CPI™/A-LOK® Tube Fittings and Instrumentation Valves

Catalog 4200-PC

June 2011

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climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
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CPI™/A-LOK® Tube Fittings Pocket Catalog
Catalog 4200-PC

This pocket catalog provides a representation of our imperial size products only. For more complete information on these products and our metric offerings, please refer to the appropriate full-line catalog, shown on pages 8 and 9.

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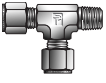

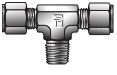

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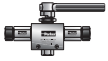

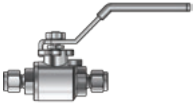

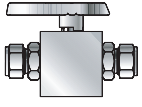

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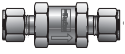

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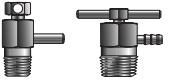

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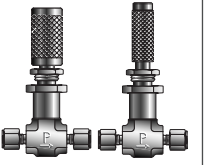

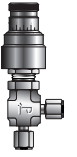

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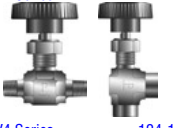

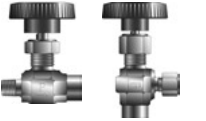

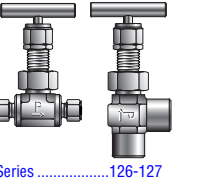

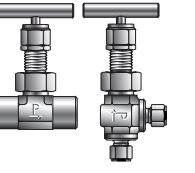

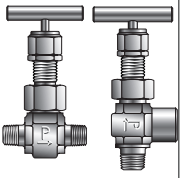

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Needle Valves

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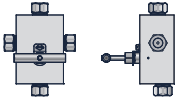

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Sample Cylinders

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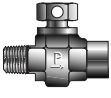

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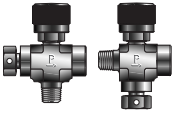

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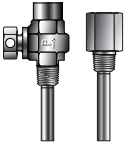


Offer of Sale

Parker Overview

Parker Instrumentation Products Division Catalogs

Catalog 4110-NV

Catalog 4121-BV

Catalog 4135-CV

Catalog 4170-MV

Parker Instrumentation Products Division Catalogs

Catalog 4230/4233

Catalog 4234

Catalog 4260

Catalog 4280

Introduction

Parker CPI™ / A-LOK® Instrumentation Tube Fittings are designed as leak-free connections for process, power and instrumentation applications. These single and two ferrule fittings are manufactured to the highest quality standards and are available in a broad range of sizes, materials and configurations.

Features

The Parker CPI™ / A-LOK® tube fitting has been specifically designed for use on instrumentation, process and control systems, analysers and environmental equipment employed in chemical, petroleum, power generating and pulp and paper plants. CPI™ / A-LOK® fittings have also been used extensively in other applications and industries wherever high reliability and quality are required.

Materials

Parker CPI™ / A-LOK® fittings are available as standard in Heat Code Traceable, 316 stainless steel. Other materials include steel, brass, aluminum, nickel-copper, Hastelloy C®, Alloy 600, Titanium, 6Mo, Incoloy 625 and 825. The raw materials used fully conform to the chemical requirements listed in Table 3. For nuclear and other critical applications, stainless steel CPI™ / A-LOK® fittings are readily available with documented heat code traceability.

Huntsville, Alabama, USA

Pipe Fittings/Adapters

Parker CPI™ / A-LOK® tube fittings are available in combination with a variety of ISO and ANSI pipe thread configurations. For a full listing of these fittings, see Catalog 4260.

Tubing

Parker CPI™ / A-LOK® tube fittings can be used with a wide variety of tubing materials and a broad range of tube wall thicknesses. CPI™ / A-LOK® seals equally well on both thin wall and heavy wall tubing. **Tubing and fitting materials should be selected to be compatible with the fluid media. Due to thermal expansion characteristics and chemical stability, the tubing should be of the same material as the fitting. (The exception is brass fittings and copper tubing.)**

Torque

Parker CPI™/A-LOK® tube fittings do not twist the tubing during installation. CPI™/A-LOK® ferrule designs assure that all make and remake motion is transmitted axially to the tubing. Since no radial movement of the tubing occurs, the tubing is not stressed. The mechanical integrity of the tubing is maintained.

No Distortion

In make-up, there is no undue force in an outward direction to distort the fitting body or ferrules to cause interference between the ferrules and nut. This assures that the nut will back-off freely for disassembly and permits a greater number of easy remakes.

Sealing

Positive, reliable connections with Parker CPI™/A-LOK® fittings have been qualified by exhaustive tests and over four decades of experience in the manufacture of quality tube fittings.

Nomenclature

Parker CPI™/A-LOK® fitting part numbers are constructed from symbols that identify the size and style of the fitting and material used.

Assembly, Remake, Gaugeability

Proper assembly is the key component to a leak-free system. CPI™/A-LOK® tube fitting assembly, remake and gaugeability instructions are found on page 15 of this catalog.

Pressure Rating & Tubing Selection

For working pressures of CPI™/A-LOK® tube connections, please see pages 21-27 of this catalog, the Instrument Tubing Selection Guide (4200-TS) found in the Technical Section of your Parker Instrumentation Products Process Binder, or the Parker Instrument Tube Fitting Installation Manual (Bulletin 4200-B4).

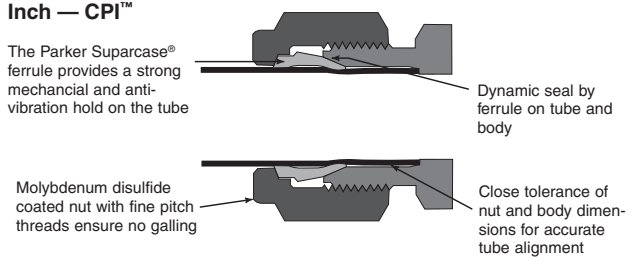
In cases where a male or female pipe thread is the second end of a Parker CPI™/A-LOK® fitting, such threads may be the pressure limiting factor of the tubing system. Pressure ratings for Pipe Ends are shown on page 27.

Barnstaple, UK

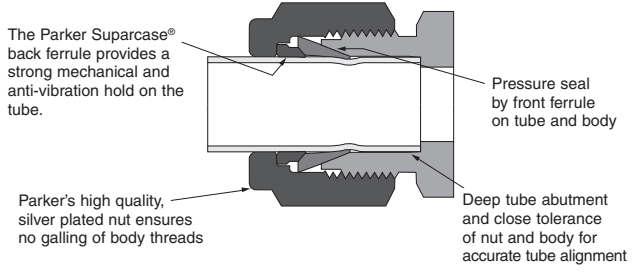
Introduction

The Parker CPI™/A-LOK® fittings consists of precision engineered parts designed to provide secure leak-proof joints capable of satisfying high pressure, vacuum and vibration applications.

Inch — CPI™



Inch — A-LOK®



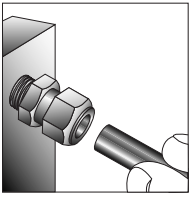
Parker Instrumentation Tube Fittings are supplied complete and ready to use. The ferrule(s) swage onto the tube as it moves down the body seat creating a pressure/vacuum-tight seal on both tube and body by the interface pressure and surface finish of mating components. The Parker Suparcase® ferrule (back-ferrule only on A-LOK®) creates a strong mechanical hold on the tube.

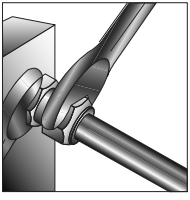
Assembly

1. Parker instrument tube fittings are sold completely assembled and ready for immediate use. Simply insert the tube as illustrated below until it bottoms in the fitting body. (If the fitting is disassembled, note that the small tapered end of the ferrule(s) go into the fitting body.)

2. Tighten nut finger tight. Then tighten nut with wrench an additional 1/4 to 1-1/4 turns identified below and illustrated in Table 1. Hold fitting body with a second wrench to prevent body from turning. It is helpful to mark the nut to facilitate counting the number of turns.

For Sizes above 16 (1"), the Parker IPD Ferrule Presetting Tool must be used. Please see Bulletin 4200-B4 or Catalog 4290-INST for additional details.





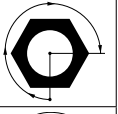
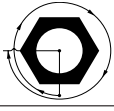
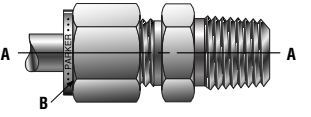
Description	Size	Wrench Tighten	Illustration
Tube Fittings	**Inch Size** 1 thru 3 (1/16" - 3/16") **Metric Size** 2 thru 4 (2-4mm)	3/4 turn from finger tight	
	Inch Size 4 thru 16 (1/4" - 1") **Metric Size** 6 thru 25 (6-25mm)	1-1/4 turns from finger tight	
Tube Plugs (FNZ/BLP)		1/4 turn from finger tight	
Port Connector (ZPC/PC)	Machined ferrule end only	1/4 turn from finger tight	

Table 1 Turns from Finger Tight

Remake

For maximum number of remakes, mark the fitting and nut before disassembly as indicated by "A" below. Before retightening, make sure the assembly has been inserted into the fitting until the ferrule seats in the fitting. Retighten the nut by hand. Rotate the nut with a wrench to the original position as indicated by the previous marks lining up. (A noticeable increase in mechanical resistance will be felt indicating the ferrule is being re-sprung into sealing position.)

Only after several remakes will it become necessary to advance the nut slightly past the original position. This advance (indicated by B in the illustration) need only be 10° - 20° (less than 1/3 of a hex flat).

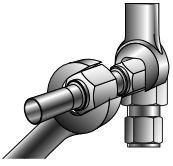


Parker CPI™/A-LOK® Fittings on Plastic Tubing

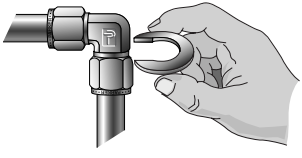
Parker CPI™ /A-LOK® Instrument Fittings can be successfully used on any of the following plastic tubing: nylon, polyethylene, polypropylene, PTFE, or vinyl. Normal make-up instructions should be followed, (1-1/4" turns from finger tight) sizes 4 thru 16 (3/4 turn from finger tight for size 3" or below) and a properly-sized insert should be used when required. (Please refer to CPI™/A-LOK® Catalog 4230/4233 for insert details). The use of the insert is dependent upon tubing O.D. Tubing 1/2" O.D. and above requires an insert. Softness of the tubing is another guideline for the use of an insert. Tubing that is soft enough to be easily pinched closed with your fingers will require an insert no matter what the O.D. may be.

Gaugeability Instructions*

1. From “finger tight” position, wrench 1-1/4 turns for 1/4" to 1" size fittings (6mm to 25mm) (1/16", 1/8", 3/16", 2mm 3mm and 4mm size tube fittings only wrench 3/4 turn from finger tight position). Hold fitting body hex with second wrench to prevent body from turning as you tighten. It is a good idea to mark the nut (scribe or ink) to help you count the turns.



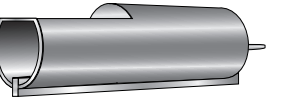
2. Now select the proper size inspection gauge and try to place it, as shown, between the nut and the body hex. If gauge does not fit at any point between them, you have correctly tightened the nut. If you can slip the gauge into the space, the fitting is not properly made up, and you must repeat the assembly procedure.



* For initial make-up only.

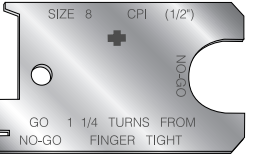
Tube Marker

Put burnish marks on the tubing quickly and accurately with this easy-to-use tube marker. Also used to check the burnish mark position. (Good for the life of the fitting.) The Tube Marker ensures proper tube depth insertion into the fitting body.



Inspection Gauges

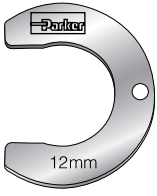
This handy gauge does double duty. Use the No-Go portion (on one end) to check the tube insertion depth. Use the other end to check the space between the nut and body hex. (Proper initial make-up prevents the gauge from being inserted.)



Gap Gauge

This compact C-Ring gauge is for inch and metric sizes. It effectively checks the gap dimensions for initial make-up. Can be combined on a key ring for easy handling.

Each gap gauge with the exception of the M10 is designed for an inch size with an equivalent metric size(s) as shown in Table 2.



Part Number	Tube Size	
	Inch	Metric
2 Gap Gauge	1/8	2-3
3 Gap Gauge	3/16	4
4 Gap Gauge	1/4	6
5 Gap Gauge	5/8	8
6 Gap Gauge	3/8	–
M10 Gap Gauge	–	10
8 Gap Gauge	1/2	12
10 Gap Gauge	5/8	14-15-16
12 Gap Gauge	3/4	18
14 Gap Gauge	7/8	20-22
16 Gap Gauge	1	25

Table 2

Instrument Tubing Selection Guide

Parker's instrument tube fittings have been designed to work in a wide variety of applications that demand the utmost in product performance.

Although Parker's Instrument tube fittings have been engineered and manufactured to consistently provide this level of reliability, no systems integrity is complete without considering the critical link, tubing.

This section is intended to assist the designer to properly select and order quality tubing.

Proper tube selection and installation, we believe, are key ingredients in building leak-free reliable tubing systems.

General Selection Criteria

The most important consideration in the selection of suitable tubing for any application is the compatibility of the tubing material with the media to be contained. Table 3 lists common materials and their associated general application. Table 3 also lists the maximum and minimum operating temperature for the various tubing materials.

In addition, Parker instrument fittings are designed to work on like materials. Stainless steel fittings should be used only with stainless steel tubing, aluminum fittings with aluminum tubing, etc. The practice of mixing materials is strongly discouraged. The only exception is brass fittings with copper tubing.

Dissimilar materials in contact may be susceptible to galvanic corrosion. Further, different materials have different levels of hardness, and can adversely affect the fitting's ability to seal on the tubing.

Table 3

Tubing Material	General Application	Recommended Temperature Range
Stainless Steel (Type 316)	High pressure, high temperature, generally corrosive media	-425°F to 1,200°F* (-255°C to 605°C)
Carbon Steel	High pressure, high temperature oil, air, some specialty chemicals	-20°F to 800°F** (-29°C to 425°C)
Copper	Low temperature, low pressure water, oil, air	-40°F to 400°F (-40°C to 205°C)
Aluminum	Low temperature, low pressure water, oil, air, some specialty chemicals	-40°F to 400°F (-40°C to 205°C)
Monel® 400	Recommended for sour gas applications; well suited for marine and general chemical processing applications	-325°F to 800°F (-198°C to 425°C)
Hastelloy® C-276	Excellent corrosion resistance to both oxidizing and reducing media and excellent resistance to localized corrosion attack	-325°F to 1,000°F (-198°C to 535°C)
Carpenter® 20	Applications requiring resistance to stress corrosion cracking in extreme conditions	-325°F to 800°F (-198°C to 425°C)
Inconel® Alloy 600	Recommended for high temperature applications with generally corrosive media	-205°F to 1,200°F (-130°C to 650°C)
Titanium	Resistant to many natural environments such as sea water, body fluids and salt solutions	-75°F to 600°F (-59°C to 315°C)

* For operating temperatures above 800°F (425°C), consideration should be given to media. 300 Series Stainless Steels are susceptible to carbide precipitation which may lead to intergranular corrosion at elevated temperatures.

** Consideration should be given to maximum temperature ratings if fittings and/or tubing are coated or plated. All temperature ratings based on temperatures per ASME B31.3 Chemical Plant and Petroleum Refinery Piping Code, 1999 Edition.

The information listed in Table 3 is general in scope. For specific applications, please contact Parker's Instrumentation Products Division, Product Engineering Department (256) 881-2040.

NOTE: Hastelloy® is a registered trademark of Haynes International. Inconel®, and Monel® are registered trademarks of Special Metals Corporation. Carpenter® is a registered trademark of CRS Holdings Inc.

Gas Service

Special care must be taken when selecting tubing for gas service. In order to achieve a gas-tight seal, ferrules in instrument fittings must seal any surface imperfections. This is accomplished by the ferrules penetrating the surface of the tubing. Penetration can only be achieved if the tubing provides radial resistance and if the tubing material is softer than the ferrules.

Thick walled tubing helps to provide resistance. Tables 4 – 9 indicate the minimum acceptable wall thickness for various materials in gas service. The ratings in white indicate combination of diameter and wall thickness which are suitable for gas service.

Acceptable tubing hardness for general application is listed in Table 11. These values are the maximum allowed by ASTM. For gas service, better results can be obtained by using tubing well below this maximum hardness. For example, a desirable hardness of 80 Rb is suitable for stainless steel. The maximum allowed by ASTM is 90 Rb.

System Pressure

The system operating pressure is another important factor in determining the type, and more importantly, the size of tubing to be used. In general, high pressure installations require strong materials such as steel or stainless steel. Heavy walled softer tubing such as copper may be used if chemical compatibility exists with the media. However, the higher strength of steel or stainless steel permits the use of thinner tubes without reducing the ultimate rating of the system. In any event, tube fitting assemblies should never be pressurized beyond the recommended working pressure.

The following tables (4 – 9) list by material the maximum suggested working pressure of various tubing sizes. Acceptable tubing diameters and wall thicknesses are those for which a rating is listed. Combinations, which do not have a pressure rating, are not recommended for use with instrument fittings.

Notes for Tables 4 –9:

- All working pressures have been calculated using the maximum allowable stress levels in accordance with ASME B31.3, Chemical Plant and Petroleum Refinery Piping Code, 1999 Edition.
- All calculations are based on maximum outside diameter and minimum wall thickness.
- All working pressures are ambient (72°F or 22°C) temperature.

Maximum Allowable Working Pressure Tables

Ratings in gray not suitable for gas service.

Table 4a*	316 or 304 STAINLESS STEEL (Seamless)							
Tube O.D. Size	Wall Thickness							
	0.010	0.012	0.014	0.016	0.020	0.028	0.035	0.049
1/16	5600	6900	8200	9500	12100	16800		
1/8						8600	10900	
3/16						5500	7000	10300
1/4						4000	5100	7500
5/16							4100	5900
3/8							3300	4800
1/2							2600	3700
5/8								3000
3/4								2400
7/8								2100
1								
1-1/4								
1-1/2								
2								

Table 4b*	316 or 304 STAINLESS STEEL (Seamless)							
Tube O.D. Size	Wall Thickness							
	0.065	0.083	0.095	0.109	0.120	0.134	0.156	0.188
1/16								
1/8								
3/16								
1/4	10300							
5/16	8100							
3/8	6600							
1/2	5100	6700						
5/8	4000	5200	6100					
3/4	3300	4300	5000	5800				
7/8	2800	3600	4200	4900				
1	2400	3200	3700	4200	4700			
1-1/4		2500	2900	3300	3700	4100	4900	
1-1/2			2400	2700	3000	3400	4000	4500
2				2000	2200	2500	2900	3200

***Notes for Tables 4 – 9:**

- All working pressures have been calculated using the maximum allowable stress levels in accordance with ASME B31.3, Chemical Plant and Petroleum Refinery Piping Code, 1999 Edition.
- All calculations are based on maximum outside diameter and minimum wall thickness.
- All working pressures are ambient (72°F or 22°C) temperature.

Maximum Allowable Working Pressure Tables are continued on the following page.

Maximum Allowable Working Pressure Tables (cont'd)

Ratings in gray not suitable for gas service.

Table 5a*	316 or 304 STAINLESS STEEL (Welded)							
Tube O.D. Size	Wall Thickness							
	0.010	0.012	0.014	0.016	0.020	0.028	0.035	0.049
1/16	4800	5900	7000	8100	10300	14300		
1/8						7300	9300	
3/16						4700	6000	8700
1/4						3400	4400	6400
5/16							3400	5000
3/8							2800	4100
1/2							2200	3200
5/8								2500
3/4								2100
7/8								1800
1								
1-1/4								
1-1/2								
2								

Table 5b*	316 or 304 STAINLESS STEEL (Welded)							
Tube O.D. Size	Wall Thickness							
	0.065	0.083	0.095	0.109	0.120	0.134	0.156	0.188
1/16								
1/8								
3/16								
1/4	8700							
5/16	6900							
3/8	5600							
1/2	4300	5700						
5/8	3400	4500	5200					
3/4	2800	3700	4200	4900				
7/8	2400	3100	3600	4200				
1	2100	2700	3100	3600	4000			
1-1/4		2100	2400	2800	3100	3500	4200	
1-1/2			2000	2300	2600	2900	3400	4200
2				1700	1900	2100	2500	3000

***Notes for Tables 4–9:**

- All working pressures have been calculated using the maximum allowable stress levels in accordance with ASME B31.3, Chemical Plant and Petroleum Refinery Piping Code, 1999 Edition.
- All calculations are based on maximum outside diameter and minimum wall thickness.
- All working pressures are ambient (72°F or 22°C) temperature.

Maximum Allowable Working Pressure Tables are continued on the following page.

Maximum Allowable Working Pressure Tables (cont'd)

Ratings in gray not suitable for gas service.

Table 6*	CARBON STEEL (Seamless)											
Tube O.D. Size	Wall Thickness											
	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120	0.134	0.148	0.165	0.180
1/8	8100	10300										
3/16	5200	6700	9700									
1/4	3800	4900	7100	9700								
5/16		3800	5500	7700								
3/8		3100	4500	6200								
1/2		2300	3300	4500	6000							
5/8		1800	2600	3500	4600	5400						
3/4			2200	2900	3800	4400	5100					
7/8			1800	2500	3200	3700	4300					
1			1600	2100	2800	3200	3700	4100				
1-1/4				1700	2200	2500	2900	3200	3700	3800		
1-1/2					1800	2100	2400	2700	3000	3400	3800	4000
2						1600	1800	2000	2200	2500	2800	3000

Table 7*	COPPER (Seamless)									
Tube O.D. Size	Wall Thickness									
	.010	.020	.028	.035	.049	.065	.083	.095	.109	.120
1/16	1700	3800	5400							
1/8			2800	3600						
3/16			1800	2300	3500					
1/4			1300	1700	2600	3500				
5/16				1300	2000	2800				
3/8				1100	1600	2300				
1/2				800	1200	1600	2200			
5/8					900	1300	1700	2000		
3/4					800	1000	1400	1600	1900	
7/8					600	900	1100	1300	1600	
1					600	800	1000	1200	1400	1500
1-1/8					500	700	900	1000	1200	1300
1-1/4							800	900	1100	1200
1-1/2							650	750	850	950

***Notes for Tables 4–9:**

- All working pressures have been calculated using the maximum allowable stress levels in accordance with ASME B31.3, Chemical Plant and Petroleum Refinery Piping Code, 1999 Edition.
- All calculations are based on maximum outside diameter and minimum wall thickness.
- All working pressures are ambient (72°F or 22°C) temperature.

Maximum Allowable Working Pressure Tables are continued on the following page.

Maximum Allowable Working Pressure Tables (cont'd)

Ratings in gray not suitable for gas service.

Table 8* ALUMINUM (Seamless)

Tube O.D. Size	Wall Thickness				
	0.035	0.049	0.065	0.083	0.095
1/8	8700				
3/16	5600	8100			
1/4	4100	5900			
5/16	3200	4600			
3/8	2600	3800			
1/2	1900	2800	3800		
5/8	1500	2200	2900		
3/4		1800	2400	3200	
7/8		1500	2100	2700	
1		1300	1800	2300	2700

Table 9* MONEL 400 (Seamless)

Tube O.D. Size	Wall Thickness									
	.010	.020	.028	.035	.049	.065	.083	.095	.109	.120
1/16	5500	11800	16300							
1/8			8100	10400						
3/16			5100	6600	9600					
1/4			3800	4800	7000	9600				
5/16				3800	5500	7500				
3/8				3100	4500	6100				
1/2				2300	3300	4500	5900			
5/8					2700	3700	4900	5600		
3/4					2300	3100	4000	4600	5400	
1						2300	2900	3400	3900	4400

***Notes for Tables 4–9:**

- All working pressures have been calculated using the maximum allowable stress levels in accordance with ASME B31.3, Chemical Plant and Petroleum Refinery Piping Code, 1999 Edition.
- All calculations are based on maximum outside diameter and minimum wall thickness.
- All working pressures are ambient (72°F or 22°C) temperature.

Maximum Allowable Working Pressure Tables are continued on the following page.

System Temperature

Operating temperature is another factor in determining the proper tubing material. Copper and aluminum tubing are suitable for low temperature media. Stainless steel and carbon steel tubing are suitable for higher temperature media. Special alloys such as Alloy 600 are recommended for extremely high temperatures (see Table 3). Table 10 lists derating factors which should be applied to the working pressures listed in Tables 4–9 for elevated temperature conditions. Simply locate the correct factor in Table 8 and multiply this by the appropriate value in Tables 4–9 for elevated temperature working pressure.

Table 10 – Temperature Derating Factors

Temperature				316	304		Monel
°F	(°C)	Copper	Aluminum	SS	SS	Steel	400
100	(38)	1.00	1.00	1.00	1.00	1.00	1.00
200	(93)	.80	1.00	1.00	1.00	.96	.88
300	(149)	.78	.81	1.00	1.00	.90	.82
400	(204)	.50	.40	.97	.94	.86	.79
500	(260)			.90	.88	.82	.79
600	(316)			.85	.82	.77	.79
700	(371)			.82	.80	.73	.79
800	(427)			.80	.76	.59	.76
900	(486)			.78	.73		.43
1000	(538)			.77	.69		
1100	(593)			.62	.49		
1200	(649)			.37	.30		

EXAMPLE: 1/2" x .049 wall seamless 316 stainless steel tubing has a working pressure of 3700 PSI @ room temperature. If the system were to operate @ 800°F (425°C), a factor of 80% or (.80) would apply (see Table 10 above) and the "at temperature" system pressure would be 3700 PSI x .80 = 2960 PSI.

Tubing Ordering Guidelines

Tubing for use with Parker instrument fittings must be carefully ordered to insure adequate quality for good performance. Each purchase order must specify the material nominal outside diameter, and wall thickness. Ordering to ASTM specifications insures that the tubing will be dimensionally, physically, and chemically within strict limits. Also, more stringent requirements may be added by the user. All tubing should be ordered free of scratches and suitable for bending.

A purchase order meeting the above criteria would read as follows:

> "1/2 x .049 316 stainless steel, seamless, or welded and redrawn per ASTM A-249. Fully annealed, 80 Rb or less. Must be suitable for bending; surface scratches, and imperfections (incomplete weld seams) are not permissible."

Table 11 lists specific ordering information for each material.

Table 11

Material	Type	ASTM Tubing Spec.	Condition	Max. Recommended Hardness
Stainless Steel	304, 316, 316L	ASTM-A-269, A-249, A-213, A632	Fully Annealed	90 Rb
Copper	K or L	ASTM-B75 B68, B88 (K or L)*	Soft Annealed Temper 0	60 Max. Rockwell 15T
Carbon Steel	1010	SAE-J524b, J525b ASTM-A-179	Fully Annealed	72 Rb
Aluminum	Alloy 6061	ASTM B-210	T6 Temper	56 Rb
Monel® 400	400	ASTM B-165	Fully Annealed	75 Rb
Hastelloy® C-276	C-276	ASTM-B-622, B-626	Fully Annealed	90 Rb
Inconel® Alloy 600	600	ASTM B-167	Fully Annealed	90 Rb
Carpenter® 20	20CB-3	ASTM B-468	Fully Annealed	90 Rb
Titanium	Commercially Pure Grade 2	ASTM B-338	Fully Annealed	99 Rb 200 Brinell Typical

*B88 Copper Tube to be ordered non-engraved

NOTE: Hastelloy® is a registered trademark of Haynes International. Inconel®, and Monel® are registered trademarks of Special Metals Corporation. Carpenter® is a registered trademark of CRS Holdings Inc.

Table 12 — Pipe Pressure Ratings

NPT / BSPT Pipe Size	BRASS			
	Male		Female	
	Straight[a]	Shape[b]	Straight[a]	Shape[b]
1/16	6000	5500	4500	3800
1/8	5600	5000	4000	2900
1/4	4100	4100	4300	3000
3/8	4000	4000	3500	2700
1/2	3900	3100	3600	2500
3/4	3800	3400	3000	2000
1	2700	2700	3100	2300
1-1/4	2000	2000	2300	1900
1-1/2	1800	1800	2100	1700
2	1600	1600	2000	1500

NPT / BSPT Pipe Size	STAINLESS STEEL			
	Male		Female	
	Straight[a]	Shape[b]	Straight[a]	Shape[b]
1/16	10000	9500	7500	7000
1/8	9100	9100	6400	5500
1/4	7500	7500	6600	5600
3/8	7200	7200	5300	5000
1/2	6600	5800	5200	4500
3/4	6400	6400	4300	3500
1	4600	4600	4500	3900
1-1/4	3500	3500	3500	3100
1-1/2	2900	2900	3200	2500
2	2600	2600	2700	2300

NPT / BSPT Pipe Size	CARBON STEEL			
	Male		Female	
	Straight[a]	Shape[b]	Straight[a]	Shape[b]
1/16	10500	10100	8000	7500
1/8	9700	9700	6800	5900
1/4	8000	8000	7000	6000
3/8	7600	7600	5600	5300
1/2	7000	6200	5500	4800
3/4	6800	6800	4600	3700
1	4900	4900	4800	4200
1-1/4	3700	3700	3700	3300
1-1/2	3100	3100	3400	2600
2	2800	2800	2800	2400

Notes:

a. Fittings manufactured from bar stock.
b. Fittings manufactured from forgings.
c. Material of construction in accordance with Table 3 on page 19.
d. Pressure ratings for fittings with both tube and pipe ends are rated to the lower pressure.

Tubing Selection Guide

Table 13 – Typical Raw Material Specifications

Basic Fitting Material	Material Designator	Straights	Shapes	Common Tubing Specification
Brass	B	CA-360 QQ-B 626 Alloy 360 ASTM-B16 Alloy 360 CA-345 ASTM-B-453 Alloy 345	CA-377 QQ-B 626 Alloy 377 ASTM-B-124 Alloy 377 BS2872 CZ122	ASTM-B75 ASME-SB75 (TEMPER "O")
Stainless Steel (Type 316)(1)	A-LOK® = 316 (1) (2) CPI™ = SS	ASME-SA-479 Type 316-SS BS970 316-S31 DIN 4401 ASTM A276 Type 316 ASTM/ASME-SA-182	ASME-SA-182 316 BS970 316-S31 DIN 4401	ASME-SA-213 ASTM-A-213 ASTM-A-249 ASTM-A-269(3) MIL T-8504 MIL T-8506
Steel	S	ASTM-A-108 QQ-S-637	ASTM-A-576	SAE J524b SAE J525b ASTM-A-179
Aluminum	A	2017-T4 or 2024-T4 ASTM-B211 QQ-A-225/5 or 6	2014T (as fabricated) ASTM-B-211 QQ-A-225/4	303, 6061T6 ASTM-B-210
Monel® 400 – Forgings Monel® 405 – Bar Stock	M	ASTM-B-164 QQ-N-281 BS3076 NA13	ASTM-B-164 QQ-N-281 BS3076 NA13	ASTM-B-165
Hastelloy C-276®	HC	ASTM-B-574 ASTMB575	ASTM-B-574	ASTM-B-622 ASTM-B-626
Inconel® Alloy 600	IN	ASTM B-166 ASME-SB-166	ASTM-B-564	ASTM-B-163
Carpenter 20®	SS20	ASTM-B-473	ASTM-B-462 ASTM-B-472	ASTM-B-468
Titanium	T	ASTM-B-348	ASTM-B-381	ASTM-B-338
Inconel® Alloy 625	625	BS3076 NA16 ASTMB425	BS3076 NA16 ASTMB425	ASTM-B-625 ASTM-B-444 ASTM-B-423 ASTM-B-829
Incoloy® Alloy 825	825			
6MO	6MO	UNS S31254 UNS N08367 ASTM A479	UNS S31254 UNS N08367 ASTM A 479	ASTM-A-269

(1) If more specific information, including heat code traceability, is required, your Parker Hannifin CPI™/A-LOK® distributor will provide details.

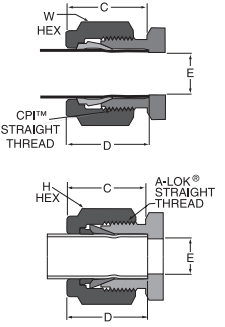
(2) If an "L" appears in the A-LOK® fitting description, then the material designator will be "SS" (e.g., JLZ drop size tee).

(3) Stainless steel CPI™/A-LOK® tube fittings work reliably on both seamless and welded-redrawn, fully annealed type 304, 316 and 316L tubing.

NOTE: Hastelloy® is a registered trademark of Haynes International. Inconel®, Incoloy®, and Monel® are registered trademarks of Special Metals Corporation. Carpenter® is a registered trademark of CRS Holdings Inc.

Table 14 — Tube End Dimensional Data

Size No.	Tube O.D.	Straight Thread	†C	H Hex	E Dia.	†D Tube Ins. Depth
	Inches					
1	1/16	10-32	.43	5/16	.052	.34
2	1/8	5/16-20	.60	7/16	.093	.50
3	3/16	3/8-20	.64	1/2	.125	.54
4	1/4	7/16-20	.70	9/16	.187	.60
5	5/16	1/2-20	.73	5/8	.250	.64
6	3/8	9/16-20	.76	11/16	.281	.67
8	1/2	3/4-20	.87	7/8	.406	.90
10	5/8	7/8-20	.87	1	.500	.96
12	3/4	1-20	.87	1-1/8	.625	.96
14	7/8	1-1/8-20	.87	1-1/4	.750	1.03
16	1	1-5/16-20	1.05	1-1/2	.875	1.24
20	1-1/4	1-5/8-20	1.52	1-7/8	1.09	1.61
24	1-1/2	1-15/16-20	1.77	2-1/4	1.34	1.96
32	2	2-5/8-20	2.47	2-3/4	1.81	2.6



NOTE: Dimensions C and D are shown in the finger-tight position.
† Average Value

How to Order

Nomenclature

Parker CPI™/A-LOK® tube fittings part numbers are constructed from symbols that identify the size and style of the fitting and material used.

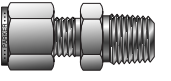
Example: The part number shown below is for a Parker CPI™/A-LOK® stainless steel male connector for 1/2" O.D. tube (–8) and 1/4" male pipe thread (–4).

How To Order CPI™ Inch Parts

8	-	4	FBZ	-	SS
1st End 1/2" Tube O.D.		2nd End 1/4" Pipe Thread	Fitting Type Male Connector		Material Stainless Steel

How To Order A-LOK® Inch Parts

8	MSC	4	N	-	316
1st End 1/2" Tube O.D.	Fitting Type Male Connector	2nd End 1/4" Pipe Thread	Thread Type NPT		Material Stainless Steel

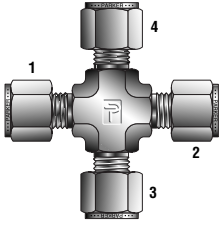


Parker CPI™/A-LOK® Tube Fittings are ordered by part number as listed in this catalog.

Size: Tube and pipe thread sizes are designed by the number of sixteenths of an inch (1/2" tube = 8/16" = 8) (1/4" pipe thread = 4/16" = 4).

Straights & Elbows: Call out largest CPI™/A-LOK® tube end size first followed by the smaller CPI™/A-LOK® tube end or pipe thread size.

Tees & Crosses: For drop size tees – first size the run (1 to 2) and then branch (3). Example – the size designator for a male run tee for 3/8" O.D. tube and 1/4" male pipe thread would be 6-4-6. For crosses – first size the run (1 to 2) and then the branch (3 to 4). For tees with all ends the same, use the tube and size before and after the style designator; i.e. 4-4-4 JBZ (CPI™), 4ET4 (A-LOK®).



Type: A letter or combination of letters and numbers are used to designate the type of fitting. (i.e. SBZ or MBT = male branch tee, GBZ or FA = female adapter, etc.) See the visual index for fitting types.

Material: Basic material type (B = brass, SS or 316 = stainless steel, type 316; S = steel; A = aluminum; M = Alloy 400; HC = Hastelloy C-276®; IN = Alloy 600; SS20 = Carpenter 20®; 6MO = 6Mo; 625 = 625; 825 = 825; T = Titanium). Parker CPI™/A-LOK® Tube fittings, for special applications, can be furnished in almost any material suitable for machining.

Special Fittings: If there is any question as to the fitting desired, particularly for special fitting configurations, it is suggested that a customer print be submitted with the fitting request for quote.

How to Order

CPI™/A-LOK® Options

Parker CPI™/A-LOK® fittings may be ordered with the following options.

How to order

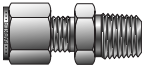
After the complete CPI™/A-LOK® number simply add a "dash" then the suffix for the option.

EXAMPLE: 8MSC4N-316-C describes an A-LOK® male connector for 1/2" OD tube and 1/4" male pipe that has been cleaned for oxygen service. For additional options, please consult the factory.

Suffix	Option	Additional Information
ZYF	Assembled with nylon ferrule(s)	
SPF	Silver plated ferrule(s)	
TF	PTFE ferrule(s)	
BP*	Bulk packed	* Indicates the quantity i.e BP50 for a fifty count package.
LWH	Lock wire hole	
BZP	Knurled nut	Replaces standard nut on CPI™/A-LOK® fittings for use on soft plastic tubing.
C	Silver plated nut	Replaces moly coated nut (BZ).
MI	Moly inside nut	
CNQ	Certified Nuclear Quality	
C1	Grade A Cleaning	Special cleaning, assembly, inspection and packaging for high purity applications.
C3	Cleaned for oxygen service	Meets the requirements of ASTM G93-88; Standard Practice for Cleaning Methods for Materials and Equipment used in Oxygen-Enriched Environments.
CNG	Compressed natural gas service	Assembled with a specific o-ring compound.
NIC	Nickel plated	
CRM	Chrome plated	
VO	Viton O-ring	
NC	NACE	MR0175-2003
NACE	NACE	MR0175-2002
DFARS	Defense Acquisition Regulations System	All components and raw material must be of US origin or from an approved country.

NPT Male Connector

For fractional tube



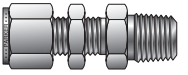
CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Inches	
			Tube O.D.	NPT Thread Size
1-1 FBZ	1MSC1N	100-1-1	1/16	1/16
1-2 FBZ	1MSC2N	100-1-2	1/16	1/8
1-4 FBZ	1MSC4N	100-1-4	1/16	1/4
2-1 FBZ	2MSC1N	200-1-1	1/8	1/16
2-2 FBZ	2MSC2N	200-1-2	1/8	1/8
2-4 FBZ	2MSC4N	200-1-4	1/8	1/4
2-6 FBZ	2MSC6N	200-1-6	1/8	3/8
2-8 FBZ	2MSC8N	200-1-8	1/8	1/2
3-1 FBZ	3MSC1N	300-1-1	3/16	1/16
3-2 FBZ	3MSC2N	300-1-2	3/16	1/8
3-4 FBZ	3MSC4N	300-1-4	3/16	1/4
4-1 FBZ	4MSC1N	400-1-1	1/4	1/16
4-2 FBZ	4MSC2N	400-1-2	1/4	1/8
4-4 FBZ	4MSC4N	400-1-4	1/4	1/4
4-6 FBZ	4MSC6N	400-1-6	1/4	3/8
4-8 FBZ	4MSC8N	400-1-8	1/4	1/2
4-12 FBZ	4MSC12N	400-1-12	1/4	3/4
5-2 FBZ	5MSC2N	500-1-2	5/16	1/8
5-4 FBZ	5MSC4N	500-1-4	5/16	1/4
5-6 FBZ	5MSC6N	500-1-6	5/16	3/8
5-8 FBZ	5MSC8N	500-1-8	5/16	1/2
6-2 FBZ	6MSC2N	600-1-2	3/8	1/8
6-4 FBZ	6MSC4N	600-1-4	3/8	1/4
6-6 FBZ	6MSC6N	600-1-6	3/8	3/8
6-8 FBZ	6MSC8N	600-1-8	3/8	1/2
6-12 FBZ	6MSC12N	600-1-12	3/8	3/4
8-2 FBZ	8MSC2N	810-1-2	1/2	1/8
8-4 FBZ	8MSC4N	810-1-4	1/2	1/4
8-6 FBZ	8MSC6N	810-1-6	1/2	3/8
8-8 FBZ	8MSC8N	810-1-8	1/2	1/2
8-12 FBZ	8MSC12N	810-1-12	1/2	3/4
8-16 FBZ	8MSC16N	810-1-16	1/2	1
10-6 FBZ	10MSC6N	1010-1-6	5/8	3/8
10-8 FBZ	10MSC8N	1010-1-8	5/8	1/2
10-12 FBZ	10MSC12N	1010-1-12	5/8	3/4
12-8 FBZ	12MSC8N	1210-1-8	3/4	1/2
12-12 FBZ	12MSC12N	1210-1-12	3/4	3/4
12-16 FBZ	12MSC16N	1210-1-16	3/4	1
14-12 FBZ	14MSC12N	1410-1-12	7/8	3/4
14-16 FBZ	14MSC16N	1410-1-16	7/8	1
16-8 FBZ	16MSC8N	1610-1-8	1	1/2
16-12 FBZ	16MSC12N	1610-1-12	1	3/4
16-16 FBZ	16MSC16N	1610-1-16	1	1
20-20 FBZ	20MSC20N	2010-1-20	1-1/4	1-1/4
24-24 FBZ	24MSC24N	2410-1-24	1-1/2	1-1/2
32-32 FBZ	32MSC32N	3210-1-32	2	2

NOTE: Sizes 20, 24 and 32 require additional lubrication prior to assembly.

For metric fittings and additional thread types, please see Catalog 4230/4233.

NPT Male Bulkhead Connector

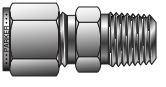
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.	NPT Thread Size
1-1 FH2BZ	1MBC1N	100-11-1	1/16	1/16
1-2 FH2BZ	1MBC2N	100-11-2	1/16	1/8
2-2 FH2BZ	2MBC2N	200-11-2	1/8	1/8
3-2 FH2BZ	3MBC2N	300-11-2	3/16	1/8
4-2 FH2BZ	4MBC2N	400-11-2	1/4	1/8
4-4 FH2BZ	4MBC4N	400-11-4	1/4	1/4
4-6 FH2BZ	4MBC6N	400-11-6	1/4	3/8
4-8 FH2BZ	4MBC8N	400-11-8	1/4	1/2
5-2 FH2BZ	5MBC2N	500-11-2	5/16	1/8
5-4 FH2BZ	5MBC4N	500-11-4	5/16	1/4
6-2 FH2BZ	6MBC2N	600-11-2	3/8	1/8
6-4 FH2BZ	6MBC4N	600-11-4	3/8	1/4
6-6 FH2BZ	6MBC6N	600-11-6	3/8	3/8
6-8 FH2BZ	6MBC8N	600-11-8	3/8	1/2
8-4 FH2BZ	8MBC4N	810-11-4	1/2	1/4
8-6 FH2BZ	8MBC6N	810-11-6	1/2	3/8
8-8 FH2BZ	8MBC8N	810-11-8	1/2	1/2
8-12 FH2BZ	8MBC12N	810-11-12	1/2	3/4
10-6 FH2BZ	10MBC6N	1010-11-6	5/8	3/8
10-8 FH2BZ	10MBC8N	1010-11-8	5/8	1/2
12-8 FH2BZ	12MBC8N	1210-11-8	3/4	1/2
12-12 FH2BZ	12MBC12N	1210-11-12	3/4	3/4
14-12 FH2BZ	14MBC12N	1410-11-12	7/8	3/4
16-12 FH2BZ	16MBC12N	1610-11-12	1	3/4
16-16 FH2BZ	16MBC16N	1610-11-16	1	1

Thermocouple Connector

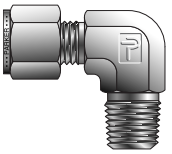
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.	NPT Thread Size
1-1 FH4BZ	1MTC1N	100-1-1BT	1/16	1/16
1-2 FH4BZ	1MTC2N	100-1-2BT	1/16	1/8
1-4 FH4BZ	1MTC4N	100-1-4BT	1/16	1/4
2-1 FH4BZ	2MTC1N	200-1-1BT	1/8	1/16
2-2 FH4BZ	2MTC2N	200-1-2BT	1/8	1/8
2-4 FH4BZ	2MTC4N	200-1-4BT	1/8	1/4
3-2 FH4BZ	3MTC2N	300-1-2BT	3/16	1/8
3-4 FH4BZ	3MTC4N	300-1-4BT	3/16	1/4
4-2 FH4BZ	4MTC2N	400-1-2BT	1/4	1/8
4-4 FH4BZ	4MTC4N	400-1-4BT	1/4	1/4
4-6 FH4BZ	4MTC6N	400-1-6BT	1/4	3/8
4-8 FH4BZ	4MTC8N	400-1-8BT	1/4	1/2
5-4 FH4BZ	5MTC4N	500-1-4BT	5/16	1/4
6-4 FH4BZ	6MTC4N	600-1-4BT	3/8	1/4
6-6 FH4BZ	6MTC6N	600-1-6BT	3/8	3/8
6-8 FH4BZ	6MTC8N	600-1-8BT	3/8	1/2
6-12 FH4BZ	6MTC12N	600-1-12BT	3/8	3/4
8-8 FH4BZ	8MTC8N	810-1-8BT	1/2	1/2
8-12 FH4BZ	8MTC12N	810-1-12BT	1/2	3/4
10-12 FH4BZ	10MTC12N	1010-1-12BT	5/8	3/4
12-12 FH4BZ	12MTC12N	1210-1-12BT	3/4	3/4
16-16 FH4BZ	16MTC16N	1610-1-16BT	1	1

For metric fittings and additional thread types, please see Catalog 4230/4233.

NPT Male Elbow
For fractional tube



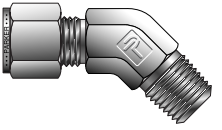
CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.	NPT Thread Size
1-1 CBZ	**1MSEL1N**	100-2-1	1/16	1/16
1-2 CBZ	**1MSEL2N**	100-2-2	1/16	1/8
2-1 CBZ	**2MSEL1N**	200-2-1	1/8	1/16
2-2 CBZ	**2MSEL2N**	200-2-2	1/8	1/8
2-4 CBZ	**2MSEL4N**	200-2-4	1/8	1/4
3-2 CBZ	**3MSEL2N**	300-2-2	3/16	1/8
3-4 CBZ	**3MSEL4N**	300-2-4	3/16	1/4
4-1 CBZ	**4MSEL1N**	400-2-1	1/4	1/16
4-2 CBZ	**4MSEL2N**	400-2-2	1/4	1/8
4-4 CBZ	**4MSEL4N**	400-2-4	1/4	1/4
4-6 CBZ	**4MSEL6N**	400-2-6	1/4	3/8
4-8 CBZ	**4MSEL8N**	400-2-8	1/4	1/2
5-2 CBZ	**5MSEL2N**	500-2-2	5/16	1/8
5-4 CBZ	**5MSEL4N**	500-2-4	5/16	1/4
6-2 CBZ	**6MSEL2N**	600-2-2	3/8	1/8
6-4 CBZ	**6MSEL4N**	600-2-4	3/8	1/4
6-6 CBZ	**6MSEL6N**	600-2-6	3/8	3/8
6-8 CBZ	**6MSEL8N**	600-2-8	3/8	1/2
6-12 CBZ	**6MSEL12N**	600-2-12	3/8	3/4
8-4 CBZ	**8MSEL4N**	810-2-4	1/2	1/4
8-6 CBZ	**8MSEL6N**	810-2-6	1/2	3/8
8-8 CBZ	**8MSEL8N**	810-2-8	1/2	1/2
8-12 CBZ	**8MSEL12N**	810-2-12	1/2	3/4
10-6 CBZ	**10MSEL6N**	1010-2-6	5/8	3/8
10-8 CBZ	**10MSEL8N**	1010-2-8	5/8	1/2
10-12 CBZ	**10MSEL12N**	1010-2-12	5/8	3/4
12-8 CBZ	**12MSEL8N**	1210-2-8	3/4	1/2
12-12 CBZ	**12MSEL12N**	1210-2-12	3/4	3/4
14-12 CBZ	**14MSEL12N**	1410-2-12	7/8	3/4
16-12 CBZ	**16MSEL12N**	1610-2-12	1	3/4
16-16 CBZ	**16MSEL16N**	1610-2-16	1	1
20-20 CBZ	**20MSEL20N**	2010-2-20	1-1/4	1-1/4
24-24 CBZ	**24MSEL24N**	2410-2-24	1-1/2	1-1/2
32-32 CBZ	**32MSEL32N**	3200-2-32	2	2

NOTE: Sizes 20, 24 require additional lubrication prior to assembly.

For metric fittings and additional thread types, please see Catalog 4230/4233.

NPT Male 45° Elbow

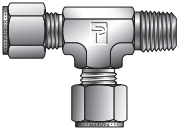
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.	NPT Thread Size
1-1 VBZ	1MVEL1N	100-5-1	1/16	1/16
2-2 VBZ	2MVEL2N	200-5-2	1/8	1/8
3-2 VBZ	3MVEL2N	300-5-2	3/16	1/8
4-2 VBZ	4MVEL2N	400-5-2	1/4	1/8
4-4 VBZ	4MVEL4N	400-5-4	1/4	1/4
5-2 VBZ	5MVEL2N	500-5-2	5/16	1/8
6-2 VBZ	6MVEL2N	600-5-2	3/8	1/8
6-4 VBZ	6MVEL4N	600-5-4	3/8	1/4
6-6 VBZ	6MVEL6N	600-5-6	3/8	3/8
8-6 VBZ	8MVEL6N	810-5-6	1/2	3/8
10-8 VBZ	10MVEL8N	1010-5-8	5/8	1/2
12-12 VBZ	12MVEL12N	1210-5-12	3/4	3/4
14-12 VBZ	14MVEL12N	1410-5-12	7/8	3/4
16-16 VBZ	16MVEL16N	1610-5-16	1	1

NPT Male Run Tee

For fractional tube

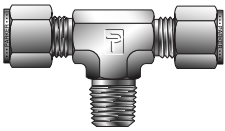


CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.	NPT Thread Size
2-2-2 RBZ	2MRT2N	200-3-2TMT	1/8	1/8
2-4-2 RBZ	2MRT4N	200-3-4TMT	1/8	1/4
3-2-3 RBZ	3MRT2N	300-3-2TMT	3/16	1/8
4-2-4 RBZ	4MRT2N	400-3-2TMT	1/4	1/8
4-4-4 RBZ	4MRT4N	400-3-4TMT	1/4	1/4
5-2-5 RBZ	5MRT2N	500-3-2TMT	5/16	1/8
5-4-5 RBZ	5MRT4N	500-3-4TMT	5/16	1/4
6-4-6 RBZ	6MRT4N	600-3-4TMT	3/8	1/4
6-6-6 RBZ	6MRT6N	600-3-6TMT	3/8	3/8
8-6-8 RBZ	8MRT6N	810-3-6TMT	1/2	3/8
8-8-8 RBZ	8MRT8N	810-3-8TMT	1/2	1/2
10-8-10 RBZ	10MRT8N	1010-3-8TMT	5/8	1/2
12-12-12 RBZ	12MRT12N	1210-3-12TMT	3/4	3/4
14-12-14 RBZ	14MRT12N	1410-3-12TMT	7/8	3/4
16-12-16 RBZ	16MRT12N	1610-3-12TMT	1	3/4
16-16-16 RBZ	16MRT16N	1610-3-16TMT	1	1

For metric fittings and additional thread types, please see Catalog 4230/4233.

NPT Male Branch Tee

For fractional tube

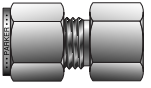


CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.	NPT Thread Size
2-2-2 SBZ	**2MBT2N**	200-3TTM	1/8	1/8
2-2-4 SBZ	**2MBT4N**	200-3-4TTM	1/8	1/4
3-3-2 SBZ	**3MBT2N**	300-3TTM	3/16	1/8
4-4-2 SBZ	**4MBT2N**	400-3TTM	1/4	1/8
4-4-4 SBZ	**4MBT4N**	400-3-4TTM	1/4	1/4
5-5-2 SBZ	**5MBT2N**	500-3TTM	5/16	1/8
5-5-4 SBZ	**5MBT4N**	500-3-4TTM	5/16	1/4
6-6-4 SBZ	**6MBT4N**	600-3TTM	3/8	1/4
6-6-6 SBZ	**6MBT6N**	600-3-6TTM	3/8	3/8
8-8-6 SBZ	**8MBT6N**	810-3TTM	1/2	3/8
8-8-8 SBZ	**8MBT8N**	810-3-8TTM	1/2	1/2
10-10-8 SBZ	**10MBT8N**	1010-3TTM	5/8	1/2
12-12-12 SBZ	**12MBT12N**	1210-3TTM	3/4	3/4
14-14-12 SBZ	**14MBT12N**	1410-3-12TTM	7/8	3/4
16-16-12 SBZ	**16MBT12N**	1610-3TTM	1	3/4
16-16-16 SBZ	**16MBT16N**	1610-3-16TTM	1	1

For metric fittings and additional thread types, please see Catalog 4230/4233.

NPT Female Connector

For fractional tube



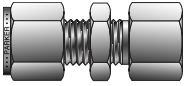
CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.	NPT Thread Size
1-1 GBZ	**1FSC1N**	100-7-1	1/16	1/16
1-2 GBZ	**1FSC2N**	100-7-2	1/16	1/8
2-2 GBZ	**2FSC2N**	200-7-2	1/8	1/8
2-4 GBZ	**2FSC4N**	200-7-4	1/8	1/4
3-2 GBZ	**3FSC2N**	300-7-2	3/16	1/8
3-4 GBZ	**3FSC4N**	300-7-4	3/16	1/4
4-2 GBZ	**4FSC2N**	400-7-2	1/4	1/8
4-4 GBZ	**4FSC4N**	400-7-4	1/4	1/4
4-6 GBZ	**4FSC6N**	400-7-6	1/4	3/8
4-8 GBZ	**4FSC8N**	400-7-8	1/4	1/2
5-2 GBZ	**5FSC2N**	500-7-2	5/16	1/8
5-4 GBZ	**5FSC4N**	500-7-4	5/16	1/4
5-6 GBZ	**5FSC6N**	500-7-6	5/16	3/8
6-2 GBZ	**6FSC2N**	600-7-2	3/8	1/8
6-4 GBZ	**6FSC4N**	600-7-4	3/8	1/4
6-6 GBZ	**6FSC6N**	600-7-6	3/8	3/8
6-8 GBZ	**6FSC8N**	600-7-8	3/8	1/2
6-12 GBZ	**6FSC12N**	600-7-12	3/8	3/4
8-4 GBZ	**8FSC4N**	810-7-4	1/2	1/4
8-6 GBZ	**8FSC6N**	810-7-6	1/2	3/8
8-8 GBZ	**8FSC8N**	810-7-8	1/2	1/2
8-12 GBZ	**8FSC12N**	810-7-12	1/2	3/4
10-6 GBZ	**10FSC6N**	1010-7-6	5/8	3/8
10-8 GBZ	**10FSC8N**	1010-7-8	5/8	1/2
10-12 GBZ	**10FSC12N**	1010-7-12	5/8	3/4
12-8 GBZ	**12FSC8N**	1210-7-8	3/4	1/2
12-12 GBZ	**12FSC12N**	1210-7-12	3/4	3/4
14-12 GBZ	**14FSC12N**	1410-7-12	7/8	3/4
16-12 GBZ	**16FSC12N**	1610-7-12	1	3/4
16-16 GBZ	**16FSC16N**	1610-7-16	1	1
20-20 GBZ	**20FSC20N**	2010-7-20	1-1/4	1-1/4
24-24 GBZ	**24FSC24N**	2410-7-24	1-1/2	1-1/2
32-32 GBZ	**32FSC32N**	3210-7-32	2	2

NOTE: Sizes 20, 24, 32 require additional lubrication prior to assembly.

For metric fittings and additional thread types, please see Catalog 4230/4233.

NPT Female Bulkhead Connector

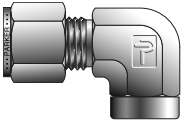
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.	NPT Thread Size
2-2 GH2BZ	2FBC2N	200-71-2	1/8	1/8
3-2 GH2BZ	3FBC2N	300-71-2	3/16	1/8
4-2 GH2BZ	4FBC2N	400-71-2	1/4	1/8
4-4 GH2BZ	4FBC4N	400-71-4	1/4	1/4
5-2 GH2BZ	5FBC2N	500-71-2	5/16	1/8
5-8 GH2BZ	5FBC8N	500-71-8	5/16	1/2
6-4 GH2BZ	6FBC4N	600-71-4	3/8	1/4
8-6 GH2BZ	8FBC6N	810-71-6	1/2	3/8
8-8 GH2BZ	8FBC8N	810-71-8	1/2	1/2
10-8 GH2BZ	10FBC8N	1010-71-8	5/8	1/2
12-12 GH2BZ	12FBC12N	1210-71-12	3/4	3/4
14-12 GH2BZ	14FBC12N	1410-71-12	7/8	3/4
16-16 GH2BZ	16FBC16N	1610-71-16	1	1

NPT Female Elbow

For fractional tube

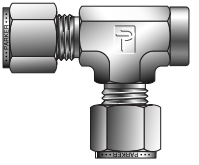


CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.	NPT Thread Size
1-1 DBZ	1FEL1N	100-8-1	1/16	1/16
1-2 DBZ	1FEL2N	100-8-2	1/16	1/8
2-2 DBZ	2FEL2N	200-8-2	1/8	1/8
2-4 DBZ	2FEL4N	200-8-4	1/8	1/4
3-2 DBZ	3FEL2N	300-8-2	3/16	1/8
4-2 DBZ	4FEL2N	400-8-2	1/4	1/8
4-4 DBZ	4FEL4N	400-8-4	1/4	1/4
4-6 DBZ	4FEL6N	400-8-6	1/4	3/8
4-8 DBZ	4FEL8N	400-8-8	1/4	1/2
5-2 DBZ	5FEL2N	500-8-2	5/16	1/8
5-4 DBZ	5FEL4N	500-8-4	5/16	1/4
6-2 DBZ	6FEL2N	600-8-2	3/8	1/8
6-4 DBZ	6FEL4N	600-8-4	3/8	1/4
6-6 DBZ	6FEL6N	600-8-6	3/8	3/8
6-8 DBZ	6FEL8N	600-8-8	3/8	1/2
8-4 DBZ	8FEL4N	810-8-4	1/2	1/4
8-6 DBZ	8FEL6N	810-8-6	1/2	3/8
8-8 DBZ	8FEL8N	810-8-8	1/2	1/2
10-6 DBZ	10FEL6N	1010-8-6	5/8	3/8
10-8 DBZ	10FEL8N	1010-8-8	5/8	1/2
12-8 DBZ	12FEL8N	1210-8-8	3/4	1/2
12-12 DBZ	12FEL12N	1210-8-12	3/4	3/4
14-12 DBZ	14FEL12N	1410-8-12	7/8	3/4
16-12 DBZ	16FEL12N	1610-8-12	1	3/4
16-16 DBZ	16FEL16N	1610-8-16	1	1

For metric fittings and additional thread types, please see Catalog 4230/4233.

NPT Female Run Tee

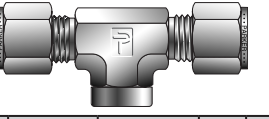
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.	NPT Thread Size
2-2-2 MBZ	2FRT2N	200-3-2TFT	1/8	1/8
3-2-3 MBZ	3FRT2N	300-3-2TFT	3/16	1/8
4-2-4 MBZ	4FRT2N	400-3-2TFT	1/4	1/8
4-4-4 MBZ	4FRT4N	400-3-4TFT	1/4	1/4
5-2-5 MBZ	5FRT2N	500-3-2TFT	5/16	1/8
6-4-6 MBZ	6FRT4N	600-3-4TFT	3/8	1/4
8-4-8 MBZ	8FRT4N	810-3-4TFT	1/2	1/4
8-6-8 MBZ	8FRT6N	810-3-6TFT	1/2	3/8
8-8-8 MBZ	8FRT8N	810-3-8TFT	1/2	1/2
10-8-10 MBZ	10FRT8N	1010-3-8TFT	5/8	1/2
12-12-12 MBZ	12FRT12N	1210-3-12TFT	3/4	3/4
14-8-14 MBZ	14FRT8N	1410-3-8TFT	7/8	1/2
14-12-14 MBZ	14FRT12N	1410-3-12TFT	7/8	3/4
16-12-16 MBZ	16FRT12N	1610-3-12TFT	1	3/4
16-16-16 MBZ	16FRT16N	1610-3-16TFT	1	1

NPT Female Branch Tee

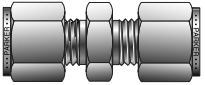
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.	NPT Thread Size
2-2-2 OBZ	2FBT2N	200-3-2TTF	1/8	1/8
3-3-2 OBZ	3FBT2N	300-3-2TTF	3/16	1/8
4-4-2 OBZ	4FBT2N	400-3-2TTF	1/4	1/8
4-4-4 OBZ	4FBT4N	400-3-4TTF	1/4	1/4
5-5-2 OBZ	5FBT2N	500-3-2TTF	5/16	1/8
6-6-4 OBZ	6FBT4N	600-3-4TTF	3/8	1/4
8-8-4 OBZ	8FBT4N	810-3-4TTF	1/2	1/4
8-8-6 OBZ	8FBT6N	810-3-6TTF	1/2	3/8
8-8-8 OBZ	8FBT8N	810-3-8TTF	1/2	1/2
10-10-8 OBZ	10FBT8N	1010-3-8TTF	5/8	1/2
12-12-12 OBZ	12FBT12N	1210-3-12TTF	3/4	3/4
14-14-12 OBZ	14FBT12N	1410-3-12TTF	7/8	3/4
16-16-12 OBZ	16FBT12N	1610-3-12TTF	1	3/4
16-16-16 OBZ	16FBT16N	1610-3-16TTF	1	1

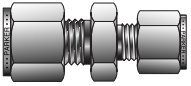
For metric fittings and additional thread types, please see Catalog 4230/4233.

Union
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.
1-1 HBZ	1SC1	100-6	1/16
2-2 HBZ	2SC2	200-6	1/8
3-3 HBZ	3SC3	300-6	3/16
4-4 HBZ	4SC4	400-6	1/4
5-5 HBZ	5SC5	500-6	5/16
6-6 HBZ	6SC6	600-6	3/8
8-8 HBZ	8SC8	810-6	1/2
10-10 HBZ	10SC10	1010-6	5/8
12-12 HBZ	12SC12	1210-6	3/4
14-14 HBZ	14SC14	1410-6	7/8
16-16 HBZ	16SC16	1610-6	1
20-20 HBZ	20SC20	2010-6	1-1/4
24-24 HBZ	24SC24	2410-6	1-1/2
32-32 HBZ	32SC32	3210-6	2

Reducing Union
For fractional tube

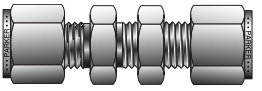


CPI™ Part No.	A-LOK® Part No.	Inter-changes With	T_1 Tube O.D.	T_2 Tube O.D.
2-1 HBZ	2RU1	200-6-1	1/8	1/16
3-1 HBZ	3RU1	300-6-1	3/16	1/16
3-2 HBZ	3RU2	300-6-2	3/16	1/8
4-1 HBZ	4RU1	400-6-1	1/4	1/16
4-2 HBZ	4RU2	400-6-2	1/4	1/8
4-3 HBZ	4RU3	400-6-3	1/4	3/16
5-2 HBZ	5RU2	500-6-2	5/16	1/8
5-4 HBZ	5RU4	500-6-4	5/16	1/4
6-1 HBZ	6RU1	600-6-1	3/8	1/16
6-2 HBZ	6RU2	600-6-2	3/8	1/8
6-4 HBZ	6RU4	600-6-4	3/8	1/4
6-5 HBZ	6RU5	600-6-5	3/8	5/16
8-2 HBZ	8RU2	810-6-2	1/2	1/8
8-4 HBZ	8RU4	810-6-4	1/2	1/4
8-6 HBZ	8RU6	810-6-6	1/2	3/8
10-6 HBZ	10RU6	1010-6-6	5/8	3/8
10-8 HBZ	10RU8	1010-6-8	5/8	1/2
12-4 HBZ	12RU4	1210-6-4	3/4	1/4
12-6 HBZ	12RU6	1210-6-6	3/4	3/8
12-8 HBZ	12RU8	1210-6-8	3/4	1/2
12-10 HBZ	12RU10	1210-6-10	3/4	5/8
16-8 HBZ	16RU8	1610-6-8	1	1/2
16-12 HBZ	16RU12	1610-6-12	1	3/4

For metric fittings and additional thread types, please see Catalog 4230/4233.

Bulkhead Union

For fractional tube



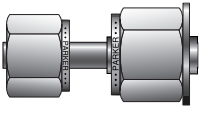
CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.
1-1 WBZ	**1BC1**	100-61	1/16
2-2 WBZ	**2BC2**	200-61	1/8
2-4 WBZ	**2BC4**	400-61-2	1/8 - 1/4
3-3 WBZ	**3BC3**	300-61	3/16
4-2 WBZ	**4BC2**	200-61-4	1/4 - 1/8
4-4 WBZ	**4BC4**	400-61	1/4
5-5 WBZ	**5BC5**	500-61	5/16
6-6 WBZ	**6BC6**	600-61	3/8
8-8 WBZ	**8BC8**	810-61	1/2
10-10 WBZ	**10BC10**	1010-61	5/8
12-12 WBZ	**12BC12**	1210-61	3/4
14-14 WBZ	**14BC14**	1410-61	7/8
16-16 WBZ	**16BC16**	1610-61	1

NOTES:
- For reducer sizes call out short end first.
- For replacement bulkhead nuts, see page 75, part WLZ.

Dielectric Union Adapter

For fractional tube

includes nuts, machined tube with molded PEEK[1)] insulator, preset ferrule, and dielectric identification ring



CPI™ Adapter Part No.	A-LOK® dapter Part No.	T_1 Tube End	T_2 Tube End
6-8 DEBTA-SS	**6-8 DELTA**	3/8	1/2
8-10 DEBTA-SS	**N/A**	1/2	5/8

NOTES:
1) Polyetherether Ketone
- Other end connectors available upon request.
- Makeup instructions included with parts in box when ordered as an Adapter only.

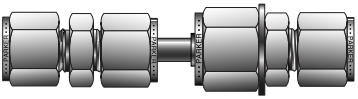
For complete details on Dielectric fittings, please see Catalog 4230/4233.

For metric fittings and additional thread types, please see Catalog 4230/4233.

Dielectric Assembly

For fractional tube

includes dielectric union adapter with assembled tube fitting unions



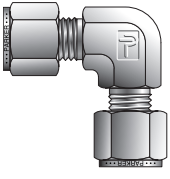
CPI™ Assembly Part No.	A-LOK® Assembly Part No.
*Compression	*Compression
4H DEBTA	4H DELTA
6H DEBTA	6H DELTA
8H DEBTA	8H DELTA

Female Pipe	Female Pipe
4G DEBTA	4G DELTA
6G DEBTA	6G DELTA
8G DEBTA	8G DELTA

Male Pipe	Male Pipe
4F DEBTA	4F DELTA
6F DEBTA	6F DELTA
8F DEBTA	8F DELTA

Union Elbow

For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.
1-1 EBZ	1EE1	100-9	1/16
2-2 EBZ	2EE2	200-9	1/8
3-3 EBZ	3EE3	300-9	3/16
4-4 EBZ	4EE4	400-9	1/4
5-5 EBZ	5EE5	500-9	5/16
6-6 EBZ	6EE6	600-9	3/8
8-8 EBZ	8EE8	810-9	1/2
10-10 EBZ	10EE10	1010-9	5/8
12-12 EBZ	12EE12	1210-9	3/4
14-14 EBZ	14EE14	1410-9	7/8
16-16 EBZ	16EE16	1610-9	1
20-20 EBZ	20EE20	2010-9	1-1/4
24-24 EBZ	24EE24	2410-9	1-1/2
32-32 EBZ	32EE32	3210-9	2

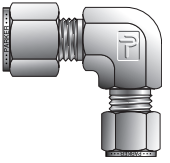
NOTE: Sizes 20, 24, 32 require additional lubrication prior to assembly.

For complete details on Dielectric fittings, please see Catalog 4230/4233.

For metric fittings and additional thread types, please see Catalog 4230/4233.

Drop Size Elbows

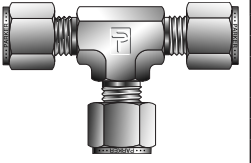
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.
3-2 EBZ	**3-2 ELZ**	300-9-2	3/16-1/8
4-2 EBZ	**4-2 ELZ**	400-9-2	1/4-1/8
5-2 EBZ	**5-2 ELZ**	500-9-2	5/16-1/8
5-4 EBZ	**5-4 ELZ**	500-9-4	5/16-1/4
6-2 EBZ	**6-2 ELZ**	600-9-2	3/8-1/8
6-4 EBZ	**6-4 ELZ**	600-9-4	3/8-1/4
6-5 EBZ	**6-5 ELZ**	600-9-5	3/8-5/16
8-4 EBZ	**8-4 ELZ**	810-9-4	1/2-1/4
8-5 EBZ	**8-5 ELZ**	810-9-5	1/2-5/16
8-6 EBZ	**8-6 ELZ**	810-9-6	1/2-3/8
10-6 EBZ	**10-6 ELZ**	1010-9-6	5/8-3/8
10-8 EBZ	**10-8 ELZ**	1010-9-8	5/8-1/2
12-4 EBZ	**12-4 ELZ**	1210-9-4	3/4-1/4
12-6 EBZ	**12-6 ELZ**	1210-9-6	3/4-3/8
12-8 EBZ	**12-8 ELZ**	1210-9-8	3/4-1/2
14-4 EBZ	**14-4 ELZ**	1410-9-4	7/8-1/4
16-8 EBZ	**16-8 ELZ**	1610-9-8	1-1/2
16-12 EBZ	**16-12 ELZ**	1610-9-12	1-3/4

Union Tee

For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.
1-1-1 JBZ	**1ET1**	100-3	1/16
2-2-2 JBZ	**2ET2**	200-3	1/8
3-3-3 JBZ	**3ET3**	300-3	3/16
4-4-4 JBZ	**4ET4**	400-3	1/4
5-5-5 JBZ	**5ET5**	500-3	5/16
6-6-6 JBZ	**6ET6**	600-3	3/8
8-8-8 JBZ	**8ET8**	810-3	1/2
10-10-10 JBZ	**10ET10**	1010-3	5/8
12-12-12 JBZ	**12ET12**	1210-3	3/4
14-14-14 JBZ	**14ET14**	1410-3	7/8
16-16-16 JBZ	**16ET16**	1610-3	1
20-20-20 JBZ	**20ET20**	2010-3	1-1/4
24-24-24 JBZ	**24ET24**	2410-3	1-1/2
32-32-32 JBZ	**32ET32**	3210-3	2

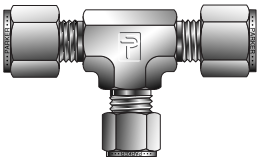
NOTE: Sizes 20, 24, 32 require additional lubrication prior to assembly.

For metric fittings and additional thread types, please see Catalog 4230/4233.

Drop Size Tees

For fractional tube

Eliminates the extra connection when adapting with a tube stub reducer



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	T_1 Tube O.D.	T_2 Tube O.D.	T_3 Tube O.D.
4-4-2 JBZ	**4-4-2 JLZ**	400-3-4-2	1/4	1/4	1/8
6-6-4 JBZ	**6-6-4 JLZ**	600-3-6-4	3/8	3/8	1/4
6-4-6 JBZ	**6-4-6 JLZ**	600-3-4-6	3/8	1/4	3/8
6-4-4 JBZ	**6-4-4 JLZ**	600-3-4-4	3/8	1/4	1/4
8-8-6 JBZ	**8-8-6 JLZ**	810-3-8-6	1/2	1/2	3/8
8-8-4 JBZ	**8-8-4 JLZ**	810-3-8-4	1/2	1/2	1/4
8-6-8 JBZ	**8-6-8 JLZ**	810-3-6-8	1/2	3/8	1/2
8-4-8 JBZ	**8-4-8 JLZ**	810-3-4-8	1/2	1/4	1/2
8-6-6 JBZ	**8-6-6 JLZ**	810-3-6-6	1/2	3/8	3/8
8-4-4 JBZ	**8-4-4 JLZ**	810-3-4-4	1/2	1/4	1/4
10-10-8 JBZ	**10-10-8 JLZ**	1010-3-10-8	5/8	5/8	1/2
10-10-6 JBZ	**10-10-6 JLZ**	1010-3-10-6	5/8	5/8	3/8
10-8-8 JBZ	**10-8-8 JLZ**	1010-3-8-8	5/8	1/2	1/2
10-8-6 JBZ	**10-8-6 JLZ**	1010-3-8-6	5/8	1/2	3/8
10-6-6 JBZ	**10-6-6 JLZ**	1010-3-6-6	5/8	3/8	3/8
10-6-8 JBZ	**10-6-8 JLZ**	1010-3-6-8	5/8	3/8	1/2
12-12-10 JBZ	**12-12-10 JLZ**	1210-3-12-10	3/4	3/4	5/8
12-12-8 JBZ	**12-12-8 JLZ**	1210-3-12-8	3/4	3/4	1/2
12-12-6 JBZ	**12-12-6 JLZ**	1210-3-12-6	3/4	3/4	3/8
12-12-4 JBZ	**12-12-4 JLZ**	1210-3-12-4	3/4	3/4	1/4
12-10-10 JBZ	**12-10-10 JLZ**	1210-3-10-10	3/4	5/8	5/8
12-8-8 JBZ	**12-8-8 JLZ**	1210-3-8-8	3/4	1/2	1/2
12-6-6 JBZ	**12-6-6 JLZ**	1210-3-6-6	3/4	3/8	3/8
12-10-8 JBZ	**12-10-8 JLZ**	1210-3-10-8	3/4	5/8	1/2
12-10-6 JBZ	**12-10-6 JLZ**	1210-3-10-6	3/4	5/8	3/8
12-8-6 JBZ	**12-8-6 JLZ**	1210-3-8-6	3/4	1/2	3/8
14-14-6 JBZ	**14-14-6 JLZ**	1410-3-14-6	7/8	7/8	3/8
14-14-4 JBZ	**14-14-4 JLZ**	1410-3-14-4	7/8	7/8	1/4
14-12-12 JBZ	**14-12-12 JLZ**	1410-3-12-12	7/8	3/4	3/4
14-12-8 JBZ	**14-12-8 JLZ**	1410-3-12-8	7/8	3/4	1/2
14-12-6 JBZ	**14-12-6 JLZ**	1410-3-12-6	7/8	3/4	3/8
14-10-6 JBZ	**14-10-6 JLZ**	1410-3-10-6	7/8	5/8	3/8
14-8-12 JBZ	**14-8-12 JLZ**	1410-3-8-12	7/8	1/2	3/4
16-16-12 JBZ	**16-16-12 JLZ**	1610-3-16-12	1	1	3/4
16-16-10 JBZ	**16-16-10 JLZ**	1610-3-16-10	1	1	5/8

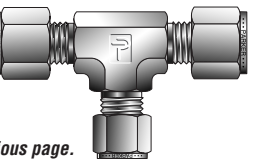
For metric fittings and additional thread types, please see Catalog 4230/4233.

Continued on the following page.

Drop Size Tees

For fractional tube

Eliminates the extra connection when adapting with a tube stub reducer

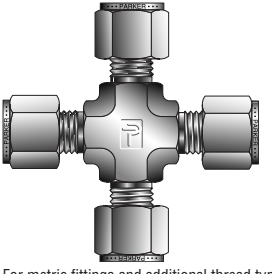


Continued from the previous page.

CPI™ Part No.	A-LOK® Part No.	Inter-changes With	T_1 Tube O.D.	T_2 Tube O.D.	T_3 Tube O.D.
16-16-8 JBZ	**16-16-8 JLZ**	1610-3-16-8	1	1	1/2
16-16-6 JBZ	**16-16-6 JLZ**	1610-3-16-6	1	1	3/8
16-16-4 JBZ	**16-16-4 JLZ**	1610-3-16-4	1	1	1/4
16-12-16 JBZ	**16-12-16 JLZ**	1610-3-12-16	1	3/4	1
16-14-14 JBZ	**16-14-14 JLZ**	1610-3-14-14	1	7/8	7/8
16-14-12 JBZ	**16-14-12 JLZ**	1610-3-14-12	1	7/8	3/4
16-14-8 JBZ	**16-14-8 JLZ**	1610-3-14-8	1	7/8	1/2
16-14-6 JBZ	**16-14-6 JLZ**	1610-3-14-6	1	7/8	3/8
16-14-4 JBZ	**16-14-4 JLZ**	1610-3-14-4	1	7/8	1/4
16-16-14 JBZ	**16-16-14 JLZ**	1610-3-16-14	1	1	7/8
16-12-10 JBZ	**16-12-10 JLZ**	1610-3-12-10	1	3/4	5/8
16-12-8 JBZ	**16-12-8 JLZ**	1610-3-12-8	1	3/4	1/2
16-10-6 JBZ	**16-10-6 JLZ**	1610-3-10-6	1	5/8	3/8
16-8-16 JBZ	**16-8-16 JLZ**	1610-3-8-16	1	1/2	1
16-8-8 JBZ	**16-8-8 JLZ**	1610-3-8-8	1	1/2	1/2
16-8-6 JBZ	**16-8-6 JLZ**	1610-3-8-6	1	1/2	3/8
16-8-4 JBZ	**16-8-4 JLZ**	1610-3-8-4	1	1/2	1/4
16-6-6 JBZ	**16-6-6 JLZ**	1610-3-6-6	1	3/8	3/8

Union Cross

For fractional tube

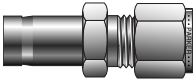


CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.
2 KBZ	**2ECR2**	200-4	1/8
3 KBZ	**3ECR3**	300-4	3/16
4 KBZ	**4ECR4**	400-4	1/4
5 KBZ	**5ECR5**	500-4	5/16
6 KBZ	**6ECR6**	600-4	3/8
8 KBZ	**8ECR8**	810-4	1/2
10 KBZ	**10ECR10**	1010-4	5/8
12 KBZ	**12ECR12**	1210-4	3/4
14 KBZ	**14ECR14**	1410-4	7/8
16 KBZ	**16ECR16**	1610-4	1

For metric fittings and additional thread types, please see Catalog 4230/4233.

Tube End Reducer

For fractional tube



NOTES:

- Sizes 1, 2, and 3 do not require a groove.
- Size 4 and above tube stub is pre-grooved as standard. Generic (non-grooved) can be ordered through Quick Response Department.
- Sizes 20, 24 require additional lubrication prior to assembly.
- Add -Z6 for assembly of nuts and ferrules on the tube stub end.

†All tube stubs over 1" come standard with nuts and ferrule(s) pre-assembled (-Z6 option).

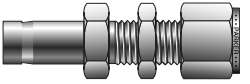
CPI™ Part No.	A-LOK® Part No.	Inter-changes With	T_1 Turned End Tube O.D.	T_2 Machined End Tube O.D.
2-1 TRBZ	**2TUR1**	100-R-2	1/8	1/16
3-1 TRBZ	**3TUR1**	100-R-3	3/16	1/16
4-1 TRBZ	**4TUR1**	100-R-4	1/4	1/16
1-2 TRBZ	**1TUR2**	200-R-1	1/16	1/8
2-2 TRBZ	**2TUR2**	200-R-2	1/8	1/8
3-2 TRBZ	**3TUR2**	200-R-3	3/16	1/8
4-2 TRBZ	**4TUR2**	200-R-4	1/4	1/8
6-2 TRBZ	**6TUR2**	200-R-6	3/8	1/8
8-2 TRBZ	**8TUR2**	200-R-8	1/2	1/8
2-3 TRBZ	**2TUR3**	300-R-2	1/8	3/16
4-3 TRBZ	**4TUR3**	300-R-4	1/4	3/16
2-4 TRBZ	**2TUR4**	400-R-2	1/8	1/4
3-4 TRBZ	**3TUR4**	400-R-3	3/16	1/4
4-4 TRBZ	**4TUR4**	400-R-4	1/4	1/4
5-4 TRBZ	**5TUR4**	400-R-5	5/16	1/4
6-4 TRBZ	**6TUR4**	400-R-6	3/8	1/4
8-4 TRBZ	**8TUR4**	400-R-8	1/2	1/4
10-4 TRBZ	**10TUR4**	400-R-10	5/8	1/4
12-4 TRBZ	**12TUR4**	400-R-12	3/4	1/4
6-5 TRBZ	**6TUR5**	500-R-6	3/8	5/16
8-5 TRBZ	**8TUR5**	500-R-8	1/2	5/16
4-6 TRBZ	**4TUR6**	600-R-4	1/4	3/8
6-6 TRBZ	**6TUR6**	600-R-6	3/8	3/8
8-6 TRBZ	**8TUR6**	600-R-8	1/2	3/8
10-6 TRBZ	**10TUR6**	600-R-10	5/8	3/8
12-6 TRBZ	**12TUR6**	600-R-12	3/4	3/8
4-8 TRBZ	**4TUR8**	810-R-4	1/4	1/2
6-8 TRBZ	**6TUR8**	810-R-6	3/8	1/2
10-8 TRBZ	**10TUR8**	810-R-10	5/8	1/2
12-8 TRBZ	**12TUR8**	810-R-12	3/4	1/2
16-8 TRBZ	**16TUR8**	810-R-16	1	1/2
12-10 TRBZ	**12TUR10**	1010-R-12	3/4	5/8
14-10 TRBZ	**14TUR10**	1010-R-14	7/8	5/8
16-10 TRBZ	**16TUR10**	1010-R-16	1	5/8
8-12 TRBZ	**8TUR12**	1210-R-8	1/2	3/4
16-12 TRBZ	**16TUR12**	1210-R-16	1	3/4
24-16 TRBZ†	**24TUR16**	1610-R-24	1-1/2	1
24-20 TRBZ†	**24TUR20**	2010-R-24	1-1/2	1-1/4
32-24 TRBZ†	**32TUR24**	2410-R-32	2	1-1/2

For metric fittings and additional thread types, please see Catalog 4230/4233.

Port Connectors

Tube End Bulkhead Adapter

For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.
2-2 T2H2BZ	**2TUBC2**	200-R1-2	1/8
4-4 T2H2BZ	**4TUBC4**	400-R1-4	1/4
6-6 TH2HBZ	**6TUBC6**	600-R1-6	3/8
8-8 T2H2BZ	**8TUBC8**	810-R1-8	1/2

NOTES:

• Tube stub is pre-grooved as standard. Generic (non-grooved) can be ordered through Quick Response Department.

• Add -Z6 for assembly of nuts and ferrules on the tube stub end.

Port Connector

For fractional tube

CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.
1-1 ZPC	**1PC1**	101-PC	1/16
1-2 ZPC	**1PC2**	201-PC-1	1/16-1/8
1-4 ZPC	**1PC4**	401-PC-1	1/16-1/4
2-2 ZPC	**2PC2**	201-PC	1/8
2-4 ZPC	**2PC4**	401-PC-2	1/8-1/4
2-6 ZPC	**2PC6**	601-PC-2	1/8-3/8
3-3 ZPC	**3PC3**	301-PC	3/16
4-4 ZPC	**4PC4**	401-PC	1/4
4-6 ZPC	**4PC6**	601-PC-4	1/4-3/8
4-8 ZPC	**4PC8**	811-PC-4	1/4-1/2
6-6 ZPC	**6PC6**	601-PC	3/8
6-8 ZPC	**6PC8**	811-PC-6	3/8-1/2
8-8 ZPC	**8PC8**	811-PC	1/2
8-12 ZPC	**8PC12**	1211-PC-8	1/2-3/4
12-12 ZPC	**12PC12**	1211-PC	3/4
16-16 ZPC	**16PC16**	1611-PC	1

NOTES:

• Tube stub is pre-grooved as standard. (Size 1, 2, and 3 not grooved). Generic (non-grooved 4-16) can be ordered through Quick Response Department.

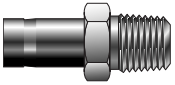
• The machined ferrule end (T2) requires only 1/4 turn from finger tight to assemble.

• Add -Z6 for assembly of nuts and ferrules on the tube stub end.

For metric fittings and additional thread types, please see Catalog 4230/4233.

NPT Tube End Male Adapter

For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.	NPT Thread Size
1-2 T2HF	**1MA2N**	1-TA-1-1	1/16	1/8
2-2 T2HF	**2MA2N**	2-TA-1-2	1/8	1/8
2-4 T2HF	**2MA4N**	2-TA-1-4	1/8	1/4
3-2 T2HF	**3MA2N**	3-TA-1-2	3/16	1/8
3-4 T2HF	**3MA4N**	3-TA-1-4	3/16	1/4
4-2 T2HF	**4MA2N**	4-TA-1-2	1/4	1/8
4-4 T2HF	**4MA4N**	4-TA-1-4	1/4	1/4
4-6 T2HF	**4MA6N**	4-TA-1-6	1/4	3/8
4-8 T2HF	**4MA8N**	4-TA-1-8	1/4	1/2
5-2 T2HF	**5MA2N**	5-TA-1-2	5/16	1/8
5-4 T2HF	**5MA4N**	5-TA-1-4	5/16	1/4
5-6 T2HF	**5MA6N**	5-TA-1-6	5/16	3/8
5-8 T2HF	**5MA8N**	5-TA-1-8	5/16	1/2
6-2 T2HF	**6MA2N**	6-TA-1-2	3/8	1/8
6-4 T2HF	**6MA4N**	6-TA-1-4	3/8	1/4
6-6 T2HF	**6MA6N**	6-TA-1-6	3/8	3/8
6-8 T2HF	**6MA8N**	6-TA-1-8	3/8	1/2
8-4 T2HF	**8MA4N**	8-TA-1-4	1/2	1/4
8-6 T2HF	**8MA6N**	8-TA-1-6	1/2	3/8
8-8 T2HF	**8MA8N**	8-TA-1-8	1/2	1/2
10-8 T2HF	**10MA8N**	10-TA-1-8	5/8	1/2
12-8 T2HF	**12MA8N**	12-TA-1-8	3/4	1/2
12-12 T2HF	**12MA12N**	12-TA-1-12	3/4	3/4
12-16 T2HF	**12MA16N**	12-TA-1-16	3/4	1
16-12 T2HF	**16MA12N**	16-TA-1-12	1	3/4
16-16 T2HF	**16MA16N**	16-TA-1-16	1	1
20-20 T2HF	**20MA20N**	20-TA-1-20	1-1/4	1-1/4
24-24 T2HF	**24MA24N**	24-TA-1-24	1-1/2	1-1/2
32-32 T2HF	**32MA32N**	32-TA-1-32	2	2

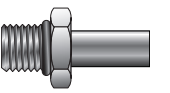
NOTES:

- Add -Z6 for assembly of nuts and ferrules on the tube stub end.
- Tube stub is pre-grooved as standard. Generic (non-grooved) can be ordered through Quick Response Department.
- Inch sizes 1, 2, and 3 and metric sizes 2, 3, and 4mm do not have grooves.
- Sizes 20, 24, 32 require additional lubrication prior to assembly.

For metric fittings and additional thread types, please see Catalog 4230/4233.

Tube End to SAE Straight Thread Adapter

For fractional tube



Add -Z6 for assembly of nuts and ferrules on the tube stub end.

CPI™ Part No.	A-LOK® Part No.	Inter-changes With	T Tube O.D.	Straight Thread Size	O-Ring Size
6-4 T2HOA	**6TUHOA4**	6-TA-1-4ST	3/8	7/16-20	3-904
6-8 T2HOA	**6TUHOA8**	6-TA-1-8ST	3/8	3/4-16	3-908
8-6 T2HOA	**8TUHOA6**	8-TA-1-6ST	1/2	9/16-18	3-906
10-10 T2HOA	**10TUHOA10**	10-TA-1-10ST	5/8	7/8-14	3-910
24-24 T2HOA†	**24TUHOA24**	24-TA-1-24ST	1-1/2	1-7/8-12	3-924

NOTES:

• Size 24 requires additional lubrication prior to assembly.

• Parts are supplied with nitrile o-rings as standard. For Fluorocarbon o-rings, add the suffix "-VO". Other o-rings available upon request.

† Size 24 is preassembled with nut and ferrules.

For metric fittings and additional thread types, please see Catalog 4230/4233.

Tube End NPT Female Adapter

For fractional tube

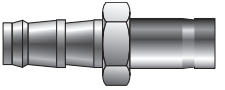
CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.	NPT Thread Size
1-2 T2HG	**1FA2N**	1-TA-7-2	1/16	1/8
2-2 T2HG	**2FA2N**	2-TA-7-2	1/8	1/8
2-4 T2HG	**2FA4N**	2-TA-7-4	1/8	1/4
3-2 T2HG	**3FA2N**	3-TA-7-2	3/16	1/8
3-4 T2HG	**3FA4N**	3-TA-7-4	3/16	1/4
4-2 T2HG	**4FA2N**	4-TA-7-2	1/4	1/8
4-4 T2HG	**4FA4N**	4-TA-7-4	1/4	1/4
4-6 T2HG	**4FA6N**	4-TA-7-6	1/4	3/8
4-8 T2HG	**4FA8N**	4-TA-7-8	1/4	1/2
5-2 T2HG	**5FA2N**	5-TA-7-2	5/16	1/8
5-4 T2HG	**5FA4N**	5-TA-7-4	5/16	1/4
5-6 T2HG	**5FA6N**	5-TA-7-6	5/16	3/8
6-2 T2HG	**6FA2N**	6-TA-7-2	3/8	1/8
6-4 T2HG	**6FA4N**	6-TA-7-4	3/8	1/4
6-6 T2HG	**6FA6N**	6-TA-7-6	3/8	3/8
6-8 T2HG	**6FA8N**	6-TA-7-8	3/8	1/2
8-4 T2HG	**8FA4N**	8-TA-7-4	1/2	1/4
8-6 T2HG	**8FA6N**	8-TA-7-6	1/2	3/8
8-8 T2HG	**8FA8N**	8-TA-7-8	1/2	1/2
10-6 T2HG	**10FA6N**	10-TA-7-6	5/8	3/8
10-8 T2HG	**10FA8N**	10-TA-7-8	5/8	1/2
12-8 T2HG	**12FA8N**	12-TA-7-8	3/4	1/2
12-12 T2HG	**12FA12N**	12-TA-7-12	3/4	3/4
12-16 T2HG	**12FA16N**	12-TA-7-16	3/4	1
14-12 T2HG	**14FA12N**	14-TA-7-12	7/8	3/4
16-12 T2HG	**16FA12N**	16-TA-7-12	1	3/4
16-16 T2HG	**16FA16N**	16-TA-7-16	1	1
20-20 T2HG	**20FA20N**	20-TA-7-20	1-1/4	1-1/4
24-24 T2HG	**24FA24N**	24-TA-7-24	1-1/2	1-1/2
32-32 T2HG	**32FA32N**	32-TA-7-32	2	2

NOTES:

- Tube stub is pre-grooved as standard.
- Generic (non-grooved) can be ordered through Quick Response Department.
- Add -Z6 for assembly of nuts and ferrules on the tube stub end.

For metric fittings and additional thread types, please see Catalog 4230/4233.

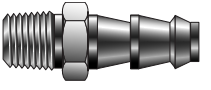
Push-Lok to Tube Adapter
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.	Hose Size
4-4 P2T2	4P2TU4	PB4-TA4	1/4	–4
6-6 P2T2	6P2TU6	PB6-TA6	3/8	–6
8-8 P2T2	8P2TU8	PB8-TA8	1/2	–8

NOTES:
- Drawing does not show Push-Lok collar.
- Tube stub is pre-grooved as standard. Generic (non-grooved) can be ordered through Quick Response Department.
- Add -Z6 for assembly of nuts and ferrules on the tube stub end.

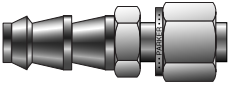
Push-Lok to Male Adapter
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	NPT Thread Size	Hose Size
4-4 P2HF	4-4 P2HF	PB4-PM4	1/4	-4
6-6 P2HF	6-6 P2HF	PB6-PM6	3/8	-6
8-8 P2HF	8-8 P2HF	PB8-PM8	1/2	-8

NOTE: Drawing does not show Push-Lok collar.

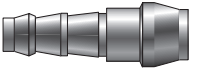
Push-Lok to CPI™/A-LOK®
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.	Hose Size
4-4 P2BZ6	4-4 P2LZ6	PB4-TA4	1/4	–4
6-6 P2BZ6	6-6 P2LZ6	PB6-TA6	3/8	–6
8-8 P2BZ6	8-8 P2LZ6	PB8-TA8	1/2	–8

NOTE: Drawing does not show Push-Lok collar. Assembly includes nut and ferrules.

Push-Lok to Port Connector
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Hose Size	Port Size
4-6 ZPB2	4-6 ZPC2	–4	3/8

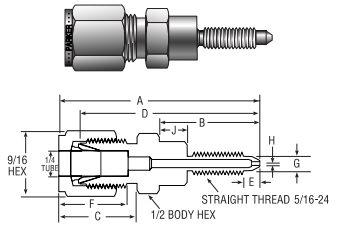
NOTE: Drawing does not show Push-Lok collar and size 6 A-LOK® nut.

For metric fittings and additional thread types, please see Catalog 4230/4233.

DP Transmitter Calibration Adapters

For fractional tube

Parker CPI™/A-LOK® adapters connect directly to the bleed port of a differential pressure transmitter so that the calibration process can be simplified. Two sizes of adapters (1/4-28 Thd., 5/16-24 Thd.) are available to fit the vent ports of Rosemount, Honeywell, and Foxboro DP transmitters. Both adapters are available in 316SS.



Calibration Adapter for Rosemount/Foxboro DP Transmitters

Calibration Adapter for Honeywell DP Transmitters

Transmitter Type	Parker Part No.	Interchanges With
(1) Rosemount/Foxboro	**4-2 ZH2LX-SS-D950373**	–
(2) Honeywell	**4-2 ZH2LX-SS-D940336**	SS-400-1-0257
(3) Rosemount/Yokogawa	**4-2 ZH2LX-SS-D030297**	SS-400-1-0253
(4) ABB	**4-2 ZH2LX-SS-D030249**	–

Straight Thread	Inches									
	A	B	C	D	E	F	G	H	J	Hex
(1) 5/16-24	**2.32**	1.41	.70	2.03	.24	.60	.25	.06	.41	1/2
(2) 1/4-28	**1.75**	.80	.70	1.46	.47	.60	.20	.03	–	1/2
(3) 5/16-24	**2.32**	1.41	.70	2.03	.40	.60	.25	.05	.41	1/2
(4) 1/4-28	**1.74**	.74	.70	1.44	.30	.60	.18	.05	–	1/2

Dimensions for reference only, subject to change.

For metric fittings and additional thread types, please see Catalog 4230/4233.

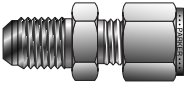
37° Flare (AN) to CPI™/A-LOK®

For fractional tube

CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.
2-2 X6HBZ6	2X6TU2	200-A-2 ANF	1/8
4-4 X6HBZ6	4X6TU4	400-A-4 ANF	1/4
6-6 X6HBZ6	6X6TU6	600-A-6 ANF	3/8
8-8 X6HBZ6	8X6TU8	810-A-8 ANF	1/2
12-12 X6HBZ6	12X6TU12	1210-A-12ANF	3/4
16-16 X6HBZ6	16X6TU16	1610-A-16ANF	1

37° Flare Connector

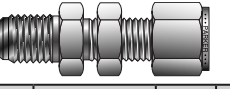
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Flare End	Tube O.D.
2-1 XHBZ	2XASC1	100-6-2 AN	1/8	1/16
2-2 XHBZ	2XASC2	200-6-2 AN	1/8	1/8
4-2 XHBZ	4XASC2	200-6-4 AN	1/4	1/8
3-3 XHBZ	3XASC3	300-6-3 AN	3/16	3/16
4-4 XHBZ	4XASC4	400-6-4 AN	1/4	1/4
5-5 XHBZ	5XASC5	500-6-5 AN	5/16	5/16
4-6 XHBZ	4XASC6	600-6-4 AN	1/4	3/8
6-6 XHBZ	6XASC6	600-6-6 AN	3/8	3/8
8-8 XHBZ	8XASC8	810-6-8 AN	1/2	1/2
10-10 XHBZ	10XASC10	1010-6-10 AN	5/8	5/8
12-12 XHBZ	12XASC12	1210-6-12 AN	3/4	3/4
16-16 XHBZ	16XASC16	1610-6-16 AN	1	1

37° Flare Bulkhead Connector

For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Flare End	Tube O.D.
2-2 XH2BZ	2XABC2	200-61-2 AN	1/8	1/8
3-3 XH2BZ	3XABC3	300-61-3 AN	3/16	3/16
4-2 XH2BZ	4XABC2	200-61-4 AN	1/4	1/8
4-4 XH2BZ	4XABC4	400-61-4 AN	1/4	1/4
5-5 XH2BZ	5XABC5	500-61-5 AN	5/16	5/16
4-6 XH2BZ	4XABC6	600-61-4 AN	1/4	3/8
6-6 XH2BZ	6XABC6	600-61-6 AN	3/8	3/8
8-8 XH2BZ	8XABC8	810-61-8 AN	1/2	1/2
10-10 XH2BZ	10XABC10	1010-61-10 AN	5/8	5/8
12-12 XH2BZ	12XABC12	1210-61-12 AN	3/4	3/4
16-16 XH2BZ	16XABC16	1610-61-16 AN	1	1

For metric fittings and additional thread types, please see Catalog 4230/4233.

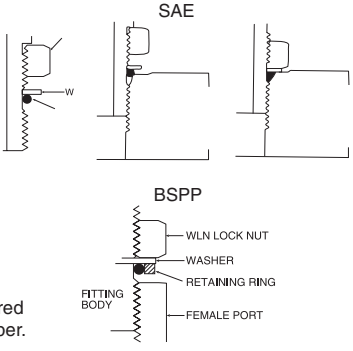
For bulkhead hole drill size and maximum bulkhead thickness, please see Catalog 4230/2433.

Introduction

BSPP / SAE Straight Thread Fittings Installation Procedure

1. Lubricate O-ring with a lubricant that is compatible with the system.
2. Screw fitting into the straight thread port until the metal back-up washer contacts the face of the port.
3. Position the fitting by backing it out *no more than one turn.*
4. Hold the fitting in position and tighten the locknut until the washer contacts the face of the port. (See torque chart.)

NOTE: WLN Lock Nuts are ordered separately by size and part number. Refer to page 75.



Size	Straight Port		Adjustable Port	
	Torque (in-lbs)	(F.F.F.T)	Torque (in-lbs)	(F.F.F.T)
4	245 ± 10	1.0 ± .25	200 ± 10	1.5 ± 25
6	630 ± 25	1.5 ± .25	400 ± 10	1.5 ± 25
8	1150 ± 50	1.5 ± .25	640 ± 10	1.5 ± 25
10	1550 ± 50	1.5 ± .25	1125 ± 50	1.5 ± 25
12	2050 ± 50	1.5 ± .25	1450 ± 50	1.5 ± 25
16	3000 ± 50	1.5 ± .25	2150 ± 50	1.5 ± 25
20	3400 ± 100	1.5 ± .25	2800 ± 100	2.0 ± 25
24	4500 ± 100	1.5 ± .25	3450 ± 100	2.0 ± 25

NOTES:

- Restrain fitting body on adjustables if necessary in installation.
- Values in charts are for assemblies with O-ring lubricated.
- Use upper limits of torque ranges for stainless steel fittings.

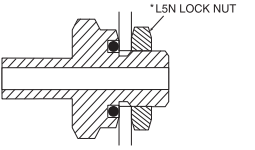
Face Seal O-Ring Fittings Installation Procedure

The O-ring requires a smooth, flat seating surface.This surface must be perpendicular to the axis of the threads.

1. Turn the O-ring seal fitting in the port until finger tight.
2. The “squeezing” effect on the O-ring can be felt during the last 1/4 turn.
3. Snug lightly with a wrench.

*Typical Application

The fitting can be adapted as a bulkhead fitting on thin wall tanks or vessels, eliminating welding, brazing or threading. Simply order the L5N locknut to take advantage of this option.



Port Size	Straight Thread Machine Length	L5N Locknut Thickness	Maximum Tank Wall Thickness
2	**.297**	.219	.078 = 5/64
3	**.297**	.219	.078 = 5/64
4	**.360**	.250	.109 = 7/65
5	**.360**	.250	.109 = 7/64
6	**.391**	.265	.125 = 1/8
8	**.438**	.312	.125 = 1/8
10	**.500**	.360	.140 = 9/64
12	**.594**	.406	.188 = 3/16
14	**.594**	.406	.188 = 3/16
16	**.594**	.406	.188 = 3/16

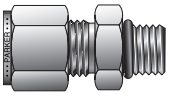
NOTES: Standard O-rings are nitrile material. For other O-rings, state material after the part number.

L5N locknuts are ordered separately by size and part number. Refer to page 75.

O-rings used with SAE/MS straight threads are nitrile. Other O-ring materials are available on request. Lubricate O-ring with a lubricant compatible with the system fluid, environment and O-ring material.

Male Connector to SAE Straight Thread

For fractional tube



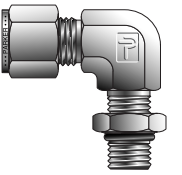
CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.	Straight Thread Size	O-Ring Size
1-2 ZHBA	**1M1SC2**	100-1-2 ST	1/16	5/16-24	3-902
2-2 ZHBA	**2M1SC2**	200-1-2 ST	1/8	5/16-24	3-902
2-6 ZHBA	**2M1SC6**	200-1-6 ST	1/8	9/16-18	3-906
3-3 ZHBA	**3M1SC3**	300-1-3 ST	3/16	3/8-24	3-903
4-4 ZHBA	**4M1SC4**	400-1-4 ST	1/4	7/16-20	3-904
4-6 ZHBA	**4M1SC6**	400-1-6 ST	1/4	9/16-18	3-906
4-8 ZHBA	**4M1SC8**	400-1-8 ST	1/4	3/4-16	3-908
4-10 ZHBA	**4M1SC10**	400-1-10 ST	1/4	7/8-14	3-910
5-5 ZHBA	**5M1SC5**	500-1-5 ST	5/16	1/2-20	3-905
6-4 ZHBA	**6M1SC4**	600-1-4 ST	3/8	7/16-20	3-904
6-6 ZHBA	**6M1SC6**	600-1-6 ST	3/8	9/16-18	3-906
6-8 ZHBA	**6M1SC8**	600-1-8 ST	3/8	3/4-16	3-908
6-10 ZHBA	**6M1SC10**	600-1-10 ST	3/8	7/8-14	3-910
8-6 ZHBA	**8M1SC6**	810-1-6 ST	1/2	9/16-18	3-906
8-8 ZHBA	**8M1SC8**	810-1-8 ST	1/2	3/4-16	3-908
8-12 ZHBA	**8M1SC12**	810-1-12 ST	1/2	1-1/16-12	3-912
10-10 ZHBA	**10M1SC10**	1010-1-10 ST	5/8	7/8-14	3-910
12-10 ZHBA	**12M1SC10**	1210-1-10 ST	3/4	7/8-14	3-910
12-12 ZHBA	**12M1SC12**	1210-1-12 ST	3/4	1-1/16-12	3-912
12-14 ZHBA	**14M1SC14**	1410-1-14 ST	7/8	1-3/16-12	3-914
16-12 ZHBA	**16M1SC12**	1610-1-12 ST	1	1-1/16-12	3-912
16-16 ZHBA	**16M1SC16**	1610-1-16 ST	1	1-5/16-12	3-916
20-20 ZHBA	**20M1SC20**	2010-1-20 ST	1-1/4	1-5/8-12	3-920
24-24 ZHBA	**24M1SC24**	2410-1-24 ST	1-1/2	1-7/8-12	3-924
32-32 ZHBA	**32M1SC32**	3210-1-32 ST	2	2-1/2-12	3-932

For use with SAE J.1926/1 port can also be used with MS-16142 port.
Sizes 20, 24, 32 require additional lubrication prior to assembly.
Parts are supplied with nitrile o-rings as standard. For Fluorocarbon o-rings, add the suffix "-VO". Other o-rings available upon request.

For metric fittings and additional thread types, please see Catalog 4230/4233.

Tube to O-Ring Seal

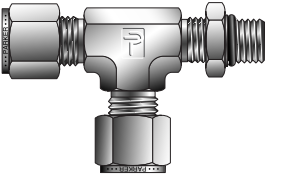
Male SAE Straight Thread Elbow
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.	Straight Thread Size	O-Ring Size
4-4 C5BZ	**4M5SEL4**	400-2-4ST	1/4	7/16-20	3-904
6-6 C5BZ	**6M5SEL6**	600-2-6ST	3/8	9/16-18	3-906
8-8 C5BZ	**8M5SEL8**	810-2-8ST	1/2	3/4-16	3-908
12-12 C5BZ	**12M5SEL12**	1210-2-12ST	3/4	1-1/16-12	3-912
16-16 C5BZ	**16M5SEL16**	1610-2-16ST	1	1-5/16-12	3-916
24-24 C5BZ	**24M5SEL24**	2410-2-24ST	1-1/2	1-7/8-12	3-924

Size 24 requires additional lubrication prior to assembly.
Parts are supplied with nitrile o-rings as standard. For Fluorocarbon o-rings, add the suffix "-VO". Other o-rings available upon request.

Male Run Tee SAE Straight Thread
For fractional tube

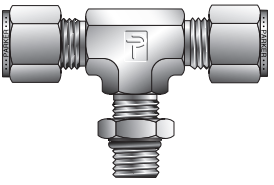


CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.	Straight Thread Size	O-Ring Size
4-4-4 R5BZ	**4M5RT4**	400-3TST	1/4	7/16-20	3-904
6-6-6 R5BZ	**6M5RT6**	600-3TST	3/8	9/16-18	3-906
8-8-8 R5BZ	**8M5RT8**	810-3TST	1/2	3/4-16	3-908
12-12-12 R5BZ	**12M5RT12**	1210-3TST	3/4	1-1/16-12	3-912
16-16-16 R5BZ	**16M5RT16**	1610-3TST	1	1-5/16-12	3-916

Parts are supplied with nitrile o-rings as standard. For Fluorocarbon o-rings, add the suffix "-VO". Other o-rings available upon request.

For metric fittings and additional thread types, please see Catalog 4230/4233.

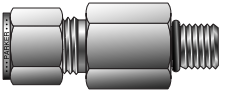
Male Branch Tee
SAE Straight Thread
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.	Straight Thread Size	O-Ring Size
4-4-4 S5BZ	**4M5BT4**	400-3TTS	1/4	7/16-20	3-904
6-6-6 S5BZ	**6M5BT6**	600-3TTS	3/8	9/16-18	3-906
8-8-8 S5BZ	**8M5BT8**	810-3TTS	1/2	3/4-16	3-908
12-12-12 S5BZ	**12M5BT12**	1210-3TTS	3/4	1-1/16-12	3-912
16-16-16 S5BZ	**16M5BT16**	1610-3TTS	1	1-5/16-12	3-916

Parts are supplied with nitrile o-rings as standard. For Fluorocarbon o-rings, add the suffix "-VO". Other o-rings available upon request.

Long Male Connector
SAE/MS Straight Thread
For fractional tube



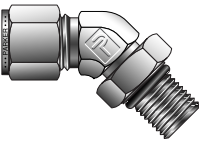
CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.	Straight Thread Size	O-Ring Size
4-4 ZH3BA	**4-4 ZH3LA**	400-1L-4ST	1/4	7/16-20	-904
6-6 ZH3BA	**6-6 ZH3LA**	600-1L-6ST	3/8	9/16-18	-906
8-8 ZH3BA	**8-8 ZH3LA**	810-1L-8ST	1/2	3/4-16	-908
12-12 ZH3BA	**12-12 ZH3LA**	1210-1L-12ST	3/4	1-1/16-12	-912
16-16 ZH3BA	**16-16 ZH3LA**	1610-1L-16ST	1	1-5/16-12	-916

Parts are supplied with nitrile o-rings as standard. For Fluorocarbon o-rings, add the suffix "-VO". Other o-rings available upon request.

For metric fittings and additional thread types, please see Catalog 4230/4233.

45° Positionable Male Elbow SAE/MS Straight Thread

For fractional tube

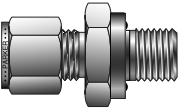


CPI™ Part No.	A-LOK® Part No.	Interchanges With	Straight Tube O.D.	Straight Thread Size	O-Ring Size
4-4 V5BZ	4M5VEL4	400-5-4ST	1/4	7/16-20	3-904
6-6 V5BZ	6M5VEL6	600-5-6ST	3/8	9/16-18	3-906
8-8 V5BZ	8M5VEL8	810-5-8ST	1/2	3/4-16	3-908
12-12 V5BZ	12M5VEL12	1210-5-12ST	3/4	1-1/16-12	3-912
16-16 V5BZ	16M5VEL16	1610-5-16ST	1	1-5/16-12	3-916

Adapts to SAE J1926 straight thread boss and MS16142 boss.
Parts are supplied with nitrile o-rings as standard. For Fluorocarbon o-rings, add the suffix "-VO". Other o-rings available upon request.

Male Connector to O-Ring Straight Thread

For fractional tube



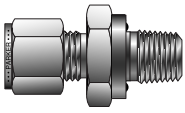
CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.	Straight Thread Size	O-Ring Size
1-2 ZHBA5	1M2SC2	100-1-OR	1/16	5/16-24	2-011
2-2 ZHBA5	2M2SC2	200-1-OR	1/8	5/16-24	2-011
3-3 ZHBA5	3M2SC3	300-1-OR	3/16	3/8-24	2-012
4-4 ZHBA5	4M2SC4	400-1-OR	1/4	7/16-20	2-111
5-5 ZHBA5	5M2SC5	500-1-OR	5/16	1/2-20	2-112
6-6 ZHBA5	6M2SC6	600-1-OR	3/8	9/16-18	2-113
8-8 ZHBA5	8M2SC8	810-1-OR	1/2	3/4-16	2-116
10-10 ZHBA5	10M2SC10	1010-1-OR	5/8	7/8-14	2-212
12-12 ZHBA5	12M2SC12	1210-1-OR	3/4	1-1/16-12	2-215
14-12 ZHBA5	14M2SC12	1410-1-OR	7/8	1-1/16-12	2-215
16-16 ZHBA5	16M2SC16	1610-1-OR	1	1-5/16-12	2-219

Parts are supplied with nitrile o-rings as standard. For Fluorocarbon o-rings, add the suffix "-VO". Other o-rings available upon request.

For metric fittings and additional thread types, please see Catalog 4230/4233.

Male Connector to O-Ring Pipe Thread

For fractional tube



CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.	NPT Thread Size	O-Ring Size
1-2 ZHBF5	**1M3SC2**	100-1-2-OR	1/16	1/8	2-111
2-2 ZHBF5	**2M3SC2**	200-1-2-OR	1/8	1/8	2-111
2-4 ZHBF5	**2M3SC4**	200-1-4-OR	1/8	1/4	2-113
3-2 ZHBF5	**3M3SC2**	300-1-2-OR	3/16	1/8	2-111
3-4 ZHBF5	**3M3SC4**	300-1-4-OR	3/16	1/4	2-113
4-2 ZHBF5	**4M3SC2**	400-1-2-OR	1/4	1/8	2-111
4-4 ZHBF5	**4M3SC4**	400-1-4-OR	1/4	1/4	2-113
4-6 ZHBF5	**4M3SC6**	400-1-6-OR	1/4	3/8	2-116
5-2 ZHBF5	**5M3SC2**	500-1-2-OR	5/16	1/8	2-111
5-4 ZHBF5	**5M3SC4**	500-1-4-OR	5/16	1/4	2-113
6-2 ZHBF5	**6M3SC2**	600-1-2-OR	3/8	1/8	2-111
6-4 ZHBF5	**6M3SC4**	600-1-4-OR	3/8	1/4	2-113
6-6 ZHBF5	**6M3SC6**	600-1-6-OR	3/8	3/8	2-116
6-8 ZHBF5	**6M3SC8**	600-1-8-OR	3/8	1/2	2-212
8-4 ZHBF5	**8M3SC4**	810-1-4-OR	1/2	1/4	2-113
8-6 ZHBF5	**8M3SC6**	810-1-6-OR	1/2	3/8	2-116
8-8 ZHBF5	**8M3SC8**	810-1-8-OR	1/2	1/2	2-212
10-8 ZHBF5	**10M3SC8**	1010-1-8-OR	5/8	1/2	2-212
10-12 ZHBF5	**10M3SC12**	1010-1-8-OR	5/8	3/4	2-215
12-8 ZHBF5	**12M3SC8**	1210-1-8-OR	3/4	1/2	2-212
12-12 ZHBF5	**12M3SC12**	1210-1-12-OR	3/4	3/4	2-215
16-12 ZHBF5	**16M3SC12**	1610-1-12-OR	1	3/4	2-215
16-16 ZHBF5	**16M3SC16**	1610-1-16-OR	1	1	2-219

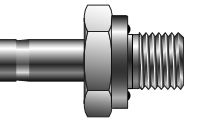
Parts are supplied with nitrile o-rings as standard. For Fluorocarbon o-rings, add the suffix “-VO”. Other o-rings available upon request.

For metric fittings and additional thread types, please see Catalog 4230/4233.

Tube to O-Ring Seal

Tube End to O-Ring Straight Thread

For fractional tube

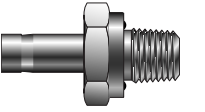


Parts are supplied with nitrile o-rings as standard. For Fluorocarbon o-rings, add the suffix "-VO". Other o-rings available upon request.

CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.	Straight Thread Size	O-Ring Size
2-2 T2HOA5	**2M2TU2**	2-TA-OR-ST	1/8	5/16-24	2-011
3-3 T2HOA5	**3M2TU3**	3-TA-OR-ST	3/16	3/8-24	2-012
4-4 T2HOA5	**4M2TU4**	4-TA-OR-ST	1/4	7/16-20	2-111
5-5 T2HOA5	**5M2TU5**	5-TA-OR-ST	5/16	1/2-20	2-112
6-6 T2HOA5	**6M2TU6**	6-TA-OR-ST	3/8	9/16-18	2-113
8-8 T2HOA5	**8M2TU8**	8-TA-OR-ST	1/2	3/4-16	2-116
10-10 T2HOA5	**10M2TU10**	10-TA-OR-ST	5/8	7/8-14	2-212
12-12 T2HOA5	**12M2TU12**	12-TA-OR-ST	3/4	1-1/16-12	2-215
16-16 T2HOA5	**16M2TU16**	16-TA-OR-ST	1	1-5/16-12	2-219

Tube End to O-Ring Pipe Thread

For fractional tube



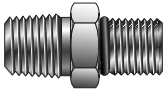
Parts are supplied with nitrile o-rings as standard. For Fluorocarbon o-rings, add the suffix "-VO". Other o-rings available upon request.

CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.	NPT Thread Size	O-Ring Size
1-2 T2HOF5	**1M3TU2**	1-TA-1-20R	1/16	1/8	2-111
4-2 T2HOF5	**4M3TU2**	4-TA-1-20R	1/4	1/8	2-111
4-4 T2HOF5	**4M3TU4**	4-TA-1-40R	1/4	1/4	2-113
4-6 T2HOF5	**4M3TU6**	4-TA-1-60R	1/4	3/8	2-116
5-2 T2HOF5	**5M3TU2**	5-TA-1-20R	5/16	1/8	2-111
5-4 T2HOF5	**5M3TU4**	5-TA-1-40R	5/16	1/4	2-113
6-2 T2HOF5	**6M3TU2**	6-TA-1-20R	3/8	1/8	2-111
6-4 T2HOF5	**6M3TU4**	6-TA-1-40R	3/8	1/4	2-113
6-6 T2HOF5	**6M3TU6**	6-TA-1-60R	3/8	3/8	2-116
8-6 T2HOF5	**8M3TU6**	8-TA-1-60R	1/2	3/8	2-116
10-8 T2HOF5	**10M3TU8**	10-TA-1-80R	5/8	1/2	2-212
12-12 T2HOF5	**12M3TU12**	12-TA-1-120R	3/4	3/4	2-215
16-16 T2HOF5	**16M3TU16**	16-TA-1-160R	1	1	2-219

For metric fittings and additional thread types, please see Catalog 4230/4233.

NPT Thread to SAE Straight Thread Adapter

For fractional tube

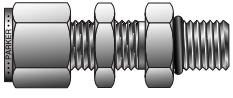


CPI™ Part No.	A-LOK® Part No.	Interchanges With	NPT Thread Size	Straight Thread Size	O-Ring Size
4-4 FHOA	**4-4 FHOA**	4-SAE-1-4	1/4-18	7/16-20	3-904
6-6 FHOA	**6-6 FHOA**	6-SAE-1-6	3/8-18	9/16-18	3-906
8-8 FHOA	**8-8 FHOA**	8-SAE-1-8	1/2-14	3/4- 16	3-908
12-12 FHOA	**12-12 FHOA**	12-SAE-1-12	3/4-14	1-1/16-12	3-912
16-16 FHOA	**16-16 FHOA**	16-SAE-1-16	1-11-1/2	1-5/16-12	3-916

For use with SAE J.1926/1 port can also be used with MS-16142 port.
Parts are supplied with nitrile o-rings as standard. For Fluorocarbon o-rings, add the suffix "-VO".
Other o-rings available upon request.

Bulkhead to Conversion Adapter

For fractional tube



CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.	Straight Thread Size
4-6 AH2BZ	**4-6 AH2LZ**	400-61-6ST	1/4	9/16-18
6-6 AH2BZ	**6-6 AH2LZ**	600-61-6ST	3/8	9/16-18

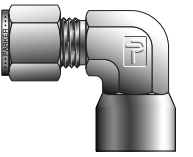
For use with SAE J.1926/1 port can also be used with MS-16142 port.
Parts are supplied with nitrile o-rings as standard. For Fluorocarbon o-rings, add the suffix "-VO".
Other o-rings available upon request.

For metric fittings and additional thread types, please see Catalog 4230/4233.

Socket Weld Elbow

For fractional tube

• For CPI™/A-LOK® to tubing socket weld connection

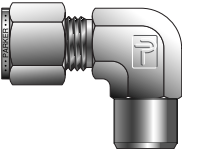


CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.
2-2 ZEBW	**2-2 ZELW**	200-9-2 W	1/8
3-3 ZEBW	**3-3 ZELW**	300-9-3 W	3/16
4-4 ZEBW	**4-4 ZELW**	400-9-4 W	1/4
6-6 ZEBW	**6-6 ZELW**	600-9-6 W	3/8
8-8 ZEBW	**8-8 ZELW**	810-9-8 W	1/2
10-10 ZEBW	**10-10 ZELW**	1010-9-10 W	5/8
12-12 ZEBW	**12-12 ZELW**	1210-9-12 W	3/4
16-16 ZEBW	**16-16 ZELW**	1610-9-16 W	1

Buttweld Elbow

For fractional tube

• For CPI™/A-LOK® to pipe buttweld connection



CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.	Buttweld Pipe Size
2-1/8 ZEBW2	**2-1/8 ZELW2**	200-2-2 W	1/8	1/8
3-1/8 ZEBW2	**3-1/8 ZELW2**	300-2-2 W	3/16	1/8
4-1/8 ZEBW2	**4-1/8 ZELW2**	400-2-2 W	1/4	1/8
4-1/4 ZEBW2	**4-1/4 ZELW2**	400-2-4 W	1/4	1/4
6-1/4 ZEBW2	**6-1/4 ZELW2**	600-2-4 W	3/8	1/4
8-3/8 ZEBW2	**8-3/8 ZELW2**	810-2-6 W	1/2	3/8
8-1/2 ZEBW2	**8-1/2 ZELW2**	810-2-8 W	1/2	1/2
10-1/2 ZEBW2	**10-1/2 ZELW2**	1010-2-8 W	5/8	1/2
12-3/4 ZEBW2	**12-3/4 ZELW2**	1210-2-12 W	3/4	3/4
16-3/4 ZEBW2	**16-3/4 ZELW2**	1610-2-12 W	1	3/4
16-1 ZEBW2	**16-1 ZELW2**	1610-2-16 W	1	1

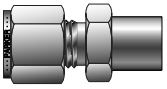
Pipe buttweld end will conform to Schedule 80 unless otherwise noted.

For metric fittings and additional thread types, please see Catalog 4230/4233.

Socket Weld Connector

For fractional tube

• For CPI™ / A-LOK® to tubing socket weld connection



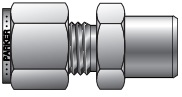
CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.
2-2 ZHBW	**2-2 ZHLW**	200-6-2 W	1/8
3-3 ZHBW	**3-3 ZHLW**	300-6-3 W	3/16
4-4 ZHBW	**4-4 ZHLW**	400-6-4 W	1/4
6-6 ZHBW	**6-6 ZHLW**	600-6-6 W	3/8
8-8 ZHBW	**8-8 ZHLW**	810-6-8 W	1/2
10-10 ZHBW	**10-10 ZHLW**	1010-6-10 W	5/8
12-12 ZHBW	**12-12 ZHLW**	1210-6-12 W	3/4
16-16 ZHBW	**16-16 ZHLW**	1610-6-16 W	1

See Catalog 4280, Welded Fittings, for additional sizes.

Buttweld Connector

For fractional tube

• For CPI™ / A-LOK® to pipe buttweld connection



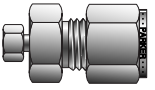
CPI™ Part No.	A-LOK® Part No.	Interchanges With	Tube O.D.	Buttweld Pipe Size
2-1/8 ZHBW2	**2-1/8 ZHLW2**	200-1-2 W	1/8	1/8
3-1/8 ZHBW2	**3-1/8 ZHLW2**	300-1-2 W	3/16	1/8
4-1/8 ZHBW2	**4-1/8 ZHLW2**	400-1-2 W	1/4	1/8
4-1/4 ZHBW2	**4-1/4 ZHLW2**	400-1-4 W	1/4	1/4
5-1/8 ZHBW2	**5-1/8 ZHLW2**	500-1-2 W	5/16	1/8
5-1/4 ZHBW2	**5-1/4-ZHLW2**	500-1-4-W	5/16	1/4
6-1/4 ZHBW2	**6-1/4 ZHLW2**	600-1-4 W	3/8	1/4
6-3/8 ZHBW2	**6-3/8 ZHLW2**	600-1-6 W	3/8	3/8
6-1/2 ZHBW2	**6-1/2 ZHLW2**	600-1-8 W	3/8	1/2
6-3/4 ZHBW2	**6-3/4 ZHLW2**	600-1-12 W	3/8	3/4
8-3/8 ZHBW2	**8-3/8 ZHLW2**	810-1-6 W	1/2	3/8
8-1/2 ZHBW2	**8-1/2 ZHLW2**	810-1-8 W	1/2	1/2
8-3/4 ZHBW2	**8-3/4 ZHLW2**	810-1-12 W	1/2	3/4
10-1/2 ZHBW2	**10-1/2 ZHLW2**	1010-1-8 W	5/8	1/2
12-3/4 ZHBW2	**12-3/4 ZHLW2**	1210-1-12 W	3/4	3/4
16-1 ZHBW2	**16-1 ZHLW2**	1610-1-16 W	1	1

Pipe Buttweld end will conform to Schedule 80 unless otherwise noted.
See Catalog 4280, Welded Fittings, for additional sizes.

For metric fittings and additional thread types, please see Catalog 4230/4233.

Column End Fitting – Low Internal Volume with Frit

For fractional tube



CPI™ Part No.	A-LOK® Part No.	T_1 Tube O.D.	T_2 Tube O.D.	Internal Volume
2-1 Z2HCZ7	**2-1 Z2HLZ7**	1/8	1/16	5.4 x 10^{-4}cc
4-1 Z2HCZ7	**4-1 Z2HLZ7**	1/4	1/16	1.2 x 10^{-3}cc
6-1 Z2HCZ7	**6-1 Z2HLZ7**	3/8	1/16	3.8 x 10^{-3}cc

Features:

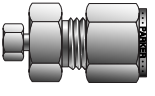
- Inverted 1/16" end substantially reduces internal volume
- Flow stream contacts entire frit surface reducing plugging and eliminating unswept volume
- Can be used as a low volume final filter

Frit Designator	
* Micron Dash No.	Micron Size
–1	0.5 µ
–2	2 µ
–3	5 µ
–4	10 µ

How to Order
EXAMPLE: 4-1Z2HLZ7-2*-SS To order with 2µ frit for 1/4" O.D. column

Column End Fitting – Low Internal Volume

For fractional tube



CPI™ Part No.	A-LOK® Part No.	T_1 Tube O.D.	T_2 Tube O.D.	Internal Volume
4-1 Z3HCZ7	**4-1 Z3HLZ7**	1/4	1/16	6.1 x 10^{-4}cc
6-1 Z3HCZ7	**6-1 Z3HLZ7**	3/8	1/16	8.1 x 10^{-4}cc
8-1 Z3HCZ7	**8-1 Z3HLZ7**	1/2	1/16	2.8 x 10^{-3}cc
16-1 Z3HCZ7	**16-1 Z3HLZ7**	1	1/16	2 x 10^{-2}cc

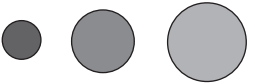
Features:

- Inverted 1/16" end substantially reduces internal volume
- Drop in frit for use with L.C.* columns or G.C.* columns
- Conical angle below frit directs flow over more frit surface
- Available for up to 1" columns

*G.C. = Gas Chromatagraph
L.C. = Liquid Chromatagraph

For additional information, please see Catalog 4230/4233.

Di-Frit (drop in)

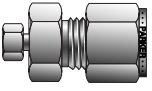


Replaceable frit for preparatory column end fitting Z3HLZ7. Frits are available in 2, 5 and 10 micron sizes.

CPI™/ A-LOK® Parker Part No.	Micron Size	Column O.D.
4 DI FRIT-5MIC-SS	5	1/4"
4 DI FRIT-10MIC-SS	10	1/4"
6 DI FRIT-2MIC-SS	2	3/8"
6 DI FRIT-5MIC-SS	5	3/8"
6 DI FRIT-10MIC-SS	10	3/8"
8 DI FRIT-5MIC-SS	5	1/2"
8 DI FRIT-10MIC-SS	10	1/2"
16 DI FRIT-2MIC-SS	2	1"
16 DI FRIT-5MIC-SS	5	1"
16 DI FRIT-10MIC-SS	10	1"

Column End Fitting – Low Internal Volume without Frit

For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	T_1 Tube O.D.	T_2 Tube O.D.	Internal Volume
2-1 ZHCZ7	2-1 ZHLZ7	-200-6-1-FGC	1/8	1/16	1.0 x 10^{-4}cc
4-1 ZHCZ7	4-1 ZHLZ7	-400-6-1-FGC	1/4	1/16	1.1 x 10^{-4}cc
6-1 ZHCZ7	6-1 ZHLZ7	-600-6-1-FGC	3/8	1/16	1.3 x 10^{-4}cc

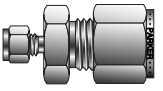
Features:

- Inverted 1/16" end substantially
- No frit for use with G.C.* columns or L.C .* columns with screens
- Can be used as a low volume reducing union

*G.C. = Gas Chromatagraph
L.C. = Liquid Chromatagraph

For metric fittings and additional thread types, please see Catalog 4230/4233.

Column End Fitting – with Frit
For fractional tube



CPI™ Part No.	A-LOK® Part No.	T_1 Tube O.D.	T_2 Tube O.D.	Internal Volume
2-1 Z2HCZ	**2-1 Z2HLZ**	1/8	1/16	2.1 x 10^{-3}cc
4-1 Z2HCZ	**4-1 Z2HLZ**	1/4	1/16	1.8 x 10^{-3}cc
6-1 Z2HCZ	**6-1 Z2HLZ**	3/8	1/16	5.4 x 10^{-3}cc

Features:

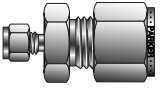
- Flow stream contacts entire frit surface reducing plugging and eliminating unswept volume
- Can be used as a low volume final filter with drop-in frit

Frit Designator	
* MICRON DASH NO.	MICRON SIZE
–1	0.5 µ
–2	2.0 µ
–3	5.0 µ
–4	10.0 µ

How to Order
EXAMPLE: 4-1Z2HLZ-2*-SS To order with 2µ frit for 1/4" O.D. column

NOTE: Size 1 not silver-plated.

Column End Fitting – without Frit
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	T_1 Tube O.D.	T_2 Tube O.D.	Internal Volume
2-1 ZHCZ	**2-1 ZHLZ**	200-6-1LV	1/8	1/16	2.1 x 10^{-3}cc
4-1 ZHCZ	**4-1 ZHLZ**	400-6-1LV	1/4	1/16	2.1 x 10^{-3}cc
6-1 ZHCZ	**6-1 ZHLZ**	600-6-1LV	3/8	1/16	2.3 x 10^{-3}cc

Size 1 Nut is not silver plated

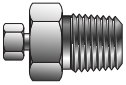
Union Connector – Low Dead Volume
For fractional tube

CPI™ Part No.	A-LOK® Part No.	Inter-changes With	T_1 Tube O.D.	T_2 Tube O.D.	Internal Volume
1-1 Z7HBZ7-SS	**1-1 Z7HLZ7**	IFO-6GC	1/16	1/16	8.7 x 10^{-5}cc
2-1 Z7HBZ7-SS	**2-1 Z7HLZ7**	–	1/8	1/16	8.7 x 10^{-5}cc
2-2 Z7HBZ7-SS	**2-2 Z7HLZ7**	–	1/8	1/8	9.7 x 10^{-2}cc

For metric fittings and additional thread types, please see Catalog 4230/4233.

Male Connector – Low Dead Volume

For fractional tube



CPI™ Part No.	A-LOK® Part No.	NPT Tube O.D.	NPT Thread Size	Internal Volume
1-1 FBZ7	**1-1 FLZ7**	1/16	1/16	3.1 x 10^{-4}cc
1-2 FBZ7	**1-2 FLZ7**	1/16	1/8	4.4 x 10^{-4}cc
1-4 FBZ7	**1-4 FLZ7**	1/16	1/4	8.8 x 10^{-4}cc

Sanitary Flange Fitting

For fractional tube

CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.	Sanitary Flange
4-8 ZHBS	**4-8 ZHLS-SS**	SS-400-SC-8	1/4	1/2
4-12 ZHBS	**4-12 ZHLS-SS**	SS-400-SC-12	1/4	3/4
4-16 ZHBS	**4-16 ZHLS-SS**	SS-400-SC-16	1/4	1
4-24 ZHBS	**4-24 ZHLS-SS**	SS-400-SC-24	1/4	1 1/2
6-8 ZHBS	**6-8 ZHLS-SS**	SS-600-SC-8	3/8	1/2
6-12 ZHBS	**6-12 ZHLS-SS**	SS-600-SC-12	3/8	3/4
6-16 ZHBS	**6-16 ZHLS-SS**	SS-600-SC-16	3/8	1
6-24 ZHBS	**6-24 ZHLS-SS**	SS-600-SC-24	3/8	1 1/2
8-8 ZHBS	**8-8 ZHLS-SS**	SS-810-SC-8	1/2	1/2
8-12 ZHBS	**8-12 ZHLS-SS**	SS-810-SC12	1/2	3/4
8-16 ZHBS	**8-16 ZHLS-SS**	SS-810-SC-16	1/2	1
8-24 ZHBS	**8-24 ZHLS-SS**	SS-810-SC-24	1/2	1 1/2

All CPI™ fittings should be ordered with the "-C" option for silver plated fittings.

Sanitary flange fittings combine the reliability and versatility of Parker tube fittings with conventional sanitary flanges. The fittings permit direct downstream connections for hookups and sampling.

Flange sizes are 1/2, 3/4, 1, and 1-1/2 in.

Parker tube fitting ends are available in 1/4, 3/8, and 1/2 in. Parker tube fittings allow use of a variety of tubing materials including metal, hard plastic, and soft plastic.

For a Thermocouple/"Bored-Thru" version of the above Sanitary Adapter fittings, add a "4" to the part number. Example: A 4-12 ZHLS-SS becomes a 4-12 ZH4LS-SS for a 3/4" Sanitary Flange with a 1/4" diameter bored through on the A-LOK® fitting end.

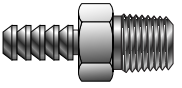
For the full line of Sanitary Fittings and Flow Components, see Catalog 4270-Sanitary/ASME-BPE Fittings.

For metric fittings and additional thread types, please see Catalog 4230/4233.

Barbed Fittings

Barbed Connector to Male Pipe

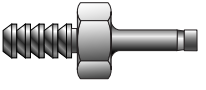
For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Hose I.D.	Male Thread Size
2-2 B2HF	**2-2 B2HF**	2-HC-1-2	1/8	1/8
2-4 B2HF	**2-4 B2HF**	2-HC-1-4	1/8	1/4
4-2 B2HF	**4-2 B2HF**	4-HC-1-2	1/4	1/8
4-4 B2HF	**4-4 B2HF**	4-HC-1-4	1/4	1/4
5-2 B2HF	**5-2 B2HF**	5-HC-1-2	5/16	1/8
5-4 B2HF	**5-4 B2HF**	5-HC-1-4	5/16	1/4
6-4 B2HF	**6-4 B2HF**	6-HC-1-4	3/8	1/4
6-6 B2HF	**6-6 B2HF**	6-HC-1-6	3/8	3/8
8-6 B2HF	**8-6 B2HF**	8-HC-1-6	1/2	3/8
8-8 B2HF	**8-8 B2HF**	8-HC-1-8	1/2	1/2
12-12 B2HF	**12-12 B2HF**	12-HC-1-12	3/4	3/4

Barbed Connector to Tube Adapter

For fractional tube



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube I.D.	Tube O.D.
2-2 B2HT2	**2B2TU2**	2-HC-A-201	1/8	1/8
2-4 B2HT2	**2B2TU4**	2-HC-A-401	1/8	1/4
4-4 B2HT2	**4B2TU4**	4-HC-A-401	1/4	1/4
6-6 B2HT2	**6B2TU6**	6-HC-A-601	3/8	3/8

NOTE: Tube adapter end is designed for use with Parker fittings or valves. Simply insert the tube adapter end until it bottoms and tighten the Parker nut 3/4 turns for sizes 3 and below, for sizes 4 and above 1-1/4 turns from finger tight.

Add -Z6 for assembly of nuts and ferrules on the tube stub end.

Hose Connector Sleeve

For fractional tube

Parker Part No.	Hose I.D.	Hose O.D.
HCS 2-4	**1/8**	1/4
HCS 4-6	**1/4**	3/8
HCS 4-7	**1/4**	7/16
HCS 4-8	**1/4**	1/2
HCS 4-9	**1/4**	9/16
HCS 5-7	**5/16**	7/16
HCS 6-8	**3/8**	1/2
HCS 6-9	**3/8**	9/16
HCS 8-11	**1/2**	11/16
HCS 12-16	**3/4**	1

For metric fittings and additional thread types, please see Catalog 4230/4233.

Insert
For fractional tube

Parker Part No.	Inter-changes With	Tube O.D.	Tube I.D.	Tube Wall
3 TIZ .125	305-2	3/16	.125	.031
4 TIZ .125	405-2	1/4	.125	.062
4 TIZ .170	405-170	1/4	.170	.040
4 TIZ .188	405-3	1/4	.188	.031
5 TIZ .125	505-2	5/16	.125	.094
5 TIZ .188	505-3	5/16	.188	.062
5 TIZ .250	505-4	5/16	.250	.031
6 TIZ .188	605-3	3/8	.188	.094
6 TIZ .250	605-4	3/8	.250	.062
8 TIZ .250	815-4	1/2	.250	.125
8 TIZ .375	815-6	1/2	.375	.062
10 TIZ .375	1015-6	5/8	.375	.125
10 TIZ .500	1015-8	5/8	.500	.062
12 TIZ .500	1215-8	3/4	.500	.125
12 TIZ .625	1215-10	3/4	.625	.062
16 TIZ .750	1615-12	1	.750	.125
16 TIZ .875	1615-14	1	.875	.062

NOTE: Tubing wall thickness and corresponding minimum I.D. flow paths are listed so the system designer can properly match the insert to the tubing.

Example: 4 TIZ .125 is used with tubing having a wall thickness of .062 and I.D. of .125.

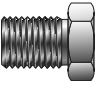
Tube Nut
For fractional tube

CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.
1 BZ	1NU1	102-1	1/16
2 BZ	2NU2	202-1	1/8
3 BZ	3NU3	302-1	3/16
4 BZ	4NU4	402-1	1/4
5 BZ	5NU5	502-1	5/16
6 BZ	6NU6	602-1	3/8
8 BZ	8NU8	812-1	1/2
10 BZ	10NU10	1012-1	5/8
12 BZ	12NU12	1212-1	3/4
14 BZ	14NU14	1412-1	7/8
16 BZ	16NU16	1612-1	1
20 BZ	20NU20	2012-1	1-1/4
24 BZ	24NU24	2412-1	1-1/2
32 BZ	32NU32	3212-1	2

NOTE: All size 20, 24 and 32 silver plated nuts should have a system compatible lube (Permatex Anti-seize – Parker Catalog 4290-INST) or equivalent applied to the fitting body threads and the inside back of nuts. This will minimize the effort required to assemble the fitting properly.

For metric fittings and additional thread types, please see Catalog 4230/4233.

Inverted Tube Nut
For fractional tube



Parker Part No.	Inter-changes With	Tube O.D.
1 BZI	1F2-1GC	1/16
2 BZI	2F2-1GC	1/8

Knurled Nut
For fractional tube

Parker Part No.	Inter-changes With	Tube O.D.
1 BZP	102-1K	1/16
2 BZP	202-1K	1/8
3 BZP	302-1K	3/16
4 BZP	402-1K	1/4
5 BZP	502-1K	5/16
6 BZP	602-1K	3/8
8 BZP	812-1K	1/2
10 BZP	1012-1K	5/8

HOW TO ASSEMBLE BZP

1. Replaces BZ/NU nuts on Parker CPI™/A-LOK® fitting bodies.
2. Insert plastic tubing until it bottoms in fitting body.
3. Tighten finger tight.

The knurled nut is designed for use with soft plastic tubing on low pressure applications where a finger tight assembly procedure is satisfactory.

Example: Laboratory test hook-ups. Nylon or PTFE ferrules are frequently used instead of metal ferrules in this type of application.

Ferrules

Parker Part No.	Inches Tube O.D.
1 TZ	1/16
2 TZ	1/8
3 TZ	3/16
4 TZ	1/4
5 TZ	5/16
6 TZ	3/8
8 TZ	1/2
10 TZ	5/8
12 TZ	3/4
14 TZ	7/8
16 TZ	1
20 TZ	1-1/4
24 TZ	1-1/2
32 TZ	2

Parker Part No.	MM Tube O.D.
TZ 3	3
TZ 6	6
TZ 8	8
TZ 10	10
TZ 12	12
TZ 16	16
TZ 20	20
TZ 25	25

Note: Ferrules are available in standard metal materials as well as standard plastics like PTFE and nylon. Please consult the factory for availability.

Front Ferrule
For fractional tube

Parker Part No.	Inter-changes With	Inches Tube O.D.
1FF1	103-1	1/16
2FF2	203-1	1/8
3FF3	303-1	3/16
4FF4	403-1	1/4
5FF5	503-1	5/16
6FF6	603-1	3/8
8FF8	813-1	1/2
10FF10	1013-1	5/8
12FF12	1213-1	3/4
14FF14	1413-1	7/8
16FF16	1613-1	1
20FF20	2013-1	1-1/4
24FF24	2413-1	1-1/2
32FF32	3213-1	2

For metric fittings and additional thread types, please see Catalog 4230/4233.

Back Ferrule

For fractional tube

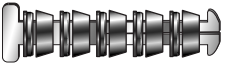
For stainless steel, sizes 4-32 are Suparcase ferrules.

Parker Part No.	Inter-changes With	Inches Tube O.D.
1BF1	104-1	1/16
2BF2	204-1	1/8
3BF3	304-1	3/16
4BF4	404-1	1/4
5BF5	504-1	5/16
6BF6	604-1	3/8
8BF8	814-1	1/2
10BF10	1014-1	5/8
12BF12	1214-1	3/4
14BF14	1414-1	7/8
16BF16	1614-1	1
20BF20	2014-1	1-1/4
24BF24	2414-1	1-1/2
32BF32	3214-1	2

Note: Ferrules are available in standard metal materials as well as standard plastics like PTFE and nylon. Please consult the factory for availability.

Ferrule Holder

Package simplifies ordering, stocking, and assembling



CPI™ Part No.	A-LOK® Part No.	Inches Tube O.D.
2 CPI-*-SET	2 ALOK-*-SET	1/8
4 CPI-*-SET	4 ALOK-*-SET	1/4
6 CPI-*-SET	6 ALOK-*-SET	3/8
8 CPI-*-SET	8 ALOK-*-SET	1/2
12 CPI-*-SET	12 ALOK-*-SET	3/4
16 CPI-*-SET	16 ALOK-*-SET	1

*Material designator – 316-SS, B-Brass, S-Steel

Plug

For fractional tube

For plugging open ended CPI™/A-LOK® fitting ends

How to Assemble

Wrench tighten only 1/4 turn from finger tight position. Assembly includes machined ferrule with lock ring.

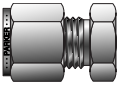
CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.	Thread
1 FNZ	1BLP1	100-P	1/16	10-32
2 FNZ	2BLP2	200-P	1/8	5/16-20
3 FNZ	3BLP3	300-P	3/16	3/8-20
4 FNZ	4BLP4	400-P	1/4	7/16-20
5 FNZ	5BLP5	500-P	5/16	1/2-20
6 FNZ	6BLP6	600-P	3/8	9/16-20
8 FNZ	8BLP8	810-P	1/2	3/4-20
10 FNZ	10BLP10	1010-P	5/8	7/8-20
12 FNZ	12BLP12	1210-P	3/4	1-20
14 FNZ	14BLP14	1410-P	7/8	1-1/8-20
16 FNZ	16BLP16	1610-P	1	1-5/16-20
20 FNZ	20BLP20	2010-P	1-1/4	1-5/8-20
24 FNZ	24BLP24	2410-P	1-1/2	1-15/16-20
32 FNZ	32BLP32	3210-P	2	2-5/8-20

For metric fittings and additional thread types, please see Catalog 4230/4233.

Cap

For fractional tube

For capping open ended tubing



CPI™ Part No.	A-LOK® Part No.	Inter-changes With	Tube O.D.
1 PNBZ	**1BLEN1**	100-C	1/16
2 PNBZ	**2BLEN2**	200-C	1/8
3 PNBZ	**3BLEN3**	300-C	3/16
4 PNBZ	**4BLEN4**	400-C	1/4
5 PNBZ	**5BLEN5**	500-C	5/16
6 PNBZ	**6BLEN6**	600-C	3/8
8 PNBZ	**8BLEN8**	810-C	1/2
10 PNBZ	**10BLEN10**	1010-C	5/8
12 PNBZ	**12BLEN12**	1210-C	3/4
14 PNBZ	**14BLEN14**	1410-C	7/8
16 PNBZ	**16BLEN16**	1610-C	1
20 PNBZ	**20BLEN20**	2010-C	1-1/4
24 PNBZ	**24BLEN24**	2410-C	1-1/2
32 PNBZ	**32BLEN32**	3210-C	2

NOTE: For body only specify PNZ.

Vent Protector NPT Male Pipe Thread

For fractional tube

CPI™ Part No.	Inter-changes With	Thread size
2 MDF	**MS-MD-2M**	1/8-27
4 MDF	**MS-MD-4M**	1/4-18
6 MDF	**MS-MD-6M**	3/8-18
8 MDF	**MS-MD-8M**	1/2-14
12 MDF	**MS-MD-12M**	3/4-14
16 MDF	**MS-MD-16M**	1-11-1/2

Parker Instrumentation vent protectors (mud dauber fittings) protect open ends of instruments, tubing, outlet vents, etc. The mesh wire screen prevents foreign bodies such as insects or debris from entering and clogging various systems and causing damage.

- Pipe plug, bored-thru design
- 40 x 40 mesh, .010 diameter wire screen
- Designed to vent female pipe, straights, elbows or tees

For metric fittings and additional thread types, please see Catalog 4230/4233.

Bulkhead Locknut
For fractional tube

Parker Part No.	Inter-changes With	A-LOK® Thread	Tube O.D.
1 WLZ	**102-61**	10-32	1/16
2 WLZ	**202-61**	5/16-20	1/8
3 WLZ	**302-61**	3/8-20	3/16
4 WLZ	**402-61**	7/16-20	1/4
5 WLZ	**502-61**	1/2-20	5/16
6 WLZ	**602-61**	9/16-20	3/8
8 WLZ	**812-61**	3/4-20	1/2
10 WLZ	**1012-61**	7/8-20	5/8
12 WLZ	**1212-61**	1"-20	3/4
14 WLZ	**1412-61**	1-1/8-20	7/8
16 WLZ	**1612-61**	1-5/16-20	1

Bulkhead Locknut
For fractional tube

Parker Part No.	SAE Adj. Straight Thread	Tube O.D.
4 WLN	**7/16-20**	1/4
6 WLN	**9/16-18**	3/8
8 WLN	**3/4-16**	1/2
12 WLN	**1-1/16-12**	3/4
16 WLN	**1-5/16-12**	1

Accessory Locknut

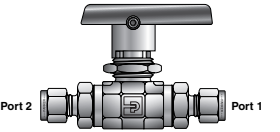
Parker Part No.	Straight Thread
2 L5N	**5/16-24**
3 L5N	**3/8-24**
4 L5N	**7/16-20**
5 L5N	**1/2-20**
6 L5N	**9/16-18**
8 L5N	**3/4-16**
10 L5N	**7/8-14**
12 L5N	**1-1/16-12**
14 L5N	**1-3/16-12**
16 L5N	**1-5/16-12**

NOTE: For use with M2SC and M2TU fittings on pages 60 and 62.

For metric fittings and additional thread types, please see Catalog 4230/4233.

Ball Valves – B Series

Two-Way



Model Shown: 6A-B6LJ2-SSP

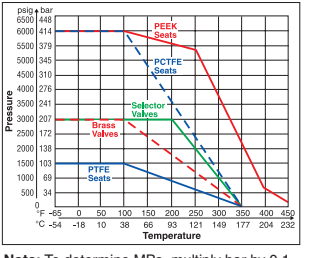
Two-Way Specifications

Pressure Ratings:

Material		CWP	With PTFE Seats
316 Stainless Steel		6000 psig (414 bar)*	1500 psig (103 bar)
Brass		3000 psig (207 bar)	1500 psig (103 bar)
Monel® Alloy 400	B2 and B6: B8:	3000 psig (207 bar) 2000 psig (138 bar)	1500 psig (103 bar) 1500 psig (103 bar)
Hastelloy® C-276	B2 and B6: B8:	4000 psig (276 bar) 3000 psig (207 bar)	1500 psig (103 bar) 1500 psig (103 bar)

* B6 Series: 6000 psig rating or 4400 psig (303 bar) CWP
B8 Series: 6000 psig rating or 4000 psig (276 bar) CWP

Pressure vs. Temperature – Two- and Three-Way



Note: To determine MPa, multiply bar by 0.1

Note: This Pressure versus Temperature chart reflects the maximum temperature range of indicated materials.

When combining seat and seal materials, the most restrictive temperature rating of the seats or seals becomes the limiting factor on valve temperature range.

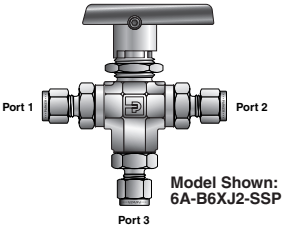
Elastomeric stem packing and seals are recommended if the application subjects the valve to thermal cycling.

Please see pressure rating charts for maximum pressure ratings.

Temperature Ratings:

PTFE.....-65°F to 350°F (-54°C to 177°C)
PCTFE .....-65°F to 350°F (-54°C to 177°C)
PEEK.....-65°F to 450°F (-54°C to 232°C)
Nitrile Rubber....-40°F to 250°F (-40°C to 121°C)
Fluorocarbon Rubber
.....-15°F to 450°F (-26°C to 232°C)
Ethylene Propylene Rubber
.....-65°F to 300°F (-54°C to 149°C)
Highly Fluorinated Fluorocarbon Rubber
.....-15°F to 200°F (-26°C to 93°C)

Three-Way



Model Shown:
6A-B6XJ2-SSP

Diverter Valve Specifications

Pressure Ratings:

Material	CWP	With PTFE Seats
316 Stainless Steel	6000 psig (414 bar)*	1500 psig (103 bar)
Brass	3000 psig (207 bar)	1500 psig (103 bar)
Monel® Alloy 400		
B2 and B6:	3000 psig (207 bar)	1500 psig (103 bar)
B8:	2000 psig (138 bar)	1500 psig (103 bar)
Hastelloy® C-276		
B2 and B6:	4000 psig (276 bar)	1500 psig (103 bar)
B8:	3000 psig (207 bar)	1500 psig (103 bar)

* B6 Series: 6000 psig rating or 4400 psig (303 bar) CWP
B8 Series: 6000 psig rating or 4000 psig (276 bar) CWP

With Side Ports as Inlet:

150 psig (10 bar)

Selector Valve Specifications

(Spring Loaded – B6 and B8 models only)

Pressure Ratings:

Material	CWP
316 Stainless Steel	6000 psig (414 bar)*
Brass	3000 psig (207 bar)

With Side Ports as Inlet:

Material	CWP
316 Stainless Steel	3000 psig (207 bar)*

How to Order
Two-Way and Three-Way B Series Ball Valves

Continued >>

Port 1	Port 2	Port 3	–	Valve Series	Seat Material	
1A	1/16" A-LOK®			B2L	J	PTFE
1Z	1/16" CPI™			B2X	J2	PCTFE
2A	1/8" A-LOK®					
2Z	1/8" CPI™					
2F	1/8" Female NPT					
2M	1/8" Male NPT					
4A	1/4" A-LOK®					
4Z	1/4" CPI™					
4M	1/4" Male NPT					
4A	1/4" A-LOK®			B6L	J	PTFE
4Z	1/4" CPI™			B6X	J2	PCTFE
4F	1/4" Female NPT				S2	Spring-Loaded PCTFE
4M	1/4" Male NPT				PKR	PTFE Lubricated PEEK
4Q	1/4" UltraSeal				SPKR	Spring-Loaded PTFE Lubricated PEEK
4V	1/4" VacuSeal					
6A	3/8" A-LOK®					
6Z	3/8" CPI™					
6M	3/8" Male NPT					
6Q	3/8" UltraSeal					
6F	3/8" Female NPT			B8L	J	PTFE
8A	1/2" A-LOK®			B8X	J2	PCTFE
8Z	1/2" CPI™				S2	Spring-Loaded PCTFE
8F	1/2" Female NPT				PKR	PTFE Lubricated PEEK
8M	1/2" Male NPT				SPKR	Spring-Loaded PTFE Lubricated PEEK
8Q	1/2" UltraSeal					
8V	1/2" VacuSeal					
12A	3/4" A-LOK®					
12Z	3/4" CPI™					
12F	3/4" Female NPT					

Note: If ports 1 and 2 are the same, eliminate the port 2 designator.

Examples:

8A-B8LJ-BN-SSP describes a B8L two-way ball valve with a 1/2" A-LOK® end connections for ports 1 and 2, PTFE seats, Nitrile rubber stem and body seals, stainless steel construction, with a panel mounting nut.

4Z4Z4F-B6XJ2-V-BP describes a B6X three-way diverter ball valve with 1/4" CPI™ end connections for side ports 1 and 2, 1/4" female NPT end connection for bottom port 3, PCTFE seats, fluorocarbon rubber stem and body seals, brass construction, and a panel mounting nut.

4M4M4F-B6XS2-EPR-SSP describes a B6X three-way selector ball valve with 1/4" male NPT end connections for side ports 1 and 2, 1/4" female NPT end connection for bottom port 3, spring-loaded PCTFE seats, ethylene propylene rubber stem and body seals, stainless steel construction, and a panel mounting nut.

<< Continued

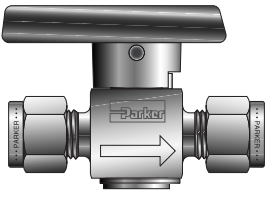
– **Seal Material** | **Body Material**

Seal Material		Body Material	
(Blank)	PTFE	SSP	316 Stainless Steel
V	Fluorocarbon Rubber	BP	Brass
EPR	Ethylene Propylene Rubber	MP	Monel® Alloy 400
BN	Nitrile Rubber	HCP	Hastelloy® C-276
KZ	Highly Fluorinated Fluorocarbon Rubber		
LT	Live-Loaded PTFE Packing with PTFE Seals		
VLT	Live-Loaded PTFE Packing with Fluorocarbon Rubber Seals		
EPRLT	Live-Loaded PTFE Packing with Ethylene Propylene Rubber Seals		
BNLT	Live-Loaded PTFE Packing with Nitrile Rubber Seals		
KZLT	Live-Loaded PTFE Packing with Highly Flourinated Fluorocarbon Rubber Seals		

Notes:

1. Panel Mounting Nut supplied with each valve. Various port combinations are available.
2. VacuSeal and UltraSeal are not available in Brass.
3. 12F (3/4" Female NPT) not panel mountable.

PR Series Rotary Plug Valves



Model Shown: 4A-PR4-VT-B

Open

Closed

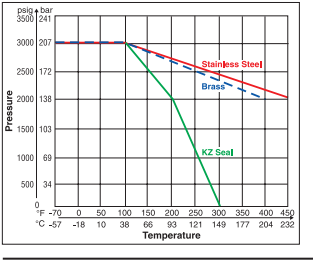
Model Shown: 4A-PR4-VT-SS

U.S. Patent 5,234,193

Temperature Ratings

Pressure Ratings	
Normal Flow Direction	3000 psig (207 bar) CWP
Reverse Flow Direction	150 psig (10 bar)
Downstream Vent Option	150 psig (10 bar)
Temperature Rating	
Nitrile Rubber	-30°F to 225°F (-34°C to 107°C)
Fluorocarbon Rubber	-10°F to 450°F (-23°C to 232°C)
Highly Fluorinated Fluorocarbon Rubber	-10°F to 300°F (-23°C to 149°C)
Ethylene Propylene Rubber	-70°F to 275°F (-57°C to 135°C)

Pressure vs. Temperature



Note: This Pressure versus Temperature chart reflects the maximum temperature range of indicated body materials.

The temperature rating of the elastomer seals become the limiting factor on temperature range.

Note: To determine MPa, multiply bar by 0.1

Flow Calculations with 1000 psig (69 bar) Inlet Pressure

Valve Series	Max. C_v	Pressure Drop ΔP		Water @ 60°F (16°C)		Air @ 60°F (16°C)	
		psig	bar	gpm	m^3/hr	scfm	m^3/hr
PR4	1.24	10	0.7	3.9	0.9	123.1	209.6
		50	3.4	8.8	2.0	265.9	446.3
		100	6.9	12.4	2.8	359.6	607.0
PR6	3.19	10	0.7	10.1	2.3	315.7	533.5
		50	3.4	22.6	5.1	672.3	1128.2
		100	6.9	31.9	7.2	891.6	1504.1

How to Order
PR Series Rotary Plug Valves

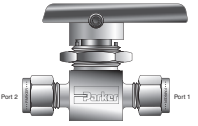
Inlet Port	Outlet Port		Valve Series		Seal Material	Back-Up Rings		Body Material
2A	1/8" A-LOK®		PR4	V	Fluorocarbon Rubber	T	PTFE	SS Stainless Steel
2Z	1/8" CPI™							
2F	1/8" Female NPT			KZ	Highly Fluorinated Fluorocarbon Rubber			B Brass
2M	1/8" Male NPT							
4A	1/4" A-LOK®							
4Z	1/4" CPI™							
4F	1/4" Female NPT			EPR	Ethylene Propylene Rubber			
4M	1/4" Male NPT							
4Q	1/4" UltraSeal							
4V	1/4" VacuSeal			BN	Nitrile Rubber			
6M	3/8" Male NPT							
6A	3/8" A-LOK®							
6Z	3/8" CPI™							
4F	1/4" Female NPT		PR6	J	PTFE			
6A	3/8" A-LOK®			J2	PCTFE			
6Z	3/8" CPI™			S2	Spring-Loaded PCTFE			
8A	1/2" A-LOK®							
8Z	1/2" CPI™			PKR	PTFE Lubricated PEEK			
8F	1/2" Female NPT							
8M	1/2" Male NPT			SPKR	Spring-Loaded PTFE Lubricated PEEK			

NOTE: If the inlet and outlet ports are the same, eliminate the outlet port designator.

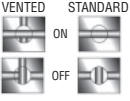
Example: 4Z-PR4-BNT-SS describes a PR Series rotary plug valve equipped with 1/4" CPI™ compression inlet and outlet ports, Nitrile seals, PTFE back-up rings, and stainless steel construction.

Ball Valves – MB Series

2-Way In-Line

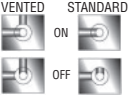


Model shown:
4A-MB6LPFA-SSP

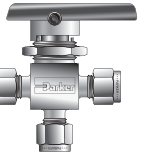


2-Way Angle

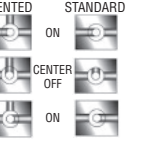
Model shown:
4A-MB6APFA-SSP



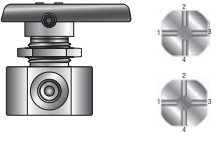
3-Way



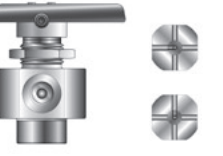
Model shown:
4A-MB6XPFA-SSP



4-Way



5-Way



Specifications

Pressure Rating	3000 psig* (207 bar) CWP - MB6 2500 psig* (172 bar) CWP - MB2/MB4/MB8
Temperature Rating	-65°F to 300°F (-54°C to 149°C)
Orificer	.052" to .406" (1.3mm to 10.3mm)
C_V	.05 to 6.96
Body Materials	Stainless Steel and Brass
Body Configurations	two-way (in-line and angle), 3-way, 4-way, and 5-way
Port Connections	Tube compression (CPI™ / A-LOK®), NPT (Male / Female), BSP, VacuSeal and UltraSeal
Port Size	1/16" to 3/4"
Seat/Packing	PFA – Perfluoroalkoxy

* Preset from factory to 1000 psig (69 bar) bubble tight service. Packing nut must be tightened to achieve higher pressures. Packing in vented MB Series Ball Valves is factory adjusted for the maximum valve pressure rating of 500 psig (34 bar).

How to Order
Two-Way In-Line, Two-Way Angle and Three-Way Patterns

Port 1	Port 2	Port 3	–	Valve Series	Seat Material	–	Body Material
1Z 1A 2Z 2A	1/16" CPI™ 1/16" A-LOK® 1/8" CPI™ 1/8" A-LOK®			MB2L MB2A MB2X	PFA Perfluoroalkoxy		SSP Stainless Steel (Stainless Steel with Stainless Steel Panel Nut) BP Brass (Brass with Panel Nut) (Only available in MB 2, 4, 6)
2F 4Z 4A	1/8" Female NPT 1/4" CPI™ 1/4" A-LOK®			MB4L MB4A MB4X			
2Z 2A 2F 4Z 4A 4F 4M 4V 6Z 6A	1/8" CPI™ 1/8" A-LOK® 1/8" Female NPT 1/4" CPI™ 1/4" A-LOK® 1/4" Female NPT 1/4" Male NPT 1/4" VacuSeal 3/8" CPI™ 3/8" A-LOK®			MB6L MB6A MB6X			
8Z 8A 8F 2Z 12A	1/2" CPI™ 1/2" A-LOK® 1/2" Female NPT 3/4" CPI™ 3/4" A-LOK®			MB8A MB8L MB8X			

* Valves with identical port connections for port 1 and port 2 require only one designator.

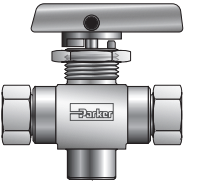
Example: 2Z-MB2LPFA-SSP describes a MB Series, two-way, in-line pattern ball valve with 1/8" CPI™ compression end connections for ports 1 and 2 Inline.

4-Way and 5-Way Patterns

End Connection	–	Valve Series	Seat Material	–	Body Material
2F 1/8" Female NPT 2Z7 1/8" CPI™ 2A7 1/8" A-LOK®		MB6X4 MB6X5	PFA Perfluoroalkoxy		SSP Stainless Steel (Stainless Steel with Stainless Steel Panel Nut)

Example: 2Z7-MB6X4PFA-SSP describes a MB-Series four-way pattern ball valve with 1/8" female CPI™ compression end connections for all ports, PFA seat and packing, stainless steel body construction, and a panel mounting nut.

HB Series Ball Valves

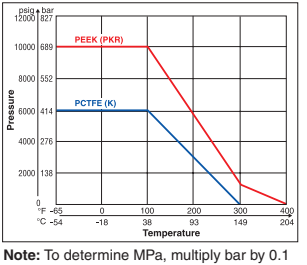


Model shown:
4F-HB4XPKR-SSP

Specifications

Pressure Rating	10,000 psig (689 bar) CWP with PEEK (PKR) Seats 6,000 psig (414 bar) CWP with PCTFE (K) Seats
Temperature Rating	Nitrile Rubber 40°F to 250°F (-40°C to 121°C) Ethylene Propylene Rubber -65°F to 300°F (-54°C to 149°C) Fluorocarbon Rubber -15°F to 400°F (-26°C to 204°C)
Body Materials	Stainless steel
Body Configurations	Two-way and three-way
Port Connections	Tube compression (CPI™/A-LOK®) Short and long female NPT
Port Size	1/8" – 1/2"

Pressure vs. Temperature



Note: To determine MPa, multiply bar by 0.1

Note: This pressure versus temperature chart reflects the maximum temperature range of indicated materials.

When combining seat and seal materials, the most restrictive temperature rating of the seats or seals becomes the limiting factor on valve temperature range.

2-Way and 3-Way

2-Way HB4L Design

3-Way HB4X Design

How to Order

Port 1	Port 2	–	Valve Series	Seat Material		–	Seal Material		–	Body Material	
2F	1/8" Female NPT		HB4L 2-way HB4X 3-way	PKR	PEEK – Polyether-ether-ketone		Blank	Fluorocarbon Rubber		SSP	Stainless Steel with Panel Nut
4F	1/4" Female NPT						BN	Nitrile Rubber			
4FL	1/4" Female NPT (Long)			K	PCTFE – Polychloro-trifluoro-ethylene		EPR	Ethylene Propylene Rubber			
4A	1/4" A-LOK® Compression										
4Z	1/4" CPI™ Compression										
4MP7	1/4" MPI™ Compression										
6A	3/8" A-LOK® Compression										
6Z	3/8" CPI™ Compression										
6MP7	3/8" MPI™ Compression										
8A	1/2" A-LOK® Compression										
8Z	1/2" CPI™ Compression										

Examples:

4Z-HB4XPKR-SSP describes a HB4X, three-way ball valve with 1/4" CPI™ compression end connections for ports 1 and 2, PEEK seats and fluorocarbon rubber seals, stainless steel body construction, and a panel mounting nut. Port 3 is always a 1/4" Female NPT port. ***Note:** If ports 1 and 2 are the same, eliminate the port 2 designator.

4F4A-HB4LK-EPR-SSP describes a HB4L, two-way ball valve with a 1/4" female NPT port 1 and a 1/4" A-LOK® compression port 2, PCTFE seats and ethylene propylene rubber seals, stainless steel body construction, and a panel mounting nut. **Note:** Port 3 will always have a 1/4" Male NPT plug when ordering a HB4L Series two-way ball valve.

MPB Series Valves

Parker MPB series manually, pneumatically and electrically actuated two-way and three-way ball valves are designed for 1/4 and 1/2 turn media shutoff or switching applications up to 20,000 psi. Our trunion style ball design and spring loaded seats make the MPB series ideal for severe service applications. The end connector design enables a variety of end connections and combinations for specific customer applications.

Two Way MPB Series Ball Valves

.187 Orifice (Standard)

.375 Orifice (High Flow)

.500 Orifice Two-Way (UltraHigh Flow)

How to Order
Two-Way and Three-Way MPB Series Ball Valves

Inlet/Outlet Connection Size		Connection Type		–	Valve Series	Valve Type		Seat Material		Three-Way Valve Type	
2 *	1/8"	F	Female Pipe		MPB	L	2-Way	PK	PEEK	Blank	Selector
4	1/4"	MP7	Parker MPI™			X	3-Way			D	Diverter
6	3/8"	MF	Female Cone & Thread								
8	1/2"										
9 **	9/16"										
12	3/4"										
16	1"										

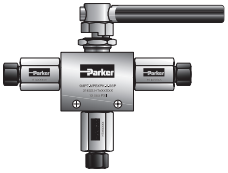
Continued >>

* Female Pipe Only
** MP7 and MF only

Example: 4MP7-MPBXPKDH-V-SSP-LD describes an MPB Series, three-way diverter ball valve with a .375" orifice, fluorocarbon rubber seals, 1/4" MPI medium pressure inverted connections on all ports and the optional lock out device.

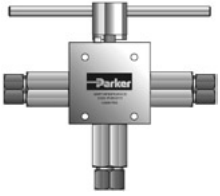
Three Way MPB Series Ball Valves

.187 Orifice (Standard)



.375 Orifice (High Flow)

.500 Orifice Three-Way

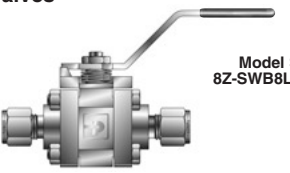


Orifice Size		Seal Material		Body Material	Options	
<< Continued						
Blank	.187"	V***	Fluorocarbon Rubber	SSP Stainless Steel	LD	Lock out Device
H	.375"	KZ	Highly Fluorinated Fluorocarbon Rubber		SRH	Spring Return Handle
UH	.500"				ACT	Actuated
		BN	Buna Rubber			
		EPR	Ethylene Propylene Rubber			

*** Fluorocarbon Rubber is the standard seal material

Example: 4MP7-MPBXPKDH-V-SSP-LD describes an MPB Series, three-way diverter ball valve with a .375" orifice, fluorocarbon rubber seals, 1/4" MPI medium pressure inverted connections on all ports and the optional lock out device.

SWB Series Ball Valves



Model Shown:
8Z-SWB8L-RT-BN-SS

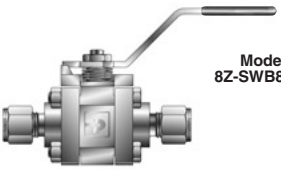
How to Order

Port Size	Port 1	Port 2	–	Valve Series	Valve Configuration	–	Seat Material
							Continued >>
4 6 8 12 16	Z CPI™ Tube1/8" Female NPT A A-LOK® Tube F Female NPT W Tube Socket Weld PSW Pipe Socket Weld PBW1 Pipe Buttweld (Schedule 10)			SWB4 SWB8 SWB12 SWB16	L 2-Way		PKR PTFE Lubricated PEEK (size 4 only) RT Glass Reinforced PTFE

Notes:
If ports 1 and 2 are the same, eliminate the port 2 designator.
Upper and Lower PTFE packing is replaced with PEEK when valves are ordered with Grafoil® Seals.

Specifications

Body Materials	Stainless Steel
Seat Materials	Reinforced PTFE PEEK (size 4 only)
Seal Materials	Nitrile Rubber Ethylene Propylene Rubber Fluorocarbon Rubber PTFE Grafoil® (size 4 only)
Flow Data	C_V: 1.1 to 35.0
Pressure Ratings	2500 psig (172 bar)
Temperature Ratings — Seats	
Reinforced PTFE Seats	-65°F to 450°F (-54°C to 232°C)
PEEK Seats	-65°F to 600°F (-54°C to 316°C)
Temperature Ratings — Seals	
Nitrile Rubber Seals	-40°F to 250°F (-40°C to 121°C)
Ethylene Propylene Rubber Seals	-65°F to 300°F (-54°C to 149°C)
Fluorocarbon Rubber Seals	-15°F to 400°F (-26°C to 204°C)
PTFE Seals	-65°F to 350°F (-54°C to 177°C)
Grafoil® Seals	-65°F to 600°F (-54°C to 316°C)



Model Shown:
8Z-SWB8L-RT-BN-SS

– **Seal Material** – **Body Material**

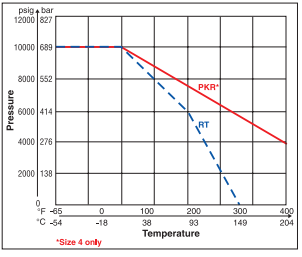
<< Continued

T	PTFE	SS	Stainless Steel
BN	Nitrile Rubber		
EPR	Ethylene Propylene Rubber		
V	Fluorocarbon Rubber		
G	Grafoil® Gasket (size 4 only		

Example: 8A*-SWB8L-RT-BN-SS describes a SWB8L Two-Way Ball Valve with 1/2" A-LOK® end connections for ports 1 and 2, reinforced PTFE seats, Nitrile rubber body seals, and stainless steel construction.

***Note:** If ports 1 and 2 are the same, eliminate the port 2 designator.

Pressure vs. Temperature

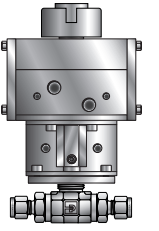


Note: This Pressure versus Temperature chart reflects the use of indicated seat materials in Stainless Steel valves without consideration of seal materials.

When combining seat and seal materials, the most restrictive temperature rating of the seats or seals becomes the limiting factor on temperature range. Please refer to page 88 for seal temperature ranges.

Specifications

Temperature Range	-4°F to 175°F (-20°C to 79°C) Optional high and low temperature ranges available
Operating Pressure	
90° Models	40 to 120 psig (2.8 to 8.3 bar) maximum AC – Normally Closed Spring Return AD – Double Acting AO – Normally Open Spring Return
180° Models	80 psig (5.5 bar) maximum ACX – Spring Return ADX – Double Acting



Model Shown:
4Z-B6LJ-V-SS-61AD

Recommended Actuators*

Valve Series	Double Acting AD	Spring Return AO	Spring Return AC
B2LJ B2LJ2	61AD or 61SAD	61AO-2 or 61SAO	61AC-2 or 61SAC
B2XJ B2XJ2	61ADX or 61SADX	61ACX-2 or 61SACX	61ACX-2 or 61SACX
B6LJ B6LJ2 B6LS2 B6LPKR B6LSPKR	61AD or 61SAD	61AO-2 or 61SAO	61AC-2 or 61SAC
B6XJ B6XJ2 B6XS2 B6XPKR B6XSPKR	61ADX or 61SADX	61ACX-2 or 61SACX	61ACX-2 or 61SACX
B8LJ	61AD	61AO-2	61AC-2
B8LJ2 B8LS2 B8LPKR	61AD	62AO-3	62AC-3
B8XJ	61ADX	61ACX-2	61ACX-2
B8XJ2 B8XS2 B8XPKR	61ADX	ACX64-3	ACX64-3
HB4LPKR	61AD	62AO-3	62AC-3
HB4LK	61AD	61AO-2	61AC-2
HB4XPKR	61ADX	ACX62-3	ACX62-3
HB4XK	61ADX	61ACX-2	61ACX-2
MB2A MB2L	61AD or 61SAD	61AO-2 or 61SAO	61AC-2 or 61SAC
MB2X	61ADX or 61SADX	61ACX-2 or 61SACX	61ACX-2 or 61SACX
MB4A MB4L	61AD or 61SAD	61AO-2 or 61SAO	61AC-2 or 61SAC
MB4X	61ADX or 61SADX	61ACX-2 or 61SACX	61ACX-2 or 61SACX
MB6A MB6L	61AD or 61SAD	61AO-2 or 61SAO	61AC-2 or 61SAC
MB6X	61ADX or 61SADX	61ACX-2 or 61SACX	61ACX-2 or 61SACX
SWB4	61AD	61AO-2	61AC-2
SWB8 SWB12	61AD	62AO-3	62AC-3
SWB16	62AD	63AO-3	63AC-3

* With 60 psig (4.1 bar) actuation pressure.

Options

- Solenoid valve
- Rotary limit switch with valve position indicator
- Breather block
- Dual mount actuator

61S Option

- Compact single piston design
- Available for MB, HB, B2, and B6 Series Valves

How to Order Actuators

Factory Assembled – Add the actuator model designation as a suffix to the ball valve part number.

Example: 4Z-B6LJ2-SS-61AC-2. Describes a B6 ball valve with a normally closed actuator.

For Field Assembly – Simply specify the actuator.

Example: 65AC-3. Mounting bracket kits are required when mounting actuators to valves.

With Mounting Brackets – Specify the ball valve series and seat material followed by the actuator.

Examples: B6LJ-61AO-2, MB6XPFA-61ACX, SWB12LRT-62AC-3

NOTE: Parker pneumatically actuated B Series Ball Valves should be ordered with elastometric stem packing and seals or the optional live-loaded PTFE packing. This reduces the need for any further packing adjustment after receipt from the factory.

How to Order Options

High Temperature Seals – Add the suffix **–HT** to the end of the part number for service up to 250°F (121°C). Add the suffix **–HT4** to the end of the part number for service up to 400°F (204°C). **NOTE:** The **–HT4** option is only available on series 62 and 63 90° models.

Example: 2F-HB4LK-BN-SS-61AD-**HT**

Low Temperature Seals – Add the suffix **–LT** to the end of the part number.

Example: 4A-MB4LPFA-SS-61AC-2-**LT**

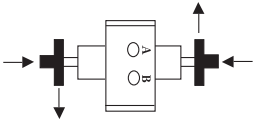
Accessories – Add one suffix to the end of the part number to identify the accessory option. The suffixes are identified in the “Accessory Options” table on the following page.

Example: 16F-SWB16L-RT-T-SS-63AC-3-**2D**

Dual Mount Actuator – Add **–DVM** as a suffix to the end of the part number.

Example: 6A-B6LPKR-SS-61AC-2-**DVM**

With DVM dual mount valve options, the following are standard arrangements: Two-way valves are provided in their failed position (in their closed position with AD actuators). Three-way valves are provided as shown below. Contact the factory for details on other available options.



How to Order Mounting Bracket Kits

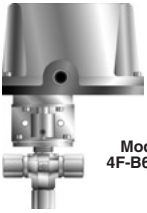
Add the valve series and actuator model designation as a suffix to **MK-**.

Example: MK-MB4L-61S

Describes a mounting kit for a MB Series ball valve with a 61S Series actuator.

Accessory Options

Suffix	Accessory
	Single Option
-1A	Breather Block
-1B	Solenoid Valve, (NEMA 4, 120 VAC)
-1C	Solenoid Valve, (NEMA 7, 120 VAC)
-1D	Solenoid Valve, (NEMA 4, 24 VDC)
-1E	Solenoid Valve, (NEMA 7, 24 VDC)
-1F	Solenoid Valve, (NEMA 4, 240 VAC)
-1G	Solenoid Valve, (NEMA 7, 240 VAC)
-1H	Limit Switch – Two SPDT switches with mounting kit
	Double Option
-2A	Breather Block, Solenoid Valve, (NEMA 4, 120 VAC)
-2B	Breather Block, Solenoid Valve, (NEMA 7, 120 VAC)
-2C	Breather Block, Solenoid Valve, (NEMA 4, 24 VDC)
-2D	Breather Block, Solenoid Valve, (NEMA 7, 24 VDC)
-2E	Breather Block, Solenoid Valve, (NEMA 4, 240 VAC)
-2F	Breather Block, Solenoid Valve, (NEMA 7, 240 VAC)
-2G	Limit Switch, Solenoid Valve, (NEMA 4, 120 VAC)
-2H	Limit Switch, Solenoid Valve, (NEMA 7, 120 VAC)
-2J	Limit Switch, Solenoid Valve, (NEMA 4, 24 VDC)
-2K	Limit Switch, Solenoid Valve, (NEMA 7, 24 VDC)
-2L	Limit Switch, Solenoid Valve, (NEMA 4, 240 VAC)
-2M	Limit Switch, Solenoid Valve, (NEMA 7, 240 VAC)
	Triple Option
-3A	Breather Block, Limit Switch, Solenoid Valve, (NEMA 4, 120 VAC)
-3B	Breather Block, Limit Switch, Solenoid Valve, (NEMA 7, 120 VAC)
-3C	Breather Block, Limit Switch, Solenoid Valve, (NEMA 4, 24 VDC)
-3D	Breather Block, Limit Switch, Solenoid Valve, (NEMA 7, 24 VDC)
-3E	Breather Block, Limit Switch, Solenoid Valve, (NEMA 4, 240 VAC)
-3F	Breather Block, Limit Switch, Solenoid Valve, (NEMA 7, 240 VAC)



Model Shown:
4F-B6XJ-SS-71XA

Model Shown:
8W-SWB8L-RT-V-SS-81CS2

Specifications

Characteristic	70 Series, 70R Series	80 Series	90 Series
Voltage	24, 115 or 230 VAC (50/60 Hz); 12 or 24 VDC	115 or 230 VAC (50/60 Hz)	24 VAC (50/60 Hz); 12 or 24 VDC
Torque	150, 300, 600 in lb (17, 34, 68 Nm)		
Enclosure	PVC composite	Epoxy coated cast aluminum	
Duty Cycle	25% (VAC models) 100% (VDC models)	75%	Continuous (after 1 hour duty cycle is reduced to 80%)
Actuator Bolt Pattern	ISO standard (5211)		
Conduit Connection	1/2" NPT	1/2" NPT (2 places)	3/4" NPT (3/4" to 1/2" reducing bushings included)
Output Shaft/ Drive	Shaft: Male, zinc plated steel	Drive: ISO compatible female drive output	Drive: Square female drive output
Temperature Limits	32°F to 150°F (0°C to 66°C) -40°F (-40°C) minimum with heater and thermostat		32°F to 130°F (0°C to 54°C) -40°F (-40°C) minimum with heater and thermostat

Materials of Construction

Part	Material		
	70 Series	80 Series	90 Series
Cover	Composite, PVC	Diecast aluminum alloy	
Base	Diecast zinc alloy	Diecast aluminum alloy	
Gear Train	Hardened steel		
Output Shaft	Zinc plated steel	N/A	
Finish	Powder coated epoxy		

Actuator Selection Tables

Valve Series	Flow Pattern	Seat Material	Suggested Actuator									
			70 Series					80 Series		90 Series		
			115 VAC	230 VAC	24 VAC	12 VDC	24 VDC	115 VAC	230 VAC	24 VAC	12 VDC	24 VDC
B	2-Way	All	71	71	71	73	72	81	81	91	91	91
B	3-Way	All	71X	71X	71X	73X	72X	81X	81X	91X	91X	91X
MB	2-Way	All	71	71	71	73	72	81	81	91	91	91
MB	3-Way	All	71X	71X	71X	73X	72X	81X	81X	91X	91X	91X
HB	2-Way	All	71	71	71	73	72	81	81	91	91	91
HB	3-Way	All	71X	71X	71X	73X	72X	81X	81X	91X	91X	91X
SWB4	2-Way	All	71	71	71	73	72	81	81	91	91	91
SWB8	2-Way	RT	71	71	71	73	72	81	81	91	91	91
SWB12	2-Way	RT	71	71	71	73	72	81	81	91	91	91
SWB16	2-Way	RT	71	71	71	73	72	81	81	91	91	91

How to Order Electric Actuators (Factory and Field Assembly)

Valve Part Number[1]	Actuator Model	Flow Pattern	Voltage	–	Options
For Factory Assembly Only See the "How to Order" section in the applicable catalog for the desired valve series	71 71R 72 72R 73 73R	Blank 2-Way X 3-Way	Blank 115 VAC A 230 VAC B 24 VAC C 12 VDC D[2] 24 VDC		T Heater and Thermostat S# Additional Limit Switch; # = number of limit switches required CSA[3] Canadian Standard
	81 83 82		Blank 115 VAC A 230 VAC		
	91 92 93		B 24 VAC C 12 VDC D 24 VDC		T Heater and Thermostat S2 Two Additional Limit Switches L2 Battery Back-Up for 2-Way L4 Battery Back-Up for 3-Way

NOTES: 1) Required for factory assembly only.
2) Not available in 71 Series
3) For field assembly only; CSA - Standard on 70 Series, optional on 80 Series, not available on 90 Series.

• Mounting bracket kits are required when ordering actuators for field assembly.

• Parker electrically actuated, B Series Ball Valves should be ordered with elastometric stem packing and seals or the optional live-loaded PTFE packing. This reduces the need for any further packing adjustment after receipt from the factory.

Field Assembly Examples:

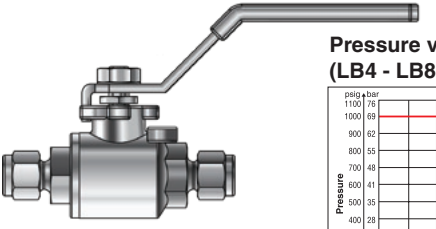
71- T describes an electric actuator for field assembly, Model 71, 2-Way electric actuator unit with a NEMA 4 and 4X rating, a 115 VAC motor with optional heater and thermostat.

91C-T describes a Model 91, two-way electric actuator unit with 12 VDC power supply and on/off Control Board with optional heater and thermostat.

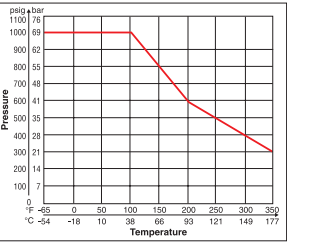
Factory Assembly Example

4Z-MB6XPFA-SS-81XA describes a factory assembled electric actuator, Model 81, 3-Way electric actuator unit with a NEMA 4, 4X, 7 and 9 rating, a 230 VAC motor and no options, mounted on an MB Series ball valve.

LB Series Ball Valves



Pressure vs. Temperature (LB4 - LB8)



Specifications

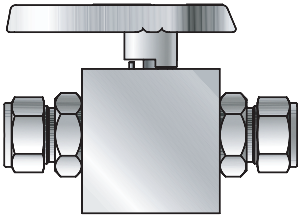
Pressure Rating	LB4, LB6 and LB8: 1000 psig (69 bar) CWP LB12 and LB16: 2000 psig (138 bar) CWP
Temperature Rating	-65°F to 350°F (-54°C to 177°C)
Orifice	.141" to .854"
Flow Coefficient	C_V = .46 to 33.5
Body Material	Stainless Steel
Body Configuration	In-line
Port Connections	Tube compression (CPI™ / A-LOK®)
Port Size	1/4" to 1"

How to Order

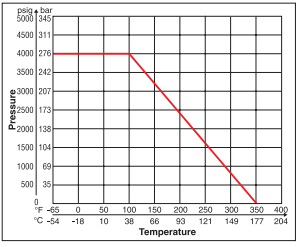
End Connection		Valve Series	Seat Material		Body Material	
4A 4Z	1/4" A-LOK® 1/4" CPI™	LB4L	T	PTFE	SS	Stainless Steel
6A 6Z	3/8" A-LOK® 3/8" CPI™	LB6L				
8A 8Z	1/2" A-LOK® 1/2" CPI™	LB8L				
12A 12Z	3/4" A-LOK® 3/4" CPI™	LB12L				
16A 16Z	1" A-LOK® 1" CPI™	LB16L				

Example: 4Z-LB4L-T-SS describes a two-way, stainless steel LB4 series ball valve with 1/4" CPI™ inlet and outlet compression ports, PTFE seats and packing, and stainless steel body construction.

B12 Series Ball Valves



Pressure vs. Temperature



Specifications

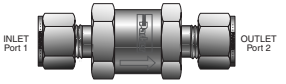
Pressure Rating	4,000 psig (276 bar) CWP
Temperature Rating	-65°F to 350°F (-54°C to 177°C)
Orifice	0.50"
Flow Coefficient	$C_V = 9.09$ $X_T = 0.32$

How to Order

Port 1	Port 2	–	Valve Series	Seat Material	–	Seal Material	–	Body Material
12F 3/4" Female NPT 12A 3/4" A-LOK® 12Z 3/4" CPI™ 16F 1" Female NPT 16A 1" A-LOK® 16Z 1" CPI™			B12L	S2 Spring-Loaded PCTFE		BN Nitrile Rubber V Fluorocarbon Rubber EPR Ethylene Propylene Rubber KZ Highly Fluorinated Fluorocarbon Rubber		SS Stainless Steel

Example: 12Z-B12LS2-VSS describes a B12 Series, two-way, in-line pattern ball valve with 3/4" CPI™ compression end connections for ports 1 and 2, spring loaded PCTFE seats, fluorocarbon rubber seals, and stainless steel body construction.

C Series Check Valves



Model Shown: 4Z-C4L-1-SS

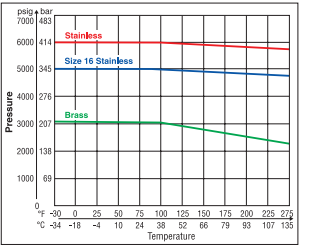
Specifications

Orifice	.078" to .656"
C_V:	.18 to 6.56
Pressure Ratings*	
316 SS – 1/8" to 3/4"	6000 psig (414 bar) CWP
316 SS – 1"	5000 psig (345 bar) CWP
PTFE Seats – all sizes	4000 psig (276 bar) CWP
Brass – 1/8" to 1"	3000 psig (207 bar) CWP
Temperature Ratings	
Fluorocarbon Rubber Seals	-15°F to +400°F (-26°C to +204°C)
Nitrile	-30°F to +275°F (-34°C to +135°C)
Ethylene Propylene Rubber Seals	-70°F to +275°F (-57°C to +135°C)
Neoprene Rubber	-45°F to +250°F (-43°C to +121°C)
PTFE	-65°F to +400°F (-54°C to +204°C)
Highly Fluorinated Fluorocarbon Rubber	-15°F to +200°F (-26°C to +93°C)

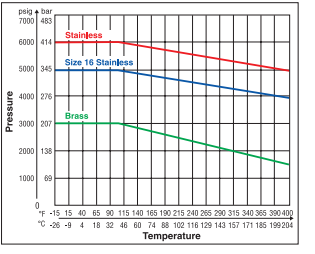
***Pressure Rating and Tubing Selection:** For working pressures of CPI™/ A-LOK® tube connections, please see pages 21-27 of this catalog, the Instrument Tubing Selection Guide (4200-TS) found in the Technical Section of your Parker Instrumentation Products Process Binder, or the Parker Instrument Tube Fitting Installation Manual (Bulletin 4200-B4).

Pressure vs. Temperature

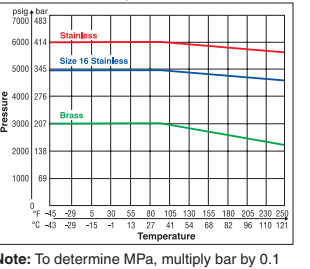
Nitrile Seat



Fluorocarbon Seat



Neoprene Seat



Note: To determine MPa, multiply bar by 0.1

How to Order

Inlet Port	Outlet Port			Body Size	Crack Pressure	Seal Material	Body Material
2A 2F 2F5	2G5 2KF	2KM 2M	2TA 2Z	C2L	1/3 psi 1 psi 5 psi 10 psi 25 psi 50 psi 75 psi 100 psi	Blank Fluorocarbon Rubber BN Nitrile EPR Ethylene Propylene Rubber NE Neoprene Rubber *T PTFE **KZ Highly Fluorinated Fluorocarbon Rubber	B Brass SS 316 Stainless Steel
4A 4F 4F5	4G5 4KF 4KM	4L 4M 4Q	4TA 4V 4Z	C4L			
6A 6F 6F5	6G5 6KF 6KM	6L 6M 6Q	6TA 6Z	C6L			
8A 8F 8F5	8G5 8KF 8KM	8L 8M 8Q	8TA 8V 8Z	C8L			
12A 12F 12F5	12G5 12KF 12KM	12L 12M 12Q	12TA 12V 12Z	C12L			
16A 16F 16F5	16G5 16KF 16KM	16L 16M	16TA 16Z	C16L			

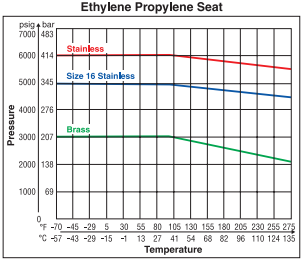
Note: If the inlet and outlet ports are the same, eliminate the outlet port designator.

* Only available with stainless steel valves.

** Not available on C2 series.

Ordering Examples:

12Z-C12L-5-BN-B describes a C Series Check Valve with 3/4" CPI™ compression inlet and outlet ports, a 5 psi cracking pressure, nitrile seal and brass body construction. **16M16A-C16L-10-NE-SS** describes a C Series Check Valve with a 1" male NPT inlet port and a 1" A-LOK® outlet port, a 10 psi cracking pressure, neoprene seal and stainless steel body construction.



Check Valves – CB / CBF Series

CB Series Check Valves

CBF Series Check Valves

Specifications

Shell Pressure Rating	3000 psi CWP
Standard Crack Pressures	1, 5, 10, 15, 50, 100, 120
Seat Materials, Back Pressure and Temperature Ratings	
Parkerfill*	1000 psi @ 100°F 300 psi @ 450°F
Parker Carbon**	2500 psi @ 100°F 1250 psi @ 450°F

* Parkerfill is a PTFE copolymer reinforced with carbon and graphite.
** Parker Carbon is a PTFE copolymer reinforced with carbon.

How to Order CB and CBF Series Filter Check Valves

Inlet Port	Outlet Port	–	Body Size	–	Crack Pressure	Seat Material	–	Body Material	–	Filter Rating
6A 8Z 6Z 8X 8A	6A 8Z 6Z 8M 8A 8G5		CB6L		1 psi 5 psi 10 psi 25 psi 50 psi 75 psi 100 psi 120 psi	PF Parkerfill PC Parker Carbon		SS 316 Stainless Steel		**Filter Rating applies TO CBF Only**
8A 10A 8Z 10Z 8X	8A 8G5 8Z 10A 8M 10Z		CB8L							
12A 12X 12Z	12A 12G5 12Z 12M		CB12L							
8A 10Z 8Z 12A 8X 12Z 10A 12X	8A 10Z 8Z 12A 8M 12Z 8G5 12G5 10A 12M		CBF8L							75 Microns 200 Microns 380 Microns 500 Microns

Note: If the inlet and outlet ports are the same, eliminate the outlet port designator.

Examples:

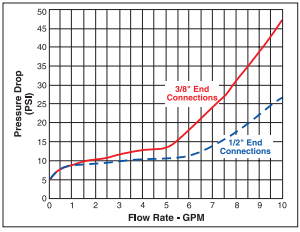
12Z12G5-CB12L-120-PF-SS describes a CB Series Check Valve with 3/4" CPI™ compression inlet and outlet ports, a 120 psi crack pressure, Parkerfill seat and stainless steel body construction.

8Z8M-CBF8L-1-PF-SS-380 describes a CBF Series Check Valve with a 3/4" CPI™ compression inlet and a 3/4" male NPT outlet, a 1 psi crack pressure, Parkerfill seat material, stainless steel body construction and a 380 Micron filter rating.

Flow Curves

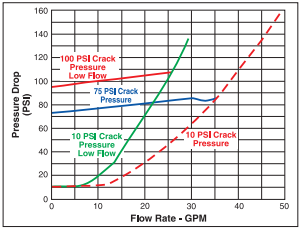
CB6 Check Valve

Flow Rate vs. Pressure Drop
CB-Series Check Valve – Size CB6
5 PSI Crack Pressure



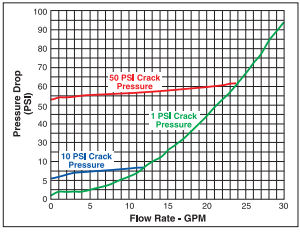
CB8 Check Valve

Flow Rate vs. Pressure Drop
CB-Series Check Valve – Size CB12
3/4" End Connections



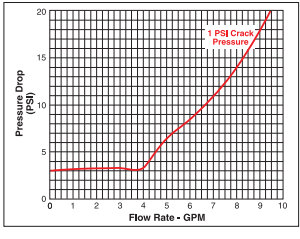
CB12 Check Valve

Flow Rate vs. Pressure Drop
CB-Series Check Valve – Size CB8
1/2" End Connections



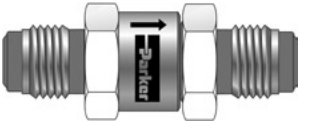
CBF8 Filter Check Valve

Flow Rate vs. Pressure Drop
CB-Series Check Valve – Size CBF8
1/2" End Connections – 380 Micron Filter



Check Valves – CO Series

CO Series Check Valves



Specifications

Orifice	156" to .406"
C_v	.43 to 2.65
Pressure Rating	6000 psig (414 bar) CWP
Temperature Ratings	
Fluorocarbon Rubber Seals	-15°F to +400°F (-26°C to +204°C)
Nitrile	-30°F to +250°F (-34°C to +121°C)
Ethylene Propylene Rubber	-70°F to +275°F (-57°C to +135°C)
Highly Fluorinated Fluorocarbon Rubber	-15°F to +200°F (-26°C to +93°C)

How to Order

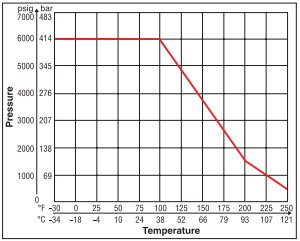
Inlet Port	Outlet Port		Body Size	Crack Pressure	Seat/Seal Material		Body Material
4A	4Q	4V1	CO4L	1/3 psi	V	Fluorocarbon Rubber	SS 316 Stainless Steel
4F	4TA	4Z		1 psi			
4M	4V			5 psi	BN	Nitrile Rubber	
6A	6TA	8V	CO6L	10 psi	EPR	Ethylene Propylene Rubber	
6F	6Z	8V1		25 psi			
6M				50 psi			
8A	8Q	8V1	CO8L	75 psi	KZ	Highly Fluorinated Fluorocarbon Rubber	
8F	8TA	8Z		100 psi			
8M	8V						

Note: If the inlet and outlet ports are the same, eliminate the outlet port designator.

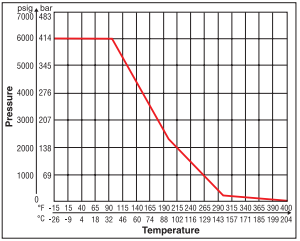
Example: 4M4F-CO4L-1-V-SS describes a CO Series Check Valve with 1/4" male NPT inlet and a 1/4" female NPT outlet, 1 psig cracking pressure, fluorocarbon rubber seals, and stainless steel body construction.

Pressure vs. Temperature

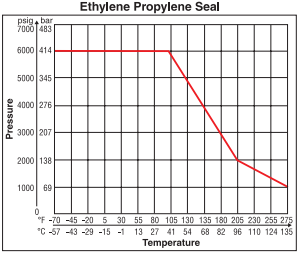
Nitrile Seal



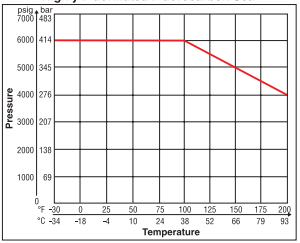
Fluorocarbon Seal



Ethylene Propylene Seal



Highly Fluorinated Fluorocarbon Seal



Note: To determine MPa, multiply bar by 0.1

LC Series Lift Check Valve

Note: Valve must be mounted in proper orientation.

Specifications

Pressure Rating	6000 psig (414 bar) CWP	
Temperature Rating	-100°F to +900°F (-148°C to +482°C)	
Flow Data		
LC6 Series	C_V = .63	X_T = .47
LC12 Series	C_V = 1.20	X_T = .63
LC16 Series	C_V = 2.29	X_T = .65

Part Numbers and Size/Connections

Part #	Size/Connection
2F-LC6L-SS	1/8" Female NPT
4Z-LC6L-SS	1/4" CPI™
4A-LC6L-SS	1/4" A-LOK®
4F-LC6L-SS	1/4" Female NPT
4A4F-LC6L-SS	1/4" A-LOK® x 1/4" Female
M6A-LC6L-SS	6mm A-LOK®
4F-LC12L-SS	1/4" Female NPT
6Z-LC12L-SS	3/8" CPI™
6A-LC12L-SS	3/8" A-LOK®
8F-LC16L-SS	1/2" Female NPT
8Z-LC16L-SS	1/2" CPI™
8A-LC16L-SS	1/2" A-LOK®

MPC and MPCB Series Check Valves

Parker MPC and MPCB series check valves are designed for uni-directional flow control of fluids and gases up to 20,000 psi.

Ball Check Valves

Poppet Check Valves

Part Numbers and Size/Connections

Ball Check Valve Part Number	Poppet Check Valve Part Number	Pressure PSI	Size/ Connection
4MP7-MPCBL-5-SS	4MP7-MPCL-5-V-SS	15,000	1/4" MPI
6MP7-MPCBL-5-SS	6MP7-MPCL-5-V-SS	15,000	3/8" MPI
8MP7-MPCBL-5-SS	8MP7-MPCL-5-V-SS	15,000	1/2" MPI
9MP7-MPCBL-5-SS	9MP7-MPCL-5-V-SS	15,000	9/16" MPI
12MP7-MPCBL-5-SS	12MP7-MPCL-5-V-SS	15,000	3/4" MPI
16MP7-MPCBL-5-SS	16MP7-MPCL-5-V-SS	12,500	1" MPI

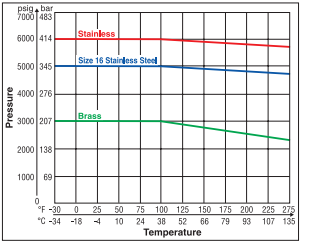
Note: For female pipe connection ends, substitute "F" in place of "MP7."

Example: 4F-MPCL-5-V-SS

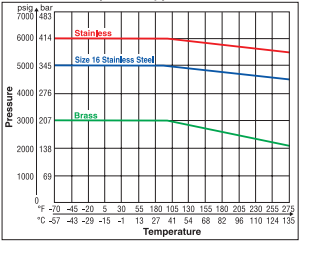
F Series Inline Filters

Pressure vs. Temperature

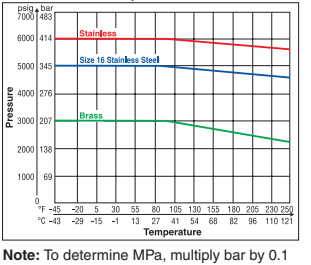
Nitrile Seat



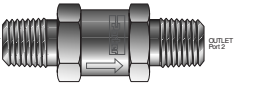
Ethylene Propylene Seat



Neoprene Seat



Note: To determine MPa, multiply bar by 0.1

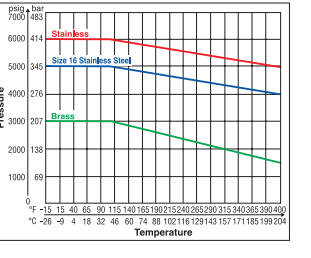


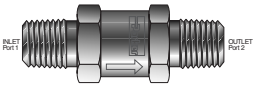
Model shown:
4M-F4L-100-BN-SS

Specifications

Pressure Ratings	
316 SS – 1/8" to 3/4"	6000 psig (414 bar) CWP
316 SS – 1"	5000 psig (345 bar) CWP
PTFE Seals – all sizes	4000 psig (276 bar) CWP
Brass – 1/8" to 1"	3000 psig (207 bar) CWP
Temperature Ratings	
Fluorocarbon Rubber	-15°F to +400°F (-26°C to +204°C)
Nitrile Rubber	-30°F to +275°F (-34°C to +135°C)
Ethylene Propylene Rubber	-70°F to +275°F (-57°C to +135°C)
Neoprene Rubber	-45°F to +250°F (-43°C to +121°C)
PTFE	-65°F to +400°F (-54°C to +204°C)
Highly Fluorinated Fluorocarbon Rubber	-15°F to +200°F (-26°C to +93°C)

FluorocarbonSeat





Model shown:
4M-F4L-100-BN-SS

How to Order

Inlet Port	Outlet Port		–	Body Size	–	Micron Rating	–	Seal Material	–	Body Material
2A	2G5	2M		F2L		1 micron	Blank	Fluorocarbon Rubber		B Brass
2F	2KF	2TA				5 micron				SS 316 Stainless Steel
2F5	2KM	2Z				10 micron	BN	Nitrile Rubber		
4A	4KF	4Q		F4L		50 micron	EPR	Ethylene Propylene Rubber		
4F	4KM	4TA				100 micron				
4F5	4L	4V				120 micron	NE	Neoprene Rubber		
4G5	4M	4Z				250 micron				
6A	6KF	6Q		F6L		450 micron	*T	PTFE		
6F	6KM	6TA					KZ	Highly Fluorinated Fluorocarbon Rubber		
6F5	6L	6Z								
6G5	6M									
8A	8KF	8Q		F8L						
8F	8KM	8TA								
8F5	8L	8V								
8G5	8M	8Z								
12A	12KF	12Q		F12L						
12F	12KM	12TA								
12F5	12L	12V								
12G5	12M	12Z								
16A	16KF	16M		F16L						
16F	16KM	16TA								
16F5	16L	16Z								
16G5										

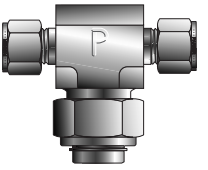
*Only available with Stainless Steel filters.
Note: If the inlet and outlet ports are the same eliminate the outlet port designator.

Examples:

4Z-F4L-5-BN-B describes an F Series Inline Filter with 1/4" male NPT inlet and outlet ports, a 5 micron element, Nitrile seal and brass body construction.

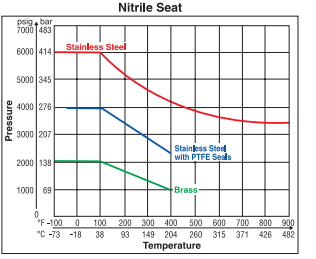
16M16A-F16L-10-NE-SS describes an F Series Inline Filter with a 1" male NPT inlet port and a 1" A-LOK® outlet port, a 10 micron element, neoprene seal and stainless steel body construction.

FT Series Tee Filters



Model Shown:
4Z-FT4-10-BN-SS

Pressure vs. Temperature



Specifications

Pressure Ratings*	
With Elastomeric and Metallic Seals	
Stainless Steel	6000 psig (414 bar) CWP
Brass	2000 psig(138 bar) CWP
With PTFE Seals	
Stainless Steel	4000 psig (276 bar) CWP
Brass	2000 psig (138 bar) CWP
Temperature Ratings	
Fluorocarbon Rubber	-40°F to +400°F (-40°C to 204°C)
Nitrile Rubber	-40°F to +275°F (-40°C to +135°C)
Ethylene Propylene Rubber	-70°F to +300°F (-57°C to +149°C)
Neoprene Rubber	-65°F to +300°F (-54°C to +149°C)
PTFE	-70°F to +400°F (-56°C to +204°C)
Highly Fluorinated Fluorocarbon Rubber	-20°F to +500°F (-29°C to +260°C)
Silver Plated Nickel Alloy Gasket (C-ring)	-100°F to +900°F (-73°C to +482°C)

***Pressure Rating and Tubing Selection:** For working pressures of CPI™/ A-LOK® tube connections, please see pages 21-27 of this catalog, the Instrument Tubing Selection Guide (4200-TS) found in the Technical Section of your Parker Instrumentation Products Process Binder, or the Parker Instrument Tube Fitting Installation Manual (Bulletin 4200-B4).

How to Order

Inlet Port	Outlet Port	Valve Series	Micron Rating	Seal Material	Body Material
2A 2F 2M 2Z 4A 4F	4M 4Q 4V 4W 4Z	FT4	1 micron 5 micron 10 micron 50 micron 100 micron 250 micron 450 micron	Blank Fluorocarbon Rubber BN Nitrile Rubber EPR Ethylene Propylene Rubber NE Neoprene Rubber KZ Highly Fluorinated Fluorocarbon Rubber HT Silver Plated Nickel Alloy C-Ring T PTFE	SS 316 Stainless Steel B Brass
6A 6M 8A	8M 8V 8Z	FT8			

Note: If the inlet and outlet ports are the same eliminate the outlet port designator.

Example: 4M-FT4-5-BN-B describes an FT Series Filter with 1/4" male NPT inlet and outlet ports, a 5 micron element, Nitrile seal and brass body construction.

MPF Series Inline Filters

Parker MPF series filters utilize sintered stainless steel filter discs to trap particles from 0.5 to 100 micron sizes. Inline filters help protect valuable equipment in the process line.

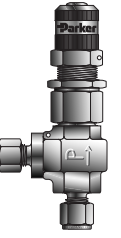
Part Numbers and Size/Connections

Parker Part Number	Pressure PSI	Size/ Connection
4MP7-MPFL-100-SS	15,000	1/4" MPI
6MP7-MPFL-100-SS	15,000	3/8" MPI
8MP7-MPFL-100-SS	15,000	1/2" MPI
9MP7-MPFL-100-SS	15,000	9/16" MPI

Notes

RH4 Series Relief Valve

Model Shown:
4M4F-RH4A-VT-SS-MN-K2



Model Shown:
4A-RH4A-BNT-SS-K1

How to Order

Inlet Port	Outlet Port	–	Valve Series	–	Seal Material	Back-Up Rings*	–	Body Material

Continued >>

Inlet Port	Outlet Port	Valve Series	Seal Material	Back-Up Rings*	Body Material
4M Male NPT 4F Female NPT 4A A-LOK® Compression 4Z CPI™ Compression 4KF Female BSP/ISO 4KM Male BSP/ISO		RH4A	V Fluorocarbon Rubber BN Nitrile Rubber EPR Ethylene Propylene Rubber NE Neoprene Rubber KZ Highly Fluorinated Fluorocarbon Rubber	T PTFE	SS 316 Stainless Steel

* To order valve with an elastomer back-up ring, eliminate Back-Up Rings code.

** To order only the valve without a spring kit, eliminate Spring Kit code.

Note: If the inlet and outlet ports are the same eliminate the outlet port designator.

Examples:

4Z-RH4A-BNT-SS-K6 describes an RH4A Series externally adjustable relief valve equipped with 1/4" CPI™ compression inlet and outlet ports, Nitrile seals, PTFE back-up ring, stainless steel construction, and a 3000 to 4000 psig (206.8 to 275.8 bar) spring kit.

4M4F-4H4A-EPRT-SS-MN-K1 describes an RH4A Series externally adjustable relief valve equipped with 1/4" male NPT inlet port, 1/4" female NPT outlet port, ethylene propylene seals, PTFE back-up ring, stainless steel construction, manual override option, and a 50 to 350 psig (3.4 to 24.1 bar) spring kit.

Specifications

Pressure Ratings			
Working Pressure	• Up to 6000 psig (414 bar) CWP • Up to 8000 psig (552 bar) during relief with no internal seal damage		
Cracking Pressures	Eight springs, from 50 psig to 6000 psig in the following ranges:		
	50-350 psig (3.4-24.1 bar)	350-750 psig (24.1-51.7 bar)	750-1500 psig (51.7-103.4 bar)
	1500-2250 psig (103.4-155.1 bar)	2250-3000 psig (155.1-206.8 bar)	3000-4000 psig (206.8-275.8 bar)
	4000-5000 psig (275.8-344.7 bar)	5000-6000 psig (344.7-413.7 bar)	
Temperature Ratings			
Fluorocarbon Rubber	-10°F to +400°F (-23°C to 204°C)		
Nitrile Rubber	-30°F to +225°F (-34°C to +107°C)		
Ethylene Propylene Rubber	-70°F to +275°F (-57°C to +135°C)		
Neoprene Rubber	-45°F to +250°F (-43°C to +121°C)		
Highly Fluorinated Fluorocarbon Rubber	-20°F to +200°F (-29°C to +93°C)		

– **Actuation** – **Spring Kit****

<< Continued

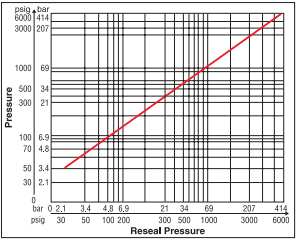
Actuation		Spring Kit**	
Blank	Standard	K1	50 - 350 psig
MN	Manual Overdrive	K2	350 - 750 psig
		K3	750 - 1500 psig
		K4	1500 - 2250 psig
		K5	2250 - 3000 psig
		K6	3000 - 4000 psig
		K7	4000 - 5000 psig
		K8	5000 - 6000 psig

* To order valve with an elastomer back-up ring, eliminate Back-Up Rings code.

** To order only the valve without a spring kit, eliminate Spring Kit code.

Note: If the inlet and outlet ports are the same eliminate the outlet port designator.

Crack Pressure vs. Reseal Pressure



Note: Valves which are not actuated for a period of time may initially crack at higher than set crack pressures.

Note: To determine MPa, multiply bar by 0.1

RL4 Series Relief Valve

Model Shown:
4M4F-RL4A-VT-SS-MN-KD

Model Shown:
4A-RL4A-BNT-SS-KC

How to Order

Inlet Port	Outlet Port		Valve Series		Seal Material	Back-Up Rings*		Body Material
								Continued >>
4M Male NPT 4F Female NPT 4A A-LOK® Compression 4Z CPI™ Compression 4KF Female BSP/ISO 4KM Male BSP/ISO			RL4A		V Fluorocarbon Rubber BN Nitrile Rubber EPR Ethylene Propylene Rubber NE Neoprene Rubber KZ Highly Fluorinated Fluorocarbon Rubber	T PTFE		SS Stainless Steel

* To order valve with an elastomer back-up ring, eliminate Back-Up Rings code.

** To order only the valve without a spring kit, eliminate Spring Kit code.

Note: If the inlet and outlet ports are the same eliminate the outlet port designator.

Examples:

4Z-RL4A-BNT-SS-KD describes an RL4A Series externally adjustable relief valve equipped with 1/4" CPI™ compression inlet and outlet ports, Nitrile seals, PTFE back-up ring, stainless steel construction, and a 100 to 150 psig (6.9 to 10.3 bar) spring kit.

4M4F-4L4A-EPRT-SS-MN-KF describes an RL4A Series externally adjustable relief valve equipped with 1/4" male NPT inlet port, 1/4" female NPT outlet port, ethylene propylene seals, PTFE back-up ring, stainless steel construction, manual override option, and a 10 to 225 psig (0.7 to 15.5 bar) spring kit.

Specifications

Working Pressure	• Up to 400 psig (28 bar) CWP • Up to 600 psig (41 bar) during relief with no internal seal damage
Cracking Pressures	Seven springs with the following ranges: 10-25 psig (0.7-1.7 bar) — 25-50 psig (1.7-3.4 bar) — 50-100 psig (3.4-6.9 bar) 100-150 psig (6.9-10.3 bar) — 150-225 psig (10.3-15.5 bar) — 225-400 psig (15.5-27.6 bar) 10-225 psig (0.7-15.5 bar)
Temperature Ratings	
Fluorocarbon Rubber	-10°F to 400°F (-23°C to 204°C)
Nitrile Rubber	-30°F to 225°F (-34°C to 107°C)
Ethylene Propylene Rubber	-70°F to 275°F (-57°C to 135°C)
Neoprene Rubber	-45°F to 250°F (-43°C to 121°C)
Highly Fluorinated Fluorocarbon Rubber	-20°F to 200°F (-29°C to 93°C)

– **Actuation** – **Spring Kit****

<< Continued

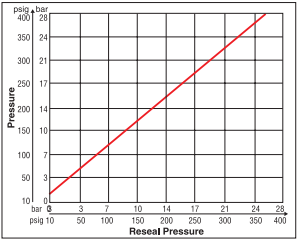
Actuation		Spring Kit**	
Blank	Standard	KA	10 - 25 psig (0.7 - 1.7 bar)
MN	Manual Overdrive	KB	25 - 50 psig (1.7 - 3.4 bar)
		KC	50 - 100 psig (3.4 - 6.9 bar)
		KD	100 - 150 psig (6.9 - 10.3 bar)
		KE	150 - 225 psig (10.3 - 15.5 bar)
		KF	10 - 225 psig (0.7 - 15.5 bar)
		KG	225 - 400 psig (15.5 - 27.6 bar)

* To order valve with an elastomer back-up ring, eliminate Back-Up Rings code.

** To order only the valve without a spring kit, eliminate Spring Kit code.

Note: If the inlet and outlet ports are the same eliminate the outlet port designator.

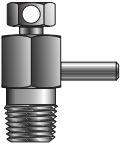
Crack Pressure vs. Reseal Pressure



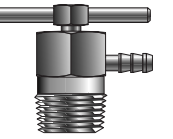
Note: Valves which are not actuated for a period of time may initially crack at higher than set crack pressures.

Note: To determine MPa, multiply bar by 0.1

BV Series Bleed Valves



Model Shown:
4M-BV4-SS



Model Shown:
8M-BV8-SS-BVT-T

Specifications

Pressure Rating	10,000 psig (689 bar) CWP
Temperature Ratings	
Stainless Steel	-65°F to 850°F (-54°C to 454°C)
Carbon Steel	-20°F to 450°F (-29°C to 232°C)
Alloy N24135 (400)	-65°F to 500°F (-54°C to 260°C)
Flow Data	
C_V = 0.13; X_T = 0.53; Orifice = 0.125" (3.2mm). Tested in accordance with ISA S75.02. Gas flow will be choked when $P_1 - P_2 / P_1 = x_T$	

How to Order

End Connection	–	Valve Series	–	Material	–	Vent Selection	–	Handle Option
2A 4KM 4M 4F5*		BV4		SS Stainless Steel S Carbon Steel M Alloy N24135		Blank Vent Tube BVT Barbed Vent Tube		Blank No Handle T Tee Bar Handle
6M 8M 8F5*		BV8						

*****Male SAE port will be supplied with a fluorocarbon rubber O-ring adding O after F5; i.e., 4F5O.

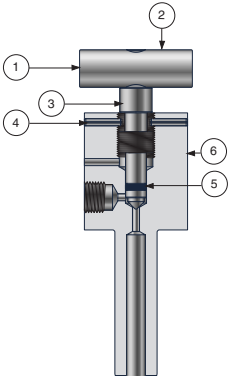
Note: If the inlet and outlet ports are the same, eliminate the outlet port designator.

Example: 4M-BV4-SS-BVT-___ describes a stainless steel BV4 Bleed Valve with a 1/4" male NPT inlet and a barbed vent tube outlet.

MPBV Series Medium Pressure Bleed Valve

Part Numbers and Size/Connections

Parker Part Number	Pressure PSI	Size/ Connection
9T7-MPBV-V-SS	15,000	9/16" Tube Stub
9HM-MPBV-V-SS	30,000	9/16" High Pressure Male



Materials of Construction

Item #	Qty	Part	Material
1	1	Soc Set Screw	300 Ser. SS
2	1	Handle	Aluminum
3	1	Stem	17-4PH-H900
4	2	Rolling Pin	420SS
5	1	O-Ring	Fluorocarbon Rubber
6	1	Body	316SS

PG Series Purge Valves

Specifications

Pressure Ratings	
Stainless Steel	4000 psig (276 bar) CWP
Brass	3000 psig (207 bar)
Carbon Steel	3000 psig (207 bar)
PTFE Ball Option	200 psig (14 bar)
Temperature Ratings	
Stainless Steel	-65°F to 600°F (-54°C to 316°C)
Brass	-65°F to 400°F (-54°C to 204°C)
Carbon Steel	-20°F to 350°F (-29°C to 177°C)
PTFE Ball Option	-65°F to 350°F (-54°C to 177°C)

Models Shown:
4Z-PG4L-SS

Caution: These valves do not have a cap thread seal. It is imperative to open the valve slowly and direct the vent hole away from persons operating or near the valve. Because of the absence of a cap seal, small amounts of media will flow through the cap thread area when the valves are opened.

PTFE Ball Option: Purge Valves with the PTFE ball option require only finger-tight operation for leak-tight shut-off and are designed with a removable cap for ball replacement.

How to Order

End Connection			–	Valve Series	Body Type		–	Material		–	Ball	
2A	4F5*	6TA		PG4	L	Straight		SS	Stainless Steel		Blank	Stainless Steel
2Z	4M	8A			A	90° Elbow		B	Brass		T	PTFE
2F	4TA	8Z			E	45° Elbow		S	Carbon Steel			
2M	6A	8F			TL	Tee with Inline Flow						
2TA	6Z	8F5*			TA	Tee with Angle Flow						
4A	6F	8TA			U	Union						
4Z	6M	8M										
4F												

NOTE: If the ports are the same, only specify one end connection.

***Male SAE port will be supplied with a fluorocarbon rubber O-ring seal by adding O after F5; i.e., 4F5O.

Option: Oxygen cleaning – Add the suffix -C3 to the end of the part number to receive valves cleaned for oxygen service per IVD Specification ES8003.

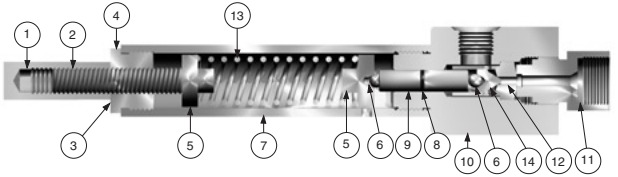
Example: 2M-PG4A-SS-T describes a stainless steel, 90° angle body PG4 Purge Valve with a 1/8" male NPT port configuration and a PTFE Ball.

MPR Series Relief Valves (Factory Set)

Parker MPR series relief valves are offered in preset pressure relief ranges from 1500 to 20,999 psi. Relief valves are tagged with the proper factory preset pressures.

Part Numbers and Size/Connections

Parker Part Number	Pressure Rating PSI	Size/ Connection
8M8F-MPRA-****-SS	1,500 to 2,999	1/2" M X F NPT
8M8F-MPRA-****-SS	3,000 to 10,999	1/2" M X F NPT
9HF8F-MPRA-****-SS	11,000 to 20,999	9HF X 1/2" NPTF



Materials of Construction

Item #	Qty	Part	Material
1	1	Cap	303SS
2	1	5/8-11 X 3 Soc Set Scr	304SS
3	1	Pressure Rating Tag	300 Ser. SS
4	1	Nut	303SS
5	2	Spring Seat	304SS
6	2	5/16 Ball	316SS
7	1	Spring Housing	304SS
8	1	O-Ring	Fluorocarbon Rubber*
9	1	Stem	17-4PH-H1150
10	1	Body	316SS
11	1	Removable Seat Gland	316SS
12	1	Seal Ring 1500 to 2999 Seal Ring 3000 to 10999 Seal Ring 11000 to 20999	316SS 316SS 316SS
13	1	Danly Spring	Steel
14	1	Stem Seat	17-4PH-H900

*Optional Seal Materials	
KZ	Highly Fluorinated Fluorocarbon Rubber
BN	Nitrile Rubber
EPR	Ethylene Propylene Rubber

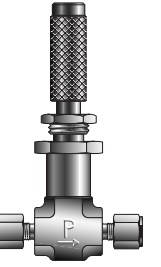
Example:
8M8F-MPRA-10000-KZ-SS

Metering Valves – N Series

NS Series

Model Shown:
2A-NSL-BN-SS-F

NM and NL Series



Model Shown:
M3A-NML-V-SS-K

Specifications

Characteristic	NS Series	NM Series	NL Series
Pressure Rating	2000 psig (138 bar) CWP at all temperatures	1000 psig (69 bar) CWP at all temperatures	
Stem Taper	1°	3°	5°
Turns to Open	13 ± 1	9 ± 1	10 ± 1
Valve/Seal Temperature Ratings			
Fluorocarbon Rubber	-10°F to 400°F (-23°C to 204°C)		
Nitrile Rubber	-10°F to 250°F (-23°C to 121°C)		
Ethylene Propylene Rubber	-40°F to 250°F (-40°C to 121°C)		
Neoprene Rubber	-40°F to 250°F (-40°C to 121°C)		
Highly Fluorinated Fluorocarbon Rubber	-25°F to 200°F (-32°C to 93°C)		
Flow Data*			
Orifice	0.03" (0.76mm)	0.06" (1.5mm)	0.13" (3.3mm)
In-line Pattern	C_V = 0.039; X_T = 0.64	C_V = 0.055; X_T = 0.41	C_V = 0.207; X_T = 0.71
Angle Pattern	C_V = 0.042; X_T = 0.53	C_V = 0.057; X_T = 0.38	C_V = 0.299; X_T = 0.60

*Flow tested in accordance with ISA S75.02. Gas flow will be choked when $P_1 - P_2 / P_1 = X_T$.
Note: These products are not intended for use as shut-off valves. For metering valves with shut-off capabilities, please refer to HR Series valves.

How to Order

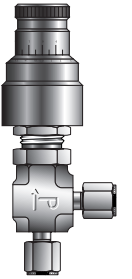
Inlet Port	Outlet Port	Valve Series	Seal Material	Body Material	Handle Type
1A 1Z 2A 2M	2Z 4A 4V 4Z	NSA NSL	BN Nitrile Rubber EPR Ethylene Propylene Rubber NE Neoprene Rubber V Fluorocarbon Rubber KZ Highly Fluorinated Fluorocarbon Rubber	SS Stainless Steel B Brass	K Knuled KS Knurled with Slot V Vernier F Precision Adjustment*
2A 2F 2Z 4A	4M 4V 4Z	NMA NML			
2F 4A 4M 4V	4Z 6A 6Z	NLA NLL			

*F Handle available only on NS Series.

Note: If the inlet and outlet ports are the same eliminate the outlet port designator.

Example: 4Z-NLL-V-SS-V describes a stainless steel in-line NLL series valve with 1/4" CPI compression ends, fluorocarbon seals and vernier handles.

HR Series



Model Shown:
2A-H0A-NE-SS-TC

Specifications

Pressure Rating	250 psig (17 bar) CWP
Turns to Open	15 ± 1
Valve/Seal Temperature Ratings	
Fluorocarbon Rubber	-10°F to 400°F (-23°C to 204°C)
Nitrile Rubber	-10°F to 250°F (-23°C to 121°C)
Ethylene Propylene Rubber	-40°F to 250°F (-40°C to 121°C)
Neoprene Rubber	-40°F to 250°F (-40°C to 121°C)
Highly Fluorinated Fluorocarbon Rubber	-25°F to 200°F (-32°C to 93°C)

Flow Data

Model	Orifice	In-Line Pattern	Angle Pattern
H0	0.000002 in²	C_V = 0.0004; X_T = 0.85	C_V = 0.0004; X_T = 0.66
H1	0.000083 in²	C_V = 0.0070; X_T = 0.85	C_V = 0.0070; X_T = 0.66
H2	0.000168 in²	C_V = 0.0140; X_T = 0.85	C_V = 0.0140; X_T = 0.66
H3	0.000241 in²	C_V = 0.0200; X_T = 0.85	C_V = 0.0210; X_T = 0.66
H4	0.000674 in²	C_V = 0.0300; X_T = 0.85	C_V = 0.0320; X_T = 0.66
H5	0.002325 in²	C_V = 0.0470; X_T = 0.85	C_V = 0.0490; X_T = 0.66
H6	0.006227 in²	C_V = 0.1180; X_T = 0.85	C_V = 0.1550; X_T = 0.66

*Flow tested in accordance with ISA S75.02. Gas flow will be choked when $P_1 - P_2 / P_1 = X_T$.
**The Turns Counter Handle (TC) requires the HT option for use at temperatures above 300°F (149°C).

How to Order

Inlet Port	Outlet Port	Valve/Stem Series*	Seal Material	Body Material	Handle Type
1A	1Z	H#A	BN Nitrile Rubber	SS Stainless Steel	K Knuled
2A	4F	H#A	EPR Ethylene Propylene Rubber	B Brass	TC Turns Counter
2F	4M	H#L	NE Neoprene Rubber		NS No Handle (Slotted Stem)
2Z	4Z		V Fluorocarbon Rubber		
4A			KZ Highly Fluorinated Fluorocarbon Rubber		

*See flow data specifications to fully identify the valve/stem series properly.

Note: If the inlet and outlet ports are the same, eliminate the outlet port designator.

Example: 4Z-H3L-V-SS-TC describes a stainless steel H3L in-line series valve with 1/4" CPI compression ends, fluorocarbon seals and vernier handle. "3" indicates a C_V of 0.0200 per page 122.

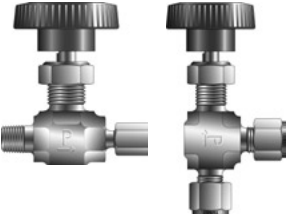
V Series Needle Valves

V2 Series

Model Shown:
2M-V2LN-B

Model Shown:
2F-V2AR-V-SS

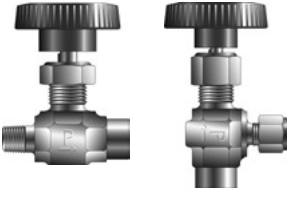
V4 Series



Model Shown:
4M4Z-V4LK-SS

Model Shown:
6A-V4AN-BN-B

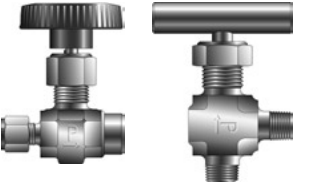
V6 Series



Model Shown:
6M4F-V6LR-V-SS

Model Shown:
4F6Z-V6AK-SS

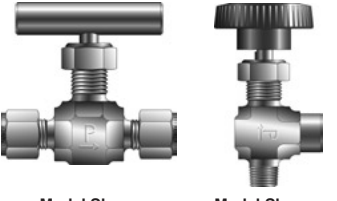
V8 Series



Model Shown:
8Z6F-V8LK-SS

Model Shown:
8M-V8AN-EPR-SS

V12 Series



Model Shown:
10Z-V12LN-B

Model Shown:
8M8F-V12AK-BN-SS

Specifications

Pressure Ratings	
316 Stainless Steel	5000 psig (345 bar) CWP
Brass, Steel and Monel® Alloy 400	3000 psig (207 bar) CWP
Temperature Ratings	
Stainless Steel and Monel® Alloy 400	65°F to 450°F (-54°C to 232°C)
Brass	-65°F to 400°F (-54°C to 204°C)
Steel	-20°F to 350°F (-29°C to 177°C)
PTFE Packing	-65°F to 450°F (-54°C to 232°C)
PCTFE Stem Tip	-65°F to 350°F (-54°C to 177°C)
Nitrile Rubber Stem Seal	-30°F to 250°F (-34°C to 121°C)
Fluorocarbon Rubber Stem Seal	-15°F to 400°F (-26°C to 204°C)
Ethylene Propylene Rubber Stem Seal	-70°F to 275°F (-57°C to 135°C)
Flow Data	
Orifice	0.078" to 0.312" (2.0mm to 7.9mm)
C_v	0.12 to 1.90
Port Size	1/8" to 3/4" (3mm to 12mm)

Note: When combining body, seat and seal materials, the most restrictive temperature rating becomes the limiting factor on temperature range.
Monel® Alloy 400 is the registered trademark of Special Metals Corporation.

How to Order

Inlet Port	Outlet Port			– Valve Series	Stem Type	– Stem Seal	– Body Material
2A 2F	2M 2Z	4A	4Z	V2	R Blunt (30°) N Needle (2-1/2°) K PCTFE	Blank PTFE BN Nitrile Rubber EPR Ethylene Propylene Rubber V Fluorocarbon Rubber	SS Stainless Steel S Steel M Monel® Alloy 400 B Brass
2A 2F 2M	2Z 4A 4M	42 4A	6A 6Z	V4			
4A 4F 4M	4Z 6A 6M	6W TZ	8A 8Z	V6			
4F 6A	6F 6Z	8A 8M	8Z	V8			
8F 8W	10A 10Z	12A	12Z	V12			

Note: If the inlet and outlet ports are the same, eliminate the outlet port designator.

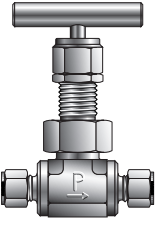
Examples:

4Z-V4AK-BN-SS describes an angle pattern V4 Series needle valve equipped with 1/4" CPI™ compression inlet and outlet ports, a PCTFE tipped stem, Nitrile seals, and stainless steel construction.

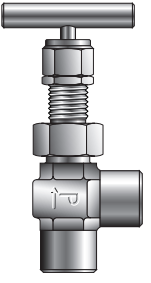
4M4F-V6LN-B describes an inline pattern V6 Series needle valve equipped with 1/4" male NPT inlet port, 1/4" female NPT outlet port, a needle stem type, PTFE stem seal, brass construction.

U Series Needle Valves

U6 Series

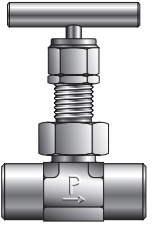


Model Shown:
4Z-U6LB-T-SS

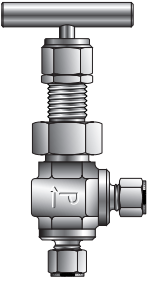


Model Shown:
4F-U6AR-T-SS

U12 Series

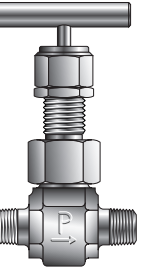


Model Shown:
6F-U12LB-G-SS-HT

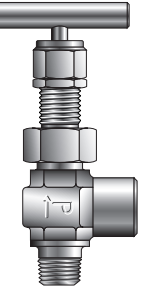


Model Shown:
M12A-U12AB-T-SS

U16 Series



Model Shown:
16M-U16LR-G-SS



Model Shown:
16M16F-U16AB-T-SS

Specifications

Pressure Rating*	6000 psig (414 bar) CWP
Temperature Ratings	
PTFE Packing	-65°F to 450°F (-54°C to 232°C)
Grafoil® Packing	-65°F to 700°F (-54°C to 371°C)
Grafoil® Packing with HT Option	-65°F to 1200°F (-54°C to 649°C)
Flow Data	
Orifice	.177" to .437" (4.5mm to 11.1mm)
C_V	.53 to 3.55

***Pressure Rating and Tubing Selection:** For working pressures of CPI™/ A-LOK® tube connections, please see pages 21-27 of this catalog, the Instrument Tubing Selection Guide (4200-TS) found in the Technical Section of your Parker Instrumentation Products Process Binder, or the Parker Instrument Tube Fitting Installation Manual (Bulletin 4200-B4).

How to Order

Inlet Port	Outlet Port		Valve Series	Stem Type	Packing	Body Material
2F 4A	4F 4M	4W 4Z	U6A U6L	B Blunt R Regulating	T PTFE G Grafoil®	SS Stainless Steel
4A 4F 4Z 6A 6F	6W 6Z 8A 8F 8W	10A 10Z 12A 12Z	U12A U12L			
8A 8F 8M 8PSW 8W 8Z	12A 12F 12M 12PSW 12W	12Z 16A 16F 16M 16Z	U16A U16L			

Note: If the inlet and outlet ports are the same, eliminate the outlet port designator.

Example: 4Z-U6AR-G-SS describes an angle pattern U6 Series needle valve equipped with 1/4" CPI™ compression inlet and outlet ports, a regulating stem type, Grafoil® packing, stainless steel construction.

VQ Series Manual Toggle Valves

Model Shown:
4M-V4LQ-SSP

Model Shown:
4M-V4AQ-EPR-SSP

Specifications

Pressure Rating	300 psig (21 bar) CWP at all temperatures
Temperature Ratings	
PTFE Stem Tip	-20°F to 200°F (-29°C to 93°C)
PCTFE Stem Tip	-65°F to 200°F (-54°C to 93°C)

How to Order Manual Toggle Valves

Inlet Port	Outlet Port		Valve Series	Stem Tip		Stem Seal		Body Material	
2A	4M		V4LQ	Blank	PTFE	Blank	Fluorocarbon Rubber	SSP	Stainless Steel with Panel Nut
2F	4Z		V4AQ	K	PCTFE	BN	Nitrile Rubber		
2M	6A					EPR	Ethylene Propylene Rubber	BP	Brass
2Z	6Z								
4A						KZ	Highly Fluorinated Fluorocarbon Rubber		
4F	8A		V6LQ						
6A	8Z		V6AQ						
6Z									

Note: If the inlet and outlet ports are the same, eliminate the outlet port designator.

Example: 4Z-V4LQK-BN-SSP describes a VQ4 Series inline pattern toggle valve equipped with 1/4" CPI™ compression inlet and outlet ports, PCTFE stem tip, Nitrile rubber stem seal, and stainless steel construction with panel mounting nut.

VQ Series Actuated Valves

Model Shown:
4F-V6AQ-11AO-B

Specifications

Pressure Ratings at All Temperatures	
Size VQ4 Normally Closed	600 psig (41 bar) CWP
Size VQ6 Normally Closed	500 psig (35 bar) CWP
Normally Open	450 psig (31 bar) CWP
Double Acting	450 psig (31 bar) CWP
Temperature Ratings	
PTFE Stem Tip	-20°F to 200°F (-29°C to 93°C)
PCTFE Stem Tip	-65°F to 200°F (-54°C to 93°C)

How to Order Actuated Valves

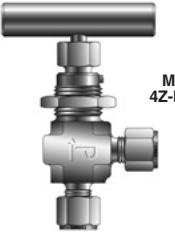
Inlet Port	Outlet Port	Valve Series	Stem Tip	–	Stem Seal	Actuator Type	–	Body Material
2A 2F 2M 2Z 4A	4M 4Z 6A 6Z	V4LQ V4AQ	Blank PTFE K PCTFE		Blank Fluoro-carbon Rubber BN Nitrile Rubber EPR Ethylene Propylene Rubber KZ Highly Fluorinated Fluoro-carbon Rubber	11AC Normally Closed 11AO Normally Opened 11AD Double Acting		SS Stainless Steel BP Brass
4F 6A 6Z	8A 8Z	V6LQ V6AQ						

Note: If the inlet and outlet ports are the same, eliminate the outlet port designator.

Example: 4M4A-V4AQ-11AC-B describes a VQ4 Series pneumatically actuated (normally closed) angle pattern valve equipped with a 1/4" Male NPT inlet port, a 1/4" A-LOK® compression outlet port, PTFE stem tip, Fluorocarbon rubber stem seal, brass construction with mounting bracket.

NP6 Series Needle Valves

Model Shown:
4Z-NP6LK-SSP



Model Shown:
4Z-NP6AR-G-SSP

Specifications

Pressure Rating	6000 psig (414 bar) CWP
Temperature Ratings	
PTFE Packing	-65°F to 450°F (-54°C to 232°C)
PCTFE	-65°F to 350°F (-54°C to 177°C)
Nitrile Rubber	-30°F to 250°F (-34°C to 121°C)
Fluorocarbon Rubber	-15°F to 400°F (-26°C to 204°C)
Ethylene Propylene Rubber	-70°F to 275°F (-57°C to 135°C)
Grafoil®	-70°F to 700°F (-57°C to 371°C)

Note: When combining body, seat and seal materials, the most restrictive temperature rating becomes the limiting factor on temperature range. Grafoil® is a registered trademark of GrafTech International Holdings, Inc.

How to Order

Inlet Port	Outlet Port		Valve Series	Stem Type		Stem Seal Material		Body Material	
4A	4Z	–	NP6L	R	Blunt	Blank	PTFE	SSP	Stainless Steel with Panel Nut
4F	6A		NP6A	K	PCTFE	BN	Nitrile Rubber		
4M	6Z					EPR	Ethylene Propylene Rubber		
						V	Fluorocarbon Rubber		
						G	Grafoil®		

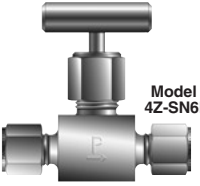
Note: If the inlet and outlet ports are the same, eliminate the outlet port designator.

Examples:

4Z-NP6AK-BN-SSP describes an angle pattern NP6 Series needle valve equipped with 1/4" CPI™ compression inlet and outlet ports, a PCTFE tipped stem, Nitrile seals, and stainless steel construction with panel mounting nut.

4M4F-NP6LR-SSP describes an inline pattern NP6 Series needle valve equipped with 1/4" male NPT inlet port, 1/4" female NPT outlet port, a blunt stem type, PTFE stem seal, stainless steel construction with panel mounting nut.

SN6 Series Needle Valves



Model Shown:
4Z-SN6LR-G-SS

Model Shown:
4M-SN6AK-SS

Specifications

Pressure Ratings**	
R Stem	6000 psig (414 bar) CWP
K Stem	3000 psig (207 bar) CWP
Temperature Ratings	
PTFE Packing	-65°F to 450°F (-54°C to 232°C)
PTCFE Stem Tip	-65°F to 350°F (-54°C to 177°C)
Grafoil® (G) Packing	-65°F to 700°F (-54°C to 371°C)

****Pressure Rating and Tubing Selection:** For working pressures of CPI™/ A-LOK® tube connections, please see pages 21-27 of this catalog, the Instrument Tubing Selection Guide (4200-TS) found in the Technical Section of your Parker Instrumentation Products Process Binder, or the Parker Instrument Tube Fitting Installation Manual (Bulletin 4200-B4).

How to Order

Inlet Port	Outlet Port		Valve Series	Stem Type		Packing		Body Material
4A A-LOK® (tube) 4Z CPI™ (tube) 4M Male pipe (NPT) 4F Female pipe (NPT)			SN6L SN6A	R Blunt (20°) K PCTFE		Blank PTFE G Grafoil®		SS 316 Stainless Steel

Notes:

- If the inlet and outlet ports are the same, eliminate the outlet port designator.
- **Handles:** SN6 valves with R-Stem are standard with 316 SS T-bar handles. SN6 valves with K-Stem are standard with round anodized aluminum handles, 1.00 inch diameter. SN6 valves are not panel mountable.

Examples:

4Z-SN6LR-SS describes an SN6 valve, inline, blunt stem, 316 SS, 1/4" CPI™ tube inlet and outlet ports, and a PTFE packing.

4M4F-SN6AK-SS describes an SN6 valve, angle, PCTFE stem tip, 316 SS, 1/4" male pipe inlet port, 1/4" female pipe outlet port, and a PTFE packing.

PV Series Rising Stem Plug Valves

Model Shown: 4F-PV4DE-V-SS

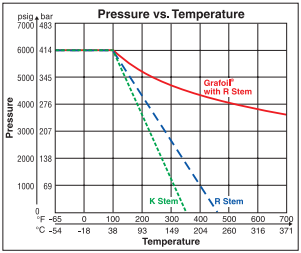
Model Shown: 4F-PVG4PK-EPR-SS

Specifications

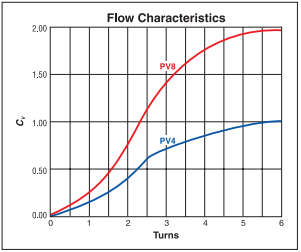
Pressure Ratings	
Acetal Seat	6000 psig (414 bar) CWP
PEEK Seat	6000 psig (414 bar) CWP
PCTFE Seat	2200 psig (152 bar) CWP
PFA Seat	750 psig (52 bar) CWP
Temperature Ratings	
Seats	
Acetal	-20°F to 250°F (-29°C to 121°C)
PEEK and PFA	-20°F to 400°F (-29°C to 204°C)
PCTFE	-20°F to 200°F (-29°C to 93°C)
Stem Seals	
Nitrile Rubber, Silicone Rubber and Ethylene Propylene Rubber	-20°F to 250°F (-29°C to 121°C)
Fluorocarbon Rubber	-20°F to 400°F (-29°C to 204°C)
Highly Fluorinated Fluorocarbon Rubber	-20°F to 200°F (-29°C to 93°C)
Flow Data*	
PV4	C_V = 0.95; X_T = 0.43; Orifice = 0.188" (4.8mm)
PV8	C_V = 2.01; X_T = 0.33; Orifice = 0.250" (6.4mm)

*Tested in accordance with ISA S75.02. Gas flow will be choked when $P_1 - P_2 / P_1 = x_T$

Pressure vs. Temperature



Flow Characteristics



How to Order

Inlet Port	Outlet Port	–	Valve Series	Seat Type	–	Stem Seal Material	–	Body Material
4A 4F 4M 4Z	6A 6Z 8M		PV4 PVG4	DE Acetal K PCTFE PK PEEK PFA PFA		V Fluorocarbon Rubber BN Nitrile Rubber SI Silicone Rubber EPR Ethylene Propylene Rubber KZ Highly Fluorinated Fluorocarbon Rubber		SS Stainless Steel SSP Stainless Steel with Panel Mounting Option
6M 6F 8A	8F 8Z 12M		PV8 PVG8					

Note: If the inlet and outlet ports are the same, eliminate the outlet port designator.

Examples:

4Z-PV4K-BN-SS describes a PV4 Series rising stem plug valve equipped with 1/4" CPI™ compression inlet and outlet ports, a PCTFE seat, Nitrile stem seals, and stainless steel construction.

4M-PVG4DE-V-SSP describes a PVG4 Series rising stem plug valve with 1/4" gauge ports equipped with a 1/4" Male NPT inlet port and 1/4" Female NPT outlet port, an acetal seat, fluorocarbon stem seals, and stainless steel construction with panel mounting option.

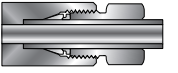
MPN Series Medium Pressure Valves

Parker MPN series valves are designed for multi-turn control of media regulation and shutoff up to 20,000 psi. Additional packing materials are available for application temperatures from -300° to +800°F. Standard critical service design features, such as the packing below the thread and the non-rotating lower stem ensure longer valve life in rugged applications.

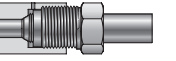
Medium Pressure Valve Connection Types

F
Female NPT
To 15,000 PSI

MP7
Parker MPI™
(Medium Pressure Inverted)
To 15,000 PSI



MF
Cone & Thread
(Medium Pressure Female)
To 20,000 PSI



Two Way Inline Valves

Two Way Angle Valves

Three Way/Two Pressure Connections

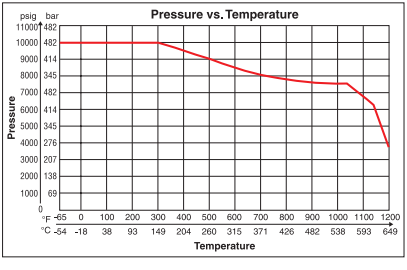
Three Way/One Pressure Connection

Three Way/Two Stem Connection

Two Way Angle Valves (Replaceable Seat)

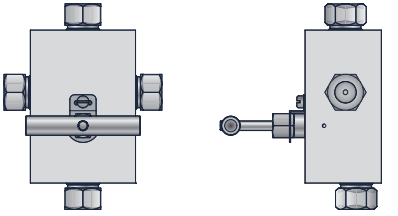
Over Critical Valves

Pressure vs. Temperature Chart



Needle Valves – MPN Series

Gauge Valve



How to Order MPN Series Valves

Inlet/Outlet Connection Size	Connection Type	–	Valve Series	Valve Type	Stem Type	High Flow
2 * 1/8"	F Female Pipe		MPN	L 2-Way Inline	B Blunt	Blank Standard Flow
4 1/4"	MP7 Parker MPI™			A 2-Way Angle	R Regulating	
6 3/8"	MF Female Cone & Thread			X***I 3-Way 2-Pressure Connections		H High Flow
8 1/2"	W Tube Socket Weld			X***D 3-Way 2-Stem Connection		
9 ** 9/16"				A***R 2-Way Angle Valve (Replaceable Seat)		
12 3/4"	PSW Pipe Socket Weld					
16 1"						

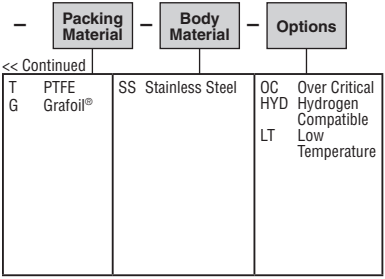
Continued >>

* Female Pipe Only

** MP7 and MF only

*** Needle Type inserted here.

Example: 4MP7-MPNAB-T-SS-OC describes an MPN Series needle valve with 1/4" MPI connections, 2 way angle flow path, blunt stem, PTFE packing, stainless steel body and the option for over critical service.


–
Packing Material
–
Body Material
–
Options
<< Continued
T PTFE
G Grafoil®
SS Stainless Steel
OC Over Critical
HYD Hydrogen Compatible
LT Low Temperature

Sample Cylinders & Accessories

Sample Cylinders

Specifications

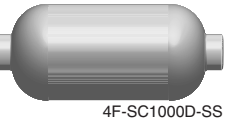
Pressure Rating	1800 psig (124 bar) CWP
Temperature Rating	-58°F to 450°F (-50°C to 232°C)
DOT-3E 1800	75, 150, 300, and 500cc with 1/4" NPT threads
DOT-3A 1800	1000 and 2250cc with 1/4" NPT threads 3785cc (1 gallon) with 1/2" NPT threads

4F-SC75D-SS

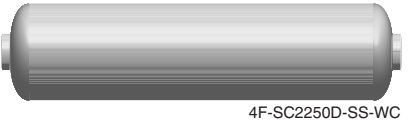
4F-SC150D-SS

4F-SC300D-SS

4F-SC500D-SS



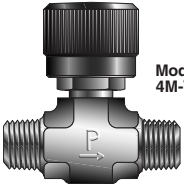
4F-SC1000D-SS



4F-SC2250D-SS-WC

8F-SC1GD-SS-WC

V4LC Series Miniature Needle Valves



Model Shown:
4M-V4LCK-SS

Specifications

Pressure Rating	5000 psig (345 bar) CWP
Temperature Ratings	
With PTFE Packings	
R Stem	-65°F to 450°F (-54°C to 232°C)
K Stem	-65°F to 350°F (-54°C to 177°C)
With Nitrile Rubber Packing	-30°F to 250°F (-34°C to 121°C)
With Fluorocarbon Rubber Packing	-15°F to 400°F (-26°C to 204°C)
With Ethylene Propylene Rubber Packing	-70°F to 275°F (-21°C to 135°C)
With Neoprene Rubber Packing	-65°F to 250°F (-54°C to 121°C)
Flow Data	
Ports	ANSI/ASME B1.20.1; 1/4" external pipe threads
Orifice	0.176" (4.5mm)

How to Order

Inlet Port		Valve Series	Stem Type		Optional Stem*		Body Material
4M	–	VL4C	K PCTFE R All metal, blunt tip	–	V Fluorocarbon Rubber BN Nitrile Rubber EPR Ethylene Propylene Rubber NE Neoprene Rubber	–	SS Stainless Steel

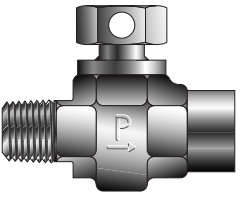
Examples:

4M-VL4CK-SS describes a needle valve with a K stem.

4M-VL4CR-SS describes a needle valve with a R stem.

4M-VL4CK-BN-SS describes a needle valve with a K stem and optional elastomeric stem packaging of Nitrile rubber.

Rupture Disc Units



Model Shown: 4M4F-RV6L-18-SS

Specifications

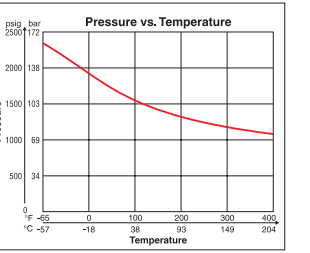
Pressure Rating	1800 psig at 70°F (124 bar at 21°C)
Temperature Ratings	
With Standard PTFE Gasket	-65°F to 150°F (-54°C to 66°C)
With Optional Metal Gasket	-65°F to 400°F (-54°C to 204°C)

NOTE: Contact your Parker Distributor for availability of optional rupture disc pressures from 160 psig to 5000 psig (11 bar to 345 bar).

How to Order and Size/Connection

Part Number	Inlet	Outlet
4M4F-RV6L-18-SS	1/4" MNPT	1/4" FNPT
8M8F-RV6L-18-SS	1/2" MNPT	1/2" MNPT

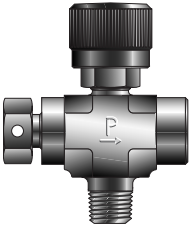
Pressure vs. Temperature



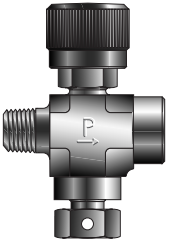
Precautions

1. Ensure the minimum burst pressure rating of the Rupture Disc Unit is approximately 40% higher than the cylinder service (filling) pressure.
2. Do not use Rupture Disc Units in a location where the release of the contents may cause death, personal injury and property damage. Rupture Disc Units are a CGA Type CG-1 pressure relief device and are designed to release the entire contents of the cylinder to atmosphere.
3. Follow the minimum recommended practices for maintenance and inspection of pressure relief devices in CGA Pamphlet S-1.1. Inspect the rupture disc frequently. Preferably, replace the disc yearly. Temperature and pressure cycling, and corrosive media can affect the disc's burst pressure.
4. For additional information on Parker Rupture Disc Units, refer to any of the Maintenance and Installation Instructions for Rupture Discs and Combination Needle/Rupture Discs (INI-207, INI-219, MI-107, and MI-117).

RV6C Series Combination Rupture Disc / Needle Valves



Model Shown:
4M4F-RV6LCK-18-SS



Model Shown:
4M4F-RV6ACK-18-SS

Specifications

Pressure Ratings	
Valve	5000 psig CWP (345 bar)
Rupture Disc	1800 psig (124 bar)
Temperature Ratings	
With Standard PTFE Gasket	-65°F to 150°F (-54°C to 66°C)
With Optional Metal Gasket and Proper Seal	-65°F to 400°F (-54°C to 204°C)
With PTFE Packing	-65°F to 350°F (-54°C to 177°C)
With Nitrile Rubber Packing	-30°F to 250°F (-34°C to 121°C)
With Fluorocarbon Rubber Packing	-15°F to 400°F (-26°C to 204°C)
With Ethylene Propylene Rubber Packing	-70°F to 275°F (-21°C to 135°C)
With Neoprene Rubber Packing	-65°F to 250°F (-54°C to 121°C)
Flow Data*	
Orifice	0.176" (4.5mm)
Ports	ANSI/ASME B1.20.1 Inlet: 1/4" external pipe threads Outlet: 1/4" internal pipe threads

How to Order

Inline Pattern: 4M4F-RV6LCK-18-SS

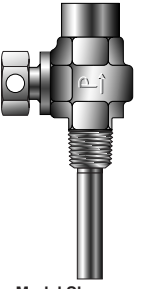
Angle Pattern: 4M4F-RV6ACK-18-SS

NOTES: 1) To obtain optional elastomeric stem packaging, insert one of the following designators prior to "-SS":
-BN Nitrile rubber
-V Fluorocarbon rubber
-EPR Ethylene propylene rubber
-NE Neoprene rubber.
Example: 4M4F-RV6LCK-18-V-SS

2) To obtain the optional high temperature gasket, add the suffix -HT to the end of the part number.
Example: 4M4F-RV6LCK-18-V-SS-HT

Dip (Outage) Tube Valves and Fittings

Parker Sample Cylinder Valves and Rupture Disc Units may be fitted with customer specified dip tubes to prevent overfilling of cylinders by providing a vapor space in sample cylinders containing liquified gases. Parker Dip Tube Fittings permit the assembly of any valve with a dip tube.



Model Shown: 4M4F-RV6L-SS-2

How to Order

Dip Tubes with Sample Cylinder Valves and Rupture Disc Units

A 316 stainless steel dip tube will be supplied press fit to the Male NPT port of products when specified by adding the dip tube length to the end of the part number. The length is measured from the end of the forging.

Examples:

4M4F-RV6L-18-SS-4 describes a Rupture Disc Unit with a four inch (102mm) long dip tube.

4M4F-RV6LCK-18-SS-2 describes a Combination Rupture Disc/ Needle Valve with a two inch (51 mm) long dip tube.

Dip Tube Fittings

A 316 stainless steel dip tube will be supplied press fit to the Male NPT port of Male x Female Pipe Adapters. They are available with 1/4" or 1/2" NPT threads. Specify the custom DT6L fitting by adding the dip tube length to the end of the part number. The length is measured from the end of the forging.

Examples:

4M4F-DT6L-SS-3 describes a 1/4" MNPT x 1/4" FNPT Fitting with a 3 inch (76 mm) long dip tube.

8M8F-DT6L-SS-2 describes a 1/2" MNPT x 1/2" FNPT Fitting with a 2 inch (51 mm) long dip tube.

Note: For further information on Dip (Outage) Tubes, refer to Parker Engineering Performance Report EPR4160.2

Model Shown: 4M4F-DT6L-SS-2

Other Valves for use with Sample Cylinders

V Series Needle Valves

SN Series Needle Valves

Offer of Sale

The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in its document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods or work described will be referred to as "Products".

1. Terms and Conditions. Seller's willingness to offer Products, or accept an order for Products, to or from Buyer is expressly conditioned on Buyer's assent to these Terms and Conditions and to the terms and conditions found on-line at www.parker.com/saleterms/. Seller objects to any contrary or additional term or condition of Buyer's order or any other document issued by Buyer.

2. Price Adjustments; Payments. Prices stated on the reverse side or preceding pages of this document are valid for 30 days. After 30 days, Seller may change prices to reflect any increase in its costs resulting from state, federal or local legislation, price increases from its suppliers, or any change in the rate, charge, or classification of any carrier. The prices stated on the reverse or preceding pages of this document do not include any sales, use, or other taxes unless so stated specifically. Unless otherwise specified by Seller, all prices are F.O.B. Seller's facility, and payment is due 30 days from the date of invoice. After 30 days, Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.

3. Delivery Dates; Title and Risk; Shipment. All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon tender to the carrier at Seller's facility (i.e., when it's on the truck, it's yours). Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyers' request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's changes in shipping, product specifications or in accordance with Section 13, herein.

4. Warranty. Seller warrants that the Products sold here-under shall be free from defects in material or workmanship for a period of twelve months from the date of delivery to Buyer or 2,000 hours of normal use, whichever occurs first. This warranty is made only to Buyer and does not extend to anyone to whom Products are sold after purchased from Seller. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Offer of Sale

5. Claims; Commencement of Actions. Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 60 days after delivery or, in the case of an alleged breach of warranty, within 30 days after the date within the warranty period on which the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for any amount due to Seller from Buyer) must be commenced within thirteen months from the date of tender of delivery by Seller or, for a cause of action based upon an alleged breach of warranty, within thirteen months from the date within the warranty period on which the defect is or should have been discovered by Buyer.

6. LIMITATION OF LIABILITY. UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WithOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.

7. Contingencies. Seller shall not be liable for any default or delay in performance if caused by circumstances beyond the reasonable control of Seller.

8. User Responsibility. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

9. Loss to 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 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.

10. Special Tooling. A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. 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 Products, 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.

11. Buyer's Obligation; Rights of Seller. To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.

12. Improper use and Indemnity. Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

13. Cancellations and Changes. Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.

14. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

15. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

16. Waiver and Severability. Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

17. Termination. This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (c) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (d) an assignment for the benefit of creditors, or (e) the dissolution or liquidation of the Buyer.

Offer of Sale

18. Governing Law. This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.

19. 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 Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("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 a Product sold pursuant to this Agreement 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 a Product 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 the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product 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 Products 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 Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

20. Taxes. Unless otherwise indicated, 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 Products.

21. Equal Opportunity Clause. For the performance of government contracts and where dollar value of the Products exceed $10,000, the equal employment opportunity clauses in Executive Order 11246, VEVRAA, and 41 C.F.R. §§ 60-1.4(a), 60-741.5(a), and 60-250.4, are hereby incorporated.

01/09

At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call 1-800-C-Parker.

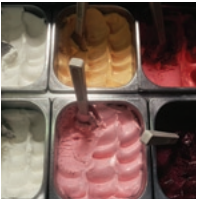
AEROSPACE

Key Markets

- Aircraft engines
- Business & general aviation
- Commercial transports
- Land-based weapons systems
- Military aircraft
- Missiles & launch vehicles
- Regional transports
- Unmanned aerial vehicles

Key Products

- Flight control systems & components
- Fluid conveyance systems
- Fluid metering delivery & atomization devices
- Fuel systems & components
- Hydraulic systems & components
- Inert nitrogen generating systems
- Pneumatic systems & components
- Wheels & brakes



CLIMATE CONTROL

Key Markets

- Agriculture
- Air conditioning
- Food, beverage & dairy
- Life sciences & medical
- Precision cooling
- Processing
- Transportation

Key Products

- CO^2 controls
- Electronic controllers
- Filter driers
- Hand shut-off valves
- Hose & fittings
- Pressure regulating valves
- Refrigerant distributors
- Safety relief valves
- Solenoid valves
- Thermostatic expansion valves

ELECTROMECHANICAL

Key Markets

- Aerospace
- Factory automation
- Life science & medical
- Machine tools
- Packaging machinery
- Paper machinery
- Plastics machinery & converting
- Primary metals
- Semiconductor & electronics
- Textile
- Wire & cable

Key Products

- AC/DC drives & systems
- Electric actuators, gantry robots & slides
- Electrohydrostatic actuation systems
- Electromechanical actuation systems
- Human machine interface
- Linear motors
- Stepper motors, servo motors, drives & controls
- Structural extrusions

FILTRATION

Key Markets

- Food & beverage
- Industrial machinery
- Life sciences
- Marine
- Mobile equipment
- Oil & gas
- Power generation
- Process
- Transportation

Key Products

- Analytical gas generators
- Compressed air & gas filters
- Condition monitoring
- Engine air, fuel & oil filtration & systems
- Hydraulic, lubrication & coolant filters
- Process, chemical, water & microfiltration filters
- Nitrogen, hydrogen & zero air generators

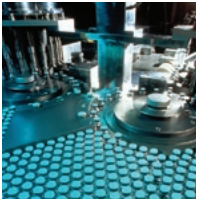
HYDRAULICS

Key Markets

- Aerospace
- Aerial lift
- Agriculture
- Construction machinery
- Forestry
- Industrial machinery
- Mining
- Oil & gas
- Power generation & energy
- Truck hydraulics

Key Products

- Diagnostic equipment
- Hydraulic cylinders & accumulators
- Hydraulic motors & pumps
- Hydraulic systems
- Hydraulic valves & controls
- Power take-offs
- Rubber & thermoplastic hose & couplings
- Tube fittings & adapters
- Quick disconnects



PNEUMATICS

Key Markets

- Aerospace
- Conveyor & material handling
- Factory automation
- Life science & medical
- Machine tools
- Packaging machinery
- Transportation & automotive

Key Products

- Air preparation
- Brass fittings & valves
- Manifolds
- Pneumatic accessories
- Pneumatic actuators & grippers
- Pneumatic valves & controls
- Quick disconnects
- Rotary actuators
- Rubber & thermoplastic hose & couplings
- Structural extrusions
- Thermoplastic tubing & fittings
- Vacuum generators, cups & sensors

PROCESS CONTROL

Key Markets

- **Chemical & refining**
- **Food, beverage & dairy**
- **Medical & dental**
- **Microelectronics**
- **Oil & gas**
- **Power generation**

Key Products

- **Analytical sample conditioning products & systems**
- **Fluoropolymer chemical delivery fittings, valves & pumps**
- **High purity gas delivery fittings, valves & regulators**
- **Instrumentation fittings, valves & regulators**
- **Medium pressure fittings & valves**
- **Process control manifolds**

SEALING & SHIELDING

Key Markets

- Aerospace
- Chemical processing
- Consumer
- Energy, oil & gas
- Fluid power
- General industrial
- Information technology
- Life sciences
- Military
- Semiconductor
- Telecommunications
- Transportation

Key Products

- Dynamic seals
- Elastomeric o-rings
- EMI shielding
- Extruded & precision-cut, fabricated elastomeric seals
- Homogeneous & inserted elastomeric shapes
- High temperature metal seals
- Metal & plastic retained composite seals
- Thermal management

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