EDR-N8E Intelligent Differential Pressure Transmitter (High Accuracy Type)

**STANDARD SPECIFICATIONS**

**Model**
- EDR-N8E

**Differential pressure range**

<table>
<thead>
<tr>
<th>Range Code</th>
<th>Measuring Span</th>
<th>Settable Range Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>8000</td>
<td>0.8 to 80kPa</td>
<td>−80≤LRV≤80kPa, −80≤URV≤80kPa</td>
</tr>
<tr>
<td>40000</td>
<td>20 to 400kPa</td>
<td>−400≤LRV≤400kPa, −400≤URV≤400kPa</td>
</tr>
</tbody>
</table>

*Note: LRV is the input differential pressure to give 100% output (20mA DC), URV is the input differential pressure to give 0% output (4mA DC).*

**Output signal**
- 4 to 20mA DC

**Output signal range**
- 3.6 to 21.6mA DC (−2.5 to 110%)

**Power supply voltage**
- 11.4 to 42.0V DC

**Allowable load resistance**
- 600Ω (at 24V DC power supply voltage)

**Communication protocol**
- Hitachi communication

**Communication line conditions**
- Power supply voltage: 16.7 to 42.0V DC
- Load resistance: 250Ω to 1.2kΩ
  - See Fig. 1 for the relationship between power supply voltage and load resistance.

**External adjustment/configuration**
- Zero point adjustment (±100% of measured span), LRV and URV adjustment and configuration and damping time constant are configurable (however, only with indicator and when the function is enabled).

**Burn-out at error**
- Burn-up, burn-down or no burn-out can be selected. (No burn-out is configured at shipment.)

**Accuracy**

<table>
<thead>
<tr>
<th>Range Code</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>8000</td>
<td>±0.04% X is 8kPa or higher</td>
</tr>
<tr>
<td></td>
<td>±(0.002×0.038×8/X) % X is less than 8kPa</td>
</tr>
<tr>
<td>40000</td>
<td>±0.04% X is 40kPa or higher</td>
</tr>
<tr>
<td></td>
<td>±(0.002×0.038×40/X) % X is less than 40kPa</td>
</tr>
</tbody>
</table>

*Note 1: Accuracy is the percentage to the X. X is the absolute value of URV, LRV or the biggest value of measured span. X’s unit is kPa.*

*Note 2: For square-root output, With zero-cut designation*

- Output 1.1% or less:
  - ±(linear output accuracy × 45%)
- Output 1.1 to 50%:
  - ±(linear output accuracy × 50/% square-root output %)
- Output 50% or higher: Same as linear output

*#h is possible to select whether getting the outputs under the zero-cut point zero, or the zero-cut point from an arbitrary straight line or proportional outputs through communication.

Without zero-cut designation
- Output 20% or less: Straight line at 0 to 20% point
- Output 20% or higher: Same as the above “With zero-cut designation”.

**Response time**
- Dead time: 0.15s (Minimum)

**Damping time constant**
- (Amplifier time constant)
- Sensor body time constant

<table>
<thead>
<tr>
<th>Range Code</th>
<th>Time constant (at 25℃)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8000</td>
<td>Approx. 0.05s</td>
</tr>
<tr>
<td>40000</td>
<td>Approx. 0.03s</td>
</tr>
</tbody>
</table>

- Response time is the sum of time constants of the Sensor body and damping time constant (amplifier time constant) and waste time.

- For possible pressure pulsation, please use the fixed electric damper (approx. 1s) (Code: Z25).
  - At this time, inserting a capillary of ø1 internal diameter (1m or longer length) is recommended.

**Storage temperature range**
- −40 to 85℃

**Operating humidity range**
- 0 to 100% RH

**Operating temperature range**
- Ambient temperature range: −40 to 85℃ (See Fig. 2)
- Wetted parts temperature range: −40 to 120℃
**Maximum operating pressure**

<table>
<thead>
<tr>
<th>Range Code</th>
<th>Maximum operating pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>8000</td>
<td>15MPa</td>
</tr>
<tr>
<td>40000</td>
<td>15MPa</td>
</tr>
</tbody>
</table>

Note) See Fig. 3 for negative pressure.

**Site vibration**

Continuous vibration below 29.4m/s²

**Temperature characteristics**

(at -20 to 60°C)

<table>
<thead>
<tr>
<th>Range Code</th>
<th>Temperature characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>8000</td>
<td>Zero shift: ±0.05+(0.2×T/50)% X is 30kPa or higher</td>
</tr>
<tr>
<td></td>
<td>±0.05+(0.15×0.5×X×T/50)% X is less than 30kPa</td>
</tr>
<tr>
<td></td>
<td>Total shift: ±0.05+(0.4×5×T/50)% X is 30kPa or higher</td>
</tr>
<tr>
<td></td>
<td>±0.05+(0.4×0.5×X×T/50)% X is less than 30kPa</td>
</tr>
<tr>
<td>40000</td>
<td>Zero shift: ±0.05+(0.2×T/50)% X is 160kPa or higher</td>
</tr>
<tr>
<td></td>
<td>±0.05+(0.15×0.5×X×T/50)% X is less than 160kPa</td>
</tr>
<tr>
<td></td>
<td>Total shift: ±0.05+(0.4×5×T/50)% X is 160kPa or higher</td>
</tr>
<tr>
<td></td>
<td>±0.05+(0.4×0.5×X×T/50)% X is less than 160kPa</td>
</tr>
</tbody>
</table>

**Static pressure characteristics**

(at 25°C)

<table>
<thead>
<tr>
<th>Range Code</th>
<th>Static pressure characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>8000</td>
<td>Zero shift: ±0.05+(0.05×P/10)% X is 40kPa or higher</td>
</tr>
<tr>
<td></td>
<td>±0.05+(0.05×0.5×X×P/10)% X is less than 40kPa</td>
</tr>
<tr>
<td></td>
<td>Total shift: ±0.05+(0.3×0.1×0.8×X×P/10)% X is less than 40kPa</td>
</tr>
<tr>
<td>40000</td>
<td>Zero shift: ±0.05+(0.05×P/10)% X is 200kPa or higher</td>
</tr>
<tr>
<td></td>
<td>±0.05+(0.05×0.5×X×P/10)% X is less than 200kPa</td>
</tr>
<tr>
<td></td>
<td>Total shift: ±0.05+(0.3×0.1×0.4×X×P/10)% X is less than 200kPa</td>
</tr>
</tbody>
</table>

Note) Static pressure characteristic is the percentage to X. X is the absolute value of URV, LRV or the biggest value of measured span. X’ unit is kPa. P is a static pressure. P’s unit is MPa.

**Overpressure characteristics**

(zero point) ±0.5%

(when the maximum operating pressure is applied)

(for the maximum span)

Long-term stability

(zero point) ±0.1% / 10 years (for the maximum span) Varied volume under the basic operation conditions (23±2°C, under atmospheric pressure)

**Materials**

- Diaphragm: SUS316L
- Sensor body: SUS316L
- Sensor body flange: SCS14A(SUS316-equivalent casting)
- Sensor body flange bolt: SCM435
- Sensor body flange O-ring: EPDM
- Amplifier case: Aluminum alloy
- Mounting plate: SPCC (anti-acid painting)
- U-bolt: SUS304
- Sealed liquid: Silicone oil

**Pressure inlet**

Upper inlet RCl/4 without oval flange

**Wire connection**

G1/2

**Check terminal**

Current output (Amper meter is required for measurement.)

**Protection grade**

JIS C 0920 IP67

**Surge absorber**

Incorporated into the power input circuit

Surge tolerance:1,000A (8/20 μs)

Impact test voltage:15,000V (1.2/50 μs)

**Color**

Light gray (anti-acid painting)

**Weight**

Approx. 4.0kg

**Mounting**

Use U-bolts for 50A pipes, etc.

**Accessories**

A set of 50A pipe mounting plate and U-bolts,

External adjustment/configuration magnet

**ADDITIONAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Communication protocol</th>
<th>HART communication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Static pressure measurement</strong></td>
<td>(Absolute pressure measurement)</td>
</tr>
<tr>
<td>Output form</td>
<td>Composite converter EDBM500MA is displayed with that indicator</td>
</tr>
<tr>
<td>Measuring span</td>
<td>0.5 to 5MPa abs.</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.2% X is 1MPa or higher</td>
</tr>
<tr>
<td>±0.2×(1/X)% X is less than 1MPa</td>
<td></td>
</tr>
<tr>
<td>Temperature characteristics</td>
<td>Zero shift</td>
</tr>
<tr>
<td>±0.05+(0.5×0.5×X×T/50)% X is less than 2MPa</td>
<td></td>
</tr>
<tr>
<td>Total shift</td>
<td>±0.05+(2.5×T/50)% X is 2MPa or higher</td>
</tr>
<tr>
<td>±0.05+(2.5×0.5×X×T/50)% X is less than 2MPa</td>
<td></td>
</tr>
<tr>
<td>Note) Accuracy and temperature characteristics are the percentages to X. X is the absolute value of URV, LRV or the biggest value of measured span. X’ unit is MPa. T (°C) is temperature variation width.</td>
<td></td>
</tr>
</tbody>
</table>

**TBS flameproof, Oil-immersion**

Applicable standard

Exdo II CT4 X Note)

Available for use at Zone1, Zone2 groups of hazardous place.

Note) If the indicator is not equipped, please construct an external alarm indication system by scaling out of the output signal.

Operating temperature range:

-20 to 55°C

Wetted parts temperature range:

-20 to 100°C

**Wire connection**

Please use X-EXRCA pressure proof packing brackets (or EXPC-16B by Shimada Electric Co., Ltd.).

**FM explosionproof approval**

(Approving)

Applicable Standard

Explosionproof C1,DIV 1.GPS B,C&D

Dust-ignition proof CL II/III,GPS E,F&G

Temperature Code T4

Operating temperature range:

-40 to 60°C

Wetted parts temperature range:

-40 to 120°C

**NEPSI explosionproof approval**

(Approving)

Applicable Standard

Explosionproof Ex d II C T4

Operating temperature range:

-40 to 60°C

Wetted parts temperature range:

-40 to 120°C
**Indicator**

Digital indicator

- Indication 5 digits, unit 7 digits, bar graph

Indication items

- Individual enable/disable indication of the following items:
  - Automatic switching when selecting the Items
  - Differential pressure%
  - Differential pressure value
  - Actual scale of differential pressure
  - Static pressure%
  - Static pressure value
  - Actual scale

Unit is selected from pressure, flow volume, height or discretionary configuration.

Configuration range: -99,999 to 99,999

Ambient temperature range: -20 to 85°C

**Sealed liquid**

- Fluorine oil

Wetted parts temperature range:

-20 to 120°C

(See Fig. 4 for negative pressure.)

Specify also the oil–prohibitive finish together for oxygen measurement.

**Wetted parts finish**

- Oil prohibitive or oil and water prohibitive finish

**Pressure inlet** (with oval flange)

- Rc 1/4, Rc1/2, 1/4 NPT, 1/2 NPT
- 15 A socket welded (socket screw-in type)

**Wetted parts conditions**

- Vacuum type

  Wetted parts temperature range: 40 to 120°C

  Sealed liquid is the same as the standard specifications.

  (Operating pressure varies depending on the temperature. See Fig. 3 for proper usage.)

- Bolt material

  Sensor body flange bolt: SUS304, SUS630

  (SUS304 MAX operating pressure is 1/2 of the standard product.)

**Seal liquid**

Fluorine oil

Wetted parts temperature range:

-20 to 120°C

(See Fig. 4 for negative pressure.)

Specify also the oil–prohibitive finish together for oxygen measurement.

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- Oil prohibitive or oil and water prohibitive finish

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  Sensor body flange bolt: SUS304, SUS630

  (SUS304 MAX operating pressure is 1/2 of the standard product.)

**Fig. 1 Power supply voltage / load resistance characteristics**

The minimum load resistance of 250Ω is required to communicate by connecting the communicator.

**Fig. 2 Wetted parts temperature and ambient temperature**

**Fig. 3 Operating pressure and wetted parts temperature**

(Standard / Vacuum type specifications)

**Fig. 4 Operating pressure and wetted parts temperature**

(Sealed liquid: Fluorine oil)
Without on-site indicator

Connected with on-site indicator

Note 1) Perform Class D grounding work (ground resistance of 100 Ω or less) for grounding.

Note 2) Ground either the transmitter or the receiving instrument. Be careful not to be dual-grounded.

Note 3) Grounding terminals on the transmitter are located inside the terminal box and outside the amplifier case.

You can use either of the groundings.

Note 4) T1, T2, and T3 terminals are not connected.

Note 5) The resistance value needs to be 20 Ω or less including wire resistance to connect an on-site indicator.

Connected with EDB500MA

EDB500MA
Composite converter

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**EXTERNAL CONNECTION DRAWING**

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## EDR-N8E  Intelligent Differential Pressure Transmitter (High Accuracy Type)

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Code</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Range Code</td>
<td>8000</td>
<td>Measuring span 0.8 to 80kPa</td>
</tr>
<tr>
<td></td>
<td>40000</td>
<td></td>
<td>Measuring span 20 to 400kPa</td>
</tr>
<tr>
<td>2</td>
<td>Communication</td>
<td>H</td>
<td>HART communication</td>
</tr>
<tr>
<td>3</td>
<td>Functional safety</td>
<td>-</td>
<td>None</td>
</tr>
<tr>
<td>4</td>
<td>Adjustment range</td>
<td>C( )</td>
<td>Describe adjustment range and unit sign in ( )</td>
</tr>
<tr>
<td>5</td>
<td>Certification</td>
<td>NC</td>
<td>TII flameproof, Oil-immersion</td>
</tr>
<tr>
<td></td>
<td>FM</td>
<td>FM explosionproof approval (Arranging)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NEPS1</td>
<td>NEPS explosionproof approval (Arranging)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Indicator</td>
<td>M</td>
<td>With digital indicator (Indication 0 to 100%)</td>
</tr>
<tr>
<td></td>
<td>M( )</td>
<td>With digital indicator describe indication scale and unit sign in actual scale indication ( )</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Bolt/mounting plate material</td>
<td>S304</td>
<td>Sensor body flange bolt:SU304 Mounting plate:SPCC U-bolt:SU304 (Maximum operating pressure is 1/2 of the standard.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S630</td>
<td>Sensor body flange bolt:SU630 Mounting plate:SPCC U-bolt:SU630</td>
</tr>
<tr>
<td>8</td>
<td>Sealed liquid</td>
<td>FO</td>
<td>Fluorine oil</td>
</tr>
<tr>
<td>9</td>
<td>Oil prohibition</td>
<td>-</td>
<td>No finish</td>
</tr>
<tr>
<td></td>
<td>NL</td>
<td>Oil prohibitive finish</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NLW</td>
<td>Oil and water prohibitive finish</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Pressure inlet</td>
<td>T0</td>
<td>Top connection R1/2 with oval flange</td>
</tr>
<tr>
<td></td>
<td>R2</td>
<td>Top connection R6/1/2 with oval flange</td>
<td></td>
</tr>
<tr>
<td></td>
<td>R4</td>
<td>Top connection R6/1 with oval flange</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N1</td>
<td>Top connection 1/4NPT with oval flange</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S2</td>
<td>Top connection 15A pipe insertion welding with oval flange (socket screw-in type)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B0</td>
<td>Bottom connection R1/4 without oval flange</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BH2</td>
<td>Bottom connection R6/1/2 with oval flange</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BN1</td>
<td>Bottom connection R6/1/4 with oval flange</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RN2</td>
<td>Bottom connection 1/2NPT with oval flange</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RN4</td>
<td>Bottom connection 1/INPT with oval flange</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B2</td>
<td>Bottom connection 15A pipe insertion welding with oval flange (socket screw-in type)</td>
<td></td>
</tr>
</tbody>
</table>

### Example of Code description:
EDR-N8E-8000-NC-M-R2

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- HART® is a registered trademark of the Field Comm Group.
- Please read the “Instruction Manual” carefully before use.
- Appearance and specifications are subject to change partially for improvement.