# Model 30 Midget Precision Regulator

Model 30



The Model 30 is designed for applications that require high capacity and accurate process control in a small package. A poppet valve which is balanced by utilizing a convoluted diaphragm, insures a constant output pressure even during wide supply pressure variations. Stability of regulated pressure is maintained under varying flow conditions through the use of an aspirator tube which adjusts the air supply in accordance with the flow velocity.

#### Features

- Control sensitivity of 1/4" water column variation allows use in precision applications.
- A compensating diaphragm lets the regulator remain unaffected by supply pressure changes.
- Flow of up to 40 SCFM with 100 psig supply allows use in applications with high flow requirements.
- An aspirator tube compensates downstream pressure droop under flow conditions.
- A separate Control Chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing.
- Unit construction lets you service the Model 30 without removing it from the line.
- Canadian Registration Number (CRN) Certification for all territories and provinces.

## **Operating Principles**

The Model 30 Regulator uses the force balance principal to control the movement of the valve assembly which in turn controls the output pressure. When the regulator is adjusted for a specific set point, the downward force of the Positive Bias Spring causes the Diaphragm Assembly to move downward. The Supply Valve opens and allows air to pass to the Outlet Port. As the set point is reached, the downward force exerted by the Positive Bias spring is balanced by the upward force of the downstream pressure acting on the bottom of the Diaphragm Assembly. The resultant force moves the supply Valve upward to reduce the flow of air to the Outlet Port.

Outlet pressure is maintained as a result of balance between forces acting on the top and bottom of the Diaphragm Assembly.



### **Technical Information**



#### **Specifications**

#### **Supply Pressure**

250 psig, [17.0 BAR], (1700 kPa) Maximum

#### **Flow Capacity**

40 SCFM (68 m<sup>3</sup>/HR) @ 100 psig, [7.0 BAR], (700 kPa) supply and 20 psig, [1.5 BAR], (150 kPa) setpoint

#### **Exhaust Capacity**

2.0 SCFM (3.4 m<sup>3</sup>/HR) where downstream pressure is 5 psig, [.35 BAR], (35 kPa) above 20 psig, [1.5 BAR], (150 kPa) setpoint

#### **Supply Pressure Effect**

Less than 0.2 psig, [.014 BAR], (.14 kPa) for 100 psig, [7.0 BAR], (700 kPa) change in supply pressure

#### Sensitivity

1/4" (.63cm) Water Column

#### **Ambient Temperature**

-40°F to +200°F, (-40°C to 93.3°C)

#### **Hazardous Locations**

Acceptable for use in Zones 1 and 2 for gas atmosphere: Groups IIA and IIB and Zones 21 and 22 for dust atmospheres

#### **Materials of Construction**

Body and Housing	Aluminum
Diaphragms Nitrile	on Dacron
Trim	Brass

# Model 30 Midget Precision Regulator

Model

30

#### **Catalog Information**

Catalog Nu	mber	302	
Pressure R	ange		
psig	[BAR]	(kPa)	
0-2	[0-0.1]	(0-15)	1
0-10	[0-0.7]	(0-70)	2
0.5-30	[0.03-2]	(3-200)	3
1-60	[0.1-4]	(10-400)	4
2-100	[0.1-7]	(15-700)	5
Pipe Size			
1/4" NPT .			2
3/8" NPT .			3

Options
Silicone Elastomers 1
Low Bleed
BSPP (Parallel) <sup>2</sup>
Fluorocarbon *Elastomers
Low Flow
Non-Relieving
Plunger Operated <sup>3</sup>
Screwdriver Adjust
Tamper Proof
BSPT (Tapered)

	Α	В	н	J	L	Ν	R	S	Т	U
Α	-	Y	Y	Ν	Y	Y	Y	Y	Y	Υ
В	Y	-	Y	Y	Ν	Ν	Ν	Y	Y	Υ
Η	Y	Y	-	Y	Y	Y	Y	Y	Y	Ν
J	Ν	Y	Y	-	Y	Y	Y	Y	Y	Υ
L	Y	Ν	Y	Y	-	Ν	Y	Y	Y	Y
Ν	Y	Ν	Y	Y	Ν	-	Y	Y	Y	Υ
R	Y	Y	Y	Ν	Y	Y	-	Y	Ν	Y
S	Y	Υ	Y	Y	Υ	Y	Ν	-	Ν	Υ
Т	Y	Y	Y	Y	Y	Y	N	Ν	-	Y
U	Y	Y	Ν	Υ	Υ	Υ	Y	Y	Y	-

<sup>1</sup> Maximum Supply Pressure - 75 psig, [5.0 BAR], (500 kPa)

<sup>2</sup> BSPP Threads in Inlet & Outlet Ports Only. Others BSPT.

<sup>3</sup> Refer to Table 1 for Push Rod Travel and Thrust

\* Viton

Table 1. Plunger Operated Regulator Parameters					
Range	Push Rod Travel (inches)	Push Rod Thrust (pounds)			
0-2 psig	.244 ± 10%	3.2 ± 10%			
0-10 psig	.344 ± 10%	15.7 ± 10%			
0-30 psig	.333 ± 10%	47.0 ± 10%			
0-60 psig	.395 ± 10%	94.0 ± 10%			
0-100 psig	.354 ± 10%	157.0 ± 10%			

#### Installation

For installations instructions, refer to the Fairchild Model 30 Midget Precision Regulator Instruction, Operation and Maintenance Instructions, IS-10000030.



# Model 30BP

# **Midget Precision Back Pressure Regulator**





# **General Information**

- The Model 30BP is a high capacity back pressure regulator that relieves excess system pressure to maintain a setpoint.
- · Combination of high capacity and compact size make the Model 30BP an excellent choice for a wide range of precision applications including: Precise Control of Paper Machinery Felt Guides, Supply of a Precise Repeatable Signal to a Pneumatic Clutch, or Control of Cylinder Pressure.
- The Model 30BP is sensitive to 1/4" Water Column variation which permits use in precision processes.
- · Flow of up to 40 SCFM allows use in applications with high flow requirements.
- · A Separate Control Chamber and Aspirator Tube isolates the diaphragm from the main flow eliminating hunting and buzzing.







# **Cross Section**

Model 30BP Regulator Detail Drawing

# **Operating Principles**

The Model 30BP Regulator uses the force balance principle to cause the Relief Valve to open and vent system pressure when set point is reached.

System pressure is transmitted through the Aspirator Tube to the bottom of the Diaphragm Assembly. When the range screw is adjusted for a specific set point, the Positive Bias Spring is compressed. It exerts a force on the top of the Diaphragm Assembly. As long as the pressure acting on the bottom of the Diaphragm Assembly produces a force less than the spring force acting on the top of the Diaphragm Assembly, the Relief Valve remains closed. As system pressure increases, the force on the bottom of the Diaphragm Assembly increases until it reaches the set point. As system pressure increases beyond set point, the assembly moves upward, lifting the Relief Valve from its seat and causing the system air to vent.

If system pressure decreases below set point, the decrease in pressure is transmitted through the Aspirator Tube to the bottom of the Diaphragm Assembly. The assembly moves downward and the force exerted by the range spring on the top of the Diaphragm Assembly will cause the Relief Valve to close. For more information, see cross sectional diagram.

## **Outline Dimensions**



# **Specifications**

Set Point Range	2-100 psig, [0.15-7.0 BAR], (15-700 kPa)			
System Pressure (Maximum)	150 psig, [10.0 BAR], (1000 kPa)			
Flow Capacity (SCFM)	40 (68m³/HR) @ 100 psig, [7.0 BAR], (700 kPa)			
Ambient Temperature	-40°F to +200°F (-40°C to 93.3°C)			
Sensitivity	1/4" (.63 cm) Water Column			



# **Outline Dimensions**



# **Specifications**

**Materials of Construction** 

Body and Housing	
Diaphragms	Nitrile on Dacron
Trim	Brass



# **Typical Application**

The Model 30BP is used to maintain a constant blanket pressure over the top of the liquid in the tank during outflow and refill.

The Model 30 non-relieving regulator with a setpoint of 7.5 psig, [0.5 BAR], (50 kPa) is used to maintain a blanket on the tank. In order to have an exhaust rate adequate to maintain the blanket pressure when the tank is being refilled, a Model 30BP set at 7.5 psig, [0.5 BAR], (50 kPa) is used as an exhaust regulator.



Pneumatic

# Installation

For installation instructions, please refer to the *Fairchild Model 30BP Midget Precision Back Pressure Regulator Installation, Operation and Maintenance Manual*, IS-100030BP.

# **Catalog Information**

Catal	og Numl	ber 302	2		BP		
Pressure Range							
psig	[BAR]	(kPa)					
0-2 0-10 .5-30 1-60 2-100	[0-0.15] [0-0.7] [0.03-2] [0.1-4] [0.15-7]	(0-15) (0-70) (3-200) (10-400) (15-700)	1 2 3 4 5				
<b>Pipe</b> 1/4" NP 3/8" NP	<b>Size</b> T T			2 3			
Silicone	- Flastome	arc <sup>1</sup>					
Eluorocarbon (Viton) Elastomers							
BSPP (Parallel) <sup>2</sup>							
Screwd	river Adius	tment				S	
Tamper Proof						Т	
BSPT (Tapered)							

<sup>1</sup> Maximum System Pressure - 75 psig, [5.0 BAR], (500 kPa) <sup>2</sup> BSPP Threads in Inlet & Outlet Ports Only. Others BSPT.





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precision pneumatic & motion control

CS-100030BP Rev. B 07/05 Litho in USA