

## Pneumatic Division

Richland, Michigan USA

[www.parker.com/pneumatics](http://www.parker.com/pneumatics)



### FLOW CONTROL VALVES

Bulletin Number		Bulletin Description	
<input type="checkbox"/>	<a href="#">P03883</a> Rev. 1	Right Angle Flow Control	
<input type="checkbox"/>	<a href="#">P03877</a> Rev. 1	3250 Kits & Technical Information	
<input type="checkbox"/>	<a href="#">V650P</a>	3250 Flow Control Valve, Installation & Service Instructions	
<input type="checkbox"/>	<a href="#">Safety Guide</a>	PDN Safety Guide	



Visit [www.pdnplu.com](http://www.pdnplu.com) for additional instruction sheets.



**Pneumatic Division**  
Richland, Michigan 49083

**P03877**  
Doc.# P03877  
ECN# 030126  
Rev. 1

**⚠ WARNING**

To avoid unpredictable system behavior that can cause personal injury and property damage:

- Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
- Disconnect air supply and depressurize all air lines connected to this product before installation, servicing, or conversion.
- Operate within the manufacturer's specified pressure, temperature, and other conditions listed in these instructions.
- Medium must be moisture-free if ambient temperature is below freezing.
- Service according to procedures listed in these instructions.
- Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
- After installation, servicing, or conversion, air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or the product does not operate properly, do not put into use.
- Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

**⚠ WARNING**

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.**

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

### Operating Temperature Range:

Standard Service: -18°C to 82°C (0°F to 180°F)\*

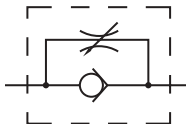
Extended Service: -18°C to 149°C (0°F to 300°F)\*

### Maximum Operating Pressure:

	kPa	psig	bar
Maximum:	1725	250	17.25

**EXTRA COPIES OF THESE INSTRUCTIONS  
ARE AVAILABLE FOR INCLUSION IN  
EQUIPMENT / MAINTENANCE MANUALS  
THAT UTILIZE THESE PRODUCTS. CONTACT  
YOUR LOCAL REPRESENTATIVE OR GO TO  
[WWW.PARKER.COM/PNEUMATIC](http://WWW.PARKER.COM/PNEUMATIC).**

### ANSI Symbol:



\*Temperatures below freezing require moisture-free air. Ambient temperatures below freezing and above 180°F require lubricants especially selected for suitability at these temperatures. Pneumatic valves should be used with filtered and lubricated air.

Pipe Port Size	Flow Capacity (SCFM)	Service Kit	Lock Nut	Viton Service
1/8	60	03250-0860	03250-0060	03250-0300
1/4	130	03250-0100	03250-0180	03250-0310
3/8	220	03250-0320	03250-0280	03250-0330
1/2	295	03250-0825	03250-0380	03250-0340
3/4	420	03250-0835	03250-0480	03250-0350

**Made in USA**



**Pneumatic Division**  
Richland, Michigan 49083

**P03883**  
Doc.# P03883  
ECN# 030134  
Rev. 1

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# General Specifications

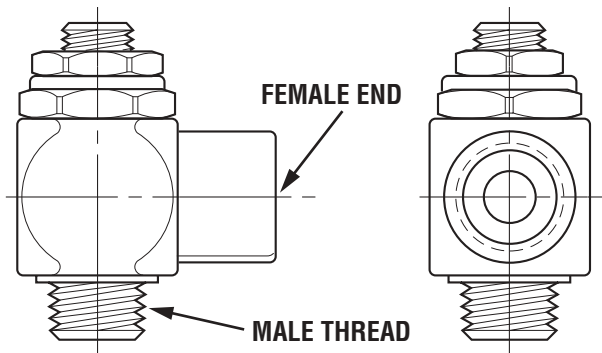
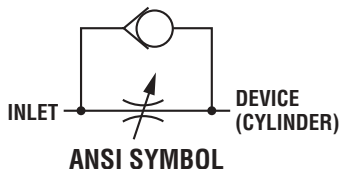
Body: Brass

Plunger: Brass and Acetal

Seals: Buna-N

\*Temperature Range: 0°F to 140°F  
(-18°C to 60°C)

Pressure Rating: 125 PSIG (9 bar) Max.



**\*CAUTION: IF IT IS POSSIBLE THAT THE AMBIENT TEMPERATURE MAY FALL BELOW FREEZING, THE MEDIUM MUST BE MOISTURE-FREE TO PREVENT INTERNAL DAMAGE OR UNPREDICTABLE BEHAVIOR**



**Pneumatic Division North America**  
Richland, Michigan 49083

**Installation & Service Instructions:**  
V-650P

**Flow Control Valves**  
1", 1-1/4" & 1-1/2" Pipe

**ISSUED: July, 1999**

**Supersedes: 3250-7035 June, 1998**

**ECN# 9071**

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**Operating Temperatures:**

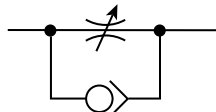
-40°C to 82°C (-40°F to 180°F)\*

**Maximum Operating Pressures:**

	kPa	psig	bar
<b>Maximum</b>	1724	250	17.24

\* Ambient temperatures below freezing require moisture-free air. Ambient temperatures below freezing and above 180°F require lubricants especially selected for suitability at these temperatures. Pneumatic valves should be used with filtered and lubricated air.

**ANSI Symbol:**



**Installation & Operating Instructions:**

Flow Control Valves are designed to provide an *adjustable restriction* for varying or metering fluid flow in one direction through the valve and Full Flow in the opposite direction through the same valve.

For most double acting cylinder applications, two Flow Control Valves should be used. This makes possible accurate and independent control of cylinder piston speed in both stroke directions. It is generally best to install Flow Control Valves in the pipe lines between the Cylinder and Directional Control Valve, as close to ports on the Cylinder as piping will permit.

Air flows through valve with minimum restrictions in direction of arrow printed on label. Flow in opposite direction is metered, depending on setting of Metering Needle.

Valve may be used for either *Meter-In Control* of air flow TO Cylinder Port or *Meter-Out Control* of air flow FROM Cylinder Port. For Meter-Out Control, install valve with Full Flow arrow pointing TOWARD Port on Cylinder. For Meter-In Control, install valve with Full Flow arrow pointing AWAY FROM Port on Cylinder. Generally, best results are obtained with Meter-Out Control.

Metered flow is adjustable. Clockwise turning of Metering Needle (**Item #4**) reduces flow — Counterclockwise adjustment increases flow. After obtaining desired flow by adjusting Metering Needle, securely tighten Lock Nut (**Item #1**) to reduce the possibility of changes from unauthorized personnel or due to vibration.

**Service Procedures:**

**⚠ CAUTION:** Always shut off air supply and depressurize all air lines connected to the valve before servicing unit.

1. Using a hex head wrench, loosen both set screws (**Item #11**) at the bottom of the valve.
2. Unscrew and remove plug assembly (**Item #9**).
3. Remove spring (**Item #7**) and poppet (**Item #8**).
4. Remove body o-ring (**Item #10**) from plug assembly and poppet o-ring (**Item #6**) from poppet and discard both o-rings.
5. Unscrew and remove lock nut (**Item #1**).
6. Remove retaining ring (**Item #2**) and discard.
7. Unscrew and remove metering needle (**Item #4**) and discard needle o-ring (**Item #3**).
8. Inspect the needle seat, poppet and poppet seat for nicks, voids, pits and deep scratches. Replace the entire valve if any of these irregularities are present.
9. Using a non-detergent hydrocarbon base oil or grease, lightly lubricate all o-rings found in the service kit and place them on their respective components.
10. Screw in the metering needle and install the **new** retaining ring.

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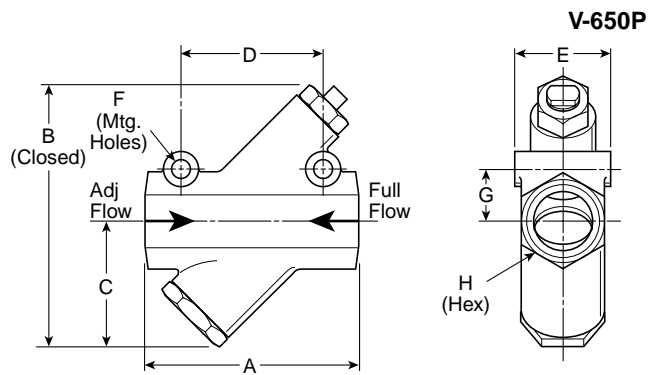
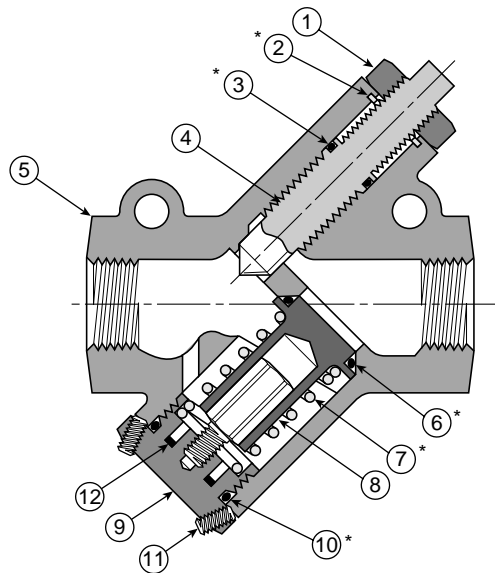
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### Flow Control Valves 1", 1-1/4" & 1-1/2"

11. Insert poppet and spring, then screw on plug assembly and tighten to 6.8 Nm (60 in-lb) torque.
12. Clean the set screws with an inorganic cleanser to be free of all oil or grease.
13. Apply thread locking compound to both set screws and tighten to 2.3 Nm (20 in-lb) torque.



Pipe Port Size	Max Flow (Needle Open)		Dimensions In Inches							
	SCFM <sup>†</sup>	GPM	A	B	C	D	E	F	G	H
1"	1000	110	5.00	6.50	3.00	3.25	2.25	.390	1.31	2-1/8"
1-1/4"	1200	130	5.00	6.50	3.00	3.25	2.25	.390	1.31	2-1/8"
1-1/2"	1800	190	5.88	8.00	3.75	3.50	2.50	.390	1.50	2-3/8"

<sup>†</sup> At 100 PSIG inlet pressure with full pressure drop.

Item No.	Pipe Port Size	1"	1-1/4"	1-1/2"
	Service Kit	03250 8013	03250 8013	03250 8014
	Description	Part Number		
1	Lock Nut	—	—	—
2 *	Retaining Ring	03250 0920	03250 0920	03250 0930
3 *	Needle O-ring	03454 0008	03454 0008	03454 0011
4	Needle	—	—	—
5	Valve Body	03250 7990	03250 7997	03250 7983
6 *	Poppet O-ring	03250 7996	03250 7996	03250 7989
7 *	Spring	03250 7995	03250 7995	03250 7995
8	Poppet	—	—	—
9	Plug Assembly	—	—	—
10 *	Body O-ring	03454 0027	03454 0027	03454 0060
11	Set Screw (2)	—	—	—
12	Bumper	—	—	—

\* Parts included in Service Kit.



**Pneumatic Division**  
Richland, Michigan 49083  
269-629-5000

**PDNSG-1**

**Pneumatic Division Safety Guide**

**ISSUED: August 1, 2006**

**Supersedes: June 1, 2006**

## **Safety Guide For Selecting And Using Pneumatic Division Products And Related Accessories**

### **⚠ WARNING:**

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF PNEUMATIC DIVISION PRODUCTS, ASSEMBLIES OR RELATED ITEMS ("PRODUCTS") CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE. POSSIBLE CONSEQUENCES OF FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THESE PRODUCTS INCLUDE BUT ARE NOT LIMITED TO:**

- Unintended or mistimed cycling or motion of machine members or failure to cycle
- Work pieces or component parts being thrown off at high speeds.
- Failure of a device to function properly for example, failure to clamp or unclamp an associated item or device.
- Explosion
- Suddenly moving or falling objects.
- Release of toxic or otherwise injurious liquids or gasses.

Before selecting or using any of these Products, it is important that you read and follow the instructions below.

### **1. GENERAL INSTRUCTIONS**

- 1.1. Scope:** This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Pneumatic Division Valves, FRLs (Filters, Pressure Regulators, and Lubricators), Vacuum products and related accessory components.
- 1.2. Fail-Safe:** Valves, FRLs, Vacuum products and their related components can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of associated valves, FRLs or Vacuum products will not endanger persons or property.
- 1.3. Relevant International Standards:** For a good guide to the application of a broad spectrum of pneumatic fluid power devices see: ISO 4414:1998, Pneumatic Fluid Power – General Rules Relating to Systems. See [www.iso.org](http://www.iso.org) for ordering information.
- 1.4. Distribution:** Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Valves, FRLs or Vacuum products. Do not select, or use Parker valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.
- 1.5. User Responsibility:** Due to the wide variety of operating conditions and applications for valves, FRLs, and vacuum products Parker and its distributors do not represent or warrant that any particular valve, FRL or vacuum product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:
  - Making the final selection of the appropriate valve, FRL, Vacuum component, or accessory.
  - Assuring that all user's performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.
  - Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the valves, FRLs or Vacuum products are used; and,
  - Assuring compliance with all applicable government and industry standards.
- 1.6. Safety Devices:** Safety devices should not be removed, or defeated.
- 1.7. Warning Labels:** Warning labels should not be removed, painted over or otherwise obscured.
- 1.8. Additional Questions:** Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to [www.parker.com](http://www.parker.com), for telephone numbers of the appropriate technical service department.

### **2. PRODUCT SELECTION INSTRUCTIONS**

- 2.1. Flow Rate:** The flow rate requirements of a system are frequently the primary consideration when designing any pneumatic system. System components need to be able to provide adequate flow and pressure for the desired application.
- 2.2. Pressure Rating:** Never exceed the rated pressure of a product. Consult product labeling, Pneumatic Division catalogs or the instruction sheets supplied for maximum pressure ratings.
- 2.3. Temperature Rating:** Never exceed the temperature rating of a product. Excessive heat can shorten the life expectancy of a product and result in complete product failure.
- 2.4. Environment:** Many environmental conditions can affect the integrity and suitability of a product for a given application. Pneumatic Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct sunlight and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.
- 2.5. Lubrication and Compressor Carryover:** Some modern synthetic oils can and will attack nitrile seals. If there is any possibility of synthetic oils or greases migrating into the pneumatic components check for compatibility with the seal materials used. Consult the factory or product literature for materials of construction.
- 2.6. Polycarbonate Bowls and Sight Glasses:** To avoid potential polycarbonate bowl failures:
  - Do not locate polycarbonate bowls or sight glasses in areas where they could be subject to direct sunlight, impact blow, or temperatures outside of the rated range.
  - Do not expose or clean polycarbonate bowls with detergents, chlorinated hydro-carbons, ketones, esters or certain alcohols.
  - Do not use polycarbonate bowls or sight glasses in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.



## Pneumatic Division Safety Guide

- 2.7. Chemical Compatibility:** For more information on plastic component chemical compatibility see Pneumatic Division technical bulletins Tec-3, Tec-4, and Tec-5
- 2.8. Product Rupture:** Product rupture can cause death, serious personal injury, and property damage.
- Do not connect pressure regulators or other Pneumatic Division products to bottled gas cylinders.
  - Do not exceed the maximum primary pressure rating of any pressure regulator or any system component.
  - Consult product labeling or product literature for pressure rating limitations.

### 3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

- 3.1. Component Inspection:** Prior to assembly or installation a careful examination of the valves, FRLs or vacuum products must be performed. All components must be checked for correct style, size, and catalog number. DO NOT use any component that displays any signs of nonconformance.
- 3.2. Installation Instructions:** Parker published Installation Instructions must be followed for installation of Parker valves, FRLs and vacuum components. These instructions are provided with every Parker valve or FRL sold, or by calling 1-800-CPARKER, or at [www.parker.com](http://www.parker.com).
- 3.3. Air Supply:** The air supply or control medium supplied to Valves, FRLs and Vacuum components must be moisture-free if ambient temperature can drop below freezing

### 4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

- 4.1. Maintenance:** Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division products so that products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.10.
- 4.2. Installation and Service Instructions:** Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at [www.parker.com](http://www.parker.com).
- 4.3. Lockout / Tagout Procedures:** Be sure to follow all required lockout and tagout procedures when servicing equipment. For more information see: OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – (Lockout / Tagout)
- 4.4. Visual Inspection:** Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:
- Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
  - Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
  - Kinked, crushed, or damaged hoses. Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
  - Any observed improper system or component function: Immediately shut down the system and correct malfunction.
  - Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.

**Caution: Leak detection solutions should be rinsed off after use.**

- 4.5. Routine Maintenance Issues:**
- Remove excessive dirt, grime and clutter from work areas.
  - Make sure all required guards and shields are in place.
- 4.6. Functional Test:** Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.
- 4.7. Service or Replacement Intervals:** It is the user's responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:
- Previous performance experiences.
  - Government and / or industrial standards.
  - When failures could result in unacceptable down time, equipment damage or personal injury risk.
- 4.8. Servicing or Replacing of any Worn or Damaged Parts:** To avoid unpredictable system behavior that can cause death, personal injury and property damage:
- Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
  - Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
  - Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
  - Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
  - After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
  - Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.
- 4.9. Putting Serviced System Back into Operation:** Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.