Medium Pressure Products

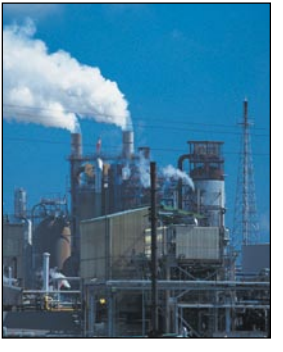
MPI™ Fittings, Valves, Regulators and Hoses
6,000 - 20,000 PSI Range

Catalog 4234-PC
October 2007

Introduction

Parker Hannifin MPI™ Fittings* are engineered and manufactured to provide secure, tight, and leak-resistant connections throughout industry, including off-shore oil and gas exploration platforms, research labs, and other facilities that require operating pressures in the range of 6,000 to 15,000 psi.

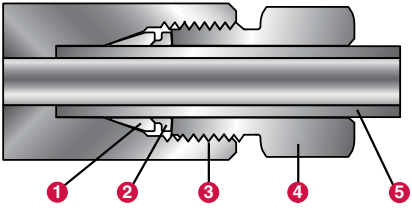
MPI™ Fittings are ideally suited to handle liquids, gases, or chemicals and can be used on a wide variety of tubing materials including cold drawn - 1/8 hard (unannealed) tubing or instrument grade thick-walled annealed stainless steel. Every Parker MPI™ Fitting is supplied complete and ready to install.



*Patent Pending

Advanced Features

Every MPI™ Fitting has the features shown below:



1. Front ferrule with corrosion-resistant Parker SUPARCASE® forms a tight pressure seal between the body and ferrule in a *second* strong mechanical hold on the tube.
2. Rear ferrule with corrosion-resistant Parker SUPARCASE® provides a strong mechanical hold on the tube.
3. Longer thread area for improved resistance to pressure and load on the ferrules.
4. Molybdenum disulfide-coated inverted nut helps prevent galling, provides easier assembly, and permits multiple remakes.
5. Long tube-support area improves resistance to vibration and line loads.

Materials and Identification

Standard MPI™ Fittings are made of Heat Code Traceable 316 stainless steel. Tubing and fitting materials should be selected based on compatibility with the fluid or gas media.

Part numbers for MPI™ Fittings use symbols that identify their style, size, and composition.

MPI™ Fittings Pressure Ratings

The maximum pressure rating is marked on each fitting. MPI™ Fittings are designed to a 4 to 1 design factor.

- Size 4 MPI™ end – to 15,000 psi
- Size 6 MPI™ end – to 15,000 psi
- Size 8 MPI™ end – to 15,000 psi
- Size 9 MPI™ end – to 15,000 psi
- Size 12 MPI™ end – to 15,000 psi
- Size 16 MPI™ end – to 12,500 psi

Assembly

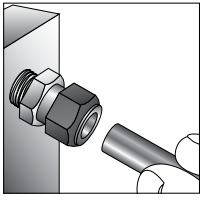
MPI™ Fittings are installed with standard hand tools. Each size can be preset with a Parker hydraulic preset tool. Tube preparation does not require cutting of threads or tube end "coning".

Dedication To Quality

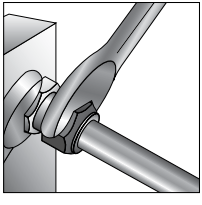
Our resources and vast product line, is available through our worldwide distribution network. For more information regarding our products and services, please contact your authorized Parker Instrumentation Distributor.

Assembly, Remake & Gaugeability Instructions

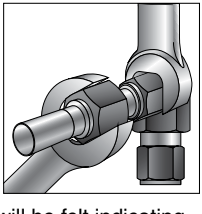
1. Parker MPI™ Fittings are sold completely assembled and ready for immediate use. Simply insert the tube as illustrated until it bottoms in the fitting body. (If the fitting is disassembled, note that the small tapered end of the ferrule(s) go into the fitting body.)



2. For MPI™ Fittings, turn the nut to the “finger-tight” position. Hold the fitting body with a second wrench to prevent the body from turning as you continue tightening the nut. For hand assembly, tighten the nut 1-1/2 turns and for a preset connection (required for 3/4" and 1") tighten the nut 1/2 turn only. See page 48 for more information on preset connections. Parker recommends that you mark the nut (using a scribe or ink) to help you count the turns.



3. For maximum number of remakes, mark the fitting and nut before disassembly. 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.)



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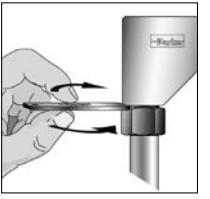
Assembly, Remake & Gaugeability Instructions (Continued)



4. Finally, check the gap between the nut and the body hex with the end of the gauge by inserting the gauge (as shown) into the beveled gap between the nut and body hex. Gently turn the gauge (that is, it "twists out"). **However, if the gauge slides into the beveled gap (does not "twist out"), the fitting is not properly made up and you must check the entire assembly procedure.**

⚠ WARNING

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

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

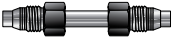
The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

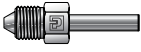
Offer of Sale

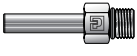
The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the "Offer of Sale".

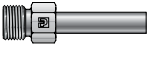
Visual Index

MPI™ Fittings









Visual Index (Continued)

Visual Index (Continued)

Medium Pressure Valves

Visual Index (Continued)

Typical Raw Material Specifications

Basic Fitting Material	Bar Stock	Forging
STAINLESS STEEL (Type 316) (1)	ASME SA-479 Type 316-SS BS970 316-S31 DIN 4401	ASME SA-182 316 BS970 316-S31 DIN 4401

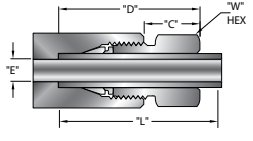
(1) If additional information, including heat code traceability, is required, contact Parker Hannifin or your nearest MPI™ Fitting distributor.

(2) Parker MPI™ Fittings work reliably on cold drawn - 1/8 hard tubing (both MPI™ and Cone & Thread), and fully annealed, heavy wall type 316 tubing. See pages 16 and 17 for more information about tubing.

Tube End Dimensional Data

Size No.	Inches						
	Tube O.D.	Straight Thread	C	D	E	*L	W HEX
4	1/4	1/2 - 20	.50	1.34	.13	1.62	9/16
6	3/8	5/8 - 20	.63	1.58	.25	1.88	11/16
8	1/2	13/16 - 20	.69	1.85	.31	2.12	15/16
9	9/16	7/8 - 20	.75	1.91	.38	2.25	1
12	3/4	1 1/8 - 18	.88	2.26	.52	2.75	1 1/4
16	1	1 3/8 - 18	1.13	2.88	.69	3.38	1 1/2

* L = Recommended Straight Length of Circular Un-bent Tubing



How To Order MPI™ Fittings

Parker MPI™ Fittings should be ordered using the part number as listed in this catalog.

Part numbers are developed as follows:

1. A combination of letters and numbers identifies the size and style of the fitting and the material used.
2. Tube and pipe thread sizes are designated by the number of sixteenths of an inch (1/4" tube = 4/16" or 4).

All standard MPI™ Fittings are manufactured from 316 stainless steel. Other materials are available upon special order.

Straights and Elbows: Specify the largest end of the MPI first, followed by the smaller tube end OR pipe thread size.

Example: Part number **4-4 HBMP7** union would have the specifications listed below.

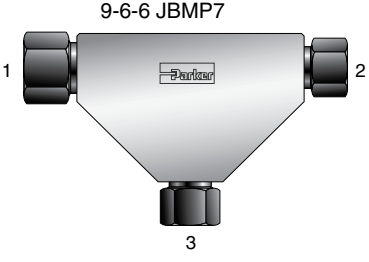
4-4 HBMP7

4	-	4	HB	MP7	-	SS
1/4" Tube		1/4 Tube	Union	Medium Pressure Inverted		Stainless Steel

Continued on the following page.

Tees:

Example: Part number **9-6-6 JBMP7** would have the following specifications:



9	-	6	-	6	JB	MP7	-	SS
9/16" Tube		3/8" Tube		3/8" Branch	Tee	Medium Pressure Inverted		Stainless Steel
(1)		(2)		(3)				

Customer Requests: When special configurations are required, please provide a blueprint of the installation to Parker with your request for a price quote.

Cryogenic Service: MPI™ fittings for cryogenic applications include a vent hole to prevent pressure build-up in front of the threads. To order “vented” MPI™ parts, add “-VT” to the end of the standard part number (e.g., 6-6 HBMP7-SS becomes 6-6 HBMP7-SS-VT).

Tubing Selection Guide

Although Parker's MPI™ Fittings are engineered and manufactured to consistently provide high levels of reliability, no system's integrity is complete without considering the critical link: tubing.

This section is intended to help you properly select and order quality tubing, both annealed and medium-pressure cold drawn - 1/8 hard (unannealed).

Parker believes that proper tubing selection and installation are key to building leak-free, reliable tubing systems.

Parker's MPI™ Fittings have been designed to operate on a wide variety of "medium pressure" applications (6,000 to 15,000 psi).

General Selection Criteria

The data tables in this section will help you select the tubing that best satisfies the needs of the application.

The most important consideration in the selection of suitable tubing for any application is the compatibility of the tubing materials with the media to be contained.

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 stainless steel.Tube fitting assemblies should never be pressurized beyond the recommended working pressure.

Maximum Allowable Working Pressure Tables

Table 1 lists 316 stainless steel along with its associated general applications and recommended temperature ranges.

Tubing Compatibility

Table 1

Tubing Material	General Application	Recommended Temperature Range
Stainless Steel	High Pressure, High Temperature, Generally Corrosive Media	-425°F to 1200°F (1) (-255°C to 650°C)

(1) 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.

All temperature ratings based on maximum rated temperatures per ASME/ANSI B31.3 Chemical Plant and Petroleum Refinery Piping Code, 1999 Edition. The information listed in Table 1 is general in scope. For specific applications, please contact Parker's Instrumentation Products Division, Product Engineering Department (256) 881-2040.

Tables 2, 3 and 4 list the maximum suggested working pressure of various tubing sizes, according to material. 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 MPI™ Fittings.

MPI™ Tubing

MPI™ tubing is marked “MPI” and is designed to provide optimum performance for MPI™ fittings. MPI™ tubing is nominal OD ±.003") 316 seamless stainless steel, cold drawn - 1/8 hard (unannealed) tubing. Tensile strength is approximately 40% higher than annealed tubing.

Table 2

316 Stainless Steel (Seamless/Unannealed - 1/8 Hard)				
Tube Size (in.)	**Nominal OD (in.)**	**Nominal ID (in.)**	**Working Pressure**	**MPI™ Tube Part No.**
1/4	.250	.125	15,000	4-240 MPITUBE-SS-15K
3/8	.375	.216	15,000	6-240 MPITUBE-SS-15K
9/16	.562	.344	15,000	9-240 MPITUBE-SS-15K
3/4	.750	.469	15,000	12-240 MPITUBE-SS-15K
1	1.000	.656	12,500	16-240 MPITUBE-SS-15K

NOTE: Working pressures calculated using an allowable stress of 35,000 psi for 1/8 hard 316 stainless steel tubing with a minimum tensile strength of 105,000 psi.

NOTE: Sizes 3/4" & 1" require hydraulic presetting when used with MPI™ fittings.

*Consult factory for pressure tables regarding other materials.

Cone & Thread Tubing

Cone & Thread (C&T) tubing is available as 1/8 hard 316 seamless stainless steel tubing and is designed to work with existing C&T fittings. C&T tubing has an undersized OD by as much as .010" to better facilitate the coning and threading operations required for use with C&T fittings. MPI™ fittings work effectively with C&T tubing as listed below but require hydraulic presetting for optimum performance.

Table 3

316 Stainless Steel (Undersized OD, Seamless (Unannealed - 1/8 Hard)							
Tube Size (in.)	Max OD (in.)	Nominal ID (in.)	Working Pressure (PSI)	Tube Size (in.)	Max OD (in.)	Nominal ID (in.)	Working Pressure (PSI)
1/4	.250	.109	12,500	9/16	.562	.359	10,000
3/8	.375	.203	12,500	3/4	.750	.516	10,000
9/16	.562	.312	12,500	1	1.000	.688	10,000

Instrumentation Grade Heavy Wall Tubing

Table 4

Tube OD Size (in.)	316 Stainless Steel (Seamless/Annealed)								
	.065	.083	.095	.109	.120	.134	.156	.188	.220
1/4	10,300	13,300							
3/8	6,600	8,600	10,000	11,700					
1/2		6,700	7,800	9,100	10,000	11,400			
3/4				5,800	6,400	7,300	8,600	10,600	
1					4,700	5,300	6,200	7,700	9,200

NOTE: Working pressures calculated using an allowable stress of 20,000 psi for annealed 316 stainless steel tubing with a nominal O.D. tolerance of ± .005".

FBMP7

MPI™ to Male NPT Connector

PARKER PART NO.	INCHES		WORKING PRESSURE (PSIG)
	MPI™ SIZE	NPT THREAD	
4-2 FBMP7	1/4	1/8 - 27	15,000
4-4 FBMP7	1/4	1/4 - 18	15,000
4-6 FBMP7	1/4	3/8 - 18	15,000
4-8 FBMP7	1/4	1/2 - 14	15,000
6-4 FBMP7	3/8	1/4 - 18	15,000
6-6 FBMP7	3/8	3/8 - 18	15,000
6-8 FBMP7	3/8	1/2 - 14	15,000
8-6 FBMP7	1/2	3/8 - 18	15,000
8-8 FBMP7	1/2	1/2 - 14	15,000
9-6 FBMP7	9/16	3/8 - 18	15,000
9-8 FBMP7	9/16	1/2 - 14	15,000
12-8 FBMP7	3/4	1/2 - 14	15,000
12-12 FBMP7	3/4	3/4 - 14	10,000
16-12 FBMP7	1	3/4 - 14	10,000
16-16 FBMP7	1	1 - 11.5	10,000

XHBMP7
37° Flare to MPI™ Connector

PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	37° FLARE ADAPTER	MPI™ SIZE	THREAD	
4-4 XHBMP7	1/4	1/4	7/16 - 20	15,000
4-6 XHBMP7	1/4	3/8	7/16 - 20	15,000
4-8 XHBMP7	1/4	1/2	7/16 - 20	15,000
4-9 XHBMP7	1/4	9/16	7/16 - 20	15,000
6-4 XHBMP7	3/8	1/4	9/16 - 18	12,500
6-6 XHBMP7	3/8	3/8	9/16 - 18	12,500
6-8 XHBMP7	3/8	1/2	9/16 - 18	12,500
6-9 XHBMP7	3/8	9/16	9/16 - 18	12,500
8-6 XHBMP7	1/2	3/8	3/4 - 16	12,500
8-8 XHBMP7	1/2	1/2	3/4 - 16	12,500
8-9 XHBMP7	1/2	9/16	3/4 - 16	12,500
12-12 XHBMP7	1/2	3/4	1 1/16 - 12	12,500
16-16 XHBMP7	1	1	1 5/16 - 12	7,200

MP7H2BX

37° Flare Bulkhead to MPI™ Connector

PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	MPI™ SIZE	37° FLARE ADAPTER	THREAD	
4-4 MP7H2BX	1/4	1/4	7/16 - 20	15,000
6-6 MP7H2BX	3/8	3/8	9/16 - 18	12,500
8-8 MP7H2BX	1/2	1/2	3/4 - 16	12,500
9-8 MP7H2BX	9/16	1/2	3/4 - 16	12,500

* Bulkhead hole approximately 1/64" (.015") larger than thread major diameter.

X41HBMP7

High Pressure to MPI™ Connector

PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	HIGH PRESSURE ADAPTER	MPI™ SIZE	THREAD	
4-4 X41HBMP7	1/4	1/4	9/16 - 18	15,000
4-6 X41HBMP7	1/4	3/8	9/16 - 18	15,000
6-4 X41HBMP7	3/8	1/4	3/4 - 16	15,000
6-6 X41HBMP7	3/8	3/8	3/4 - 16	15,000
6-9 X41HBMP7	3/8	9/16	3/4 - 16	15,000
9-6 X41HBMP7	9/16	3/8	1 1/8 - 12	15,000
9-9 X41HBMP7	9/16	9/16	1 1/8 - 12	15,000
9-12 X41HBMP7	9/16	3/4	1 1/8 - 12	15,000

X42HBMP7

Medium Pressure to MPI™ Connector

PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	MEDIUM PRESSURE ADAPTER	MPI™ SIZE	THREAD	
4-4 X42HBMP7	1/4	1/4	7/16 - 20	15,000
4-6 X42HBMP7	1/4	3/8	7/16 - 20	15,000
4-9 X42HBMP7	1/4	9/16	7/16 - 20	15,000
6-4 X42HBMP7	3/8	1/4	9/16 - 18	15,000
6-6 X42HBMP7	3/8	3/8	9/16 - 18	15,000
6-8 X42HBMP7	3/8	1/2	9/16 - 18	15,000
6-9 X42HBMP7	3/8	9/16	9/16 - 18	15,000
9-4 X42HBMP7	9/16	1/4	13/16 - 16	15,000
9-6 X42HBMP7	9/16	3/8	13/16 - 16	15,000
9-8 X42HBMP7	9/16	1/2	13/16 - 16	15,000
9-9 X42HBMP7	9/16	9/16	13/16 - 16	15,000
9-12 X42HBMP7	9/16	3/4	3/4 - 14 NPS	15,000
12-9 X42HBMP7	3/4	9/16	3/4 - 14 NPS	15,000
12-12 X42HBMP7	3/4	3/4	3/4 - 14 NPS	15,000
12-16 X42HBMP7	3/4	1	3/4 - 14 NPS	12,500

GBMP7
MPI™ Female NPT Connector

PARKER PART NO.	INCHES		WORKING PRESSURE (PSIG)
	MPI™ Size	NPT THREAD	
4-2 GBMP7	1/4	1/8 - 27	15,000
4-4 GBMP7	1/4	1/4 - 18	15,000
4-6 GBMP7	1/4	3/8 - 18	15,000
4-8 GBMP7	1/4	1/2 - 14	15,000
6-2 GBMP7	3/8	1/8 - 27	15,000
6-4 GBMP7	3/8	1/4 - 18	15,000
6-6 GBMP7	3/8	3/8 - 18	15,000
6-8 GBMP7	3/8	1/2 - 14	15,000
8-4 GBMP7	1/2	1/4 - 18	15,000
8-6 GBMP7	1/2	3/8 - 18	15,000
8-8 GBMP7	1/2	1/2 - 14	15,000
9-4 GBMP7	9/16	1/4 -18	15,000
9-6 GBMP7	9/16	3/8 - 18	15,000
9-8 GBMP7	9/16	1/2 - 14	15,000
12-8 GBMP7	3/4	1/2 - 14	15,000

MP7HBA

MPI™ to SAE Male O-Ring Connector

PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	MPI™ SIZE	SAE* END	THREAD	
4-4 MP7HBA	1/4	1/4	7/16 - 20	12,500
4-6 MP7HBA	1/4	3/8	9/16 - 18	12,500
4-8 MP7HBA	1/4	1/2	3/4 - 16	12,500
6-4 MP7HBA	3/8	1/4	7/16 - 20	12,500
6-6 MP7HBA	3/8	3/8	9/16 - 18	12,500
6-8 MP7HBA	3/8	1/2	3/4 - 16	12,500
8-4 MP7HBA	1/2	1/4	7/16 - 20	12,500
8-6 MP7HBA	1/2	3/8	9/16 - 18	12,500
8-8 MP7HBA	1/2	1/2	3/4 - 16	12,500
9-6 MP7HBA	9/16	3/8	9/16 - 18	12,500
9-8 MP7HBA	9/16	1/2	3/4 - 16	12,500

* All male o-ring ends for MPI™ fittings are heavy duty and comply with SAE J1926-2. This end has maximum thread engagement for strength and requires the minimum full thread engagement specified in SAE J9126 for the female port. Standard O-ring material is Nitrile #N0552-90.

M40HBMP7

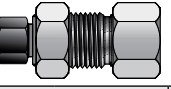
Type "M" High Pressure Hose to MPI™ Connector

PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	HOSE* ADAPTER	MPI™ SIZE	THREAD	
6-4 M40HBMP7	- 6	1/4	9/16 - 18	15,000
6-6 M40HBMP7	- 6	3/8	9/16 - 18	15,000
8-6 M40HBMP7	- 8	3/8	3/4 - 16	15,000
8-8 M40HBMP7	- 8	1/2	3/4 - 16	15,000
8-9 M40HBMP7	- 8	9/16	3/4 - 16	15,000
10-4 M40HBMP7	- 10	1/4	7/8 - 14	15,000
10-6 M40HBMP7	- 10	3/8	7/8 - 14	15,000
11-8 M40HBMP7	- 11	1/2	1 - 12	15,000
11-9 M40HBMP7	- 11	9/16	1 - 12	15,000
11-12 M40HBMP7	-11	3/4	1 - 12	15,000
16-16 M40HBMP7	- 16	1	1 5/16 - 12	12,500

* Adapts to Type "M" Swivel Hose Connection.

GH2BMP7

MPI™ Bulkhead to Female NPT Connector



PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	MPI™ SIZE	NPT THREAD	THREAD	
4-4 GH2BMP7	1/4	1/4 - 18	3/4 - 20	15,000
6-8 GH2BMP7	3/8	1/2 - 14	7/8 - 20	15,000
6-12 GH2BMP7	3/8	3/4 - 14	7/8 - 20	10,000
8-12 GH2BMP7	1/2	3/4 - 14	1 1/8 - 20	10,000
9-4 GH2BMP7	9/16	1/4 - 18	1 1/8 - 20	15,000

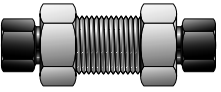
* Bulkhead hole approximately 1/64" (.015") larger than thread major diameter.

HBMP7
MPI™ to Union Connector

PARKER PART NO.	INCHES MPI™ SIZE	WORKING PRESSURE (PSIG)
4-4 HBMP7	1/4	15,000
6-4 HBMP7	3/8 - 1/4	15,000
6-6 HBMP7	3/8	15,000
8-4 HBMP7	1/2 - 1/4	15,000
8-6 HBMP7	1/2 - 3/8	15,000
8-8 HBMP7	1/2	15,000
9-4 HBMP7	9/16 - 1/4	15,000
9-6 HBMP7	9/16 - 3/8	15,000
9-8 HBMP7	9/16 - 1/2	15,000
9-9 HBMP7	9/16	15,000
12-6 HBMP7	3/4 - 3/8	15,000
12-9 HBMP7	3/4 - 9/16	15,000
12-12 HBMP7	3/4	15,000
16-16 HBMP7	1	12,500

WBMP7

MPI™ Bulkhead Union Connector



PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	MPI™ SIZE	THREADS*	HEX	
4-4 WBMP7	1/4	3/4-20	1	15,000
6-6 WBMP7	3/8	7/8-20	1 1/8	15,000
8-8 WBMP7	1/2	1 1/8-20	1 3/8	15,000
8-9 WBMP7	1/2 - 9/16	1 1/8-20	1 3/8	15,000
9-8 WBMP7	9/16 - 1/2	1 1/8-20	1 3/8	15,000
9-9 WBMP7	9/16	1 1/8-20	1 3/8	15,000
12-12 WBMP7	3/4	1 7/16-18	1 7/8	15,000
16-16 WBMP7	1	1 7/8-12	2 1/2	12,500

* Bulkhead hole approximately 1/64" (.015") larger than thread major diameter.

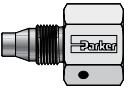
GM7
MPI™ Male End to Female NPT

PARKER PART NO.	INCHES		WORKING PRESSURE (PSIG)
	MPI™ MALE THREAD[1]	NPT THREAD	
4-4 GM7	1/4	1/4 - 18	15,000
4-6 GM7	1/4	3/8 - 18	15,000
6-4 GM7	3/8	1/4 - 18	15,000
6-6 GM7	3/8	3/8 - 18	15,000
6-8 GM7	3/8	1/2 - 14	15,000
8-4 GM7	1/2	1/4 - 18	15,000
8-6 GM7	1/2	3/8 - 18	15,000
8-8 GM7	1/2	1/2 - 14	15,000
9-4 GM7	9/16	1/4 - 18	15,000
9-6 GM7	9/16	3/8 - 18	15,000
9-8 GM7	9/16	1/2 - 14	15,000
12-4 GM7	3/4	1/4 - 18	15,000
12-6 GM7	3/4	3/8 - 18	15,000
12-8 GM7	3/4	1/2 - 14	15,000

[1]Assemble 1/4 to 1/2 turn from finger tight & lubricate threads & taper before each remake.

GM7

MPI™ Male End to High Pressure C&T Port



PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	MPI™ MALE THREAD*	HIGH PRESS C&T PORT	C&T THREAD	
4-4HF GM7	1/4	1/4	9/16 - 18	15,000
6-4HF GM7	3/8	1/4	9/16 - 18	15,000
6-6HF GM7	3/8	3/8	3/4 - 16	15,000
8-4HF GM7	1/2	1/4	9/16 - 18	15,000
8-6HF GM7	1/2	3/8	3/4 - 16	15,000
9-4HF GM7	9/16	1/4	9/16 - 18	15,000
9-6HF GM7	9/16	3/8	3/4 - 16	15,000
12-4HF GM7	3/4	1/4	9/16 - 18	15,000
12-6HF GM7	3/4	3/8	3/4 - 16	15,000

* Assemble 1/4 to 1/2 turn from finger tight & lubricate threads & taper before each remake.

T7HBT7
MPI™ Tube Port Connector

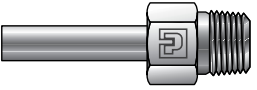
PARKER PART NO.	INCHES		WORKING PRESSURE (PSIG)
	TUBE SIZE	L	
* 4 T7HBT7-SS	1/4	2.72	15,000
4 T7HBT7-SS 4.0	1/4	4.00	15,000
4 T7HBT7-SS 6.0	1/4	6.00	15,000
4 T7HBT7-SS 8.0	1/4	8.00	15,000
4 T7HBT7-SS 10.0	1/4	10.00	15,000
4 T7HBT7-SS 12.0	1/4	12.00	15,000
* 6 T7HBT7-SS	3/8	3.19	15,000
6 T7HBT7-SS 4.0	3/8	4.00	15,000
6 T7HBT7-SS 6.0	3/8	6.00	15,000
6 T7HBT7-SS 8.0	3/8	8.00	15,000
6 T7HBT7-SS 10.0	3/8	10.00	15,000
6 T7HBT7-SS 12.0	3/8	12.00	15,000
* 9 T7HBT7-SS	9/16	3.85	15,000
9 T7HBT7-SS 6.0	9/16	6.00	15,000
9 T7HBT7-SS 8.0	9/16	8.00	15,000
9 T7HBT7-SS 10.0	9/16	10.00	15,000
9 T7HBT7-SS 12.0	9/16	12.00	15,000
* 12 T7HBT7-SS	3/4	4.55	15,000
12 T7HBT7-SS 6.0	3/4	6.00	15,000
12 T7HBT7-SS 8.0	3/4	8.00	15,000
12 T7HBT7-SS 10.0	3/4	10.00	15,000
12 T7HBT7-SS 12.0	3/4	12.00	15,000

Assemble 1/2 turn from finger tight.

* Same Assembled Length as MP7PC.

T7HF

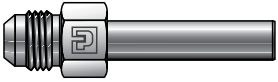
MPI™ Tube Stub to Male NPT Pipe



PARKER PART NO.	INCHES		WORKING PRESSURE (PSIG)
	MPI™ TUBE STUB	NPT THREAD	
4-4 T7HF	1/4	1/4 - 18	15,000
4-6 T7HF	1/4	3/8 - 18	15,000
4-8 T7HF	1/4	1/2 - 14	15,000
6-4 T7HF	3/8	1/4 - 18	15,000
6-6 T7HF	3/8	3/8 - 18	15,000
6-8 T7HF	3/8	1/2 - 14	15,000
8-4 T7HF	1/2	1/4 - 18	15,000
8-6 T7HF	1/2	3/8 - 18	15,000
8-8 T7HF	1/2	1/2 - 14	15,000
9-4 T7HF	9/16	1/4 - 18	15,000
9-6 T7HF	9/16	3/8 - 18	15,000
9-8 T7HF	9/16	1/2 - 14	15,000
9-12 T7HF	9/16	3/4 - 14	10,000
12-8 T7HF	3/4	1/2 - 14	15,000
12-12 T7HF	3/4	3/4 - 14	10,000

Add "-Z6" to part number for part assembled with preset ferrules and nuts.

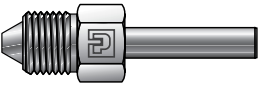
XHT7
37° Flare to MPI™ Tube Stub



PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	37° FLARE ADAPTER SIZE	MPI™ TUBE STUB	THREAD	
4-4 XHT7	1/4	1/4	7/16 - 20	15,000
4-6 XHT7	1/4	3/8	7/16 - 20	15,000
6-4 XHT7	3/8	1/4	9/16 - 18	12,500
6-6 XHT7	3/8	3/8	9/16 - 18	12,500
6-8 XHT7	3/8	1/2	9/16 - 18	12,500
6-9 XHT7	3/8	9/16	9/16 - 18	12,500
8-6 XHT7	1/2	3/8	3/4 - 16	12,500
8-8 XHT7	1/2	1/2	3/4 - 16	12,500
8-9 XHT7	1/2	9/16	3/4 - 16	12,500

Add "-Z6" to part number for part assembled with preset ferrules and nuts.

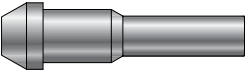
X41HT7
High Pressure to MPI™ Tube Stub



PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	HIGH PRESSURE ADAPTER SIZE	MPI™ TUBE STUB	THREAD	
4-4 X41HT7	1/4	1/4	9/16 - 18	15,000
4-6 X41HT7	1/4	3/8	9/16 - 18	15,000
4-8 X41HT7	1/4	1/2	9/16 - 18	15,000
4-9 X41HT7	1/4	9/16	9/16 - 18	15,000
6-4 X41HT7	3/8	1/4	3/4 - 16	15,000
6-6 X41HT7	3/8	3/8	3/4 - 16	15,000
6-8 X41HT7	3/8	1/2	3/4 - 16	15,000
6-9 X41HT7	3/8	9/16	3/4 - 16	15,000
9-4 X41HT7	9/16	1/4	1 1/8 - 12	15,000
9-6 X41HT7	9/16	3/8	1 1/8 - 12	15,000
9-8 X41HT7	9/16	1/2	1 1/8 - 12	15,000
9-9 X41HT7	9/16	9/16	1 1/8 - 12	15,000

Add "-Z6" to part number for part assembled with preset ferrules and nuts.

X47HT7
Medium Pressure Port Connector to MPI™ Tube Stub



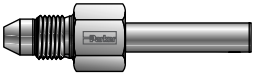
PARKER PART NO.	INCHES		WORKING PRESSURE (PSIG)
	MP PORT CONNECTOR #1	MPI™ TUBE STUB #2	
16-9 X47HT7	1	9/16	15,000
16-12 X47HT7	1	3/4	15,000
16-16 X47HT7	1	1	12,500

End # 1 must be used with a Medium Pressure Gland.

Add "-Z6" to part number for part assembled with preset ferrules and nuts.

X42HT7

Medium Pressure to MPI™ Tube Stub

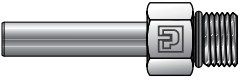


PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	MEDIUM PRESSURE ADAPTER	MPI™ TUBE STUB	THREAD	
4-4 X42HT7	1/4	1/4	7/16 - 20	15,000
4-6 X42HT7	1/4	3/8	7/16 - 20	15,000
4-8 X42HT7	1/4	1/2	7/16 - 20	15,000
4-9 X42HT7	1/4	9/16	7/16 - 20	15,000
6-4 X42HT7	3/8	1/4	9/16 - 18	15,000
6-6 X42HT7	3/8	3/8	9/16 - 18	15,000
6-8 X42HT7	3/8	1/2	9/16 - 18	15,000
6-9 X42HT7	3/8	9/16	9/16 - 18	15,000
9-4 X42HT7	9/16	1/4	13/16 - 16	15,000
9-6 X42HT7	9/16	3/8	13/16 - 16	15,000
9-8 X42HT7	9/16	1/2	13/16 - 16	15,000
9-9 X42HT7	9/16	9/16	13/16 - 16	15,000
9-12 X42HT7	9/16	3/4	13/16 - 16	15,000
12-9 X42HT7	3/4	9/16	3/4 - 14 NPS	15,000
12-12 X42HT7	3/4	3/4	3/4 - 14 NPS	15,000

Add "-Z6" to part number for part assembled with preset ferrules and nuts.

T7HOA

MPI™ Tube Stub to Male SAE O-ring



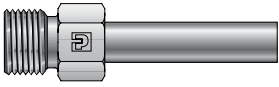
PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	MPI™ TUBE STUB	SAE O-RING END	THREAD	
4-4 T7HOA	1/4	1/4	7/16 - 20	12,500
4-6 T7HOA	1/4	3/8	9/16 - 18	12,500
4-8 T7HOA	1/4	1/2	3/4 - 16	12,500
6-4 T7HOA	3/8	1/4	7/16 - 20	12,500
6-6 T7HOA	3/8	3/8	9/16 - 18	12,500
6-8 T7HOA	3/8	1/2	3/4 - 16	12,500
8-4 T7HOA	1/2	1/4	7/16 - 20	12,500
8-6 T7HOA	1/2	3/8	9/16 - 18	12,500
8-8 T7HOA	1/2	1/2	3/4 - 16	12,500
9-4 T7HOA	9/16	1/4	7/16 - 20	12,500
9-6 T7HOA	9/16	3/8	9/16 - 18	12,500
9-8 T7HOA	9/16	1/2	3/4 - 16	12,500

Add "-Z6" to part number for part assembled with preset ferrules and nuts.

* All male o-ring ends for MPI™ fittings are heavy duty and comply with SAE J1926-2. This end has maximum thread engagement for strength and requires the minimum full thread engagement specified in SAE J9126 for the female port. Standard O-ring material is Nitrile #N0552-90.

M40HT7

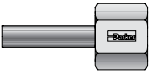
Type "M" High Pressure Hose Adapter to MPI™ Tube Stub



PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	HOSE ADAPTER SIZE	MPI™ TUBE STUB	THREAD	
6-4 M40HT7	-6	1/4	9/16 - 18	15,000
6-6 M40HT7	-6	3/8	9/16 - 18	15,000
8-6 M40HT7	-8	3/8	3/4 - 16	15,000
8-9 M40HT7	-8	9/16	3/4 - 16	15,000
11-6 M40HT7	-11	3/8	1 - 12	15,000
11-9 M40HT7	-11	9/16	1 - 12	15,000
11-12 M40HT7	-11	3/4	1 - 12	15,000
16-12 M40HT7	-16	3/4	1 5/16 - 12	15,000
16-16 M40HT7	-16	1	1 5/16 - 12	12,500

Add "-Z6" to part number for part assembled with preset ferrules and nuts.

TRBMP7
MPI™ Tube Stub Reducer



PARKER PART NO.	INCHES		WORKING PRESSURE (PSIG)
	MPI™ TUBE STUBE #1	MPI™ TUBE STUB #2	
4-6 TRBMP7	1/4	3/8	15,000
4-8 TRBMP7	1/4	1/2	15,000
4-9 TRBMP7	1/4	9/16	15,000
6-4 TRBMP7	3/8	1/4	15,000
6-8 TRBMP7	3/8	1/2	15,000
6-9 TRBMP7	3/8	9/16	15,000
8-4 TRBMP7	1/2	1/4	15,000
8-6 TRBMP7	1/2	3/8	15,000
9-4 TRBMP7	9/16	1/4	15,000
9-6 TRBMP7	9/16	3/8	15,000
9-12 TRBMP7	9/16	3/4	15,000
12-4 TRBMP7	3/4	1/4	15,000
12-6 TRBMP7	3/4	3/8	15,000
12-9 TRBMP7	3/4	9/16	15,000

Add “-Z6” to part number for part assembled with preset ferrules and nuts.

T7HG

MPI™ Tube Stub to Female NPT Pipe

PARKER PART NO.	INCHES		WORKING PRESSURE (PSIG)
	MPI™ TUBE STUB	NPT THREAD	
4-2 T7HG	1/4	1/8 - 27	15,000
4-4 T7HG	1/4	1/4 - 18	15,000
4-8 T7HG	1/4	1/2 - 14	15,000
6-2 T7HG	3/8	1/8 - 27	15,000
6-4 T7HG	3/8	1/4 - 18	15,000
6-8 T7HG	3/8	1/2 - 14	15,000
8-2 T7HG	1/2	1/8 - 27	15,000
8-4 T7HG	1/2	1/4 - 18	15,000
8-8 T7HG	1/2	1/2 - 14	15,000
9-4 T7HG	9/16	1/4 - 18	15,000
9-8 T7HG	9/16	1/2 - 14	15,000
12-8 T7HG	3/4	1/2 - 14	15,000
12-12 T7HG	3/4	3/4 - 11 1/2	10,000
16-16 T7HG	1	1 - 11 1/2	10,000

Add "-Z6" to part number for part assembled with preset ferrules and nuts.

MP7PC
MPI™ Port Connector

PARKER PART NO.	INCHES		WORKING PRESSURE (PSIG)
	MPI™ TUBE STUBE #1	MPI™ PORT #2*	
4-4 MP7PC	1/4	1/4	15,000
4-6 MP7PC	1/4	3/8	15,000
6-6 MP7PC	3/8	3/8	15,000
6-8 MP7PC	3/8	1/2	15,000
6-9 MP7PC	3/8	9/16	15,000
8-8 MP7PC	1/2	1/2	15,000
9-9 MP7PC	9/16	9/16	15,000
9-12 MP7PC	9/16	3/4	15,000
12-12 MP7PC	3/4	3/4	15,000
12-16 MP7PC	3/4	1	12,500
16-16 MP7PC	1	1	12,500

* Assemble 1/4 to 1/2 turn from finger tight.

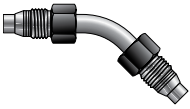
Add “-Z6” to part number for part assembled with preset ferrules and nuts.

NBMP7
45° MPI™ Union Elbow

PARKER PART NO.	INCHES	WORKING PRESSURE (PSIG)
	MPI™ SIZE	
4-4 NBMP7	1/4	15,000
6-6 NBMP7	3/8	15,000
8-8 NBMP7	1/2	15,000
9-9 NBMP7	9/16	15,000
12-12 NBMP7	3/4	15,000

T7NBT7

45° MPI™ Tube Stub Elbow



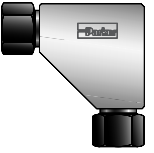
PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	TUBE SIZE	H	R	
4 T7NBT7-SS	1/4	1.69	0.75	15,000
* 4 T7NBT7-SS 2.9	1/4	2.88	0.75	15,000
4 T7NBT7-SS 6.0	1/4	6.00	0.75	15,000
4 T7NBT7-SS 8.0	1/4	8.00	0.75	15,000
4 T7NBT7-SS 10.0	1/4	10.00	0.75	15,000
4 T7NBT7-SS 12.0	1/4	12.00	0.75	15,000
6 T7NBT7-SS	3/8	2.14	1.25	15,000
* 6 T7NBT7-SS 3.4	3/8	3.42	1.25	15,000
6 T7NBT7-SS 6.0	3/8	6.00	1.25	15,000
6 T7NBT7-SS 8.0	3/8	8.00	1.25	15,000
6 T7NBT7-SS 10.0	3/8	10.00	1.25	15,000
6 T7NBT7-SS 12.0	3/8	12.00	1.25	15,000
9 T7NBT7-SS	9/16	2.77	2.00	15,000
* 9 T7NBT7-SS 4.2	9/16	4.18	2.00	15,000
9 T7NBT7-SS 6.0	9/16	6.00	2.00	15,000
9 T7NBT7-SS 8.0	9/16	8.00	2.00	15,000
9 T7NBT7-SS 10.0	9/16	10.00	2.00	15,000
9 T7NBT7-SS 12.0	9/16	12.00	2.00	15,000
12 T7NBT7-SS	3/4	3.55	3.00	15,000
12 T7NBT7-SS 5.1	3/4	5.11	3.00	15,000
12 T7NBT7-SS 6.0	3/4	6.00	3.00	15,000
12 T7NBT7-SS 8.0	3/4	8.00	3.00	15,000
12 T7NBT7-SS 10.0	3/4	10.00	3.00	15,000
12 T7NBT7-SS 12.0	3/4	12.00	3.00	15,000

Assemble 1/2 turn from finger tight.

* Similar Assembled Lengths as NBMP7 with Two (2) MP7PC's.

EBMP7

MPI™ Union Elbow



PARKER PART NO.	INCHES MPI™ SIZE	WORKING PRESSURE (PSIG)
4-4 EBMP7	1/4	15,000
6-6 EBMP7	3/8	15,000
8-8 EBMP7	1/2	15,000
9-9 EBMP7	9/16	15,000
12-12 EBMP7	3/4	15,000
16-16 EBMP7	1	12,500

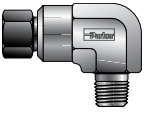
T7EBT7
MPI™ Tube Elbow

PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	TUBE SIZE	H	R	
4 T7EBT7-SS	1/4	2.12	0.75	15,000
* 4 T7EBT7-SS 2.9	1/4	2.91	0.75	15,000
4 T7EBT7-SS 6.0	1/4	6.00	0.75	15,000
4 T7EBT7-SS 8.0	1/4	8.00	0.75	15,000
4 T7EBT7-SS 10.0	1/4	10.00	0.75	15,000
4 T7EBT7-SS 12.0	1/4	12.00	0.75	15,000
6 T7EBT7-SS	3/8	2.88	1.25	15,000
* 6 T7EBT7-SS 3.5	3/8	3.47	1.25	15,000
6 T7EBT7-SS 6.0	3/8	6.00	1.25	15,000
6 T7EBT7-SS 8.0	3/8	8.00	1.25	15,000
6 T7EBT7-SS 10.0	3/8	10.00	1.25	15,000
6 T7EBT7-SS 12.0	3/8	12.00	1.25	15,000
* 9 T7EBT7-SS	9/16	4.22	2.00	15,000
9 T7EBT7-SS 6.0	9/16	6.00	2.00	15,000
9 T7EBT7-SS 8.0	9/16	8.00	2.00	15,000
9 T7EBT7-SS 10.0	9/16	10.00	2.00	15,000
9 T7EBT7-SS 12.0	9/16	12.00	2.00	15,000
12 T7EBT7-SS	3/4	5.31	3.00	15,000
12 T7EBT7-SS 6.0	3/4	6.00	3.00	15,000
12 T7EBT7-SS 8.0	3/4	8.00	3.00	15,000
12 T7EBT7-SS 10.0	3/4	10.00	3.00	15,000
12 T7EBT7-SS 12.0	3/4	12.00	3.00	15,000

Assemble 1/2 turn from finger tight.

* Same Assembled Lengths as EBMP7 with Two (2) MP7PC's.

CBMP7
MPI™ to Male NPT Elbow



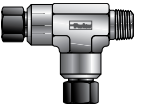
PARKER PART NO.	INCHES		WORKING PRESSURE (PSIG)
	MPI™ TUBE SIZE	NPT THREAD	
4-4 CBMP7	1/4	1/4 - 18	15,000
4-6 CBMP7	1/4	3/8 - 18	12,000
4-8 CBMP7	1/4	1/2 - 14	10,000
6-4 CBMP7	3/8	1/4 - 18	12,500
6-6 CBMP7	3/8	3/8 - 18	12,000
6-8 CBMP7	3/8	1/2 - 14	10,000

JBMP7
MPI™ Union Tee

PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	MPI™ SIZE #1	MPI™ SIZE #2	MPI™ SIZE #3	
4-4-4 JBMP7	1/4	1/4	1/4	15,000
6-6-6 JBMP7	3/8	3/8	3/8	15,000
8-8-8 JBMP7	1/2	1/2	1/2	15,000
9-9-9 JBMP7	9/16	9/16	9/16	15,000
12-12-12 JBMP7	3/4	3/4	3/4	15,000
16-16-16 JBMP7	1	1	1	12,500
4-4-6 JBMP7	1/4	1/4	3/8	15,000
6-6-4 JBMP7	3/8	3/8	1/4	15,000
6-4-4 JBMP7	3/8	1/4	1/4	15,000
6-6-8 JBMP7	3/8	3/8	1/2	15,000
6-6-9 JBMP7	3/8	3/8	9/16	15,000
8-8-6 JBMP7	1/2	1/2	3/8	15,000
8-6-6 JBMP7	1/2	3/8	3/8	15,000
9-9-4 JBMP7	9/16	9/16	1/4	15,000
9-9-6 JBMP7	9/16	9/16	3/8	15,000
9-6-4 JBMP7	9/16	3/8	1/4	15,000
9-6-6 JBMP7	9/16	3/8	3/8	15,000
12-12-9 JBMP7	3/4	3/4	9/16	15,000
16-16-9 JBMP7	1	1	9/16	12,500
16-16-12 JBMP7	1	1	3/4	12,500

RBMP7

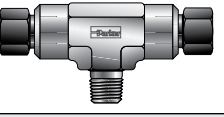
MPI™ to Male Run NPT Tee



PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	MPI™ SIZE #1	NPT THREAD #2	MPI™ SIZE #3	
4-4-4 RBMP7	1/4	1/4 - 18	1/4	15,000
4-4-6 RBMP7	1/4	1/4 - 18	3/8	12,500
4-6-4 RBMP7	1/4	3/8 -18	1/4	12,000
4-6-6 RBMP7	1/4	3/8 -18	3/8	12,000
6-4-4 RBMP7	3/8	1/4 - 18	1/4	12,500
6-4-6 RBMP7	3/8	1/4 - 18	3/8	12,500
6-6-4 RBMP7	3/8	3/8 -18	1/4	12,000
6-6-6 RBMP7	3/8	3/8 -18	3/8	12,000

SBMP7

MPI™ to Male Branch NPT Tee

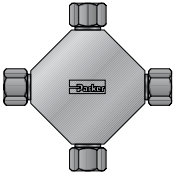


PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	MPI™ SIZE #1	NPT THREAD #2	MPI™ SIZE #3	
4-4-4 SBMP7	1/4	1/4	1/4 - 18	15,000
4-4-6 SBMP7	1/4	3/8	3/8 -18	12,000
6-6-4 SBMP7	3/8	1/4	1/4 - 18	12,500
6-6-6 SBMP7	3/8	3/8	3/8 -18	12,000

OBMP7
MPI™ to NPT Female Branch Tee

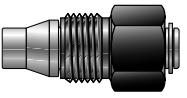
PARKER PART NO.	INCHES			WORKING PRESSURE (PSIG)
	MPI™ SIZE #1	MPI™ SIZE #2	NPT THREAD #3	
4-4-4 OBMP7	1/4	1/4	1/4-18	15,000
6-6-4 OBMP7	3/8	3/8	1/4-18	15,000
6-6-8 OBMP7	3/8	3/8	1/2-14	15,000
8-8-8 OBMP7	1/2	1/2	1/2-14	15,000
9-9-8 OBMP7	9/16	9/16	1/2-14	15,000
12-12-8 OBMP7	3/4	3/4	1/2-14	15,000

KBMP7
MPI™ Union Cross



PARKER PART NO.	INCHES	WORKING PRESSURE (PSIG)
	MPI™ SIZE	
4 KBMP7	1/4	15,000
6 KBMP7	3/8	15,000
8 KBMP7	1/2	15,000
9 KBMP7	9/16	15,000
12 KBMP7	3/4	15,000

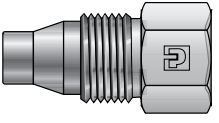
FNMP7
MPI™ Plug



PARKER PART NO.	INCHES MPI™ SIZE	WORKING PRESSURE (PSIG)
4 FNMP7	1/4	15,000
6 FNMP7	3/8	15,000
8 FNMP7	1/2	15,000
9 FNMP7	9/16	15,000
12 FNMP7	3/4	15,000
16 FNMP7	1	12,500

Assemble 1/4 to 1/2 turn from finger tight.

FNM7
MPI™ Plug



PARKER PART NO.	INCHES MPI™ SIZE	WORKING PRESSURE (PSIG)
4 FNM7	1/4	15,000
6 FNM7	3/8	15,000
8 FNM7	1/2	15,000
9 FNM7	9/16	15,000
12 FNM7	3/4	15,000

Assemble 1/4 to 1/2 turn from finger tight and lubricate threads and taper before each remake.

PNBMP7
MPI™ Cap

PARKER PART NO.	INCHES MPI™ SIZE	WORKING PRESSURE (PSIG)
4 PNBMP7	1/4	15,000
6 PNBMP7	3/8	15,000
8 PNBMP7	1/2	15,000
9 PNBMP7	9/16	15,000
12 PNBMP7	3/4	15,000
16 PNBMP7	1	12,500

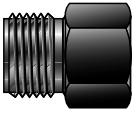
MPFF
MPI™ Front Ferrule

PARKER PART NO.	TUBE O.D.
4 MPFF	1/4
6 MPFF	3/8
8 MPFF	1/2
9 MPFF	9/16
12 MPFF	3/4
16 MPFF	1

MPBF
MPI™ Back Ferrule

PARKER PART NO.	TUBE O.D.
4 MPBF	1/4
6 MPBF	3/8
8 MPBF	1/2
9 MPBF	9/16
12 MPBF	3/4
16 MPBF	1

BMP7
MPI™ Nut



PARKER PART NO.	MPI™ SIZE
4 MPFF	1/4
4 BMP7	1/4
6 BMP7	3/8
8 BMP7	1/2
9 BMP7	9/16
12 BMP7	3/4
16 BMP7	1

Gaugeability Tools

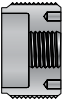
Inspection Gauge

MPIF Inspection Gauge

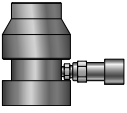
This one handy gauge works for all MPI™ sizes. The end of the gauge checks the fitting gap after make-up.

MPI™ HYDRAULIC PRESET TOOLS

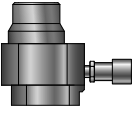
MPI™
Body Die



MPI™
Nut Die



PARKER PART No.
MPI SMALL PRESET ASSEMBLY



PARKER PART No.
MPI LARGE PRESET ASSEMBLY

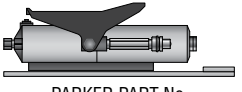
Body Dies and Nut Dies Used with the

MPI SMALL PRESET ASSEMBLY		INCHES	PRESET
BODY DIE PART No.	NUT DIE PART No.	MPI™ NUT SIZE	PRESSURE (PSIG)
4 MPI BODY DIE	4 MPI NUT DIE	4	3,000
6 MPI BODY DIE	6 MPI NUT DIE	6	3,500
8 MPI BODY DIE	8 MPI NUT DIE	8	6,500
9 MPI BODY DIE	9 MPI NUT DIE	9	8,000

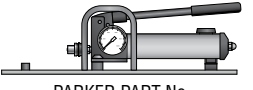
Body Dies and Nut Dies Used with the

MPI LARGE PRESET ASSEMBLY		INCHES	PRESET
BODY DIE PART No.	NUT DIE PART No.	MPI™ NUT SIZE	PRESSURE (PSIG)
*9 MPI BODY DIE	9 MPI LARGE NUT DIE	9	3,400
12 MPI BODY DIE	12 MPI NUT DIE	12	5,100
16 MPI BODY DIE	16 MPI NUT DIE	16	8,000

* Requires a **9 MPI BODY DIE ADAPTER.**



PARKER PART No.
MPI AIR PUMP KIT



PARKER PART No.
MPI HAND PUMP KIT

Note: One Pump Kit, Preset Assembly, Body Die and Nut Die are required for presetting. Pump Kits and Preset Assemblies can be interchanged but Body Dies and Nut Dies are for a specific Preset Assembly. Detailed operating instructions are included with each kit.

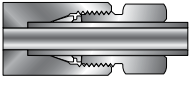
Introduction

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

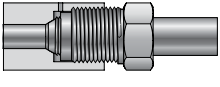
F
Female NPT
To 15,000 PSI

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

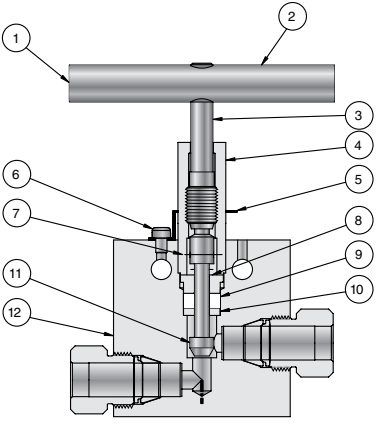


T7
Parker MPI™ Tube Stub
To 15,000 PSI

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

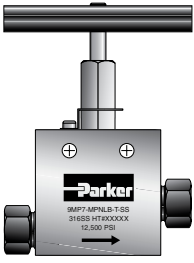


Materials of Construction

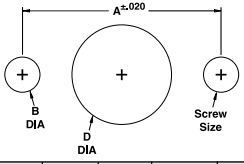


Item #	Description	Material
1	Soc Set Screw	Steel
2	Handle	Aluminum
3	Upper Stem Assembly	17-4PH
4	Packing Gland	316SS
5	Locking Device	300 SER. SS
6	10-32 X 1/4 Fill HD SCR.	300 SER. SS
7	Stem Pin	304SS
8	Top Packing Washer	416SS
9	Packing	PTFE
10	Bottom Packing Washer	316SS
11	Lower Stem	17-4PH-H900
12	Body	316SS

Two Way Inline Valves



Panel Hole Sizes
Medium Pressure Needle Valve Panel Mount



VALVE SIZE	A	B	SCREW SIZE	D
4 & 6	1.25	.219	10 - 32	.75
8 & 9	1.375	.219	10 - 32	1.00
12	1.75	2.19	10 - 32	1.19
16	2.50	.219	10 - 32	1.63

TUBING SIZE	PARKER PART No.	PSI	CONNECTION	INCHES ORIFICE
1/4" O.D.	4MP7-MPNLB-T-SS	15,000	1/4" MPI	0.125
3/8" O.D.	6MP7-MPNLB-T-SS	15,000	3/8" MPI	0.203
1/2" O.D.	8MP7-MPNLB-T-SS	15,000	1/2" MPI	0.313
9/16" O.D.	9MP7-MPNLB-T-SS	15,000	9/16" MPI	0.313
3/4" O.D.	12MP7-MPNLB-T-SS	15,000	3/4" MPI	0.438
3/4" O.D.	12MP7-MPNLBH-T-SS	10,000	3/4" MPI	0.516
1" O.D.	16MP7-MPNLB-T-SS	12,500	1" MPI	0.563
1" O.D.	16MP7-MPNLBH-T-SS	10,000	1" MPI	0.688

PIPE SIZE	PARKER PART No.	PSI	CONNECTION	INCHES ORIFICE
1/8" NPT	2F-MPNLB-T-SS	15,000	1/8" NPTF	0.203
1/4" NPT	4F-MPNLB-T-SS	15,000	1/4" NPTF	0.203
3/8" NPT	6F-MPNLB-T-SS	15,000	3/8" NPTF	0.312
1/2" NPT	8F-MPNLB-T-SS	15,000	1/2" NPTF	0.312
3/4" NPT	12F-MPNLB-T-SS	10,000	3/4" NPTF	0.687
1" NPT	16F-MPNLB-T-SS	10,000	1" NPTF	0.687

Two Way Angle Valves

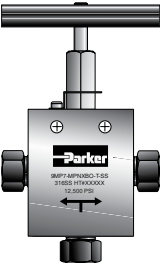
TUBING SIZE	PARKER PART No.	PSI	CONNECTION	INCHES ORIFICE
1/4" O.D.	4MP7-MPNAB-T-SS	15,000	1/4" MPI	0.125
3/8" O.D.	6MP7-MPNAB-T-SS	15,000	3/8" MPI	0.203
1/2" O.D.	8MP7-MPNAB-T-SS	15,000	1/2" MPI	0.313
9/16" O.D.	9MP7-MPNAB-T-SS	15,000	9/16 MPI	0.313
3/4" O.D.	12MP7-MPNAB-T-SS	15,000	3/4" MPI	0.438
3/4" O.D.	12MP7-MPNABH-T-SS	10,000	3/4" MPI	0.516
1" O.D.	16MP7-MPNAB-T-SS	12,500	1" MPI	0.563
1" O.D.	16MP7-MPNABH-T-SS	10,000	1" MPI	0.688

PIPE SIZE	PARKER PART No.	PSI	CONNECTION	INCHES ORIFICE
1/8" NPT	2F-MPNAB-T-SS	15,000	1/8" NPTF	0.203
1/4" NPT	4F-MPNAB-T-SS	15,000	1/4" NPTF	0.203
3/8" NPT	6F-MPNAB-T-SS	15,000	3/8" NPTF	0.312
1/2" NPT	8F-MPNAB-T-SS	15,000	1/2" NPTF	0.312
3/4" NPT	12F-MPNAB-T-SS	10,000	3/4" NPTF	0.687
1" NPT	16F-MPNAB-T-SS	10,000	1" NPTF	0.687

Three Way/Two Pressure Connections

TUBING SIZE	PARKER PART No.	PSI	CONNECTION	INCHES ORIFICE
1/4" O.D.	4MP7-MPNXBI-T-SS	15,000	1/4" MPI	0.125
3/8" O.D.	6MP7-MPNXBI-T-SS	15,000	3/8" MPI	0.203
1/2" O.D.	8MP7-MPNXBI-T-SS	15,000	1/2" MPI	0.313
9/16" O.D.	9MP7-MPNXBI-T-SS	15,000	9/16" MPI	0.313
3/4" O.D.	12MP7-MPNXBI-T-SS	15,000	3/4" MPI	0.438
3/4" O.D.	12MP7-MPNXBIH-T-SS	10,000	3/4" MPI	0.516
1" O.D.	16MP7-MPNXBI-T-SS	12,500	1" MPI	0.563
1" O.D.	16MP7-MPNXBIH-T-SS	10,000	1" MPI	0.688

Three Way/One Pressure Connection



TUBING SIZE	PARKER PART No.	PSI	CONNECTION	INCHES ORIFICE
1/4" O.D.	4MP7-MPNXBO-T-SS	15,000	1/4" MPI	0.125
3/8" O.D.	6MP7-MPNXBO-T-SS	15,000	3/8" MPI	0.203
1/2" O.D.	8MP7-MPNXBO-T-SS	15,000	1/2" MPI	0.313
9/16" O.D.	9MP7-MPNXBO-T-SS	15,000	9/16" MPI	0.313
3/4" O.D.	12MP7-MPNXBO-T-SS	15,000	3/4" MPI	0.438
3/4" O.D.	12MP7-MPNXBOH-T-SS	10,000	3/4" MPI	0.516
1" O.D.	16MP7-MPNXBO-T-SS	12,500	1" MPI	0.563
1" O.D.	16MP7-MPNXBOH-T-SS	10,000	1" MPI	0.688

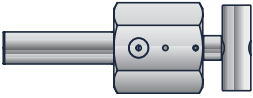
Three Way/Two Stem Connection

TUBING SIZE	PARKER PART No.	PSI	CONNECTION	INCHES ORIFICE
1/4" O.D.	4MP7-MPNXBD-T-SS	15,000	1/4" MPI	0.125
3/8" O.D.	6MP7-MPNXBD-T-SS	15,000	3/8" MPI	0.203
1/2" O.D.	8MP7-MPNXBD-T-SS	12,500	1/2" MPI	0.313
9/16" O.D.	9MP7-MPNXBD-T-SS	12,500	9/16" MPI	0.313
3/4" O.D.	12MP7-MPNXBD-T-SS	15,000	3/4" MPI	0.438
3/4" O.D.	12MP7-MPNXBDH-T-SS	10,000	3/4" MPI	0.516
1" O.D.	16MP7-MPNXBD-T-SS	12,500	1" MPI	0.563
1" O.D.	16MP7-MPNXBDH-T-SS	10,000	1" MPI	0.688

Two Way Angle Valves (Replaceable Seat)

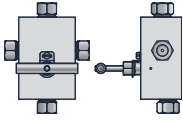
TUBING SIZE	PARKER PART No.	PSI	CONNECTION	INCHES ORIFICE
1/4" O.D.	4MP7-MPNABR-T-SS	15,000	1/4" MPI	0.125
3/8" O.D.	6MP7-MPNABR-T-SS	15,000	3/8" MPI	0.203
1/2" O.D.	8MP7-MPNABR-T-SS	15,000	1/2" MPI	0.313
9/16" O.D.	9MP7-MPNABR-T-SS	15,000	9/16" MPI	0.313
3/4" O.D.	12MP7-MPNABR-T-SS	15,000	3/4" MPI	0.438
3/4" O.D.	12MP7-MPNABRH-T-SS	10,000	3/4" MPI	0.516
1" O.D.	16MP7-MPNABR-T-SS	12,500	1" MPI	0.563
1" O.D.	16MP7-MPNABRH-T-SS	10,000	1" MPI	0.688

Bleed Valve



PARKER PART NO.	PSI	CONNECTION
9T7-MPBV-V-SS	15,000	9/16" Tube Stub
9HM-MPBV-V-SS	30,000	9/16" High Pressure Male

Gauge Valve



PARKER PART NO.	PSI	CONNECTION
9MP7-MPGV-V-SS	15,000	9/16" MPI™
9HF-MPGV-V-SS	30,000	9/16" High Pressure Female

MPB Series

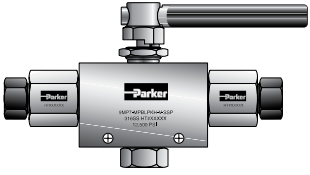
Introduction

Parker MPB series manually, pneumatically and electrically actuated 2-way and 3-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.

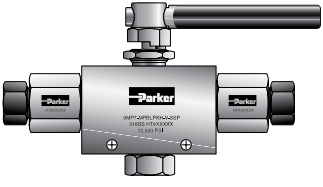
Two Way Ball Valves

TUBING SIZE	PARKER PART NO.	PSI	CONNECT.	INCHES		
				ORIF.	MIN. ORIF.	C_v
1/8" O.D.	2F-MPBLPK-V-SSP	15,000	1/8" NPT	0.187	0.187	1.45
1/4" O.D.	4F-MPBLPK-V-SSP	15,000	1/4" NPT	0.187	0.187	1.45
1/4" O.D.	4MP7-MPBLPK-V-SSP	15,000	1/4" MPI	0.187	0.125	0.45
3/8" O.D.	6F-MPBLPK-V-SSP	15,000	3/8" NPT	0.187	0.187	1.45
3/8" O.D.	6MP7-MPBLPK-V-SSP	15,000	3/8" MPI	0.187	0.187	1.45
1/2" O.D.	8MP7-MPBLPK-V-SSP	15,000	1/2" MPI	0.187	0.187	1.45
9/16" O.D.	9MP7-MPBLPK-V-SSP	15,000	9/16" MPI	0.187	0.187	1.45
1/2" O.D.	8F-MPBLPKH-V-SSP	15,000	1/2" NPT	0.375	0.375	6.08
1/2" O.D.	8MP7-MPBLPKH-V-SSP	15,000	1/2" MPI	0.375	0.359	5.82
9/16" O.D.	9MP7-MPBLPKH-V-SSP	15,000	9/16" MPI	0.375	0.359	5.82
3/4" O.D.	12MP7-MPBLPKH-V-SSP	15,000	3/4" MPI	0.375	0.375	6.08
1" O.D.	16MP7-MPBLPKH-V-SSP	12,500	1" MPI	0.375	0.375	6.08
3/4" O.D.	12 MP7-MPBLPKUH-V-SSP	10,000	3/4" MPI	0.500	0.469	7.60
1" O.D.	16MP7-MPBLPKUH-V-SSP	10,000	1" MPI	0.500	0.500	8.80

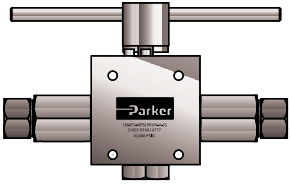
.187 Orifice



.375 Orifice

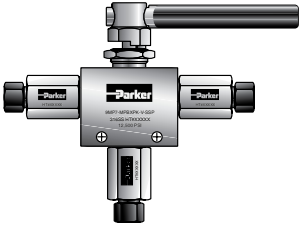


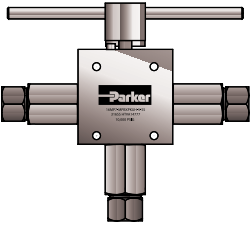
.500 Orifice



Three Way Ball Valves

.500 Orifice

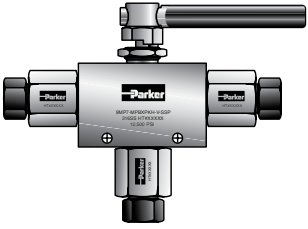




TUBING SIZE	3-WAY 90 DEGREES	PSI	CONNECT.	INCHES ORIF.	INCHES MIN. ORIF.	INCHES C_v
1/8" O.D.	2F-MPBXPKD-V-SSP	15,000	1/8" NPT	0.187	0.187	0.71
1/4" O.D.	4F-MPBXPKD-V-SSP	15,000	1/4" NPT	0.187	0.187	0.71
1/4" O.D.	4MP7-MPBXPKD-V-SSP	15,000	4MP7	0.187	0.125	0.18
3/8" O.D.	6F-MPBXPKD-V-SSP	15,000	3/8" NPT	0.187	0.187	0.71
3/8" O.D.	6MP7-MPBXPKD-V-SSP	15,000	6MP7	0.187	0.187	0.71
1/2" O.D.	8MP7-MPBXPKD-V-SSP	15,000	8MP7	0.187	0.187	0.71
9/16" O.D.	9MP7-MPBXPKD-V-SSP	15,000	9MP7	0.187	0.187	0.71
1/2" O.D.	8F-MPBXPKDH-V-SSP	15,000	1/2" NPT	0.375	0.375	2.40
1/2" O.D.	8MP7-MPBXPKDH-V-SSP	15,000	8MP7	0.375	0.359	2.30
9/16" O.D.	9MP7-MPBXPKDH-V-SSP	15,000	9MP7	0.375	0.359	2.30
3/4" O.D.	12MF-MPBXPKDH-V-SSP	15,000	12MF	0.375	0.375	2.40
1" O.D.	16MF-MPBXPKDH-V-SSP	15,000	16MF	0.375	0.375	2.40
3/4" O.D.	12MP7-MPBXPKDUH-V-SSP	10,000	3/4" MPI	0.500	0.469	3.20
1" O.D.	16MP7-MPBXPKDUH-V-SSP	10,000	1" MPI	0.500	0.500	3.80

Locking Devices – Add suffix "-LD" to the end of the part number.
Example: 9MP7-MPBLPKH-V-SS-LD

Three Way Ball Valves (Continued)



TUBING SIZE	3-WAY 180 DEGREES	PSI	CONNECT.	INCHES		
				ORIF.	MIN. ORIF.	C_v
1/8" O.D.	2F-MPBXPK-V-SSP	15,000	1/8" NPT	0.187	0.187	0.71
1/4" O.D.	4F-MPBXPK-V-SSP	15,000	1/4" NPT	0.187	0.187	0.71
1/4" O.D.	4MP7-MPBXPK-V-SSP	15,000	4MP7	0.187	0.125	0.18
3/8" O.D.	6F-MPBXPK-V-SSP	15,000	3/8" NPT	0.187	0.187	0.71
3/8" O.D.	6MP7-MPBXPK-V-SSP	15,000	6MP7	0.187	0.187	0.71
1/2" O.D.	8MP7-MPBXPK-V-SSP	15,000	8MP7	0.187	0.187	0.71
9/16" O.D.	9MP7-MPBXPK-V-SSP	15,000	9MP7	0.187	0.187	0.71
1/2" O.D.	8F-MPBXPKH-V-SSP	15,000	1/2" NPT	0.375	0.375	2.40
1/2" O.D.	8MP7-MPBXPKH-V-SSP	15,000	8MP7	0.375	0.359	2.30
9/16" O.D.	9MP7-MPBXPKH-V-SSP	15,000	9MP7	0.375	0.359	2.30
3/4" O.D.	12MF-MPBXPKH-V-SSP	15,000	12MF	0.375	0.375	2.40
1" O.D.	16MF-MPBXPKH-V-SSP	15,000	16MF	0.375	0.375	2.40
3/4" O.D.	12MP7-MPBXPKUH-V-SSP	10,000	3/4" MPI	0.500	0.469	3.20
1" O.D.	16MP7-MPBXPKUH-V-SSP	10,000	1" MPI	0.500	0.500	3.80

Locking Devices – Add suffix "-LD" to the end of the part number.
Example: 9MP7-MPBLPKH-V-SS-LD

MPF Series

Introduction

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.

Inline Filters

TUBING SIZE*	PSI	CONNECT.	INCHES ORIF.	FILTER MICRON SIZE AVAILABLE					
				0.05	2	5	10	40	100
1/4" O.D.	15,000	1/4" MPI	0.125	*	*	*	*	*	*
3/8" O.D.	15,000	3/8" MPI	0.219	*	*	*	*	*	*
1/2" O.D.	15,000	1/2" MPI	0.359	*	*	*	*	*	*
9/16" O.D.	15,000	9/16" MPI	0.359	*	*	*	*	*	*

* Parker Part Number for each tubing size is provided in the table below.

TUBING SIZE	PARKER PART No.
1/4" O.D.	4MP7-MPFL-100-SS
3/8" O.D.	6MP7-MPFL-100-SS
1/2" O.D.	8MP7-MPFL-100-SS
9/16" O.D.	9MP7-MPFL-100-SS

MPC and MPCB Series

Introduction

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

TUBING	BALL CHECK VALVE PART NO.	PSI	CONNECTION	INCHES ORIFICE
1/4" O.D.	4MP7-MPCBL-5-SS	15,000	1/4" MPI	0.125
3/8" O.D.	6MP7-MPCBL-5-SS	15,000	3/8" MPI	0.219
1/2" O.D.	8MP7-MPCBL-5-SS	15,000	1/2" MPI	0.359
9/16" O.D.	9MP7-MPCBL-5-SS	15,000	9/16" MPI	0.359
3/4" O.D.	12MP7-MPCBL-5-SS	15,000	3/4" MPI	0.438
1" O.D.	16MP7-MPCBL-5-SS	12,500	1" MPI	0.563

TUBING	POPPET CHECK VALVE PART NO.	PSI	CONNECTION	INCHES ORIFICE
1/4" O.D.	4MP7-MPCL-5-V-SS	15,000	1/4" MPI	0.125
3/8" O.D.	6MP7-MPCL-5-V-SS	15,000	3/8" MPI	0.219
1/2" O.D.	8MP7-MPCL-5-V-SS	15,000	1/2" MPI	0.359
9/16" O.D.	9MP7-MPCL-5-V-SS	15,000	9/16" MPI	0.359
3/4" O.D.	12MP7-MPCL-5-V-SS	15,000	3/4" MPI	0.438
1" O.D.	16MP7-MPCL-5-V-SS	12,500	1" MPI	0.563

MPR Series

Introduction

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.

Relief Valves (Factory Set)

PARKER PART No.	PSI PRESSURE RATING	CONNECTION	INCHES ORIF.	GPM MAX. FLOW CAPACITY
8M8F-MPRA-****-SS	1,500 to 2,999	1/2" M X F NPT	0.250	13
8M8F-MPRA-****-SS	3,000 to 10,999	1/2" M X F NPT	0.250	25
9HF8F-MPRA-****-SS	11,000 to 20,999	9HF X 1/2" NPTF	0.188	20

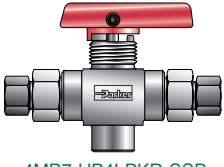
HB4 Series

Introduction

Parker HB4 Series Ball Valves are engineered and manufactured to provide reliable shut-off or switching functions. Their compact and rugged design incorporates spring-loaded seats for high cycle life and low operating torques at pressures up to 10,000 psi (689 bar). Every HB4 Series Ball Valve is manufactured with Parker SUPARCASE® trunnions and ball to resist corrosion, seizures, and particle abrasion.

SPECIFICATIONS	FLOW DATA
Pressure rating: 10,000 psi (689 bar) CWP with PEEK (PKR) Seats; 6,000 psi (414 bar) CWP with PCTFE (K) Seats **Temperature rating:** -65°F to 400°F (-54°C to 204°C) **Body material:** Stainless Steel **Body configurations:** Two-way and Three-way	**Two-way HB4L:** C_v = 1.02; x_T = 0.42; Orifice = 0.188" (4.8 mm) **Three-way HB4X:** C_v = 0.62; x_T = 0.71; Orifice = 0.188" (4.8 mm) Tested in accordance with ISA S75.02. Gas flow will be choked when $P_1 - P_2 / P_1 = x_T$.

For additional information about the HB Series of Ball Valves, including flow data and pressure ratings, see Catalog 4121-HB or contact your authorized Parker Instrumentation Distributor or the Parker Hannifin Instrumentation Products Division at (256) 435-2130.



4MP7-HB4LPKR-SSP

TUBING SIZE	PARKER PART No.	
	2-WAY	3-WAY
1/4" O.D.	4MP7-HB4LPKR-SSP	4MP7-HB4XPKR-SSP
3/8" O.D.	**6MP7-HB4LPKR-SSP**	**6MP7-HB4XPKR-SSP**
9/16" O.D.	**9MP7-HB4LPKR-SSP**	**9MP7-HB4XPKR-SSP**

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

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

7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and not withstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

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

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

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

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

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter 'Events of Force Majeure'). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

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

11/98-P

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Catalog 4234-PC, 10/07 DP