Parker
FluidConnectors

Alternative Fuel Products

Catalog 3850 USA
May 2000

The Natural Choice

Introduction

Parker Hannifin products control motion in a broad spectrum of essential uses. Parker has 800 product lines for hydraulic, pneumatic, instrumentation, and electromechanical applications in some 1,200 industrial and aero-space markets. In the field of motion control, no single manufacturer represents as broad a product line. Nearly 26,000 parker employees operate 143 manufacturing plants and 87 administrative and sales offices, company stores and warehouses around the world. The Company has the largest distribution network in this field, with over 4,900 distributors servicing more than 284,000 customers worldwide.

Parker Hannifin is the country's leader in designing and manufacturing products for delivering compressed (CNG) and Liquified Natural Gas (LNG). Parker makes the most complete product package for handling CNG including fittings, filters, couplings, valves, hoses, nozzles and receptacles.

Parker's development of new technologies and steady growth in established markets have made Parker Hannifin a global leader in motion control.

NGV

THE NATURAL GAS VEHICLE COALITION

Parker Hannifin Corporation
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CNG Products

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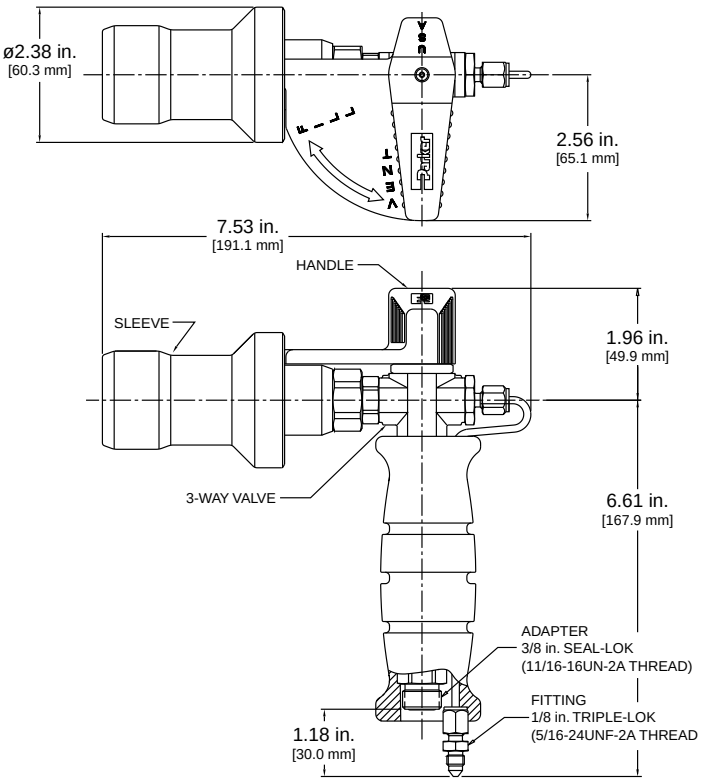
Self-Serve CNG Refueling Nozzle For Public Stations

Parker's "FM" Series product line was designed specifically for transferring compressed natural gas from compressors and dispensers to vehicles utilizing CNG. The "FM" Series nozzles will interchange (allow connection) to any receptacle conforming to the NGV1/ANSI standard.

Type-1 nozzle w/vent recovery configuration.



Features:

- Compatible with the NGV1/ANSI standard receptacle profile.
- Push-To-Connect, one hand operation.
- Interlock design (Patented Design):
  - Minimizes operator error.
  - Prevents free flow of fuel without connection.
  - Prevents disconnection while dispensing fuel.
- Automatic shut-off and venting before disconnection.
- Thermoplastic handle and outer sleeve on nozzles prevents paint chipping.
- Vent port of 3-way valve is available in two configurations
  - **Vent recovery line:** routes gas expended at nozzle interface away from the user. Gas can also be reclaimed at compressor suction.
  - **Muffler/Silencer:** gas expended at nozzle interface is vented through muffler/silencer upon disconnection.
- Color options available for valve handle (Black, Blue, & Yellow)
- Durable ball locking device for longer life.

Materials of Construction:

Nozzle

Body:	Stainless Steel
Valving:	Stainless Steel
Sleeve:	Stainless Steel with Thermoplastic Coating
Seals:	Special Nitrile Compound
Valve Handle:	Thermoplastic
Grip:	Ozone Resistant Foam

Specifications:

Pressure:	Rated to 3600 psi (248 bar)
Temperature:	-40°F to 185°F (-40°C to 85°C)
Flow Rate:	812 SCFM (See Flow Curve)
Weight:	2.75 lbs. (1.25 kg)

How To Order

Nozzles

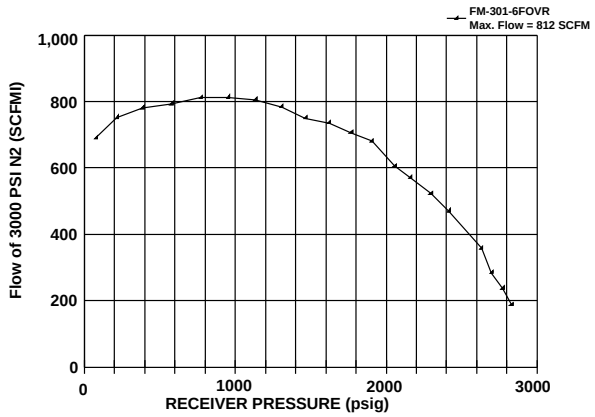
Part Number	Vent Port Style	Service Pressure	Accepts Receptacles
FM-301-6FOVR	Vent Recovery	3000 psi *(207 bar)*	All FM Series Receptacles 3000 psi and 3600 psi
FM-362-6FOVR	Vent Recovery	3600 psi *(248 bar)*	FM Series Receptacles 3600 psi Only
FM-301-6FO	Silencer/ Muffler	3000 psi *(207 bar)*	All FM Series Receptacles 3000 psi and 3600 psi
FM-361-6FO	Silencer/ Muffler	3600 psi *(207 bar)*	FM Series Receptacles 3600 psi Only

All dimensions as shown in drawing – Independant of service pressure.

See part numbering description on the "How To Order FM Series" page.

High Pressure Gas Flow Performance

Parker CNG Nozzle (Part. No. FM-301-6FOVR)



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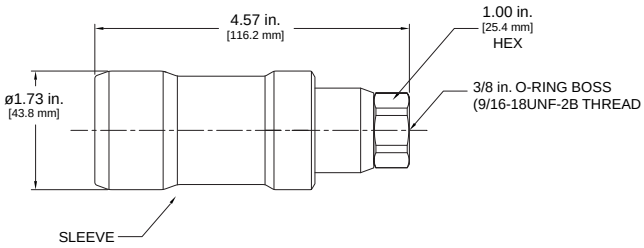
Fast Fill, Push-To-Connect Refueling Nozzle For Public Or Private Use

Parker's Push-To-Connect "FM" Series product line was designed specifically for transferring compressed natural gas from compressors and dispensers to the vehicles utilizing CNG.

The Push-To-Connect "FM" Series nozzle will interchange (allow connection) with any receptacle conforming to the NGV1/ANSI standard. This Parker "FM" Series nozzle can be used stand-alone in self-depressurizing refueling systems (Type-3), or in conjunction with a 3-way valve in systems requiring the fill/vent function to be accomplished at the nozzle (Type-2).

Type-2 & 3 NGV1 Nozzle



Features:

- Compatible with the NGV1/ANSI standard.
- Push-To-Connect, pull on thermoplastic sleeve to disconnect.
- Protective thermoplastic coating on nozzles prevents paint chipping of vehicles.
- Durable ball locking design for longer life.
- This nozzle can be classified as Type-2 or Type-3 and subsequently can be used for both fast-fill or time-fill service.
- Color options available for sleeves (Black, Blue, & Yellow)

Materials of Construction:

Nozzle

Body:	Stainless Steel or Brass
Valving:	Stainless Steel
Sleeve:	Stainless Steel with Thermoplastic Coating
Seals:	Special Nitrile Compound

Specifications:

Pressure:	Rated to 3600 psi
Temperature:	-40°F to 275°F
Flow Rate:	1416 SCFM (See Flow Curve)
Weight:	1.60 lbs.

How to Order:

Nozzles

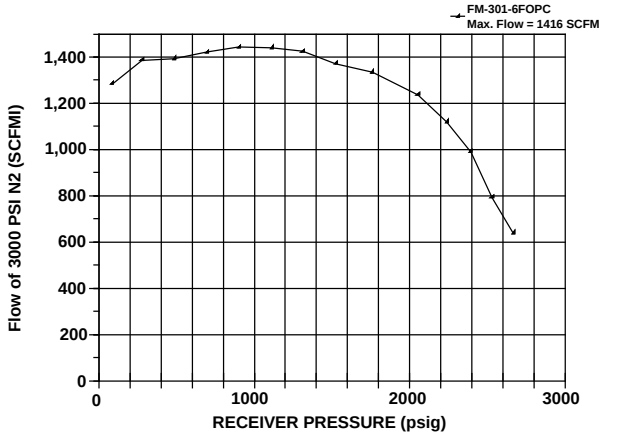
Part Number	Material	Service Pressure	Accepts Receptacles
FM-301-6FOPC	Brass	3000 psi	All FM Series Receptacles 3000 psi and 3600 psi
FMS-301-6FOPC	Stainless Steel	3000 psi	All FM Series Receptacles 3000 psi and 3600 psi
FM-361-6FOPC	Brass	3600 psi	FM Series Receptacles 3600 psi Only
FMS-361-6FOPC	Stainless Steel	3600 psi	FM Series Receptacles 3600 psi Only

All dimensions as shown in drawing – Independant of service pressure.

See part numbering description on the "How To Order FM Series" page.

High Pressure Gas Flow Performance

Parker CNG Nozzle (Part. No. FM-301-6FOPC)



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Fast Fill, Sleeve-Operated Refueling Nozzle For Public Or Private Use.

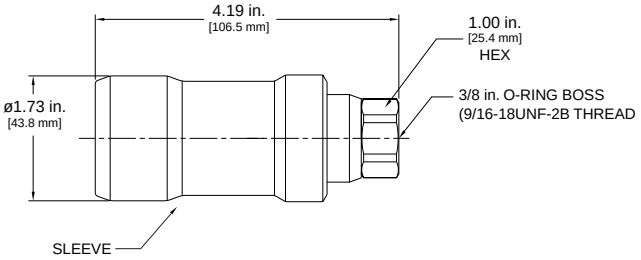
Parker's Sleeve-Operated "FM" Series product line was designed specifically for transferring compressed natural gas from compressors and dispensers to the vehicles utilizing CNG.

The Sleeve-Operated "FM" Series nozzle will interchange (allow connection) with any receptacle conforming to the NGV1/ANSI standard. This Parker "FM" Series nozzle can be used stand-alone in self-depressurizing refueling systems (Type-3), or in conjunction with a 3-way valve in systems requiring the fill/vent function to be accomplished at the nozzle (Type-2).

Type 2 & 3 NGV1 Nozzle

Features:

- Compatible with the NGV1/ANSI standard.
- Sleeve-Lock connection operation: Retract locking ball sleeve, push on to receptacle, release sleeve. Nozzle is then firmly engaged to receptacle.
- Themoplastic sleeve coating prevents paint chipping on vehicle while refueling .
- Durable ball locking design for longer life.
- This nozzle can be classified as Type-2 or 3 and subsequently can be used for both fast-fill or time-fill service.
- Left-Hand thread configurations available for use on home refueling units.
- Color options available for sleeves (Black, Blue & Yellow).



Materials of Construction:

Body: Brass (CA 360)
Valving: Stainless Steel (AISI 303)
Sleeve: Brass with plastic cover
Seals: Special Nitrile Compound

Specifications:

Pressure: Rated to 3600 psi
Temperature: -40° F to 185° F *(-40° C to 85° C)*
Flow Rate: 1507 SCFM (See Flow Curve)
Weight: 1.30 lbs. *(.60 kg)*

How to Order:

Nozzles

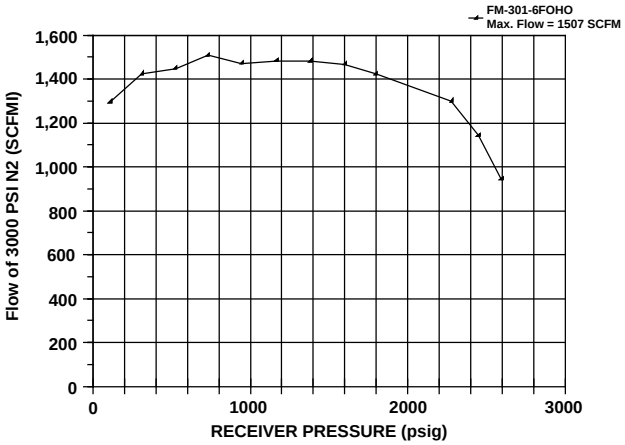
Part Number	Service Pressure	Port Connection	Accepts Receptacles
FM-301-6FOHO	3000 psi *(207 bar)*	#6 SAE Straight Th'd	All FM Series Receptacles 3000 psi and 3600 psi
FM-361-6FOHO	3600 psi *(248 bar)*	#6 SAE Straight Th'd	FM Series Receptacles 3600 psi Only
FM-301-6LTHO	3000 psi *(207 bar)*	#6 SAE Left Hand Straight Th'd	All FM Series Receptacles 3000 psi and 3600 psi
FM-361-6LTHO	3600 psi *(248 bar)*	#6 SAE Left Hand Straight Th'd	FM Series Receptacles 3600 psi Only

All dimensions as shown in drawing – Independant of service pressure.

See part numbering description on the "How To Order FM Series" page.

High Pressure Gas Flow Performance

Parker CNG Nozzle (Part. No. FM-301-6FOHO)



NGV1 Profile Receptacles

Parker FM Series receptacles are designed for rigid mounting on a compressed natural gas vehicle. Receptacles can be employed in both fast-fill and time-fill dispensing applications.The NGV1/ANSI standard used by FM Series receptacles, allows vehicle fueling to be acomplished with all CNG nozzles, conforming to the NGV1/ANSI standard.

Features

- FM Series receptacles can be used with all versions of Parker FM Series nozzles.
- FM Series receptacles meet all dimensional and performance requirements of the NGV1/ANSI standard.
- Receptacles employ a differential pressure-actuated valve (non-contact).
- Internal check valve provides unidirectional flow - natural gas will only flow from dispenser to vehicle (not vice-versa).
- Brass or Stainless steel Body construction available
- Ozone resistant rubber dust cap is available.
- Ventable pressure tight cap available.
- Extensive end configurations and mounting methods available as standard.
- Internal components are 316 Stainless Steel.
- Seal is comprised of a special Nitrile compound formulated for compressed natural gas service.

Materials of Construction

Body:	CA360 Brass or 303 Stainless Steel
Adapter:	316 Stainless Steel
Valving:	316 Stainless Steel
Seal:	Special CNG Nitrile Compound *(Proprietary)*
Dust Cap:	Low Temperature Nitrile Compound

Specifications

Pressure:	3000 or 3600 psi *(connected & disconnected)*
Temperature:	-40° F to +250° F *(-40° C to 121°C)*
Rated Flow:	1500 scfm
Smallest Internal Orifice:	. 075 in^2 *(.48 cm^2)*
Weight:	. 0.20 lbs.

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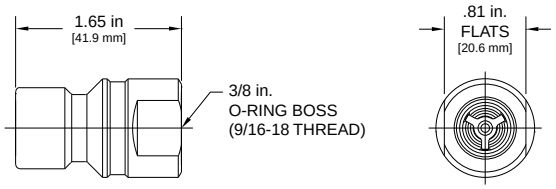
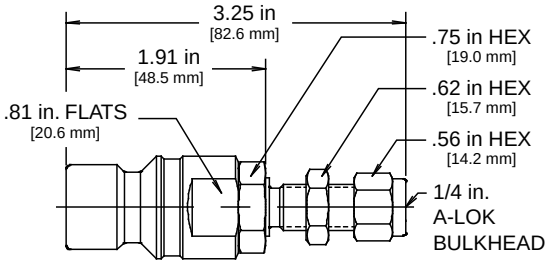
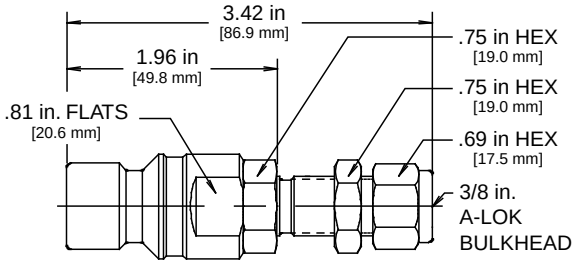


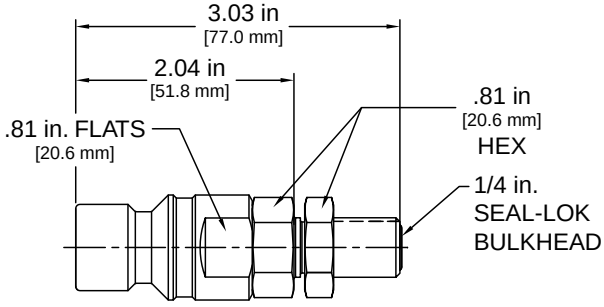
Material	End Connection	Part Number 3000 PSI (207 bar)	Part Number 3600 PSI (248 bar)
Brass	9/16-18 SAE Straight Thread	FM-302-6FO	FM-362-6FO
303SS	9/16-18 SAE Straight Thread	FMS-302-6FO	FMS-362-6FO



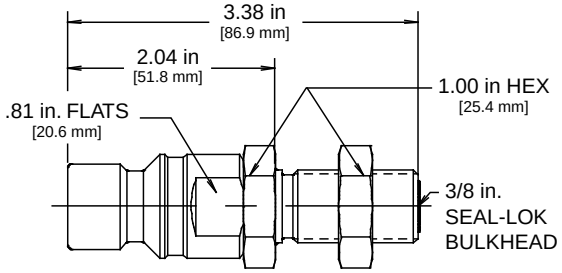
Material	End Connection	Part Number 3000 PSI (207 bar)	Part Number 3600 PSI (248 bar)
Brass	1/4" Tube Size, Two Ferrule Compression (A-Lok)	FM-302-4AH	FM-362-4AH
303SS	1/4" Tube Size, Two Ferrule Compression (A-Lok)	FMS-302-4AH	FMS-362-4AH



Material	End Connection	Part Number 3000 PSI (207 bar)	Part Number 3600 PSI (248 bar)
Brass	3/8" Tube Size, Two Ferrule Compression (A-Lok)	FM-302-6AH	FM-362-6AH
303SS	3/8" Tube Size, Two Ferrule Compression (A-Lok)	FMS-302-6AH	FMS-362-6AH



Material	End Connection	Part Number 3000 PSI (207 bar)	Part Number 3600 PSI (248 bar)
Brass	1/4" Tube Size, O-Ring Face Seal (Seal Lok)	FM-302-4LH	FM-362-4LH
303SS	1/4" Tube Size, O-Ring Face Seal (Seal Lok)	FMS-302-4LH	FMS-362-4LH



Material	End Connection	Part Number 3000 PSI (207 bar)	Part Number 3600 PSI (248 bar)
Brass	3/8" Tube Size, O-Ring Face Seal (Seal Lok)	FM-302-6LH	FM-362-6LH
303SS	3/8" Tube Size, O-Ring Face Seal (Seal Lok)	FMS-302-6LH	FMS-362-6LH

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NGV1 Profile Filtered Receptacle

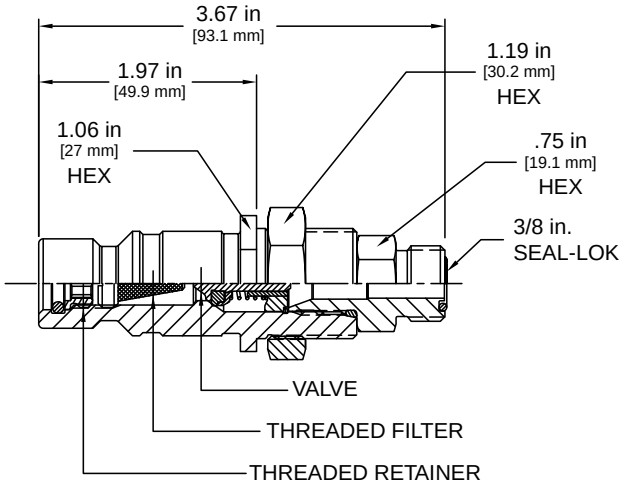
Parker FM Series Filtered Receptacles are designed for rigid mounting on a compressed natural gas vehicle. Receptacles can be employed in both fast-fill and time-fill dispensing applications. The filter element eliminates contaminants from the environment and unclean compressed natural gas sources. It serves both as a prefilter to on-board vehicle components and as a protection to the FM receptacle valving and seals. The NGV1 profile utilized by Filtered FM Receptacles allows:

Features

- Filter element provides for protection to the FM receptacle valving and seals from external contaminants that can be introduced during fueling
- Filter element is field replaceable and can be simply cleaned by flushing with a reverse flow
- Filter can prevent expensive repairs, prolong useful life of down stream CNG components and reduce downtime for end users
- FM Series Filtered Receptacles are NGV1 certified
- Available with a 400 or 200 micron filter element
- See “How to order-FM Series” section on page 10 for ordering instructions.

Material of Construction:

Body:	303 Stainless Steel
Adapter:	316 Stainless Steel
Valving:	316 Stainless Steel
Seal:	Special CNG Nitrile Compound *(proprietary)*
Filter Element:	Stainless Steel



Specifications

Pressure:	3000 or 3600 psi *(248 bar)*
Temperature:	-40°C to 250°F *(-40°C to 121°C)*
Rated Flow:	1350 CFM
Smallest Internal Orifice:	.070 in^2 *(/45 cm2)*
Filter Element:	200 micron, 400 micron

Nozzles

FM - 301 - 6 FO VR - YE

- **YE** — Blank = Black Color Option on Sleeve or Handle; BU = Blue Color Option; YE = Yellow Color Option; 3WV = Independent 3-WAy Valve Option *(only available for type 2/3 nozzles)*
- **VR** — Nozzle Style: Blank = Integral 3-Way Valve (type 1); VR = Integral 3-Way Valve with (type 1) Vent Recovery Option; HO = Hand Operated Sleeve (type 2 & 3); PC = Push-to-Connect (type 2 & 3)
- **FO** — Supply Port Config. (Nozzle or 3-Way Valve): FO = SAE O-Ring Boss; LT = Left Hand SAE O-Ring Boss
- **6** — Supply Port Size (Nozzle or 3-Way Valve): 6 = 3/8"
- **1** — 1 = NGV-1 Nozzle
- **301** — Pressure Rating: 30 = 3,000 psi; 36 = 3,600 psi
- **FM** — FM Series

Receptacles

FMS - 302 F - 6FO

- **6FO** — Port Size: 4 = 1/4"; 6 = 3/8"; Port Configuration: AH = A-Lok Bulkhead; FO = SAE O-Ring Boss; LH = Seal-Lock Bulkhead
- **F** — Blank = Standard; F = Filtered Option
- **2** — 2 = NGV-1 Receptacle
- **302** — Pressure Rating: 30 = 3,000 psi; 36 = 3,600 psi
- **S** — Body Material: Blank = Brass; S = Stainless Steel
- **FMS** — FM Series

Dust Caps

FM - 66 M

- **M** — Style: M = Low Temperature (Nitrile); P = Pressure Tight (Aluminum)
- **66** — 66 = Dust Cap
- **FM** — FM = Series

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Quick Coupling for Compressed Natural Gas Service

Parker's CNG-620 Quick Disconnect Coupling is ideal for fork lifts, golf carts, dispensers, utilities, and maintenance fleets. This Parker CNG fueling coupling is designed for use in Natural Gas Vehicle retro-fitting and refueling.

Features:

- Connects under pressure up to 3600 psi (receptacles pressurized).
- Actuation bar (Patented) eliminates need to bleed pressure before connecting.
- Grip-Ring style sleeve provides easy gripping action for gloved or wet hands.
- Interface seal designed (special Nitrile compound with Teflon washer) to withstand high pressures (3600 psi maximum working pressure).
- Integral Check Valve remains open during pressure differential created upon refueling.
- Industrial Interchange Profile (ISO 7241 Series B).
- Reduces the vented volume of gas with unique unidirectional flow design (will not permit backflow).
- Receptacle provides secondary check valve when used with an in-line vehicle check valve.

Materials of Construction:

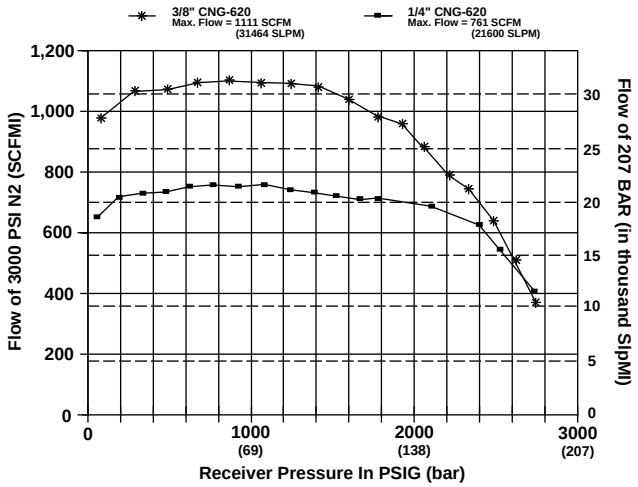
Body: Brass or Stainless Steel
Internals: Stainless Steel
Valve Seals: Special Nitrile Compound

Specifications:

Sizes: 1/4" to 1/2" available
Pressure: 3600 psi *(248 bar)* Maximum Working
Temperature: -40°F to 250°F *(-40° C to 121° C)*
Dimensions: Meets ISO 7241-1 Series B geometry

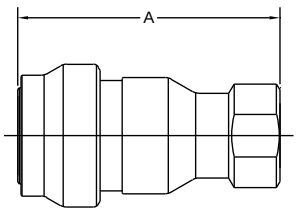
High Pressure Gas Flow Performance

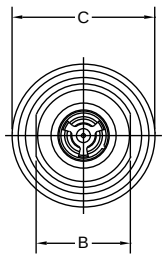
Parker 1/4" & 3/8" CNG-620 Coupling



How to Order:

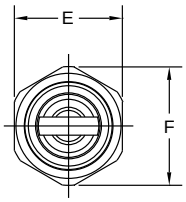
Coupler

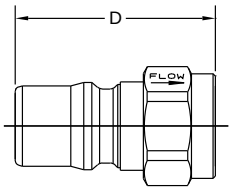




Body Size	Part Number	Thread Size	Material	Dimension (in.) Overall Length	Wrench Flats	Largest Diameter
				A	B	C
1/4"	BH2-60-620	1/4-18 NPTF	Brass	2.26 *(57 mm)*	.81 *(21 mm)*	1.23 *(31 mm)*
3/8"	BH3-60-620	3/8-18 NPTF	Brass	2.49 *(63 mm)*	.88 *(22 mm)*	1.48 *(38 mm)*
1/2"	BH4-60-620	1/2-18NPTF	Brass	2.95 *(75 mm)*	1.13 *(29 mm)*	1.85 *(47 mm)*

Nipple





Body Size	Part Number	Thread Size	Material	Dimension (in.) Overall Length	Wrench Flats	Largest Diameter
				A	B	C
1/4"	BH2-61-620	1/4-18 NPTF	Brass	1.39 *(35 mm)*	.75 *(19 mm)*	.82 *(21 mm)*
1/4"	SH2-63-620	1/4-18 NPTF	303 SS	1.39 *(35 mm)*	.75 *(19 mm)*	.82 *(21 mm)*
1/4"	SH2-63-T6-620	9/16-18 SAE Straight Thread	303 SS	1.54 *(39 mm)*	.88 *(22 mm)*	.95 *(24 mm)*
3/8"	SH3-63-620	3/8-18 NPTF Straight Thread	303 SS	1.58 *(39 mm)*	.88 *(22 mm)*	.95 *(24 mm)*
1/2"	SH4-63-620	1/2-14 NPTF Straight Thread	303 SS	1.90 *(48 mm)*	1.13 *(29 mm)*	1.23 *(31 mm)*

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Parker CNG Break-Away Couplings are designed specifically for Break-Away harnesses located on CNG dispensers.

A Break-Away coupling is required to shut-off gas at dispenser in the event of an accidental disconnect (drive-off). The Parker Break-Away coupling is used as a component of the tripod leverage towers.

Features:

- Meets ISO 7241-1 (series B) dimensions; Industrial Interchange Profile.
- Corrosion resistant stainless steel componentry.
- Unique valving designed for Compressed Natural Gas Applications.
- Utilized in conjunction with Break-Away leverage towers

Materials of Construction:

Coupler Body: 303 Stainless Steel
Nipple Body: 303 Stainless Steel
Valving: 303 Stainless Steel
Valve Seal: Special Nitrile Compound
Interface Seal: Special Nitrile Compound with Teflon™ backup ring

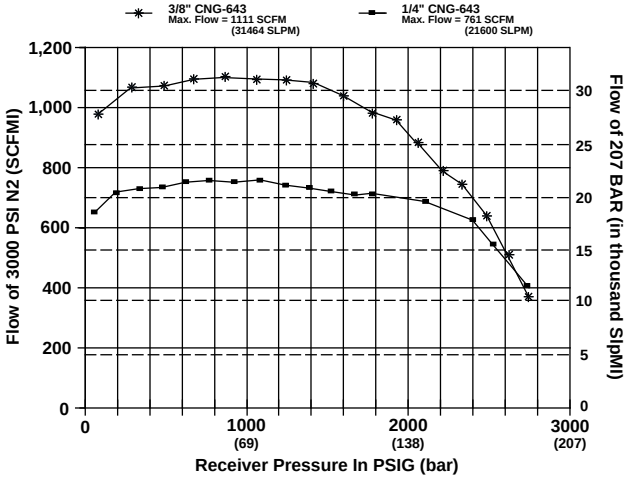
Specifications:

Sizes: 1/4" & 3/8" bodysizes with NPTF ends.
Pressure: 3600 psi *(248 bar)*
Temperature: -40° F to 250° F *(-40° C to 121° C)*

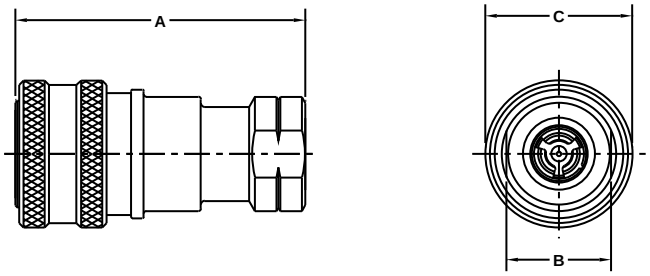
Parker Break-Away Coupling For CNG Dispenser Applications

High Pressure Gas Flow Performance

Parker 1/4" & 3/8" CNG-643 Coupling

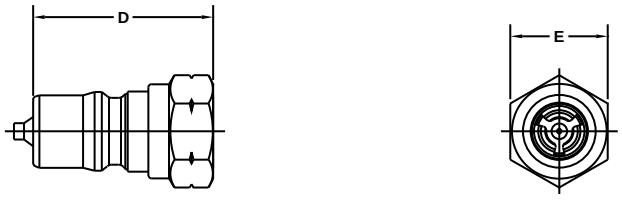


Coupler



Body Size	Part Number	Thread Size	Overall Length	Wrench Flats	Largest Diameter
			A	B	C
1/4"	SH2-62-643	1/4-18 NPTF	2.26 *(57 mm)*	.81 *(17 mm)*	1.14 *(29 mm)*
3/8"	SH3-62-643	3/8-18 NPTF	2.49 *(63 mm)*	.88 *(22 mm)*	1.40 *(36 mm)*

Nipple



Body Size	Part Number	Thread Size	Overall Length	Hex Size	Largest Diameter
			A	B	C
1/4"	SH2-63-643	1/4-18 NPTF	1.39 *(35 mm)*	.75 *(19 mm)*	.87 *(22 mm)*
3/8"	SH3-63-643	3/8-18 NPTF	1.50 *(38 mm)*	.88 *(22 mm)*	.95 *(24 mm)*

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NGV1 Profile Pressure Cap

Parker FM Series Pressure Caps are designed to work with NGV1 Profile Receptacles. They utilize conventional ball locking mechanism for retention onto FM receptacles. FM Series Pressure Caps provide an additional safeguard in case of accidental pressure leak from receptacles. Pressure can be vented with a pressure relief bleed valve located on cap.

Features:

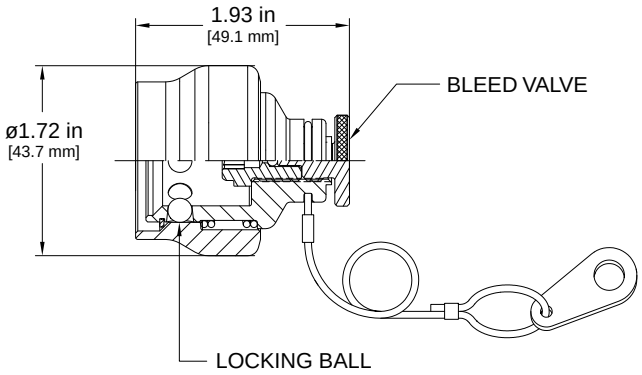
- FM Series pressure caps can be used with all versions of Parker FM Series Receptacles
- Pressure caps employ reliable ball locking mechanism and seal for pressure contaminants
- Trapped pressure can be vented using the pressure relief bleed valve on cap

Material of Construction:

Body:	Anodized Aluminum
Locking Balls:	SS
Seal:	Nitrile

Specifications

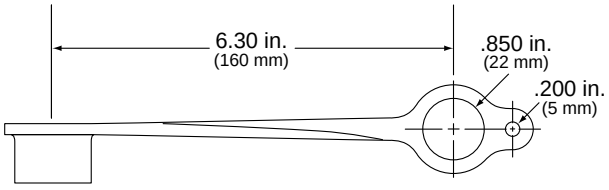
Pressure:	3600 psi *(248 bar)*
Temperature:	-40° F to 250° F *(-40°C to 121°C)*



Dust Caps

Parker Dust caps are recommended to protect receptacle from environmental contaminants.

FM Series Receptacle Dust Cap	
Dust Cap Part No.	**Material**
FM-66M	Nitrile



CNG-620 Series Receptacle Dust Caps & Plugs			
Body Size	**Dust Plug Part No.**	**Dust Cap Part No.**	**Material**
1/4”	H2-65M	H2-66M	Nitrile
3/8”	H3-65M	H3-66M	Nitrile
1/2"	H4-65M	H4-66M	Nitrile

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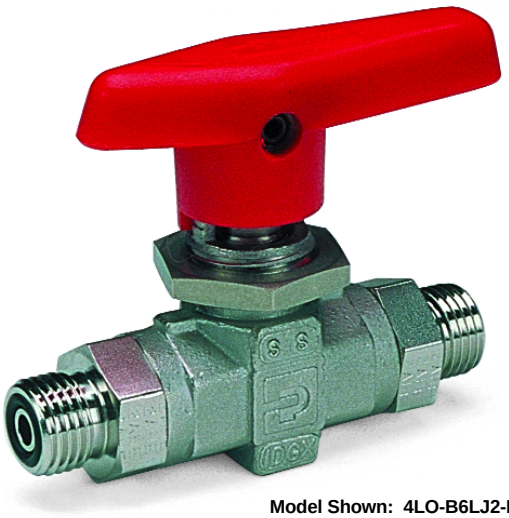
For Tank Isolation on Natural Gas Vehicles

Parker manually actuated two-way B Series Ball Valves provide quick 1/4 turn on-off control of flow from the vehicle tank to the engine. Tested and certified for this application per IAS NGV 3.1, and used on the majority of vehicles powered by CNG today.



Model Shown: 4LO-B6LJ2-BN-SSP

Features

- Free floating ball design provides seat wear compensation
- 316 Stainless Steel construction
- Buna-N rubber body seals
- Non-adjustable Buna-N rubber O-ring stem seals
- Micro-finished ball provides a positive seal
- Straight through flow path for minimum pressure drop
- Bi-directional flow
- Wide variety of US Customary and SI ports
- 90 degree actuation
- Panel mountable
- Heat code traceability
- Handle indicates flow direction
- Low operating torques
- Positive handle stops
- 100% factory tested

Materials of Construction

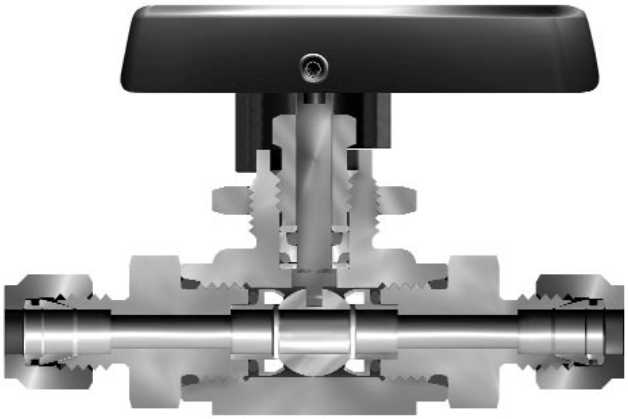
Body:	Stainless Steel
Stem and Body Seals:	Buna-N rubber (BN)
Seats:	PCTFE (J2) or PEEK (PKR)
Ports:	CPI™ or A-LOK® compression with silver plated ferrule (ZS or AS); Seal-Lok® O-ring face seal with or without Buna-N rubber seals (LO or L)

Suggested Options

Body:	Electron beam welded
Handle Color:	Red (R)

IAS Certifications

Note: *To order valves certified by IAS (A.G.A./CGA) per NGV 3.1, please contact the factory or your local Parker Distributor.*



Specifications

Pressure:	6000 psig CWP *(414 bar)*
Temperature:	-40°F to 250°F *(-40°C to 121°C)*
C_v Ratings:	1.04 to 6.42

Options

- Valve Seats:
  PCTFE and PEEK;
  Spring-loaded PCTFE and PEEK
- Valve Stem and Body Seals
  Buna-N rubber
- Electron beam welded end ports
- Handle color

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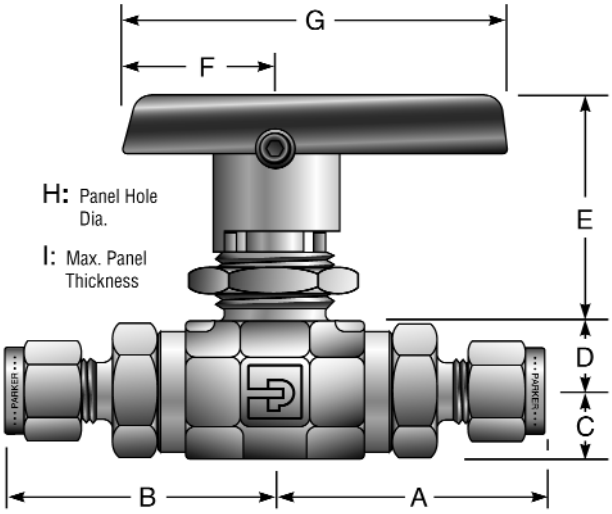

Model Shown: 4AS-B6LJ2-BN-SSP-EBW

Dimensions/Flow Data

Port Size	Basic Part No.	Flow Data Orifice Inch	Orifice mm	C_v	X_T*	End Connections Port 1	Port 2	Dimensions Inches (mm) A†	B†	C	D	E	F	G	H	I
4AS	B6L	0.187	4.7	1.04	0.42	1/4" A-LOK®		1.74 (44.20)	1.74 (44.20)	0.42 (10.7)	0.47 (11.9)	1.53 (38.9)	1.00 (25.4)	2.50 (63.5)	0.77 (19.6)	0.25 (6.4)
4ZS						1/4" CPI™										
4F		0.250	6.4	2.34	0.29	1/4" Female NPT		1.51 (38.35)	1.51 (38.35)							
4L		0.172	4.4	1.00	0.42	1/4"Male Seal-Lok		1.48 (37.70)	1.48 (37.70)							
4M		0.250	6.4	2.34	0.29	1/4" Male NPT		1.62 (41.15)	1.62 (41.15)							
6AS		0.250	6.4	2.34	0.29	3/8" A-LOK®		1.80 (45.72)	1.80 (45.72)							
6ZS						3/8" CPI™										
6M		0.250	6.4	2.34	0.29	3/8" Male NPT		1.62 (41.15)	1.62 (41.15)							
M6AS		0.187	4.7	1.04	0.42	6mm A-LOK®		1.75 (44.45)	1.75 (44.45)							
M6ZS						6mm CPI™										
M8AS		0.250	6.4	2.34	0.42	8mm A-LOK®		1.78 (45.21)	1.78 (45.21)							
M8ZS						8mm CPI™										
M10AS		0.250	6.4	2.34	0.42	10mm A-LOK®		1.81 (45.97)	1.81 (45.97)							
M10ZS						10mm CPI™										
6F	B8L	0.406	10.3	6.42	0.37	3/8" Female NPT		1.95 (49.53)	1.95 (49.53)	0.69 (17.5)	0.70 (17.8)	1.74 (44.2)	1.50 (38.1)	4.00 (101.6)	0.90 (22.9)	0.38 (9.7)
8F		0.406	10.3	6.42	0.37	1/2" Female NPT		2.15 (54.61)	2.15 (54.61)							
8AS		0.406	10.3	6.42	0.37	1/2" A-LOK®		2.34 (59.44)	2.34 (59.44)							
8ZS						1/2" CPI™										
8M		0.406	10.3	6.42	0.37	1/2" Male NPT		2.22 (56.39)	2.22 (56.39)							
12AS		0.406	10.3	6.42	0.37	3/4" A-LOK®		2.33 (59.18)	2.33 (59.18)							
12ZS						3/4" CPI™										
M12AS		0.375	9.5	5.57	0.37	12mm A-LOK®		2.33 (59.18)	2.33 (59.18)							
M12ZS						12mm CPI™										
M16AS		0.406	10.3	6.42	0.37	16mm A-LOK®		2.33 (59.18)	2.33 (59.18)							
M16ZS						16mm CPI™										

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

† For CPI™ and A-LOK®, measured with nuts in the finger tight position

How to Order Two-Way B Series Ball Valves

Example: **4ZS** ❶ **4F** ❷ **– B6L** ❹ **– J2** ❺ **– BN** ❻ **– SSP** ❼ **– EBW** ❽

Describes a B6L Ball valve with a 1/4" CPI™ end connection with silver plated ferrule for port 1 and 1/4" female NPT end connection for port 2, PCTFE seats, Buna-N rubber stem and body seals, stainless steel construction, and EBW ports with a panel mounting nut.

Example: **6AS** ❶ ***** ❷ **– B6L** ❹ **– SPKR** ❺ **– BN** ❻ **– SSP** ❼ **– R** ❽

Describes a B6L Ball valve with 3/8" A-LOK® end connections with silver plated front ferrule for port 1 and 2, Spring-loaded PEEK seats, Buna-N rubber stem and body seals, stainless steel construction, with a panel mounting nut and red handle.

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

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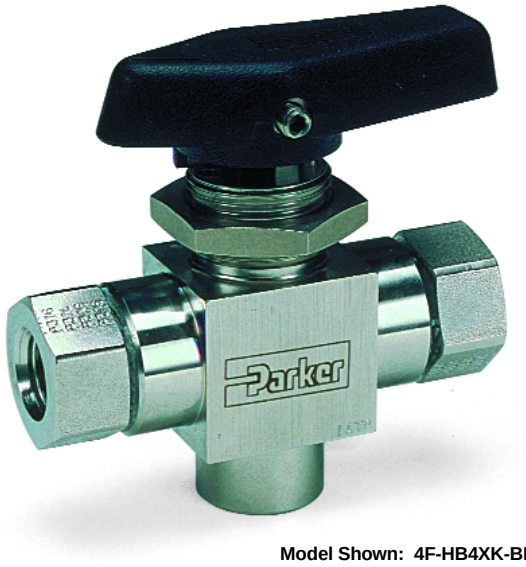
For Filling Natural Gas Vehicles

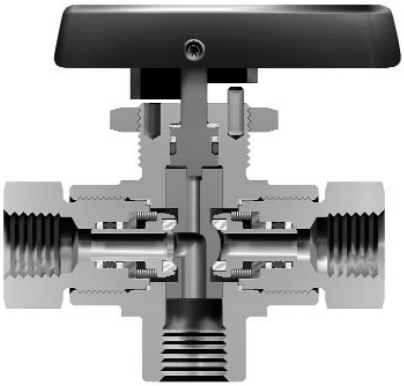
Parker HB Series Ball Valves, featuring Supracase™ treated ball and trunnions, provide reliable switching functions when used with Type-2 and Type-3 refueling nozzles. The treated trunnion style ball enhances the resistance of the trunnions against seizure and the resistance of the spherical ball to particle abrasion.

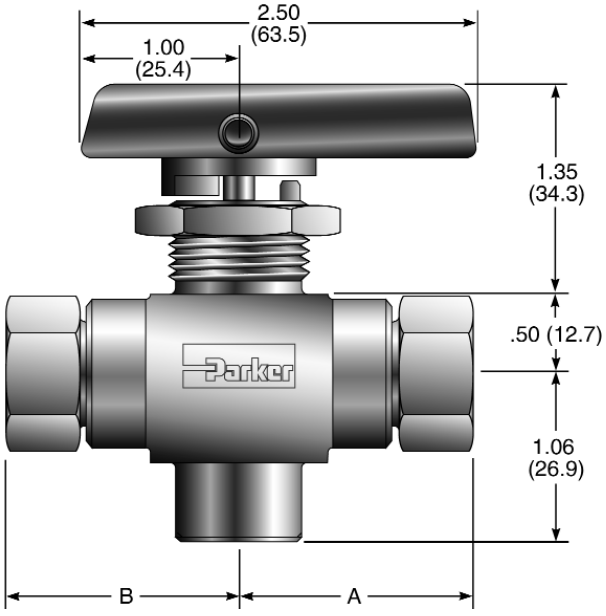
Features

- Used in conjunction withType-2 and Type-3 refueling nozzles
- Suparcase™ ball/trunnion for longer cycle life
- Blow-out resistant two-piece ball/stem
- Full operating pressure at any port
- Low operating torque
- Panel mountable to 3/8" (9.6 mm) thickness
- No packing to adjust
- 316 stainless steel construction
- Buna-N rubber seals
- Color coded fracture resistant handles
- Handle indicates direction of flow
- Positive handle stops
- Wide variety of US Customary and SI ports
- 180 degree actuation
- Top of stem marked to indicate flow direction
- Compact package
- Heat code traceability
- 100% factory tested



Model Shown: 4F-HB4XK-BN-SSP





( ) Denotes dimensions in mm

Port Size	End Connections		Dimensions			
			A†		B†	
	Port 1	Port 2	inch	mm	inch	mm
2F	1/8" Female NPT		1.47	37.3	1.47	37.3
4F	1/4" Female NPT		1.47	37.3	1.47	37.3
4FL	1/4" Female NPT (Long)		1.97	50.0	1.97	50.0
4AS	1/4" A-LOK®		2.07	52.6	2.07	52.6
4ZS	1/4" CPI™		2.07	52.6	2.07	52.6
M6AS	6mm A-LOK®		2.07	52.6	2.07	52.6
M6ZS	6mm CPI™		2.07	52.6	2.07	52.6
6AS	3/8" A-LOK®		2.19	55.6	2.19	55.6
6ZS	3/8" CPI™		2.19	55.6	2.19	55.6
8AS	1/2" A-LOK®		2.30	58.4	2.30	58.4
8ZS	1/2" CPI™		2.30	58.4	2.30	58.4
M8AS	8mm A-LOK®		2.07	52.6	2.07	52.6
M8ZS	8mm CPI™		2.07	52.6	2.07	52.6
M10AS	10mm A-LOK®		2.20	55.9	2.20	55.9
M10ZS	10mm CPI™		2.20	55.9	2.20	55.9
M12AS	12mm A-LOK®		2.30	58.4	2.30	58.4
M12ZS	12mm CPI™		2.30	58.4	2.30	58.4

† For CPI™ and A-LOK®, measured with nuts in the finger tight position.

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Specifications

Pressure Rating: Up to10,000 psig CWP *(689 bar)* with PEEK (PKR) Seats;
6,000 psig CWP *(414 bar)* with PCTFE (K) Seats;

Temperature: -40°F to 250°F *(-40°C to 121°C)*

Body Material: Stainless Steel

Port Connections: Tube compression (CPI™/A-LOK®) NPT (Short and Long Female)

Port Size: 1/8" to 1/2"
6 mm to 12 mm

Flow Data

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 $P_1 - P_2 / P_1 = X_T$

How to Order

The correct part number is easily derived by following the circled number sequence. The six product characteristics required are coded as shown below.

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

4ZS		–	HB4X	–	PKR	–	BN	–	SSP
❶	❷		❸		❹		❺		❻
Port 1	Port 2		Valve Series		Seat Material		Seal Material		Body Material

Describes a HB4X, Three-Way Ball Valve with 1/4" CPI™ compression end connections with silver plated ferrules for ports 1 and 2, PEEK seats and BUNA-N rubber seals, stainless steel body construction, and a panel mounting nut.

Note: *Bottom port 3 is always a 1/4" FNPT port.*

4F	4AS	–	HB4X	–	K	–	BN	–	SSP
❶	❷		❸		❹		❺		❻
Port 1	Port 2		Valve Series		Seat Material		Seal Material		Body Material

Describes a HB4X, Three-Way Ball Valve with 1/4" female NPT port 1 and a 1/4" A-LOK® compression port 2 with silver plated ferrules, PCTFE seats and Buna-N seals, stainless steel body construction, and a panel mounting nut.

Note: *Bottom port 3 is always a 1/4" FNPT port.*

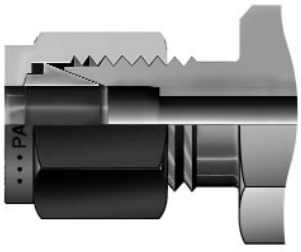
1 Port 1	2 Port 2	3 Valve Series	4 Seat Material	5 Seal Material	6 Body Material
2F - 1/8" Female NPT	2F - 1/8" Female NPT	HB4X (3-Way)	PKR (PEEK, Polyether-etherketone) K (PCTFE, Polychloro-) trifluoroethylene)	BN (Buna-N Rubber)	SSP (Stainless Steel with Panel Nut)
4F - 1/4" Female NPT	4F - 1/4" Female NPT				
4FL - 1/4" Female NPT (Long)	4FL - 1/4" Female NPT (Long)				
4AS - 1/4" A-LOK®	4AS - 1/4" A-LOK®				
4ZS - 1/4" CPI™	4ZS - 1/4" CPI™				
6AS - 1/4" A-LOK®	6AS - 1/4" A-LOK®				
6ZS - 1/4" CPI™	6ZS - 1/4" CPI™				
8AS - 1/4" A-LOK®	8AS - 1/4" A-LOK®				
8ZS - 1/4" CPI™	8ZS - 1/4" CPI™				
M6AS - 6mm A-LOK®	M6AS - 6mm A-LOK®				
M6ZS - 6mm CPI™	M6ZS - 6mm CPI™				
M8AS - 8mm A-LOK®	M8AS - 8mm A-LOK®				
M8ZS - 8mm CPI™	M8ZS - 8mm CPI™				
M10AS - 10mm A-LOK®	M10AS - 10mm A-LOK®				
M10ZS - 10mm CPI™	M10ZS - 10mm CPI™				
M12AS - 12mm A-LOK®	M12AS - 12mm A-LOK®				
M12ZS - 12mm CPI™	M12ZS - 12mm CPI™				

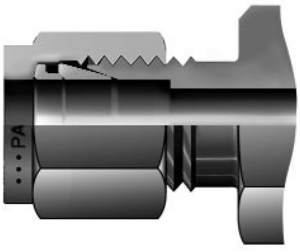
Available End Configurations

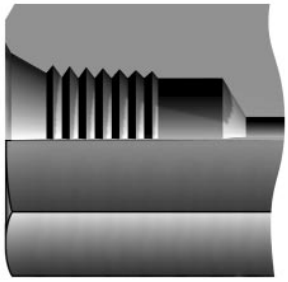
ZS - Single ferrule CPI™ compression port (silver plated ferrule)

AS - Two ferrule A-LOK® compression port (silver plated front ferrule)

F - ANSI/ASME B1.20.1, Internal pipe threads





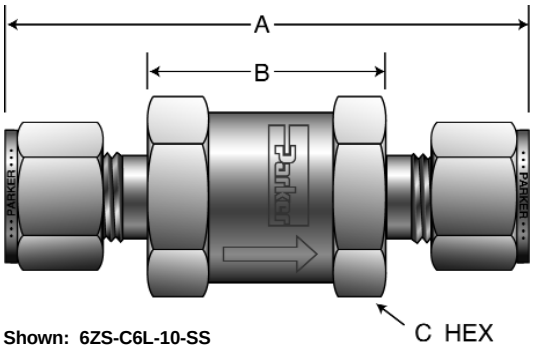


Used after the Receptacle on Natural Gas Vehicles

Parker C Series Check Valves are designed for uni-directional flow control of CNG. They are often installed immediately after the refueling receptacle as a redundant safety device, and are certified per NGV 3.1.

Features

- Resilient, custom molded, blow-out resistant seat design
- Back stropped poppet minimizes spring stress
- 100% factory tested for both crack and reseat
- Cracking pressures: 1, 5, 10, 25, 5 0, 75, and 100 psi
- Port connections: CPI™, A-LOK®, and Seal-Lok®
- Heat code traceability
- 100% factory tested



Model Shown: 6ZS-C6L-10-SS

Dimensions/Flow Data

Basic Part Number	End Connections Port 1 (Inlet)	End Connections Port 2 (Outlet)	Flow Data Orifice Inch	Flow Data Orifice mm	C_v*	X_T	Dimensions A* inch	Dimensions A* mm	Dimensions B inch	Dimensions B mm	Dimensions C inch	Dimensions C mm
4AS-C4L	1/4" A-LOK®		.187	4.7	.75	.53	2.42	61.5	1.03	26.2	.750	19.1
4ZS-C4L	1/4" CPI™		.187	4.7	.75	.53	2.42	61.5	1.03	26.2	.750	19.1
4L-C4L	1/4" Seal-Lok®		.172	4.4	.66	.52	2.40	61.0	1.05	26.7	.750	19.1
6AS-C4L	3/8" A-LOK®		.187	4.7	.75	.53	2.55	64.8	1.03	26.2	.750	19.1
6ZS-C4L	3/8" CPI™		.187	4.7	.75	.53	2.55	64.8	1.03	26.2	.750	19.1
M6AS-C4L	6mm A-LOK®		.187	4.7	.75	.53	2.43	61.7	1.03	26.2	.750	19.1
M6ZS-C4L	6mm CPI™		.187	4.7	.75	.53	2.43	61.7	1.03	26.2	.750	19.1
6AS-C6L	3/8" A-LOK®		.281	7.1	2.09	.74	3.27	83.1	1.75	44.5	1.000	25.4
6ZS-C6L	3/8" CPI™		.281	7.1	2.09	.74	3.27	83.1	1.75	44.5	1.000	25.4
6L-C6L	3/8" Seal-Lok®		.264	6.7	2.05	.74	2.65	67.3	1.77	45.0	1.000	25.4
8AS-C6L	1/2" A-LOK®		.359	9.1	2.26	.77	3.55	90.2	1.81	46.0	1.000	25.4
8ZS-C6L	1/2" CPI™		.359	9.1	2.26	.77	3.55	90.2	1.81	46.0	1.000	25.4
M8AS-C6L	8mm A-LOK®		.250	6.4	2.02	.73	3.33	84.6	1.87	47.5	1.000	25.4
M8ZS-C6L	8mm CPI™		.250	6.4	2.02	.73	3.33	84.6	1.87	47.5	1.000	25.4
8AS-C8L	1/2" A-LOK®		.423	10.7	3.30	.77	4.08	103.6	2.34	59.4	1.250	31.8
8ZS-C8L	1/2" CPI™		.423	10.7	3.30	.77	4.09	103.9	2.34	59.4	1.250	31.8
8L-C8L	1/2" Seal-Lok®		.378	9.6	2.96	.71	3.22	81.8	2.21	56.1	1.250	31.8
M12AS-C8L	12mm A-LOK®		.375	9.5	2.93	.71	4.06	103.1	2.34	59.4	1.250	31.8
M12ZS-C8L	12mm CPI™		.375	9.5	2.93	.71	4.06	103.1	2.34	59.4	1.250	31.8
12AS-C12L	3/4" A-LOK®		.594	15.1	6.01	0.38	4.34	110.2	2.60	66.0	1.375	34.9
12ZS-C12L	3/4" CPI™		.594	15.1	6.01	0.38	4.34	110.2	2.60	66.0	1.375	34.9
12L-C12L	3/4" Seal-Lok®		.594	15.1	6.01	0.38	3.78	96.0	2.44	62.0	1.375	34.9
M20AS-C12L	20mm A-LOK®		.594	15.1	6.01	0.38	4.32	109.7	2.56	65.0	1.375	34.9
M20ZS-C12L	20mm CPI™		.594	15.1	6.01	0.38	4.32	109.7	2.56	65.0	1.375	34.9
16AS-C16L	1" A-LOK®		.656	16.7	6.56	0.27	4.63	117.6	2.53	64.3	1.625	41.3
16ZS-C16L	1" CPI™		.656	16.7	6.56	0.27	4.63	117.6	2.53	64.3	1.625	41.3
16L-C16L	1" Seal-Lok®		.656	16.7	6.56	0.27	3.83	97.3	2.45	62.2	1.625	41.3
M25AS-C16L	25mm A-LOK®		.656	16.7	6.56	0.27	4.74	120.4	2.64	67.1	1.625	41.3
M25ZS-C16L	25mm CPI™		.656	16.7	6.56	0.27	4.74	120.4	2.64	67.1	1.625	41.3

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

† For CPI™ and A-LOK®, measured with nuts in the finger tight position

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Specifications

Pressure Rating: 316 Stainless Steel
1/8" to 3/4": 6,000 psig CWP *(414 bar)*
1": 5,000 psig CWP *(345 bar)*

Temperature: Buna-N rubber
-40°F to 250°F *(-40°C to 121°C)*

Orifice: 0.187" to .656" *(4.7 mm to 16.7 mm)*

C_V Factor: 0.66 to 6.56

Suggested Options

Body: Electron beam welded

IAS Certifications

Note: *To order valves certified by IAS (A.G.A./CGA) per NGV 3.1, please contact the factory or your local Parker Distributor.*

How to Order

The correct part number is easily derived by following the circled number sequence. The six product charachteristics required are coded as shown below.

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

12ZS		–	C12L	–	5	–	BN	–	SS
❶	❷		❸		❹		❺		❻
Inlet Port	Outlet Port		Body Size		Crack Pressure		Seat Material		Body Material

Describes a C Series Check Valve with 3/4" CPI™ compression inlet and outlet ports with silver plated ferrules, a 5 psi cracking pressure, Buna-N rubber seat and stainless steel body construction.

16M	16AS	–	C12L	–	10	–	BN	–	SS
❶	❷		❸		❹		❺		❻
Inlet Port	Outlet Port		Body Size		Crack Pressure		Seat Material		Body Material

Describes a C Series Check Valve with a 1" male NPT inlet and a 1" A-LOK® compression outlet port with silver plated ferrules, a 10 psi cracking pressure, Buna-N rubber seat and stainless steel body construction.

1 Inlet Port	2 Outlet Port	3 Body Size	4 Crack Pressure	5 Seat Material	6 Body Material
4AS, 4ZS, 4F, 4F5, 4G5, 4L, 4M, 6AS, 6ZS, M6AS, M6ZS	4AS, 4ZS, 4F, 4F5, 4G5, 4L, 4M, 6AS, 6ZS, M6AS, M6ZS	C4L	1 psi	BN Buna-N	SS 316 Stainless
6AS, 6ZS, 6F5, 6G5, 6L, 6M, 8AS, 8ZS, M8AS, M8ZS	6AS, 6ZS, 6F5, 6G5, 6L, 6M, 8AS, 8ZS, M8AS, M8ZS	C6L	5 psi 10 psi		
8AS, 8ZS, 8F, 8F5, 8G5, 8L, 8M, M12AS, M12ZS	8AS, 8ZS, 8F, 8F5, 8G5, 8L, 8M, M12AS, M12ZS	C8L	25 psi 50 psi		
12AS, 12ZS, 12F, 12F5, 12G5, 12L, 12M, M20AS, M20ZS	12AS, 12ZS, 12F, 12F5, 12G5, 12L, 12M, M20AS, M20ZS	C12L	75 psi 100 psi		
16AS, 16ZS, 16F, 16F5, 16G5, 16L, 16M, M25AS, M25ZS	16AS, 16ZS, 16F, 16F5, 16G5, 16L, 16M, M25AS, M25ZS	C16L			

Available End Configurations

AS - Two ferrule A-LOK® compression port (silver plated front ferrule)

F - ANSI/ASME B1.20.1, Internal pipe threads

F5 - SAE J1926/2, Part 2: Heavy-duty (S Series) stud ends

G5 - SAE J1926/1, Part 1: Threaded port with O-ring seal in truncated housing

ZS - Single ferrule CPI™ compression port (silver plated ferrule)

L - SAE J1453, Fitting – O-ring Face Seal – External thread groove designed to seal with an elastomer against a sleeve

M - ANSI/ASME B1.20.1 External pipe threads

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CNG - Compressed Natural Gas

Refueling hose specially designed for conveying compressed natural gas. High-strength conductive polymer core tube formulated to dissipate static electrical buildup.

Features

- Abrasion and weather resistant urethane cover
- Twin and multi-line bonded assemblies available for fill applications
- Static dissipative design
- Three pressure range designs cover most applications
- Standard cover is red and perforated for use with CNG fuels
- Wide range of fitting configurations available adaptable to all Parker nozzles

Specifications

Conforms To: NFPA 52
ANSI NGV 4.2
CSA 12.52-1999
AGA 1-93

Pressure Range: 3600 psi to 5000 psi *(248 bar to 345 bar)*

Temperature: -40°F to +150°F *(-40°C to 66°C)*

Couplings: 55 series, 3CNG-4 only
58 series, 3CNG-6, 4CNG-6, 5CNG-4, 5CNG-6, 5CNG-8

Note: *All hose assemblies must be proof tested per NFPA 52. CNG kit -size includes warning tag and thermoplastic hose guards. (Refer to CNG hose assembly instructions Bulletin # 4660-CNG-PFD-2)*

See Parflex Catalog #4660 for size and dimensional data of Hose fittings available.

Not for use in airless paint spray applications

Part Number	I.D. in.	Max O.D. in.	Max Working Pressure psi (bar)	Min. Burst Pressure psi (bar)	Min. Bend Radius in.	Weight per 100 ft. lbs.	Hose Guard Kit Part Number
3CNG-4	1/4	.52	3600 (248)	14,400 (993)	2.0	6.2	CNGG3-4-KIT
3CNG-6	3/8	.77	3600 (248)	14,400 (993)	2.5	15.0	CNGG3-6-KIT
4CNG-6	3/8	.77	4000 (276)	16,000 (1100)	2.5	15.0	CNGG3-6-KIT
5CNG-3	3/16	.43	5000 (345)	20,000 (1379)	1.5	5.0	CNGG5-3-KIT
5CNG-4	1/4	.62	5000 (345)	20,000 (1379)	2.0	11.0	CNGG5-4-KIT
5CNG-6	3/8	.77	5000 (345)	20,000 (1379)	3.0	17.0	CNGG3-6-KIT
5CNG-8	1/2	.89	5000 (345)	20,000 (1379)	4.0	20.5	CNGG5-8-KIT

Nozzle/Hose Kits

FM-301-6FOVR Nozzle w/vent recovery hose

Parker Kit Operations Department can offer complete nozzle and hose assemblies. Assemblies can vary in nozzle design (ventable or silencer style), port option interface between nozzle and hose, andf hose style (size, pressure rating, assembly length). Please contact Parker Kit Operations Department* or authorized Parker Distributor for complete nozzle and hose assemblies.

** For information regarding nozzle/hose assembly kits, please contact Parker Kit Operations Department at (419) 878-7000.*

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LNG Products

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1/2" Parker LNG Nozzle

Parker's 1/2" LNG Nozzle was designed to fuel cars and light trucks equipped with 9 to 50 gallon tanks. The 12 GPM flow rate of the 1/2" nozzle provides exceptional fill times.

Features:

- Non-Spill design.
- Minimal air inclusion.
- Valves automatically open on connect and close on disconnect.
- Swivel integrated into nozzle design. No hose swivel required.
- Nozzle design directs any leakage away from operator.
- Field replaceable interface seal.
- May be used for other cryogenic fluids (i.e. liquid argon, nitrogen, oxygen).
- Factory rebuildable*

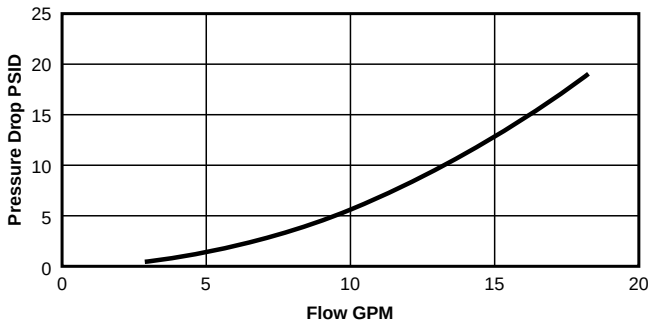
Specifications:

Pressure:	500 psi *(Working)*
Temperature:	-320° F to +160° F
Rated Flow:	12 gpm
Weight:	3.70 lbs *(Nozzle)*
Port size:	1" NPTF
Air Inclusion:	1.02 ml/connect
Spillage:	0.36 ml/disconnect

Materials of Construction:

Main Body & Handles:	Stainless Steel
Collar & Internals:	Stainless Steel & Brass
Seals:	Polytetrafluorethylene
Receptacles:	Stainless Steel

1/2" LNG Coupling Flow Data (Water)



* For information regarding rebuilds, call 612.544.7781 between 8:00 am and 5:00 pm central time

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1" Parker LNG Nozzle (Patent# 5,404,909)

Parker's patented 1" LNG Nozzle is the most widely used fueling nozzle in its class. It's rugged design and low spill characteristics make it the ideal choice. It is most commonly used for fueling large vehicles like class 8 trucks and transit buses.

Features:

- Simple operation.
- Built in safety features include:
  - Dispensing valve cannot be opened when nozzle is disconnected from the vehicle.
  - Nozzle cannot be disconnected while dispensing valve is open.
  - Dispensing valve includes a breakaway mechanism that closes valving if accidental drive-away occurs.
- Minimal spillage during disconnection.
- Built in swivel to facilitate alignment.
- Anti-icing nitrogen purge capability at nozzle interface.
- Rugged design for long life.
- Factory rebuildable*

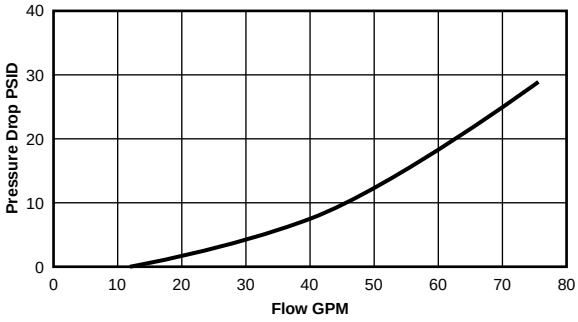
Specifications:

Pressure:	500 psi *(Working)*
Temperature:	-260° F to +160° F
Rated Flow:	50 gpm
Weight:	8.85 lbs *(Nozzle)*
Port size:	1" NPTF
Air Inclusion:	4.50 ml/connect
Spillage:	2.40 ml/disconnect

Materials of Construction:

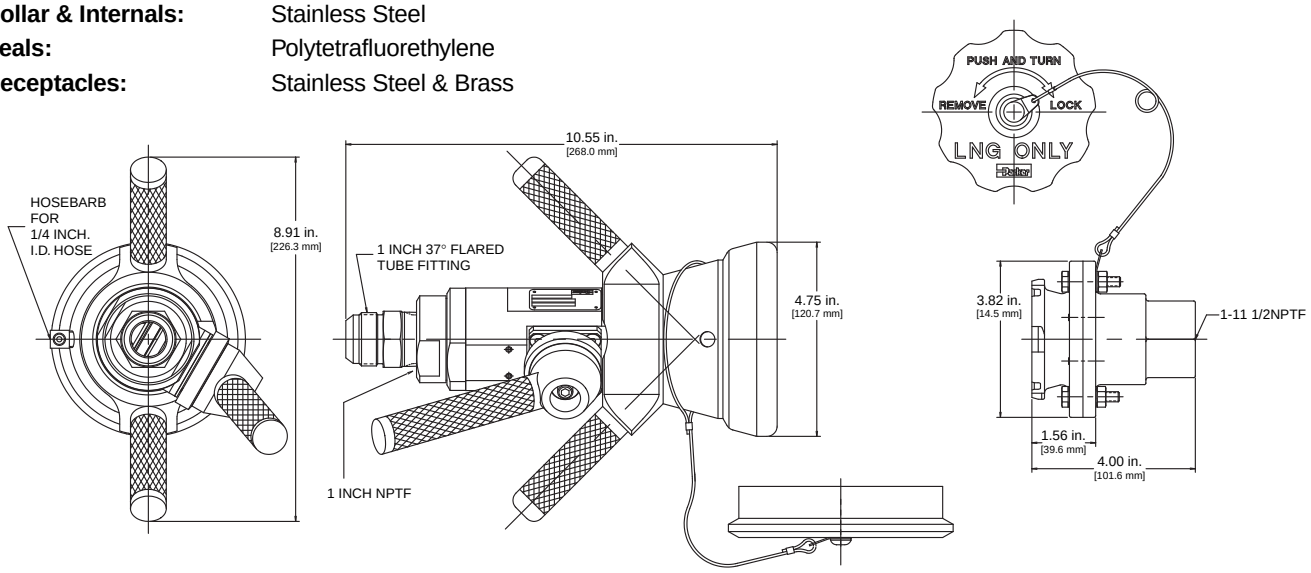
Main Body & Handles:	Aluminum
Collar & Internals:	Stainless Steel
Seals:	Polytetrafluorethylene
Receptacles:	Stainless Steel & Brass

1" LNG Coupling Flow Data (Water)



Ordering Information

	Part No.
Nozzle:	1169-60B
Receptacle:	1169-63
Receptacle Dust Cap:	1169-66
Nozzle Dust Cap:	1169-65
Receptacle With Dust Cap	1169-6366
Nozzle With Dust Cap:	1169-60B65



* For information regarding rebuilds call 612.544.7781 between 8:00 am and 5:00 pm central time

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Parker Parflex Flexible Metal Hose

Parflex Flexible Metal Hoses are the most flexible metal hoses available. These styles of hoses are used wherever temperature and permeation are a concern. NPT, JIC, a complete range of end connections are available to meet your needs.

Note: *all assemblies are leak tested with 150 lbs. of Nitrogen for 30 seconds. Helium leak testing is also available.*
Assemblies are factory made only.

Features:

- Most flexible metal hose available.
- Every assembly is leak tested before shipment.
- Working temperatures from -400°F to 1500° F.
- 321 Stainless Steel tube. 316 available.
- Least permeable hose available.
- Three styles to precisley meet your pressure and flexibility requirements.

  9A – Standard

  9M – Ultra Flexible

  9H – High Pressure

Materials of Construction

Core Tube: 321/316 Stainless Steel

Exterior Braid: 304 Stainless Steel

Specifications

Sizes: 1/4" I.D. to 6" I.D.

Pressure: 210 psi to 2,700 psi *(Working)*

Temperature: -400°F to 1500°F

Consult bulletin 4690-MH1 available from Parker Catalog Services for complete information and specifications on Standard, Ultra Flexible, and High Pressure Metal Hoses.

Standard 9A Specifications

Inside Diameter (in.)	Number of Braids	Outside Diameter (in.)	Static Min. Bend Radius (in.)	Dynamic Min. Bend Radius (in.)	Working Pressure (psi)	Burst Pressure (psi	Weight Per Foot (lbs)
	0	0.41			90		0.04
1/4	1	0.47	1.0	4.5	1,800	7,233	0.11
	2	0.53			2,700	9,100	0.18
	0	0.65			70		0.10
3/8	1	0.71	1.2	5.0	1,668	6,230	0.20
	2	0.77			2,336	9,345	0.30
	0	0.77			70		0.11
1/2	1	0.83	1.5	5.5	1,186	4,743	0.22
	2	0.89			1,779	7,115	0.33
	0	0.96			57		0.17
5/8	1	1.02	1.8	7.0	1.205	4,820	0.33
	2	1.08			1,808	7,230	0.49
	0	1.16			43		0.19
3/4	1	1.22	2.1	8.0	898	3,591	0.37
	2	1.28			1,347	5,387	0.55
	0	1.47			43		0.26
1	1	1.53	2.7	9.0	718	2,872	0.50
	2	1.59			1,077	4,308	0.74
	0	1.75			43		0.29
1-1/4	1	1.83	3.1	10.0	645	2,581	0.61
	2	1.91			968	3,872	0.93
	0	2.08			28		0.47
1-1/2	1	2.16	3.9	11.0	531	2,125	0.85
	2	2.24			797	3,188	1.23
	0	2.61			14		0.59
2	1	2.69	5.1	13.0	449	1,797	1.11
	2	2.77			674	2,696	1.63
	0	3.40			14		0.84
2-1/2	1	3.50	6.8	16.0	417	1,669	1.64
	2	3.60			626	2,504	2.44
	0	3.88			14		1.18
3	1	3.98	7.8	18.0	346	1,384	2.06
	2	4.08			519	2,076	2.94
	0	4.96			14		1.41
4	1	5.06	9.8	22.0	299	1,194	2.47
	2	5.16			448	1,791	3.53
	0	6.00			14		2.18
5	1	6.13	12.8	28.0	275	1,099	3.61
	2	6.25			412	1,649	5.04
	0	7.01			11		2.69
6	1	7.14	14.8	32.0	210	839	4.44
	2	7.26			315	1,259	6.19

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Tube Fittings

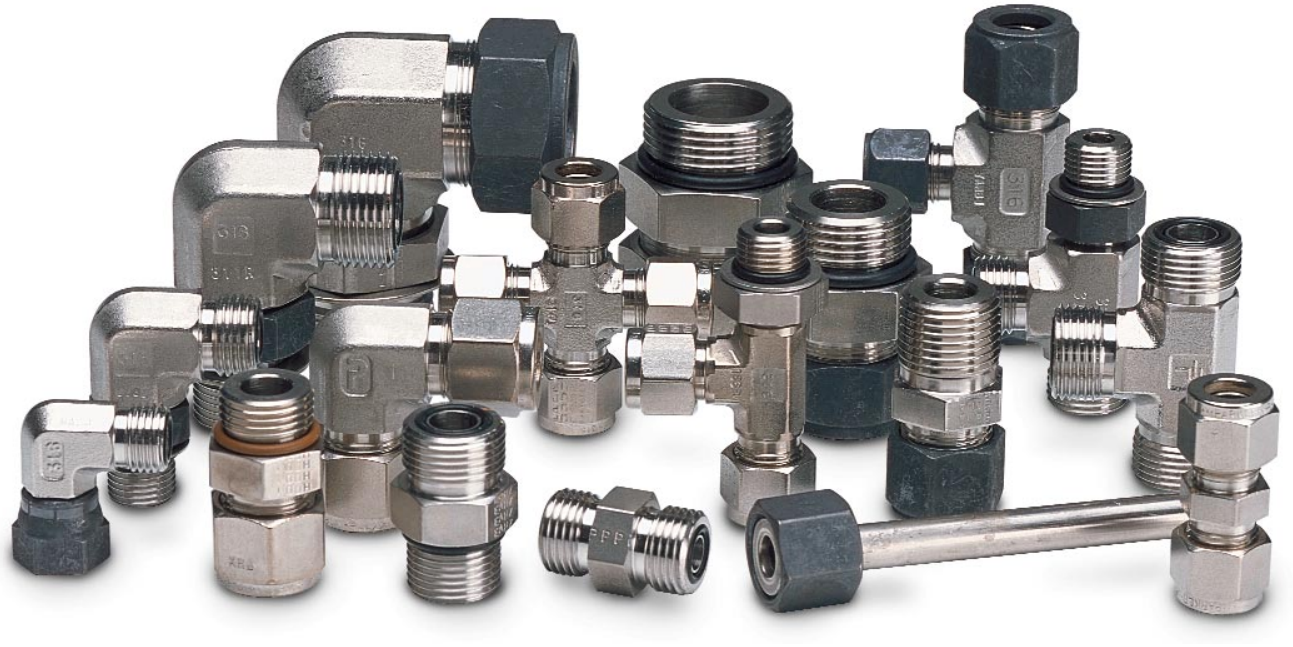

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Table 1 – Typical Raw Material Specifications

BASIC FITTING MATERIAL	BAR STOCK	FORGING	COMMON TUBING SPECIFICATION
BRASS	CA-360 QQ-B 626 Alloy 360 ASTM-B16 Alloy 360 CA-345 ASTM-B-453 Alloy 345 BS970 316-S31 DIN 4401 ASME SA479-316	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)	ASME-SA-479 Type 316-SS BS970 316-S31 DIN 4401	ASME-SA-182 316 BS970 316-S31 DIN 4401	ASME-SA-213 ASTM-A-213 ASTM-A-249 ASTM-A-269(2) MIL T-8504 MIL T-8506
STEEL	ASTM-A-108 QQ-S-637	ASTM-A-576	SAE J524b SAE J525b ASTM-A-179
ALUMINUM	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
NICKEL-COPPER	ASTM-B-164 QQ-N-281 BS3076 NA13	ASTM-B-164 QQ-N-281 BS3076 NA13	ASTM-B-165
HASTELLOY C-276®	ASTM-B-574 ASTMB575	ASTM-B-574	ASTM-B-622 ASTM-B-626
ALLOY 600	ASTM B-166 ASME-SB-166	ASTM-B-564	ASTM-B-163
CARPENTER 20®	ASTM-B-473	ASTM-B-462 ASTM-B-472	ASTM-B-468
TITANIUM	ASTM-B-348	ASTM-B-381	ASTM-B-338
INCOLOY 625 INCOLOY 825	BS3076 NA16 ASTMB425	BS3076 NA16 ASTMB425	ASTM-B-625 ASTM-B-444 ASTM-B-423 ASTM-B-829
6MO	UNS S31254 ASTM A479	UNS S31254 ASTM A 479	ASTM-A-269

(1) If more specific information, including heat code traceability, is required, your Parker Hannifin CPI™ distributor will provide details.
(2) Stainless steel CPI™ tube fittings work reliably on both seamless and welded-redrawn, fully annealed type 304, 316 and 316L tubing.

Tube End Dimensional Data

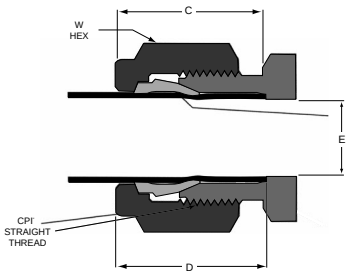
	INCHES					
SIZE NO.	TUBE O.D.	CPI™ STRAIGHT THREAD	†C	W HEX	E DIA.	†D TUBE INS. DEPTH
1	1/16	10-32	.43	5/16	.052	.34
2	1/8	5/16-20	.60	7/16	.093	.50
3	3/16	3/8-20	.64	1/2	.125	.54
4	1/4	7/16-20	.70	9/16	.187	.60
5	5/16	1/2-20	.73	5/8	.250	.64
6	3/8	9/16-20	.76	11/16	.281	.67
8	1/2	3/4-20	.87	7/8	.406	.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	2.65

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

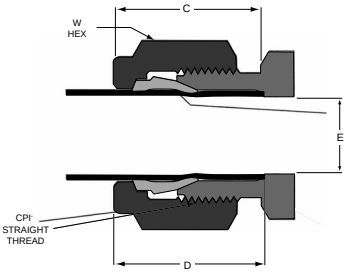
† Average Value

Dimensions for reference only, subject to change.

INCHES



MILLIMETERS



	MILLIMETERS					
SIZE NO.	TUBE O.D.	CPI™ STRAIGHT THREAD	†C	W HEX	E DIA.	†D TUBE INS. DEPTH
2	2mm	5/16-20	15,3	12,0	1,7	12,9
3	3mm	5/16-20	15,3	12,0	2,4	12,9
4	4mm	3/8-20	16,1	12,0	2,4	13,7
6	6mm	7/16-20	17,7	14,0	4,8	15,3
8	8mm	1/2-20	18,6	15,0	6,4	16,2
10	10mm	5/8-20	19,5	18,0	7,9	17,2
12	12mm	3/4-20	22,0	22,0	9,5	22,8
14	14mm	7/8-20	22,0	24,0	11,1	24,4
15	15mm	7/8-20	22,0	24,0	11,9	24,4
16	16mm	7/8-20	22,0	24,0	12,7	24,4
18	18mm	1-20	22,0	27,0	15,1	24,4
20	20mm	1-1/8-20	22,0	30,0	15,9	26,0
22	22mm	1-1/8-20	22,0	30,0	18,3	26,0
25	25mm	1-5/16-20	26,5	35,0	21,8	31,3

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

† Average Value

Dimensions for reference only, subject to change.

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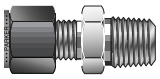
Nomenclature

Parker CPI™ 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™ stainless steel male connector for 1/2" O.D. tube (–8) and 1/4" male pipe thread (–4).

How To Order Inch Parts

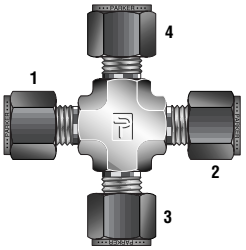


Parker CPI™ tube fittings are ordered by part number as listed in this catalog.

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™ tube end size first followed by the smaller CPI™ 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 RBZ. 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 the style designator; i.e. 4-4-4 JBZ



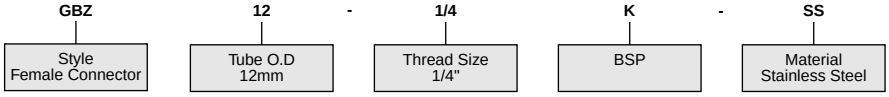
Type: A letter or combination of letters and numbers are used to designate the type of fitting. (i.e. MBT = male branch tee, FA = female adapter, etc.) See the visual index for fitting types.

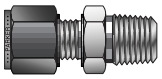
Material: Basic material type (B = brass, 316 = stainless steel, type 316; S = steel; A = aluminum; M = Monel; HC = Hastelloy C-276®; IN = Alloy 600; SS20 = Carpenter 20®; 6MO = 6MO; 625 = 625; 825 = 825; T = Titanium). Parker CPI™ tube fittings, for special applications, can be furnished in almost any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

Availability: Items priced in current price list 4230 are carried in stock. Price and delivery for non-stocked items quoted on request through the Quick Response Department.

How To Order Metric Parts



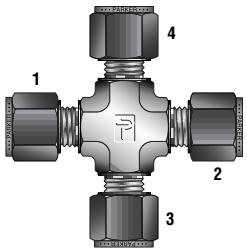


Parker CPI™ tube fittings are ordered by part number as listed in this catalog.

Size: Metric tube is designated in millimeters and prefixed “M” (i.e. 12mm tube = M12.) The pipe thread size is written as a fraction (i.e. 1/4 NPT = 1/4N).

Straights & Elbows: Call out largest CPI™ tube end size first followed by the smaller CPI™ 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 6mm tube and 1/4" male pipe thread would be RBZ 6-1/4-6. For crosses – first size the run (1 to 2) and then the branch (3 to 4). For tees with all ends the same size, use the tube end size after the style designator; i.e, JBZ 4-4-4



Type: A letter or combination of letters and numbers are used to designate the type of fitting. See the visual index for fitting types.

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

Thread types:

K = BSP Taper	BS21, ISO7/1, DIN 2999
R = BSPP	BS2779, ISO 228/1+2, DIN 3852 FORM A
BR = BSPP	BS2779, ISO 228/1+2, DIN 3852 FORM B
M = Metric	BS2779, ISO 228/1+2, DIN 3852
RED = BSPP	BS2779, ISO 228/1+2, DIN 3852 with elastic sealing

Please see visual index.

Color Coding

For easy reference, table heads are color indicated as follows:

fractional

metric

Availability: Items priced in current price list 4230 are carried in stock. Price and delivery for non-stocked items quoted on request through the Parker ICD Quick Response Department.

NOTE: Hastelloy C-276 is a registered trademark of Cabot Corporation. Carpenter 20 is a registered trademark of Carpenter Technology Corporation.

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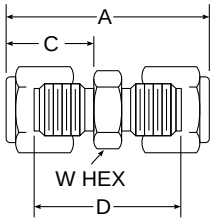
union
HBZ

includes body, nut and ferrule



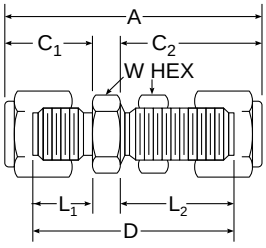
PARKER PART NO.	INCHES				
	TUBE O.D.	W HEX	†A	†C	D
1-1 HBZ	1/16	5/16	1.02	.44	.69
2-1 HBZ	1/8-1/16	7/16	1.22	.60-.44	.81
2-2 HBZ	1/8	7/16	1.40	.60	.88
3-1 HBZ	3/16-1/16	7/16	1.29	.64-.44	.86
3-2 HBZ	3/16-1/8	7/16	1.44	.64-.60	.92
3-3 HBZ	3/16	7/16	1.47	.64	.95
4-1 HBZ	1/4-1/16	1/2	1.35	.70-.44	.91
4-2 HBZ	1/4-1/8	1/2	1.52	.70-.60	.97
4-3 HBZ	1/4-3/16	1/2	1.55	.70-.64	1.00
4-4 HBZ	1/4	1/2	1.61	.70	1.03
5-4 HBZ	5/16-1/4	9/16	1.67	.73-.70	1.08
5-5 HBZ	5/16	9/16	1.70	.73	1.11
6-1 HBZ	3/8-1/16	5/8	1.45	.76-.44	1.00
6-2 HBZ	3/8-1/8	5/8	1.61	.76-.60	1.06
6-4 HBZ	3/8-1/4	5/8	1.71	.76-.70	1.13
6-5 HBZ	3/8-5/16	5/8	1.75	.76-.73	1.16
6-6 HBZ	3/8	5/8	1.77	.76	1.19
8-2 HBZ	1/2-1/8	13/16	1.75	.87-.60	1.09
8-4 HBZ	1/2-1/4	13/16	1.85	.87-.70	1.16
8-6 HBZ	1/2-3/8	13/16	1.91	.87-.76	1.22
8-8 HBZ	1/2	13/16	2.02	.87	1.22
10-6 HBZ	5/8-3/8	15/16	1.94	.87-.76	1.25
10-8 HBZ	5/8-1/2	15/16	2.05	.87-.87	1.25
10-10 HBZ	5/8	15/16	2.05	.87	1.25
12-6 HBZ	3/4-3/8	1-1/16	2.00	.87-.76	1.31
12-8 HBZ	3/4-5/8	1-1/16	2.11	.87-.87	1.31
12-10 HBZ	3/4-5/8	1-1/16	2.11	.87-.87	1.31
12-12 HBZ	3/4	1-1/16	2.11	.87	1.31
14-14 HBZ	7/8	1-3/16	2.18	.87	1.38
16-8 HBZ	1-1/2	1-3/8	2.39	1.05-.87	1.50
16-12 HBZ	1-3/4	1-3/4	2.39	1.05-.87	1.50
16-16 HBZ	1	1-3/8	2.56	1.05	1.59
20-20 HBZ	1-1/4	1-3/4	3.61	1.52	1.89
24-24 HBZ	1-1/2	2-1/8	4.23	1.77	2.11

†Average Value

Dimensions for Reference Only, Subject to Change

bulkhead union
WBZ

includes body, nut, ferrule and locknut



PARKER PART NO.	INCHES									
	TUBE O.D.	W HEX	BULKHEAD HOLE DRILL SIZE	MAXIMUM BULKHEAD THICKNESS	†A	†C_1	L_1	D	†C_2	L_2
1-1 WBZ	1/16	5/16	13/64	1/8	1.27	.44	.28	.94	.69	.53
2-2 WBZ	1/8	1/2	21/64	1/2	2.02	.60	.34	1.50	1.23	.97
3-3 WBZ	3/16	9/16	25/64	1/2	2.11	.64	.38	1.59	1.26	1.00
4-2 WBZ	1/4-1/8	5/8	21/64	1/2	2.17	.70	.41	1.63	1.23	.97
4-4 WBZ	1/4	5/8	29/64	17/32	2.27	.70	.41	1.69	1.31	1.02
5-5 WBZ	5/16	11/16	33/64	9/16	2.40	.73	.44	1.81	1.42	1.12
6-6 WBZ	3/8	3/4	37/64	9/16	2.46	.76	.47	1.88	1.44	1.15
8-8 WBZ	1/2	15/16	49/64	19/32	2.80	.87	.47	2.00	1.65	1.25
10-10 WBZ	5/8	1-1/16	57/64	19/32	2.86	.87	.47	2.06	1.68	1.28
12-12 WBZ	3/4	1-3/16	1-1/64	25/32	3.11	.87	.47	2.31	1.87	1.47
14-14 WBZ	7/8	1-3/8	1-9/64	15/16	3.33	.87	.47	2.53	2.09	1.69
16-16 WBZ	1	1-9/16	1-21/64	15/16	3.78	1.05	.56	2.81	2.27	1.78

†Average Value

Dimensions for Reference Only, Subject to Change

NOTE: For reducer sizes call out short end first. For replacement bulkhead nuts see Page 30, Part WLZ.

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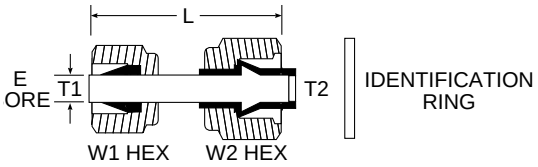
dielectric union assembly DEBTA

includes nuts, machined tube with molded ferrule, preset ferrule, and dielectric identification ring

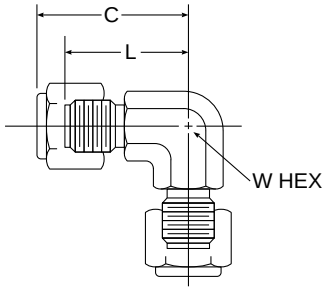


PARKER PART NO.	INCHES					
	TUBE END T1	TUBE END T2	W1 HEX	W2 HEX	L	E BORE
6-8 DEBTA-SS	3/8	1/2	11/16	7/8	2.08	.30

Makeup instructions included with parts in box.
Note: To order CPI silver-plated nut specify 6-8 DEBTA-SS-C.

union elbow EBZ

includes body, nut and ferrule



PARKER PART NO.	INCHES			
	TUBE O.D.	W HEX	†C	L
1-1 EBZ	1/16	5/16	.71	.56
2-2 EBZ	1/8	5/16	.92	.66
3-3 EBZ	3/16	7/16	.95	.69
4-4 EBZ	1/4	7/16	1.01	.72
5-5 EBZ	5/16	9/16	1.14	.84
6-6 EBZ	3/8	9/16	1.13	.84
8-8 EBZ	1/2	13/16	1.42	1.02
10-10 EBZ	5/8	7/8	1.43	1.03
12-12 EBZ	3/4	1-1/16	1.56	1.16
14-14 EBZ	7/8	1-5/16	1.76	1.36
16-16 EBZ	1	1-5/16	1.94	1.45
20-20 EBZ	1-1/4	1-5/8	2.61	1.75
24-24 EBZ	1-1/2	1-7/8	3.06	2.00

†Average Value

Dimensions for Reference Only, Subject to Change

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Table 1 – Typical Raw Material Specifications

BASIC FITTING MATERIAL	BAR STOCK	FORGING	COMMON TUBING SPECIFICATION
BRASS	CA-360 QQ-B 626 Alloy 360 ASTM-B16 Alloy 360 CA-345 ASTM-B-453 Alloy 345 BS970 316-S31 DIN 4401 ASME SA479-316	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)	ASME-SA-479 Type 316-SS BS970 316-S31 DIN 4401	ASME-SA-182 316 BS970 316-S31 DIN 4401	ASME-SA-213 ASTM-A-213 ASTM-A-249 ASTM-A-269(2) MIL T-8504 MIL T-8506
STEEL	ASTM-A-108 QQ-S-637	ASTM-A-576	SAE J524b SAE J525b ASTM-A-179
ALUMINUM	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
NICKEL-COPPER	ASTM-B-164 QQ-N-281 BS3076 NA13	ASTM-B-164 QQ-N-281 BS3076 NA13	ASTM-B-165
HASTELLOY C-276®	ASTM-B-574 ASTMB575	ASTM-B-574	ASTM-B-622 ASTM-B-626
ALLOY 600	ASTM B-166 ASME-SB-166	ASTM-B-564	ASTM-B-163
CARPENTER 20®	ASTM-B-473	ASTM-B-462 ASTM-B-472	ASTM-B-468
TITANIUM	ASTM-B-348	ASTM-B-381	ASTM-B-338
INCOLOY 625 INCOLOY 825	BS3076 NA16 ASTMB425	BS3076 NA16 ASTMB425	ASTM-B-625 ASTM-B-444 ASTM-B-423 ASTM-B-829
6MO	UNS S31254 ASTM A479	UNS S31254 ASTM A 479	ASTM-A-269

(1) If more specific information, including heat code traceability, is required, your Parker Hannifin A-LOK® distributor will provide details.
(2) Stainless steel A-LOK® tube fittings work reliably on both seamless and welded-redrawn, fully annealed type 304, 316 and 316L tubing.

Tube End Dimensional Data

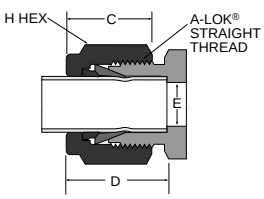
SIZE NO.	INCHES TUBE O.D.	A-LOK® STRAIGHT THREAD	†C	H HEX	E DIA.	†D TUBE INS. DEPTH
1	1/16	10-32	.43	5/16	.052	.34
2	1/8	5/16-20	.60	7/16	.093	.50
3	3/16	3/8-20	.64	1/2	.125	.54
4	1/4	7/16-20	.70	9/16	.187	.60
5	5/16	1/2-20	.73	5/8	.250	.64
6	3/8	9/16-20	.76	11/16	.281	.67
8	1/2	3/4-20	.87	7/8	.406	.90
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	2.65

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

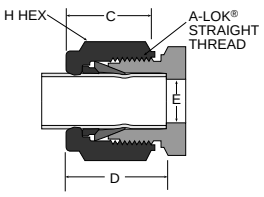
† Average Value

Dimensions for reference only, subject to change.

INCHES



MILLIMETERS



SIZE NO.	MILLIMETERS TUBE O.D.	A-LOK® STRAIGHT THREAD	†C	H HEX	E DIA.	†D TUBE INS. DEPTH
2	2mm	5/16-20	15,3	12,0	1,7	12,9
3	3mm	5/16-20	15,3	12,0	2,4	12,9
4	4mm	3/8-20	16,1	12,0	2,4	13,7
6	6mm	7/16-20	17,7	14,0	4,8	15,3
8	8mm	1/2-20	18,6	15,0	6,4	16,2
10	10mm	5/8-20	19,5	18,0	7,9	17,2
12	12mm	3/4-20	22,0	22,0	9,5	22,8
14	14mm	7/8-20	22,0	24,0	11,1	24,4
15	15mm	7/8-20	22,0	24,0	11,9	24,4
16	16mm	7/8-20	22,0	24,0	12,7	24,4
18	18mm	1-20	22,0	27,0	15,1	24,4
20	20mm	1-1/8-20	22,0	30,0	15,9	26,0
22	22mm	1-1/8-20	22,0	30,0	18,3	26,0
25	25mm	1-5/16-20	26,5	35,0	21,8	31,3

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

† Average Value

Dimensions for reference only, subject to change.

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Cleveland, OH 44124

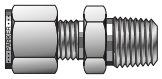
Nomenclature

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

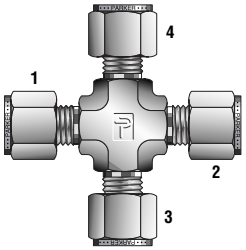
Example: The part number shown below is for a Parker A-LOK® stainless steel male connector for 1/2" O.D. tube (–8) and 1/4" male pipe thread (–4).

How To Order 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 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 A-LOK® tube end size first followed by the smaller 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. 4ET4.

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

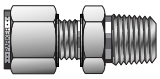
Material: Basic material type (B = brass, 316 = stainless steel, type 316; S = steel; A = aluminum; M = Monel; HC = Hastelloy C-276®; IN = Alloy 600; SS20 = Carpenter 20®; 6MO = 6Mo; 625 = 625; 825 = 825; T = Titanium). Parker A-LOK® Tube fittings, for special applications, can be furnished in almost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

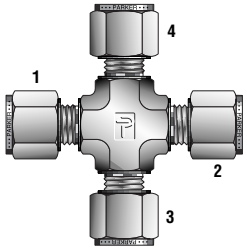
Availability: Items priced in current price list 4233 are carried in stock. Price and delivery for non-stocked items quoted on request through the Quick Response Department.

How To Order Metric Parts

M12	FSC	1/4	N	-	316
Tube O.D. 12mm	Style Female Connector	Thread Size 1/4"	Thread Type* NPT		Material Stainless Steel



Parker A-LOK® tube fittings are ordered by part number as listed in this catalog.



Size: Metric tube is designated in millimeters and prefixed “M” (i.e. 12mm tube = M12.) The pipe thread size is written as a fraction (i.e. 1/4 NPT = 1/4N).

Straights & Elbows: Call out largest A-LOK® tube end size first followed by the smaller 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 6mm 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 size, use the tube end size after the style designator; i.e, ETM4

Type: A letter or combination of letters and numbers are used to designate the type of fitting. See the visual index for fitting types.

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

Thread types:

N = NPT	ANSI B1.20.1
K = BSP Taper	BS21, ISO7/1
R = BSPP	BS2779, ISO 228/1+2, DIN 3852 FORM A
BR = BSPP	BS2779, ISO 228/1+2, DIN 3852 FORM B
M = Metric	BS2779, ISO 228/1+2, DIN 3852
RED = BSPP	BS2779, ISO 228/1+2, DIN 3852 with elastic sealing

Please see visual index.

Color Coding

For easy reference, table heads are color indicated as follows:

fractional

metric

Availability: Items priced in current price list 4233 are carried in stock. Price and delivery for non-stocked items quoted on request through the Parker ICD Quick Response Department.

NOTE: Hastelloy C-276 is a registered trademark of Cabot Corporation. Carpenter 20 is a registered trademark of Carpenter Technology Corporation.

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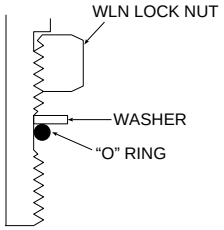
SAE Straight Thread Fittings Installation Procedure

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.



NOTE: Replacement WLN Lock Nuts are ordered separately by size and part number. Refer to page 30.

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.

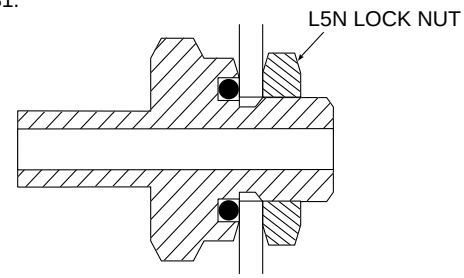
Typical Application

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.

Notes

Standard “O” rings are Buna-N material. For other “O” rings, state material after the part number.

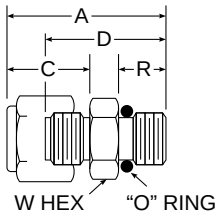
L5N locknuts are ordered separately by size and part number. Refer to page 31.



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

male connector to SAE straight thread M1SC

includes body, nut, ferrules and “O” ring



PARKER PART NO.	INTER-CHANGES WITH	INCHES							O-RING AS UNIFORM DASH NO.
		TUBE O.D.	STRAIGHT THREAD SIZE	W HEX	†A	†C	D	R	
1M1SC2		1/16	5/16-24	7/16	.92	.43	.77	.30	3-902
2M1SC2		1/8	5/16-24	7/16	1.09	.60	.83	.30	3-902
3M1SC3		3/16	3/8-24	1/2	1.20	.64	.94	.30	3-903
4M1SC4	400-1-4 ST	1/4	7/16-20	9/16	1.29	.70	1.00	.36	3-904
4M1SC6	400-1-6 ST	1/4	9/16-18	11/16	1.35	.70	1.06	.39	3-906
4M1SC8		1/4	3/4-16	7/8	1.51	.70	1.22	.44	3-908
5M1SC5		5/16	1/2-20	5/8	1.43	.73	1.13	.36	3-905
6M1SC4		3/8	7/16-20	5/8	1.38	.76	1.09	.36	3-904
6M1SC6	600-1-6 ST	3/8	9/16-18	11/16	1.42	.76	1.13	.39	3-906
6M1SC8		3/8	7/8-14	7/8	1.57	.76	1.28	.44	3-908
6M1SC10		3/8	7/8-14	1.00	1.63	.76	1.34	.50	3-910
8M1SC6	810-1-6 ST	1/2	9/16-18	7/8	1.54	.87	1.14	.39	3-906
8M1SC8	810-1-8 ST	1/2	3/4-16	7/8	1.68	.87	1.28	.44	3-908
8M1SC12		1/2	1-1/16-12	1-1/4	1.78	.87	1.38	.59	3-912
10M1SC10	1010-1-10 ST	5/8	7/8-14	1	1.78	.87	1.38	.50	3-910
12M1SC10		3/4	7/8-14	1-1/8	1.68	.87	1.28	.50	3-910
12M1SC12	1210-1-12 ST	3/4	1-1/16-12	1-1/4	1.93	.87	1.38	.59	3-912
14M1SC14		7/8	1-3/16-12	1-3/8	1.93	.87	1.53	.59	3-914
16M1SC12		1	1-1/16-12	1-3/8	2.12	1.05	1.63	.59	3-912
16M1SC16	1610-1-16ST	1	1-5/16-12	1-3/8	2.11	1.04	1.63	.59	3-916

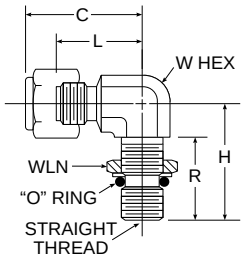
†Average Value

Dimensions for Reference Only, Subject to Change

Parker Hannifin Corporation
6035 Parkland Blvd.
Cleveland, OH 44124

male SAE straight thread elbow M5SEL

includes body, nut, ferrules, locknut assembly and “O” ring



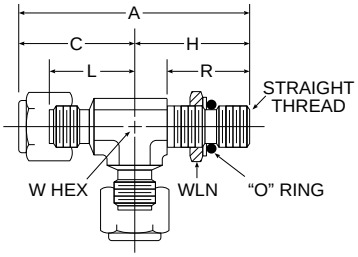
PARKER PART NO.	INTER-CHANGES WITH	INCHES							O-RING ARP UNIFORM DASH NO.
		TUBE O.D.	STRAIGHT THREAD SIZE	W HEX	†C	H	L	R	
4M5SEL4	400-2-4ST	1/4	7/16-20	1/2	1.12	1.13	.83	.78	3-904
6M5SEL6	600-2-6ST	3/8	9/16-18	9/16	1.26	1.27	.97	.84	3-906
8M5SEL8	810-2-8ST	1/2	3/4-16	3/4	1.48	1.48	1.08	.97	3-908
12M5SEL12	1210-2-12ST	3/4	1-1/16-12	1-1/16	1.63	1.92	1.23	1.28	3-912
16M5SEL16	1610-2-16ST	1	1-5/16-12	1-5/16	2.01	2.11	1.52	1.28	3-916

†Average Value

Dimensions for Reference Only, Subject to Change

male run tee SAE straight thread M5RT

includes body, nut, ferrules, locknut assembly and “O” ring



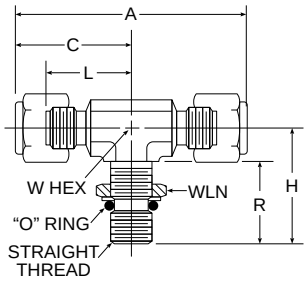
PARKER PART NO.	INTER-CHANGES WITH	INCHES								O-RING ARP UNIFORM DASH NO.
		TUBE O.D.	STRAIGHT THREAD SIZE	W HEX	†A	†C	H	L	R	
4M5RT4	400-3TST	1/4	7/16-20	7/16	2.25	1.12	1.13	.83	.78	3-904
6M5RT6	600-3TST	3/8	9/16-18	9/16	2.53	1.26	1.27	.97	.84	3-906
8M5RT8	810-3TST	1/2	3/4-16	3/4	2.96	1.48	1.48	1.08	.97	3-908
12M5RT12	1210-3TST	3/4	1-1/16-12	1-1/16	3.55	1.63	1.92	1.23	1.28	3-912
16M5RT16	1610-3TST	1	1-5/16-12	1-5/16	4.12	2.01	2.11	1.52	1.28	3-916

†Average Value

Dimensions for Reference Only, Subject to Change

male branch tee SAE straight thread M5BT

includes body, nut, ferrules, locknut assembly and "O" ring



PARKER PART NO.	INTER-CHANGES WITH	INCHES								O-RING ARP UNIFORM DASH NO.
		TUBE O.D.	STRAIGHT THREAD SIZE	W HEX	†A	†C	H	L	R	
4M5BT4	400-3TTS	1/4	7/16-20	7/16	2.24	1.12	1.13	.83	.78	3-904
6M5BT6	600-3TTS	3/8	9/16-18	9/16	2.52	1.26	1.27	.97	.84	3-906
8M5BT8	810-3TTS	1/2	3/4-16	3/4	2.96	1.48	1.48	1.08	.97	3-908
12M5BT12	1210-3TTS	3/4	1-1/16-12	1-1/16	3.26	1.63	1.92	1.23	1.28	3-912
16M5BT16	1610-3TTS	1	1-5/16-12	1-5/16	4.02	2.01	2.11	1.52	1.28	3-916

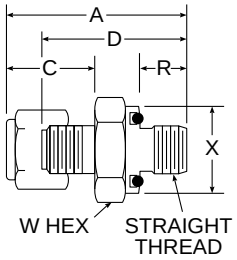
†Average Value

Dimensions for Reference Only, Subject to Change

Parker Hannifin Corporation
6035 Parkland Blvd.
Cleveland, OH 44124

male connector to “O” ring straight thread M2SC

includes body, nut, ferrules and "O" ring



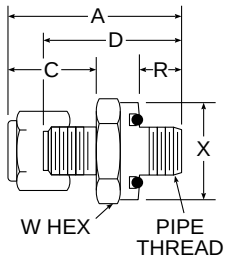
PARKER PART NO.	INTER-CHANGES WITH	INCHES								O-RING ARP UNIFORM DASH NO.
		TUBE O.D.	STRAIGHT THREAD SIZE	W HEX	†A	†C	D	R	X DIA.	
1M2SC1	100-1-OR	1/16	5/16-24	9/16	1.06	.43	.91	.34	.55	2-011
2M2SC2	200-1-OR	1/8	5/16-24	9/16	1.29	.60	1.03	.34	.55	2-011
3M2SC3	300-1-OR	3/16	3/8-24	5/8	1.35	.64	1.09	.38	.62	2-012
4M2SC4	400-1-OR	1/4	7/16-20	3/4	1.51	.70	1.22	.41	.74	2-111
5M2SC5	500-1-OR	5/16	1/2-20	7/8	1.61	.73	1.31	.44	.86	2-112
6M2SC6	600-1-OR	3/8	9/16-18	15/16	1.67	.76	1.38	.44	.93	2-113
8M2SC8	810-1-OR	1/2	3/4-16	1-1/8	1.81	.87	1.41	.47	1.12	2-116
10M2SC10	1010-1-OR	5/8	7/8-14	1-3/8	1.90	.87	1.50	.47	1.30	2-212
12M2SC12	1210-1-OR	3/4	1-1/16-12	1-1/2	2.06	.87	1.66	.56	1.49	2-215
14M2SC12		7/8	1-1/16-12	1-1/2	2.06	.87	1.66	.56	1.49	2-215
16M2SC16		1	1-5/16-12	1-3/4	2.30	1.05	1.81	.56	1.74	2-219

†Average Value

Dimensions for Reference Only, Subject to Change

male connector to “O” ring pipe thread M3SC

includes body, nut, ferrules and "O" ring



PARKER PART NO.	INTER-CHANGES WITH	INCHES								O-RING ARP UNIFORM DASH NO.
		TUBE O.D.	NPT PIPE THREAD	W HEX	†A	†C	D	R	X DIA.	
1M3SC2		1/16	1/8	3/4	1.12	.43	.97	.28	.74	2-011
2M3SC2	200-1-2-OR	1/8	1/8	3/4	1.29	.60	1.03	.28	.74	2-011
2M3SC4		1/8	1/4	15/16	1.43	.60	1.17	.38	.93	2-113
3M3SC2		3/16	1/8	3/4	1.32	.64	1.06	.28	.74	2-011
3M3SC4		3/16	1/4	15/16	1.46	.64	1.20	.38	.93	2-113
4M3SC2	400-1-2-OR	1/4	1/8	3/4	1.38	.70	1.09	.28	.74	2-011
4M3SC4	400-1-4-OR	1/4	1/4	15/16	1.51	.70	1.22	.38	.93	2-113
4M3SC6		1/4	3/8	1-1/8	1.57	.70	1.28	.41	1.12	2-116
5M3SC2		5/16	1/8	3/4	1.43	.73	1.13	.28	.74	2-011
5M3SC4		5/16	1/4	15/16	1.46	.73	1.16	.38	.93	2-113
6M3SC2		3/8	1/8	3/4	1.45	.76	1.16	.28	.74	2-011
6M3SC4		3/8	1/4	15/16	1.57	.76	1.28	.38	.93	2-113
6M3SC6		3/8	3/8	1-1/8	1.63	.76	1.34	.41	1.12	2-116
6M3SC8		3/8	1/2	1-3/8	1.85	.76	1.56	.53	1.30	2-212
8M3SC4		1/2	1/4	15/16	1.68	.87	1.28	.38	.93	2-113
8M3SC6		1/2	3/8	1-1/8	1.76	.87	1.36	.41	1.12	2-116
8M3SC8		1/2	1/2	1-3/8	1.98	.87	1.58	.53	1.30	2-212
10M3SC8		5/8	1/2	1-3/8	1.96	.87	1.56	.53	1.30	2-212
10M3SC12		5/8	3/4	1-1/2	2.06	.87	1.66	.56	1.49	2-215
12M3SC8		3/4	1/2	1-3/8	1.98	.87	1.58	.53	1.30	2-212
12M3SC12		3/4	3/4	1-1/2	2.06	.87	1.66	.56	1.49	2-215
16M3SC12		1	3/4	1-1/2	2.24	1.05	1.75	.56	1.49	2-215
16M3SC16		1	1	1-3/4	2.40	1.05	1.91	.66	1.74	2-219

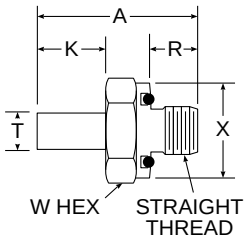
†Average Value

Dimensions for Reference Only, Subject to Change

Parker Hannifin Corporation
6035 Parkland Blvd.
Cleveland, OH 44124

tube end to "O" ring straight thread M2TU

includes "O" ring

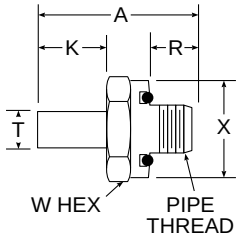


PARKER PART NO.	INTER-CHANGES WITH	INCHES T TUBE O.D.	STRAIGHT THREAD SIZE	W HEX	A	K	R	X DIA.	O-RING ARP UNIFORM DASH NO.
2M2TU2	2-TA-OR-ST	1/8	5/16-24	9/16	1.22	.53	.34	.55	2-011
3M2TU3	3-TA-OR-ST	3/16	3/8-24	5/8	1.28	.56	.38	.62	2-012
4M2TU4	4-TA-OR-ST	1/4	7/16-20	3/4	1.44	.63	.41	.74	2-111
5M2TU5	5-TA-OR-ST	5/16	1/2-20	7/8	1.54	.66	.44	.86	2-112
6M2TU6	6-TA-OR-ST	3/8	9/16-18	15/16	1.66	.69	.47	.93	2-113
8M2TU8	8-TA-OR-ST	1/2	3/4-16	1-1/8	1.84	.91	.47	1.12	2-116
10M2TU10		5/8	7/8-14	1-3/8	2.00	.97	.47	1.30	2-212
12M2TU12		3/4	1-1/16-12	1-1/2	2.16	.97	.56	1.49	2-215
16M2TU16		1	1-5/16-12	1-3/4	2.47	1.22	.56	1.74	2-219

Dimensions for Reference Only, Subject to Change

tube end to "O" ring pipe thread M3TU

includes "O" ring

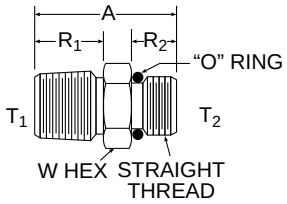


PARKER PART NO.	T TUBE O.D.	INCHES NPT PIPE THREAD	W HEX	A	K	R	X DIA.	O-RING APR UNIFORM DASH NO.
1M3TU2	1/16	1/8	3/4	1.03	.34	.28	.74	2-111
4M3TU2	1/4	1/8	3/4	1.31	.63	.28	.74	2-111
4M3TU4	1/4	1/4	15/16	1.44	.63	.38	.93	2-113
4M3TU6	1/4	3/8	1-1/8	1.53	.63	.41	1.12	2-116
5M3TU2	5/16	1/8	3/4	1.34	.66	.28	.74	2-111
5M3TU4	5/16	1/4	15/16	1.47	.66	.38	.93	2-113
6M3TU2	3/8	1/8	3/4	1.38	.69	.28	.74	2-111
6M3TU4	3/8	1/4	15/16	1.50	.69	.38	.93	2-113
6M3TU6	3/8	3/8	1-1/8	1.59	.69	.41	1.12	2-116
8M3TU6	1/2	3/8	1-1/8	1.81	.91	.41	1.12	2-116
10M3TU8	5/8	1/2	1-3/8	2.14	.97	.53	1.30	2-212
12M3TU12	3/4	3/4	1-1/2	2.16	.97	.56	1.49	2-215
16M3TU16	1"	1"	1-3/4	2.56	1.22	.66	1.65	2-219

Dimensions for Reference Only, Subject to Change

pipe thread to SAE straight thread adapter FHOA

includes "O" ring



PARKER PART NO.	INCHES NPT T_1 PIPE THREAD	T_2 STRAIGHT THREAD	W HEX	A	R_1	R_2	O-RING AS UNIFORM DASH NO.
4-4 FHOA	1/4-18	7/16-20	9/16	1.20	.56	.36	3-904
6-6 FHOA	3/8-18	9/16-18	11/16	1.26	.56	.39	3-906
8-8 FHOA	1/2-14	3/4- 16	7/8	1.53	.75	.44	3-908
12-12 FHOA	3/4-14	1-1/16-12	1-1/4	1.75	.75	.59	3-912
16-16 FHOA	1-11-1/2	1-5/16-12	1-1/2	2.00	.94	.59	3-916

Dimensions for Reference Only, Subject to Change

Parker Hannifin Corporation
6035 Parkland Blvd.
Cleveland, OH 44124

Introduction

The Seal-Lok fitting is the Tube Fittings Division's most recently developed fitting. It was introduced in an effort to eliminate leakage in hydraulic systems and allow higher operating pressures.

The Seal-Lok fitting is an O-ring face seal type fitting that consists of a nut, a fitting body, an O-ring and a sleeve. As shown in Fig. B1, the flat face sleeve is brazed to the tube (the tubing may also be flanged to 90˚) and when the fitting is assembled, it compresses an O-ring in a precision machined groove in the fitting body to form a leak tight seal.

Seal-Lok fittings are suitable for any range of tube wall thickness and are also readily adaptable to pipe, metric tubing and hose.

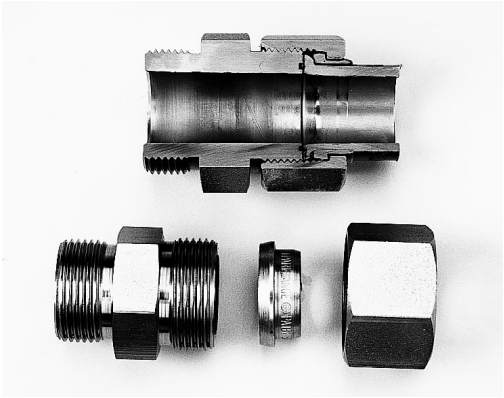


Fig. B1 — Flange Style Seal-Lok Fitting Components (nut, sleeve, fitting body with O-rings) and Assembled Seal-Lok Fitting Cutaway

Standard Material Specification. The standard materials used in the manufacture of Seal-Lok fittings are shown below.

Seal-Lok Fittings	Steel		Stainless Steel	
	ASTM	Type	ASTM	Type
Forged Bodies	A576	1214/1215	A182	316
Bar Stock Bodies	A108	12L14	A479	316
Cold Formed Nuts	A576	C1010	–	–
Machined Nuts*	A108	12L14 11L37	A479	316
Braze Sleeves & Braze Connectors	A108	12L14	A262	316L
Flange Sleeves	A108	12L14	A479	316

Table B1 — Standard Material Specifications for Seal-Lok Fittings

*All stainless steel nuts are coated to prevent galling at assembly.

Note: Other materials can be produced upon request.

Threads: The standard products shown in the visual index are manufactured with the applicable thread(s) from the thread forms listed below:

- SAE Straight Thread, UN/UNF Class 2A or 2B
- NPTF and NPT

Finish: Zinc with yellow chromate is used on all standard steel products. Stainless steel fittings are passivated.

Conformance Standards

Approvals

DET Norske Veritas — Approved for use in hydraulic systems up to size 38mm O.D. (1 1/2") as shown on certificate P-9538.

AGA/CGA — Stainless steel fittings approved for use in Natural Gas Vehicle per Engineering Report No. 125-AGA1-85.

American Bureau of Shipping (ABS) — Type approved for hydraulic systems and compressed air/instrument air systems per certificate No. 98-C12949-X.

Specifications

SAE Standards. Seal-Lok fittings meet or exceed all requirements of SAE J1453.

Consult catalog 4300, available from Parker Catalog Services for complete information and specifications on standards, sizes and options for Seal-Lok fittings.

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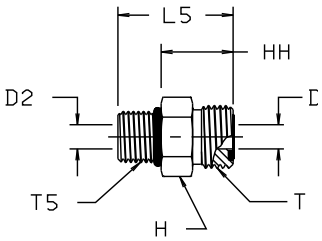
Cleveland, OH 44124

Straight Thread Connector



F5OLO

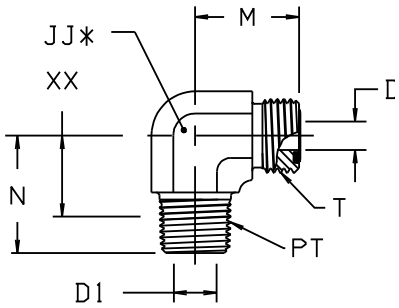
ORFS tube end / straight thread O-ring

SAE 520120
Part Number Information
F5L - Body only
F5OLO - Assembled with O-rings
All dimensions are in inches

TUBE FITTING PART #	TUBE. O.D	T TUBE END UN/UNF-2A	T5 PORT THD UN/UNF-2A	D** DRILL	D2** DRILL	H HEX	HH AFTER ASSY.	L5	STANDARD MATERIAL FROM STOCK SS
4 F5OLO	1/4	9/16-18	7/16-20	0.172	0.172	5/8	0.70	1.13	•
4-6 F5OLO	1/4	9/16-18	9/16-18	0.172	0.264	3/4	0.73	1.20	•
6 F5OLO	3/8	11/16-16	9/16-18	0.264	0.264	3/4	0.78	1.25	•
6-4 F5OLO	3/8	11/16-16	7/16-20	0.264	0.172	3/4	0.91	1.34	•
6-8 F5OLO	3/8	11/16-16	3/4-16	0.264	0.264	7/8	0.83	1.38	•
8 F5OLO	1/2	13/16-16	3/4-16	0.378	0.378	7/8	0.89	1.44	•
8-6 F5OLO	1/2	13/16-16	9/16-18	0.378	0.264	7/8	1.00	1.47	•

**Manufacturing option permits a single drill through equal to the smaller of D and D2.

Male Pipe Elbow



*JJ — ACROSS WRENCH FLATS

CLO

ORFS tube end / male pipe end

Part Number Information
CL - Body only
CLO - Assembled with O-rings
All dimensions are in inches

TUBE FITTING PART #	TUBE O.D.	T TUBE END UN/UNF-2A	PT PORT THD NPTF	D DRILL	D1 DRILL	JJ	M	N	XX AFTER ASSY.	STANDARD MATERIAL FROM STOCK SS
4 CLO	1/4	9/16-18	1/8-27	0.172	0.188	9/16	0.85	0.80	0.57	•
4-4 CLO	1/4	9/16-18	1/4-18	0.172	0.281	9/16	0.85	1.12	0.78	•
4-6 CLO	1/4	9/16-18	3/8-18	0.172	0.406	3/4	0.97	1.22	0.87	•
6 CLO	3/8	11/16-16	1/4-18	0.264	0.281	3/4	0.98	1.09	0.75	•
6-6 CLO	3/8	11/16-16	3/8-18	0.264	0.406	3/4	0.98	1.22	0.87	•
6-8 CLO	3/8	11/16-16	1/2-14	0.264	0.531	7/8	1.15	1.47	1.01	•
8 CLO	1/2	13/16-16	3/8-18	0.378	0.406	3/4	1.10	1.22	0.87	•
8-4 CLO	1/2	13/16-16	1/4-18	0.378	0.281	3/4	1.10	1.22	0.87	•
8-8 CLO	1/2	13/16-16	1/2-14	0.378	0.531	7/8	1.10	1.47	1.01	•

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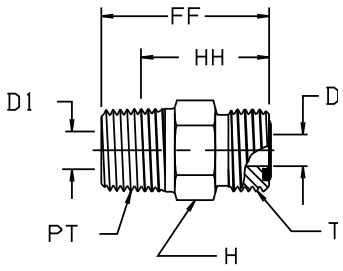
Male Pipe Connector



FLO

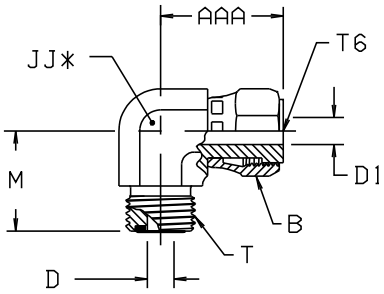
ORFS tube end / male pipe end

Part Number Information
FL - Body only
FLO - Assembled with O-rings
All dimensions are in inches

TUBE FITTING PART #	TUBE O.D.	T TUBE END UN/UNF-2A	PT PORT THD NPTF	D DRILL	D1 DRILL	FF	H HEX	HH AFTER ASSY.	STANDARD MATERIAL FROM STOCK SS
4 FLO	1/4	9/16-18	1/8-27	0.172	0.188	1.07	5/8	0.83	•
4-4 FLO	1/4	9/16-18	1/4-18	0.172	0.281	1.26	5/8	0.92	•
4-6 FLO	1/4	9/16-18	3/8-18	0.172	0.172	1.32	3/4	0.98	•
6 FLO	3/8	11/16-16	1/4-18	0.264	0.264	1.25	3/4	0.91	•
6-6 FLO	3/8	11/16-16	3/8-18	0.264	0.406	1.34	3/4	0.99	•
6-8 FLO	3/8	11/16-16	1/2-14	0.264	0.531	1.55	7/8	1.09	•
8 FLO	1/2	13/16-16	3/8-18	0.378	0.406	1.48	7/8	1.13	•
8-4 FLO	1/2	13/16-16	1/4-18	0.378	0.281	1.48	7/8	1.13	•
8-8 FLO	1/2	13/16-16	1/2-14	0.378	0.531	1.64	7/8	1.18	•

* Manufacturing option permits a single drill through equal to the smaller of D and D1.

Swivel Nut Elbow



*JJ — ACROSS WRENCH FLATS

C6LO

ORFS swivel / ORFS tube end

SAE 520221
Part Number Information
C6L - Body only
C6LO - Assembled with O-rings
All dimensions are in inches

TUBE FITTING PART #	TUBE O.D.	T TUBE END UN/UNF-2A	T6 SWIVEL UN/UNF-2B	AAA	B HEX	D DRILL	D1 DRILL	JJ	M	STANDARD MATERIAL FROM STOCK SS
4 C6LO	1/4	9/16-18	9/16-18	1.07	11/16	0.172	0.166	9/16	0.85	•
6 C6LO	3/8	11/16-16	11/16-16	1.17	13/16	0.264	0.264	3/4	0.98	•
8 C6LO	1/2	13/16-16	13/16-16	1.49	15/16	0.378	0.358	3/4	1.10	•

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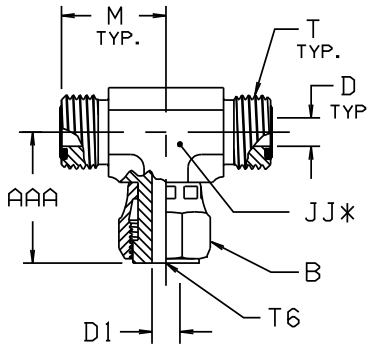
Swivel Nut Branch Tee

S6LO

ORFS swivel / ORFS tube ends

SAE 520433
Part Number Information
S6L - Body only
S6LO - Assembled with O-rings
All dimensions are in inches



*JJ — ACROSS WRENCH FLATS

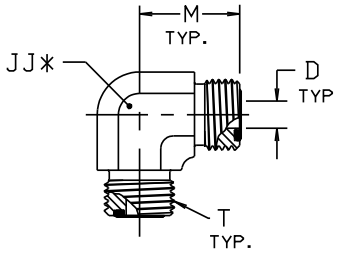
TUBE FITTING PART #	TUBE O.D.	T TUBE END UN/UNF-2A	T6 SWIVEL UN/UNF-2B	AAA	B HEX	D DRILL	D1 DRILL	JJ	M	STANDARD MATERIAL FROM STOCK SS
4 S6LO	1/4	9/16-18	9/16-18	1.07	11/16	0.172	0.166	9/16	0.85	•
6 S6LO	3/8	11/16-16	11/16-16	1.17	13/16	0.264	0.264	3/4	0.98	•
8 S6LO	1/2	13/16-16	13/16-16	1.49	15/16	0.378	0.358	3/4	1.10	•

Union Elbow

ELO

ORFS tube end / ORFS tube end

SAE 520201
Part Number Information
EL - Body only
ELO - Assembled with O-rings
All dimensions are in inches



*JJ — ACROSS WRENCH FLATS

TUBE FITTING PART #	TUBE O.D.	T TUBE END UN/UNF-2A	D DRILL	JJ	M	STANDARD MATERIAL FROM STOCK SS
4 ELO	1/4	9/16-18	0.172	9/16	0.85	•
6 ELO	3/8	11/16-16	0.264	3/4	0.98	•
8 ELO	1/2	13/16-16	0.378	3/4	1.10	•

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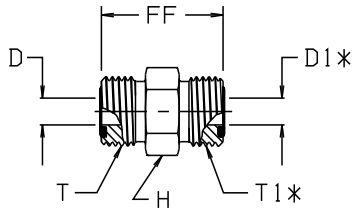
Union

HLO

ORFS tube end / ORFS tube end

SAE 520101
Part Number Information
HL - Body only
HLO - Assembled with O-rings
All dimensions are in inches



*D1 & T1 ARE FOR JUMP SIZES ONLY.

OTHERWISE D & T ARE TYPICAL

TUBE FITTING PART #	TUBE O.D.	T TUBE END UN/UNF-2A	T1 TUBE END UN/UNF-2A	D** DRILL	D1** DRILL	FF	H HEX	STANDARD MATERIAL FROM STOCK SS
4 HLO	1/4	9/16-18		0.172		1.08	5/8	•
6 HLO	3/8	11/16-16		0.264		1.22	3/4	•
8 HLO	1/2	13/16-16		0.378		1.39	7/8	•

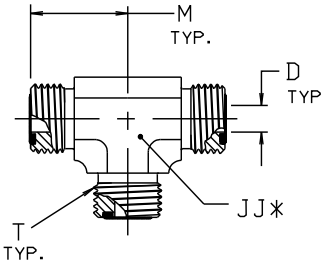
**Manufacturing option permits a single drill through equal to the smaller of D and D1.

Union Tee

JLO

ORFS tube ends

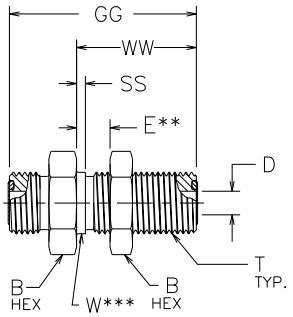
SAE 520401
Part Number Information
JL - Body only
JLO - Assembled with O-rings
All dimensions are in inches



*JJ — ACROSS WRENCH FLATS

TUBE FITTING PART #	TUBE O.D.	T TUBE END UN/UNF-2A	D DRILL	JJ	M	STANDARD MATERIAL FROM STOCK SS
4 JLO	1/4	9/16-18	0.172	9/16	0.85	•
6 JLO	3/8	11/16-16	0.264	3/4	0.98	•
8 JLO	1/2	13/16-16	0.378	3/4	1.10	•

Bulkhead Union



WLO

ORFS tube end / ORFS tube end

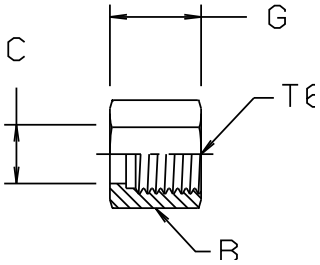
SAE 520601

Part Number Information
WL - Body only
WLO - Assembled with O-rings
WLO - WLNL - Assembled with O-rings and locknut
All dimensions are in inches

TUBE FITTING PART #	TUBE O.D.	T TUBE END UN/UNF-2A	B HEX	D DRILL	E** MAX	GG	SS	W*** DIA.	WW	STANDARD MATERIAL FROM STOCK SS
4 WLO	1/4	9/16-18	13/16	0.172	0.53	1.90	0.06	0.56	1.24	•
6 WLO	3/8	11/16-16	1	0.264	0.53	2.09	0.06	0.69	1.34	•
8 WLO	1/2	13/16-16	1 1/8	0.378	0.53	2.30	0.06	0.81	1.44	•

** Maximum bulkhead thickness.
*** Bulkhead pilot diameter. Recommended clearance hole is W + 0.015".

Nut



BL

ORFS tube nut

SAE 520110

All dimensions are in inches

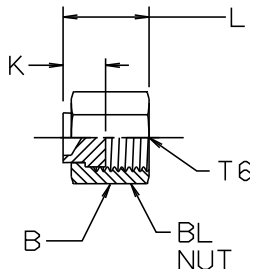
TUBE FITTING PART #	TUBE O.D.	T6 UN/UNF-2B	B HEX	C	G	STANDARD MATERIAL FROM STOCK SS
4 BL	1/4	9/16-18	11/16	0.41	0.58	•
6 BL	3/8	11/16-16	13/16	0.53	0.67	•
8 BL	1/2	13/16-16	15/16	0.65	0.83	•

Cap

FNL

ORFS tube end cap

SAE 520112



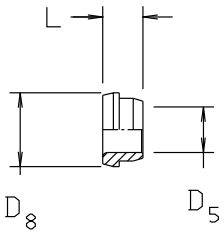
All dimensions are in inches

TUBE FITTING PART #	TUBE O.D.	T6 UN/UNF-2B	B HEX	K	L	STANDARD MATERIAL FROM STOCK SS
4 FNL	1/4	9/16-18	11/16	0.34	0.65	•
6 FNL	3/8	11/16-16	13/16	0.37	0.74	•
8 FNL	1/2	13/16-16	15/16	0.47	0.90	•

Parflange Sleeve for Inch Tubing

TPL

ORFS Mechanically Attachable Sleeve



All dimensions are in inches

TUBE FITTING PART #	D5 TUBE O.D.	D8 DIA.	L	STANDARD MATERIAL FROM STOCK SS
4 TPL	1/4	.50	0.30	•
6 TPL	3/8	.62	0.34	•
8 TPL	1/2	.74	0.42	•

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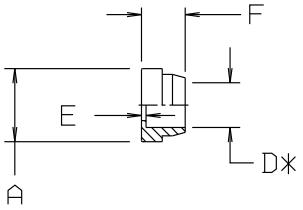
Sleeve

TL

ORFS silver braze sleeve*

SAE 520115



*D IS FOR SILVER BRAZING

All dimensions are in inches

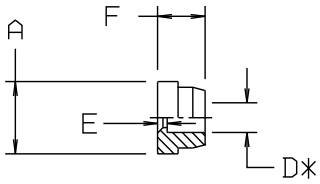
TUBE FITTING PART #	D* TUBE O.D.	A DIA.	D*	E	F	STANDARD MATERIAL FROM STOCK SS
4 TL	1/4	0.50	0.26	0.04	0.37	•
6 TL	3/8	0.62	0.38	0.04	0.37	•
8 TL	1/2	0.75	0.51	0.04	0.37	•

Reducer Sleeve

TL Reducer

ORFS silver braze sleeve reducer*

SAE 520115



*D IS FOR SILVER BRAZING

All dimensions are in inches

TUBE FITTING PART #	TUBE O.D. REDUCTION	A	D*	E	F	STANDARD MATERIAL FROM STOCK SS
6-4 TL	3/8 to 1/4	0.62	0.26	0.08	0.41	•

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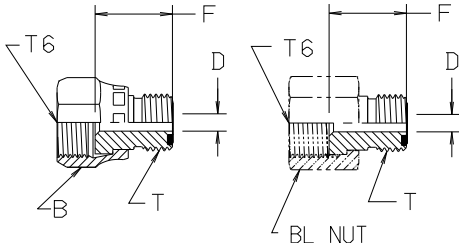
Tube End Reducer

TRLO

ORFS swivel / ORFS tube end

SAE 520123

Part Number Information
TRL - Body only
TRL-BL - Body with Large Nut
TRLO - Body with O-Ring
TRLO-BL - Body with O-Ring and Large Nut
All dimensions are in inches



ASSEMBLED WITH CRIMP NUT

ASSEMBLED WITH LARGE BL NUT

TUBE FITTING PART #	TUBE O.D.	T TUBE END UN/UNF-2A	T6 UN/UNF-2B	B HEX	D DRILL	F	STANDARD MATERIAL FROM STOCK SS
***6-4 TRLO**	3/8 to 1/4	9/16-18	11/16-16	13/16	0.172	0.77	•
8-4 TRLO	1/2 to 1/4	9/16-18	13/16-16	15/16	0.172	0.86	•
***8-6 TRLO**	1/2 to 3/8	11/16-16	13/16-16	15/16	0.264	0.88	•

* These sizes come manufactured with a crimp style nut on the large end, therefore, levels TRLN and TRLON do not apply.

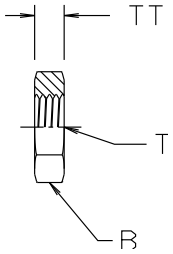
Bulkhead Locknut

WLNL

Bulkhead fitting locknut

SAE 520118

All dimensions are in inches



TUBE FITTING PART #	TUBE O.D.	T TUBE END UN/UNF-2B	B HEX	TT	STANDARD MATERIAL FROM STOCK SS
4 WLNL	1/4	9/16-18	13/16	0.27	•
6 WLNL	3/8	11/16-16	1	0.32	•
8 WLNL	1/2	13/16-16	1 1/8	0.35	•

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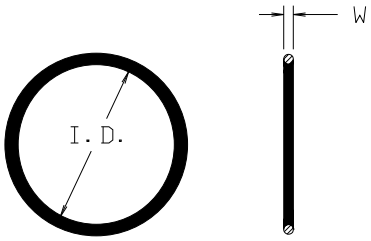
ORFS Tube End O-ring

Face Seal O-Ring



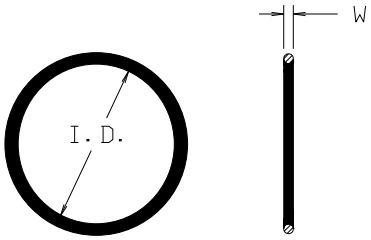
Part Number Information
Specify size and compound
ÊExample: 2-018 N0756
All dimensions are in inches

TUBE FITTING SIZE	O-RING PART #	TUBE O.D.	I.D.	W	STANDARD MATERIAL FROM STOCK N0756
4	2-011	1/4	0.30	0.07	•
6	2-012	3/8	0.36	0.07	•
8	2-014	1/2	0.49	0.07	•

N0756 is a necessary 75-durometer Nitrile (e.g., Buna-N) for CNG applications.
Other compounds may be purchased from O-ring Division (606) 269-2351.

SAE Straight Thread Port O-ring

SAE O-Ring



Part Number Information
Specify size and compound
Example: 3-906 N0552
All dimensions are in inches

TUBE FITTING SIZE	O-RING PART #	TUBE O.D.	I.D.	W	STANDARD MATERIAL FROM STOCK N0756
4	3-904	1/4	0.35	0.07	•
6	3-906	3/8	0.47	0.08	•
8	3-908	1/2	0.64	0.09	•

N0756 is a necessary 75-durometer Nitrile (e.g., Buna-N) for CNG applications.
Other compounds may be purchased from O-ring Division (606) 269-2351.

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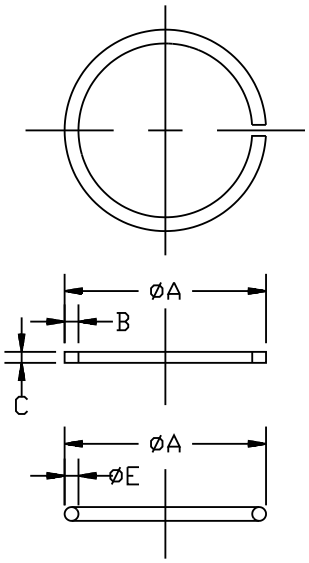
Silver Braze Ring for Inch Tubing

SBR



Part Number Information
Specify size and tube material
ÊExample: 8 SBR (Braze ring for 1/2" steel or copper tubing)
8 SBR-SS (Braze ring for 1/2" stainless steel tubing)
All dimensions are in inches

TUBE FITTING PART #	TUBE O.D.	A	B	C	E	STANDARD MATERIAL FROM STOCK SS
4 SBR	1/4	0.33	-	-	0.05	•
6 SBR	3/8	0.49	0.07	0.03	-	•
8 SBR	1/2	0.57	0.07	0.03	-	•

SBR-SS recommended for stainless tubing, but can be used on steel tubing.
Contact the Tube Fittings Division for braze rings used in marine applications.

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SAFETY GUIDE FOR SELECTING AND USING QUICK ACTION COUPLINGS AND RELATED ACCESSORIES

DANGER: Failure or improper selection or improper use of quick action couplings or related accessories can cause death, personal injury and property damage. Possible consequences of failure or improper selection or improper use of quick action couplings or related accessories include but are not limited to:

- **Couplings or parts thrown off at high speed.**
- **High velocity fluid discharge.**
- **Explosion or burning of the conveyed fluid.**
- **Contact with suddenly moving or falling objects that are to be held in position or moved by the conveyed fluid.**
- **Dangerously whipping hose.**
- **Contact with conveyed fluids that may be hot, cold, toxic, or otherwise injurious.**
- **Sparking or explosion while paint or flammable liquid spraying.**

Before selecting or using any Parker quick action couplings or related accessories, it is important that you read and follow the following instructions.

1.1 Scope: This safety guide provides instructions for selecting and using (including installing connecting, disconnecting, and maintaining) quick action couplings and related accessories (including caps, plugs, blow guns, and two way valves). This safety guide is a supplement to and is to be used with, the specific Parker publications for the specific quick action couplings and related accessories that are being considered for use.

1.2 Fail-Safe: Quick action couplings or the hose they are attached to can fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of the quick action coupling or hose will not endanger persons or property.

1.3 Distribution: Provide a copy of this safety guide to each person that is responsible for selecting or using quick action coupling products. Do not select or use quick action couplings without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.

1.4 User Responsibility: Due to the wide variety of operating conditions and uses for quick action couplings, Parker and its distributors do not represent or warrant that any particular quick action coupling is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the quick action couplings.
- Assuring that the user's requirements are met and that the use presents no health or safety hazards.
- Providing all appropriate health and safety warnings on the equipment on which the quick action couplings are used.

1.5 Additional Questions: Call the appropriate Parker customer service department if you have any questions or require any additional information. For the telephone numbers of the appropriate customer service department, see the Parker publication for the product being considered or used.

2.0 QUICK ACTION COUPLING SELECTION INSTRUCTIONS

2.1 Pressure: Quick action couplings selection must be made so that the published rated pressure of the coupling is equal to or greater than the maximum system pressure. Surge pressures in the system higher than the rated pressure of the coupling will shorten the quick action coupling's life. Do not confuse burst pressure or other pressure values with rated pressure and do not use burst pressure or other pressure values for this purpose.

2.2 Fluid Compatibility: Quick action couplings selection must assure compatibility of the body and seal materials with the fluid media used. See the fluid compatibility chart in the Parker publication for the product being considered or used.

2.3 Temperature: Be certain that fluid and ambient temperatures, both steady and transient, do not exceed the limitations of the quick action couplings. Use caution and hand protection when connecting or disconnecting quick action couplings that are heated or cooled by the media they are conducting or by their environment.

2.4 Size: Transmission of power by means of pressurized liquid varies with pressure and rate of flow. The size of the quick action couplings and other components of the system must be adequate to keep pressure losses to a minimum and avoid damage due to heat generation or excessive fluid velocity.

2.5 Pressurized Connect or Disconnect: If connecting or disconnecting under pressure is a requirement, use only quick action couplings designed for that purpose. The rated operating pressure of a quick action coupling may not be the pressure at which it may be safely connected or disconnected.

2.6 Environment: Care must be taken to ensure that quick action couplings are either compatible with or protected from the environment (that is, surrounding conditions) to which they are exposed. Environmental conditions including but not limited to ultraviolet radiation, ozone, moisture, water, salt water, chemicals, and air pollutants can cause degradation and premature failure.

2.7 Locking Means: Ball locking quick action couplings can unintentionally disconnect if they are dragged over obstructions on the end of a hose or if the sleeve is bumped or moved enough to cause disconnect. Sleeves designed with flanges to provide better gripping for oily or gloved hands are especially susceptible to accidental disconnect and should not be used where these conditions exist. Sleeve lock or union (threaded) sleeve designs should be considered where there is a potential for accidental uncoupling.

2.8 Mechanical Loads: External forces can significantly reduce quick action couplings' life or cause failure. Mechanical loads which must be considered include excessive tensile or side loads, and vibration. Unusual applications may require special testing prior to quick action couplings selection.

2.9 Specifications and Standards: When selecting quick action couplings, government, industry, and Parker specifications must be reviewed and followed as applicable.

2.10 Vacuum: Not all quick action couplings are suitable or recommended for vacuum service. Quick action couplings used for vacuum applications must be selected to ensure that the quick actions couplings will withstand the vacuum and pressure of the system.

2.11 Fire Resistant Fluids: Some fire resistant fluids require seals other than the standard nitrile used in many quick action couplings.

2.12 Radiant Heat: Quick action couplings can be heated to destruction or loss of sealability without contact by such nearby items as hot manifolds or molten metal. The same heat source may then initiate a fire. This can occur despite the presence of cool air around the quick action couplings.

2.13 Welding and Brazing: Heating of plated parts, including quick action couplings and port adapters, above 450°F (232°C) such as during welding, brazing, or soldering may emit deadly gases and may cause coupling seal damage.

3.0 QUICK ACTION COUPLING INSTALLATION INSTRUCTIONS

3.1 Pre-Installation Inspection: Before installing a quick action coupling, visually inspect it and check for correct style, body material, seal material, and catalog number. Before final installation, coupling halves should be connected and disconnected with a sample of the mating half with which they will be used.

3.2 Quick Action Coupling Halves From Other Manufacturers: If a quick action coupling assembly is made up of one Parker half and one half from another manufacturer, the lowest pressure rating of the two halves should not be exceeded.

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3.3 Fitting Installation: Use a thread sealant, lubricant, or a combination of both when assembling pipe thread joints in quick action couplings. Be sure the sealant is compatible with the system fluid or gas. To avoid system contamination, use a liquid or paste type sealant rather than a tape style. Use the flats provided to hold the quick action coupling when installing fittings. Do not use pipe wrenches or a vice on other parts of the coupling to hold it when installing or removing fittings as damage or loosening of threaded joints in the coupling assembly could result. Do not apply excessive torque to taper pipe threads because cracking or splitting of the female component can result.

3.4 Caps and Plugs: Use dust caps and plugs when quick action couplings are not coupled to exclude dirt and contamination and to protect critical surfaces from damage.

3.5 Coupling Location: Locate quick action couplings where they can be reached for connect or disconnect without exposing the operator to slipping, falling, getting sprayed, or coming in contact with hot or moving parts.

3.6 Hose Whips: Use a hose whip (a short length of hose between the tool and the coupling half) instead of rigidly mounting a coupling half on hand tools or other devices. This reduces the potential for coupling damage if the tool is dropped and provides some isolation from mechanical vibration which could cause uncoupling.

4.0 QUICK ACTION COUPLING MAINTENANCE INSTRUCTIONS

4.1 Even with proper selection and installation, quick action coupling life may be significantly reduced without a continuing maintenance program. Frequency should be determined by the severity of the application and risk potential. A maintenance program must be established and followed by the user and must include the following as a minimum:

4.2 Visual Inspection of Quick Action Couplings: Any of the following conditions require immediate shut down and replacement of the quick action coupling:

- Cracked, damaged, or corroded quick action coupling parts.
- Leaks at the fitting, valve or mating seal.
- Broken coupling mounting hardware, especially breakaway clamps.

4.3 Visual Inspection All Other: The following items must be tightened, repaired or replaced as required:

- Leaking seals or port connections.
- Remove excess dirt buildup on the coupling locking means or on the interface area of either coupling half.
- Clamps, guards, and shields.
- System fluid level, fluid type and any air entrapment.

4.4 Functional Test: Operate the system at maximum operating pressure and check for possible malfunctions and freedom from leaks. Personnel must avoid potential hazardous areas while testing and using the system.

4.5 Replacement Intervals: Specific replacement intervals must be considered based on previous service life, government or industry recommendations, or when failures could result in unacceptable downtime, damage or injury risk. See instruction 1.2 above.

Additional copies of the preceding safety information can be ordered by requesting “Safety Guide For Selecting and Using Quick Action Couplings and Related Accessories,” Parker Publication No. 3800-B1.0

Contact The Quick Coupling Division, Minneapolis, MN.

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