EH 3000 series is a dot printing type analog recorder sized 288x288mm with 180mm width chart. Recording points are 5 kinds, 1 point to 12 points and records clearly temperature, pressure, flow, level, etc. at regular interval.

**Features**

- **High accuracy ±0.25%**
  By large scale plate and sharp pointer location, it is easy to see the indication and high accuracy of ±0.25% (DC voltage input).

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

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

- **6 chart speeds**
  6 chart speeds (12.5, 25, 50, 75, 100, 150mm/h) are switchable as standard. 5 chart speed and hour/minute change are prepared as option.

- **Alarm setting as standard**
  High and low limit alarm can easily programmed by pointer location. Also you can check the alarm by front LED.

- **Easy operation and robust structure**
  Operation switch and setting switch are separate arranged for easy operation and robust structure that adopted steel casing and die-cast door.

- **Chart paper illumination**
  White LED illumination is adopted for to read the indication in the dark places. You can also adjust the brightness.

- **Flat front chart chassis**
  Front chart feeding part is flat so easy to read the recorded result and also to take note.

- **Unit structure and light-weight**
  Light-weight (60% of the previous unit weight) is realized by easy maintenance structure.

- **CE approval**

**Models**

<table>
<thead>
<tr>
<th>Input point</th>
<th>D1 : 1 point</th>
<th>D2 : 2 points</th>
<th>D3 : 3 points</th>
<th>D6 : 6 points</th>
<th>12 : 12 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input signals</td>
<td>5 : Thermocouple/DC voltage</td>
<td>7 : Resistance thermometer</td>
<td>Thermocouple with burnout/DC voltage</td>
<td>Built-in voltage divider input (option)*1</td>
<td></td>
</tr>
<tr>
<td>Input and scale plate</td>
<td>0 : Standard input</td>
<td>+ standard scale plate</td>
<td>1 : Non-standard input*2</td>
<td>+ Non-standard scale plate</td>
<td></td>
</tr>
<tr>
<td>Alarm output</td>
<td>0 : None</td>
<td>2 : 2 alarm outputs*3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chart speed and burnout</td>
<td>0 : Standard 6-speed + burnout disabled</td>
<td>1 : Standard 6-speed + up-scale burnout*4</td>
<td>2 : Standard 6-speed + down-scale burnout*4</td>
<td>A : Standard 5-speed hour/minute change + burnout disabled*3</td>
<td>B : Standard 5-speed hour/minute change + up-scale burnout*4</td>
</tr>
</tbody>
</table>

*1: Optional built-in voltage divider and thermocouple/resistance thermometer burnout input is only type “7”.

*2: Built-in voltage divider input included. Triple scale is available. (Input and scale selection are needed for non-standard input and non-standard scale plate.)

*3: Option

*4: Burnout on all channels is programmed together for thermocouple/resistance thermometer input.
Input Specifications:

- **Input types:** DC voltage --- ±13.8mV, ±27.6mV, ±69mV, ±200mV, ±500mV, ±2V, ±5V
- **Built-in voltage divider (option):** ±10V, ±20V, ±50V
- **DC current:** External shunt resistor (250Ω) required (option)
- **Thermocouple:** K, E, J, T, R (option B, S, N, U, L)
- **Resistance Thermometer:** Pt100, JPt100 (option)
- **Linear scale for thermocouple and resistance thermometer**
- **Input designation:** Single scale (standard), double / triple scale (option)
- **Accuracy ratings:** DC voltage input --- ±0.25% of input span
- **Thermocouple and resistance thermometer** --- ±0.5% of input span (except for some inputs)
- **Indicating dead band:** ±0.2% of input span
- **Reference junction compensation accuracy:**
  - K, E, J, T --- ±1.0°C or below (23°C±1°C)
  - ±2.0°C or below (0°C to 50°C)
  - (For internal reference junction compensation, the errors above are added to the accuracy rating)
- **Temperature drift:** ±0.02%FS / °C (Converted into reference ranges)
- **Indicating resolution:** Approximately 1/3,600
- **Allowable signal source resistance:**
  - DC voltage inputs, thermocouple inputs --- 1kΩ or less (no burnout)
  - Resistance thermometer inputs --- per wire 10Ω or less (same resistance for 3 wires)
- **Input resistance:**
  - DC voltage inputs (±5V or less), thermocouple inputs --- approximately 8MΩ
  - DC voltage inputs (voltage divider built-in) --- approximately 1MΩ
- **Maximum input voltage:**
  - DC voltage inputs, thermocouple inputs, --- ±10V DC or less
  - DC voltage inputs (voltage divider built-in) --- ±6V DC or less
  - Resistance thermometer --- ±6V DC or less
- **Maximum common mode voltage:** 30V AC
- **Common mode rejection ratio:**
  - 120dB or more
- **Normal mode rejection ratio:** 50dB or more

Recording Specifications:

- **Chart paper:** Fan-fold type
  - effective chart width 180mm (total width 200mm), total length of 20m
- **Recording points:** 1, 2, 3, 6, 12 points
- **Dotting interval:** 6 seconds/point
- **Recording system:** Inkpad dotting
  - 1: red 2: blue 3: sky blue, 4: green, 5 brown, 6 purple
  - 7: orange, 8 gray, 9 blue, 10 greenish brown, 11 scarlet
  - 12 violet
- **Chart speed:** 12.5, 25, 50, 75, 100, 150mm/h
- **Chart speed accuracy:** ±0.1% (based on chart paper scale)

General Specifications:

- **Rated power voltage:** 100 to 240V AC, 50/60Hz
- **Power voltage fluctuation:** Indication fluctuation 0.2% or less (converted into reference ranges at 90 to 264V AC)
- **Power consumption:** Maximum 20VA (100V AC), 25VA (240V AC)
- **Environmental conditions:**
  - Reference operation condition ---
    - Ambient temperature range: 21 to 25°C
    - Ambient humidity range: 45 to 85%RH
    - Power voltage: 100V AC ±1% Power frequency: 50/60Hz ±0.5%
    - Altitude: leftright 0°C, forward tilting 0°C, backward tilting 0°C
    - Warm-up time: longer than 30 minutes
  - 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%
    - Altitude: leftright 0 to 10°, forward tilting 0°, backward tilting 0 to 30°

Transportation condition:

- **(At the packed condition on shipment from our factory)---**
  - Ambient temperature range: -20 to 80°C
  - Ambient humidity range: 5 to 90%RH (No dew condensation)
  - Vibration: 10 to 60Hz, 4.9m/s² (0.5G) or less
  - Impact: 362m/s² (40G) or less

Storage condition:

- **Ambient temperature and humidity range** ---20 to 40°C: 5 to 90%RH, 40 to 60°C: 5 to 65%RH

Insulation resistance:

- Primary terminals and protective conductor terminals --- 20MΩ or more at 500V DC
- Secondary terminals and protective conductor terminals --- 20MΩ or more at 500V DC
- Primary and secondary terminals --- 20MΩ or more at 500V DC

Dielectric strength:

- Primary terminals and protective conductor terminals --- 1 minute at 1500V AC
- Secondary terminals and protective conductor terminals --- 1 minute at 500V AC
- Primary and secondary terminals --- 1 minute at 1500V AC

Illumination:

- White LED lamp, 3 levels of brightness, and lights can be OFF.
- Case:
  - Door frame --- aluminum die-cast,
  - Door window --- glass, Back case --- steel
- Color:
  - door frame --- Gray (equivalent to Mussel N3)
  - Back case --- Gray (equivalent to Mussel N7)
- Door window --- transparent

Mounting:

- Panel mounting

Weight:

- Approximately 8.0kg

Terminal screws:

- Power terminals / protective conductor terminals / alarm terminals --- M4.0, measuring terminal --- M4.0

Indicating Specifications:

- **Analog indication:** Scale plate and pointer
- **Scale plate:** Max. triple scale (option) (minimum scale division:150)

Alarm Specifications:

- **Alarm display:** Pointer and alarm-point seal pasted on scale.
- **Alarm LED lamp lights for alarming:** (All channels common display)
- **Alarm types:** Higher and lower limit alarm
- **Alarm dead band:** 0.4% of input span

Operation / Programming Specifications:

- **Switches:**
  - POWER --- ON/OFF the recorder power supply
  - AUTO CH --- Switching automatic channels change (recording mode) and fixed channel
    - (Chart feed stops when 1 point indication mode selected)
  - RECORD --- Indication / Recording start / stop
  - FEED --- Feed chart paper
  - MODE --- Select setting mode
    - Select setting / adjusted parameter, move pointer
  - ENTRY --- Parameter / Adjusted value confirmed
  - CAL --- User indication adjustment, shift adjustment
  - KEY LOCK --- Setting key locked
- **Indication:**
  - LED (green) --- Power ON monitor
  - LED (red) --- Alarm monitor (All channels common OR output monitor)
  - LED (white) --- Chart speed

Standard:

- **CE approval:** EMC directive, low voltage directive conformity, EN61326-1, EN61010-1
  - *Under EMC directive test condition, indication equivalent to maximum 500μV might fluctuate.*
### OPTION SPECIFICATIONS

**Alarm output:**
- Alarm contact output is available
- Alarm relay — Mechanical relay 1 N.O. (form A) and relays 2 N.C. (form B) contact, 2 outputs (high and low), all channels common
- Maximum contact rating — 250V AC 2A, 30V DC 2A (resistive load)
- 250V AC 1A, 30V DC 1A (inductive load)

**Non-standard input:**
- Minimum width of scale —
  - DC voltage — 10mV DC width or more
  - DC current — 10mA DC width or more
- Thermocouple — K, 200°C width or more,
  - E, J, T, 150°C width or more
  - R, 600°C width or more
- Resistance thermometer — 100°C width or more

**Non-standard scale plate:**
- Scale plate for non-standard input

**Double / Triple scale:**
- Measures input with 2 or 3 types of scales (each scale is serial channel only), minimum division; divided into 150 equal parts
- Chart speed: 5-speed change, 12.5, 25, 50, 100, 200mm/minute, hour change
- Dotting interval: 3 seconds/point
- DC current input: 2500 of shunt resistor is applied to measure voltage input (max 20mA)

**Built-in-voltage divider:**
- Built-in voltage divider (1/1000) measures DC voltage input of ±10V, ±25V, ±50V, input type "T" only
- Burnout: Function for detecting disconnection for sensor with thermocouple or resistance thermometer input.

### 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>DC current</td>
<td>0 to 20mA</td>
<td>10mA</td>
</tr>
<tr>
<td>K</td>
<td>-200 to 330°C</td>
<td>200°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 680°C</td>
<td>400°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 1370°C</td>
<td>700°C</td>
</tr>
<tr>
<td>E</td>
<td>-200 to 200°C</td>
<td>150°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 380°C</td>
<td>250°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 720°C</td>
<td>380°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 900°C</td>
<td>720°C</td>
</tr>
<tr>
<td>J</td>
<td>-200 to 250°C</td>
<td>150°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 500°C</td>
<td>300°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 1200°C</td>
<td>500°C</td>
</tr>
<tr>
<td>T</td>
<td>-200 to 280°C</td>
<td>150°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 400°C</td>
<td>300°C</td>
</tr>
<tr>
<td>R</td>
<td>0 to 1240°C</td>
<td>600°C</td>
</tr>
<tr>
<td></td>
<td>0 to 1760°C</td>
<td>1300°C</td>
</tr>
<tr>
<td>B</td>
<td>0 to 1820°C</td>
<td>900°C</td>
</tr>
<tr>
<td>S</td>
<td>0 to 1350°C</td>
<td>700°C</td>
</tr>
<tr>
<td></td>
<td>0 to 1760°C</td>
<td>1400°C</td>
</tr>
<tr>
<td>N</td>
<td>-200 to 420°C</td>
<td>240°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 770°C</td>
<td>430°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 1300°C</td>
<td>870°C</td>
</tr>
<tr>
<td>U</td>
<td>-200 to 280°C</td>
<td>160°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 500°C</td>
<td>280°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 600°C</td>
<td>530°C</td>
</tr>
<tr>
<td>L</td>
<td>-200 to 250°C</td>
<td>150°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 490°C</td>
<td>280°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 900°C</td>
<td>500°C</td>
</tr>
<tr>
<td>RTD</td>
<td>-140 to 150°C</td>
<td>100°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 300°C</td>
<td>200°C</td>
</tr>
<tr>
<td></td>
<td>-200 to 650°C</td>
<td>400°C</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</td>
<td>-200 to -50°C</td>
<td>±1.0%</td>
</tr>
<tr>
<td>E, J, T, L</td>
<td>-200 to -50°C</td>
<td>±1.0%</td>
</tr>
<tr>
<td>R, S</td>
<td>0 to 100°C</td>
<td>±1.5%</td>
</tr>
<tr>
<td>B</td>
<td>0 to 400°C</td>
<td>None</td>
</tr>
<tr>
<td>U, L</td>
<td>-200 to -50°C</td>
<td>±1.5%</td>
</tr>
</tbody>
</table>

Note: The accuracy ratings are converted into the measuring range

---

**K, E, J, T, R**: IEC584, JIS C1602-1995

**PH100**: IEC751, JIS C1604-1997

*Scale plate will be standard plate of 0 to 100 equally divided (no unit).

*Specify other range.
Easy operation

**EH3000Series**

Flat front chart chassis enables easy memo writing.

All operations and settings adjustable.

---

**TERMINAL BOARD**

- Power/protective conductor terminals (M4)
- Alarm output conductor terminals (M4) (option)
- N.O terminals
- COM terminals
- N.C terminals
- Measurement input terminals (M4)
  - TC.mV(+), RTD(A) terminals
  - TC.mV(-), RTD(B) terminals
  - RTD(b) terminals

---

**DIMENSIONS**

- Panel cutout
- Minimum clearance for plural installation

---

Specifications subject to change without notice. Printed in Japan (I) 2013. 5