AL3000 SERIES 100MM CHART
MULTI-POINT TYPE HYBRID RECORDER

MODEL AL3 7 5 - 7 7 7

AL3000 series conforming to CE, UL and CSA are 100mm multi-point type hybrid recorders with a simultaneous display of multi-channel data, bargraph display, alarm display/printing and other unique features. Software packages of "KIDS" for data processing of measured values and "PASS" for programming parameters are available.

■ FEATURES
- Simultaneous digital displays of multipoint data
  Simultaneous digital display of 6 points allows measured data to be viewed at a glance.

- Universal input
  The recorders accept total 56 ranges of 10 DC voltage ranges, 35 thermocouple ranges and 11 resistance thermometer ranges, and these ranges can be programmed for each channel.

- Data acquisition software package "KIDS"
  The data acquisition software package "KIDS" is available for data processing by a personal computer.

- Engineering software package "PASS"
  Parameters (including inputs and printings) and message printings can be executed through a personal computer by the engineering software package "PASS".

- Communications interface (option)
  RS-232C, RS-422A or RS-485 with MODBUS protocol for easy configuration with your personal computer

- Clear trend and digital printings
  Cassette type wire-dotting system 6-color ink ribbon for clear trend and digital printings

- Universal power voltage
  100VAC to 240VAC, 50/60Hz

- Chart illumination
  Convenient to confirm printed data in night or dark places

- CE, UL and CSA
  The recorder conforms to the rules of safety standards of CE, UL and CSA (C-UL).
  The front panel is the structure with water-proof and dust-proof (IP54).

■ DIMENSIONS

Panel cutout and minimum clearance for installation

* 243mm for adding Form A mechanical relay

Unit: mm
MODELS

AL3 7 5 -

Input point
6: 6 points/5 seconds
A: 6 points/1 second (option)

Communications interface (option)
N: None
A: RS-422A
R: RS-232C
S: RS-485

Alarm output/remote contacts (option)
0: None
1: 6 (MOS relay) alarm outputs + remote contacts
2: 6 (Form C mechanical relay) outputs + remote contact (Note 1)
A: 6 (Form A mechanical relay) outputs + remote contacts

Others (option)
0: None
1: Printing format + high-speed trace printing

Note 1: Not conforming to CE, UL and CSA

INPUT SPECIFICATIONS

Number of measuring points: 6 points

Input signals:
- Universal input
- DC voltage, thermocouple, resistance thermometer
- DC current (by adding shunt resistors)

Range setup:
Programming of input types and ranges by keys

Scale setup:
Programming of maximum values, minimum values and engineering units by keys

Accuracy rating: Refer to the table of inputs.

Temperature drift:
±0.01% of full scale/°C
[Input signals except resistance thermometer inputs:
Converted into reference ranges (reference: the table of inputs)]

Measuring cycle:
About 5 seconds/6 points

Reference junction compensation accuracy:
- K, E, J, T, N, Platinel II ........... ±0.5°C or less
- R, S, NiMo-Ni, CR-AuFe, W-WRe26, WRe5-WRe26
- U, L ........................................ ±1.0°C or less
(The above errors are added to the accuracy ratings for internal reference junction compensation.)

Input resolution:
About 1/56000 (converted into reference ranges)

Burnout:
For thermocouple inputs and resistance thermometer inputs
Up-scale burnout, down-scale burnout or burnout disable is selectable for each input.

Input correction:
Zero/span correction and shift correction for each channel

Maximum common mode voltage: 30VAC
Common mode rejection ratio:
130dB or more (50/60Hz)
Series mode rejection ratio:
50dB or more (50/60Hz)

Terminal board:
Detachable type, removable for wirings

Allowable signal source resistance:
- Thermocouple inputs, DC voltage inputs ...
  1kΩ (burnout disabled) or lower
- Resistance thermometer inputs ...
  10Ω or lower (per wire)
  (same resistance for 3 wires)

Input resistance:
- Thermocouple inputs, DC voltage inputs ...
  about 8MΩ
- DC voltage ±5 V or higher ... about 1MΩ

Maximum input voltage:
- Thermocouple inputs, DC voltage inputs (for ±2VDC or lower range) ...
  ±10VDC or lower
- DC voltage inputs (for ±5VDC or higher range) ...
  ±60VDC or lower
- Resistance thermometer inputs ...
  ±6VDC or lower
# PRINTING SPECIFICATIONS

Printing interval: About 5 seconds/point  
Printing deadband: 0.2%  
Printing system: Wire-dot type 6-color ribbon  
Printing color:  
<table>
<thead>
<tr>
<th>Channel No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colors</td>
<td>Red</td>
<td>Black</td>
<td>Blue</td>
<td>Green</td>
<td>Brown</td>
<td>Purple</td>
</tr>
</tbody>
</table>

Digital printing  
Periodic data printing, digital data printing:  
Repetition of red, black, blue, green, brown and purple  
Channel number printing:  
Same color as trace printing  
Periodic printing:  
Range (scale), tag, engineering unit ... Same color as trace printing  
Month/day or year/month/day, time, time line, chart speed ... black  
List printing:  
Programmed parameters ... Same color as trace printing  
Others ... black  
Programming change mark: Black  
Alarm printing: Red  
Chart: Fan-fold type, total width 114mm, total length 10m  
Effective chart width: 100mm  
Chart speed: 1 to 1500 mm/hr (Default ... 20mm/hr)  
Periodic data printing:  
Digital printing of time, channel numbers and measured values on trace printing  
Interval time (hour, minute) ... optional programming (limited by chart speeds)  
Digital data printing:  
Digital printing of time and measured values by interrupting trace printing on demand.  
Alarm printing:  
Alarm activated ... Time, channel number, alarm type and level (alarm setpoint No.) in right side of a chart  
Alarm reset... Time, channel number and level (alarm setpoint No.) in right side of a chart  
Memory capacity ... Maximum 48 data  
Programming change mark:  
Marking a black in right side of chart when a parameter is changed  
Subtract printing:  
Printing of difference between two channels or between a channel and a referenced value (programmed value)  

List printing:  
Printing of year/month/day, chart speed, parameters of each channel and others.  
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 printing of channels of which ranges are not programmed.

# DISPLAY SPECIFICATIONS

Display items:  
LCD display  
“Simultaneous display of 6-channel measured values”, or “time (year/month/day/hour/minute), alarm activated channels and chart speed”  
Status display:  
Printing status, key lock and alarm activation

# ALARM SPECIFICATIONS

Alarm judgment cycle: Same as measuring cycle  
Alarm display:  
Status display “ALARM” and flashing of measured value at an alarm activated channel  
Alarm types:  
Absolute value alarm, differential alarm, rate-of-change alarm  
Alarm programming:  
Individual programming for each channel  
Maximum 4 levels/channel  
Alarm deadband:  
0.1 to 9.9% of scale programming range (Default: 0.1%)  
Alarm output:  
Option (Refer to the list of options.)

# PROGRAMMING/OPERATION

Programming parameters:  
Time, chart speed, periodic data printing, ranges, scales, engineering units, tags, alarms, burnout, subtract printing, °C/°F, passcode (key lock)  
(Options: Communications, printing format)  
Printing operation:  
RECORD ON/OFF... Printing on/off  
FEED ................. Fast-feeding of chart  
LIST ................. List printing  
DATA PRINT ........... Digital data printing  
Data display selection: (Key selection):  
- Measured values display and multi-point sequential bargraph display  
- Measured values display and 1-point continuous bargraph display  
- Time/other displays and 1-point continuous bargraph display
GENERAL SPECIFICATIONS

Rated power voltage:
100 to 240VAC, 50/60Hz
Maximum power consumption: 45VA

Environmental conditions:

• Reference operating condition ...
  Ambient temperature/humidity range:
  21 to 25°C, 20 to 80%RH
  Power voltage: 100VAC ± 1%
  Power frequency: 50/60Hz ± 0.5%
  Attitude: Left/right 0°, Forward tilting 0°, Backward tilting 0°
  Warm-up time: 30 minutes or longer

• Normal operating condition ...
  Ambient temperature/humidity range:
  0 to 40°C, 20 to 80%RH
  Power voltage: 90 to 264VAC
  Power frequency: 50/60Hz ± 2%
  Attitude: Left/right 0° to 10°, Forward tilting 0°, Backward tilting 0° to 30°

• Transportation condition (at the packed condition on shipment from our factory) ...
  Ambient temperature/humidity range:
  -20 to 60°C, 5 to 90%RH
  (No dew condensation)
  Vibration: 10 to 60Hz, 4.9m/s² or less
  Impact: 392m/s² or less

• Storage condition ...
  Ambient temperature/humidity range:
  -20 to 60°C, 5 to 90%RH
  (No dew condensation)

Insulation resistance:

Between secondary terminals and protective conductor terminal … 20MΩ or more at 500VDC
Between primary terminals and protective conductor terminal ... 20MΩ or more at 500VDC
Between primary terminals and secondary terminals ... 20MΩ or more at 500VDC
Between alarm terminals (Form C mechanical relay) and other secondary terminals ... 20MΩ or more at 500VDC

Note: Primary terminals:
  Power (L, N), Alarm (MOS relay, Form A mechanical relay)
Secondary terminals:
  Input, Alarm (Form C mechanical relay), Remote contacts, Communications

Dielectric strength:

Between secondary terminals and protective conductor terminal ........ 1 minute at 500VAC
Between primary terminals and protective conductor terminal .......... 1 minute at 1500VAC
Between primary terminals and secondary terminals .................. 1 minute at 2300VAC
Between alarm terminals (Form C mechanical relay) and other secondary terminals ... 1 minute at 1000VAC

Note: Primary terminals:
  Power (L, N), Alarm (MOS relay, Form A mechanical relay)
Secondary terminals:
  Input, Alarm (Form C mechanical relay), Remote contacts, Communications

Power failure protection:

Programmed parameters stored into EEPROM memory
Clock circuit sustained for 10 years or longer by a lithium battery (at the operation of 8 hours or longer per day)

Case assembly material:
  Door ... ABS resin (frame) with glass
  Enclosure ... Steel

Color: Door (frame) ... Black (frame - equivalent to Munsell N3.0)
  Enclosure ..... Gray (equivalent to Munsell N7.0)

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

Clock accuracy:
  ±2 minutes or shorter per 30-day (under reference operating conditions, except errors by turning power supply on or off)

Terminal screws:
  Power terminals ................... M4.0
  Protective conductor terminals.. M4.0
  Measuring input terminals ........... M3.5
  Alarm terminals .................. M3.5
  Remote contact terminals ......... M3.5
  Communications terminals ...... M3.5

Chart illumination: CFL (Cold cathode fluorescent lamp)

STANDARDS

CE: EN61326 + A1 Class A
    EN61000-3-2 + A14
    EN61000-3-3
    EN61010-1 + A2

UL: UL3111-1

CSA (C-UL): C22.2, No.1010

Front protection: Conforming to IEC529 IP54
### MEASURING RANGES/ACCURACY RATING/DISPLAY RESOLUTION

The accuracy ratings are based on the measuring ranges (under the reference operating condition). For thermocouple inputs, the accuracy of reference junction compensation is not included with the accuracy ratings. The indication equivalent to maximum 200µV or 5ºC may vary under the test environment by EMC directives.

[Reference operating condition]  Ambient temperature/humidity range: 21 to 25ºC, 45 to 65%RH  
Power voltage: 100VAC ± 1%  
Power frequency: 50/60Hz ± 0.5%  
Attitude: Left/right 0°, Forward tilting 0°, Backward tilting 0°  
Warm up time: 30 minutes or longer

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<table>
<thead>
<tr>
<th>Input kinds</th>
<th>Measuring ranges</th>
<th>Reference ranges</th>
<th>Accuracy ratings</th>
<th>Display resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>K, E, J, T, L</td>
<td>-200 to 0ºC</td>
<td>±0.2% ± 1 digit</td>
<td>±0.2% ± 1 digit</td>
<td>±0.2% ± 1 digit</td>
</tr>
<tr>
<td>R, S</td>
<td>0 to 100ºC</td>
<td>±0.2% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>0 to 100ºC</td>
<td>±0.15% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N, U</td>
<td>0 to 100ºC</td>
<td>±0.3% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W-WRe26</td>
<td>0 to 100ºC</td>
<td>±0.2% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PtRh40-PtRh20</td>
<td>0 to 100ºC</td>
<td>±0.2% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NiMo-Ni</td>
<td>0 to 100ºC</td>
<td>±0.2% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR-AuFe</td>
<td>0 to 100ºC</td>
<td>±0.2% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platine II</td>
<td>0 to 100ºC</td>
<td>±0.2% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>0 to 100ºC</td>
<td>±0.2% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>0 to 100ºC</td>
<td>±0.2% ± 1 digit</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Input kinds</th>
<th>Measuring ranges</th>
<th>Reference ranges</th>
<th>Accuracy ratings</th>
<th>Display resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt100 (1)</td>
<td>0 to 100ºC</td>
<td>±0.15% ± 1 digit</td>
<td>±0.15% ± 1 digit</td>
<td>±0.15% ± 1 digit</td>
</tr>
<tr>
<td>Pt100 (2)</td>
<td>0 to 200ºC</td>
<td>±0.15% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JPt100</td>
<td>0 to 200ºC</td>
<td>±0.15% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pt50</td>
<td>0 to 200ºC</td>
<td>±0.15% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pt-Co</td>
<td>0 to 200ºC</td>
<td>±0.15% ± 1 digit</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The accuracy ratings of thermocouple input are converted accuracy into reference ranges.

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<table>
<thead>
<tr>
<th>Thermocouple</th>
<th>Input kinds</th>
<th>Measuring ranges</th>
<th>Reference ranges</th>
<th>Accuracy ratings</th>
<th>Display resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>K, E, J, T, L</td>
<td>-200 to 300ºC</td>
<td>±13.8mV</td>
<td>±13.8mV</td>
<td>±0.1ºC</td>
<td></td>
</tr>
<tr>
<td>-200 to 600ºC</td>
<td>±27.6mV</td>
<td>±0.1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200 to 1370ºC</td>
<td>±69.0mV</td>
<td>±1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>-200 to 200ºC</td>
<td>±13.8mV</td>
<td>±13.8mV</td>
<td>±0.1ºC</td>
<td></td>
</tr>
<tr>
<td>-200 to 350ºC</td>
<td>±27.6mV</td>
<td>±0.1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200 to 900ºC</td>
<td>±69.0mV</td>
<td>±1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>-200 to 250ºC</td>
<td>±13.8mV</td>
<td>±0.1% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200 to 500ºC</td>
<td>±27.6mV</td>
<td>±0.1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200 to 1200ºC</td>
<td>±69.0mV</td>
<td>±1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>-200 to 250ºC</td>
<td>±13.8mV</td>
<td>±0.1% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200 to 400ºC</td>
<td>±27.6mV</td>
<td>±0.1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>0 to 1200ºC</td>
<td>±13.8mV</td>
<td>±1ºC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 1760ºC</td>
<td>±27.6mV</td>
<td>±1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>0 to 1300ºC</td>
<td>±13.8mV</td>
<td>±1ºC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 1760ºC</td>
<td>±27.6mV</td>
<td>±1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>0 to 1820ºC</td>
<td>±13.8mV</td>
<td>±1ºC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>-200 to 400ºC</td>
<td>±13.8mV</td>
<td>±0.15% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200 to 750ºC</td>
<td>±27.6mV</td>
<td>±0.1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200 to 1300ºC</td>
<td>±69.0mV</td>
<td>±1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W-WRe26</td>
<td>0 to 2315ºC</td>
<td>±69.0mV</td>
<td>±1ºC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WRe5-WRe26</td>
<td>0 to 2315ºC</td>
<td>±69.0mV</td>
<td>±1ºC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PtRh40-PtRh20</td>
<td>0 to 1880ºC</td>
<td>±13.8mV</td>
<td>±0.2% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NiMo-Ni</td>
<td>-50 to 290ºC</td>
<td>±13.8mV</td>
<td>±0.1ºC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-50 to 600ºC</td>
<td>±27.6mV</td>
<td>±0.1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-50 to 1310ºC</td>
<td>±69.0mV</td>
<td>±1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR-AuFe</td>
<td>0 to 280 K</td>
<td>±13.8mV</td>
<td>±0.1 K</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platine II</td>
<td>0 to 350ºC</td>
<td>±13.8mV</td>
<td>±0.1ºC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 650ºC</td>
<td>±27.6mV</td>
<td>±0.1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 1395ºC</td>
<td>±69.0mV</td>
<td>±1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>-200 to 250ºC</td>
<td>±13.8mV</td>
<td>±0.1% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200 to 500ºC</td>
<td>±27.6mV</td>
<td>±0.1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200 to 600ºC</td>
<td>±69.0mV</td>
<td>±1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>-200 to 250ºC</td>
<td>±13.8mV</td>
<td>±0.1% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200 to 500ºC</td>
<td>±27.6mV</td>
<td>±0.1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200 to 900ºC</td>
<td>±69.0mV</td>
<td>±1ºC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

U (Cu-CuNi), L (Fe-CuNi): DIN43710  
W-WRe26, WRe5-WRe26, PtRh20-PtRh5, PtRh40-PtRh20, NiMo-Ni, CR-AuFe, Platine II: ASTM Vol. 14.03

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### DC voltage

<table>
<thead>
<tr>
<th>Input kinds</th>
<th>Measuring ranges</th>
<th>Reference ranges</th>
<th>Accuracy ratings</th>
<th>Display resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt100 (1)</td>
<td>-140 to 150ºC</td>
<td>±160ºC</td>
<td>±0.15% ± 1 digit</td>
<td></td>
</tr>
<tr>
<td>-200 to 300ºC</td>
<td>±220ºC</td>
<td>±0.1% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200 to 850ºC</td>
<td>±400ºC</td>
<td>±0.1% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pt100 (2)</td>
<td>-140 to 150ºC</td>
<td>±160ºC</td>
<td>±0.15% ± 1 digit</td>
<td></td>
</tr>
<tr>
<td>-200 to 300ºC</td>
<td>±220ºC</td>
<td>±0.1% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200 to 649ºC</td>
<td>±400ºC</td>
<td>±0.1% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JPt100</td>
<td>-140 to 150ºC</td>
<td>±160ºC</td>
<td>±0.15% ± 1 digit</td>
<td></td>
</tr>
<tr>
<td>-200 to 300ºC</td>
<td>±220ºC</td>
<td>±0.1% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200 to 649ºC</td>
<td>±400ºC</td>
<td>±0.1% ± 1 digit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pt50</td>
<td>-200 to 649ºC</td>
<td>±220ºC</td>
<td>±0.15% ± 1 digit</td>
<td></td>
</tr>
<tr>
<td>Pt-Co</td>
<td>4 to 374K</td>
<td>±220ºC</td>
<td>±0.15% ± 1 digit</td>
<td></td>
</tr>
</tbody>
</table>

### Resistance thermometer

<table>
<thead>
<tr>
<th>Input kinds</th>
<th>Measuring ranges</th>
<th>Reference ranges</th>
<th>Accuracy ratings</th>
<th>Display resolution</th>
</tr>
</thead>
</table>
| Note:** The accuracy ratings of thermocouple input are converted accuracy into reference ranges.**
<table>
<thead>
<tr>
<th>Options</th>
<th>Explanations</th>
</tr>
</thead>
</table>
| Measuring interval            | About 1 second/6 points, CE conformance, (UL approval pending), Common mode rejection ratio: 120db or more (50/60Hz), Series mode rejection ratio: 50db or more (50/60Hz)  
Condition: Peak value of noise including signal is limited to 1.5 times or more of reference range. The indication equivalent to maximum 2mV or 25ºC may vary under the test environment by EMC directives. |
| Remote contacts               | By 4-point contact input (2-point common) signal, the following operations are selectable. Chart speed 3-speed/record off, digital data print, list print                                                                                                                                                                                                 |
| Alarm output                  | Alarm output: 6 points independent output, OR output enabled  
Maximum contact rating:  
MOS relay output ...................... 240V (AC, DC), 50mA (AC, DC), resistive load  
Mechanical relay output .......... 100VAC 0.5A, 240VAC 0.2A, (common to Form A and Form C)  
100VDC 0.3A, resistive load  
(Form C: not conforming to CE, UL and CSA.)                                                                                                                                                                                                 |
| Printing format (Note)        | Zone printing ... Printing area is divided into maximum 2 zones.  
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 area in the event of over-range or under-range                                                                                                                                 |
| Communications interface      | 3 kinds of RS-232C, RS-422A, RS-485 (to be specified)  
Parameter programming, operation, data acquisition (MODBUS protocol)                                                                                                                                                                                                                                                                       |
| High-speed trace printing     | Printing interval about 2.5 seconds (standard: 5 seconds)                                                                                                                                                                                                                                                                                     |
| Shunt resistor for current    | Measurement of current by adding a resistor of 250Ω (for 20mA) or 100Ω (for 50mA)                                                                                                                                                                                                                                                         |
| 16m chart                     | Total length of 15.6m                                                                                                                                                                                                                                                                                                                     |
| Basic mathematics             | The following math-function can be executed in time order or between channels.  
Arithmetic, Square root, Logarithm, Natural Logarithm, Exponential, Maximum, Minimum, Average, Temperature/humidity                                                                                                                                                                                                                     |
| Totalizing                    | Totalizing of measured data and calculated results  
Interval: 00:01 to 24:00, or none                                                                                                                                                                                                                                                                                                               |
| Aluminum die-cast door        | Case for horizontal high-density panel installation and aluminum die-cast door                                                                                                                                                                                                                                                              |

Note: One from 4 printing formats is to be specified.

### Data acquisition software package "KIDS"

The "KIDS" is a software package for storing data being measured by AL3000 and AH3000 series recorders and for replaying of the stored data.

Main function and features:
- Data processing: Up to 5 sets (max. 100 channels)  
Real-time data, real-time trend, historical data, historical trend and daily report  
- Communications interfaces: RS-232C, RS-422A or RS-485  
- Stored data: Enable to export to Microsoft Excel, Lotus 1-2-3 and other application software.  
- OS: Windows 95/98, Windows NT4.0

### Engineering software package "PASS"

The "PASS" is a software package, through a communications interface (optional) or a configuration port, for programming parameters of AL3000 and AH3000 series recorders by a personal computer.

Main functions and features
- Input parameters:  
Ranges, scales, tags, engineering units, alarms, burnout  
- Printing parameters:  
Chart speed, data interval, subtract printing, zone printing, compressed/expanded printing, automatic range-shift printing  
- Operation: Message printing  
- Others:  
Clock setting, temperature units (ºC, ºF), alarm deadband, communications specification (for programming through a configuration port only)  
- OS: Windows95/98, WindowsNT4.0

Specifications subject to change without notice. Printed in Japan (l) 2002.1