D-Series
SMART Pressure Transmitter
Models: DPC-2000

Key Features
- High accuracy ±0.075% (better accuracy upon request)
- 4-20mA, 0-20mA or 0-5mA analogue with digital communications
- Fully HART ® compatible
- Programmable range, zero shift, characteristic and damping ratio with local panel keys
- ATEX certified (Intrinsic Safety, Flameproof)
- Gold (Au) plated diaphragm option
- Lighter weight

Series Overview
The D-Series pressure, differential pressure and temperature transmitters offer customers cost-effective and accurate solutions to their individual process requirements. Available with a wide range of process connections and easily configurable via the D-Soft software, the D-Series can be used for a variety of applications when pressure, differential pressure, temperature, level or flow measurements are needed.

Other models in this series include:
- DPT-2000 SMART Temperature Transmitter
- DPR-2000 SMART Differential Pressure Transmitter
- DPR-2000G SMART Differential Pressure Transmitter for low range
- DPR-2200 SMART Differential Pressure Transmitter with 2 remote chemical seals

Product Applications
The DPC-2000 is suitable for a wide range of applications in many industry sectors:
- Oil & Gas
- Petrochemical
- Water & Wastewater
- Power

The choice of models available ensures that the DPC-2000 is:
- Suitable for use in corrosive atmospheres
- Resistant to chemical attack

How can we help you?
Delta Controls offers fast, efficient and knowledgeable support when and where you need it. Please visit our website at www.delta-controls.com to find your local support centre or call us on:
+44 (0) 1252 729 140

www.delta-controls.com
**Application & Construction**

The DPC SMART Pressure Transmitters are suitable for measurement of pressure, underpressure, and absolute pressure of gases, vapours and liquids. The active sensing element is a piezoresistive silicon sensor separated from the medium by a diaphragm and by a specifically sealed type of manometric liquid. The casing is made of cast aluminium alloy or 316 stainless steel with degree of protection IP66/67. The design of the casing enables the use of a local display, rotation of the display by 90°, rotation of the casing by 0-355° relative to the sensor, and a choice of cable direction.

The communication standard for data interchange with the transmitter is the Hart protocol.

Communication with the transmitter is carried out with:
- a KAP-03, KAP03Ex communicator,
- some other Hart type communicators, (+)
- a PC using a HART/USB/Bluetooth converter and Raport2 configuration software.

The data interchange with the transmitter enables the users to:
- identify the transmitter;
- configure the output parameters:
  - measurement units and the values of the start points and end points at the measurement range;
  - damping time constant;
  - conversion characteristic (inversion, user’s non-linear characteristic);
- read the currently measured pressure value of the output current and the percentage output control level;
- force an output current with a set value;
- calibrate the transmitter in relation to a model pressure

**Installation**

The transmitter can be installed directly on the installation. A universal mounting bracket is provided to transmitter fitting on 2˝ pipe. When the pressure of steam or other hot media is measured, a siphon or impulse line should be used.

The needle valve placed upstream the transmitter simplifies installation process and enables the zero point adjustment or the transmitter replacement. When the special process connections are required for the measurement of levels and pressures (e.g. at food and chemical industries), the transmitter is provided with a diaphragm seal. The transmitter’s electrical connections should be performed with twisted cable. The place for the communicator should be assigned before the communicator installation.

**Measuring Ranges**

<table>
<thead>
<tr>
<th>No.</th>
<th>Nominal measuring range (FSO)</th>
<th>Minimum set range</th>
<th>Rangeability</th>
<th>Overpressure limit (without hysteresis) + **</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0...1000 bar (0...100MPa)</td>
<td>10bar (1MPa)</td>
<td>100:1</td>
<td>1200 bar (120 MPa)</td>
</tr>
<tr>
<td>2</td>
<td>0...300 bar (0...30 MPa)</td>
<td>3 bar (300 kPa)</td>
<td>100:1</td>
<td>450 bar (45 MPa)</td>
</tr>
<tr>
<td>3</td>
<td>0...180 bar (0...16MPa)</td>
<td>16bar (160kPa)</td>
<td>100:1</td>
<td>450 bar (45 MPa)</td>
</tr>
<tr>
<td>4</td>
<td>0...7 bar (0...7 MPa)</td>
<td>0.7 bar (70 kPa)</td>
<td>100:1</td>
<td>140 bar (14 MPa)</td>
</tr>
<tr>
<td>5</td>
<td>0...25 bar (0...2.5 MPa)</td>
<td>0.25 bar (25 kPa)</td>
<td>100:1</td>
<td>50 bar (5 MPa)</td>
</tr>
<tr>
<td>6</td>
<td>0...7 bar (0...0.7 MPa)</td>
<td>0.07 bar (7 kPa)</td>
<td>100:1</td>
<td>14 bar (1.4 MPa)</td>
</tr>
<tr>
<td>7</td>
<td>-1...7 bar (-100…700kPa)</td>
<td>0.07 bar (7 kPa)</td>
<td>114:1</td>
<td>14 bar (1.4 MPa)</td>
</tr>
<tr>
<td>8</td>
<td>0...2 bar (0...200 kPa)</td>
<td>100 mbar (10 kPa)</td>
<td>20:1</td>
<td>4 bar (400 kPa)</td>
</tr>
<tr>
<td>9</td>
<td>0...1 bar (0...100 kPa)</td>
<td>50 mbar (5 kPa)</td>
<td>20:1</td>
<td>2 bar (200 kPa)</td>
</tr>
<tr>
<td>10</td>
<td>-0.5...0.5 bar (-50…50 kPa)</td>
<td>50 mbar (5 kPa)</td>
<td>20:1</td>
<td>2 bar (200 kPa)</td>
</tr>
<tr>
<td>11</td>
<td>0...25 bar (0...25 kPa)</td>
<td>25 mbar (2.5 kPa)</td>
<td>10:1</td>
<td>1 bar (100 kPa)</td>
</tr>
<tr>
<td>12</td>
<td>-100…100 mbar (-10…10 kPa)</td>
<td>20 mbar (2 kPa)</td>
<td>10:1</td>
<td>1 bar (100 kPa)</td>
</tr>
<tr>
<td>13</td>
<td>-15...70 mbar* (+5...2 MPa)</td>
<td>5 mbar (0.5 kPa)</td>
<td>17:1</td>
<td>0.5 bar (50 kPa)</td>
</tr>
<tr>
<td>14</td>
<td>0...1.3 bar abs (0…130 kPa abs)</td>
<td>100 mbar abs (10 kPa abs)</td>
<td>13:1</td>
<td>2 bar (200 kPa)</td>
</tr>
<tr>
<td>15</td>
<td>0...7 bar abs (0…0.7 MPa abs)</td>
<td>100 mbar abs (10 kPa abs)</td>
<td>70:1</td>
<td>14 bar (1.4 MPa)</td>
</tr>
<tr>
<td>16</td>
<td>0...25 bar abs (0…2.5 MPa abs)</td>
<td>25 mbar abs (25 kPa abs)</td>
<td>100:1</td>
<td>50 bar (5 MPa)</td>
</tr>
<tr>
<td>17</td>
<td>0...70 bar abs (0…7 MPa abs)</td>
<td>0.7 bar abs (7 MPa abs)</td>
<td>100:1</td>
<td>140 bar (14 MPa)</td>
</tr>
</tbody>
</table>

*only for transmitters without diaphragm seal

**Technical Data**

**Metrological parameters**

<table>
<thead>
<tr>
<th>Accuracy</th>
<th>≤ ±0.075% of the calibrated range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term stability</td>
<td>= accuracy for 3 years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thermal error</th>
<th>&lt; ±0.05% (FSO) / 10°C (0.1% for ranges 12, 13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>max. Thermal error</td>
<td>±0.25% (FSO) in the whole compensation range (0.4% for ranges 12, 13)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thermal compensation range</th>
<th>-25…80°C – special version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional electronic damping</td>
<td>0…60 s</td>
</tr>
<tr>
<td>Error due to supply voltage changes</td>
<td>0.002% (FSO) / V</td>
</tr>
</tbody>
</table>

**Power supply:**

- **model DPC-2000ALW** 12...55 V DC (Ex ia 13.5...28 V) (Ex d 13.5...45V)
- **model DPC-2000AL** 12...36 V DC

**Additional voltage drop**

when display illumination switched on 3 V

**Output signal**

4…20 mA, two wire transmission

special version: 0…20 or 0…5, 4…20 [mA]

**Load resistance**

\[
R = \frac{U_{in}[V] \times 12V^-}{0.85} \times 0.02\Omega
\]

* - 15 V when display illumination switched on

**Resistance required for communication**

250…1100 Ω

**Materials**

**Wetted parts and diaphragms:** 316Lss, Hastelloy C 276, Au

**Casing:** Aluminium, 316SS

Material of window: polycarbonate glass, hardened glass
Operating conditions

Operating temperature range (ambient temp.)
-40...85°C
Exi version -40...80°C
Exd version -40...75°C

Medium temperature range
-40...120°C
over 120°C – measurement with the use of impulse line or diaphragm seals
CAUTION: the medium must not be allowed to freeze in the impulse line or close to the process connection of the transmitter

Medium temperature range
-40...120°C

Measurements in the hazardous areas

For pressure measurements in the areas under explosion hazard the Atex intrinsically safe transmitters, II 1/2G Ex ia IIB T5 Ga/Gb are available

Technical data

Metrological parameters, materials of process connection, diaphragms and casing, and operating conditions – see the description on previous page.

Electrical parameters

Power supply (from DP/PA coupler)
10.5 -28V DC
12.05 - 28V DC - when display illumination switched on. Power supply from intrinsically-safe coupler according to FISCO requirements.
Vr=15VDC
Ii=0.38A for IIB
Current consumption 14mA

Electrical diagrams for transmitters

Version: DPC-2000ALW
output signal: 4-20mA

Version: DPC-2000ALE
with 0...5 or 0...20mA output signal
<table>
<thead>
<tr>
<th>Model</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPC-2000</td>
<td>ALW..</td>
<td>Stainless steel housing, IP66/IP67, with display, output 4-20mA + Hart</td>
</tr>
<tr>
<td></td>
<td>ALE</td>
<td>(Exia)</td>
</tr>
<tr>
<td>Casing, output signal,</td>
<td>ALW/SS</td>
<td>Stainless steel housing, IP66/IP67, with display, output 4-20mA + Hart</td>
</tr>
</tbody>
</table>

**Versions, certificates**

- Ex ia I M1 (aluminum enclosure only) 
- Ex ia II D T6 ex d I M1 (steel enclosure only) 
- Ex ia II D Ex ia T6/T8 C75/T100°C (not available for ALE) 

**How to Order**

**Example 2:** Pressure transmitter with display, output 4-20mA + HART, version EExia, nominal measuring range 0..25bar, calibrated range 0..16bar, process connection G1/2", electrical connection 1/2NPT F, mounting bracket for 2" pipe

**DPC-2000ALW/EExia/0..25bar/0..16bar/G1/2"/US/AL**