EDR-N7C is an intelligent transmitter equipped with semiconductor sensors and microprocessors.

**STANDARD SPECIFICATIONS**

**Model**
EDR-N7C

**Measuring range**

<table>
<thead>
<tr>
<th>Range Code</th>
<th>Measuring Span</th>
<th>Settable Range Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>Differential pressure</td>
<td>0.5 to 8kPa, X &gt; 8kPa, X &lt; 8kPa</td>
</tr>
<tr>
<td></td>
<td>Pressure</td>
<td>0.2 to 5MPa abs., 0 ≤ LRV ≤ 5MPa abs., 0 ≤ URV ≤ 5MPa abs.</td>
</tr>
<tr>
<td></td>
<td>Temperature</td>
<td>more than 50℃, X &gt; 850℃, X &lt; 850℃</td>
</tr>
<tr>
<td>8000</td>
<td>Differential pressure</td>
<td>2 to 80kPa, X &gt; 80kPa, X &lt; 80kPa</td>
</tr>
<tr>
<td></td>
<td>Pressure</td>
<td>0.2 to 5MPa abs., 0 ≤ LRV ≤ 5MPa abs., 0 ≤ URV ≤ 5MPa abs.</td>
</tr>
<tr>
<td></td>
<td>Temperature</td>
<td>more than 50℃, X &gt; 850℃, X &lt; 850℃</td>
</tr>
</tbody>
</table>

Note 1: URV is the input differential pressure to give 100% output (20mA DC)
LRV is the input differential pressure to give 0% output (4mA DC)

<table>
<thead>
<tr>
<th>Output</th>
<th>4 to 20mA DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply voltage</td>
<td>11.4 to 42.0V DC</td>
</tr>
<tr>
<td>Allowable load resistance</td>
<td>600Ω(at 24V DC power supply voltage)</td>
</tr>
<tr>
<td>Communication line condition</td>
<td>Power supply voltage 16.7 to 42.0V DC</td>
</tr>
<tr>
<td>Load resistance</td>
<td>250Ω to 1.2kΩ (Refer to Fig.1 for the relation between power supply voltage and load resistance)</td>
</tr>
</tbody>
</table>

**Accuracy**

<table>
<thead>
<tr>
<th>Range Code</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>Differential pressure: ±0.2%, Larger value: X &gt; 1kPa</td>
</tr>
<tr>
<td></td>
<td>Pressure: ±(0.05×X/10)%, ±(0.05×X/10) × 100%</td>
</tr>
<tr>
<td></td>
<td>Temperature: ±0.1%, Larger value: ±0.1%</td>
</tr>
</tbody>
</table>

| 8000       | Differential pressure: ±0.1%, X > 8kPa |
|            | Pressure: ±(0.05×X/10)%, ±(0.05×X/10) × 100% |
|            | Temperature: ±0.1%, X > 100℃ |

Note 2: When square root output, if zero cut is specified,
for output less than 1.1%: ±(linear output accuracy × 45) %
for output 1.1 to 50%: ± (linear output accuracy × 50/square root output%) %
for output more than 50%: same as linear output

Note 1: Accuracy is percent value against X, and X is the largest value among absolute value of URV, LRV and measuring span. Unit is kPa.

Note 2: When square root output, if zero cut is specified,
for output less than 1.1%: ±(linear output accuracy × 45) %
for output 1.1 to 50%: ± (linear output accuracy × 50/square root output%) %
for output more than 50%: same as linear output

Accuracy of output after calculating temperature and pressure compensation

\[
\pm \left(\frac{0.05}{\rho_I} + \frac{0.05}{\rho_B} + \frac{0.3}{\rho_I} + \frac{0.3}{\rho_B}\right) \% 
\]

Accuracy of output after calculating saturated steam pressure compensation

\[
\pm \left(\frac{0.05}{\rho_I} + \frac{0.05}{\rho_B} + \frac{0.05}{\rho_I} \times \left(\frac{\rho}{0.3 \rho} + \frac{0.3}{\rho}\right)\right) \%
\]
Can select any one among burn up, burn down and without burn out.

**Dead time**
Approx. 0.4sec

**Damping time constant**
Adjustable from 0.2 to 102.4sec (0.1sec increment) electrically by the DCR communicator.

### Time constant of sensor body

<table>
<thead>
<tr>
<th>Range Code</th>
<th>Time Constant of Sensor Body (at 25°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>Approx. 0.7sec</td>
</tr>
<tr>
<td>8000</td>
<td>Approx. 0.2sec</td>
</tr>
</tbody>
</table>

- Transmitter time constant equals total sum of the above time constant of sensor body, damping setting time constant (amplifier time constant) and dead time.
- When pressure pulsation is expected, fixed electrical damper (about 1sec) shall be specified, at the same time we recommend that inner diameter φ1 capillary tube (more than 1m length) is inserted.

**Storage**
- Ambient temperature limits: ~20 to 120°C
- Wetted parts temperature limits: ~20 to 85°C

**Working pressure**
- 5MPa abs.

**Site vibration**
- Less than 29.4m/s² continuous vibration

**Temperature effect** (at ~20 to 60°C)

<table>
<thead>
<tr>
<th>Range Code</th>
<th>Temperature Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>±(0.05+(0.45×T/50)/%</td>
</tr>
<tr>
<td>8000</td>
<td>±(0.05+(0.25×T/50)/%</td>
</tr>
</tbody>
</table>

Note) Temperature effect is percent value against X, X is the largest value among absolute value of URV,LRV and measuring span. Unit is kPa.

T is temperature variation width(℃).

**Zero adjustment**
Externally adjustable within ± 100% of measurement span.

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**Calculation formula**

**[Assumed input]**
Calculating temperature and pressure compensation

![Diagram showing calculation](image)

Calculating saturated steam pressure compensation

![Diagram showing saturated steam pressure compensation](image)

**[Real input]**
Calculating temperature and pressure compensation

![Diagram showing real input calculation](image)

Calculating saturated steam pressure compensation

![Diagram showing saturated steam pressure compensation](image)

**Note:**
Calculation formula can be selected and set from following five kinds by communicator:

1. Without compensation
2. Temperature compensation
3. Pressure compensation
4. Temperature and pressure compensation
5. Saturated steam pressure compensation

- **ΔP:** Measured differential pressure (kPa)
- **T₁:** Measured temperature (℃)
- **P₀:** Measured pressure (MPa abs.)
- **T₂:** Base temperature for compensation (℃)
- **P₁:** Base pressure for compensation (MPa abs.)
- **ρ₁:** Density in measurement pressure (kg/m³)
- **ρ₂:** Density in the value which added measurement differential pressure and measurement pressure (kg/m³)
- **ρ₃:** Density in base pressure (kg/m³)

Calculating saturated steam pressure compensation, ρ₁/ρ₂ and ρ₃/ρ₂ are effective to double, it’s become fixed with 2.

**Temperature input:**
- Pt100Ω or JPt100Ω (three wires connection type)

**Zero adjustment**
Externally adjustable within ± 100% of measurement span.
### Pressure Effect (at 25℃)

<table>
<thead>
<tr>
<th>Range Code</th>
<th>Pressure Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>±[0.05×(0.1×P/5)]% X is more than 40kPa</td>
</tr>
<tr>
<td>8000</td>
<td>±[0.05×(0.1×P/5)]% X is less than 40kPa</td>
</tr>
<tr>
<td></td>
<td>±[0.05×(0.1×P/5)]% Overall shift</td>
</tr>
</tbody>
</table>

**Note:** Static pressure effect is percent value against X, X is the largest value among absolute value of URV, LRV and measuring span. Unit is kPa. P is static pressure value, unit MPa.

### Overpressure Effect

(Zero shift) (at maximum working pressure application)

±0.5% (at maximum span)

### Material

**Diaphragm**
- Hastelloy C
  (Diaphragm material shall be selected considering corrosion resistance, hydrogen transmission, etc.)

**Wetted parts other than diaphragm**
- Aluminium alloy
- SPCC (acid resistant coating)
- SUS304
- Silicone oil
- Top connection Rc1/4 without oval flange
- G1/2
- With output check terminal (output voltage 40 to 200mV DC)
- Degree of protection JIS C 0920 IP67
- Built-in transmitter
- Surge capacity: 1,000A (8/20 μsec)
- Impulse test voltage: 15,000V (1.2/50 μsec)
- Light gray amplifier case (acid resistant coating)
- Approx. 3.3kg
- On 2-inch pipe with U bolt
- 2-inch pipe mounting bracket and U-bolt
- Zero adjustment magnet

### Electrical connection

X-RCAC type pressure resistant packing fixture must be used for using pressure resistant oil filled explosion proof type products. (also applicable to use SXBM-16B made by Shimada Electric Co., Ltd.)

**FM explosion proof type**

**Explosion proof CL, DIV 1, GPS B, C&D**

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

**Temperature Code T4**

**NEMA 4X**

**Ambient temperature limits:** -40 to 60℃

**Ambient temperature range:** -20 to 60℃

**Certificate No. GY711366**

**Digital indicator** 4.5 figures display (0 to 100% scale standard)

(Can set to arbitrary scale within the range of -17,500 to 17,500)

Scale plates various units to be stuck are supplied.

**Indication reshuffling of the differential pressure / pressure / temperature and the arbitrary scale setting**

(range of -1,750-1,750) of the pressure are possible by the communicator, too.

In the case of temperature indication, display “°” and, in the case of pressure indication, distinguish “P” next to numerical value. (Refer to fig. 4 for the indication example)

### Wetted parts materials

<table>
<thead>
<tr>
<th>Wetted Parts</th>
<th>Diaphragm</th>
<th>Wetted Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUS316L</td>
<td>SUS316L</td>
<td>SUS316L</td>
</tr>
</tbody>
</table>

* Material shall be selected considering corrosion resistance. In case hydrogen is present in measuring fluid, it is possible hydrogen transmission can be generated through diaphragm. If corrosion resistance is not so important, we recommend SUS316L or SUS36 with gold plating because hydrogen transmission value of this material is relatively low. (But it is difficult to prevent hydrogen transmission completely even if diaphragm of SUS316L with gold plating is applied).

No oil finish or no-oil and no water finish Rc1/2, Rc1/4, 1/2NPT, 1/4NPT, 15A socket welding (socket screw-in type)

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**Additional Specification**

**Structure**
- TII Ex explosion proof type
  - Flameproof
  - Exdo II CT4
  - Exdo II CT4X
  
  **Note:** X is for operating condition (as below)

  - With meter: Abnormality code is displayed on meter to alert winking, so it is no need to build external alarm display system.
  - Without meter: it is necessary to build external alarm display system, output exceeds 21mA

  **Ambient temperature limits:** -20 to 55℃
  **Wetted parts temperature limits:** -20 to 100℃

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**CS·3253 - 976**
To be attached to the sensor body
(Steam temperature shall be set to get liquid contact temperature less than 120 °C. But less than 100 °C for explosion proof type)
Thermal insulation type

Fig.1 Supply voltage / load resistance property of transmitter

Fig.2 Wetted parts temperature and allowable ambient temperature

Fig.3 Working pressure and process fluid temperature

Differential pressure display (0.00～25.00kPa)

Differential pressure display (0.00～5.00MPa abs.)

Temperature display

Note 1) In the case of temperature indication, display ° and, in the case of pressure indication, distinguish “P” next to numerical value.

Note 2) The bar graph displays the percentage of the span of the differential pressure by a 10% unit (round off one place).

Note 3) The indication of the LCD is able to change setting of either / change indication to only differential pressure by a communicator.

Fig.4 Indication example
Notes:
(1) Grounding shall be done according to class D grounding practice (grounding resistance less than 100Ω).
(2) Grounding shall be done at one point either transmitter side or receiver instrument side. Give attention to avoid grounding at two points.
(3) Grounding terminals on transmitter side are furnished inside of terminal box and outside of amplifier case. Either of them can be utilized.
(4) Local indicator is not able to use.
With oval flange (top connection)
**CODE TABLES**

<table>
<thead>
<tr>
<th>No.</th>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>EDR-N7C</td>
<td>Water-proof, without indicator, diaphragm material: Hastelloy C, wetted parts other than diaphragm:SUS316, top process connection Rc1/4 without oval flange. Range of differential pressure: 0<del>Range code, Range of pressure: 0</del>5 MPa abs., Range of temperature: 0~300℃, Base pressure: 0.5 MPa abs., Base temperature: 50℃. Select a necessary code alone among those in the optional code table below.</td>
</tr>
</tbody>
</table>

**OPTION**

<table>
<thead>
<tr>
<th>No.</th>
<th>Item Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Adjustment range</td>
<td>C( ) Fill in ( ) with adjustment range, unit mark, Fill in necessary items in order of differential pressure, pressure and temperature.</td>
</tr>
<tr>
<td>3.</td>
<td>Certification</td>
<td>FCJ JIS explosion-proof standard approval - Exek II CT4</td>
</tr>
<tr>
<td>4.</td>
<td>Indicator</td>
<td>MJ( ) With digital indicator and actual scale display, Fill in ( ) with scale and unit mark</td>
</tr>
<tr>
<td>5.</td>
<td>Wetted Parts materials</td>
<td>304L316Diaphragm : SUS316L, Body wetted parts : SUS316</td>
</tr>
<tr>
<td>6.</td>
<td>No-oil finish</td>
<td>NL No-oil finish</td>
</tr>
<tr>
<td>7.</td>
<td>Process connections</td>
<td>E2 Top connection with oval flange Rc1/2</td>
</tr>
<tr>
<td>8.</td>
<td>Steam jacket</td>
<td>ST With steam jacket, <em>Steam temperature shall be set to get process fluid temperature less than 120℃. But less than 100℃ for explosion-proof type.</em></td>
</tr>
<tr>
<td>9.</td>
<td>Calculation formula</td>
<td>OFF Without compensation(An initial value when there is no designation)</td>
</tr>
</tbody>
</table>

Note: Please select the material of the diaphragm in consideration of corrosion resistance. Hastelloy C might generate the hydrogen permeation by the galvanizing steel pipe piping and the water quality, etc., and cause the output shift and the transformation of the diaphragm. Please select small SUS316L of the hydrogen permeation when there is no problem in corrosion resistance.
Be sure to read the User’s Manual to ensure correct, safe use.

Some specifications and design are subject to change with or without notice for improvement of quality and performance.