

Type 3210 & 3220

Analog Weatherproof Regulators

Description

The Type 3210 single loop and 3220 double loop electro-pneumatic servo pressure controllers incorporate two solenoid valves and an internal pressure sensor for increased sensitivity and accuracy. With current or voltage signal inputs, the Type 3210/3220 controls an output pressure with an accuracy of $\pm .5\%$ or better full scale. A wide range of output pressures available, from 29" Hg vacuum to 600 psig. With a flow of 1.25 SCFM at 100 PSI, the 3210/3220 can be used alone or in conjunction with a volume booster to achieve flow rates in excess of 2,000 SCFM. The double loop (3220) option permits 0-10 VDC feedback from a remote sensor.

Applications include: Semiconductor, Robotics Controller, Machine Automation, Tire Manufacturing and Testing, Molding and Forming Operations and a wide variety of industrial applications.

Features

- Weatherproof Enclosure
- User Selectable Input Signal
- Analog Monitor Output
- Single Loop and Dual Loop Control
- 1.25 SCFM Flow Rate

Type 3210/3220 Ordering Information

2	0	0	600	P	1		
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
0	0	0	0	0	0	0	0
M	M	M	M	M	M	M	M
T	T	T	T	T	T	T	T
O	O	O	O	O	O	O	O
E	E	E	E	E	E	E	E
I	I	I	I	I	I	I	I
0	0	0	0	0	0	0	0
G	G	G	G	G	G	G	G
A	A	A	A	A	A	A	A
V	V	V	V	V	V	V	V
W	W	W	W	W	W	W	W
600	600	600	600	600	600	600	600
P	P	P	P	P	P	P	P
0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
1	1	1	1	1	1	1	1
00	00	00	00	00	00	00	00
14	14	14	14	14	14	14	14
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—

Number of Loops

1 Loop
2 Loop

Logic Output

CMOS

TTL

Open-Collector

Analog Control

Signal

0-10V

4-20mA

Lower Output

Pressure

Lower Limit of Output

Pressure

Pressure Units

PSIG

PSIA absolute

Vacuum

Inches of water

column

Upper Output

Pressure

Upper Limit of Output

Pressure (PSIG)

Mounting

Pipe (in-line)

Supply and Output

Ports

1/8 NPT

1/8 BSPT

1/8 BSPP

Connector

Options

None

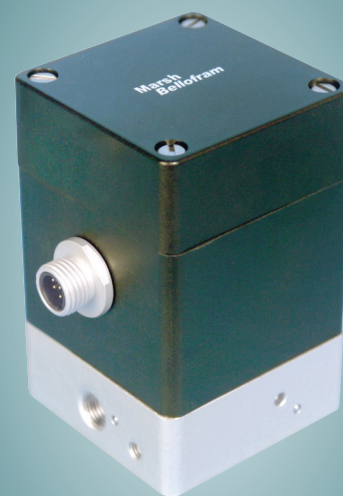
12 VDC supply

External Volume Booster:

X2, X3, Z2, Z3, Z4, N3, N4,

N6, N8, Q6, Q8, QA, QB,

QC: see chart on page 88



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Type 3210 and 3220

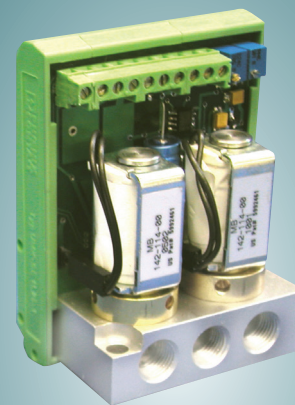
Performance	Full-Scale Accuracy 0.5%	
Electrical Inputs		
Supply Voltage	15-24VDC (12VDC option)	
Stand by Supply Current	80 mA	
Maximum Supply Current	325 mA	
E/P Control	0-10V, 10K OHMS	
I/P Control	4-20 mA, 250 OHMS	
2nd-loop Remote Sensor Feedback	T3220: 0-10V	
Electrical Outputs		
Monitor Output	0-10V	
Logic Output	CMOS, TTL, Open-Collector	
Pneumatic Inputs	Max. Output PSIG (BAR)	Max. Supply PSIG (BAR)
Supply Pressure	Up to 5 (.35)	20 (1.4)
	>5 to 15 (.35-1.03)	30 (2.1)
	>15 to 30 (1.03-2.1)	60 (4.1)
	>30 to 100 (2.1-6.9)	165 (11.4)
	>100 to 150 (6.9-10.3)	200 (13.8)
	>150 to 300 (10.3-20.7)	350 (24.1)
	>300 to 600 (20.7-41.4)	650 (44.8)
Pneumatic Outputs		
Full-scale Atmospheric Pressure Ranges	1, 5, 15, 30, 100, 150, 300, 500, 600 PSIG	
	0.07, 0.35, 1.03, 2.07, 6.9, 10.34, 20.68, 34.47, 68.95 BAR	
Vacuum Pressure Ranges	30" Hg, 150 PSIA (2.1 BAR, 10.3 BAR)	
Forward Flow Capacity	1.25 SCFM (35.4 LPM)	
Exhaust Flow Capacity	1.25 SCFM (35.4 LPM)	
Environmental		
Operating Temperature	32-141°F (0-60°C)	
Media-Wetted Materials	Aluminum, copper alloys, nickel, buna-n, silicon, 316SS	
Required Accessories	6-pin micro cordset	
Recommended Accessories	DIN-rail Bracket, Panel Bracket, Power Supply, Control Knob, Remote Pressure Sensor, External Volume Booster	

Type 3000

Comparison of I/P's

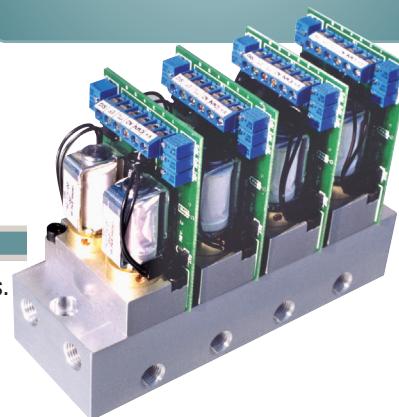
Type 3000 Series Comparison Chart

T1000, T1500, T1001 and T2000	T3000 Series
Steady Air Consumption	Minimal Air Consumption at Steady State
Many are Loop Powered	All Require Supply Voltage
Most Available in Intrinsically Safe or Explosion Proof Versions	No Hazardous Area Approvals
"Standard" Pressure Range to 120 PSI, No Vacuum Models, Limited Low Pressure Control Capability	Wide variety to 600 psi or vacuum, even possible in 0 to 0.2 psi range
Downstream Sensor Feedback Not Available	Second Loop Feedback Available
	Analog and Logic Output Signal Monitoring
	Digital Versions have Keypad or Serial User Interface
	Wide Range of Input Signal/Output Pressure Endpoint, Available in Digital



Type 3110

Type 3110
Manifold Mount



Air Quality

Bellofram specifies the use of instrument quality air (clean, dry, oil free) for all transducers. Transducers should be used within the following conditions:

Dew Point < 35°F (2°C) (indoor)

Oil Content < 1ppm

Particles < 3µm.

The use of filters in the supply air system is highly recommended. Contact us for information on our filters and filter regulators.

Type 3000 Series Electro-Pneumatic Transducers

		Packaging				
		DIN-mount Circuit Card	Weatherproof Enclosure			
		Low Flow (1.2 SCFM) (34 LPM)	Low Flow (1.2 SCFM) (34 LPM)	Medium Flow (15 SCFM) (425 LPM)	High Flow (60 SCFM) (1700 LPM)	Very High Flow (175 SCFM) (5000 LPM)
User Interface	Analog 0-10V 4-20mA	T3110, T3120 or T3111	T3210 or T3220	T3211, T3221 or T3311	T3212 or T3222	T3215
	Serial RS-485, RS-232, USB	T3410S or T3420S	T3510S or T3520S	T3511S or T3521S	T3512S or T3522S	
	Keypad/Display Programmer	N/A	T3510P or T3520P	T3511P or T3521P	T3512P or T3522P	
Mounting		DIN tray, manifold, panel	In-line, DIN-rail, panel bracket, or manifold	In-line, DIN-rail, panel bracket, or manifold	In-line, DIN-rail, panel bracket, or manifold	In-line or panel bracket

Type 3000 Series

Overview

Features and Capabilities

The Type 3000 series of electro-pneumatic transducers offers an innovative set of features and capabilities. Each electronic pressure regulator utilizes a pair of reliable quick-firing solenoid valves and an onboard pressure sensor to precisely control downstream pressure and at the same time achieve excellent accuracy and stability.

Feed-and-bleed transducers are inherently resistant to shock, vibration, and orientation. To size the regulator for the application, a selection of external volume boosters up to 2000 SCFM (56,000 lpm) are available.

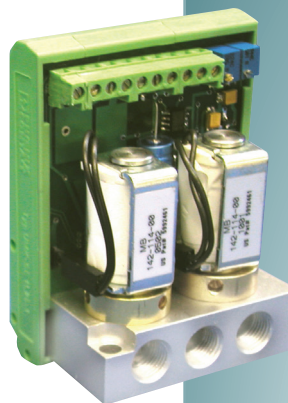
- Analog Control Signals: 0-10v, 4-20 mA, etc.
- Remote Sensor Feedback
- Monitor Output
- High/Low Logic Output
- Digital Signal Processing
- PID Tuning
- Deadband Adjustment
- Serial, Keypad/Display

Theory of Operation

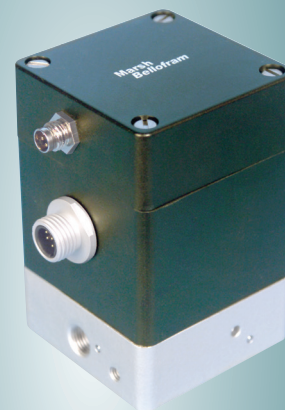
T3000 transducers utilize proven feed-and-bleed technology. The Supply Solenoid Valve feeds supply pressure to the downstream application. The Exhaust Solenoid Valve bleeds off overpressure. By monitoring the onboard pressure sensor (or the user-supplied remote sensor on two-loop units), the electronics rapidly fire one solenoid or the other to maintain the desired setpoint.

Standard Type 3000s hold output pressure upon loss of electrical power, as long as there are no downstream flow demands. Special versions are available for Fail High or Low Operation.

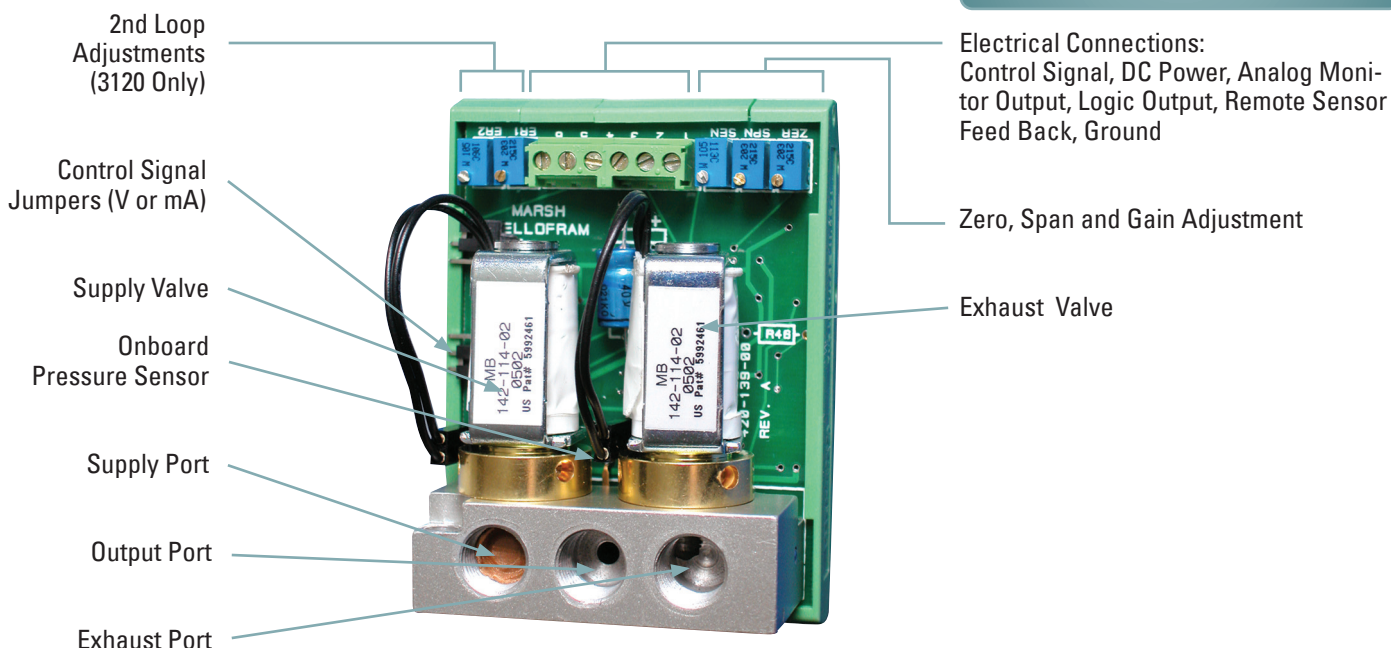
Type 3110



Type 3210



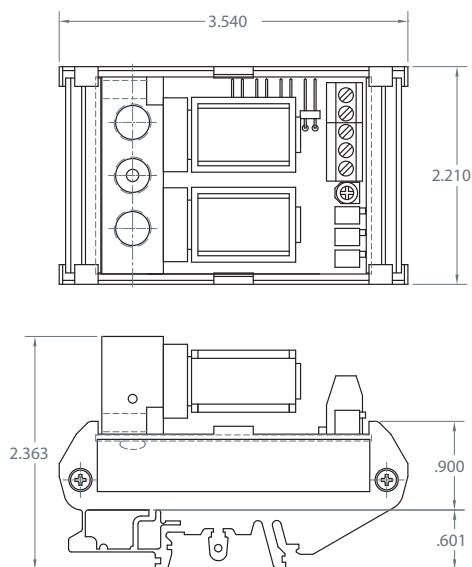
Type 3211



Dimensional Drawings

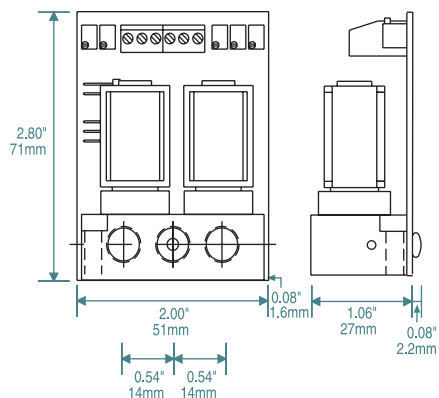
DIN Tray Mount

(3100, 3400)



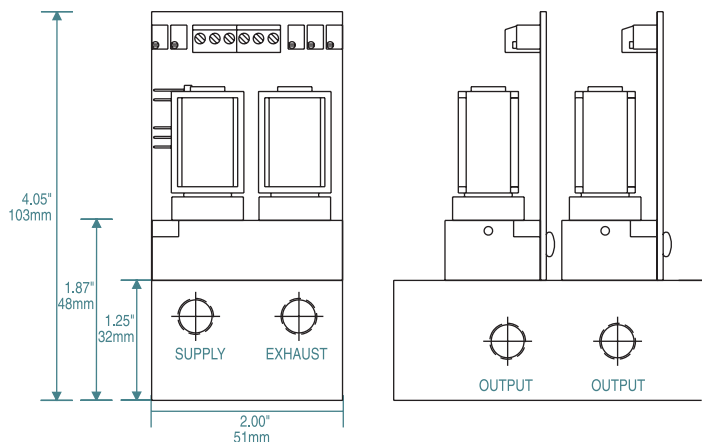
Panel Mount

(3100, 3400)



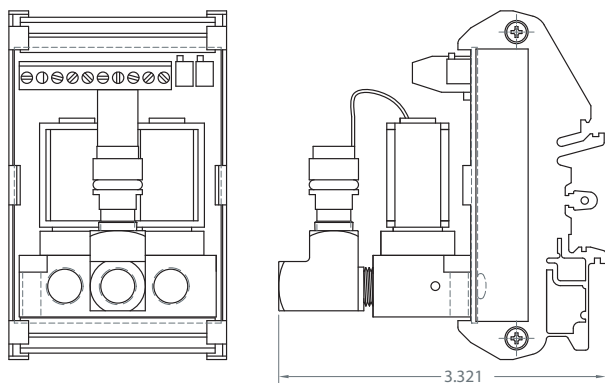
Manifold Mount

(3100, 3400)

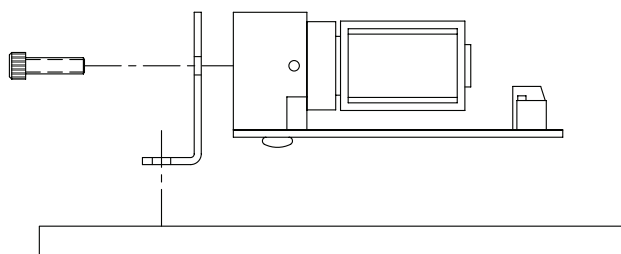


High-Pressure Units (>150 PSIG) T3111, 3410 and

High Pressure (>150 PSIG / 10.3 BAR) units

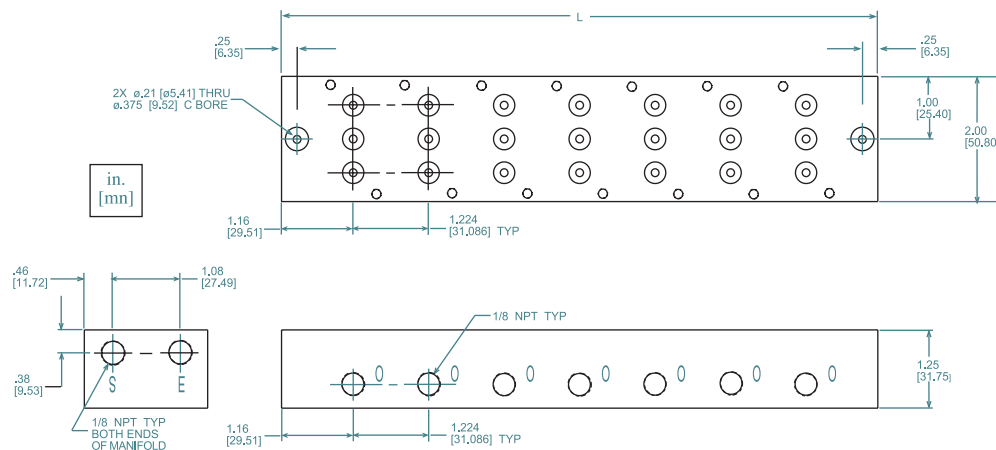


Flush Panel Mount T3100, T3111



Type 3100 and 3400 Series Manifold Block (7 Station Manifold Shown)

(7 station manifold shown)



Manifolds are available in 2 to 10 stations.

To calculate the overall length "L" of the manifold use the following formula:

$$L = 2 \times 1.16 + (S-1) \times 1.224$$

Where S = the number of manifold stations

EXAMPLE: 7 Station Manifold:

$$L = 2 \times 1.16 + (7-1) \times 1.224$$

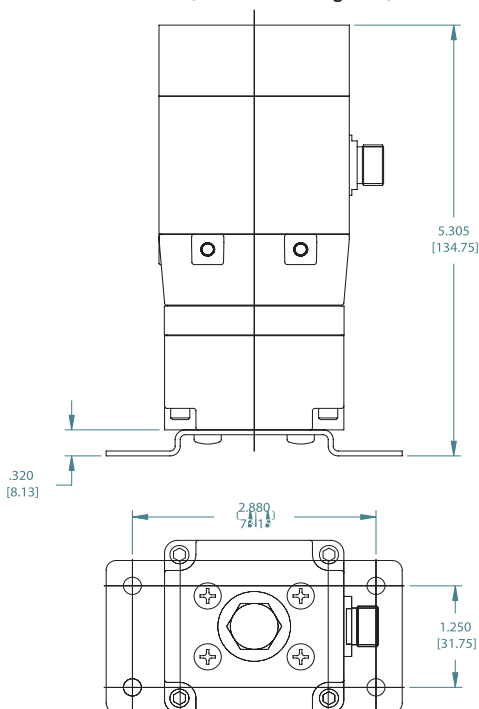
$$L = 9.664 \text{ in. [245.47 mm]}$$

Circuit Board Regulators — Mounting and Packaging

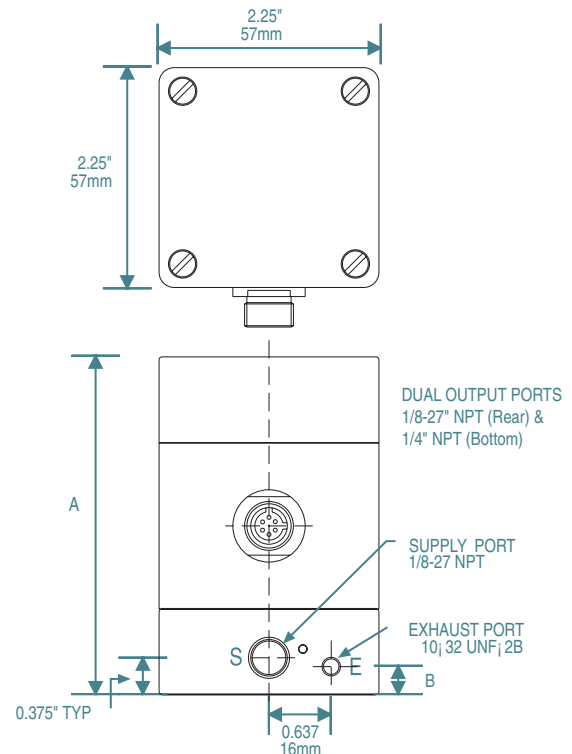
Mounting	Product Configuration	Accessories
DIN Tray	Product mounted in DIN Tray	None
Panel	Product configured for panel mounting	For 'flush' mounting, order Flush Mount Bracket (161-520-00) separately
Multi-Unit Manifold	Product configured for multi-unit manifold mounting	Order Multi-Unit Manifold (350-110-XX) separately. XX = # stations.

Weatherproof Regulator Mounting Options

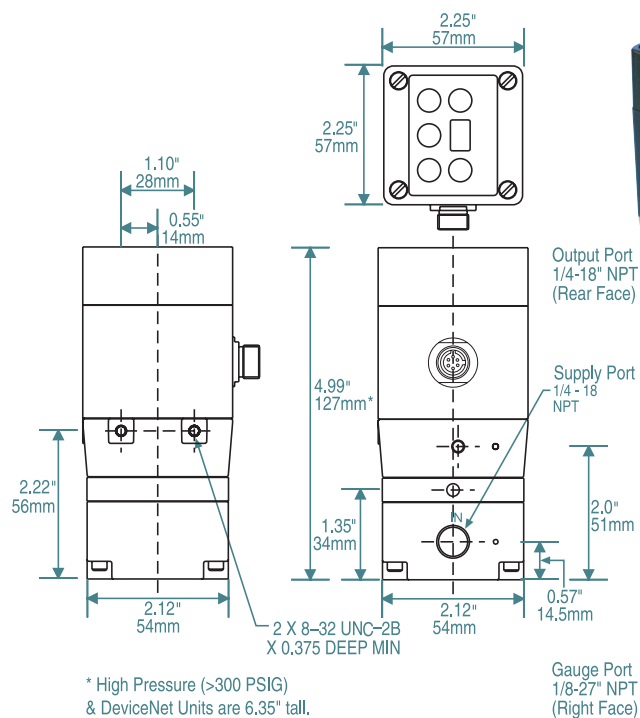
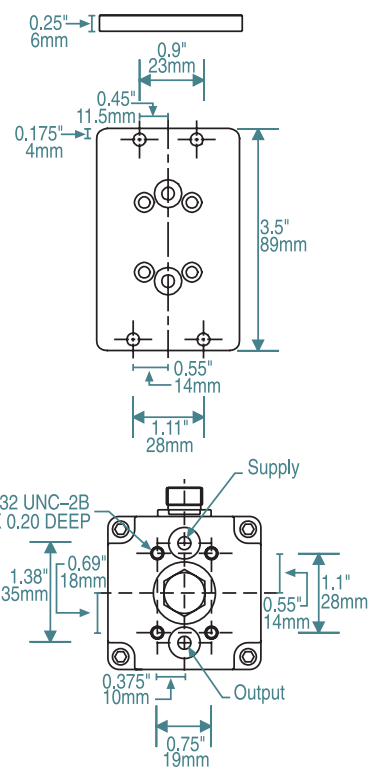
The Type 3200 and 3500 regulators can be mounted in-line or by brackets which are available separately (DIN-rail bracket — 010-115-000; Panel bracket — 010-135-000). Bracket mounting holes (2 X 8-32 UNC 2B X 0.375"/9.5mm deep minimum) are available on the rear and right faces (when looking at product with IN/OUT flow from left to right) and also on the bottom of the medium-flow booster (shown in diagram).



Low-Flow Weatherproof T3210, T3220, T3510,



	Pressure Range			
	"A" Dimensions		"B" Dimension	
	Inches	mm	Inches	mm
0-165 PSIG	3.46"	88 mm	0.285"	7.2 mm
0-350 PSIG	3.87"	98.3 mm	0.71"	18.0 mm
0-600 PSIG	5.43"	138 mm	0.71"	18.0 mm

Medium-Flow Weatherproof T3211, T3221, 3511,**Manifold Mount T3211, T3221, 3511, 3521****High-Flow Weatherproof T3212, T3222**