Features

- Maintains consistent output under pressure shock and vibration conditions.
- Temperature Compensation provides stable operation under environmental changes.
- Adjustable Positive and Negative Bias permits use with various final control elements.
- High Output Flow meets requirements for most industrial control applications.
- Adjustable Gain allows a single device to cover most industrial and process control requirements.

Operating Principles

The T5221 Transducer is an electro-pneumatic device that converts a DC current or voltage input signal to a proportional output pressure. This device is made up of four sections, the Signal Conversion Section, the Pneumatic Section, the Ratio Section, and the Booster Section.

The Signal Conversion Section (PC Board) accepts a DC current or voltage. This signal current is applied to a Coil which creates a magnetic force that moves a Flexure Arm.

The Pneumatic Section operates as a force balance system. A Sapphire Ball floats inside a Nozzle and controls the output pressure by exhausting air supplied through an Orifice. This Sapphire Ball acts as a piston exerting a force which is balanced against the force transferred to the Flexure arm by the Coil. Signal pressure from the Pneumatic Section is routed to the underside of the Signal Diaphragm in the Ratio Section. Signal pressure acting on the Signal Diaphragm transmits a force through the lever to the Control Diaphragm of the booster. The output pressure is a function of signal pressure times the ratio of lever arm lengths on either side of the Pivot.

The Booster Section supplies the unit's output pressure. At set point, the lever Arm force acting on the top of the Control Diaphragm is balanced by the force due to the booster output pressure acting on the underside of the Control Diaphragm.
Hazardous Area Specifications

<table>
<thead>
<tr>
<th>Factory Mutual (FM) Approvals</th>
<th>Intrinsically Safe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Entity Parameters</strong></td>
<td>TFN5221 NEMA 4X Enclosure</td>
</tr>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Voc = 40 VDC</td>
<td></td>
</tr>
<tr>
<td>Isc = 200 mA</td>
<td></td>
</tr>
<tr>
<td>Ca = 0 F</td>
<td></td>
</tr>
<tr>
<td>La = 0 mH</td>
<td></td>
</tr>
<tr>
<td><em>(Voc = Open Circuit Voltage)</em></td>
<td></td>
</tr>
<tr>
<td><em>(Isc = Short Circuit Voltage)</em></td>
<td></td>
</tr>
<tr>
<td><em>(Ca = External Capacitance)</em></td>
<td></td>
</tr>
<tr>
<td><em>(La = External Inductance)</em></td>
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</tbody>
</table>

**Canadian Standards Association (CSA) Approvals**

Approvals are valid when connected through a Shunt Zener Diode Safety Barrier meeting the following parametric requirements:

Rated: 28V Maximum 300 Ohm Minimum

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**Specifications**

**Output Range**
Minimum: 10" (25.4 cm) Water Column to 50" (127 cm)
Water Column
Maximum: 0-150 psig, [0-10 BAR], (0-1000 kPa)

**Supply Pressure**
Transducer: 20 + 2 psig, [1.5 + 0.15 BAR], (150 + 15 Kpa)
Ratio Relay: 250 psig, [17 BAR], (1700 kPa)

**Air Consumption**
0.36 (0.6 m³/HR) Maximum

**Output Capacity (SCFM)**
40 (68 m³/HR) Maximum with 100 psig, [7 BAR], (700 kPa)
Booster supply

**Exhaust Capacity (SCFM)**
5.5 (9.4 m³/HR) downstream pressure @ 5 psig, [.35 BAR],
(35 kPa) above 20 psig, [.15 BAR], (150 kPa) setpoint.

**Supply Pressure Effect**
Transducer: 1 % of Span for a + 2 psig, [.15 BAR],
(15 kPa) change.
Ratio Relay: Less than 0.1 psig, [.007 BAR], (.7 kPa) for
100 psig, [7 BAR], (700 kPa) change.

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**Terminal Based Linearity**
+ 0.50 % Full Scale

**Independent Linearity**
+ 0.25 % Full Scale

**RFI/EMI Effect**
Less than 0.5% of Span @ 30 v/m class 3 Band ABC (20-1000 mHz)
per SAMA PMC 33.1 1978 and less than 0.5% of Span @ 10 v/m level
3, 27-500 mHz Band per IEC Standard 801-3 1984, EMC Directive
89/336/EEC European Norms EN 50081-2 and EN 50082-2.

**Impedance / Input Signal**

<table>
<thead>
<tr>
<th>Range</th>
<th>OHMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 mA</td>
<td>2000</td>
</tr>
<tr>
<td>4-20 mA</td>
<td>120 (Add 332 OHMS for CSA units)</td>
</tr>
<tr>
<td>10-50 mA</td>
<td>50 (Add 332 OHMS for CSA units)</td>
</tr>
<tr>
<td>1-5 VDC</td>
<td>375</td>
</tr>
<tr>
<td>1-9 VDC</td>
<td>2550</td>
</tr>
</tbody>
</table>

**Ambient Temperature**
-40 °F to +150 °F, (-40 °C to 65.5 °C)

**Materials of Construction**
Body and Housing: Aluminum
Ball and Orifice: Sapphire
Nozzle: Stainless Steel

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*Supply Pressure must be no less than 10 psig, [0.7 BAR], (70 kPa) above max. booster output.*
Model T5221 Electro-Pneumatic I/P, E/P Transducer

Catalog Information

Catalog Number: T 5221

Underwriting Group
- Canadian Standard: C
- Factory Mutual: F

Approval Class
- Intrinsically Safe: I

Input
- 1-5 mA
- 4-20 mA
- 10-50 mA
- 1-5 VDC
- 1-9 VDC

Output
- psig
- [BAR]
- (kPa)

Options
- Tamper Proof: T

Installation
For installation instructions, refer to the Fairchild T5221 Electro-Pneumatic Transducer Installation, Operation and Maintenance Instructions, IS-500T5221.

For operation instructions, refer to the Fairchild T5221 Electro-Pneumatic Transducer Installation, Operation and Maintenance Instructions, OM-500T5221.

Mounting Kits

Model T5221 Transducer Kits & Accessories

Mounting Bracket: 15307-1

Mounting Bracket Kits 15307-1 (included with unit)