

# WILKERSON®

Richland, Michigan 49083

FRL-SIF-602

P17 Series

High Precision Regulator

P19 Series

High Flow Precision Regulator

ISSUED: July, 2004

Supersedes: None



 **WARNING**

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**Table of Contents**

Regulator Comparison Chart ..... 1

**P17 High Precision Regulator**

    Features ..... 2

    Applications ..... 2

    Dimensions ..... 2

    Ordering Information ..... 2

    Technical Information ..... 3

    Kits & Accessories ..... 3

    Materials of Construction ..... 3

    Specifications ..... 3

**P19 High Flow Precision Regulator**

    Features ..... 4

    Applications ..... 4

    Dimensions ..... 4

    Ordering Information ..... 4

    Technical Information ..... 5

    Kits & Accessories ..... 5

    Materials of Construction ..... 5

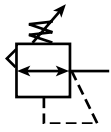
    Specifications ..... 5

Offer of Sale ..... Back Cover

**Regulator Comparison Chart**

		High Precision Regulators			Precision Regulator	Standard Regulator
	<i>Examples</i> →	P17	P17-02-FH0	P19	P15, P16	R18, R28, R39
<b>Repeatability / Sensitivity</b>	Regulator's ability to return to a set pressure after inducing flow.	0.005 PSIG 1/8" Water Column	0.005 PSIG 1/8" Water Column	0.010 PSIG 1/4" Water Column	0.5 to 1.0 PSIG	2 to 4 PSIG
<b>Reduced Pressure Variation</b>	This refers to the regulator's ability to maintain a consistent output pressure when faced with variables such as time, cycling, temperature, supply pressure, flow, etc.	Best	Best	Better	Good	Average
<b>Input Pressure</b>	Unregulated air pressure going into the regulator	150 PSIG Max.	150 PSIG Max.	250 PSIG Max.	Varies	Varies
<b>Effect of Supply Pressure Variation on Regulated Pressure</b>	Reduced / set pressure variation when input pressure changes by 100 PSIG	0.020 PSIG	0.020 PSIG	0.100 PSIG	4 PSIG	Approx. 3 - 6 PSIG
<b>Reduced Pressure Range</b>	Reduced pressure ranges available	2-40 PSIG 2-120 PSIG	2-120 PSIG	0-2 PSIG 0-30 PSIG 0-60 PSIG 0-150 PSIG	Varies	Varies
<b>Flow Capacity</b>	Regulator's flow capacity	14 SCFM	14 SCFM	80 SCFM	Varies	Varies
<b>Exhaust (Relief) Capacity</b>	Regulator's exhaust/relief flow rating when backpressure is introduced from downstream	3 SCFM	11 SCFM	4 SCFM	Low	Low
<b>Overpressure to Relieve</b> <i>*Key in cylinder applications</i>	Regulator's sensitivity to relieve excess downstream pressure over the set pressure.	Best (0.005 PSIG)	Best (0.005 PSIG)	Better (0.010 PSIG)	Good (1 PSIG)	Average (5-10 PSIG)
<b>Constant Bleed</b>	Does the regulator constantly bleed air to the atmosphere to maintain accuracy?	Yes	Yes	Yes	Varies	No
<b>Size Constraints</b>	Overall size of regulator	4.5" H x 2.06" W	4.5" H x 2.06" W	5.5" H x 3" W	Varies	Varies
<b>Mounting Constraints</b>	Mounting options	Panel, Pipe, or Bracket	Panel, Pipe, or Bracket	Panel, Pipe, or Bracket	Panel, Pipe, Bracket, or Modular	Varies
<b>Port Size</b>	Inlet / Outlet port size	1/4"	1/4"	1/4" or 3/8"	Varies	Varies

# P17 High Precision Regulator



The P17 are high precision, multi-stage pressure regulators. This pressure controller provides the highest level of regulation accuracy and repeatability available and is ideal for applications that call for the utmost in control and maximum stability under variable operating conditions. A stainless steel measuring capsule is used as a sensing element to activate the high gain servo balanced control mechanism in which the main valve is controlled by a pilot valve. This allows for greater accuracy and eliminates many of the problems associated with conventional regulators using range springs and diaphragms.

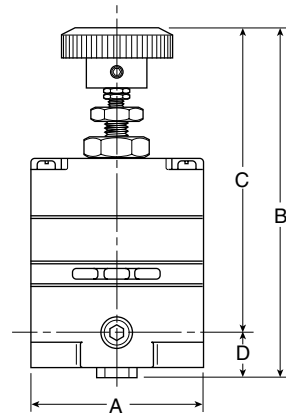
## Features

- Accurate Pressure Regulation. Controls Output Pressure to within 0.1% Accuracy.
- Multi-Stage Regulation for Maximum Control and Stability.
- Two Full Flow Gauge Ports.
- Super Sensitive Relief. Downstream Pressure Buildup, Down to 0.005 PSIG Above the Set Pressure, is Automatically Vented through Internal Relief Valve.
- P17-02-FH0 has High Exhaust Relief Capacity.

## Applications

The P17 regulators are well suited for any process that requires very precise regulation of air pressure in pipes and vessels. These regulators are often used, but not limited to the following applications:

- Air Gauging
- Gas Mixing
- Calibration Standards
- Air Hoists
- Web Tensioning
- Gate Actuators
- Roll Loading
- Valve Operators
- Cylinder Loading



P17 Regulator Dimensions		
<b>A</b> 2.06 52mm	<b>B</b> 4.35 110mm	<b>C</b> 3.82 97mm
<b>D</b> 0.53 13.5mm		

**⚠ WARNING**

**Do not connect regulator to bottled gas.**

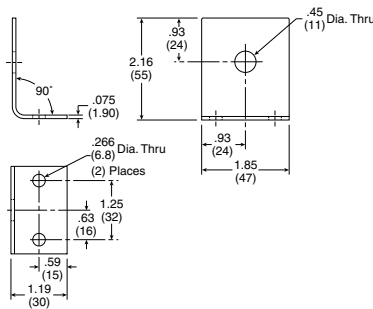
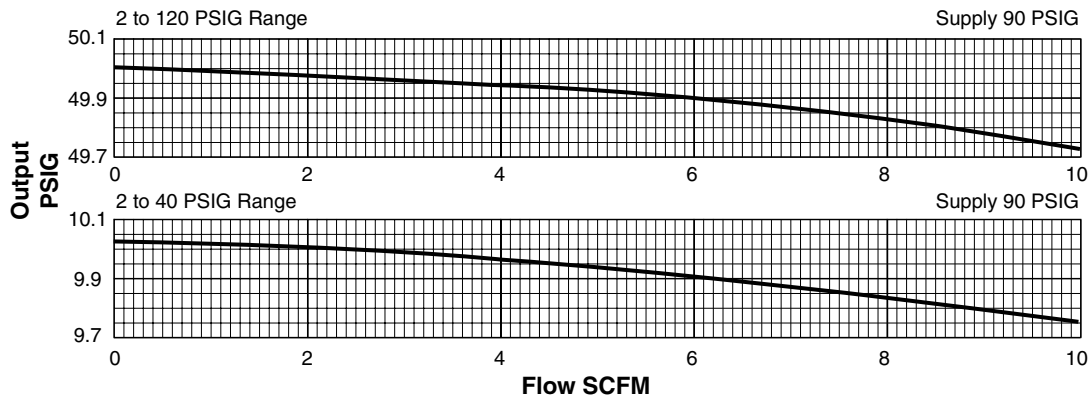
**Do not exceed maximum primary pressure rating.**

**Product rupture can cause serious injury.**

## Ordering Information

Relieving		Reduced Pressure Range (PSIG)		
		2 to 40	2 to 120	2 to 120 High Relief
In / Out Ports	1/4"	P17-02-B00	P17-02-F00	P17-02-FH0

Technical Information



Mounting Bracket: 446-707-045

P17 Regulator Kits & Accessories

Mounting Bracket Kits

- Pipe Mounting ..... SA200YW57
- Right Angle Mounting ..... 446-707-045

Service Kits

- 2-40 PSIG ..... RKR210A\*
- 2-120 PSIG ..... RKR210C\*
- 2-120 PSIG (High Relieving) ..... RKR220C\*

\* Parts in Kit

Materials of Construction

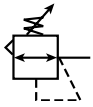
- Adjusting Stem & Capsule ..... Stainless Steel
- Body ..... Zinc
- Control Knob ..... Plastic
- Diaphragm(s) ..... Buna-N
- Seals ..... Buna-N
- Springs ..... Stainless Steel
- Valve Poppet ..... Stainless Steel

Specifications

- Constant Bleed Rate** ..... Less than 0.08 SCFM (0.15m<sup>3</sup>/hr)  
(Equals Bleed Rate plus other consumption)
- Total Air Consumption** ..... 6 SCFH (0.21m<sup>3</sup>/hr.)
- Effect of Supply Pressure Variation**  
of 25 PSIG (1.7 bar) on outlet: ... Less than 0.005 PSIG (0.0003 bar)
- Exhaust (Relief) Capacity**  
At 5 PSIG (0.34 bar) above 20 PSIG (1.38 bar) Setpoint  
  - Standard Model** ..... 3 SCFM (3.4m<sup>3</sup>/hr)
  - High-Relief Model** ..... 11 SCFM (17m<sup>3</sup>/hr)
- Flow Capacity**  
At 100 PSIG (6.89 bar) Supply,  
20 PSIG (1.38 bar) Outlet ..... 14 SCFM (25m<sup>3</sup>/hr)
- Gauge Ports** ..... 1/4" NPTF  
(Can be used as additional full flow 1/4" outlet ports)
- Operating Pressure Range:**

	<b>PSIG</b>	<b>bar</b>
<b>PRIMARY – Maximum</b>	150	10.34
<b>SECONDARY – Spring Pressure</b>		
<b>40 PSIG</b>	<b>Minimum</b>	2     0.14
	<b>Maximum</b>	40    2.76
<b>120 PSIG</b>	<b>Minimum</b>	2     0.14
	<b>Maximum</b>	120   8.27
- Operating Temperature Range** ..... -18°C \* to 65°C (0°F\* to 150°F)  
\* Temperatures below 0°C (32°F) require moisture free air.
- Repeatability / Sensitivity** ..... 0.005 PSIG (0.0003 bar)  
Inches of Water Column = 1/8"
- Weight** ..... 1.4 lb (0.64 kg)

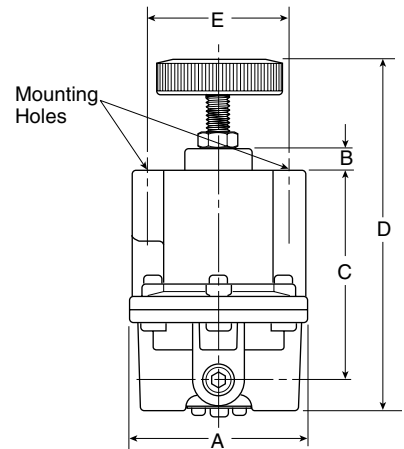
# P19 High Flow Precision Regulator



The P19 is designed for applications that require high flow 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.

## Features

- Adjusting Knob.
- Diaphragm Design for Good Repeatability, Response and Sensitivity.
- Balanced Poppet.
- Two Full Flow Gauge Ports.
- Precise Regulation. Will Sense a Decrease in Downstream Pressure as Small as 1/4" of Water.
- High Flow Capacity. Flows of 80 SCFM Attainable with Minimal Drop.
- Stable Output. Dampening Action of Aspiration Tube makes Regulator Insensitive to Changes in Flow.
- On-line Maintenance. Can be Serviced Without Removal of Air Line.



P19 Regulator Dimensions		
A	B	C
3.00 76mm	0.38 10mm	3.40 86mm
D	E	
6.06 154mm	2.25 57mm	

## Applications

The P19 regulators are an ideal choice for any application that calls for accurately maintained output pressure under high flow conditions. This includes, but is not limited to such applications as:

- Test Equipment
- Gas Mixing
  - Valve Operators
  - Positioning Cylinders
  - Laboratory Equipment
  - Web Tensioning
  - Clutch & Brake Controls
  - Roll Loading
  - Test Panels
  - Actuators

**⚠ WARNING**

**Do not connect regulator to bottled gas.**

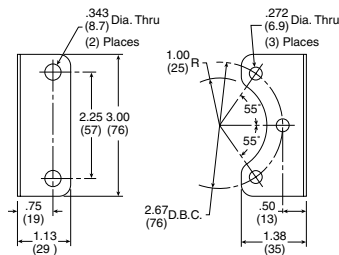
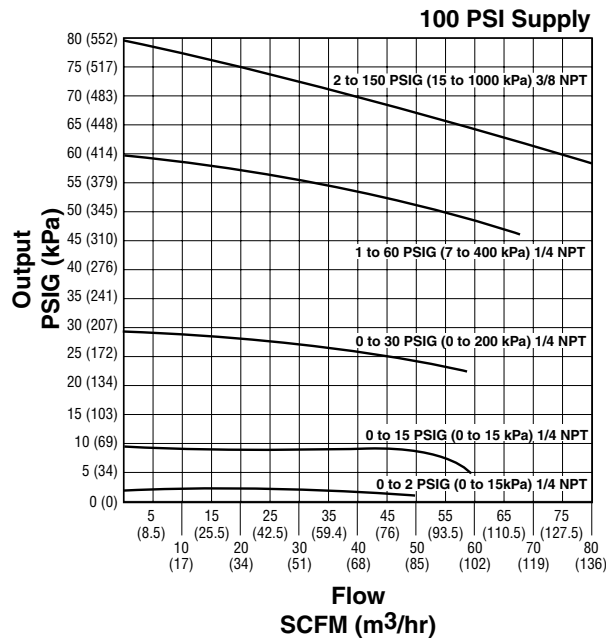
**Do not exceed maximum primary pressure rating.**

**Product rupture can cause serious injury.**

## Ordering Information

Relieving		Reduced Pressure Range (PSIG)			
		0 to 2	0 to 30	0 to 60	0 to 150
In / Out Ports	1/4"	P19-02-A00	P19-02-C00	P19-02-D00	P19-02-H00
	3/8"	N/A	P19-03-C00	P19-03-D00	P19-03-H00

Technical Information



Mounting Bracket: 446-707-025

P19 Regulator Kits & Accessories

Mounting Bracket Kit ..... 446-707-025

Service Kits – Relieving

- 0 to 2 PSIG ..... RKR230E
- 0 to 30 PSIG ..... RKR230B
- 0 to 60 PSIG ..... RKR230C
- 0 to 150 PSIG ..... RKR230D

Materials of Construction

- Adjusting Stem & Spring ..... Steel
- Biased Spring ..... Stainless Steel
- Body, Bonnet ..... Aluminum
- Control Knob ..... Plastic
- Diaphragm ..... Buna-N Elastomer and Polyester Fabric
- Seals ..... Buna-N
- Valve Poppet ..... Brass
- Valve Poppet Seat ..... Buna-N

Specifications

Constant Bleed Rate ..... 1.0 to 12.5 SCFH  
(Depending upon output pressure)

Gauge Ports ..... Two Ports 1/4"  
(Can be used as additional Full Flow 1/4 Inch Outlet Ports)

Effect of Supply Pressure Variation –  
Less than 0.1 PSIG for 100 PSIG (6.89 bar) change

Exhaust (Relief) Capacity –  
4 SCFM with downstream pressure 5 PSIG above set pressure.  
Exhaust commences at 0.01 PSIG above set pressure.

Flow Capacity –  
At 100 PSIG (6.89 bar) Supply,  
80 PSIG (5.5 bar) Outlet ..... 80 SCFM (37.8 dm³/s)

Operating Temperature Range – ..... -40°C to 71°C  
(-40°F to 160°F)

Operating Pressure Range –	<b>PSIG</b>	<b>bar</b>
<b>PRIMARY – Maximum</b>	250	17

Port Threads ..... 1/4"

Exhaust (Relief) Capacity ..... 4.0 SCFM  
(Downstream pressure 5PSI above set pressure)

Repeatability / Sensitivity ..... ±0.010 PSIG (±0.00068 bar)  
Inches of Water Column = 1/4"

Response ..... 250 ms  
The valve will open to full flow and fill a volume of 1250 cm³

Weight ..... 1lb. 10 oz. (0.74 kg)

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**2. Payment:** Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Amounts not timely paid shall bear interest at the maximum rate permitted by law for each month or portion thereof that the Buyer is late in making payment. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.

**3. Delivery:** Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

**4. Warranty:** Seller warrants that the items sold hereunder shall be free from defects in material or workmanship for a period of 18 months from date of shipment from The Company. THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED.

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**6. Changes, Reschedules and Cancellations:** Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

**7. Special Tooling:** A tooling charge may be imposed for any special tooling, including without limitations, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller

shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

**8. Buyer's Property:** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer, or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

**9. Taxes:** Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

**10. Indemnity For Infringement of Intellectual Property Rights:** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets (hereinafter "Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgements resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

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**12. Entire Agreement/Governing Law:** The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.

**WILKERSON®**

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