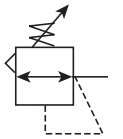
WILKERSON®

Richland, Michigan 49083

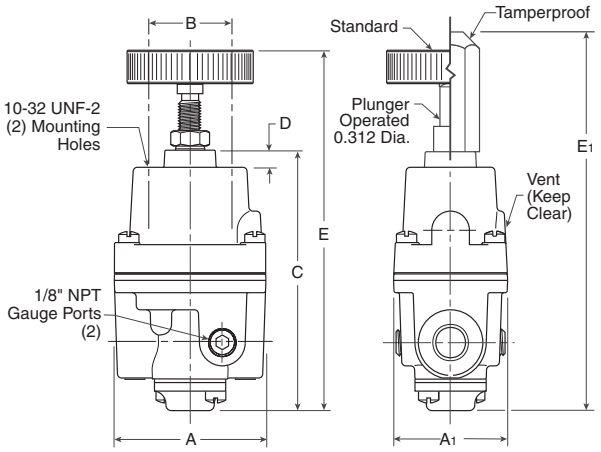
FRL-SIF-619
Precision Regulators
ISSUED: April, 2009
Supersedes: None

WRA302 Compact High Precision Regulator



Features

- Control sensitivity of .250" (.63 cm) 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 Regulator without removing it from the line.



WRA302 Regulator Dimensions		
A 2.25 (57.3)	**A1** 1.70 (43.1)	**B** 1.25 (31.8)
C 3.81 (96.7)	**D** 0.25 (6.4)	**E** 5.22 (132.6)
E1 5.56 (141.1)		

Inches (mm)

The WRA302 Regulator 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.

⚠ WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

Ordering Information

WRA302	4	2	

Springs
3 0.5 to 30 PSIG
4 1 to 60 PSIG
5 2 to 100 PSIG

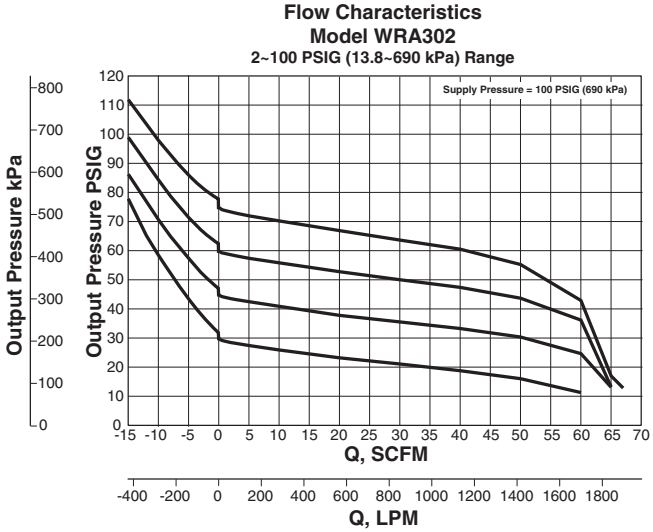
Pipe Size
2 1/4" NPT

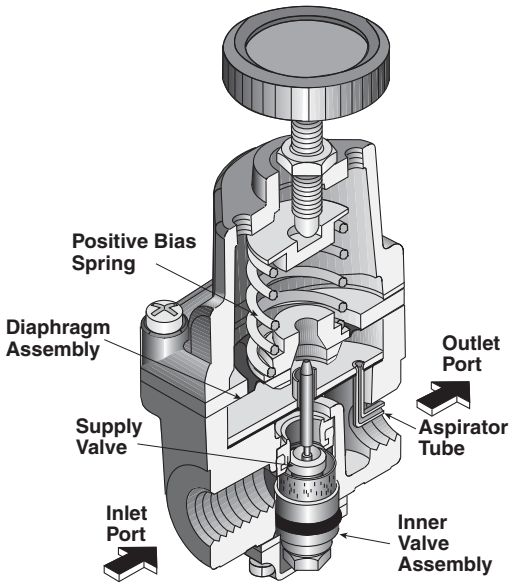
Options	
Blank	**No Options**
H	BSPP
N	Non-Relieving

Note: Other Spring Ranges, Port Sizes, and Options Available. Please Consult Factory

BOLD ITEMS ARE MOST POPULAR.

Technical Information





Operating Principles

The WRA302 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.

WRA302 Kits and Accessories

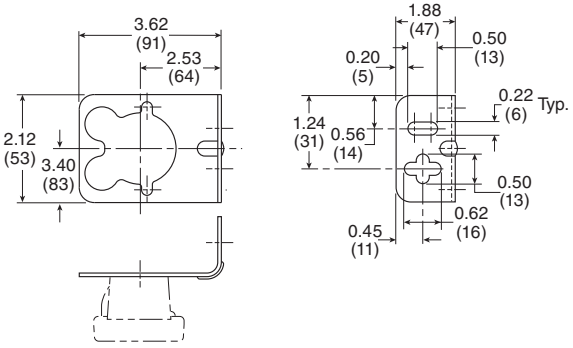
Service Kits

1/2 to 30, 1 to 60, & 2 to 100 PSIG, Nitrile, Standard PS16116-13

1/2 to 30, 1 to 60, & 2 to 100 PSIG, Nitrile, Non-relieving PS16116-14

Tamper Resistant Kit PS12163

Mounting Bracket Kit PS417B



Specifications

Supply Pressure ..... 250 PSIG, (17.0 bar), (1700 kPa) Maximum

Flow Capacity –
40 SCFM (68 m^3/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^3/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 ..... .250" (.010 PSIG) (.64 cm) Water Column

Ambient Temperature ..... -40°F to +200°F, (-40°C to 93°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

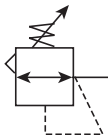
Materials of Construction

Body and Housing ..... Aluminum

Diaphragms ..... Nitrile on Dacron

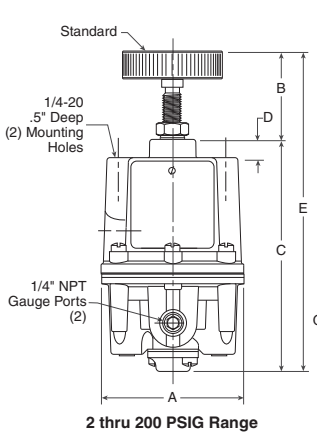
Trim ..... Brass

WRA102 Standard High Precision Regulator

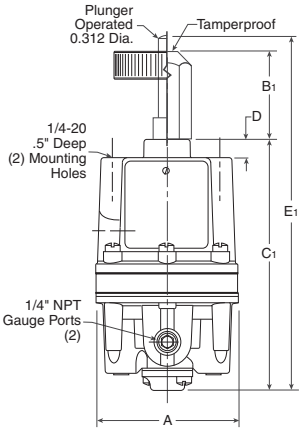


Features

- Control sensitivity of .125" (.32 cm) water column allows use in precision processes.
- Pressure balanced supply valve prevents supply pressure changes from affecting the setpoint.
- Optional check valve permits dumping of downstream pressure when supply is opened to atmosphere.
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing.
- An aspirator tube compensates downstream pressure droop under flow conditions.



2 thru 200 PSIG Range



300 & 400 PSIG Range

WRA102 Regulator Dimensions		
A 3.00 (76.2)	**B** 2.22 (56.5)	**B_1** 2.13 (53.9)
C 4.42 (111.9)	**C_1** 4.78 (121.6)	**D** 0.38 (9.4)
E 6.63 (168.5)	**E_1** 7.28 (184.9)	

Inches (mm)

The WRA102 Regulator is designed for applications that require high capacity and accurate process control. A poppet valve which is balanced by utilizing a rolling 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.

⚠ WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

Ordering Information

WRA102	6	2	

Springs	
3	**0.5 to 30 PSIG**
4	**1 to 60 PSIG**
6	**2 to 150 PSIG**

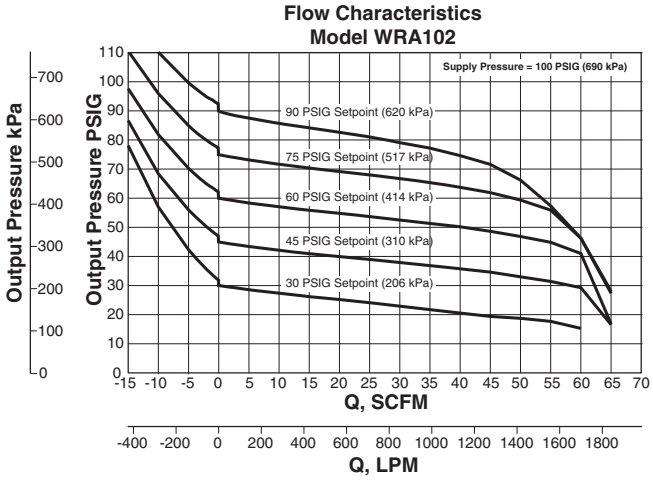
Pipe Size
2 1/4" NPT

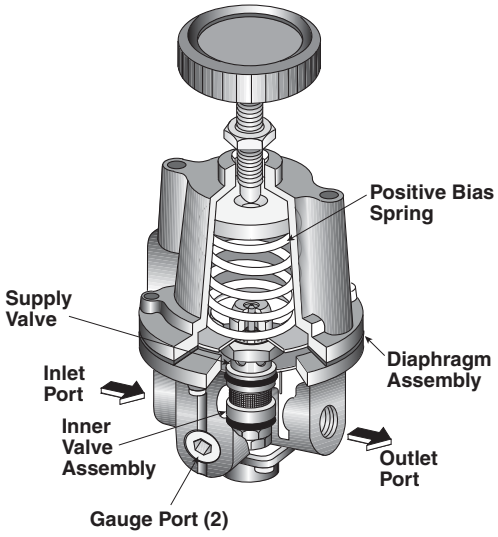
Options	
Blank	**No Options**
H	BSPP
N	Non-Relieving

Note: Other Spring Ranges, Port Sizes, and Options Available. Please Consult Factory

BOLD ITEMS ARE MOST POPULAR.

Technical Information





Operating Principles

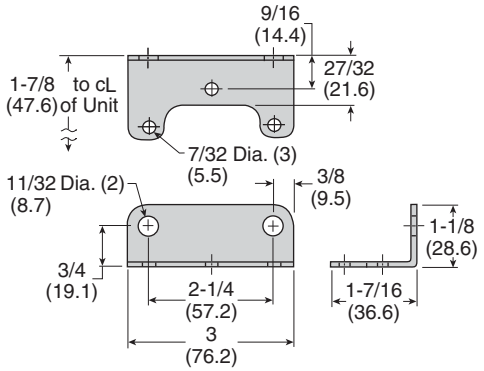
The WRA102 Series regulator use the force balance principal to control the movement of the Valve Assembly that controls the output pressure. When the regulator is adjusted for a specific set point, the downward force of the Positive Bias Spring moves the Diaphragm Assembly downward. The Supply Valve 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 force of the downstream pressure that acts on 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.

WRA102 Kits & Accessories

Mounting Bracket Kit –

Zinc Plated Steel PS09921



Service Kits

0 to 200 PSIG, Relieving..... PS12125-1
0 to 200 PSIG, Non--relieving PS12125-4

Tamper Resistant Kit..... PS12165

Specifications

Supply Pressure..... 500 PSIG, (35.0 bar), (3500 kPa) Maximum

Flow Capacity –
40 SCFM (68 m^3/HR) @ 100 PSIG, (7.0 bar), (700 kPa) Supply and 20 PSIG, (1.5 bar), (150 kPa) Setpoint

Exhaust Capacity –
5.5 SCFM (9.35 m /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 0.1 PSIG, (.007 bar), (.7 kPa) for 100 PSIG, (7.0 bar), (700 kPa) change in Supply Pressure

Sensitivity..... .125" (.005 PSIG) (.32 cm) Water Column

Ambient Temperature .....-40°F to +200°F, (-40°C to 93°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

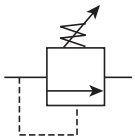
Materials of Construction

Body and Housing ..... Aluminum

Diaphragms..... Buna N on Dacron (Standard Unit Only)

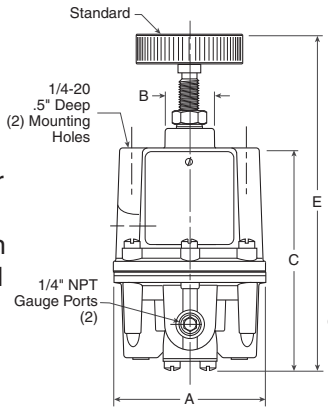
Trim.....Brass, Zinc Plated Steel

WRA102BP High Precision Relief Valve

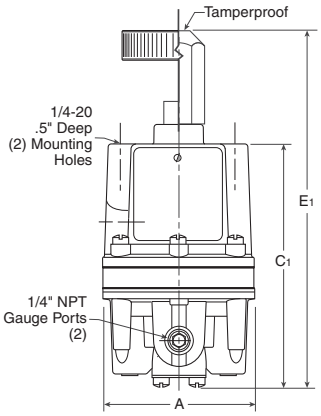


Features

- Control sensitivity of .125" (.32 cm) water column allows use in precision applications.
- A separate Control Chamber and Aspirator Tube isolate the diaphragm from the main flow to eliminate hunting and buzzing.
- Unit construction lets you service the WRA102BP without removing it from the line.
- Mounting Bracket is available.



2 thru 200 PSIG Range



300 & 400 PSIG Range

WRA102BP Regulator Dimensions		
A 3.00 (76.2)	**B** 0.97 (24.6)	**C** 4.19 (106.4)
C_1 4.56 (115.9)	**E** 6.31 (160.3)	**E_1** 6.75 (171.4)

Inches (mm)

The WRA102BP is a high capacity relief valve that relieves excess pressure in a pneumatic system.

The WRA102BP provides greater accuracy than standard relief valves over a narrow pressure range. The WRA102BP is an excellent choice for a wide range of precision applications.

⚠ WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

Ordering Information

WRA102	6	2	BP	

Springs
3 0.5 to 30 PSIG
4 1 to 60 PSIG
6 2 to 150 PSIG

Pipe Size
2 1/4" NPT

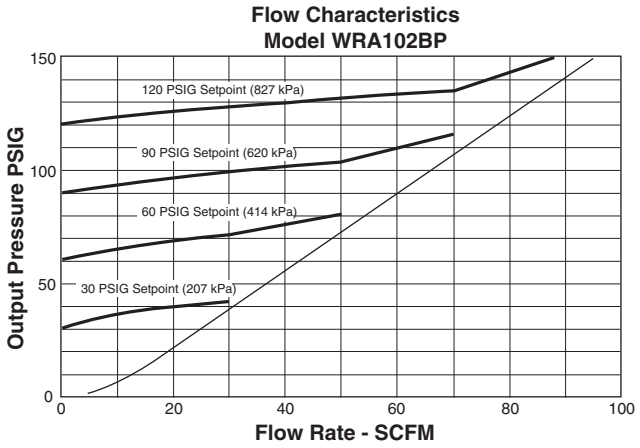
Options
BP Back Pressure

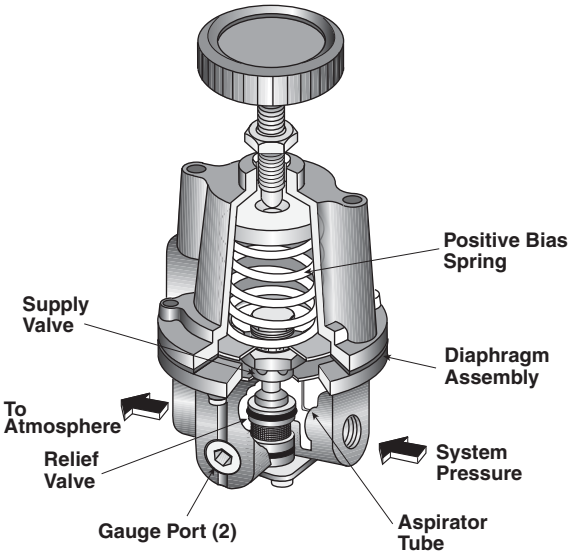
Options
Blank No Options
H BSPP
N Non-Relieving

Note: Other Spring Ranges, Port Sizes, and Options Available. Please Consult Factory

BOLD ITEMS ARE MOST POPULAR.

Technical Information





Operating Principles

The WRA102BP Regulator uses the force balance principle to open the Relief Valve and vent system pressure when the set point is exceeded.

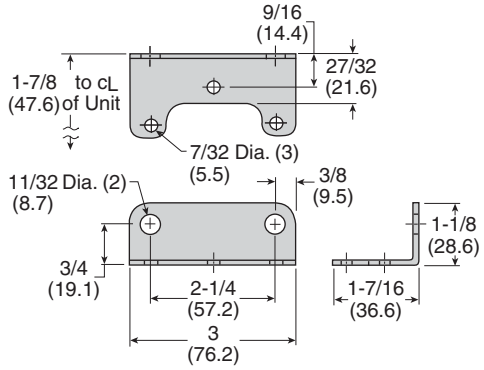
Downstream pressure is transmitted through the Aspirator Tube to the bottom of the Diaphragm Assembly. When you adjust the range screw for a specific set point, the Positive Bias Spring compresses and exerts a force on the top of the Diaphragm Assembly. As long as the pressure acting on the bottom of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

If downstream pressure decreases below the set point, the assembly moves downward closing the Relief Valve.

WRA102BP Kits & Accessories

Mounting Bracket Kit –

Zinc Plated Steel PS09921



Service Kits

0 to 200 PSIG, Standard PS12127-1

Tamper Resistant Kit PS12165

Specifications

Set Point Range	System Pressure (Maximum)
2-200 PSIG (0.15-14 bar) (15-1400 kPa)	300 PSIG (21.0 bar) (2100 kPa)
300-400 PSIG (21-28 bar) (2100-2800 kPa)	500 PSIG (35.0 bar) (3500 kPa)

Flow Capacity (SCFM) –

40 (68 m^3/HR) @ 100 PSIG, (7.0 bar), (700 kPa) System Pressure

Sensitivity ..... .125" (.005 PSIG) (.32 cm) Water Column

Ambient Temperature ..... -40°F to +200°F, (-40°C to +93°C)

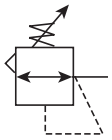
Materials of Construction

Body and Housing ..... Aluminum

Trim ..... Zinc Plated Steel, Brass

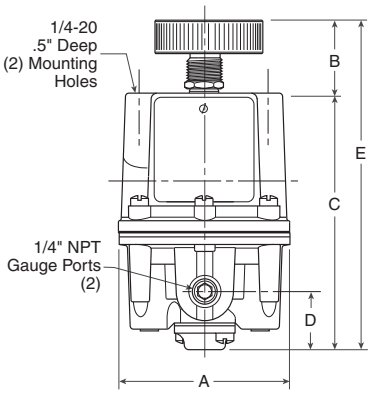
Nozzle ..... Nitrile on Dacron

WRA171 High Precision Vacuum Regulator



Features

- Control sensitivity of .125" (.32 cm) water column allows use in precision applications.
- Balanced supply valve minimizes effects of vacuum variation.
- Aspirator tube compensates for downstream pressure droop under flow conditions.
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing.
- Construction allows servicing without removing from the line.



WRA171 Regulator Dimensions		
A 3.00 (76.2)	**B** 1.13 (28.7)	**C** 4.83 (122.6)
D 1.00 (25.4)	**E** 5.96 (151.3)	

Inches (mm)

The WRA171 is a high accuracy vacuum regulator that provides uniform vacuum regulation independent of vacuum supply changes and flow demand.

This unit has a diaphragm assembly with three springs to provide a more balanced loading of the diaphragm.

⚠ WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

Ordering Information

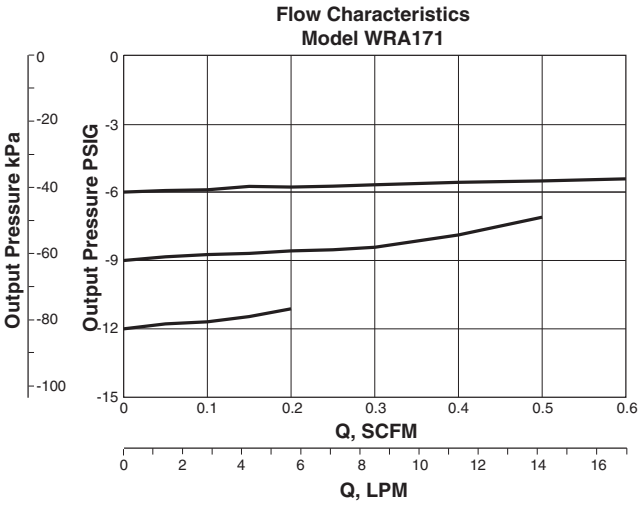
WRA171	3	2	N	N	K	N

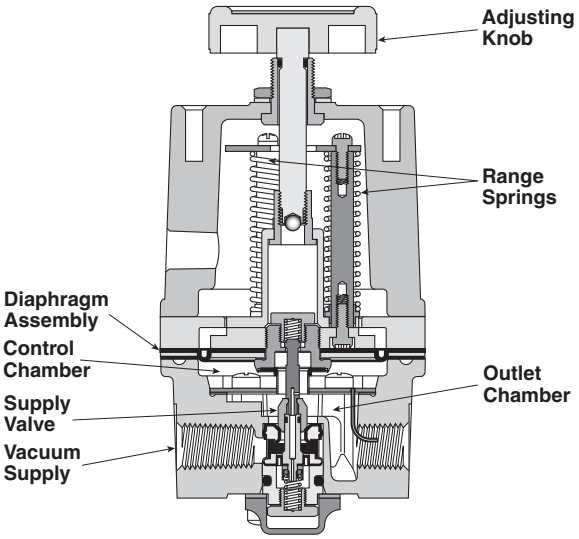
Springs	Pipe Size	Thread Type	Options	Options	Options
3 0 to 30 Hg	**2 1/4" NPT**	**N NPT**	**N Nitrile**	**K Knob Assembly**	**N Non-Relieving**

Note: Other Spring Ranges, Port Sizes, and Options Available. Please Consult Factory

BOLD ITEMS ARE MOST POPULAR.

Technical Information





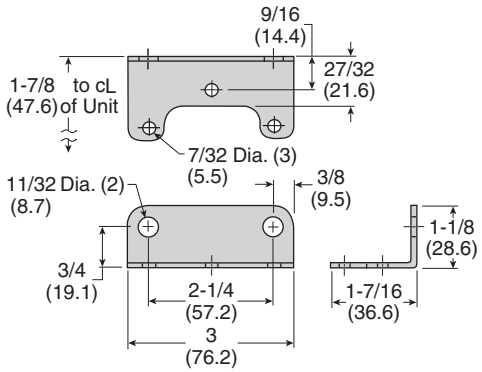
Operating Principles

The Model WRA171 Series vacuum regulator uses the force balance principle to control the movement of the Valve Assembly that controls output vacuum.

When the regulator is adjusted for a specific set point, the upward force of the Range Springs moves the Diaphragm Assembly upward. The Supply Valve opens and allows air to pass to the inlet port. As the set point is reached, the upward force exerted by the Range Springs is balanced by the force of the vacuum that pulls downward on the Diaphragm Assembly. The resultant force moves the Supply Valve downward to reduce the flow of air to the inlet port. Outlet vacuum is maintained as a result of balance between forces acting on the top and bottom of the Diaphragm Assembly.

WRA171 Kits and Accessories

Mounting Bracket PS09921



Service Kits
(Includes Diaphragm Assy, Valve Assy, Seat Assy & Gasket) –
0-30" Hg, Nitrile, Nonrelieving PS20966-9

Tamper Resistant Kit PS20967-1

Specifications

Vacuum Supply (Max) .....29.92 Hg (760 torr)

Flow Capacity .....3 SCFM @ 650 torr Sypply, 250 torr Setpoint

Sensitivity..... .125" (.005 PSIG) (.32 cm) Water Column

Ambient Temperature ..... -40°F to +200°F, (-40°C to +93°C)

Vacuum Supply Effect –
Less than 1 torr for 100 torr (.04 Hg for 3.94 Hg) Change in Vacuum Supply

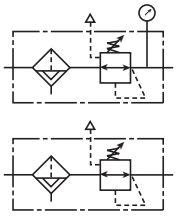
Materials of Construction

Body and Housing..... Aluminum

Trim.....Zinc Plated Steel, Brass

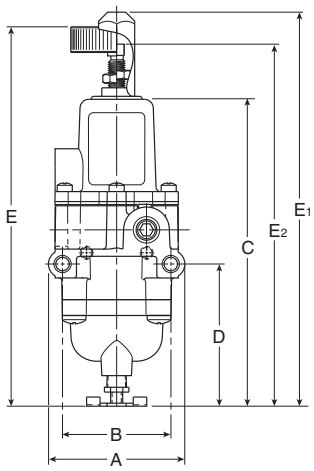
Elastomers ..... Nitrile

WEA632 Precision Filter / Regulator



Features

- The no-brass construction is well suited to harsh environments.
- Internal and external epoxy finish for superior corrosion resistance.
- Non-bleed design to reduce consumption.
- Integral Relief Valve.
- A Gauge Port provides convenient pressure gauge mounting.
- The standard 5-micron filter minimizes internal contamination.
- The Filter Dripwell contains a Drain Plug to easily drain trapped liquids.
- Standard Tapped Exhaust.
- Soft Relief Seat minimizes air loss.



WEA632 Regulator Dimensions		
A 3.00 (76.2)	**B** 2.22 (56.5)	**B1** 2.13 (53.9)
C 4.42 (111.9)	**C1** 4.78 (121.6)	**D** 0.38 (9.4)
E 6.63 (168.5)	**E1** 7.28 (184.9)	

Inches (mm)

⚠ WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

Ordering Information

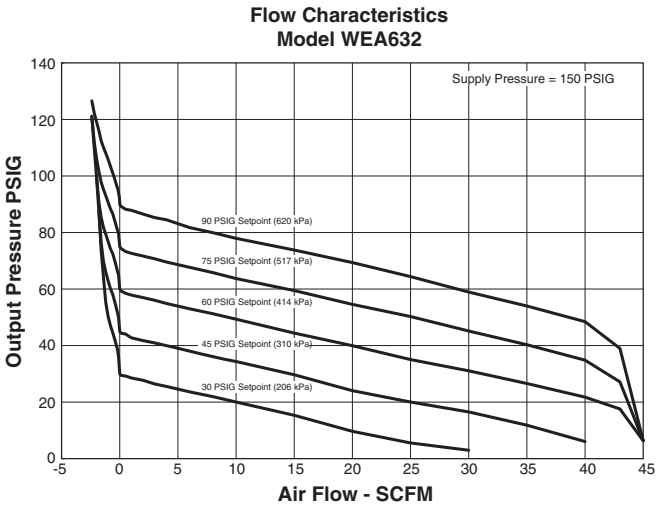
WEA632	5	2	N	S	

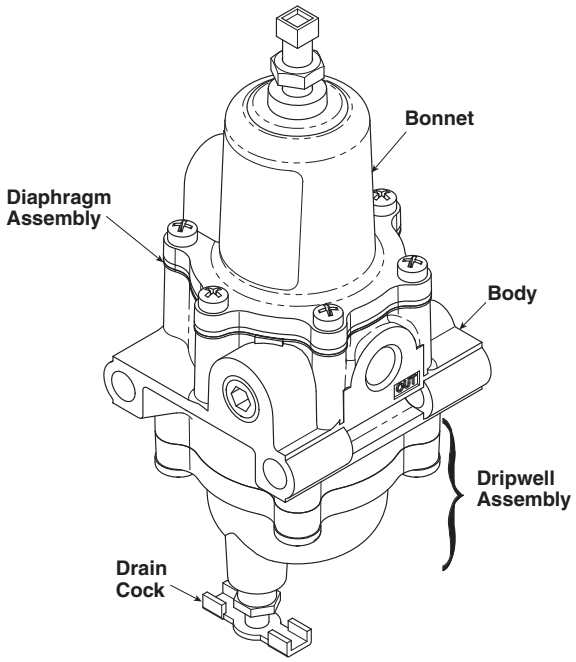
Springs	Pipe Size	Thread Type	Adjustment	Options
4 1 to 60 PSIG **5 2 to 120 PSIG**	**2 1/4" NPT**	**N NPT** U BSPP	**S Screw (Std.)** K Knob T Tamperproof	**Blank None**

Note: Other Spring Ranges, Port Sizes, and Options Available.
Please Consult Factory

BOLD ITEMS ARE MOST POPULAR.

Technical Information





Operating Principles

When you turn the Adjustment Screw to a specific setpoint, the Spring exerts a downward force against the top of the Diaphragm Assembly. This downward force opens the Supply Valve. Output pressure flows through the Outlet Port and the passage to the Control Chamber where it creates an upward force on the bottom of the Diaphragm Assembly.

When the setpoint is reached, the force of the Spring that acts on the top of the Diaphragm Assembly balances with the force of output pressure that acts on the bottom of the Diaphragm Assembly and closes the Supply Valve.

When the output pressure increases above the setpoint, the Diaphragm Assembly moves upward to close the Supply Valve and open the Exhaust Valve. Output pressure flows through the Exhaust Valve and out of the Exhaust Vent on the side of the unit until it reaches the setpoint.

WEA632 Kits & Accessories

Service Kits
1 to 60, 2 to 120 PSIG PS19968-NR

Tamper Resistant Kit PS12165

Specifications

Supply Pressure ..... 250 PSIG, (17 bar), (1700 kPa) Maximum

Flow Capacity (SCFM) ..... 25 (42.5 m^3/HR) @ 100 PSIG, (7 bar), (700 kPa) supply and 20 PSIG, (1.5 bar), (150 kPa) setpoint

Exhaust Capacity (SCFM) ..... 0.8 (1.36 m^3/HR) where downstream pressure is 5 PSIG, (.35 bar), (35 kPa) above 20 PSIG, (1.5 bar), (150 kPa) setpoint. (0.8 SCFM for 120 # unit)

Maximum Supply Pressure ..... 250 PSIG, (14 bar), (1400 kPa)

Consumption ..... Undetectable

Supply Pressure Effect ..... Less than 1.25 PSIG, (.09 bar), (9 kPa) change for 100 PSIG, (7.0 bar), (700 kPa) change in supply pressure (1.90 PSIG for 120 # unit)

Sensitivity ..... 1.0" (.036 PSIG) (2.54 cm) Water Column

Temperature Range ..... -40° F to + 160° F, (-40° C to + 71° C)

Materials of Construction

Body and Housing ..... Epoxy Coated Aluminum

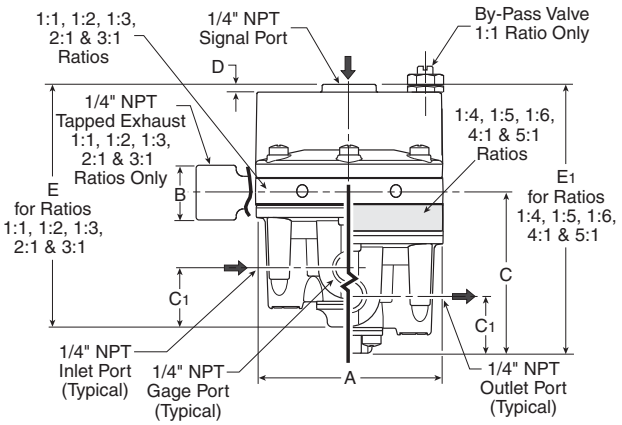
Trim ..... Stainless Steel, Nickel Plated Steel

Elastomers ..... Nitrile

WBA208 Precision Pneumatic Input Signal Amplifier

Features

- The WBA208 uses a pneumatic input signal to accurately control output pressure based on a predetermined ratio.
- A balanced Supply Valve minimizes the effects of supply pressure variation.
- An Aspirator Tube compensates downstream pressure droop under flowing conditions.
- Optional Adjustable By-Pass Needle Valve allows tuning for optimum dynamic response (1:1 ratio only).
- Optional Fixed Negative Bias allows operation with pneumatic devices that cannot be adjusted to zero input pressure.
- A separate Control Chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing.
- Unit construction allows servicing without removal.
- Mounting Bracket available.



WBA208 Regulator Dimensions		
A 3.00 (76.2)	**B** .94 (23.8)	**C** 2.13 (53.9)
C1 .94 (23.8)	**D** .13 (3.2)	**E** 3.88 (98.3)
E1 4.31 (109.5)		

Inches (mm)

Ordering Information

WBA208	1	2	

Pilot Ratio	
1	**1:1**
2	**1:2**
3	**1:3**

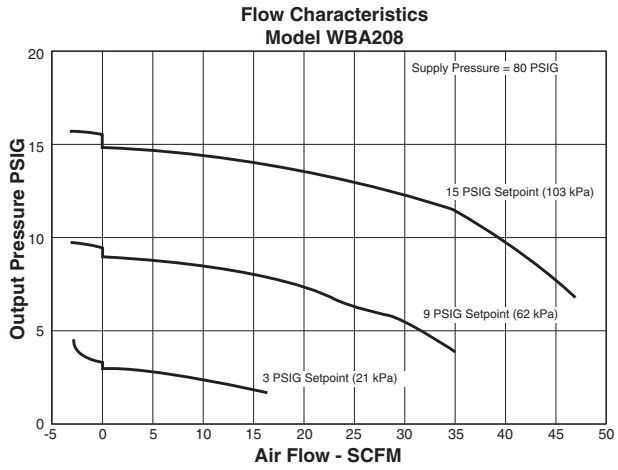
Pipe Size
2 1/4" NPT

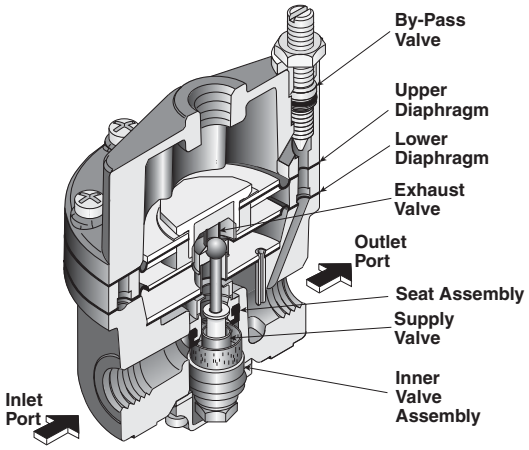
Options	
Blank	**No Options**
E	Tapped Exhaust
H	BSPP
I	By-Pass Valve

Note: Other Spring Ranges, Port Sizes, and Options Available. Please Consult Factory

BOLD ITEMS ARE MOST POPULAR.

Technical Information





Materials of Construction

Body and Housing ..... Aluminum
Diaphragm..... Nitrile on Dacron Fabric
Trim.....Zinc Plated Steel, Brass

Operating Principles

The WBA208 Input Signal Amplifier is a pneumatic device capable of high flow and exhaust capacity. This device uses a force balance system to control the movement of the supply and exhaust valves.

At set point, the force due to signal pressure that acts on the top of the Upper Diaphragm balances with the force due to output pressure acting on the bottom of the Lower Diaphragm.

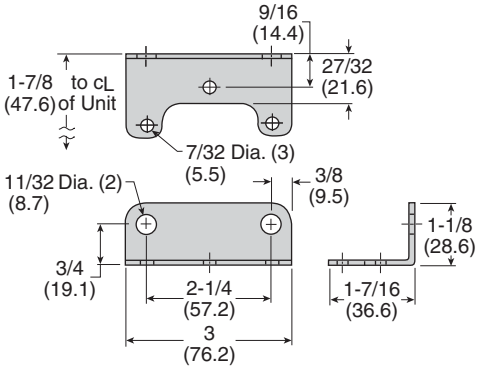
Specifications

	Signal:Output		
Ratio	**1:1**	**1:2**	**1:3**
Maximum Output Pressure, PSIG (bar)	150 (10.0)	150 (10.0)	150 (10.0)
Maximum Supply Pressure, PSIG (bar)	250 (17.0)	250 (17.0)	250 (17.0)
Flow Capacity SCFM, (m³/HR) 100 PSIG, (7.0 bar) Supply, 20 PSIG, (1.5 bar) Output.	45 (76.5)	45 (76.5)	45 (76.5)
Exhaust Capacity SCFM, (m³/HR) Downstream Pressure 5 PSIG, (.35 bar) Above Output Pressure Set Point of 20 PSIG, (1.5 bar).	11 (18.7)	11 (18.7)	11 (18.7)
Sensitivity (Water Column)	.250" (.64 cm)	.500" (1.27 cm)	.750" (1.9 cm)
Ratio Accuracy % of 100 PSIG, (7.0 bar) Output Span	1.0	1.0	1.0
% of Output Span with (7.0 bar) Input Span	—	—	—
Supply Pressure Effect, PSIG (bar) for change of 100 PSIG, (7.0 bar).	0.10 (.007)	0.20 (.014)	0.30 (.021)
Ambient Temperature, °F (°C)	-40 to +200 (-40 to +93)		

WBA208 Kits and Accessories

Mounting Bracket PS09921

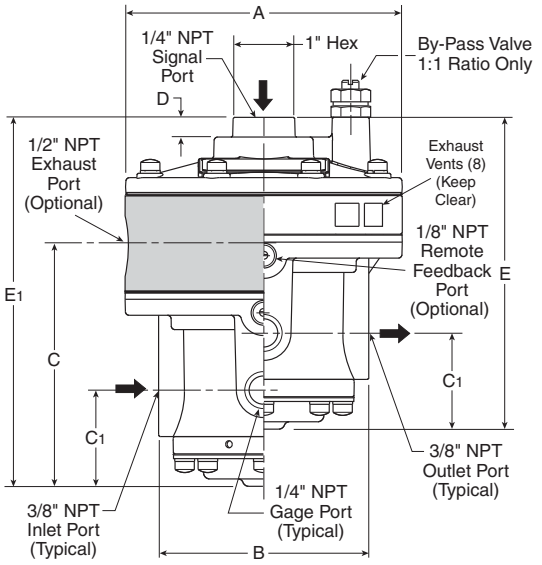
Service Kits
1:1 Ratio PS19513-11
1:1 Ratio w/ By-Pass Valve.....PS19513-11I
1:2 Ratio PS19513-12
1:3 Ratio PS19513-13



WBA45 Precision Pneumatic Input Signal Amplifier

Features

- Five signal to output ratios meet most control element requirements.
- Control sensitivity of water column allows use in precision applications.
- Large Supply and Exhaust Valves provide high forward and exhaust flows.
- Soft Supply and Exhaust Valve seats minimize air consumption.
- A balanced Supply Valve minimizes the effect of supply pressure variation.
- 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.
- Optional remote feedback port minimizes pressure drop at final control element under flow conditions.
- The optional adjustable By-pass Valve lets you tune for optimum dynamic response. (1:1 ratio only)
- Unit construction lets you service the WBA45 without removing it from the line.



WBA45 Regulator Dimensions		
A 4.50 (114.3)	**B** 3.41 (86.5)	**C** 3.86 (98)
C1 1.56 (39.6)	**D** .31 (7.9)	**E** 5.07 (128.8)
E1 5.83 (148.2)		

Inches (mm)

Ordering Information

WBA45	1	4	A	

Pilot Ratio	
1	**1:1**
2	**1:2**
3	**1:3**

Pipe Size	
4	**1/2" NPT**
6	**3/4" NPT**

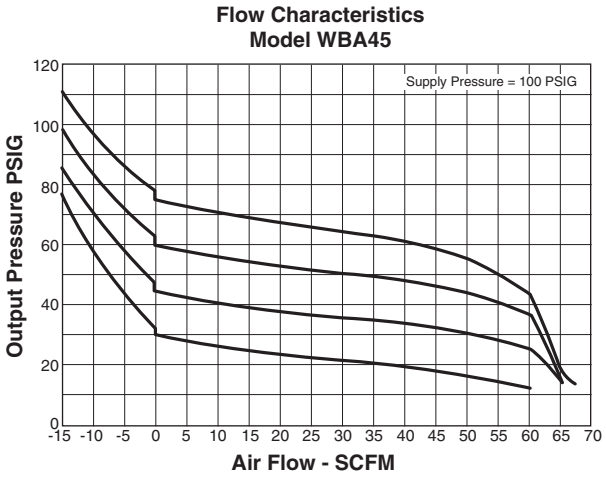
Type	
A	**45 Series**

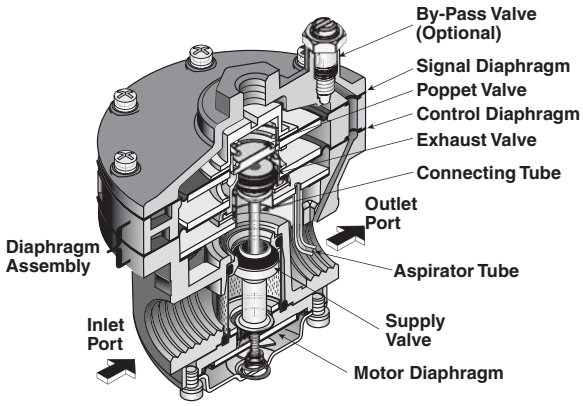
Options	
Blank	**No Options**
E	Tapped Exhaust
H	BSPP
I	By-Pass Valve

Note: Other Spring Ranges, Port Sizes, and Options Available. Please Consult Factory

BOLD ITEMS ARE MOST POPULAR.

Technical Information





Operating Principles

When signal pressure on the top of the Signal Diaphragm creates a downward force on the Diaphragm Assembly, the Supply Valve opens. Output pressure flows through the Outlet Port and the Aspirator Tube to the Control Chamber to create an upward force on the bottom of the Control Diaphragm. When the setpoint is reached, the force of the signal pressure that acts on the top of the Signal Diaphragm balances with the force of the output pressure that acts on the bottom of the Control Diaphragm to close the Supply Valve.

When the output pressure increases above the signal pressure, the Diaphragm Assembly moves upward to close the Supply Valve and open the Exhaust Valve. Because the Poppet Valve is closed, pressure flows down the Connecting Tube to the bottom of the Motor Diaphragm. This pressure keeps the Supply Valve tightly closed while in the exhaust mode. The Poppet Valve opens and excess output pressure exhausts through the vent in the side of the unit until it reaches the setpoint.

Materials of Construction

Body and Housing ..... Aluminum
Diaphragm ..... Nitrile on Dacron Fabric
Trim ..... Zinc Plated Steel, Brass

Specifications

	Signal:Output		
Ratio	**1:1**	**1:2**	**1:3**
Maximum Output Pressure, PSIG (bar)	150 (10.0)	150 (10.0)	150 (10.0)
Maximum Supply Pressure, PSIG (bar)	250 (17.0)	250 (17.0)	250 (17.0)
Flow Capacity SCFM, (m^3/HR) 100 PSIG, (7.0 bar) Supply, 20 PSIG, (1.5 bar) Output	150 (255)	150 (255)	150 (255)
Exhaust Capacity SCFM, (m^3/HR) Downstream Pressure 5 PSIG, (.35 bar) Above 20 PSIG, (1.5 bar) Setpoint	40 (62.5)	40 (62.5)	40 (62.5)
Sensitivity (water column)	1.0" (2.54 cm)	2.0" (5.08 cm)	3.0" (7.62 cm)
Ratio Accuracy % of 100 PSIG, (7.0 bar) Output Span	3.0	3.0	3.0
% of Output Span with 100 PSIG (7.0 bar) Input Span	—	—	—
Supply Pressure Effect, PSIG (bar) for change of 100 PSIG, (7.0 bar), (700 kPa).	0.10 (.007)	0.20 (.014)	0.30 (.021)
Ambient Temperature, °F (°C)	-40 to +200 (-40 to +93)		
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.		

WBA45 Kits and Accessories

Service Kits

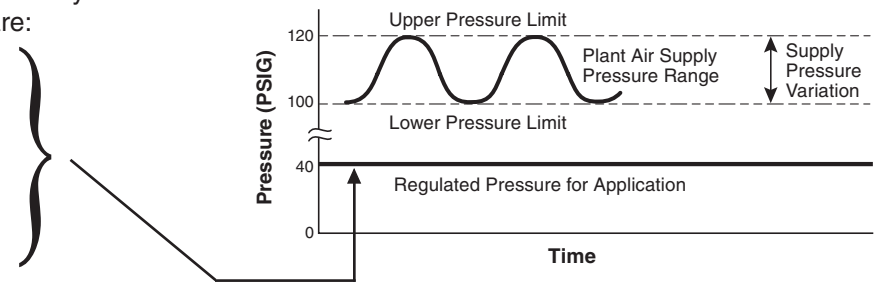
1:1 Ratio PS19549-1
1:1 Ratio w/ Tapped Exhaust PS19549-1E
1:3 Ratio PS19549-3
1:2 Ratio PS19549-2
1:1 w/ Tapped Exhaust, I Option PS19549-20E

Precision Regulators Application Guide

Pneumatic pressure regulators are designed to provide a constant pressure output from a fluctuating supply pressure – much the way an electronic voltage regulator works. Pressure regulators provide varying degrees of accuracy with regard to their reduced pressure output. General Purpose pressure regulators work for most fluid power applications. However, for more pressure-critical applications precision regulators can provide the customer with the control they need.

A partial listing of things that can potentially cause regulator output pressure variation are:

- Temperature changes
- Inlet pressure changes
- Variations in flow
- Excess downstream pressure
- Cycling
- Time
- Leakage



Who needs precision regulators?

Design level applications:
When designing a pneumatic system it is important to determine not only the air flow that the application will require but also the acceptable level of pressure variation. Some pneumatic applications cannot tolerate fluctuations in pressure. These applications can include static situations with only a steady pressure maintained, or dynamic flow situations involving any number of changing variables in play while trying to maintain a constant pressure.

Problem solving device for existing applications:
Sometimes an existing pneumatic application does not meet the customer's needs with regards to pressure control and/or stability. Any or all of the variables listed above can cause issues with pressure stability. As applications are expanded, added on to, or modified the pressure and flow requirements can change.

How do precision regulators differ from general purpose pneumatic regulators?

Examples-→	**High Precision Regulators** *WRA302, WRA102, WRA102BP, WRA171*	**Precision Regulators** *P12, P15 / P16, Dial Air*	**General Purpose Regulators** *R18, R28, R39, R30*
Sensitivity: *Reduced pressure repeatability/variation under no-flow condition*	.005 to .010 PSIG (1/8" to 1/4" of water column)	.5 to 1 PSIG	2 to 4 PSIG
Regulator's ability to control back pressure accurately: **key for cylinder applications*	Begins to relieve at .005 to .010 PSIG overpressure	Begins to relieve at .5 to 2 PSIG overpressure	Begins to relieve at 5 to 10 PSIG overpressure
Regulator's ability to maintain set pressure under varying flow, input pressure, temperature conditions:	High	Medium	Standard
Constant Bleed - does the regulator constantly bleed a small volume of air to the atmosphere to maintain stability?	Yes	No	No

1" Water Column = .0360 PSI

1PSI = 27.7612 Inches Water Column

Application Chart

Original Equipment Manufacturers (OEMs)

Air Gauging	Manufacturers of Air Gauging Equipment.
Anesthesia Equipment	Manufacturers
Calibration Stands	Similar to Test Stands
Clamping Pressure Control	End Effect Grippers, Roll Loading
Control Panels	Manufacturers and Users
Coordinate Measuring Machines	Manufacturers use in Force Counterbalance Applications in Z-axis
Dispensing Equipment	Adhesive, Paint, or any other form of Liquid or Gas
Food Process Machinery	Manufacturers
Gas Analyzers	Used for Reference and Calibration Air Pressures
Ink or Paint Robotics Spraying Systems	Manufacturers use to Maintain an Even Pressure on System
Leak Testing Equipment	Manufacturers of Equipment that Detects Leaks (i.e., Plastic Bottles)
Medical Equipment	Manufacturers that Utilize for Blood Processing and Sampling as Examples
Oxygen Ventilators	Manufacturers
Pharmaceutical Process Machinery	Pill or Tablet Making Machines
Phone Cable Pressurization Systems	Manufacturers
Polishing Machinery	Used to Maintain Even Pressure on Polishing Head
Semi-conductor Manufacturing Machinery	Manufacturers
Smoke Stack Analyzers	Used for Reference and Calibration Air Pressures
Soil or Environmental Analysis Equipment	Used for Reference and Calibration Air Pressures
Tank Blanketing	Maintain Pressure on Top Level of a Tank or Storage Vessel
Test Equipment	Similar to Test Stands
Test Stands	Manufacturers of Test Stands, Laboratory Test Stands, Engineering Test Stands, Production Test Stands
Tool Balancers	Manufacturers of Tool Balancers, Manipulators, and Articulating Arms use High Relief Capacity Precision Regulators in a Force-balancing Application. Used as part of a Pneumatic Counter-balance System, the Regulator helps suspend the tool in the air and then makes it easy to move out of the way when not in use.
Web Tensioning	Machinery Builders for Printing Presses, Paper Converting, Packaging, Textiles, Plastics. Primarily Unwind Stands and Rewind Stands.

System Integrators

Automation Integrators	Anyone Involved in Designs or Projects that Automate Processes

Energy Controls Systems

HVAC	Anyone who would be involved in Designs that would include Damper and Louvre Control for HVAC Applications

End Users

Instrumentation Supervisors	
Instrumentation Technicians	
Project Engineers	
Store Room Supervisors	

MRO

Chemical	
Petrochemical	
Pulp & Paper	
Food & Drug	
Refineries	
Power	
Mining	
Oil & Gas	