



# Type 650

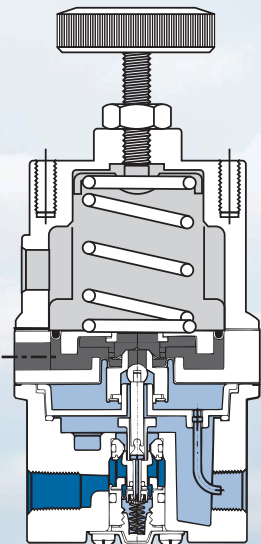
## Positive Bias Relay

Increases flow capacity plus adds an adjustable bias pressure

Used extensively for increased flow capacity or remote pressure control applications, the Type 650 positive bias relay is a signal operated regulator that provides an output pressure that is the sum of the input signal pressure plus an adjustable preset bias. The unit allows flow capacities up to 50 SCFM with minimal pressure drop. The Type 650 is most often used for conversion of a low flow control signal to the higher flow requirements of an operating system.

### Features

- **High Flow Capacity**  
Allows flows up to 50 SCFM
- **Four Bias Ranges**  
From 0-15 psi to 2-150 psi
- **High Relief Capacity**  
Large relief valve provides 15 SCFM relief capacity
- **Balanced Supply Valve**  
Rolling diaphragm design makes unit insensitive to supply pressure variation
- **Accurate Pressure Conversion**  
High sensitivity achieves accurate conversion of signal to output with no lag



- Supply Pressure
- Output Pressure
- Signal Pressure
- Atmospheric Pressure

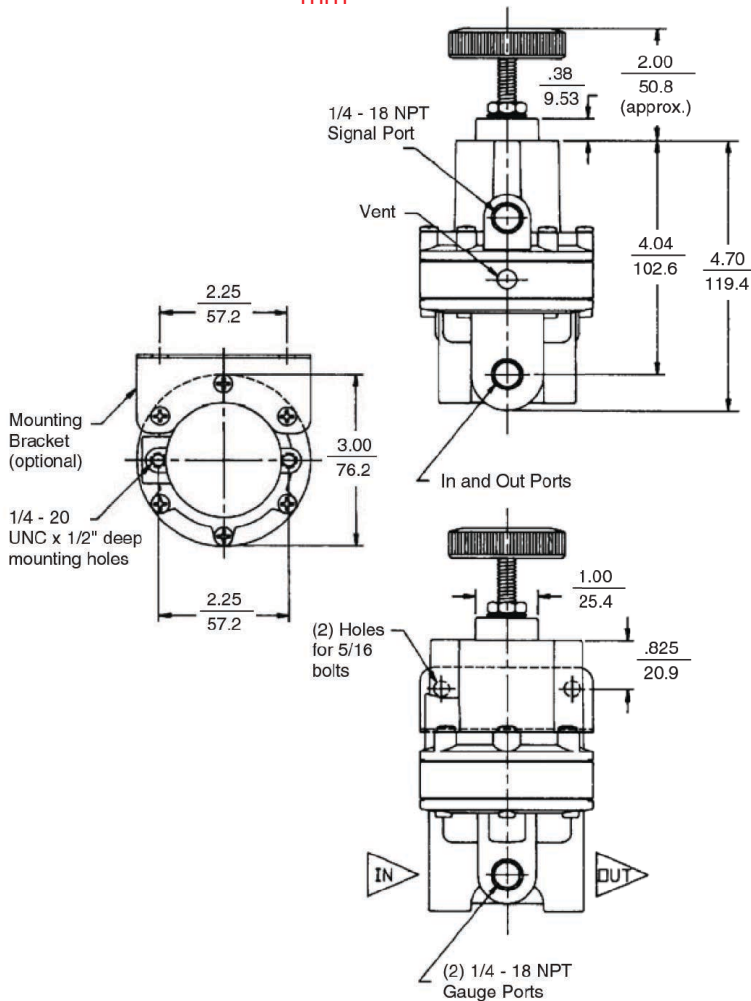
### Principles of Operation

A pressure introduced through the signal port in combination with the bias spring creates a downward force on the upper diaphragm area. This force is balanced by the output pressure acting against the lower control diaphragm area. If signal pressure and/or bias spring force is increased above the output pressure then there is a net downward force on the diaphragm assembly causing the supply valve to open. Output pressure increases until equilibrium is achieved.



# Type 650 Positive Bias Relay

## Dimensions $\frac{\text{in}}{\text{mm}}$



**Warranty** ControlAir, Inc. products are warranted to be free from defects in materials and workmanship for a period of eighteen months from the date of sale, provided said products are used according to ControlAir, Inc. recommended usages. ControlAir, Inc.'s liability is limited to the repair, purchase price refund, or replacement in kind, at ControlAir, Inc.'s sole option, of any products proved defective. ControlAir, Inc. reserves the right to discontinue manufacture of any products or change products materials, designs or specifications without notice. Note: ControlAir does not assume responsibility for the selection, use, or maintenance of any product. Responsibility for the proper selection, use, and maintenance of any ControlAir product remains solely with the purchaser and end user. Drawing downloads available at [www.controlair.com](http://www.controlair.com)

## Specifications

<b>Flow Capacity</b>	50 SCFM (1,415 NI/min) at 100 psig (7 BAR) supply with 20 psig (1.4 BAR) output
<b>Exhaust Capacity</b>	15 SCFM (425 NI/min) Downstream 5 psig (0.35 BAR) above set pressure
<b>Sensitivity</b>	1/4" (3.2 mm) water column
<b>Effect of Supply Pressure Change</b>	0.1 psi for a 50 psig change
<b>Maximum Supply Pressure</b>	250 psig (17 BAR)
<b>Maximum Signal Pressure</b>	150 psig (10 BAR)
<b>Maximum Output Pressure</b>	150 psig (10 BAR)
<b>Ambient Temperature Limits</b>	-40°F to 160°F (-40°C to 71°C)
<b>Weight</b>	1.75 lbs. (635 gm)
<b>Mounting</b>	pipe, panel or bracket
<b>Materials</b>	Body: Diecast aluminum Internal Components: Stainless steel, brass, plated steel, acetal Diaphragm: Nitrile elastomer and polyester fabric Knob: ABS plastic.

## Ordering

Model Number	Port Size NPT	Bias Range	
		(psi)	(BAR)
650-BA	1/4"	0-2	0-0.14
650-BC	1/4"	0-15	0-1
650-BD	1/4"	0-30	0-2
650-BE	1/4"	0-60	0-4
650-BF	1/4"	0-150	0-10
650-CC	3/8"	0-15	0-1
650-CD	3/8"	0-30	0-2
650-CE	3/8"	0-60	0-4
650-CF	3/8"	0-150	0-10
650-DA	1/2"	0 - 2	0-0.14
650-DC	1/2"	0-15	0-1
650-DD	1/2"	0-30	0-2
650-DE	1/2"	0-60	0-4
650-DF	1/2"	0-150	0-10

## Options (Add proper letter at end of model number)

- E** Tapped Exhaust - 1/8" NPT port allows captured exhaust
- T** Tamperproof Cover - prevents casual adjustment of bias setting
- U** BSP Porting
- X** ATEX 94/9/EC
- Z** Negative Bias - built in -4 ±1 psig bias

## Accessories Part Number

Accessories	Part Number
Mounting Bracket	446 707025
Gauge 0-15 psi	446 725003
Gauge 0-30 psi	446 725004
Gauge 0-60 psi	446 725001
Gauge 0-160 psi	446 725002



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