# FINE CONTROLS (UK) LTD

Fine Controls have been supplying process controls & instrumentation equipment since 1994, & now serves an ever expanding customer base, both in the UK & globally.

We offer a full range of valve & instrumentation products & services, with our product rangerepresenting leading technologies & brands:

**Flow:** Flow Meters & Transmitters, Flow Switches, Flow Control Valves & Batch Control Systems

**Temperature:** Temperature Probes & Thermowells, Temperature ransmitters,Temperature Regulators & Temperature Displays

**Level:** Level Transmitters & Switches

**Pressure:** Pressure Gauges &Transmitters, Precision & High Pressure Regulators & I-P Converters, Volume boosters.

**Precision Pneumatics:** Pressure Regulators, I-P Converters, Volume Boosters, Vacuum Regulators

**Valves:** Solenoid & Pneumatic Valves, Control Valves & Positioners, Actuated Ball, Globe or Diaphragm Valves & Isolation Valves

**Services:** Repair, Calibration, Panel Build, System Design & Commissioning

A rotork Brand FAIRCHILD

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SIEMENS

alcon SOLENOID VALVES

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SOLDO CONTROLS

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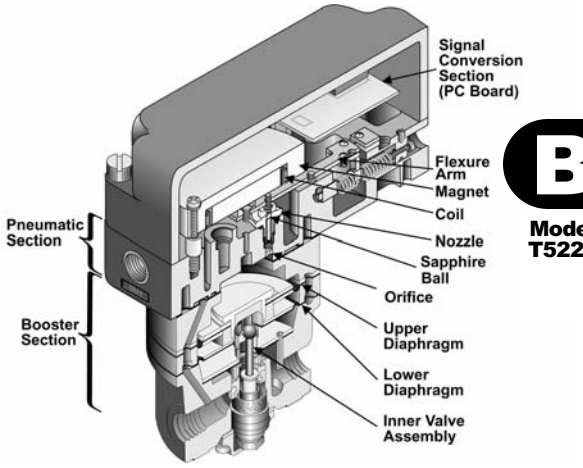
Fine Controls (UK) LTD, Bassendale Road, Croft Business Park,
Bromborough, Wirral, CH62 3QL UK
Tel: 0151 343 9966
Email: sales@finecontrols.com

## Features

- Fast Response to Input Signal changes results in faster loop control and savings in process materials.
- Integrated Volume Booster Output meets input requirements of final control elements requiring a higher capacity output signal and/or increased output pressure.
- Six Input Signal Ranges meet most process and machine requirements.
- Negative Bias Option allows zero pressure based operation.
- Five Booster Ratios meet industrial equipment requirements for higher output pressure ranges.
- Temperature Compensation provides stable operation under environmental changes.
- Vibration Resistance maintains set points under adverse vibration conditions.
- Various Mounting Configurations allow installation flexibility for most applications.
- NEMA 3R or optional NEMA 4X Enclosure for outdoor and indoor installations.
- Conduit Port for convenient wiring.





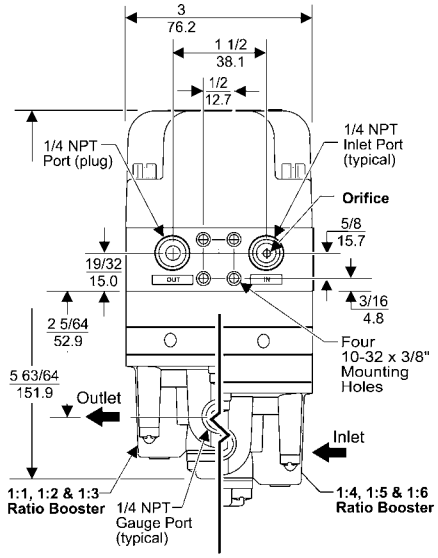

## Operating Principles

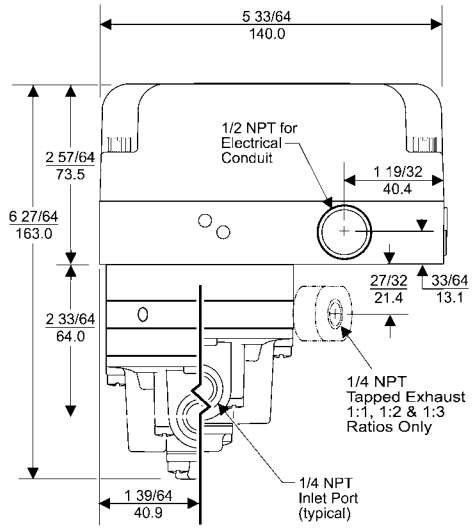
The T5220 Transducer is an electro-pneumatic device that converts a DC current or voltage input signal to a proportional pneumatic output This device is made up of two sections, the Signal Conversion Section and the Pneumatic Section.

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

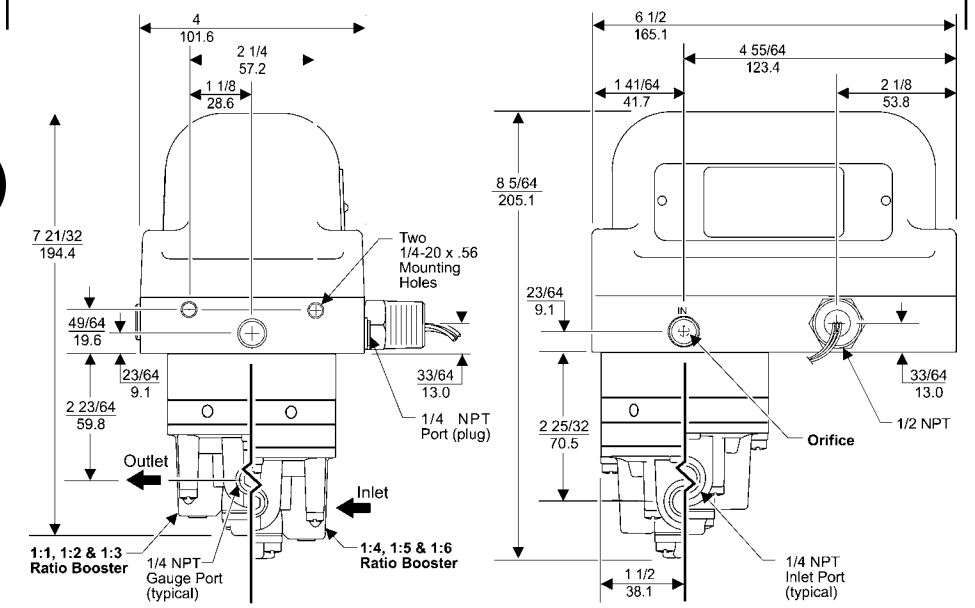
The Pneumatic Section operates as a force balance system. A Sapphire Ball floats inside a Nozzle and controls the output pressure by exhausting air supplied through an Orifice. This Sapphire Ball acts as a piston exerting a force which is balanced against the force transferred to the Flexure Arm by the Coil.

The Booster Section amplifies the output pressure of the transducer. At set point, the force due to transducer output pressure acting on the top of the Upper Diaphragm is balanced by the force due to booster output pressure acting on the underside of the Lower Diaphragm.



**T5220 Explosion-Proof**

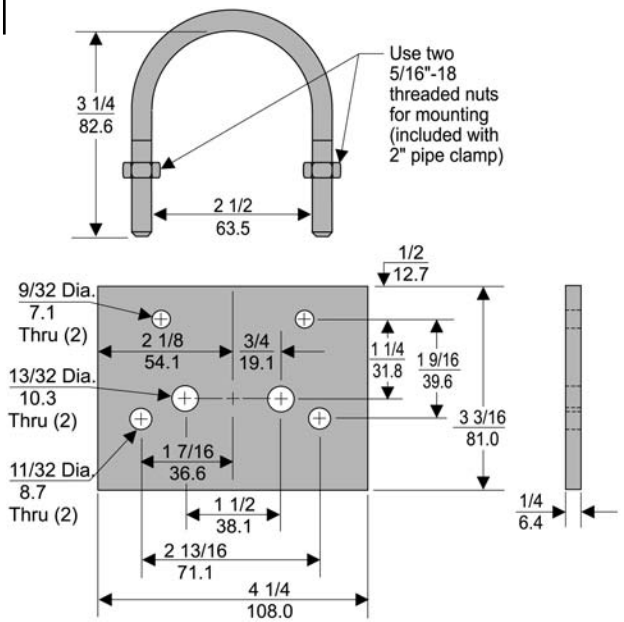



## Hazardous Area Specifications

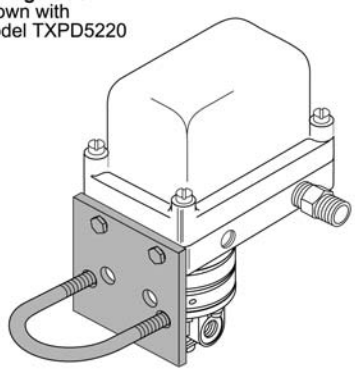
| | Explosion-Proof | Intrinsically Safe |
|---|---|---|
| **Factory Mutual (FM) Approvals** | **TFXPD5220**<br>Class I, Division 1, Groups B, C and D;<br>Class II, Division 1, Groups E, F, and G;<br>Maximum Ambient 65° C. | **TFI5220**<br>Class I, Division 1, Groups A, B, C, and D;<br>Class II, Division 1, Groups E, F, and G;<br>Class III, Division 1, Fibers;<br>NEMA 3R Enclosure. ***(Upright Position ONLY)*** |
| | **TFXPDI5220**<br>Class I, Division 1, Groups A, B, C, and D;<br>Class II, Division 1, Groups E, F, and G;<br>Class III, Division 1, Fibers;<br>NEMA 3R Enclosure. ***(Upright Position ONLY)*** | ***Entity Parameters***<br>$Voc^1$ = 40 VDC; $Ca^3$ = 0 µF<br>$Isc^2$ = 125 mA; $La^4$ = 0 mH<br>*[1]Voc = Open Circuit Voltage; [3]Ca = External Capacitance*<br>*[2]Isc = Short Circuit Voltage; [4]La = External Inductance* |
| | **TFN5220**<br>NEMA 4X Enclosure. | |
| **Canadian Standards Association (CSA) Approvals** | | **TCI5220**<br>Class I, Division 1, Groups A, B, C, and D;<br>Class II, Division 1, Groups E, F, and G;<br>Type 3 Enclosure;<br>Rated 1-5 mA, 4-20 mA, 10-50 mA,<br>1-5 VDC, 1-9 VDC;<br>Temperature Code T4A. |
| FM APPROVED | | ***Approvals are valid when connected through a Shunt Zener Diode Safety Barrier meeting the following parametric requirements:***<br>Rated: 28V Maximum 300 Ohm Minimum |

## Mounting Kits

### 14140

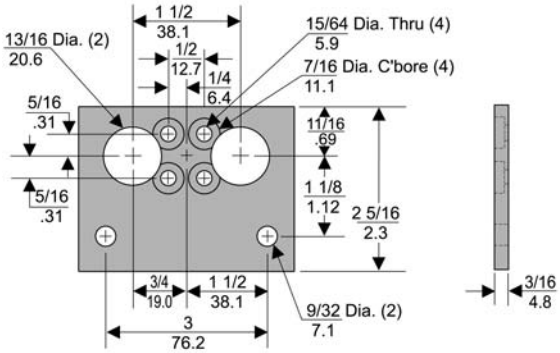



**2" Pipe Mounting Configuration** shown with Model TXPD5220



**Mounting Kit 14140**
Includes the following:
Mounting Plate • 2" Pipe Clamp
Support Bar • Two 1/4" Lockwashers
Two 1/4-20 x 5/8" Bolts • Two 3/8" Lockwashers
Two 3/8-16 Nuts • Two 3/8-16 x1 1/2" Caps

### 15268

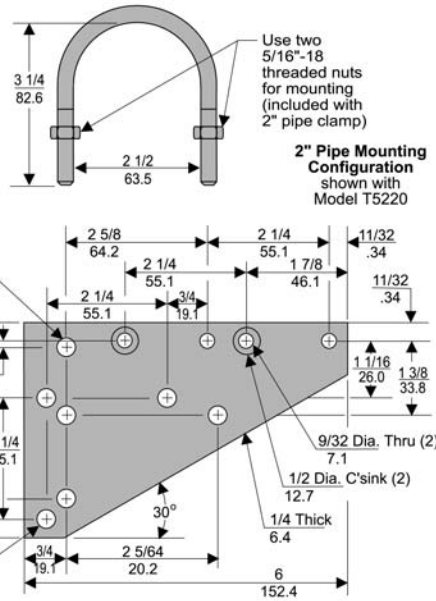



**Panel Mounting Configuration** shown with Model T5220

**NOTE:** For Outdoor Use, Mount In Upright Position. (cover up)

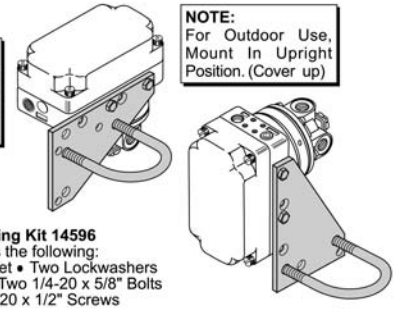
**Mounting Kit 15268**
Includes the following:
Mounting Bracket • Four 10-32 x 7/16" Screws

### 14596




**NOTE:** If Not Mounted In An Upright Position, Zero & Span Adjustments Must Be Re-Calibrated For Proper Output Range.

**NOTE:** For Outdoor Use, Mount In Upright Position. (Cover up)



**Mounting Kit 14596**
Includes the following:
Mounting Bracket • Two Lockwashers
2" Pipe Clamp • Two 1/4-20 x 5/8" Bolts
Two 1/4-20 x 1/2" Screws

## Model T5220 Transducer Kits & Accessories

**Mounting Bracket Kits**.....14140 (sold separately)
15268 (sold separately)
14596 (sold separately)

## Specifications

**Supply Pressure**[1]
20 + 2 psig, [1.5 + 0.15 BAR], (150 + 15 kPa)

**Output Capacity (SCFM)**
15 (25.5 m³/HR) Max. @ 20 psig, [1.5 BAR], (150 kPa) supply. 45 (76.5 m³/HR) @ 100 psig, [7.0 BAR], (700 kPa) (with separate supply.)

**Exhaust Capacity (SCFM)**
7 (11.9 m³/HR) downstream pressure @ 5 psig, [.35 BAR], (35 kPa) above 3 psig, [0.2 BAR], (20 kPa) set point.
14 (23.8 m³/HR) downstream pressure @ 5 psig, [.35 BAR], (35 kPa) above 15 psig, [1.0 BAR], (100 kPa) set point.

**Air Consumption (SCFM)**
0.28 (0.48 m³/HR) Max. (dead end) @ 20 psig, [1.5 BAR], (150 kPa) supply

**Output Range (1:1 Ratio)**
3-15 psig, [0.2-1.0 BAR], (20-100 kPa)

**Supply Pressure Effect**
+ 0.3% of Span for a 1 psig, [0.07 BAR], (7 kPa) supply change between 18-22 psig, [1.2-14.5 BAR], (120-145 kPa).

**Shock & Vibration Effect**
Negligible up to 2 g's between 5 Hz and 200 Hz

**Terminal Based Linearity**
+ 0.50% Full Scale (T5220 only), within 0.6% Output Span (T5222-T5226)

**Independent Linearity**
within 0.25% Full Scale (T5220 only), within 0.3% Output Span (T5222-T5226)

**Hysteresis & Repeatability**
within 0.1% Full Scale (T5220 only), within 0.1% Times Ratio of Output Span (T5222-T5226)

| **Impedence / Input Signal** | ***Range*** | ***OHMS (nominal)*** |
|---|---|---|
| | 1-5 mA | 2000 |
| | 4-20 mA | 120[2] |
| | 10-50 mA | 50[2] |
| | 1-5 VDC | 375 |
| | 0-6 VDC | 375[3] |
| | 0-12 VDC | 2550[3] |
| | 1-9 VDC | 2550 |

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

**Temperature Coefficient**
Less than 1% of Span / 50° F (10° C)

**Materials of Construction**
Body and Housing . . . . . Aluminum
Ball and Orifice . . . . . Sapphire, Brass
Nozzle . . . . . Stainless Steel

## Pressure Ranges

| **Ratio** | **Standard Output** | | | **Negative Bias Output (B) Option** | | |
|---|---|---|---|---|---|---|
| | psig | [BAR] | (kPa) | psig | [BAR] | (kPa) |
| 1:1[1] | 3-15 | [0.2-1.0] | (20-100) | 0-12 | [0-0.8] | (0-80) |
| 1:2[2] | 6-30 | [0.3-2.0] | (30-200) | 0-24 | [0-1.5] | (0-150) |
| 1:3[2] | 9-45 | [0.6-3.0] | (60-300) | 0-36 | [0-2.5] | (0-250) |
| 1:4[2] | 12-60 | [0.9-4.0] | (90-400) | 0-48 | [0-3.0] | (0-300) |
| 1:5[2] | 15-75 | [1.0-5.0] | (100-500) | 0-60 | [0-4.0] | (0-400) |
| 1:6[2] | 18-90 | [1.2-6.0] | (120-600) | 0-72 | [0-5.0] | (0-500) |

[1] Standard unit is configured for common supply to transducer and booster.

[2] Units require 20 psig, [1.5 BAR], (150 kPa) for transducer and a separate supply for booster. A common supply of up to 110 psig, [7.7 BAR], (770 kPa) can be used provided the prefix Z147 is added to the original order, and the supply pressure is noted.

## Catalog Information

**Catalog Number T [ ][ ][ ][ ] 522 [ ]-[ ][ ][ ]**

**Underwriting Group**
Factory Mutual . . . . . F
Canadian Standard . . . . . C

**Approval Class**
Explosion-Proof[1] . . . . . XPD
NEMA 4X/IP65[1] . . . . . N
None (leave blank) . . . . .

Intrinsically Safe[2] . . . . . I
None (leave blank) . . . . .

**Options**
Negative Bias- *3 psig, [0.2 BAR], (20 kPa)* . . . . B
High Option[3] . . . . . HI

**Booster Ratio**[4]
1:1 (standard) . . . . . 0
1:2 . . . . . 2
1:3 . . . . . 3
1:4 . . . . . 4
1:5 . . . . . 5
1:6 . . . . . 6

**Input**
1-5 mA . . . . . 1
4-20 mA . . . . . 4
10-50 mA[5] . . . . .
1-5 VDC . . . . . 5
0-6 VDC[6] . . . . . 6
0-12 VDC[6] . . . . . 8
1-9 VDC . . . . . 9

**Output**
psig . . . . . 0
[BAR] . . . . . 1
(kPa) . . . . . 2

**Options**
Tapped Exhaust - *1:1, 1:2, or 1:3 Ratios Only* . . . . . E

[1] Factory Mutual Approval Only.

[2] Intrinsically Safe Units cannot be set for Reverse Acting Mode in field.

[3] If high flow (SCFM) is required for the standard 1:1 ratio, select HI Option. Separate supply is required.

[4] Refer to Table 1. for Pressure Ranges

[5] Units shipped calibrated 4-20 mA; 10-50 mA units must be calibrated in field.

[6] Not approved for intrinsically safe ratings.

## Installation

For Installation Instructions, refer to the *Fairchild T5220 Series Electro-Pneumatic Transducer Installation, Operation & Maintenance Instructions,* IS-500T5220.