PDCR/PMP 4300 Series

Druck Motorsport/Automotive Pressure Transducers

Success in motorsport depends on hundreds of components working together under extreme conditions, and Baker Hughes continues to develop Druck pressure transducers that give the ultimate performance. Druck motorsport sensors have become a world-leading product line used in Formula 1, World Rally Championship and the Indy Racing League, amongst others.

The PDCR/PMP 4300 Series is the latest in the range of products that for many years has been “fine tuned” in design to suit all chassis and engine pressure measurement requirements.

Features
- Race proven technology
- High temperature capability to 350°F (175°C)
- Amplified or millivolt output
- Stainless steel or titanium construction
- Fully EMC protected
- Flexible mechanical/electrical interface options
Race Proven Technology
Since 1990 Druck products have been successfully applied to motorsport, and the PDCR/PMP 4300 Series is a high performance pressure sensor for this harsh environment application.

High Performance
Baker Hughes has a new advanced and comprehensive silicon processing facility and is one of a few companies turning raw silicon into finished pressure sensing products.

Each pressure module is fully temperature cycled to enhance long-term measurement stability. All metalwork is welded to form a rugged housing. Upon completion of the electrical connections the units are again thermally cycled to eliminate any possible defects in application.

This rugged construction enables the 4300 Series to operate under extreme temperature and vibration conditions.

Reliability remains at the forefront of Baker Hughes's design and build philosophy. The combination of high technology sensing elements and advanced signal conditioning and packaging techniques provides reliable and accurate pressure measurements.

Flexible Design
The pressure sensing module and the electronics form a completely flexible core. Various configurations of electrical terminations and pressure connectors are available in both stainless steel and titanium. Baker Hughes has considerable experience in solving specific application problems by developing standard designs to suit customer-specific applications.
Dimensions

Wiring Details

P***431*

<table>
<thead>
<tr>
<th>Cable Core Colour</th>
<th>PDCR431*</th>
<th>PMP431*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>+ve supply</td>
<td>+ve supply</td>
</tr>
<tr>
<td>Black</td>
<td>-ve supply</td>
<td>0V/common</td>
</tr>
<tr>
<td>Green</td>
<td>+ve output</td>
<td>Not connected</td>
</tr>
<tr>
<td>White</td>
<td>-ve output</td>
<td>+ve output</td>
</tr>
<tr>
<td>Blue</td>
<td>Temp (optional)</td>
<td>Temp (optional)</td>
</tr>
<tr>
<td>Screen</td>
<td>Conn. to case</td>
<td>Conn. to case</td>
</tr>
</tbody>
</table>

P***436*

<table>
<thead>
<tr>
<th>Pin Number</th>
<th>PDCR436*</th>
<th>PMP436*</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>+ve supply</td>
<td>+ve supply</td>
</tr>
<tr>
<td>2</td>
<td>-ve supply</td>
<td>0V/common</td>
</tr>
<tr>
<td>3</td>
<td>+ve output</td>
<td>+ve output</td>
</tr>
<tr>
<td>4</td>
<td>-ve output</td>
<td>Temp (optional)</td>
</tr>
<tr>
<td>5</td>
<td>Temp (optional)</td>
<td>case</td>
</tr>
</tbody>
</table>

or case
Specifications

Pressure Measurement

Pressure Ranges
1.6, 3 bar absolute (25, 45 psi absolute)
10, 15, 30, 80, 125, 250 bar absolute or sealed gauge
(145, 217, 435, 1160, 1810, 3625 psi absolute or sealed gauge)

Note 1: All ranges are 0 based.
Note 2: Sealed Gauge ranges are available on PMP (Amplified) options only.

Overpressure
Stainless steel: 2 x rated pressure or 375 bar (5440 psi) maximum
Titanium: 2 x rated pressure

Pressure Containment
Stainless steel: 375 bar (5440 psi) maximum
Titanium: 500 bar (7250 psi) maximum

Media Compatibility
Fluids compatible with stainless steel 316L or titanium grade 2 and 4

Resolution
Infinite

Excitation Voltage
PDCR 4300: 10 VDC nominally
(Other regulated DC excitation levels can be specified)
PMP 4300: 12 VDC ±4 VDC

Supply Current
PDCR 4300: <2 mA
PMP 4300: <5 mA

Zero Offset
PDCR 4300: ±3 mVDC
PMP 4300: ±50 mVDC

Span Setting
PDCR 4300: ±3 mV
PMP 4300: ±50 mVDC

Performance Specifications

Accuracy
PDCR 4300:
• ±0.2% full scale (FS) Best Straight Line (BSL) all ranges
PMP 4300:
• ±0.1% full scale (FS) Best Straight Line (BSL) for ranges up to (and including) 60 bar (870 psi)
• ±0.2% FS BSL for ranges above 60 bar (870 psi)

Long Term Stability
<0.1% FS/year at reference conditions

Operating Temperature Range
-30° to 175°C (-25° to 350°F)

Compensated Temperature Range
Choose one of four options:
-30° to 175°C (-25° to 350°F)
0° to 175°C (32° to 350°F)
20° to 150°C (68° to 300°F)
40° to 170°C (104° to 340°F)

Thermal Performance

<table>
<thead>
<tr>
<th>Temp. Range</th>
<th>PDCR43xx</th>
<th>PMP43xx</th>
</tr>
</thead>
<tbody>
<tr>
<td>-30 to +175°C</td>
<td>±3.1% FS referred to 20°C</td>
<td>±2% FS referred to 20°C</td>
</tr>
<tr>
<td>0 to +175°C</td>
<td>±2.6% FS referred to 20°C</td>
<td>±1.75% FS referred to 20°C</td>
</tr>
<tr>
<td>+20 to +150°C</td>
<td>±2% FS referred to 20°C</td>
<td>±1.3% FS referred to 20°C</td>
</tr>
<tr>
<td>+40 to +170°C</td>
<td>±2% FS referred to 40°C</td>
<td>±1.3% FS referred to 40°C</td>
</tr>
</tbody>
</table>

Temperature Signal Output (Optional)
PDCR 4300: 1.5 VDC ±1 VDC at 20°C (70°F)
PMP 4300: 2.9 VDC ±0.5 VDC at 20°C (70°F)

Temperature Signal Sensitivity (Optional)
PDCR 4300: 3 mV/°C ±2 mV/°C
PMP 4300: 7 mV/°C ±1 mV/°C

Insulation Resistance
>100 MΩ at 50 VDC

Output Impedance
PDCR 4300: 2 kΩ nominal
PMP 4300: <100 Ω

Physical Specifications

Pressure Connection
Select from the standard fittings listed in the ordering information.

Electrical Connection
• 1 m (3.28 ft) of 5 core Raychem cable spec EPD 96401A
• 5 pin Deutsch Hermetic AS-Micro

Weight
PDCR 4300:
• AS micro stainless steel: <28 g (1 oz)
• AS micro titanium: <16 g (0.5 oz)
• Cable and stainless steel: <53 g (1.8 oz)
• Cable and titanium: <43 g (1.5 oz)
• Cable versions quoted with 1 m (40 in.) of cable
Options

1. Mating electrical connector (supplied loose)
2. Temperature signal output

Calibration Standards

Transducers manufactured by Baker Hughes are calibrated against precision pressure calibration equipment, which is traceable to International Standards.

4300 Series Ordering Information

1) Specify the model number

<table>
<thead>
<tr>
<th>Output Type</th>
<th>Model Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>PMP</td>
<td>43</td>
<td>Amplified Voltage output</td>
</tr>
<tr>
<td>PDCR</td>
<td>43</td>
<td>Passive mV output</td>
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</table>

Electrical Connector

1. Raychem cable
6. Deutsch Hermetic 5 pin AS micro

Material of Construction

1. Stainless steel
2. Titanium

Output Voltage

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OV1</td>
<td>0.2 to 4.7 V (Note 1)</td>
</tr>
<tr>
<td>OV2</td>
<td>0.2 to 4.5 V (Note 1)</td>
</tr>
<tr>
<td>OV3</td>
<td>0 to 50 mV (Note 2)</td>
</tr>
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</table>

Compensated Temperature Range

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>-30 to +175°C</td>
</tr>
<tr>
<td>T2</td>
<td>20 to +150°C</td>
</tr>
<tr>
<td>T3</td>
<td>40 to +170°C</td>
</tr>
<tr>
<td>T4</td>
<td>0 to +175°C</td>
</tr>
</tbody>
</table>

Pressure Connections

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PB</td>
<td>GI/4 Male Flat</td>
</tr>
<tr>
<td>PD</td>
<td>GI/8 Male 60° Int Cone (Note 4)</td>
</tr>
<tr>
<td>PF</td>
<td>1/4 NPT Male</td>
</tr>
<tr>
<td>PG</td>
<td>1/8 NPT Male</td>
</tr>
<tr>
<td>P13</td>
<td>M14 x 1.5 60° Int Cone</td>
</tr>
<tr>
<td>P14</td>
<td>M8 x 1 Male</td>
</tr>
<tr>
<td>P18</td>
<td>M10 x 1 Male</td>
</tr>
<tr>
<td>P19</td>
<td>M10 x 1 Male 90° Ext Cone (Note 4)</td>
</tr>
<tr>
<td>P20</td>
<td>3/8-24 UNF Male</td>
</tr>
<tr>
<td>P21</td>
<td>5/16-24 UNJF MS33656 Male</td>
</tr>
<tr>
<td>P22</td>
<td>7/16-20 UNF Flat End 74°</td>
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<tr>
<td>P23</td>
<td>GI/8 BSP Male</td>
</tr>
<tr>
<td>P24</td>
<td>M10 x 1 Male Snubber</td>
</tr>
<tr>
<td>PS6</td>
<td>M10 x 1 Male Wirelock (Note 4)</td>
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</table>

Options

<table>
<thead>
<tr>
<th>Letter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Mating electrical connector (Note 3)</td>
</tr>
<tr>
<td>B</td>
<td>Temperature signal output (Note 5)</td>
</tr>
</tbody>
</table>

Note 1: Select with output type PMP
Note 2: Select with output type PDCR
Note 3: Suitable for electrical connector option 6
Note 4: Only available in stainless steel construction
Note 5: If selected on PDCR436*, pin 5 is not connected to case

Example: PMP4311-OV1-T4-P18-B, 10 bar, absolute, 2 m cable
2) State the pressure range and units
Pressure ranges are all zero based and can be any value from 1.6 bar to 250 bar. Unit options are:
- bar
- psi
- kPa

3) State the pressure reference
Reference options are:
- Absolute
- Sealed gauge (Only for PMP versions of 10 bar range or above)

4) State cable length and units
- Default cable length is 1 m (3 ft)
- Longer cables can be requested up to a maximum of 10 m (33 ft)