EL3000 series is a dot printing type analog recorder sized 144x144mm with 100mm width chart. The unit starts recording as soon as the power supply and input are connected and it is also easy to operate. Scale plate, input range and function of the recorder can be selected for various purpose and applications as many kinds of options are prepared.

**FEATURES**

- **Universal power supply**
  Universal power supply with voltage range of 100 to 240V AC (50/60Hz) is applied.

- **Linear temperature scale**
  Temperature scale of thermocouple and resistance thermometer input is a linear scale that is excellent in reading indication value.

- **Standard 6 chart speeds**
  6 chart speeds (5, 10, 20, 40, 80, 160mm/h) are switchable as standard.
  5 chart speed and hour/minute change are prepared as option.

- **Alarm setting (common alarm) as standard**
  Higher and lower limit alarm can be programmed for every point. Alarm value is easy to be programmed by pointer location.
  You can check the alarm by front LED lighting.
  Alarm output is prepared as option.

- **CE marking**
  The EL recorder is conformed to the rules of safety standards of CE. (Conformity pending)

- **Unit structure and light-weight**
  Light-weight (50% of the previous unit weight) was realized by easy maintenance unit structure.

- **Employing removable type terminal board**
  Employing easy connecting removable type terminal board.

**MODELS**

- **Input point**
  1: 1point
  2: 2points
  3: 3points
  6: 6points

- **Input signals**
  5: Thermocouple/DC voltage
  7: Resistance thermometer
  Thermocouple with burnout/DC voltage
  Built-in voltage divider input (option)*1

- **Input and scale plate (option)**
  0: Standard input + standard scale plate
  1: Non-standard input
  (Including current input, and built-in voltage divider) + standard scale plate
  2: Standard input + non-standard scale plate
  3: Non-standard input
  (Including current input, and built-in voltage divider) + Non-standard scale plate

- **Alarm output (option)**
  0: None
  1: 2 alarm outputs

- **Chart speed and burnout (option)**
  0: Standard 6-speed burnout disabled
  1: Standard 6-speed + up-scale burnout
  2: Standard 6-speed + down-scale burnout
  A: Standard 5-speed hour/minute change + burnout disabled
  B: Standard 5-speed hour/minute change + up-scale burnout
  C: Standard 5-speed hour/minute change + down-scale burnout

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*1: Optional built-in voltage divider and thermocouple/resistance thermometer burnout input is only type "7".
*2: Double scale is available.
*3: Burnout on all channels is programmed together for thermocouple/resistance thermometer input.
**INPUT SPECIFICATIONS**

Measurement point: 1,2,3 and 6 points
Reference range and types: DC voltage — ±13.8mV, ±27.6mV, ±69mV, 200mV, ±500mV, ±2V, ±5V
Built-in voltage divider; ±10V, ±25V, ±50V
DC current — External installation of shunt resistor (250Ω) is applied (option)
Thermocouples --- K, E, J, T, R, and B (option)
Resistance thermometer --- Pt100 (1997)
(Measured current; 1mA)
1) Linear scale for thermocouple and resistance thermometer
Input designation: Single scale (standard), double scale (option)
Accuracy rating: ±0.5% of input span (except for some input under standard operating condition)
Refer to the table of standard range and minimum width of scale for non-standard input

Indicating deadband: 0.3% of input span
Reference junction compensation accuracy: ±1.0°C or less (23°C±10°C)
±2.0°C or less (0 to 50°C)
(For internal reference junction compensation, the error above are added to the accuracy rating)

Temperature drift: ±0.02%/°C (Converted into reference ranges)
Measurement cycle: 6 seconds/point
Indicating resolution: Approximately 1/2,000
Burnout (option): On thermocouple or resistance thermometer
input, disconnection of signal can be detected.
(Up-scale and down scale burnout on all channels can be programmed.)
Burnout detection --- Voltage application method (approximately 8V, 1mA)

Allowable signal source resistance: Thermocouple inputs, DC voltage inputs (±5V or less)
--- 1kΩ (burnout disabled) or less
DC voltage inputs (input more than ±5V) --- 100Ω or less
Resistance thermometer inputs --- per wire 100Ω or less (Same resistance for 3 wires)

Input resistance: Thermocouple inputs, DC voltage inputs (±5V or less) --- Approximately 8MΩ
DC voltage inputs (more than ±5V) --- Approximately 1 MΩ

Maximum input voltage: Thermocouple inputs, DC voltage inputs --- ±10V DC or less
DC voltage inputs (Voltage divider built-in) --- ±60V DC or less

Maximum common mode voltage: 30V AC
Common mode rejection ratio: 120dB or more (50/60Hz±0.1%)
Normal mode rejection ratio: 50dB or more (50/60Hz±0.1%)

**RECORDING SPECIFICATIONS**

Recording accuracy: ±0.5% of recording span
Recording system: Inkpad dotting
Balancing time: Input span movement — approximately 2 seconds
Chart paper: Fan-fold type: total width of 114mm,
Chart paper: 1 minute at 2300V AC --- Primary and secondary terminals --- 1 minute at 2300V AC
Chart feed stops when 1 point indication stops when all switches are OFF

Warm-up time: longer than 30 minutes
Ambient operating condition
--- Ambient temperature range: 0 to 50°C
Ambient humidity range: 5 to 90%RH (No dew condensation)
Power frequency: 50/60Hz ±2%
Ambient humidity range: ±2.0°C or less (0 to 50°C)
Ambient temperature range: ±1.0°C or less (23°C±10°C)

Insulation resistance: Secondary terminals and protective conductor terminals --- 20MΩ or more at 500V DC
Primary terminals and protective conductor terminals --- 20MΩ or more at 500V DC
Primary and secondary terminals --- 20MΩ or more at 500V DC
Notes: Primary terminals --- Power (L,N), Alarm terminals (mechanical relay)
Secondary terminals --- Measurement input terminals
Dielectric strength: Secondary terminals and protective conductor terminals --- 1 minute at 500V AC
Primary terminals and protective conductor terminals --- 1 minute at 1500V AC
Primary and secondary terminals --- 1 minute at 2300V AC
Notes: Primary terminals --- Power (L,N), Alarm terminals (mechanical relay)
Secondary terminals --- Measurement input terminals

Case: Door (frame) --- ABS resin, window --- glass
Color: Door (frame) --- Black (equivalent to Mussel N1.5),
window --- Transparent
Mounting: Panel mounting
Weight: Approximately 1.7kg
Power voltage fluctuation: ±50% or more

**OPERATION / PROGRAMMING SPECIFICATIONS**

Switches: POWER --- ON/OFF the recorder power supply
AUTO CH --- Switching automatic channels change and fixed channel (Chart feed stops when 1 point indication mode selected)
CHART SPEED --- Selecting chart speed (Chart feed stop when all switches are OFF)
SET-RUN --- Switching alarm setup/normal operation mode

Indication: Moves pointer for alarm setup and calibration

**GENERAL SPECIFICATIONS**

Rated power voltage: 100 to 240V AC, 50/60Hz (Universal power supply) with power supply switch

Power consumption: Maximum 12VA (100V AC)
Maximum 20VA (240V AC)

**STANDARDS (Conformity pending)**

CE marking: EMC directive, low voltage directive conformity
EN61326-A1+A2, EN61000-3-2
EN61000-3-3+A1, EN61010-1
* Under EMC directive test condition, indication equivalent to maximum 500µV fluctuates in case

**MAINTENANCE**

Input correction: Zero/span correction for all channels
Memory reset: Initializes indication adjustment value (User maintenance area)
### OPTION SPECIFICATIONS

<table>
<thead>
<tr>
<th>Options</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm output</td>
<td>Alarm contact output is available</td>
</tr>
<tr>
<td></td>
<td>Alarm relay — Mechanical relay 1a contact, 2 outputs (common)</td>
</tr>
<tr>
<td></td>
<td>Maximum contact rating — 250V AC 2A, 30V DC 2A (resistive load)</td>
</tr>
<tr>
<td></td>
<td>250V AC 0.5A, 30V DC 0.5A (inductive load)</td>
</tr>
<tr>
<td>DC current input</td>
<td>250 Ω of shunt resistor is applied to measure voltage input</td>
</tr>
<tr>
<td>Built-in voltage divider</td>
<td>Built-in voltage divider(1/1000) measures input in the range of ±5V to ±50V (input type “7” only)</td>
</tr>
</tbody>
</table>

### Non-standard input

- Refer to the table of standard range and programmable minimum width of scale
- Minimum width of scale:
  - DC voltage: 10mV DC width or more
  - Thermocouple:
    - K: 250°C width or more
    - E, J, T: 200°C width or more
    - R: 800°C width or more
  - Resistance thermometer: 100°C width or more

### Non-standard scale plate

- Scale plate for non-standard input

### Double scale

- Function for detecting disconnection for sensor with thermocouple or resistance thermometer input.
- Up-scale and down scale burnout on all channels can be programmed (Input type “7” only), parallel operation is not possible

### Burnout

- Function for detecting disconnection for sensor with thermocouple or resistance thermometer input.
- Up-scale and down scale burnout on all channels can be programmed (Input type “7” only), parallel operation is not possible

### Chart speed

- 5-speed change, 5,10,20,40,80mm/minute, hour change
- 18m chart paper Maximum length 15.6m

#### Standard range and minimum width of scale

<table>
<thead>
<tr>
<th>Input type</th>
<th>Standard range</th>
<th>Minimum width of scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC voltage</td>
<td>-13.8 to 13.8mV</td>
<td>10mV</td>
</tr>
<tr>
<td></td>
<td>-27.6 to 27.6mV</td>
<td>17mV</td>
</tr>
<tr>
<td></td>
<td>-69 to 69mV</td>
<td>35mV</td>
</tr>
<tr>
<td></td>
<td>-200 to 200mV</td>
<td>100mV</td>
</tr>
<tr>
<td></td>
<td>-500 to 500mV</td>
<td>250mV</td>
</tr>
<tr>
<td></td>
<td>-2 to 2V</td>
<td>1V</td>
</tr>
<tr>
<td></td>
<td>-5 to 5V</td>
<td>2.5V</td>
</tr>
<tr>
<td></td>
<td>-10 to 10V</td>
<td>5V</td>
</tr>
<tr>
<td></td>
<td>-25 to 25V</td>
<td>13V</td>
</tr>
<tr>
<td></td>
<td>-50 to 50V</td>
<td>25V</td>
</tr>
<tr>
<td>DC current</td>
<td>4 to 20mA</td>
<td>10mA</td>
</tr>
<tr>
<td>K</td>
<td>-200 to 330ºC</td>
<td>250ºC</td>
</tr>
<tr>
<td>E</td>
<td>-200 to 660ºC</td>
<td>400ºC</td>
</tr>
<tr>
<td>J</td>
<td>-200 to 1370ºC</td>
<td>700ºC</td>
</tr>
<tr>
<td>T</td>
<td>-200 to 200ºC</td>
<td>200ºC</td>
</tr>
<tr>
<td>R</td>
<td>-200 to 1240ºC</td>
<td>800ºC</td>
</tr>
<tr>
<td>B</td>
<td>0 to 1820ºC</td>
<td>900ºC</td>
</tr>
<tr>
<td>RTD</td>
<td>-140 to 150ºC</td>
<td>150ºC</td>
</tr>
<tr>
<td></td>
<td>-200 to 300ºC</td>
<td>200ºC</td>
</tr>
<tr>
<td></td>
<td>-200 to 650ºC</td>
<td>400ºC</td>
</tr>
</tbody>
</table>

#### Standard input and chart paper Nos.

<table>
<thead>
<tr>
<th>Input type</th>
<th>Scales</th>
<th>Chart paper Nos.</th>
<th>Minimum scales</th>
<th>Input signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC voltage</td>
<td>0 to 10mV</td>
<td>EM-008</td>
<td>0.2</td>
<td>M1</td>
</tr>
<tr>
<td></td>
<td>0 to 20mV</td>
<td>EM-519</td>
<td>0.5</td>
<td>M8</td>
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<tr>
<td></td>
<td>0 to 50mV</td>
<td>EL42003</td>
<td>1</td>
<td>M9</td>
</tr>
<tr>
<td></td>
<td>-5 to 5mV</td>
<td>EL20506</td>
<td>0.2</td>
<td>M6</td>
</tr>
<tr>
<td></td>
<td>-10 to 10mV</td>
<td>EL20507</td>
<td>0.5</td>
<td>M7</td>
</tr>
<tr>
<td></td>
<td>1 to 5V</td>
<td>EL20410</td>
<td>0.05</td>
<td>V6</td>
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<tr>
<td>T/C</td>
<td>0 to 250ºC</td>
<td>EL050096</td>
<td>5</td>
<td>K2</td>
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<tr>
<td></td>
<td>0 to 300ºC</td>
<td>EL050100</td>
<td>5</td>
<td>K3</td>
</tr>
<tr>
<td></td>
<td>0 to 400ºC</td>
<td>EL050099</td>
<td>10</td>
<td>K4</td>
</tr>
<tr>
<td></td>
<td>0 to 600ºC</td>
<td>EL050081</td>
<td>10</td>
<td>K6</td>
</tr>
<tr>
<td></td>
<td>0 to 800ºC</td>
<td>EL05121</td>
<td>10</td>
<td>K8</td>
</tr>
<tr>
<td></td>
<td>0 to 1000ºC</td>
<td>EL05157</td>
<td>20</td>
<td>KA</td>
</tr>
<tr>
<td></td>
<td>0 to 1200ºC</td>
<td>EL05060</td>
<td>20</td>
<td>KC</td>
</tr>
<tr>
<td></td>
<td>0 to 200ºC</td>
<td>EL05047</td>
<td>5</td>
<td>E2</td>
</tr>
<tr>
<td></td>
<td>0 to 300ºC</td>
<td>EL050100</td>
<td>5</td>
<td>E3</td>
</tr>
<tr>
<td></td>
<td>0 to 400ºC</td>
<td>EL05009</td>
<td>10</td>
<td>J4</td>
</tr>
<tr>
<td></td>
<td>0 to 200ºC</td>
<td>EL05047</td>
<td>5</td>
<td>T2</td>
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<tr>
<td></td>
<td>0 to 300ºC</td>
<td>EL050100</td>
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<td>T3</td>
</tr>
<tr>
<td></td>
<td>0 to 150ºC</td>
<td>EL05007</td>
<td>5</td>
<td>T5</td>
</tr>
<tr>
<td></td>
<td>0 to 1400ºC</td>
<td>EL05137</td>
<td>20</td>
<td>R4</td>
</tr>
<tr>
<td></td>
<td>0 to 1600ºC</td>
<td>EL05113</td>
<td>20</td>
<td>R6</td>
</tr>
<tr>
<td>RTD</td>
<td>0 to 100ºC</td>
<td>EL05052</td>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>0 to 150ºC</td>
<td>EL05034</td>
<td>2</td>
<td>3A</td>
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<tr>
<td></td>
<td>0 to 200ºC</td>
<td>EL05047</td>
<td>5</td>
<td>32</td>
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<tr>
<td></td>
<td>0 to 300ºC</td>
<td>EL050100</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>0 to 500ºC</td>
<td>EL05048</td>
<td>10</td>
<td>35</td>
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<tr>
<td></td>
<td>-20 to 80ºC</td>
<td>EL05035</td>
<td>2</td>
<td>3E</td>
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<tr>
<td></td>
<td>-50 to 50ºC</td>
<td>EL05006</td>
<td>2</td>
<td>3E</td>
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<tr>
<td></td>
<td>-50 to 150ºC</td>
<td>EL05007</td>
<td>5</td>
<td>35</td>
</tr>
</tbody>
</table>

#### Exceptions of accuracy ratings

<table>
<thead>
<tr>
<th>Input types</th>
<th>Measuring range</th>
<th>Accuracy ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>K, E, J, T</td>
<td>-200 to -50ºC</td>
<td>±1.0% of measuring range</td>
</tr>
<tr>
<td>B</td>
<td>0 to 400ºC</td>
<td>None</td>
</tr>
<tr>
<td>R</td>
<td>0 to 400ºC</td>
<td>±1.0% of measuring range</td>
</tr>
</tbody>
</table>

Note: The accuracy ratings are converted into the measuring range
### TERMINAL BOARD

- **Alarm output terminals (option)**
- **Power/protective conductor terminals**
- **Thermocouple and DC voltage**
- **(+) (A) Terminals**
- **(-) (B) Terminals**
- **(B) Terminals**
- **Resistance thermometer**
- **Measurement input terminals**

### DIMENSIONS

- **Panel cutout**
  - Width: 138 mm
  - Height: 138 mm

- **Minimum clearance for plural installation**
  - Unit: mm
  - Clearance: 200 mm

Specifications subject to change without notice. Printed in Japan (I) 2006. 2 Recycled Paper