right side of chart  
 Memory capacity....Maximum 48 data

Programming change mark: Mark in right side of chart whenever programming changes.

List printing: Printing of year, month, day, parameters of each channel and other parameters.

Subtract printing: Printing of difference of measured values of one channel and another channel (or reference value)

Fixed-time printing: Printing of month, day, time, time line, ranges (scales), tags and engineering units every fixed-time (interlocking to chart speed)

Skip function: No display or printings of channels.

## INPUTS

Input signals	Measuring ranges	Reference ranges	Accuracy ratings	Display resolutions	Input signals	Measuring ranges	Reference ranges	Accuracy ratings	Display resolutions			
DC voltage	-13.8 to 13.8mV	$\pm 13.8\text{mV}$	$\pm 0.1\% \pm 1 \text{ digit}$	Equivalent to $10\mu\text{V}$	WWRRe5-26	0 to 2320°C	$\pm 69.0\text{mV}$	$\pm 0.15\% \pm 1 \text{ digit}$	1°C			
	-27.6 to 27.6mV	$\pm 27.6\text{mV}$		Equivalent to $10\mu\text{V}$		PR5-20	0 to 1800°C		$\pm 13.8\text{mV}$	1°C		
	-69.0 to 69.0mV	$\pm 69.0\text{mV}$		Equivalent to $10\mu\text{V}$		PR20-40	0 to 1800°C		$\pm 13.8\text{mV}$	1°C		
	-200 to 200mV	$\pm 200.0\text{mV}$		Equivalent to $100\mu\text{V}$		Ni-NiMo	0 to 290°C		$\pm 13.8\text{mV}$	$\pm 0.2\% \pm 1 \text{ digit}$	0.1°C	
	-500 to 500mV	$\pm 500.0\text{mV}$		Equivalent to $100\mu\text{V}$			0 to 600°C		$\pm 27.6\text{mV}$	0.1°C		
	-2 to 2V	$\pm 2\text{V}$		Equivalent to 1mV		AuFe-Cr	0 to 1310°C		$\pm 69.0\text{mV}$	$\pm 0.1\% \pm 1 \text{ digit}$	1°C	
-5 to 5V	$\pm 5\text{V}$	Equivalent to 1mV	0 to 300 K	$\pm 13.8\text{mV}$	0.1K							
Thermocouples	K	-200 to 300°C	$\pm 13.8\text{mV}$	0.1°C	Platinel	-100 to 350°C	$\pm 13.8\text{mV}$	$\pm 0.15\% \pm 1 \text{ digit}$	0.1°C			
		-200 to 600°C	$\pm 27.6\text{mV}$	0.1°C		-100 to 650°C	$\pm 27.6\text{mV}$		0.1°C			
		-200 to 1370°C	$\pm 69.0\text{mV}$	1°C		-100 to 1390°C	$\pm 69.0\text{mV}$		1°C			
	E	-200 to 200°C	$\pm 13.8\text{mV}$	0.1°C		U	-200 to 250°C		$\pm 13.8\text{mV}$	$\pm 0.1\% \pm 1 \text{ digit}$	0.1°C	
		-200 to 350°C	$\pm 27.6\text{mV}$	0.1°C			-200 to 500°C		$\pm 27.6\text{mV}$		0.1°C	
		-200 to 900°C	$\pm 69.0\text{mV}$	1°C			-200 to 600°C		$\pm 69.0\text{mV}$		0.1°C	
	J	-200 to 250°C	$\pm 13.8\text{mV}$	0.1°C		L	-200 to 250°C		$\pm 13.8\text{mV}$	$\pm 0.1\% \pm 1 \text{ digit}$	0.1°C	
		-200 to 500°C	$\pm 27.6\text{mV}$	0.1°C			-200 to 500°C		$\pm 27.6\text{mV}$		0.1°C	
		-200 to 1200°C	$\pm 69.0\text{mV}$	1°C			-200 to 900°C		$\pm 69.0\text{mV}$		1°C	
	Resistance Thermometer	I	-200 to 250°C	$\pm 13.8\text{mV}$		0.1°C	Pt100 (1)		-140 to 150°C	160 $\Omega$	0.15% $\pm 1 \text{ digit}$	0.1°C
			-200 to 400°C	$\pm 27.6\text{mV}$		0.1°C			-200 to 300°C	220 $\Omega$		0.1% $\pm 1 \text{ digit}$
		R	0 to 1200°C	$\pm 13.8\text{mV}$		1°C			Pt100 (2)	-200 to 850°C		400 $\Omega$
0 to 1760°C			$\pm 27.6\text{mV}$	1°C	-140 to 150°C	160 $\Omega$		0.15% $\pm 1 \text{ digit}$		0.1°C		
S		0 to 1300°C	$\pm 13.8\text{mV}$	1°C	Pt100 (2)	-200 to 300°C		220 $\Omega$	0.1% $\pm 1 \text{ digit}$	0.1°C		
		0 to 1760°C	$\pm 27.6\text{mV}$	1°C		-200 to 649°C		400 $\Omega$		0.1% $\pm 1 \text{ digit}$		0.1°C
B	0 to 1820°C	$\pm 13.8\text{mV}$	1°C	JPt100	-140 to 150°C	160 $\Omega$	0.15% $\pm 1 \text{ digit}$	0.1°C				
II	-200 to 400°C	$\pm 13.8\text{mV}$	$\pm 0.15\% \pm 1 \text{ digit}$	0.1°C	JPt100	-200 to 300°C	220 $\Omega$	0.1% $\pm 1 \text{ digit}$	0.1°C			
	-200 to 750°C	$\pm 27.6\text{mV}$		0.1°C	JPt100	-200 to 649°C	400 $\Omega$		0.1% $\pm 1 \text{ digit}$	0.1°C		
	-200 to 1300°C	$\pm 69.0\text{mV}$		1°C	Pt50	-200 to 649°C	220 $\Omega$		$\pm 0.1\% \pm 1 \text{ digit}$	0.1°C		
WRe0-26	0 to 2320°C	$\pm 69.0\text{mV}$		1°C	Pt-Co	4 to 374 K	220 $\Omega$	$\pm 0.15\% \pm 1 \text{ digit}$	0.1°C			

K, E, J, T, R, S, B, N. IEC584, JIS C1602-1995 U (Cu-CuNi), L (Fe-CuNi), DIN43710  
 Platinel: Platinel alloy No. 5355 (+), Platinel alloy No. 7674 (-)  
 WWRRe5-26: W-5% Re/W-26% Re (Hoskins Manufacturing Company)  
 Note) Accuracy ratings are of measuring ranges at reference operation conditions. The reference junction compensation accuracy is not included with the accuracy ratings of thermocouple inputs.

Pt100 (1): IEC751 (1995), JIS C1604-1997  
 Pt100 (2): IEC751 (1983), JIS C1604-1989, JIS C1606-1989  
 JPt100: JIS C1604-1981, JIS C1606-1986

## DISPLAY SPECIFICATIONS

### Display items:

- AL3000 .....LCD: Simultaneous display of 6-channel measured values, or time (year/month/day/hour/minute), alarm-on channels and chart speed
- AH3000 ....Multi-point sequential display (fluorescent character display tube): Channel number, measured value (multi-point sequential display or 1-point continuous display), time, chart speed
- Multi-point simultaneous display (LCD): Simultaneous display of 6 or 12-channel measured values, or time (year/month/day/hour/minute), alarm-on channels and chart speed

### Status display:

- AL3000 .....Printing status and key lock
- AH3000 ....Multi-point sequential display: Printing status, key lock, digital printing status and programming error information
- Multi-point simultaneous display: Printing status and key lock

## ALARM SPECIFICATIONS

### Alarm display:

- AL3000 .....\*ALARM\* illumination and flashing alarm-on channels
- AH3000 ....Multi-point sequential display: \*ALARM\* illumination and alarm-on channels (up to 12 points)
- Multi-point simultaneous display: \*ALARM\* illumination and flashing alarm-on channels

Alarm types: Absolute value alarm, Differential alarm, change-of-ratio alarm

Alarm programming: Individual programming each channel. Maximum 4 levels/channel

Alarm printing: Alarm-on....Time, channel number, alarm type and alarm point number in right side of chart

Alarm deadband: 0.1 to 9.9% of scale programming range (Default: 0.1%)

## GENERAL SPECIFICATIONS

### Rated power voltage:

100 to 240VAC, 50/60Hz

Power consumption: Maximum 45VA

### Environmental conditions:

- Reference operating condition....
    - Ambient temperature/humidity range: 21 to 25°C, 45 to 65%RH
    - Power voltage: 100VAC  $\pm$  1%
    - Power frequency: 50/60Hz  $\pm$  0.5%
    - Attitude: Left/right 0°, Forward tilting 0°, Backward tilting 0°
    - Warm-up time: More than 30 minutes
  - Normal operating condition....
    - Ambient temperature/humidity range: 0 to 40°C, 20 to 80%RH
    - Power voltage: 90 to 264VAC
    - Power frequency: 50/60Hz  $\pm$  2%
    - Attitude: Left/right 0 to 10°, Forward tilting 0°, Backward tilting 0 to 30°
- Power failure protection:  
 Programmed parameters stored into EEPROM memory  
 Clock circuit sustained for minimum 10 years by a lithium battery (At the operation more than 8 hours/day)

Mounting: Panel mounting  
 Weight: AL3000 About 3.0kg (full options)  
 AH3000 About 8.5kg (full options)

## STANDARDS

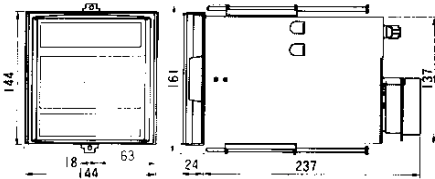
CE-marking: EN55011 Group 1 Class A, EN50082-2, EN61010-1 + A2  
 UL: UL3111-1 (Approval pending)  
 CSA: C22.2, No.1010 (Approval pending)  
 IP: IEC529 IP54 (Front part)

## OPTIONAL SPECIFICATIONS

Options	Explanations	
Remote contacts	By signals of 4-point contacts and 2-point common contacts, the following operations are executed. Selection of 3-chart-speed/stop, digital data printing and list printing	
Alarm outputs	Alarm output: AL3000 ....6-point individual output AH3000 ....6, 12 or 24-point individual output OR output available Maximum contact rating: MDS relay (N.O.) output.....240V (AC, DC), 50mA (AC, DC) Resistive load Mechanical relay contact output* ..... 100V AC 0.5A, 240V AC 0.2A, 100V DC 0.2A Resistive load [*Not conforming to CE-marking, UL and CSA]	
Printing format	Zone printing	Printing area is divided into a maximum of 4 zones (AH3000) or 2 zones (AL3000)
	Compressed/expanded printing	A part of printing area of each channel is printing compressed or expanded.
	Automatic range shift printing	Printing range is automatically changed into a new printing range in the event of overrange or underrange.
Communications interface	3 kinds of RS-232C, RS-422A, RS-485 (to be specified)	
High-speed trace printing	Printing interval about 2.5 seconds (standard: 5 seconds)	
Voltage-divider	Voltage divider (1/1000) is externally added for inputs exceeding $\pm$ 5V to $\pm$ 60V.	
Shunt-resistor	Measurement of current by adding resistor of 250 $\Omega$ (for 20mA) or 100 $\Omega$ (for 50mA)	
16m chart	Total length of 15.6m (AL3000 only)	

## EXTERNAL DIMENSIONS

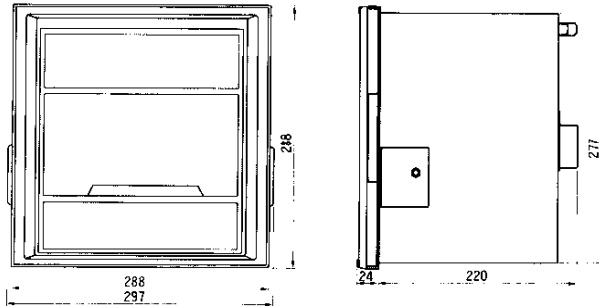
### AL3000 series



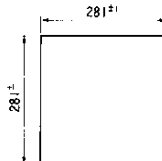
### Panel cutout



### AH3000 series



### Panel cutout



## MODELS

AL3 7 6 5 - □ □ □  
 AH3 7 □ □ - □ □ □

### Series

AL3000 series 100mm hybrid recorders  
 AH3000 series 180mm hybrid recorders

### Input (AH3000 series)

6: 6-input, 2: 12-input, 4: 24-input

### Display

0: Multi-point sequential display  
 5: Multi-point simultaneous display  
 (6-input: 6-point simultaneous display  
 12-input: 12-point simultaneous display  
 24-input: 12-point simultaneous display/2-block)

### Communications interface (options)

N: None, A: RS-422A, R: RS-232C, S: RS-485

### Alarm outputs and remote contacts (options)

0: None  
 1: 6 (MOS relay) alarm outputs + remote contacts  
 2: 6 (mechanical relay) alarm outputs + remote contacts (\*See note.)  
 <The followings are only available on AH3000 series.>  
 3: 12 (MOS relay) alarm outputs + remote contacts  
 4: 12 (mechanical relay) alarm outputs + remote contacts (\*See note.)  
 5: 24 (MOS relay) alarm outputs + remote contacts  
 6: 24 (mechanical relay) alarm outputs + remote contacts (\*See note.)

### Others

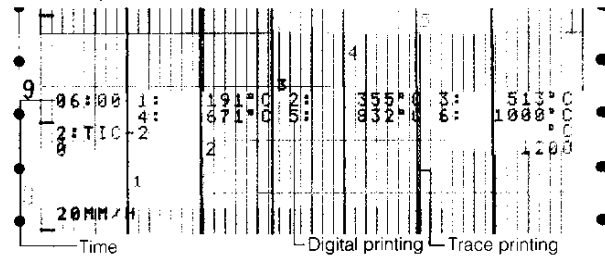
0: None, 1: Printing format + high-speed trace printing (options)

Note: Not conforming to CE-marking, UL and CSA

## Printing format

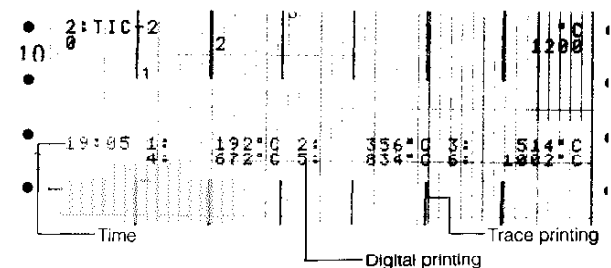
### Periodic data printing

Data are printed on trace printing at fixed intervals.



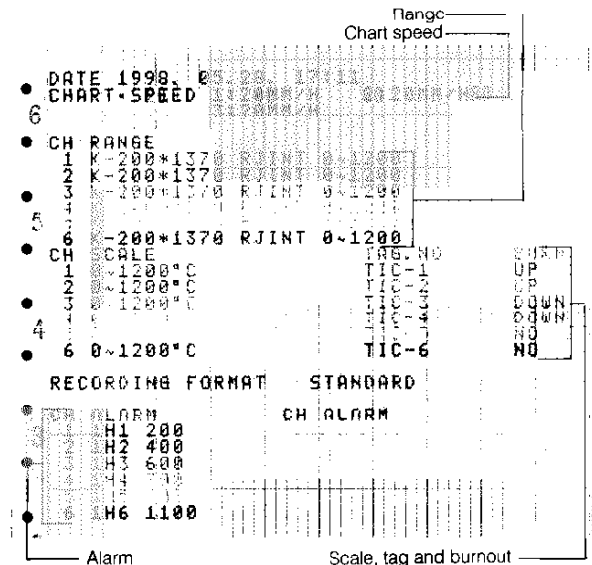
### Digital data printing

Print current data digitally by interrupting trace printing on demand.



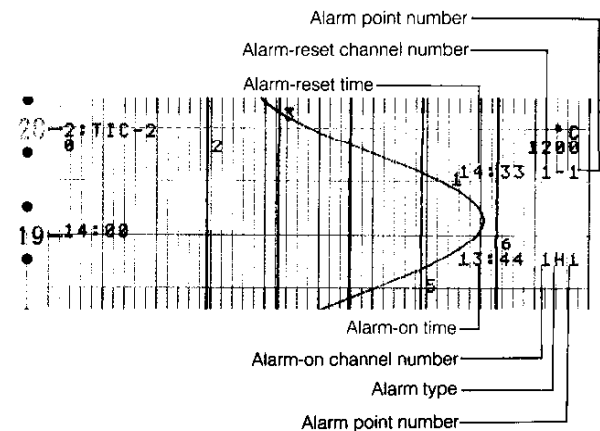
### List printing

Print programmed parameters of all channels including measuring ranges and scales.



### Alarm printing

Time, channel number, alarm type and alarm point number are printed when alarm is on or reset.



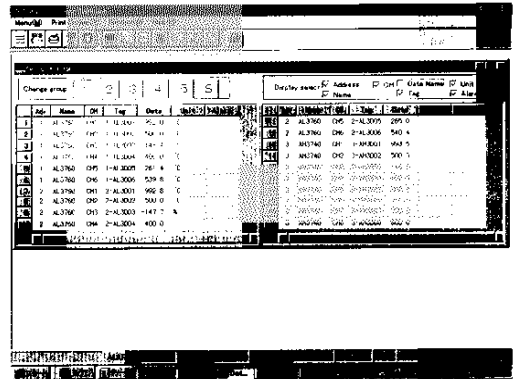
Data acquisition package software "KIDS"

The data acquisition software "KIDS" is a package software for storing measured data by AL3000/AH3000 hybrid recorders and for playing back of stored data.

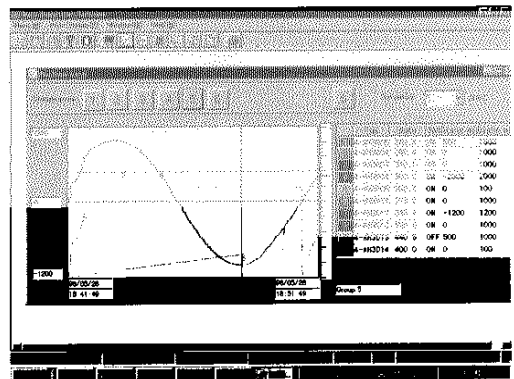
■ Main functions and features

- Data processing: Maximum 100 channels (up to 5 sets of AL3000/AH3000)  
Real-time data, real-time trend, historical data, historical trend and daily report
- Communications interface: RS232C, RS422A or RS485
- Stored data: Can be exported to Microsoft Excel, Lotus 1-2-3 and other application software
- Media: CD-ROM

Real-time data screen



Real-time trend screen



Sales & Service  
Call

1-800-932-2548

<http://www.servonics.com>

\*Specifications subject to change without notice.



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